Celebrate Nurses Week

2015 Nursing Professional Poster Display
# Table of Contents

**Education Posters** ........................................................................................................................................ 7

- Postpericardiotomy Syndrome ..................................................................................................................... 8
- The Path to Perioperative Nursing as experienced by Twelve New Graduate Nurses ..................... 10
- Utilizing the Behavioral Response Team to Assist in Caring for Patients with Behavioral Challenges ... 12
- Behavioral Triggers and the Therapeutic Approach .............................................................................. 13
- DiGeorge Syndrome .................................................................................................................................. 15
- Down Syndrome ......................................................................................................................................... 17
- The Role of the Pediatric Anesthesia Clinical Research Nurse: An Interdisciplinary Collaboration .... 19
- Bio-enhanced Anterior Cruciate Ligament Repair: An Innovative Treatment for Anterior Cruciate Ligament Injuries ......................................................................................................................... 21
- Network In-Situ Simulation Program ........................................................................................................ 23
- The Anesthesia Research Internship Program – Growth and Development ........................................ 26
- Case Study: The Breast Milk Enhancing Effect of Moringa Oleifera Capsules in Combination with Mother’s Milk Tea in a Mother of an Ill Neonate Admitted with Hypoplastic Left Heart Syndrome ..... 29
- Malignant Hyperthermia Preparedness: A Multidisciplinary Approached Aimed at the Recognition and Management of a Malignant Hyperthermia Crisis during Surgery and Other Invasive Procedures ..... 31
- Overcoming Obstacles: Bridging the Adolescent on Outpatient Ventricular Assist Device (VAD) Support ........................................................................................................................................ 34
- Identify Benzocaine-Induced Methemoglobinemia .................................................................................. 36
- Eating Disorders: Systemic Effects ............................................................................................................... 38
- The ABCs of Aneurysmal Bone Cyst .......................................................................................................... 40
- Improving the Health Literacy of Asthma Education Materials ............................................................... 42
- Challenges of Early Phase Trials in Pediatric Oncology Patients ............................................................ 44
- Case study: Feeding refusal/poor weight gain in a 4 months old exclusively breastfed infant ............ 46
- Amniotic Membrane Transplantation: The Surgical Treatment to Manage Ocular Manifestations in Stevens - Johnson Syndrome and Toxic Epidermal Necrolysis ................................................................. 47
- The Nuts and Bolts of Creating a Asynchronous Journal Club for Pediatric Nurses ............................ 49
- Hospital Infantil Teletón de Oncología and Dana-Farber/Boston Children’s Cancer and Blood Disorders Center Nurses Partner to Improve Pediatric Oncology Care ...................................................................... 50
- What is it We Need? Exploring the Learning Needs of a Large Staff ....................................................... 53
- Lyme Carditis ............................................................................................................................................ 55
Therapeutic Management of Emergency Room Patients in Behavioral Crisis ........................................... 57
Legislative Action Interest Group (LAIG) Supporting Nurse Participation in Health Policy ....................... 58
Long-Acting Reversible Contraception (LARC) in the Adolescent Population ....................................... 60
Management of a Malignant Hyperthermia Crisis in the Boston Children’s Hospital Satellite Facilities at Waltham and Lexington................................................................. 62
Partners in Telemedicine ...................................................................................................................... 64
Types of Seizures in the Pediatric Population ......................................................................................... 66

Evidence Based Practice Posters ........................................................................................................ 68
To Wear or Not to Wear: Mask Use in Pediatric Oncology Patients ......................................................... 69
Use of Reiki to Enhance the Practice of Critical Care Nurses: A Critical Appraisal of the Literature ..... 72
Improving Intravenous Fluid Delivery in Pediatric Septic and Hypovolemic Shock .......................... 74

Project Posters .................................................................................................................................. 77
Revitalizing & Energizing the RN Peer Review Process ..................................................................... 78
Sharps Injury Prevention in the Pediatric Perioperative Setting ............................................................. 80
Integrating Research Into the Electronic Health Record to Improve Clinical Care ............................. 83
Hospital Length of Stay after Pediatric Renal Transplantation ............................................................. 86
Awareness of International Volunteering; Waltham Nurses Global Impact ........................................ 88
DisCo: Patient-Centered Digital Communication After Discharge ...................................................... 90
Influences on New Graduate Nurse Transition: A Literature Review Using a Social Ecological Framework .......................................................................................................................... 92
The Need for Succession Planning in a Pediatric Operating Room: Development of a Perioperative New Graduate Program ........................................................................................................ 94
Cultivating Global Partnerships in Pediatric Critical Care Nursing: Reinvigorating the Medical Surgical Intensive Care Unit (MSICU) Sister Pediatric Intensive Care Unit (PICU) Project ............................................. 97
Bridging the Gap: Walking for Success on ECMO .............................................................................. 100
Martha Eliot Health and Safety Fair .................................................................................................... 103
Increasing Awareness and Utilization of Adolescent Clinic Resources by Implementing a Patient Questionnaire ........................................................................................................................................... 104
Same Day Motility in the Pediatric Population: Creating a Peri-Procedural Program for Outpatient Motility Studies ............................................................................................................ 105
Using the EMR to Address the Needs of At-Risk Patients and Improve Safety .................................... 107
Ergonomics- Keeping Staff safe at work! ............................................................................................. 110
RNSAFE: A Remote Way to Witness High Risk Medications ............................................................... 112
The Impact of a Support Team for the MyChildren’s Patient Portal .......................................................... 115
Retirement of a Custom Legacy Application While Promoting the Enterprise EHR Solution ............ 118
Creative Staffing Solutions: A Cross-Training Program for In-Patient Cardiac Nurses to the Cardiac Intensive Care Unit (CICU) ................................................................. 121
Use of Electronic Tool for Perioperative Patient Handoff ................................................................. 123

QI Project Posters ........................................................................................................................................ 125

Are We Ready for Ebola? ......................................................................................................................... 126
Initiative to Prevent EEG Lead-Related Pressure Ulcers ................................................................. 128
Improving the Hospital Experience for Individuals with Intellectual Disabilities ...................... 130
Utilizing time study data to expand the nursing role in the CCS Clinic ........................................... 132
Population Management: Defining the Population ........................................................................... 136
Consistency of Care in the Cardiac Catheterization Lab: Heart Transplant and Pulmonary Vein Stenosis (PVS) Patients ........................................................................................................... 139
An Assessment of the Current Practice and Care of Pediatric Congenital Heart Patients Post Cardiac Catheterization ............................................................................................................. 142
Increasing Pediatric Advanced Care Team Consultation in the Neonatal Intensive Care Unit ...... 145
Implementation of a Sepsis Triage Trigger Tool .................................................................................. 148
Reducing Medication Errors with a Hospital-Wide Red Zone Medication Safety Initiative ............ 151
Filling in the Gaps in Health Care-Creating a Community Based Center of Excellence for Patient and Family Centered Care Coordination in the Primary Care Setting ......................................................... 154
The Expansion of the Nursing Role in Primary Care ........................................................................ 158
Effectiveness of the Trauma Nurse Leader Education Initiative to Improve Nursing Documentation for Pediatric Patients Meeting Trauma Stat and Alert Criteria ........................................................................ 161
Financial Health of Families with Hospitalized Infants: A Quality Improvement Initiative .............. 164
Implementation of an Inpatient Cardiology Anticoagulation Monitoring Program (I-CAMP) ........ 167
Time is of the Essence: Overcoming Barriers to Expedited Treatment of Chlamydia .................... 169
Improving the Use of Sterile Water for Oral Care and Tube Flushes in Pediatric Intensive Care Units .............................................................................................................................................. 172
Use of Healthcare Social Media by Patients and Parents .................................................................... 174
Bone Health QAPI Project for Pediatric Lung Transplant Patients .................................................... 177
Creation of a Vascular Access Team in the Operating Room (OR) .................................................... 179
Can It Be Done? Can One Busy Urban Primary Care Program Increase the Role of the Registered Nurse to Better Meet the Complex Needs of our Patient Population .................................................................................. 181
To Keep, Toss or Decrease...Methods for Decreasing Costs ........................................................... 184
Reducing Non-Emergent Emergency Department Visits: A Quality Improvement Study .......................... 187
Using Pressure Ulcer Prevalence (PUP) Survey Data to Identify Opportunities to Improve Pressure Ulcer Prevention Strategies ................................................................................................................................. 190
Improving Bone Health in Children Supported on Ventricular Assist Devices (VAD) ......................... 193
Monitoring the Health of the Work Environment with a Daily Assessment Tool: The REAL (Relative Environment Assessment Lens) Indicator ........................................................................................................... 196
Male Nurses, Do They Experience Discrimination in Assignments? ................................................. 199
Barriers to the use of face protection for standard precautions by health care workers .................... 202
Inappropriate Clostridium Difficile Testing in Pediatric Patients Receiving Laxatives or Stool Softeners .......................................................................................................................................................... 204
Association Between Storage Interval and Contamination of Reprocessed Flexible Endoscopes in a Pediatric Gastrointestinal Procedural Unit .............................................................................................................. 206
PICC Line Placement: 2 versus 1 RN ...................................................................................................... 209
Emergency Department Abscess Follow-up Program ........................................................................... 211
And the Survey Says... Improving our ICU Mentor Program through a Qualitative Survey Design ...... 214
Identification of Nutritional Challenges in the Neonate with Complex Congenital Heart Disease ...... 217
Fire in the MSICU: What do we do? ....................................................................................................... 219
Roles for Nursing in Value-Based Care: CHICO High Risk Care Management Program ..................... 222
Ensuring Timely Refills of Baclofen Pumps: Importance, Implications and Measures ....................... 225
From Worst to First: Journey to Medication Scanning Compliance in a Pediatric Emergency Department .................................................................................................................................................................. 228
Beneficial Outcomes of Nursing Assessment for Caries Risk using an Electronic Caries Risk Assessment Tool in the Primary Care ............................................................................................................... 231
Quantifying and Qualifying Care Coordination in the Boston Children’s Hospital Ambulatory Cardiology Clinics ....................................................................................................................................................... 234
Improving Nurse-to-Nurse Handover of Care in the NICU Utilizing a Modified I-PASS Sheet .......... 237
Improving HPV Immunization Rates among Adolescent Boys and Girls ........................................... 240
Optimizing Needle Pain Procedures: Collaboration between Nursing, Phlebotomy, and Child Life .............................. 243
Predictors of Infection in Proximal Tibia Allograft and Allograft-Prosthesis Composite Reconstructions ......................................................................................................................................................... 246
Optimizing Outcomes: Improving the Health of the Work Environment in the Cardiovascular Program .................................................................................................................................................... 249
HWE: Listening to Our Constituents ....................................................................................................... 252
Standardizing New Tracheostomy Education Across the Continuum ................................................. 255
Emergency Medical Identification for Patients at Risk for Bladder Rupture: A Boston Children’s Hospital Quality Improvement Initiative ................................................................. 258

Vascular Access Management in the Neonate with Congenital Heart Disease awaiting Cardiac Surgery .................................................................................................................. 261

Reduce Time to IV Antibiotic Administration in Patients Diagnosed with Probable Sepsis – A Lean Six Sigma Green Belt Project ................................................................. 264

Research Posters ................................................................................................................. 267

Consortium for Congenital Cardiac Care Measurement of Nursing Practice (C4-MNP): Phase 1 .... 268

Complexity Assessment and Monitoring to Ensure Optimal Outcomes (CAMEO) Acuity Across Cardiovascular Nursing .......................................................................................... 271

Integrating Complexity of Nursing Care Using the CAMEO .................................................. 274

Prevention and Management of Narcotic and Benzodiazepine Withdrawal in the Pediatric Intensive Care Unit ........................................................................................................ 277

The Healthy Work Environment: Assessment, Initiatives, and Outcomes in a Pediatric Intensive Care Unit .................................................................................................................. 280

Relationship of Health-Related Quality of Life to Neurodevelopmental Function in Fontan Adolescents .................................................................................................................. 283

Parent Perception of their Role in the Pediatric Cardiac Intensive Care Unit (PCICU) ............ 285

Critical Care Nursing Experience and Education are Associated with Outcomes Following Pediatric Cardiac Surgery: An Analysis of the STS Congenital Heart Surgery Database ......... 288

 Newly Licensed Nurses’ Experiences with Death and Dying in the Pediatric Intensive Care Unit ................................................................. 291

Undergraduate Nursing Student Responses to the TEDx Talk ‘On Being Present, Not Perfect’” .... 294

Quality of Life (QOL) in Children Dying of Cancer: The State of the Science ......................... 297

Predicting Immobility-related and Medical Device-related Pressure Ulcer Risk in Pediatric Patients: Validating the Braden Q + Device Study .................................................................. 299

Experience from Surveying Parental Motivation for Enrolling or Declining Participation in Pediatric Anesthesia Clinical Research: An Assessment of Randomized and Non-Randomized Clinical Studies 302

Assessment of Vitamin B12 Status in Pediatric Intestinal Failure Patients: Is Methylmalonic Acid a Reliable Biomarker? .......................................................................................... 306

Use of Ceftaroline to Treat Pulmonary Exacerbations for Patients with Cystic Fibrosis (CF) with Methicillin Resistant Staphylococcus Aureus (MRSA) Infection ........................................................................................................ 309

Pediatric Oncology Nurses’ Attitudes about Children Participating in Oncology Clinical Trials ........ 312

Index of Authors .................................................................................................................. 314
EDUCATION POSTERS
## Postpericardiotomy Syndrome

**Author(s):** Annmarie Baldwin MSN, RN, CCRN, NP-C

**Target Audience:** Registered Nurses, clinical assistants, nurse practitioners and physicians

**Objectives:**
- Define what postpericardiotomy syndrome is
- To educate clinical staff about the etiology, diagnosis and treatment of Postpericardiotomy syndrome

**Impact/Significance:**
- Increase knowledge background regarding postpericardiotomy syndrome
- Improve the identification and care of patients with postpericardiotomy syndrome

**Key Points:**
- What is postpericardiotomy syndrome?
- What is the etiology of postpericardiotomy syndrome?
- What are the clinical findings in postpericardiotomy syndrome?
- Diagnosis and treatment recommendations for postpericardiotomy syndrome

If this poster has been presented at a conference, which one: Northeast Pediatric Cardiology Nurses’ Association Conference October 2014
Postpericardiotomy Syndrome
Annmarie Baldwin MSN, RN, CCRN, NP-C

What Is Postpericardiotomy Syndrome (PPS)

- Postpericardiotomy syndrome (PPS) is a febrile illness which is the result of an inflammatory response within the pleura and pericardium.
- It occurs most commonly in patients after cardiac surgery or any surgery involving opening the pericardium.
- It may also occur after an MI catheterization procedure for stent placement, pacemaker placement, trauma and cardiac punctures.
- PPS is most often seen with TOP repair, ASD and VSD repairs, and cardiac transplant.

Etiology

- Believed to be an autoimmune response in the setting of a recent or remote viral infection.
- Associated with high antinuclear antibodies as well as high antibody titers of adenovirus, coxsackievirus B3, and cytomegalovirus.
- It occurs in approximately 25-30% of patients after a pericardiotomy.
- It is very rare in infants and patients under 2 years of age.

Presentation

- Symptoms usually develop within 1-6 weeks after a pericardiotomy, with a median onset of 4 weeks.
- Temperatures typically occur after the first week and are usually between 38-39°C, but can spike as high as 40°C.
- Patients typically present with fever, malaise, chest pain, and decreased appetite but typically appear well even in the setting of a higher fever.
- Children may report chest pain that worsens with inspiration and while supine position, as well as some reports of dyspnea.
- It is often seen with pleural and pericardial effusions.

Diagnosis

- Diagnosis is made by exclusion, but requires the following symptoms:
  - fever, pericardial and/or pleural rub, pleuritic chest pain and absence of any other identifiable causes.
- Echocardiography is the diagnostic standard and is used to assess for the following:
  - Presence of a fluid collection, ventricular contractility, and cardiac tamponade.
- Common laboratory abnormalities:
  - Elevated CRP and ESR
  - Leukocytosis with left shift.
  - Elevated antinuclear antibodies titer.
- ECG findings associated with PPS is similar to those seen in pericarditis and may include:
  - Global ST segment elevation and T-wave inversion.
  - Low QRS amplitude.

Treatment

- Medical management includes the use of nonsteroidal anti-inflammatory drugs such as aspirin or ibuprofen, typically for 4-6 week duration.
- There is reoccurrence rate of about 21%.
- For patients with reoccurrence corticosteroids such as prednisone may be administered for 1 week, followed by a 4-week tapering.
- Some patients may require pericardial and/or pleural drains depending on the size of the effusions.

References


Cardiovascular and Critical Care Nursing Science
Ann-Marie Baldwin@childrens.harvard.edu
The Path to Perioperative Nursing as experienced by Twelve New Graduate Nurses

Author(s): Jessica Baxter BSN, RN
Caite Cutler BSN, RN
Jennifer Hines BSN, RN
Daniela Rosa BSN, RN
Katie Stasaitis BSN, RN
Elizabeth Tierney BSN, RN

Target Audience: All perioperative staff considering creating a new graduate program

Objectives:
To provide details on the backgrounds of the 12 new graduate nurses and how they chose to participate in this program
To describe the perioperative new graduate program
To identify the new graduate nurses’ experiences and views throughout the program
To investigate future possibilities of similar programs at both BCH and in other institutions

Impact/Significance: The lessons learned from this newly developed Perioperative New Grad Program at Boston Children’s Hospital may be able to provide a foundation to other institutions looking to implement a similar program and provide insight to other new graduate nurses about this rewarding career.

Key Points: The twelve new graduate nurses came from a variety of backgrounds. The curriculum developed for the program was well thought-out and included a comprehensive mixture of hospital wide classes, hands-on labs, and didactic learning. Strengths of the program included the fact that the group cohorts enriched cohesiveness, the preceptors and faculty enhanced learning and provided mentorship, and the program curriculum was comprehensive and prepared the new nurse for their future career. The weaknesses of the program included the fact that the orientation groups started fairly close together, there were multiple preceptors per orientee, and there was occasionally an imbalance in didactic learning and hands-on training. Recommendations for future programs include modifying the time spend in pre-operative experiences, limiting group size, and ensuring mindfully assigned cases.

If this poster has been presented at a conference, which one: This poster will be presented at the AORN Surgical Conference and Expo 2015 in Denver, Colorado
The Path to Perioperative Nursing as Experienced by Twelve New Graduate Nurses

Jessica Baxter BSN, RN, Caite Cutler BSN, RN, Jennifer Hines BSN, RN, Daniela Rosa BSN, RN, Katie Staisaitis BSN, RN, and Elizabeth Tierney BSN, RN

Background
- Many new graduate nurses are unfamiliar with perioperative nursing and the potential for a long-term, fulfilling career in this area.
- The perioperative environment is highly technical and complex, which requires a novice nurse to quickly hone their critical thinking and advocacy skills.
- In the beginning of 2013, 12 new graduate nurses began their perioperative careers in the pilot Perioperative New Graduate Program at Boston Children's Hospital (BCH).

Objectives
- To provide details on the backgrounds of the 12 new graduate nurses and how they chose to participate in this program.
- To describe the perioperative new graduate program.
- To identify the new graduate nurses’ experiences and views throughout the program.
- To provide recommendations for similar programs at both BCH and other institutions.

Participant Backgrounds
A survey was conducted to assess the backgrounds of the participants in the BCH Perioperative New Graduate Program. All 12 participants responded anonymously. The following graphs reflect their responses.

The Program
The BCH Perioperative New Graduate Program consisted of two cohorts of six nurses. The cohorts began in January 2013 and March 2013.

Program Curriculum
- BCH new graduate nurse hospital-wide orientation comprised of seven classes and an individual presentation by each participant of a Focused Learning Development Project.
- PRE-OR rotations: Inpatient units, Central Processing Department, Post Anesthesia Care Unit, Day Surgery/Pre-Operative and Nurse Liaison.
- Completion of AORN Periop 101 Modules and Exam.
- Certification of Pediatric Emergency Assessment, Recognition, and Stabilization (PEAR7S).
- OR skills training with program instructors and other educators.
- Six surgical rotations: General surgery, Urology, Otolaryngology, Orthopedics, Plastic surgery, and Neurosurgery.
- Surgical rotations monitored by service expert nurses for circulating and scrub nurse roles.
- OR shifts and BCH Satellite Location experiences.
- Monthly meetings attended by cohort leaders and instructors to evaluate progress.

Strengths
- Group cohorts enhanced cohesiveness.
- Support from peers.
- Learning together reinforced new skills and information.
- Fostered a sense of camaraderie.

Challenges
- Orientation groups began close together.
- Limited case availability.
- Delayed transitions between services.
- Limited service experts available for orientees.

Participants
- Trista Aguilera, BSN, RN
- Jessica Baxter, BSN, RN
- Caite Cutler, BSN, RN
- Daniela Rosa, BSN, RN
- Jennifer Hines, BSN, RN
- Katie Staisaitis, BSN, RN
- Elizabeth Tierney, BSN, RN

Recommends for Future Programs
- Suggest program instructors are current and experienced staff nurses.
- Create cohorts of four to six participants.
- Aim for ample time between orientation groups to allow appropriate case distribution.
- Coordinate skills labs to complement didactic content.
- Replace the surgical floor shadowing with an ICU experience in the pre-OR rotations.
- Designate time for debriefing to share experiences and suggestions among participants.
- Ensure case assignments are appropriately assigned to participants transitioning off of orientation.

The Participants

Acknowledgements
The New Graduate Nurses would like to thank the following for their guidance and continued support:
- Anne Michel, MS, RN, NEA-BC
- Pamela G. Gorgone, MS, RN, CCRN, CPN
- Janet Ori, RN
- Loretta Aristotelis, MSN, RN, CNOR, NE-BC
- Our instructors: Eileen Coule, BSN, RN, CNOR; Bonnie Harrington, MS, RN, CNOR, Kimberly O'Brien, RN
- Lisa Fronge, BSN, RN, CNOR, RNC
- The OR preceptors
- The entire perioperative staff at Boston Children’s Hospital
- Karen Conwell, MSN, RN, CCRN, and her team

“Perioperative environment is a difficult place for novice nurses to fit in, unless there is a concerted effort from both staff members and leaders to embrace the novice nurse’s desire to learn” (Wilson, 2012, p.435)
Utilizing the Behavioral Response Team to Assist in Caring for Patients with Behavioral Challenges

Author(s): Melissa Clark BSN, RN
Doug Crook BSN, RN
Sally Nelson M.Ed., RN, NEA-BC

Target Audience: All Boston Children’s Hospital staff involved with patient care

Objectives:
- Inform and educate staff regarding the role of the Behavioral Response Team at Boston Children’s Hospital
- Demonstrate how the Behavioral Response Team may be used as a resource to improve psychiatric competency
- Educate staff on how and when to initiate Behavioral Response Team involvement

Impact/Significance: Meeting the needs of patients with complex psychological and behavioral presentations may elicit anxiety for nurses who do not feel comfortable and confident with the skills required for this specialized care. The Behavioral Response Team supports the development and implementation of innovative and alternative solutions to managing behavioral symptoms and improves both patient and staff experiences.

Key Points:
- The Behavioral Response Team is available for rapid response at time of crisis, or as a support to direct care staff before a crisis develops.
- The BRT does not require a formal written consult and can be utilized by any staff within posted hours of availability.
Behavioral Triggers and the Therapeutic Approach

Author(s): Melissa Clark BSN, RN
Doug Crook BSN, RN
Sally Nelson M.Ed., RN, NEA-BC

Target Audience: Clinical staff responsible for providing direct patient care including, but not limited to, nurses, medical staff, clinical assistants, care companions, and therapists.

Objectives: Provide education that will foster clinical staff’s understanding of patient triggers

Educate clinical staff on the importance trigger identification plays in minimizing and averting behavioral crises

Educate staff to facilitate the patient’s self-regulation by providing a therapeutic environment and individualized strategies addressing their identified needs

Support the provision of safe, competent care for children with mental health needs

Impact/Significance: The Center for Disease Control (CDC) estimates that 1 in 5 children living in the United States have a diagnosable mental illness. As the population of children needing psychological and behavioral supports in the hospital setting increases, the need for education on how to effectively accommodate these children grows as well. Education may help decrease misconceptions and anxieties that may be present when caring for patients with mental health needs. It also supports an integrated treatment approach in which addressing psychological needs is valued as a necessary component in providing exceptional, innovative care.

Key Points:
- Identifying triggers is a key component to understanding an individual’s needs
- Avoiding triggers may prevent behavioral crisis
- Some methods are more effective than others in managing crisis
- Balancing therapeutic responses with providing structure and limits in the medical environment can be a difficult undertaking, but may be important in caring for a child in behavioral crisis.
- Focusing on an individuals’ strengths while providing frequent praise is an ideal intervention, especially for children with behavioral challenges
DiGeorge Syndrome

Authors: Michele Keough BSN, RN, CPN  
Christine DeGray BSN, RN, CPN  
Katherine Penny MSN, RN, CWOCN, CPNP

Target Audience: Registered Nurses and clinical assistants.

Objectives: To understand DiGeorge Syndrome  
To educate nursing staff about the immunologic effects in DiGeorge Syndrome

Impact of Topic: To improve care of children with DiGeorge Syndrome  
To increase knowledge of DiGeorge Syndrome and Immunologic effects

Key Points:  
• What is DiGeorge Syndrome?  
• Features of DiGeorge Syndrome  
• Diagnosis of DiGeorge Syndrome  
• Immunologic effects of DiGeorge Syndrome

If this poster has been presented at a conference, which one: Northeast Pediatric Cardiology Nurses Association  
October 2014
DiGeorge Syndrome

Christine DeGray BSN, RN, CPN  Michele Keough BSN, RN, CPN  Katherine Penny MSN, RN, CWOCN, CPNP

What is DiGeorge Syndrome?

- DiGeorge Syndrome was first described in the 1960s by Dr. Angelo DiGeorge.
- DiGeorge Syndrome (22q11.2 deletion syndrome), also known as velocardiofacial syndrome (VCFS), is a primary immunodeficiency disease caused by abnormal cell and tissue development during fetal growth, resulting in poor development of several body systems.
- Common medical problems associated with DiGeorge Syndrome include heart defects, poor immune system function, olfactory and low calcium levels.

Diagnosis

- DiGeorge Syndrome is diagnosed by the Fluorescence In Situ Hybridization test (FISH test): a blood test that looks for changes in 22q11.
  - A band containing 30-40 genes is missing from one of their two copies of chromosome 22.
- Often children with constitutional heart defects such as Truncus Arteriosus, Interrupted Aortic Arch, Tetralogy of Fallot, Ventricular Septal defect, and Vascular Ring are often tested for DiGeorge Syndrome since these tend to be the most common heart defects associated with the syndrome.

![Figure 1: Cardiac Defects Associated with DiGeorge Syndrome](image)

![Figure 2: Genetic Deletions Resulting in DiGeorge Syndrome](image)

Immunologic Effects

- The thymus is crucial in the development of cellular immune system T-cells.
  - Develops in the first three months of fetal development.
- The thymus controls the development and maturation of the T-lymphocyte.
  - Size of the thymus affects the number of T-lymphocytes that can develop.
  - T-lymphocytes are essential for protection against infection.
- Children with DiGeorge Syndrome may have poor T-cell production resulting in increased susceptibility to viral, fungal and bacterial infections.
- Between 12% of children with DiGeorge Syndrome completely lack T-cells.
- Immunoglobulin evaluations should be performed to monitor for T-cell disorder and recurrent infections.
- Live viral vaccines should be avoided and all blood products should be irradiated.

Table 1. Clinical Characteristics

| Characteristic of DiGeorge Syndrome | \hline
| Malnutrition | \hline
| Poor appetite | \hline
| Feeding difficulties | \hline
| Constitutional Heart Defects | \hline
| Truncus Arteriosus | \hline
| Interrupted Aortic Arch | \hline
| Tetralogy of Fallot | \hline
| Ventricular Septal defect | \hline
| Vascular Ring | \hline
| Absent/Malformed Kidneys | \hline
| Hearing loss or Abnormal Ears | \hline
| Distorted Facial Features | \hline
| Small Eyes | \hline
| Squinting Eyelids | \hline
| Hooved Ears | \hline
| Small Muzzle | \hline
| Small Chin | \hline
| Micrognathia | \hline
| Severe Immunologic Dysfunction | \hline
| Abnormal T cells | \hline
| Underdeveloped/Abnormal Thymus | \hline
| Low IQ (range 70-50) | \hline
| Psychiatric Disorders in Adults | \hline
| Schizophrenia | \hline
| Bipolar Disorder | \hline

Current Knowledge

- DiGeorge Syndrome is one of the most frequent chromosome defects in newborns (1:5,000-4,000 births).
- It is most often a random event and is rarely inherited.

Long-Term Outlook for Children with DiGeorge Syndrome

- Children with DiGeorge syndrome generally grow into adulthood as long as they have the recommended treatment of heart defects, special attention to their immune system and support for the needs of other DiGeorge syndrome features.

References

Down Syndrome

Authors: Michele Keough BSN, RN, CPN
          Christine DeGray BSN, RN, CPN
          Katherine Penny MSN, RN, CWOCN, CPNP

Target Audience: Registered Nurses and clinical assistants.

Objectives:
To describe what Down Syndrome is
To help educate nurses about patients with Down Syndrome

Impact of Topic:
To help nurses care for patients with Down Syndrome
To increase knowledge of Down Syndrome for the bedside nurse

Key Points:
- Types of Down Syndrome
- Features of Down Syndrome
- Common medical conditions associated with Down Syndrome
- Diagnosis of Down Syndrome

If this poster has been presented at a conference, which one: Northeast Pediatric Cardiology Nurses Association
October 2014
Down Syndrome
Christine DeGray BSN, RN, CPN. Michele Keough BSN, RN, CPN, Katherine Penny MSN, RN, CWOCN, CPNP

When was Down Syndrome Discovered?
John Langdon Down, an English physician, published an accurate description of a person with Down syndrome in 1866. Although others had mentioned and recognized characteristics of the syndrome previously, he was the first to describe the condition as a distinct and separate entity.

Types of Down Syndrome
Trisomy 21
- Accounts for approximately 65% of all cases
- Results from an error in the cell division called "nondisjunction."
- A gamete is produced with an extra copy of chromosome 21 (the gamete has 34 chromosomes). When combined with a normal gamete from the other parent, the child has 47 chromosomes, with three copies of chromosome 21.

Mosaicism
- Accounts for approximately 1% of all cases
- Occurs when nondisjunction of chromosome 21 occurs in one or not all of the initial cell divisions. This allows a mixture of 2 types of chromosomes. Some contain 40 and some contain 47.
- The ones that contain 47 chromosomes contain an extra chromosome 21.

Patients with mosaicism may have fewer characteristics than those with other types of Down Syndrome.

Trisomy 13/18
- Accounts for approximately 4% of all cases
- Part of Chromosome 21 breaks off during cell division and attaches to another chromosome, typically 14. The total number of chromosomes in the cells remains at 46 but the presence of an extra part of chromosome 21 cause the characteristics of Down syndrome.

Table 1. Clinical Features

<table>
<thead>
<tr>
<th>Features Associated with Down Syndrome</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Low/deflated muscle tone</td>
</tr>
<tr>
<td>2. Short neck with excess skin</td>
</tr>
<tr>
<td>3. Flattened facial profile and nose</td>
</tr>
<tr>
<td>4. Upward slant to the eye</td>
</tr>
<tr>
<td>5. Skin folds that cover the inner corner of eye</td>
</tr>
<tr>
<td>6. Small abnormally shaped ears, head, mouth</td>
</tr>
<tr>
<td>7. White spots on iris (Brushfield spots)</td>
</tr>
<tr>
<td>8. Wide, short hands with short fingers</td>
</tr>
<tr>
<td>9. Deep crease on palm of hand</td>
</tr>
<tr>
<td>10. Hyperflexibility</td>
</tr>
<tr>
<td>11. Fifth finger lacks a flexion furrow</td>
</tr>
<tr>
<td>12. Deep groove between first and second toe</td>
</tr>
<tr>
<td>13. Enlarged tongue (sticks out)</td>
</tr>
</tbody>
</table>

Figure 2. Co-morbidities Associated with Down Syndrome

Cardiovascular and Critical Care Nursing Science

Diagnosis
- Down syndrome can be diagnosed prenatally or at birth.
- Prenatal assessment consists of screening tests and diagnostic tests.
- Screening tests estimate the chance of the unborn fetus having Down syndrome by providing a probability.
- Combined screening using blood tests and ultrasound is highly accurate regarding the probability of the child having DS, but does not provide a definitive diagnosis.
- Diagnostic tests include chorionic villus sampling (CVS) and amniocentesis.
  - There are some risks with these procedures but they are 100% accurate in the diagnosis of Down syndrome.
- At birth, a patient's physical traits are assessed.
  - Patients with suspected Down syndrome have a blood sample drawn for karyotype or FISH study.

Current Knowledge
- Down syndrome is the most commonly occurring chromosomal condition: one in every 601 babies in the United States is born with Down syndrome.
- More than 400,000 people in the US are currently living with Down syndrome.
- The incidence of births of children with Down syndrome increase with the age of the mother, but due to higher fertility rates in younger women, 80 percent of children born with Down syndrome are born to women under the age of 35.
- Life expectancy for people with Down syndrome has increased from 22 years in 1963 to 60 years today.
- People with Down syndrome attend school, work, participate in decisions that affect them and contribute to society in many ways.
- Quality educational programs, a stimulating home environment, good health care and positive support from family, friends and the community enable people with Down syndrome to realize their life aspirations and lead fulfilling lives.

References: ndsa.org, imda.org, nsdp.org, nh.gov/medineplus/downsyndrome.html

Michelle.Keough@childrens.harvard.edu
The Role of the Pediatric Anesthesia Clinical Research Nurse: An Interdisciplinary Collaboration

Author(s): Christine Dube MS, BSN, RN
Vanessa Young BA, RN
Michelle Anderson BSN, RN
Brenda Barton BSN, RN
Izabela Leahy BSN, MS, RN

Target Audience: The target audience includes nurses and research nurses interested in learning more about the role of the clinical research nurse. More specifically, nurses interested in learning about the role of the pediatric anesthesia clinical research nurse (CRN).

Objectives: This abstract aims to describe distinctive activities of the pediatric CRN in the anesthesia setting. The pediatric CRN in anesthesia not only acts as a liaison between families and the research team, but is the major nexus between the principal investigator or anesthesiologist on the study, and the collaborating surgeons from many different departments. This is unique because the CRN’s collaborate with physicians in specialties that can include plastics, urology, neurosurgery, orthopedics, otolaryngology, cardiology, critical care and many other departments. As part of the role they are required to become proficient on various disease and recovery processes across the spectrum. The specialized role of the clinical research nurse for pediatric patients in anesthesia will be examined and defined further. Defining this role will enhance the quality of clinical research conducted by the CRN in anesthesia, and influence the development of novel medical treatments.

Impact/Significance: Clinical research nurses (CRN) are specially trained staff nurses responsible for safeguarding research subjects and maintaining the integrity of the research protocol in settings ranging from ambulatory to inpatient, with healthy to acutely ill subjects (McCabe and Cahill, 2007). They support study implementation within the context of the care delivery setting. Beyond becoming experts on various subspecialties, CRNs also need to understand the recovery process for different surgical procedures, post-operative pain management and how this relates to the study. The CRN in anesthesia has the responsibility and accountability for building relationships with the families, study subjects, surgeons, nurses and staff in the operating room (OR), post-anesthesia cares unit (PACU), and bedside nurses on various units. Ongoing nursing in-services and communicating with the bedside nurses about the many different aspects
of studies carried out on different units is part of the broad knowledge base that makes this particular CRN role unique.

Key Points:
The role of a research nurse demands a diverse portfolio of talents (Gordon, 2008). The CRN in anesthesia must have an array of skills and characteristics to execute various research protocols successfully. The role is unique because in addition to having strong research and clinical abilities nurses are required to become proficient on various disease and recovery processes. Furthermore, they need to understand how this relates to the research study protocol. Finally, communication and organization are key qualities of the pediatric CRN in anesthesia necessary to successfully execute a study.

References:
Gordon, C. (2008) Exploring the new specialty of clinical research nursing. This is an extended version of the article published in Nursing Times; 104: 29, 34-35.

Bio-enhanced Anterior Cruciate Ligament Repair: An Innovative Treatment for Anterior Cruciate Ligament Injuries

Author(s): Kristin Leonard RN, CNOR
Patricia Dwyer PhD(c), RN, CNOR

Target Audience: Healthcare providers at Boston Children’s Hospital

Objectives:
- Describe the incidence of adolescent Anterior Cruciate Ligament (ACL) injuries
- Discuss clinical implications of conventional ACL reconstruction
- Present an innovative surgical approach for the treatment of ACL tears

Impact/Significance:
Over 500,000 people suffer ACL injuries each year. Adolescents are particularly vulnerable. Currently, ACL reconstruction with autologous or cadaver graft is the gold standard of treatment. However, these patients are at increased risk for the development of posttraumatic osteoarthritis. A new approach to ACL repair has been developed which uses a bioengineered scaffold to stimulate healing of the torn ACL. This treatment has shown promise in porcine studies.

Key Points:
- Over 75% of patients develop osteoarthritis post ACL injury within 15 years.
- A new procedure uses a bio-enhanced cylinder-shaped sponge to create a temporary bridge for ACL healing.
- There was significantly less cartilage damage and equivalent biomechanics seen with bio-enhanced ACL repair at one year in porcine model.
- Bio-enhanced ACL Repair is in the pipeline.
- FDA has recently approved the procedure for human trails.
Bio-enhanced Anterior Cruciate Ligament Repair: An Innovative Treatment for Anterior Cruciate Ligament Injuries
Kristin Leonard, RN, CNOR; Vanessa Ramos, CST; Patricia Dwyer, PhD(c), RN, CNOR

Background
- > 500,000/year people suffer Anterior Cruciate Ligament (ACL) injuries.
- Adolescents are at high risk.
- ACL reconstruction with autologous or cadaver graft is the gold standard of treatment.
- Over 75% of patients develop posttraumatic osteoarthritis (OA) post ACL injury within 15 years.

Objectives
- Describe the incidence of adolescent Anterior Cruciate Ligament (ACL) injuries.
- Discuss clinical implications of conventional ACL reconstruction.
- Present an innovative surgical approach for the treatment of ACL tears.

Surgical Treatment
- Synovial fluid inside the knee inhibits clot formation which is the natural scaffold for healing.
- Without this clot, the gap between the torn ends of the ACL can not heal.
- A protein scaffold and innovative surgical technique was developed by Martha M. Murray MD and colleagues.
- Autologous blood is added to a protein scaffold.
- The new procedure uses a bio-enhanced cylinder-shaped sponge to create a temporary bridge for ACL healing.

Preclinical Trial Results
- Bio-enhanced scaffold repair tested in 62 adolescent pigs with transected ACLs.
- Biomechanics were equivalent to reconstruction at 3 months and 1 year in porcine model.
- No adverse reactions to the scaffold were observed in porcine model.
- Less macroscopic cartilage damage was seen with Bio-enhanced scaffold repair at 1 year in porcine model.

Nursing Implications
- Bio-enhanced ACL repair is in the pipeline.
- FDA has recently approved the procedure for human trials.
- Interdisciplinary planning contributes to optimal patient care during surgical procedures.
- Nurses play a key role in translating lab protocols to human surgical procedures.
- A designated perioperative nursing team is utilized during the surgical procedure.
- Nursing leadership assists with scheduling and oversees the availability of equipment.
- Nursing provides continuous feedback to improve procedures and efficiency.
- Preoperative, intraoperative, and postoperative nurses monitor adherence to study protocols.
- Nurses play an essential role in developing research to improve surgical outcomes.

Acknowledgements and References
- We would like to thank Dr. Martha Murray for her support in the development of this poster and for the use of her presentation slides and photos.
Network In-Situ Simulation Program

Author(s): Lindsey Elliott MSN, RN
Julee Bolg MS, MBA, RN, NE-BC.

Target Audience: Unit Nurses and Educators in Emergency Departments, Inpatient Units, NICU, and Nursing Leadership.

Objectives: To implement a Simulation Program in Emergency Departments, Inpatient Units, Nurseries/NICU’s in 9 community hospitals where Boston Children’s Pediatricians, Pediatric Emergency Medicine Physicians, and Neonatologist are currently practicing.

Impact/Significance: BCH community hospitals are leading the care of critically ill babies and children who present with a wide breath of possible diagnoses in the northeast region. As a result clinical staff members need to have the competence to perform high-risk, low volume procedures. Both physician and nursing event managers must also have the ability to lead a team, which may consist of members who have limited comfort with critically ill babies and/or children. Historically physicians have been able to receiving additional training through simulation boot camps at the main campus. However as the Network and the number of physician staff members have grown, it became increasingly difficult to continue with that type of practice. It was also believed that nursing and other clinical staff members might also benefit from simulation training. After a two year development the program began delivering simulation courses at the community hospitals in August 2014. In the first year the Network Sim Program will have conducted 54 courses and are projected to have had 500 clinicians participate in their specialized courses. Each community hospital was allowed one to two unit or “service lines” depending on where BCH physicians’ practices and their hospital leadership felt the need was greatest. Courses were created for the Emergency Department, Inpatient Unit, and Nursery/NICU with each service line receiving 4 courses per year. Each location also provided 2-4 “local facilitators” who were trained by the Sim program to help the Network Superfacilitators teach the courses. The impact of the course has been overwhelming. The Network Sim program has identified both cultural and clinical practice changes and community partners are reporting positive responses at many sites as a result of the Sim courses.

Key Points:
- 8/14-8/15: 54 courses at 9 Community Hospitals
  - Includes ED, Inpatient, NICU/Nursery
• By 8/15 estimated 400 clinicians will participate in courses including; Physicians, Nurses, Respiratory Therapists, Clinical Assistants and Child Life specialists

• Clinical Practice Changes
  o Creation of seizure kit to be placed in Pyxis for easier access on inpatient unit
  o Use of stickers to identify team member roles during resuscitation in ED
  o Development of improved code blue documentation sheet in level 2 nursery
  o Debriefing structure used in simulation is currently being used by staff at level 3 NICU to debrief codes and critical situations

• Cultural Changes Identified
  o Establishing Roles during care of critically ill patient
  o Learning Hospital Resources- i.e. emergency blood release
  o Knowing Outside Resources- Contacting a Children’s, utilizing Teleconnect, and organizing a transfer
  o Medicating neonates prior to procedures

• Future Program Development
  o Provided foundation for Satellite Sim Courses that began in March 2015
    ▪ Waltham Rapid Response Team
    ▪ Lexington and Waltham PACU and OR
Network In-Situ Simulation Program
Lindsey Elliott RN MSN, Julee Bolg MS MBA RN NE-BC

Who is the Boston Children’s Network?

- Largest pediatric referral center in the region
- Maintains a Community of Care (CoC) network, which includes affiliated hospitals, satellite locations, physician office locations and over 400 pediatricians in the state.

Why bring Simulation to the Network Hospitals?

- BCH community hospitals are leading the care of critically ill babies and children who present with a wide breath of possible diagnoses in the northeast region. As a result clinical staff members need to have the competence to perform high-risk, low volume procedures.

How did Network In-Situ Simulation begin?

- Introduction to Simulation for Community Hospital Leaders
  - Network Physician Simulation Boot Camps
- Needs Assessment of Community Hospital Providers
  - Community Hospital Facilitator Training
  - Course Development
- In Situ Courses Begin (extending through June 2015)

What are In-Situ Courses?

54 courses are being held from August 5, 2014 to June 25, 2015 at 9 of the 10 participating Network Hospitals in one or two selected units. Courses are being overseen by Network Physicians and a Nurse who are trained and experienced Simulation facilitators and a Sim Technician with the support of Network leadership and the Simulation Program.

Participants include Physicians, Nurses, Respiratory Therapists, and Clinical Assistants from the following departments.
- Emergency Medicine
- In-Patient Pediatrics
- Level I, II and III Nurseries

How many participants will attend these courses?

<table>
<thead>
<tr>
<th>Course Participants</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nurses</td>
</tr>
<tr>
<td>Physicians</td>
</tr>
<tr>
<td>Respiratory</td>
</tr>
<tr>
<td>Other</td>
</tr>
<tr>
<td>Total</td>
</tr>
</tbody>
</table>

What is the impact already seen?

- Improved Role Clarity and Development
  - Creation of ED nurse leader role
  - Role clarity (identifying “stickers”)
- Improved Equipment Access, Placement, and Logistics
  - Respiratory equipment on inpatient unit
  - Available medications
  - Blood products
  - Reorganization of stock room
- Clinical Knowledge Reinforcement
  - Chest tube training
  - Seizure management lecture
  - Improved Nursing Pediatric Orientation Approach
  - Latent Safety Threats identified
  - Current Code Blue Process
The Anesthesia Research Internship Program – Growth and Development

Author(s): Izabela Leahy BSN, MS, RN
Vanessa Young BA, RN
Hannah Gartner BA

Target Audience: The target audience is graduate students hoping to enter medical school. More specifically, students whose programs require them to write a thesis research paper are those most eligible for this internship program.

Objectives: This program, which was developed and has been managed by the Sr. Director and Clinical Coordinator for clinical research in anesthesia, aims to give students interested in the health care field experience with both the research and clinical sides of working in a hospital. While in the program the students are required to work with a PI on all aspects of the research process. They also gain behind the scenes hospital experience through Anesthesia Technician training and shadowing surgical procedures. The hope is that by the end of their nine months at BCH, these students will have produced an outstanding piece of research, and affirmed their desire to work in medicine through their exposure to the OR.

Impact/Significance: Programs such as this are incredibly beneficial to students. Not only are they able to reaffirm their desires to work in health care, but many of them experience increased chances of getting into medical school due to the direct experience gained through working in the OR. Furthermore, a large percentage of the theses written by the most recent group are going to result in abstract presentations and/or publication, which makes the students stand out even more within a competitive applicant pool. When looking at the the intern group for 2014-2015, it is important to keep in mind that these students are still in the process of interviewing for medical school, so most have yet to receive an official offer.
This program also benefits the hospital by allowing the Department of Anesthesiology, Perioperative and Pain Medicine greater efficiency in their research endeavors and by providing added support within the OR. The research projects that the students work on are retrospective chart reviews, some of which have been going on for an extended period of time. Having a student intern allows these PIs to complete these projects much more quickly. In their technician training the students directly assist other personnel in the operating room. This frees up anesthesia technicians that would otherwise have done that job to perform other tasks, thereby enhancing the productivity of the hospital.

Key Points: It is vital that students wishing to go to medical school participate in internship programs. The program we offer is especially effective because it includes both a research and a clinical aspect. Finally, it is important to note that students are not the only ones who gain from a program such as this – the department, and therefore the institution in general may experience greater efficiency and growth through the implementation of these programs.
The Anesthesia Research Internship Program

This program, which began in 2011, was developed and has been managed by the Sr. Director and Clinical Coordinator for clinical research in anesthesia. Graduate-level students work within the Boston Children’s Hospital Department of Anesthesiology, Perioperative and Pain Medicine on research projects and as anesthesia technicians for a two-semester period (8 months). Over the past few years, the program has changed and grown dramatically:

- 2011-2012: Three total students
- 2012-2013: Seven total students
- 2013-2014: Three total students
- 2014-2015: Thirteen total students

The program is structured in two parts:
1. Students work with an Attending Anesthesiologist as the Primary Investigator (PI) on a hospital study. All of these studies take the form of prospective chart review.
2. Students are trained as Anesthesia Technicians in the OR.

This year, the program was expanded not only in size but also in content. Students met with PIs on a regular basis, and were required to present their research to their peers as well as to department staff at Grand Rounds. Furthermore, clear deadlines for research were set, which ensured the completion of the thesis in a timely manner.

This coming year, a few changes have also been made. Applications have been streamlined, so that students may be tracked throughout the process. Deadlines and dates will be further articulated at the very beginning of the program, so that time at the hospital will be utilized. Finally, the program has been expanded to include Masters of Public Health (MPH) candidates.

Impact and Significance

<table>
<thead>
<tr>
<th>Year</th>
<th>Medical School Admissions</th>
</tr>
</thead>
<tbody>
<tr>
<td>2011-2012</td>
<td>20</td>
</tr>
<tr>
<td>2012-2013</td>
<td>24</td>
</tr>
<tr>
<td>2013-2014</td>
<td>28</td>
</tr>
<tr>
<td>2014-2015</td>
<td>32</td>
</tr>
</tbody>
</table>

Number of students:
- Admitted to med school
- Accepted to med school pending
- Applying to med school next year

Testimonials

After completing their internship, students and PIs are asked to complete a survey which evaluates their experience within the program. Here is what some of them had to say:

“Although a bit intimidating, presenting at the grand rounds seems like a great idea. This way, it really feels like we are doing something with the hospital and providing useful information.”

“Overall, this has been a great experience and definitely helped with getting accepted to medical school. At almost all of my interviews, I was asked about the internship and my research.”

“[I] really enjoyed the internship program. [It] gave me a very realistic view on clinical research, and I was able to gain experience tackling obstacles in the research process that I had not previously been able to.”

“I really enjoyed working with my intern. She was quick, motivated, and willing.”

These testimonials show the immense value this program has for those who participate in it. Experiences such as this are essential for today’s students, helping them greatly as they advance in their studies and their careers. Knowing this, students come into this program with enthusiasm and eagerness to learn. The above quotes demonstrate this zeal, while also showing the real-world utility of this program. The students contribute directly to the hospital, while also getting to learn in an applied setting.
Case Study: The Breast Milk Enhancing Effect of Moringa Oleifera Capsules in Combination with Mother’s Milk Tea in a Mother of an Ill Neonate Admitted with Hypoplastic Left Heart Syndrome

Author(s): Mary Grimanis, APRN, PNP-BC

Target Audience: This case serves to educate nurses, advanced nurse practitioners, pediatricians, neonatologists, obstetricians, nutritionists, feeding therapists, mothers, fathers, partners and researchers on the use of Moringa Oleifera leaf capsules as a galactogogue in boosting breast milk production, offering a method to improve clinical outcome in hospitalized ill infants.

Objectives: To recognize the challenges postpartum mothers face in achieving adequate breast milk volumes for their ill neonates.

To evaluate evidence based literature supporting Moringa Oleifera leaf capsules as an effective and safe galactogogue for use by mothers of hospitalized ill infants.

To illustrate a clinical case in the cardiac ICU whereby Moringa Oleifera capsules had a positive lactation enhancing effect when used daily with Mother’s Milk tea (containing a combination of fennel, anise, coriander, fenugreek and blessed thistle).

Key Points:

1) This clinical case demonstrated that breast milk production doubled upon using Moringa Oleifera capsules in tandem with Mother’s Milk tea for low breast milk production in a mother of an ill neonate with HLHS.

2) Since scientific research has revealed Moringa’s capacity to increase serum prolactin levels, enhance maternal milk supply and infant weight gain, this tree leaf, used as a highly nutritious vegetable around the globe can potentially aid in reducing hospital length of stay, reduce reliance on infant formula, and contribute to decreasing infant morbidity and mortality.

3) Further investigation of the specific lactation enhancing effects of Moringa Oleifera capsules and Mother’s Milk tea is needed while also determining whether their combined use can synergistically boost breast milk supply.
Case Study: The Breast Milk Enhancing Effect of Moringa Oleifera Capsules in Combination with Mother’s Milk Tea in a Mother of an Ill Neonate Admitted with Hypoplastic Left Heart Syndrome

Mary Grimanis, APRN, PNP-BC, IBCLC
Lactation Support Program, Hale Family Center for Families

Moringa Oleifera Leaf Capsules as a Galactagogue for Mothers of High Risk Neonates

- Breast milk is a highly valued and nutritionally complete fluid, laden with live immune enhancing cells which offers immeasurable benefits to 8 neonates in critical care settings.
- Mothers of hospitalized critically ill neonates often face challenges in achieving adequate breast milk volumes.
- Maternal-infant separation, postpartum complications, infrequent pumping, and stress affect breast milk production.
- Increased breast milk production can be achieved by increased breast pumping efforts and lactation support.
- Galactagogue: term used to describe herbal and nutritional supplements known for their lactation enhancing effects.
- The Moringa Oleifera tree is a perennial soft wood tree with nutrient-rich leaves and pods, considered a vegetable in the tropics. The tree’s leaves and pods are rich in macronutrients, micronutrients and antioxidants. The leaves are an excellent source of provitamin A, vitamin B, and C, iron and essential amino acids. (Molina, 2012; Elbert and Palade, 2014; Fatey, 2005; Fuglie, 2001)
- Mother’s milk tea is a blend of herbs including fenugreek, anise, coriander, fennel seeds and bressed thyme which are believed to boost lactation. Despite traditional reports, few scientific studies have affirmed their clinical effects.

Evidence

Moringa has demonstrated lactation augmenting effects based on data from several randomized control studies. Mothers taking specified amounts of powdered Moringa leaves were determined to have higher measurable serum prolactin levels, unveiling one of its plausible milk enhancing effects (Yates-Amante & Lim, 1996). Other studies supporting Moringa’s role as a galactagogue have revealed positive outcomes in increasing breast milk volume and infant weight gain (Daza & Perez, 1991; Co, M. A., 2002; Yates-Amante & Lim, 1996; Estrella, 2000; Espinosa-Koo, 2005; Gabor, 2001).

Clinical Case

E.L. was born 3.24 kg. to a G1 P0-1 mother at 39 weeks gestation, vaginal delivery, with a prenatal diagnosis of Hypoplastic Left Heart Syndrome. Early previously received a Fetal Aortic Vascularoplasty at 21 weeks of gestation. On day of life #7, she underwent a Stage I Norwood repair which was complicated by postoperative heart failure.

E.L. mother, Ms. L., had an unremarkable medical history with reports of typical breast changes during her pregnancy. She was supported in her pumping efforts by her baby’s father.

Ms. L. had a slow start in breast milk production reporting expressing mere drops of colostrum by day 3 postpartum. By day 6, she developed some breast fullness, expressing an ounce of breast milk during each of her 8 pumping sessions. For the next 2 weeks, Ms. L. reported that her breast milk volumes remained stationary at 1 to 1½ ounces each session despite pumping 8 times in 24 hours.

During a lactation consult on postpartum day #13, Ms. L. expressed concern about her low breast milk volumes, reporting the belief that the stress of Emily’s critical condition was contributing to low production.

Intervention

- Mother’s Milk Tea – 3 cups daily was started on day 14
- Moringa Oleifera leaf capsules (200 mg) – 3 capsules twice daily
- Continued pumping 8 times daily

Outcome

- Day 21 – milk supply doubled to 3-6 ounces each pumping session 8 times daily
- Intermittent breast milk volume declines with setbacks in E.L.’s clinical progress
- Post-Op Chylothorax complication – continued to receive Modified Fat (Skimmed) Breastmilk
- As E.L. a clinical condition improved, milk production increased.

Key Points/Discussion

- This case study offers support to a small collection of research studies underscoring the lactation enhancing effect of Moringa Oleifera leaf capsules. However, it raises other clinical and empirical questions regarding how other galactagogues impact milk production when used in tandem with Moringa.
- Additional studies of Moringa Oleifera’s lactation enhancing effects could offer valuable support to mothers struggling with breast milk supply. A longitudinal study encompassing a larger sample size is needed within the context of a randomized controlled clinical trial.
- Although Moringa is a relatively new galactagogue utilized in the United States, it offers the most evidence based research from in vivo and in vitro studies demonstrating its nutrient profile and its safety at dietary levels. (Adekeye, EJ et al., 2014; Adekeye, O. et al., 2012)
- Randomized controlled trials have revealed its effectiveness as a nutrient rich food supplement to improve alleviation malnutrition and its ability to achieve a galactagogue effect.

Conclusion

Moringa Oleifera leaf capsules have considerable implications for enhancing breast milk supply, reducing reliance on infant formula and increasing breastfeeding duration, as well as reducing infant morbidity and mortality which can contribute to decreasing hospital length of stay.

Selected References


Malignant Hyperthermia Preparedness: A Multidisciplinary Approach Aimed at the Recognition and Management of a Malignant Hyperthermia Crisis during Surgery and Other Invasive Procedures

Authors: S. Harrington
K. McGeoghan
K. Laramie
E. O’Melia
K. Stasaitis
M. Palmieri
L. Brown
K. Connolly
D. White
K. Mead
D. Paradise

Target Audience: For all healthcare providers when inhaled anesthetics and/or succinylcholine are utilized for surgical and non-local procedures.

Objectives:
- Develop standard guidelines and cognitive aids, i.e. MH checklist, for the recognition and treatment of a MH crisis
- Identify emergency drugs and equipment needed for the treatment of a MH crisis.
- Identify team members and develop a response plan for a MH crisis anywhere within the main campus and satellite locations.

Impact/Significance: Achieving a successful outcome in a MH crisis situation involves a coordinated team response. It is essential that all healthcare providers involved in the areas where the delivery of volatile (inhalation) anesthetics are administered, are knowledgeable regarding the location of emergency drugs and equipment and have the skills needed to deliver safe and quality patient care.

Key Points: Awareness in anesthetic emergencies facilitates in the delivery of safe and quality patient care for patients undergoing surgical intervention and other invasive procedure where anesthetic volatile inhalation are administered.
Early recognition and timely intervention of a MH crisis is required to achieve favorable patient outcomes. Staff education in this life threatening emergency facilitates the delivery of safe and quality patient care in the perioperative setting.
Malignant Hyperthermia Preparedness: A Multidisciplinary Approach to the Recognition and Management of a Malignant Hyperthermia Crisis during Surgery and Other Invasive Procedures.

S Harrington, BS, RN, K. McGeoghan, BS, RN, K. Laramie, BS, RN, K. Stasaitis, BS, RN, E. O'Melia, BS, RN, L. Brown, BS, RN, CCRN, M. Palmieri, BS, RN, D. Paradise, BS, RN, K. Connolly, MSN, RN

### Definition

Malignant hyperthermia (MH) is a potentially fatal, inherited disorder usually associated with the administration of certain inhaled general anesthetics and/or the drug succinylcholine.

### Purpose

A hospital-wide multidisciplinary MH committee was formed to develop a shared set of MH guidelines.

The committee reviewed standards and guidelines from numerous sources in order to develop a consistent institution-wide MH crisis response plan when inhaled anesthetics and/or succinylcholine are used.

### Objectives

- Develop standard guidelines for the recognition and treatment of MH
- Develop a response plan for a MH crisis anywhere within the main campus and satellite locations.
- Identify emergency medications and equipment needed for the treatment of a MH crisis.

### Rapid Response for a MH Crisis

#### Recognition

- Unexplained rise in ETCO2
- Unexplained tachycardia
- Unexplained increase in O2 requirement
- Temperature changes (a late sign)

#### Rapid Intervention

- Discontinue volatile agents and succinylcholine
- Call for help:
  - 59111 Anesthesiologist in charge
  - 59110 OR charge nurse, provide location and call back number

#### Treatment

- Administer Dantrolene 2.5mg/kg IV
- Start cooling measures
- Treat Hyperkalemia
- Treat Atrial Fibrillation
- Arterial line placement
- Foley catheter placement

#### Monitor

- Core temperature
- Renal function
- Arterial blood gases
- Avoid Lactated Ringers

### Interventions

- Reorganize MH cart
- Develop cognitive aids that outline steps in recognizing and treating a MH crisis
- Implement a system for a quick response to a MH crisis
- Develop and present an in-service for all areas where inhaled anesthetics and/or succinylcholine are utilized.
- Develop MH simulation scenario for staff
- Develop annual competency

### Significance

Early recognition and timely intervention of a MH crisis are required to achieve favorable patient outcomes. Staff education in this life-threatening emergency facilitates the delivery of safe and quality patient care in the perioperative setting.

Achieving a successful outcome in a MH crisis situation involves a coordinated team response. It is essential that all healthcare providers involved in the areas where the delivery of volatile (inhalation) anesthetics are administered, are knowledgeable regarding the location of emergency medications and equipment and have the skills needed to deliver safe and quality patient care.
**Overcoming Obstacles: Bridging the Adolescent on Outpatient Ventricular Assist Device (VAD) Support**

**Author(s):** Beth Hawkins, RN, MSN, FNP-C  
Janelle Nobrega, MSN, RN, CPNP  
Cheryl O’Connell, MBA, RN, NE-BC, CPHQ  
Francis Fynn Thompson, MD  
Christina VanderPluym, MD

**Target Audience:** Nursing, Physicians, Auxiliary Staff, Social Workers, Psychiatry

**Objectives:** Illustrate outpatient VAD support in a high risk patient population via case presentation  
Demonstrate effective collaboration with community providers  
Discuss obstacles associated with transitioning VAD patients back to school  
Provide education on what makes adolescents developmentally difficult to support on VAD therapy

**Impact/Significance:** VADs are well established as a surgical intervention for patients with advanced systolic or diastolic heart failure. Adolescents are high-risk patients to support on a VAD, nevertheless, they constitute the majority of the pediatric population who qualify for devices that allow outpatient management. A case study will be used to illustrate the process of a high-risk adolescent who was successfully supported on a HeartWare LVAD while living in dormitory residence at university. To date, he is the first student to live in residency at university while on mechanical circulatory support.

**Key Points:**  
High risk adolescents on VAD therapy may be able to successfully transition to outpatient management in a university setting  
Future research will be needed to better understand what factors enable high risk adolescents on VAD therapy to transition to outpatient management
Bridging the Adolescent on Outpatient Ventricular Assist Device (VAD) Support
Beth Hawkins MSN, RN, FNP-C, Janelle Nobrega MSN, RN, CPNP, Cheryl O’Connell MBA, RN, NE-BC, CPHQ, Francis Fynn-Thompson MD, Christina VanderPluyum MD

Background
- VADs are a well established surgical intervention for patients with advanced myocardial or diastolic heart failure
- Adolescents are high-risk patients to support on a VAD but constitute the majority of the pediatric population who qualify for devices that allow outpatient management
- A case study will be used to illustrate the process of successfully supporting a high-risk adolescent on a HeartWare LVAD while living in dormitory residence at university
- To date, he is the first student to live in residency at university while on a mechanical circulatory support

Objectives
- Illustrate outpatient VAD support in a high-risk patient population via case presentation
- Demonstrate effective collaboration with community providers
- Discuss obstacles associated with transitioning VAD patients back to school
- Provide education on what makes adolescents developmentally difficult to support on VAD therapy

Demographics of Outpatient HeartWare:
<table>
<thead>
<tr>
<th>HeartWare Patients</th>
<th>N=9 (66% Male)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>10-18 years</td>
</tr>
<tr>
<td>Days on Outpatient Support</td>
<td>1092</td>
</tr>
<tr>
<td>Patients Returned to School</td>
<td>7</td>
</tr>
<tr>
<td>Diagnosis</td>
<td></td>
</tr>
<tr>
<td>Cardiomyopathy</td>
<td>7</td>
</tr>
<tr>
<td>Congenital Heart Disease</td>
<td>2</td>
</tr>
</tbody>
</table>

The Road to University


Adapting Adolescent Forms of Communication

- How long do I need to wait to be able to go on carnival rides?
- This fluid restriction crap is the hardest thing I have ever had to go through in my whole life
- It was only a matter of time before I got a nose bleed during one of my final exams
- I love how there was a fire drill right in the middle of my dressing change
- Is Gatorade powder ok to use for college?

Overcoming Obstacles
- Adapting telehealth communication
- Independent living, exit site dressing changes
- Contracting to reduce risky behaviors
- Establishing independence and trust

Training the Community Providers
- Pre-transition meetings at Bentley University
  - Administrators
  - Health Services
  - Legal Counsel
  - Campus Police
  - Fire Department
  - EMS
  - Guidance Counselors
  - Directors of Dormitory Residence

Key Points
- High risk adolescents on VAD therapy may be able to successfully transition to outpatient management in a university setting
- Future research is needed to better understand what factors enable high risk adolescents on VAD therapy to transition to outpatient management.
Identify Benzocaine-Induced Methemoglobinemia

Author(s): Rachel Huang BSN, RN

Target Audience: GPU staff

Objectives: Recognize and treat methemoglobinemia.

Impact/Significance: Methemoglobinemia is a rare, but potentially lethal, adverse reaction associated with cetacaine, a commonly used drug in the GPU.

Key Points:
- Cetacaine spray should be administered for less than or equal to 1 second.
- Methemoglobinemia is an elevation of an abnormal form of hemoglobin that is unable to bind to and transport oxygen.
- The key clinical sign of methemoglobinemia is cyanosis with an oxygen saturation higher than expected.
- Treatment of methemoglobinemia is methylene blue.
- Methylene blue is contraindicated in patients with G6PD-deficiency.
Identify Benzocaine-induced methemoglobinemia
Rachel Huang, RN, BSN

How is Benzocaine used?
- To improve patient tolerance in endoscopic, bronchoscopic, and intubation (1,2)
- Adult dosage for spray: Apply for ≤1 second. Reduced dosage for pediatrics recommended (1)

How is it diagnosed?
- Rainbow-SET Radial 7, 8 wavelength pulse ox (3), co-oximetry (1,2,4)
- Oxygen saturation at mid-80s, and is higher than expected for cyanosis (1)
- Normal ABGs because measuring dissolved oxygen, not bound oxygen(1)

Methemoglobin levels and signs/symptoms
- 70% Death
- 60% Confusion
- 50% SO2, HA, distinct
- 20% Cyanosis
- 5% Normal level

Contraindications:
- Patients with G6PD-deficiency may not respond to methylene blue. Treat with ascorbic acid 500-1000 mg/day orally, or if life-threatening exchange transfusion (1)

Nursing Implications:
- Screen for G6PD-deficiency or methylene blue allergy
- Assess for break in mucous membrane
- Recognize signs and symptoms of M6b
- Only give methylene blue after lab confirmation of M6b (1)

References:
Eating Disorders: Systemic Effects

Author(s): Nancy Jones RN, CPN
            Carrie Jenkins BSN, RN, CPN
            Aimee Kadehjian BSN, RN

Target Audience: Inpatient RN’s, Outpatient RN’s, Nutritionist, Diet Technicians, Social Workers, Child Life Specialists, Clinical Nursing Assistant

Objectives: To educate and increase awareness of health care professionals in regard to the systemic effects in the eating disorder patient.

Impact/Significance: With an increased understanding of the comorbidities associated with patients who have eating disorders, clinicians will have a heightened awareness of the interventions used to improve patient care outcomes, for example, the Eating Disorder Protocol established at Boston Children’s Hospital.

Key Points: Diagnostic and Statistical Manual of Mental Disorders (DSM) for Eating Disorders
            Comorbidities affected
            Boston Children’s Hospital Eating Disorder Protocol
            Multi-disciplinary approach
            Family centered involvement
EATING DISORDERS: Systemic Effects
Nancy Jones RN, CPN, Carrie Jenkins BSN, RN, CPN, Aimee Kadehjian BSN, RN

Anorexia Nervosa
- Weight loss through restriction of diet, fasting, and excessive exercise
- Episodes of binge eating and purging

Eating Disorder DSM-5
- Restriction of energy intake that leads to a body mass index < 18.5
- Increase fear of gaining weight or becoming fat, or persistent behavior that prevents weight gain, despite being underweight
- Distorted perception of body weight and shape, undue influence of weight and shape on self-worth, or denial of the medical seriousness of one's low body weight

Bulimia Nervosa
- Episodes of binge eating
- Use of inappropriate compensatory behaviors to prevent weight gain, such as, self-induced vomiting

The Brain
- Brain atrophy that is evident on neurologic imaging
  - Both gray and white matter is reduced
- Impaired memory resulting in other mental and emotional issues
  - Mood changes
  - Difficulty concentrating
  - Anxiety
  - Depression
  - Inability to rationalize

Dermatologic
- Xeroderma – dry, scaly skin
- Lasigo – fine downy hair
- Acne
- Hair loss
- Slower wound healing

Musculoskeletal
- Osteoporosis – due to low calcium and low hormone levels
- Muscle wasting/atrophy
- Exertional fatigue
- Increased risk for fractures
- Weakness

Gastrointestinal
- Glossoptosis – delayed emptying of the stomach
- Constipation
- Elevation of liver function tests
- Bulimia nervosa
  - Tooth enamel erosion
  - Metabolic alkalosis
  - Dehydration

Endocrine
- Hypoglycemia – due to depleted glycogen stores
- Severe hypoglycemia can cause sudden death due to liver failure
- Hypothyroidism/Thyroid – leads to elevated blood cortisol levels which can contribute to osteoporosis
  - At least 30% of female patients have osteoporosis

Cardiovascular
- Bradycardia – less than 60 bpm
- Risk for cardiac arrest
- Acrocyanosis – cold, blue, occasionally sweaty extremities
- Orthostasis
- Anemia
- Hypothermia – due to decreased fat stores patient unable to maintain thermoregulation

Gynecologic
- Amenorrhea
- Infertility
- Pregnancy is associated with:
  - Miscarriages
  - Prematurity
  - Low birth weight

Multidisciplinary Team Approach
- Adolescent Team
- General Pediatric Resident
- Psychiatry Team
- Registered Nurse
- Nutritionist
- Clinical Assistant
- Child Life Specialist

Family Centered Involvement
- Daily bedside rounds
- Counseling needs
- Consulting with the psychology team
- Team meeting as needed

BCH protocol
- Daily chemistry to monitor for renal function
- Blood testing – Thyroid Function Test, LFT’s
- EKG upon admission
- Daily AM weights
- VS/Oro/Endoscopy VS G1/4 hours
- Bedrest for VS below parame
- Made limited to 30 minutes & monitored by staff
- Ensure supplements PO or IV for not tolerating meals
- Psychiatry consult daily

34Kg  BMI 11.7
"I wanted to be the purest form of myself. I knew I was killing myself, but I couldn't do anything about it."

50.8Kg  BMI 17.5
"I would love to bring hope to people. It took me a while to believe that the disorder was too big to handle on my own. I wished I had reached out earlier for help because once you're so far in you can't get out on your own."
The ABCs of Aneurysmal Bone Cyst

Author(s): Jennifer Klein MS, RN, FNP, CNRN

Target Audience: Nurses

Objectives: Educate nursing staff about Aneurysmal Bone Cysts and their diagnosis and treatment.

Impact/Significance: Not very common occurrence
Case study displays rare case of some fatally effected by Aneurysmal Bone Cysts.

Key Points: Typically benign tumors.
Usually curable.

If this poster has been presented at a conference, which one: AANN 3/28-4/1
Introduction

The Aneurysmal Bone Cyst is a cystic lesion that typically affects people in the second decade of life.

WHO definition:
- “Benign cystic lesions of bone composed of blood filled spaces separated by connective tissue septa containing fibroblasts, osteoclast-type giant cells and reactive woven bone.”

Approximately 25% of ABCs occur in spine.

Distribution
- Lumbar spine: 40-45%
- Cervical spine: 30%
- Thoracic spine: 25-30%

Spinal Aneurysmal Bone Cysts are primarily a pediatric tumors and often present with neurologic deficit, pain and deformity.

Diagnostic Studies: CT or MRI

Symptoms

Pain
Mass/swelling
Pathologic fracture
Deformity
Weakness, decreased range of motion

Treatment

Surgical excision
- Curettage
- Gross total resection (GTR)
- Endovascular embolization
- Intra-lesional injection of ablating agents
- Radiation.

May 23, 2011

Presents at 14 years old with posterior cervical pain for 5 months. CT of the neck demonstrated an expansile lytic lesion of C2 vertebral body.
IR guided biopsy = Aneurysmal Bone Cyst

May 31, 2011

Progressive disease despite multiple surgeries
C1-C3 lateral mass fusion with resection of C2 mass.
Stabilization and treatment with a Halo.

2011-2014

Presents with increased numbness, pain, and weakness. MRI showed increase size of Aneurysmal Bone Cyst

Feb 8, 2014

Together with his family and physicians, the decision was made to have no further treatment.

Feb 26, 2014

Patient went home on hospice and passed away with his family at his side at 18 years old

---

Improving the Health Literacy of Asthma Education Materials

Author(s): Elizabeth M Klements MS, PPCNP-BC, AE-C
Kristin Erekson MA, CHES
Kendall McCarty MSN, RN, CPNP, AE-C

Target Audience: Health Care Professionals

Objectives: To improve asthma education and teaching by applying the following best practices in health literacy (as recommended by experts such as the Centers for Disease Control and Prevention and U.S. Department of Health & Human Services) to Boston Children’s asthma education materials:

a) Be more interactive
b) Utilize imagery
c) Be culturally sensitive
d) Lower literacy level

Impact/Significance: The U.S. Department of Health and Human Services defines health literacy as “the degree to which individuals have the capacity to obtain, process and understand basic health information and services needed to make appropriate health decisions.” Low caregiver health literacy can negatively affect a child’s asthma care and outcomes. Low caregiver health literacy among children with asthma has been associated with increased ED visits, hospitalizations, missed school and work days or misuse of medication.

Key Points: This project reduced the reading level of Boston Children’s asthma Family Education Sheets from a ninth grade to a fourth grade reading level. These materials are available in eight of the most common languages spoken by Boston Children’s patients with asthma. These sheets were also used as scripts to produce nine short asthma education videos, which have also been translated to Spanish.

If this poster has been presented at a conference, which one: American Academy of Ambulatory Care Nursing (AAACN) Annual Conference, Buena Vista, Florida, April 15-18, 2015
Improving the Health Literacy of Asthma Education Materials

Elizabeth M. Klemens, MS, PPCNP-BC, AE-C
Kendall McCarty, MSN, CPNP, AE-C
Kristin Erekson, MA, CHES

Background
The U.S. Department of Health and Human Services defines health literacy as "the degree to which individuals have the capacity to obtain, process and understand basic health information and services needed to make appropriate health decisions." Low caregiver health literacy can negatively affect a child's asthma care and outcomes. Low caregiver health literacy among children with asthma has been associated with increased ED visits, hospitalizations, missed school and work days or misuse of medications.

Objectives
To improve written asthma education materials by applying the following best practices in health literacy:
- Be more interactive
- Use images to replace text
- Be culturally sensitive
- Improve literacy level

Methods
- Reviewed existing asthma family education materials with nursing, education and health literacy experts
- Conducted a review of the literature
- Consulted with a convenience sample of inner-city parents

Results
This project achieved its objectives by:
- Including open-ended questions in written materials to engage patients and families.
- Using photographs of culturally diverse children along with simple step-by-step instructions.
- Reducing the reading level of material from a ninth grade to a fourth grade reading level.
- Translating materials into the eight most common languages spoken by asthma patients at Boston Children's.

The materials were then used as scripts to create nine pediatric educational videos in English and Spanish on asthma devices and care.


Scan this QR code to watch our asthma education videos on your mobile device.
Challenges of Early Phase Trials in Pediatric Oncology Patients

Author(s): Maggie Malsch BSN, RN, CPHON
Bethany Trainor BSN, RN

Target Audience: Pediatric oncology nursing staff

Objectives: To improve inpatient pediatric oncology nurses’ research knowledge in order to care for patients on early phase trials.

Impact/Significance: Clinical research protocol compliance and overall safety of patients on early phase clinical research protocols

Key Points:

1) Inpatient pediatric oncology units are known to have high acuity and their own challenges but add on an increasing amount of early phase trials and it can add more work and anxiety to the bedside nurse. Early phase trials have a number of challenges that need to be addressed for successful implementation, including decreasing the number of violations and deviations.

2) To address these issues and provide an increased level of early phase trial nursing knowledge we have implemented education, resources and reminders to improve over all protocol compliance and safety of patients on clinical research protocols.

3) With the addition of these changes we have had a significant decrease in the number of missed samples, improvement in documentation of protocol requirements and increased nursing confidence when providing education to their patients and families on early phase trials.

If this poster has been presented at a conference, which one: IACRN Boston 2014
Challenges of Early Phase Trials in Pediatric Oncology Patients
Maggie Malsch BSN, RN, CPHON, Bethany Trainor BSN, RN

Background
Inpatient pediatric oncology units are known to have high acuity and their own challenge. However, when you add on an increasing amount of early phase trials it can increase work load, patient acuity and anxiety for the bedside nurse.
Early phase trials have a number of challenges that need to be addressed for successful implementation, including decreasing the number of violations and deviations. Some of those challenges include nursing education related to lab monitoring, PK, urine sampling and medication requirements.

At this time in development of this program there are a small number of subjects per trial but an increasing number of early phase trials. Our population of pediatric patients has shown to have increasing challenges of PO medications (i.e. complaints of taste, nausea and emesis) as well as with continuous IV medication for multiple days. This adds the additional challenge of providing patients and families increased quality of life when participating in an early phase trial.

Intervention
To address these issues and provide an increased level of early phase trial nursing knowledge we have implemented several changes. Currently, we have an inpatient research nurse whose focus is to help maintain protocol compliance. We have weekly e-mail reminders with a summary of upcoming patients on protocols and their specific study requirements. In addition to these emails, there are bedside binders with a checklist for each requirement, a daily check in with each bedside RN and the research nurse is present during rounds with the inpatient clinical team. Most recently we have developed a half day research course to review basic research knowledge and resources we have developed to help the bedside nurse while caring for patients on research protocols.

Challenges
- Nursing education on:
  - Lab monitoring for required labs
  - PK/PD and urine sampling
  - Oral and IV medication requirements
  - Uptick/down times of medications
  - Importance of completing all protocol requirements

Collaboration Checklist for Inpatient Research Visits (Nursing Double-Checks)
- Verify consent is signed before expiration date
- Original signed orders in chart, all pages with fill-in lines are completed (i.e. covering MD information, weight, study ID #, randomization #, calculated study medication is correct).
- Review any special instructions (i.e. is filter required, safety lab results required) prior to medication administration.
- Call research oncology pharmacy to ensure orders have been received and confirm time of arrival to Unit.
- Double-check all lab time points on orders match with lab set-up of tubes and lab slips (CTSU and/or Hospital Lab, if applicable)
- Confirm labels for tubes are at bedside or if tubes already labeled, check they match with subject identifiers (name, MRN, study ID or visit #).
- Verify data collection sheet or Case Report Forms for nursing to document is in chart, and each page has subject label/identifier on it.
- Verify study coordinator/covering MD information is on orders for any questions/issues.
- Review any specifics on centrifuging/pipetting needs on off hours in CTSU

Results and Future Directions
With the addition of these changes we have had a significant decrease in the number of missed samples, improvement in documentation of protocol requirements and increased nursing confidence when providing education to their patients and families on early phase trials. Future directions may involve a formal quality improvement program to identify more specific issues related to trial implementation as well as mechanisms to fix those issues.

8 years old with relapsed ALL currently has participated in # of Oncology studies
Case study: Feeding refusal/poor weight gain in a 4 months old exclusively breastfed infant

Author(s): Carole Mansoor RN, CPNP, IBCLC
Christine Fischer-Rothman MD, CLC
Karen Sussman-Karten BSN, RN, IBCLC

Target Audience: Primary care providers, Pediatricians, Lactation Consultants, Nurses, GI/ Clinical Nutrition, Feeding Specialists

Objectives: Raising awareness among clinicians of the importance of a thorough lactation evaluation when assessing poor weight gain/feeding refusal in a breastfeeding infant

Impact/Significance: A thorough lactation assessment of mother baby dyad may reduce unnecessary expensive testing and consultations with specialists

Key Points: Ruling out breastfeeding problems needs to be the first step in evaluating poor weight gain in breastfeeding infants.
Amniotic Membrane Transplantation: The Surgical Treatment to Manage Ocular Manifestations in Stevens - Johnson Syndrome and Toxic Epidermal Necrolysis

Author(s): Leigh Graham BSN, MS, RN, CNOR
              Kristin Mead BSN, RN, CNOR

Target Audience: Healthcare providers at Boston Children’s Hospital

Objectives:
- Increase awareness of acute ocular manifestations in patients’ with Stevens - Johnson Syndrome (SJS) or Toxic Epidermal Necrolysis (TEN).
- Educate perioperative staff about the manifestations of ocular involvement in patients’ with SJS and TEN.
- Describe the newest surgical treatment for ocular involvement in the acute phase of SJS or TEN.
- Discuss the nursing implications of treating a patient undergoing an Amniotic Membrane Transplant (AMT).

Impact/Significance: Surgical treatment of the ocular surface in patients with SJS and TEN is a newer practice. This poster informs healthcare providers of a new and improved way to treat a syndrome that has the potential to result in chronic eye pain and photophobia.

Key Points:
- Defines SJS and TEN, and describes its effect on the eye.
- Explains the importance of early intervention in ocular health.
- Presents an innovative surgical technique to treat ocular manifestations in SJS and TEN.
- Describes essential nursing implications for SJS/TEN patients undergoing an AMT.
Amniotic Membrane Transplantation: The Surgical Treatment to Manage Ocular Manifestations in Stevens-Johnson Syndrome and Toxic Epidermal Necrolysis

Leigh Graham MS, BSN, RN, CNOR and Kristin Mead BSN, RN, CNOR

Objectives
- Increase awareness of acute ocular manifestations in patients with Stevens-Johnson Syndrome (SJS) or Toxic Epidermal Necrolysis (TEN).
- Educate peroperative staff about the manifestations of ocular involvement in patients with SJS and TEN.
- Describe the newest surgical treatment for ocular involvement in the acute phase of SJS or TEN.

Background
- SJS and TEN are rare, acute, exfoliative diseases that result in the blisters of the skin and mucous membranes.
- Both diseases are most commonly triggered by medications.
- These diseases may present as a febrile illness including malaise, headache, cough, rhinorrhea and target lesions.
- Early and accurate diagnosis is paramount in preventing long term sequelae.
- The incidence of SJS is approximately 6 cases per million people per year (Gregory, 2011).
- The incidence of TEN is approximately 1-2 cases per million people per year (Gregory, 2011).

Ocular Manifestations
- Ocular manifestations involve the conjunctiva, the cornea, lid margins, eyelashes and eyelid skin.
- Mild cases are manifested by conjunctivitis, minimal ocular discomfort, dry eye and minimal photophobia.
- More severe cases involve diffuse and destructive inflammation.
- Inflammation can lead to adhesions between the eyelid and eye (symphtephoron).
- Symphtephoron causes the eyelid to turn in and the eyelashes are misshapen.
- The misaligned lashes can cause corneal abrasions and ulcerations.
- Destruction of the corneal stem cells can result in vascularization and thickening of the corneal epithelium, severely limiting vision.
- Left untreated, severe cases result in significant ocular discomfort, dry eye and decreased vision and blindness.

Medical Management
Systemic Care
- The acute complications of SJS/TEN result from the loss of skin and mucous membranes.
- Patients are treated the same as burn patients; treatment is focused on preventing sepsis and pneumonia.
- Supportive care is the only universally accepted and effective treatment.
- Supportive care is essential to patients’ survival.

Ophthalmologic Care
- Daily eye hygiene is performed to remove debris and may decrease the chance of ocular surface infection.
- Various topical antibiotic medications are used to prevent infection.
- A symphtephoron ring can be placed in the eye to prevent the formation of symphtephoron.

Indications for Amniotic Membrane Transplant
- Not all SJS/TEN patients with ocular involvement require an amniotic membrane transplant.
- For milder cases, medical management is warranted.
- Lid margin inflammation with eyelash loss, membranes, conjunctivitis and early symphtephoron formation are all signs of worsening inflammation.
- These cases proceed to amniotic membrane transplant.

Surgical Intervention
Surgical Treatment for Ocular Manifestations
- Eyelids: Eyelashes on all four lids are trimmed. Necrotic or membranous tissue is debrided. Half a square of amniotic membrane is placed over the eyelid and is attached approximately 1-2 mm from the eyelashes.
- The membrane is inserted under the eyelid and into the fornix.
- It is secured by sutures through the eyelid and tied over a bolster on the external lid skin.
- The membrane is secured by two bolsters on the eyelid.
- This process is repeated on all eyelids.

Ocular Surface
- A full square of amniotic membrane is placed over the center of the eye.
- It is sutured to the conjunctiva approximately 2 mm from the iris.
- The membrane is secured in all 4 quadrants and a symphtephoron ring is inserted.
- This process is repeated on the other eye.

Significance
- Surgical treatment of the ocular surface in patients with SJS/TEN is a never practice.
- Amniotic membrane transplant is a new and improved way to treat a syndrome that has the potential to result in chronic eye pain, photophobia or blindness.
- Not all SJS/TEN patients with ocular involvement require an amniotic membrane transplant.

Acknowledgements & References
The authors would like to thank Zane Montagu, MD and Ellen Rock, MD for their support in creating this article.

Presentation of Ocular Manifestations
- Symphtephoron and conjunctival scarring
- Excoriation, symphtephoron, corneal scarring and neovascularization
- Complete resolution of the cornea and loss of epithelial cells

Ophthalmologic Care
- Daily eye hygiene is performed to remove debris and may decrease the chance of ocular surface infection.
- Various topical antibiotic medications are used to prevent infection.
- A symphtephoron ring can be placed in the eye to prevent the formation of symphtephoron.
The Nuts and Bolts of Creating a Asynchronous Journal Club for Pediatric Nurses

Author(s): Marilyn Moonan MSN, RN, CPN
Shelly Pignataro MSN, RN

Target Audience: Staff nurses

Objectives:
- Summarize the steps in setting up an online journal club
- Describe the clinical nurse educator’s role in developing, implementing and maintaining an online journal club.
- Describe ongoing process for maintaining in the journal club

Impact/Significance: The creation of an asynchronous online journal club has helped nurses develop critical thinking, apply evidence based practice, build leadership abilities and incorporate reflective thinking in their clinical practice.

Key Points:
- Using Wordpress, a free web software blogging tool, an interdisciplinary group created an online journal club designed for pediatric surgical nurses in the inpatient and outpatient setting. The multidisciplinary group consisted of nursing educational coordinators, staff nurse leaders, the hospital librarian, the nurse scientist and a quality improvement analyst. Barriers included managing technical difficulties with registration of individual nurses, encouraging "buy in" from staff, and assuring accountability from managers. Through trial and error, we have resolved technical problems and developed incentives and guidelines for participation. As a result, we now have a robust online journal club that promotes team building by encouraging interaction and dialogue among peers. An added benefit is that the nurses learn how to appraise and critique literature. We have 133 current online journal club members and 121 comments on 14 articles, over the past year. In summary, through dissemination of nursing journal articles, nurses are able to discuss current evidence and practice by reading the posted articles and related discussion questions.

If this poster has been presented at a conference, which one: Association for Nursing Professional Development
July 2015
Hospital Infantil Teletón de Oncología and Dana-Farber/Boston Children’s Cancer and Blood Disorders Center Nurses Partner to Improve Pediatric Oncology Care

Author(s): Stephanie Barajas, Lic. Enf.
Megan Green BSN, RN, CPON
Kathleen Houlahan MSN, RN
Rose Mintor MSN, RN, CPON
Lisa Morrissey MPH, MSN, RN, CPHON
Mariana Noriega, Lic. Enf.

Target Audience: Nurses interested in global nursing collaborations

Objectives: Select HITO nurses receive advanced training at top ranked US pediatric cancer center and use this expertise to educate nurses and other clinicians in Queretaro.

DF/BCHCC staff gain deeper insights into the health care systems of Mexico and Latin America and further DF/BCHCC’s strong commitment to improving patient outcomes globally.

Impact/Significance: Nurses are the largest workforce in health care and have a significant influence on patient outcomes. Research demonstrates the positive association between specialized nursing education and lower mortality rates among children with cancer (1). The nursing collaboration between Hospital Infantil Teletón Oncología (HITO) and Dana-Farber/Boston Children’s Cancer and Blood Disorders Center (DF/BCHCC) is a model that promotes optimal patient care through specialized nursing education and clinical training. The collaboration provided DFCI/BCH and HITO nurses the opportunity to build a pediatric oncology nursing curriculum and develop safe policies, guidelines, and outcome measures for nurses in the HITO program.

Key Points: A three month fellowship was offered in Boston for five nurse leaders from HITO. A formal pediatric oncology curriculum was designed which included didactic education and observership in:
• Oncology, neuro-oncology and BMT (inpatient and outpatient care)
• ICU, Peri-operative and Emergency Care
• Infection Prevention and Monitoring
- Simulation lab

In phase, DF/BCH nurses with diverse areas of expertise travelled to Queretaro and partnered with HITO nurse leaders to facilitate initial operations and nursing education. Initiatives included:
- Assessment and preparation for hospital opening
- Classroom based education and simulation
- Policies and education material development
- Safety & quality improvement initiatives

Outcomes of the project:
- Evidence based nursing policies developed for HITO
- Certification for HITO nurse leaders in Basic Life Support (BLS), Pediatric Advanced Life Support (PALS); completion of APHON Chemotherapy and Biotherapy Provider Course
- Education and clinical training of over 50 HITO nurses, pre and post opening of HITO facility

If this poster has been presented at a conference, which one: International Society of Pediatric Oncology (SIOP) 2014, Toronto, CA
Hospital Infantil Teletón de Oncología and Dana-Farber/Boston Children’s Cancer and Blood Disorders Center Nurses Partner to Improve Pediatric Oncology Care
Stephanie Barajas, Megan Green BSN, RN, Kathleen Houlihan MSN, RN, Rose Mintor MSN, RN, Lisa Morrissey MPH MSN, RN, Mariana Noriega

Background:
Nurses are the largest workforce in health care and have a significant influence on patient outcomes. Research demonstrates the positive association between specialized nursing education and lower mortality rates among children with cancer (1). The nursing collaboration between Hospital Infantil Teletón Oncología (HITO) and Dana-Farber/Boston Children’s Cancer and Blood Disorders Center (DF/BCHCC) is a model that promotes optimal patient care through specialized nursing education and clinical training. The collaboration provided DFCI/BCH and HITO nurses the opportunity to build a pediatric oncology nursing curriculum and develop safe policies, guidelines, and outcome measures for nurses in the HITO program.

Goals:
- Select HITO nurses receive advanced training at top ranked US pediatric cancer center and use this expertise to educate nurses and other clinicians in Queretaro.
- DF/BCHCC staff gain deeper insights into the health care systems of Mexico and Latin America and further DF/BCHCC’s strong commitment to improving patient outcomes globally.

Methods:

**Phase 1 (June - September 2013):**
Three month fellowship in Boston for five nurse leaders from HITO. Formal curriculum designed to provide didactic education and observership in:
- Oncology, neuro-oncology and BMT (inpatient and outpatient care)
- ICU, Peri-operative and Emergency Care
- Infection Prevention and Monitoring
- Simulation lab

**Phase 2 (November 2013 - April 2014):**
DF/BCH nurses with diverse areas of expertise travel to Queretaro, partner with HITO nurse leaders to facilitate initial operations and nursing education. Initiatives included:
- Assessment and preparation for hospital opening
- Classroom based education and simulation
- Policies and education material development
- Safety & quality improvement initiatives

Outcomes:
- Evidence based nursing policies developed for HITO
- Certification for HITO nurse leaders in Basic Life Support (BLS), Pediatric Advanced Life Support (PALS); completion of APHON Chemotherapy and Biotherapy Provider Course
- Education and clinical training of over 50 HITO nurses, pre and post opening of HITO facility

Lessons Learned/Future Steps:
- Increase use of translators
- Pre-assessment of culture, systems, and facilities of collaborating country
- Schedule evaluations & “check-in” meetings at pre-determined time points
- Create pre and post assessment tools
- Offer more hands-on skills and practice sessions
- Upfront identification of data measurements
- Ongoing educational programming via teleconference
What is it We Need? Exploring the Learning Needs of a Large Staff

Author(s): Margaret Necchi BSN, RN
Michelle Audain BSN, RN

Target Audience: All nurses across the learning continuum
In today’s ever changing healthcare environment, learning never stops and no one person learns using the same method. Meeting the learning needs of a large staff is challenging due to individual learning styles, varying levels of expertise, and a lack of dedicated time for education. In the MSICU we struggled with these issues until we implemented several educational methods to meet the learning needs of our diverse staff.

Objectives: The goals of these efforts included:
1. To meet the learning needs of a group of more than 150 nurses by matching educational tools to their varied learning style.
2. To engage the staff nurses to be responsible for some of their own learning and encourage active participation in the learning process.
3. To ensure staff knowledge base grows with changes in medical technology.

Impact/Significance: Continued support and education of the bedside nurse to optimize patient outcomes.

Remain current in today’s practices by embedding evidence-based practice and clinical and technical supports at bedside.

Ongoing education decreases apprehension related to new technology or protocols.

Key Points: The MSICU has a unit-based Education Committee is tasked with supporting and meeting the educational needs of our diverse staff. Biannual needs assessments are performed to identify knowledge gaps and a thoughtful plan of action is created. Part of this plan is the creation of four unit based Education Days per year. The lecture topics are determined by staff preference as well as new and relevant updates in nursing research and practice. A second component of the Education Days is skill stations that enable the nurse to perform hands-on activities to increase skill competency. Examples of these stations include: working with external drains, defibrillators, skin care, and other unit-based initiatives. The third components are bi-monthly rolling education/skill carts on the unit to reinforce bedside nurses’ knowledge in topics such as
arrhythmias, phaskeal medication administration, chest tube care, and insufion usage. The fourth and final component to our varied education approach are bimonthly posters created identifying the top ten things you need to know about current ICU care.

There is no one educational method that works for every staff nurse therefore utilizing a variety of teaching methods ensures that the learning needs of the nurses are met.
Lyme Carditis

Author(s): Marlene Pelletier BSN, RN, CPN

Target Audience: Registered Nurses

Objectives:

To describe Lyme Disease and Lyme Carditis

To educate nurses about signs and symptoms, diagnosis, and treatments of both Lyme Disease and Lyme Carditis

Impact/Significance:

Lyme Disease is the most commonly reported vector borne disease in the US. It is sometimes called the great imitator. It is important for pediatric nurses to have knowledge of Lyme disease as it can have multiple impacts in the pediatric population, including Lyme Carditis. Lyme Carditis occurs in approximately 1% of Lyme disease cases in the US.

Key Points:

Signs and symptoms of Lyme disease
Diagnosis
Treatment
Lyme Carditis presentation and treatment

If this poster has been presented at a conference, which one: Poster presented at the 2014 Northeast Pediatric Cardiology Nurses Association Annual Conference, Boston, MA, October
Lyme Carditis
Marlene Pelletier BSN, RN, CPN

Lyme Disease
Background
- Multisystem illness caused by Borrelia burgdorferi – a spirochete transmitted by ticks (deer ticks)
- Most commonly reported vector borne disease in the US
- Nymphs (immature ticks) carry the highest risk for infection during their feeding months May-July
  - Majority of deer ticks cause Lyme disease (LD)
  o Tick must be embedded for ≥ 24-48 hours for disease transmission
  - Tick size is equal to a pin head and often goes unnoticed
- Most prevalent in the mid Atlantic and coastal US from April-October
- Peak incidence in children ages 5-14 years

Signs and Symptoms
Early localized stage: 3-30 days post tick bite
- Red, expanding rash called erythema migrans (EM)
  - Gradually expands over a period of several days
  - Circular with diameter of 2-20 inches
  - Center of rash may be clear as it enlarges giving a bull’s eye appearance
  - May be warm and not painful
  - Not restricted to the bite site
  - Occurs in 70-80% of infected individuals
- Flu-like symptoms, headache, fever, chills, fatigue, swollen lymph nodes
  and muscle/joint aches

Early disseminated stage: days to weeks post tick bite
- Additional EMs throughout the body
- Bell’s Palsy, severe malaise and fatigue, meningitis, paresis, arthritis, atrophic-ventricular nodal block and mild hepatitis

Late disseminated stage: months to years post tick bite
- Meningitis, impaired memory, poor school performance, misdiagnosis of attention deficit hyperactivity disorder, cardiac heart block, ventricular tachyarrhythmia syncope, congestive heart failure, abdominal pain, nausea, arthritis and impaired vision/blindness

Diagnosis
- Based on symptoms, history and physical findings (i.e. EMs)
- Centers for Disease Control and Prevention (CDC) recommends a 2-step process to test blood for antibodies against the LD bacteria (Figure 1)
  - Both tests can be done using the same sample
  - Antibodies can take 2-6 weeks to appear

Figure 1. Two-Tiered Testing Recommended by Centers for Disease Control and Prevention (CDC)

Two-Tiered Testing for Lyme Disease

First Test
- Enzyme Immunoassay (EIA)
- Immunofluorescence Assay (IFA)
- Positive or equivocal result
- Positive or equivocal result

Second Test
- IgM Western Blot
- IgG Western Blot
- Positive or equivocal result
- Positive or equivocal result

Manifestations
- Cardiac conduction abnormalities are the most common form of Lyme carditis ranging from asymptomatic 1st degree to complete heart block
- Other manifestations may include pericarditis/myocarditis, tachyarhythmias, prolonged QT interval, and pericardial effusions

Clinical Presentation
- Recent study by Costello et al. examined 267 children with early disseminated LD
  - 16% (n=33) were diagnosed with Lyme carditis
    - 14 (42%) had advanced heart block
      o Median time to recovery to sinus rhythm: 3 days (range 1-7)
    - 0 (0%) needed a permanent pacemaker
    - 0 (0%) had complete heart block
    - 4 (12%) had depressed ventricular systolic function
    - 3 (9%) presented in cardiogenic shock requiring mechanical ventilation, inotropic support and temporary pacing

Treatment
- Monitor closely complete heart block resolves within 1 week and prolonged PR interval normalizes in 6 weeks
- No preventative treatment for carditis
- Mild carditis is treated with oral antibiotics
- IV antibiotics are used for more severe cases
- Pacemakers are placed for permanent complete heart block in rare cases

Figure 2. Example Electrocardiogram of Patient with Lyme carditis
- Electrocardiogram obtained in an 18-year-old adolescent with Lyme carditis (Figure 2)
  - Shows complete heart block with atrial rate 60 and ventricular rate 52

Lyme Carditis is heart disease caused by infection from the spirochete Borrelia burgdorferi
- Occurs during the early disseminated stage
- Occurs in 1% of cases in the U.S.
- Symptoms include:
  - Palpitations
  - Chest pain
  - Dyspnea
  - Light headedness
  - Fatigue
  - Fainting
- Can occur with other signs of LD including:
  - EM, arthritis or neurological signs

Cardiovascular and Critical Care Services
MarlenePelletier@childrens.harvard.edu

56 | Page
Therapeutic Management of Emergency Room Patients in Behavioral Crisis

Author(s): Jennifer Schlebusch Milieu Counselor-Behavioral Response Team ED

Target Audience: All direct care staff

Objective: To improve the care of patients at risk for unsafe behaviors on presentation to the Emergency Department by providing direct care staff with a brief summary of the patients’ self-identified and parent-identified triggers, behaviors, and strategies for de-escalation.

Impact/Significance: This program was implemented in Spring of 2014 to assist the ED staff to manage an increase in load and acuity of the patient with psychiatric or behavioral needs. It enables all direct care staff to have a ‘snapshot’ of a patient’s behavioral history and current status, allowing caregivers to more therapeutically interact with their patients.

Key Points: Implementing the role of a milieu counselor in the emergency department to round on all behavioral and psychiatry patients and assess patients’ current level of distress, identify triggers and coping skills, and provide strategies for self-regulation and distraction in collaboration with medicine, psychiatry, and child life teams. Using a behavioral health worksheet and interview to identify these triggers and coping strategies, and suggest possible new ideas.
Legislative Action Interest Group (LAIG) Supporting Nurse Participation in Health Policy

Author(s): Ashley Waddell MS, RN
Amy Judge DeLong BA
Kathryn Audette MSW

Target Audience: Nurses and nurse leaders interested in influencing health policy.

Objectives: To describe the Legislative Action Interest Group (LAIG) including the structure and outcomes of this collaborative effort between the Department of Nursing and the Office of Government Relations to engage nurses in health policy.

Impact/Significance: Nurses have clinical and experiential knowledge of value to policymakers; however they may lack the skills or understanding about how to bring this knowledge into a government setting. Targeted education and guidance can enhance nurses’ contributions in health policy arenas. Boston Children’s Hospital nurses have:

- Participated in more than 20 legislative hearings and regulatory sessions, many delivering testimony and offering expert opinion.
- Traveled to Washington, D.C. to participate in patient advocacy events and have met with more than 40 US congressional staffers and legislators.
- Applied advocacy skills in work with external professional organizations, including strategy development, policy analysis, and preparation of position statements.

Key Points:

- Nurses have clinical, experiential and research-based knowledge regarding patient care and the health care system.
- Policy makers value the perspectives of nurses and wish for public policy to reflect the realities of the practice environment.
- In many cases, nurses lack the skills or understanding about how to effectively bring this knowledge into policy-making forums.
- Interdisciplinary collaboration (nursing and government relations) greatly strengthens the LAIG model for providing education and support to foster nurse participation in health policy.
- This collaboration is mutually beneficial: Nursing and government relations staffs benefit from an expanding view of real-world implications of policy decisions and the development of collaborative advocacy strategies.

If this poster has been presented at a conference, which one: Robert Wood Johnson Foundation Nursing and Health Policy Collaborative meeting: Integrating Health Policy into Nursing Doctoral Programs: Continuing the Conversation 2015
Legislative Action Interest Group (LAIG)
Supporting Nurse Participation in Health Policy
Ashley Waddell MS, RN, Amy Judge DeLong BA, Kathryn Audette MSW

Problem & Significance
- Good public policy reflects the values and needs of the people it is meant to serve.
- Public policy should be informed by those who are impacted.
- Nurses have clinical experience and research-based knowledge regarding patient care and the health care system.
- Policy makers value the nursing perspective and wish for public policy to reflect the realities of practice.
- In many cases, nurses lack the skills or understanding about how to effectively bring this knowledge into policy-making forums.
- Targeted education and professional support can enhance nurses’ contributions in the health and public policy areas.

Intervention
The Legislative Action Interest Group (LAIG) is a collaborative effort to leverage the clinical expertise of nurses in the policy-making arena.

Government Relations
- Legislative Process
- Political Landscape
- Opportunities to Influence

Nursing
- Clinical Expertise
- Practice Realities
- Professional Nursing Association Insight

LAIG Goals
- Bring together policy and clinical experts to influence state and federal health policy.
- Implement strategies that enhance nurses’ contributions in the policy arena.
- Increase nurses’ knowledge of legislative processes and health policy issues.
- Align hospital policy initiatives with the day-to-day needs and experiences of clinicians.

Structure & Process
What is LAIG?
- A facilitated monthly forum that supports exploration of state & federal policy issues & advocacy strategies.
- Open to clinicians interested in influencing health policy

Participants
- Direct Care Nurses
- Advanced Practice Nurses
- Nurse Educators
- Government Relations Staff
- Social Worker

Engage, Influence & Educate
- Prepare & deliver testimony
- Meet with state and federal elected officials
- Write & vet policy position statements with internal stakeholders
- Develop and vet grass-roots advocacy efforts within the hospital environment

Policy Priorities
- Nurse to patient staffing ratios
- ARNP scope of practice
- Nurse Licensure Compact
- Nurse mandatory overtime
- Safe patient handling
- Telemedicine
- Pediatric wellness bills

Outcomes
- Boston Children’s Hospital nurses have participated in more than 20 state legislative hearings and regulatory sessions.
- Delivering testimony at many high-profile public hearings. Policies addressed include:
  - Nurse staffing ratios
  - Nurse Licensure Compact
  - Mandatory Nurse Overtime
- Nurses traveled to Washington, D.C. to participate in patient advocacy events and have met with more than 40 U.S. congressional staffers and legislators.
- Experienced LAIG members facilitate and navigate health policy conversations with savvy gained through continued exposure to such content.
- LAIG meetings ensure the Government Relations staff better understand, and can articulate to external audiences, how to best align policy initiatives with the day-to-day needs and experiences of direct care providers.
- Participating nurses understand the value of engaging in the legislative process, as evidenced by their continued engagement in advocacy efforts.
- This collaboration is mutually beneficial: Nursing and Government Relations staff benefit from an expanding view of real-world implications of policy decisions and the development of collaborative advocacy strategies.

Implications for Nursing Doctoral Education
Assemble a Forum
- Engage members of the university or college Government Relations staff or a Professor of Political Science to provide expertise on the political landscape, legislative process, and advocacy strategy.
- Engage students who are interested in influencing public policy.
- Identify a nurse leader within the college who has the authority to oversee and approve positions generated by group members.
- Support experiential learning opportunities so that members can see their work through.

Further Consideration
- Interdisciplinary collaboration greatly strengthens this model.
- The perspectives and expertise of participating disciplines (nursing, political science and social work) enrich our shared work, improve our advocacy efforts and is mutually beneficial in achieving shared educational goals.
- Further investigation into the formal policy education within each discipline could provide illuminating for the future of nursing education.
Long-Acting Reversible Contraception (LARC) in the Adolescent Population

Author(s): Kathleen Waddicor BSN, RN, CPN
Ann Cooley Carlson BSN, RN, NC-BC
Jason Dick BA, Population Manager
Erin Towler BSN, RN, CPN

Target Audience: Multi-disciplinary team members caring for the adolescent population

Objectives: Describe what are Long-Acting Reversible Contraception (LARC) and their benefits for use with Adolescent patients.

List the common side effects of LARC methods.

Impact/Significance: According to the 2012 committee opinion released by the American College of Obstetricians and Gynecologists (ACOG), “Eighty two percent of adolescent pregnancies are unplanned. Nonuse, inconsistent use and use of methods with high typical use failure rates are reflected in the unintended adolescent pregnancies in the United States.”1 ACOG reports that the most commonly used contraceptive methods within the Adolescent population include withdrawal, condoms, and oral contraceptive pills (OCPs). The American Academy of Pediatrics (AAP), in September 2014, has recommended that the first line contraceptive choice for sexually active adolescents to be a LARC method.2 Choice of long-acting reversible contraception (LARC) methods (intrauterine devices and contraceptive implants) offers the Adolescent population three to five years of a highly effective form of birth control.

Key Points: Long-Acting Reversible Contraception (LARC): describe methods, side effects, and benefits with use in the Adolescent population.
LARC (Long-Acting Reversible Contraception) in the Adolescent Population

Kathleen Waddick, RN, BSN, CPM, Ann Cooley Carlton, RN, BSN, NC-BC, Erin Towler, RN, BSN, CPM, Jason Dick, BA

Introduction

According to the committee opinion released by the American College of Obstetricians and Gynecologists (ACOG), the majority (80%) of adolescent pregnancies are unplanned. In the United States, this is largely attributed to lack of and/or inconsistent use of contraception. ACOG reports that the most commonly used contraceptive methods within the adolescent population include intrauterine devices (IUDs) and the intrauterine levonorgestrel implant (Mirena) (1).

As of September 2013, the American Academy of Pediatrics (AAP) is recommending that the first line contraceptive choice for sexually active adolescents be a Long-Acting Reversible Contraception (LARC) method (2).

The Adolescent/Young Adult Program at Boston Children's Hospital now offers LARC as a choice for patients.

What is LARC?

Although short-term contraceptive methods, including condoms, OCPs, the patch, the vaginal ring, and the Depo-Provera shot, continue to be the most popular option among adolescents, it has been proven that LARC has higher continuation rates and lower pregnancy rates. There are two different types of LARC methods approved for use by the FDA, the intrauterine device (IUD) and the hormonal implant.

WHAT IS AN IUD?

The IUD is a type of birth control inserted through the vagina into the uterus to prevent pregnancy. There are three types of IUDs currently approved for use as LARC:

1. Mirena: Releases levonorgestrel hormone; effective for 5 years
2. Skyla: Releases etonorgestrel hormone; effective for 3 years
3. Paraguard: Non-hormonal copper wire coiled around stem in arm of device; effective for 10-12 years

WHAT ARE THE POTENTIAL BENEFITS OF AN IUD?

- Lasts 3-10 years (from date of insertion)
- Private
- Reversible form of birth control
- No need to remember
- Suppression of menstruation
- Improvement of dysmenorrhea
- Highly effective contraception method (>99%)
- Safe

WHAT IS A HORMONAL IMPLANT?

Hormonal implants are a type of birth control in the shape of a tiny tube placed under the skin of upper arm. There are two types of hormonal implants currently approved for use as LARC:

1. Nexplanon: Releases etonorgestrel hormone; effective for 3 years; radiopaque
2. Implanon: Releases etonorgestrel hormone; effective for 3 years

WHAT ARE THE POTENTIAL BENEFITS OF A HORMONAL IMPLANT?

- Lasts 3 years (from date of insertion)
- Private
- Reversible form of birth control
- No need to remember
- No pelvic insertion required
- Highly effective contraception method (>99%)
- Safe

WHAT ARE THE POTENTIAL SIDE EFFECTS OF AN IUD?

- Syndrome of insertion
- Perforation
- Mispagination
- Mispagination
- Pain/cramping
- Irregular bleeding

WHAT ARE THE POTENTIAL SIDE EFFECTS OF A HORMONAL IMPLANT?

- Pain at insertion site
- Swelling at insertion site
- Irregular bleeding

LARC at Boston Children’s Hospital

In August 2013, the Adolescent/Young Adult Program started offering the Mirena IUD to patients. In July 2014, the Adolescent/Young Adult Program started offering the Nexplanon to patients. LARC is available to all Boston Children’s Hospital primary care patients, specialty care patients, and outside referrals. Parental consent is required for minors, and insurance checks are completed prior to insertion scheduling. Patients receive family planning and birth control counseling from their primary care provider or a certified family planning counselor.

MIRENA IUD (as of 3/31/2015)

- 89/93 (95.7%) successful insertions; 4/93 (4.3%) failed insertions
- 5/89 (5.6%) patients experienced short-term complications (complications at insertion appointment)
- 17/89 (19.1%) patients experienced long-term complications (complications between date of insertion and follow-up appointment)

<table>
<thead>
<tr>
<th>Mirena IUD</th>
<th>Adverse reaction/side effect</th>
<th>BCCH Mirena IUD</th>
<th>Benchmarks [ACOG]</th>
<th>1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Syncope (nulliparous)</td>
<td>0/89 (0.0%)</td>
<td>8.7%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Perforation</td>
<td>0/89 (0.0%)</td>
<td>1/1000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mispagination</td>
<td>2/89 (2.2%)</td>
<td>10%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mispagination</td>
<td>5/89 (5.6%)</td>
<td>5-22% at 56 mos</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Irregular bleeding</td>
<td>9/89 (10.1%)</td>
<td>5%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>PID &lt;21 days =21 days</td>
<td>1/89 (possible)</td>
<td>9.2/1000; 1.8/1000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pain at insertion site</td>
<td>2/89 (2.2%)</td>
<td>&gt;50% discomfort</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pain at follow-up</td>
<td>9/89 (10.1%)</td>
<td>12.8%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Continued</td>
<td>84.6% at 1-265 days</td>
<td>85% at 265 days</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

NEXPLANON (as of 3/31/2015)

- 42/42 (100%) successful insertions
- 0/42 (0%) patients experienced short-term complications (complications at insertion appointment)
- 2/42 (4.8%) patients experienced long-term complications (complications between date of insertion and follow-up appointment)

<table>
<thead>
<tr>
<th>Nexplanon</th>
<th>Adverse reaction/side effect</th>
<th>BCCH Nexplanon</th>
<th>Benchmarks [ACOG]</th>
<th>1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Irregular bleeding</td>
<td>2/42 (4.8%)</td>
<td>16%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Continued</td>
<td>100% at 147 days</td>
<td>80% at 365 days</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Conclusion

National benchmarks from ACOG and the data available from the Adolescent/Young Adult Program’s utilization of LARC methods indicate the Mirena IUD and Nexplanon offer a highly effective birth control method for patients. These methods have low incidence of both short-term and long-term complications. Previous notions that LARC methods are not appropriate for adolescent patients are not supported by the data that is now available to us. As continuation rates demonstrate (IUD, 94.4%; Nexplanon, 100%), our adolescent population is embracing LARC.

This option is available to patients from all departments and divisions of the hospital, and can offer relief and reliable help with family planning and reproductive conditions.

Next Steps

More providers and clinical fellows are being trained in insertion of LARC methods in order to increase availability.
Management of a Malignant Hyperthermia Crisis in the Boston Children’s Hospital Satellite Facilities at Waltham and Lexington

Author(s): Susan O’Leary BSN, RN, CPN  
Karen Murphy RN, CPN  
Kristin Mead BSN, RN, CNOR  
Doreen White BSN, RN, CNOR

Target Audience: Boston Children’s Hospital Healthcare Providers who care for patients at risk for a MH crisis in the Satellite Facilities of Waltham and Lexington

Objectives: Describe the differences in the management of malignant hyperthermia crisis between Waltham and Lexington satellite facilities.

Provide an algorithm mapping out the management of a Malignant Hyperthermia Crisis in satellite facilities.

Impact/Significance: It is important for nurses who float amongst facilities to be aware of the similarities and differences when managing a MH crisis.

Key Points: Differences in managing an emergency situation vary depending upon the location and availability of resources.

Greater understanding of challenges presented at satellite locations provides opportunities for preparation and staff education.
Management of a Malignant Hyperthermia Crisis in the Boston Children’s Hospital Satellite Facilities at Waltham and Lexington

Kristin Mead, BSN, RN, CNOR; Karen Murphy, RN, CPN; Susan O’Leary, BSN, RN, CPN; & Doreen White, BSN, RN, CNOR

Background
- Malignant Hyperthermia (MH) is a rare, genetic condition which causes a severe hypermetabolic reaction and skeletal muscle rigidity.
- MH is triggered by the administration of either an inhaled volatile general anesthetic and/or succinylcholine.
- MH can be potentially fatal.
- Early recognition, accurate diagnosis, and rapid intervention are critical to the treatment of a MH crisis.
- Response plans are imperative to the survival of MH patients.
- Boston Children’s Hospital (BCH) has two perioperative satellite locations: Waltham and Lexington.
- Facilities resources must be considered when developing MH action plans.

Objectives
- Describe the differences in the management plan of MH crises at the BCH satellite locations.
- Identify the Waltham and Lexington facility resources.
- Provide a management plan algorithm for MH crisis in each location.
- Highlight the difference in treatment plans for staff who float between facilities.

Differences
- Waltham is supported by a larger staff, hospitalist, and code team with lister capability.
- Waltham processes labs to monitor for hyperkalemia and glucose levels.
- Waltham calls a hospital code, initiates treatment and arranges for transport to the main campus.
- Lexington is a free standing facility supported solely by the perioperative staff.
- Lexington calls 911 for additional support, initiates treatment, and transports to a nearby hospital.

Management of a Malignant Hyperthermia Crisis at Waltham

Recognition
- Unexplained rise in ETCO
d- Unexplained bradycardia
- Unexplained increase in O2 requirement
- Rise in Body Temperature (a late sign)

Rapid Intervention
- Discontinue volatile agents and succinylcholine
- Call for help
- Initiate Perioperative Code by pressing Code Button
- Call 9-1-1 (Waltham Code Rear)
- Assist with restraint
- Obtain MH Cart, Code Cart, Cooling Supplies
- Off or PRN, IV fluids, press call button to initiate transport of patient

Treatment
- Hyperventilate with 100% O2
- Obtain IV Access
- Administer Dantrolene 2.5mg/kg
- Start cooling measures
- Foley Catheter
- IO Peds
- Cold IV Fluids
- Treat arrhythmias
- J J Tube for Labe
- Glucocorticoids
- Core temperature (continue cooling measures until temp < 38 degrees C )

Monitor/Transport
- Notify blood bank (treat coagulopathy)
- Notify Social Work, PRN, or MD
- Transport to Main Campus

Nursing Implications
- Differences in managing emergency situations vary depending upon location and availability of resources.
- Nurses who float amongst facilities must be aware of the similarities and differences in MH management.
- Staff education needs to highlight differences in MH treatment based on facility location.
- Include MH training in Refresher.
- Incorporate MH crisis management into Simulation Training.

Management of a Malignant Hyperthermia Crisis at Lexington

Recognition
- Unexplained rise in ETCO
d- Unexplained bradycardia
- Unexplained increase in O2 requirement
- Rise in Body Temperature (a late sign)

Rapid Intervention
- Discontinue volatile agents and succinylcholine
- Call for help
- Initiate Perioperative Code by pressing Code Button
- Call 9-1-1 (Lexington Code Rear)
- Assist with restraint
- Obtain MH Cart, Code Cart, Cooling Supplies
- Change IV fluids to 912 to initiate transport

Treatment
- Hyperventilate with 100% O2
- Obtain IV Access
- Administer Dantrolene 2.5mg/kg
- Start cooling measures
- Foley Catheter
- IO Peds
- Cold IV Fluids
- Treat arrhythmias
- Glucocorticoids
- Core temperature (continue cooling measures until temp < 38 degrees C )

Monitor/Transport
- Transport to nearest Emergency Department
- Charge KU cart to the Communication Center & R440C

Acknowledgements & References
The authors would like to thank Linda Bouchard, MD for her expertise and oversight on MH preparedness at the Satellite facilities.


Partners in Telemedicine

Author(s): Tamar Winter BSN, RN, IBCLC
Grace Yoon MS, RN, NNP-BC

Target Audience: Nursing staff, NICU nurses

Objectives: To inform nurses of their roles and contribution in Telemedicine

Impact/Significance: Telemedicine is the wave of the future in medical care. As the nation is looking to reduce healthcare costs and as more complex medical patients are being cared for, the need to reduce provider hours, while increasing access to medical care must be met. Hospitals and providers are turning to telemedicine to meet those needs. Nursing expertise is crucial to ensuring a smooth transition between the telemedicine visit and the patient’s care.

The Department of Ophthalmology has utilized telemedicine to screen babies at risk for retinopathy of prematurity (ROP) and nursing plays an active role in this process. ROP is one of the leading causes of preventable blindness in children in developed countries. Typically, the Ophthalmologists make weekly rounds to examine the preterm infants who meet ROP screening criteria. Less than 10% of those screened develop ROP severe enough to require treatment. This is an inefficient use of the Ophthalmologists time and healthcare dollars. Studies have shown that ROP screening by Telemedicine is a reliable method of identifying babies with severe ROP. Nurses are capable of taking accurate retinal images and discerning ROP diagnosis. These nursing skills contribute to a reliable ROP telemedicine system.

Key Points: Retinal photos are taken using a specially designed camera (RetCam Shuttle), by trained RNs or NNPs.

The Telemedicine procedures include:
- Identify babies at risk for ROP, following guidelines set by the AAP
- Obtain retinal images of preterm babies, using specially designed camera (RetCam Shuttle)
- View the photos to determine readability
- Determine which photos depict ROP
- Upload images into MD screening report form
- Send images and report form via secure method to the Ophthalmologist
- Coordinate follow-up ROP screening based on Ophthalmologist’s recommendations
- Coordinate transfer, if indicated for in-person screening or treatment of severe ROP
Partners in Telemedicine
Tamar Winter, RN, BSN, IBCLC, Grace Yoon, RN, MSN, NNP-BC

**Objective:** To Inform nurses of their role and contribution to Telemedicine

**Background**
Telemedicine is the wave of the future in medical care. As the nation is looking to reduce healthcare costs and as more complex medical patients are being cared for, the need to reduce provider hours, while increasing access to medical care must be met. Hospitals and providers are turning to telemedicine to meet those needs. Nursing expertise is crucial to ensuring a smooth transition between the telemedicine visit and the patient’s care.

**Significance**
The Ophthalmology Department, in 2012, began a program of Telescreening for Retinopathy of Prematurity.
- ROP is a leading cause of preventable blindness in children in developed countries
- The Ophthalmologists make weekly rounds to examine the preterm infants who meet ROP screening criteria
- Less than 10% of those screened develop ROP severe enough to require treatment
- This is an inefficient use of the Ophthalmologists time and healthcare dollars
- Studies have shown that ROP screening by Telemedicine is a reliable method of identifying babies with severe ROP
- Nurses are capable of taking accurate retinal images and discerning ROP diagnosis. These nursing skills contribute to a reliable ROP telemedicine system.

**RN/NNP Procedure**
- Identify babies at risk for ROP
- Obtain retinal images using specially designed camera (RetCam Shuttle)
- View the photos to determine readability
- Determine which photos depict ROP
- Upload images into MD screening report form
- Send images and report forms via secure method to the Ophthalmologist
- Ophthalmologists sends report to nursing
- RN/NNP coordinates follow-up ROP screening based on Ophthalmologist’s recommendations
- If indicated, coordinates transfer of the infant for in-person screening or treatment of severe ROP

**Sample Retinal Images**
- Normal blood vessels
- Abnormal vessels, indicating advanced ROP
- Moderate to severe ROP
Types of Seizures in the Pediatric Population

Author(s): Janice Wong RN, BSN.

Target Audience: General public, nurses, and nurse practitioners

Objectives: A seizure or convulsion is a paroxysmal, time-limited change in motor activity and/or behavior that results from abnormal electrical activity in the brain. Epilepsy is defined as a medical condition in which seizures are triggered recurrently from within the brain; when two or more unprovoked seizures occur greater than 24 hours apart. According to Russ, Larson & Halfon (2012), more than 450,000 children (ages 6-17 years old) have been diagnosed with epilepsy in the United States. Pastor, Reuben, Kobau, Helmers & Lukacs (2010) showed that students who are aged from 6-17 years old with epilepsy were more likely to miss 11 or more days of school in the past year, compare to students who have other health problem other than epilepsy. Pastor et.al, (2010) also demonstrated students who are diagnosed with epilepsy have limitations of participating in sports or clubs. The goal of this presentation is to review various types of childhood seizures such as (1) febrile seizures, (2) partial seizures; and (3) generalized seizures, along with clinical manifestations of each seizure type. Noteworthy, diagnosis tests; diet; pharmaceutical and innovative treatments at Boston Children’s Hospital would also be reviewed in this presentation as well. The goal of this poster is to increase awareness of the general public about different seizure types in the pediatric population and clinical manifestations and emergency interventions during a seizure.

Impact/Significance: Seizures are common in the pediatric population and occur approximately in 10% of children. Less than one third of seizures in children are caused by epilepsy (Kliegman, Stanton, Geme, Schor, & Behrman, 2011). Indeed, the cumulative lifetime incident of epilepsy is 3%; more than half of the cases begin in childhood. The outlook for most children with epilepsy is generally good (Koh, Kobau, Whittemore, Mann, Johnson, Hutter, & Jones, 2014). However, seizure may signal a potentially serious underlying systemic or central nervous system disorder that require comprehensive investigation and management. It is very essential and necessary to increase awareness of the general public of epilepsy and its own clinical manifestations.

Key Points: epilepsy, febrile seizure, partial seizure, generalized seizure.
References


EVIDENCE BASED PRACTICE POSTERS
To Wear or Not to Wear: Mask Use in Pediatric Oncology Patients

Group Members:

Amanda Lulloff MS, RN
Michele Farrington BSN, RN, CPHON
Susan Adrian MS, RN, CPNP
Colleen Nixon MSN, RN, CPHON
Jennifer Sabounjian BSN, RN

Statement of the Problem:
Pediatric oncology patients have a higher risk for infection secondary to neutropenia, presence of central venous catheters, malnutrition, and invasive procedures (Friese, 2007). Prevention of infection is a top priority and universal use of evidence-based preventive and management strategies can optimize patient outcomes (Shelton, 2003). Health care associated infections primarily result from noncompliance with infection control practices (Centers for Disease Control, 1994; Martel, et al., 2013). Many pediatric oncology units utilize the practice of patients wearing surgical/procedural masks when leaving the inpatient unit as a measure to prevent infection.

Informal benchmarking at institutions across the country and during the 2012 APHON conference revealed common yet variable use of surgical/procedural masks to reduce infection risk in pediatric oncology patients. The variability resulted from inconsistent implementation of surgical/procedural mask use and inconsistent patient compliance.

Clinical Question:
Are pediatric oncology patients who wear surgical masks at a decreased risk of acquiring infections compared with pediatric oncology patients who do not wear surgical masks over the course of the same chemotherapy treatment?

Search for the Evidence:
• Iowa Model of Evidence-Based Practice to Promote Quality Care provided the framework
• Trigger – surgical/procedural mask wearing in neutropenic, pediatric oncology patients is inconsistent within and among institutions
• Research and related literature assembled, systematically critiqued and synthesized
  o CINAHL, PubMed and Boston College Library
  o n=47 articles published from 1981-2013
• Benchmarking survey created and distributed on the APHON Member Connect Open Forum to determine current practice patterns
• Practice recommendation made for surgical/procedural mask use for neutropenic, pediatric oncology patients
Critical Appraisal of the Evidence:

- Surgical/procedural masks are not effective for neutropenic, pediatric oncology patients (Booth, et al., 2013; Davidson, et al., 2013; Diaz & Smaldone, 2010; Garbin, et al., 2013)
- Fit of mask/seal is essential (Bessesen, et al., 2013; Condon & Sinha, 2010; Diaz & Smaldone, 2010; Oberg & Brosseau, 2008)
- Self-reported and/or observed compliance of mask use is low (Condon & Sinha, 2010; Larson, et al., 2010; Lipp & Edwards, 2005; Martel, et al. 2013)
- N95 masks should be worn in areas of active construction (Garbin, et al., 2011; Maschmeyer, 2009; Raad, et al., 2002; Zitella, et al., 2006)

Implications:

- Current evidence does not support mask wearing in the neutropenic, pediatric oncology population.
- Wide variability exists in clinical settings on mask wearing based on different beliefs and perceptions.
- Health care teams must be willing to address and change practices that are not evidence-based in order to improve patient outcomes.
- Patient/caregiver education must be focused on evidence-based interventions for infection prevention, including instructions regarding not wearing surgical/procedural masks.

If this poster has been presented at a conference, which one: Association Pediatric Hematology/Oncology National Conference-Portland OR, September 2014
To Wear or Not to Wear: Mask Use in Pediatric Oncology Patients
Amanda Lulloff, MS, RN1; Michele Farrington, BSN, RN, CPHON2; Susan Adrian, MS, RN, CPNP3; Colleen Nixon, MS, RN, CPHON1; & Jennifer Sabounjian4

Background
Pediatric oncology patients have a higher risk for infection secondary to neutropenia, presence of central venous catheters, malnutrition, and invasive procedures (Friesel, 2007). Prevention of infection is a top priority and universal use of evidence-based preventive and management strategies can optimize patient outcomes (Shelton, 2003). Health care associated infections primarily result from noncompliance with infection control practices (Centers for Disease Control, 1994; Martel, et al., 2013). Many pediatric oncology units utilize the practice of patients wearing surgical/procedural masks when leaving the inpatient unit as a measure to prevent infection.

Informal benchmarking at institutions across the country and during the 2012 APHON conference revealed common yet variable use of surgical/procedural masks to reduce infection risk in pediatric oncology patients. The variability resulted from inconsistent implementation of surgical/procedural mask use and inconsistent patient compliance.

Project Purpose
To examine current evidence and practices related to surgical/procedural mask use in neutropenic, pediatric oncology patients and to formulate evidence-based recommendations.

Process
• Iowa Model of Evidence-Based Practice to Promote Quality Care provided the framework
• Trigger – surgical/procedural mask wearing in neutropenic, pediatric oncology patients is inconsistent within and among institutions
• Research and related literature assembled, systematically critiqued and synthesized
• CINAHL, PubMed and Boston College Library
• n=47 articles published from 1981-2013
• Benchmarking survey created and distributed on the APHON Member Connect Open Forum to determine current practice patterns
• Practice recommendation made for surgical/procedural mask use for neutropenic, pediatric oncology patients

Literature Review Results
• Surgical/procedural masks are not effective for neutropenic, pediatric oncology patients (Booth, et al., 2013; Davidson, et al., 2013; Diaz & Smallbone, 2010; Garbin, et al., 2013)
• Fit of mask/seal is essential (Bessoson, et al., 2013; Condon & Sinha, 2010; Diaz & Smallbone, 2010; Oberg & Brossaen, 2008)
• Self-reported and/or observed compliance of mask use is low (Condon & Sinha, 2010; Larson, et al., 2010; Lipp & Edwards, 2005; Martel, et al. 2013)
• N95 masks should be worn in areas of active construction (Garbin, et al., 2011; Maschmeyer, 2009; Raad, et al., 2002; Zitella, et al., 2006)

Conclusions/Next Steps
• Current evidence does not support mask wearing in the neutropenic, pediatric oncology population.
• Wide variability exists in clinical settings on mask wearing based on different beliefs and perceptions.
• Health care teams must be willing to address and change practices that are not evidence-based in order to improve patient outcomes.
• Patient/caregiver education must be focused on evidence-based interventions for infection prevention, including instructions regarding not wearing surgical/procedural masks.

Anecdotal Comments from Respondents
• “The mask helps other people in a public place stay away. Not so much protects the patient from airborne germs.”
• “Used mostly for parental piece of mind.”
• “Our patients wear the N-95 mask.”
• “Because the surgical mask is only good for a period of time because of moisture, I think it provides a false sense of security to families.”

Patient/Caregiver Education Handout Example

1Boston Children’s Hospital
2University of Iowa Children’s Hospital
3O’Youville College
4Northeastern University
Use of Reiki to Enhance the Practice of Critical Care Nurses: A Critical Appraisal of the Literature

Group Members: Delia Cox BSN, RN  
Christopher Reeves BS, RN

Statement of the Problem:
Critical care nurses practice in a high-stress and unpredictable environment. These environments, like the emergency department or ICU, can lead to burnout and compassion fatigue. Burnout and compassion fatigue can manifest in nursing staff as physiologic and/or emotional symptoms. Reiki is a form of energy therapy developed in Japan used to promote healing. This technique has been previously documented both objectively and subjectively to reduce stress, manage pain, and enhance well-being in patients, particularly in palliative and oncological settings.

Clinical Question:
How does job satisfaction and self-efficacy compare in critical care nurses receiving Reiki compared to those who do not.

Search for the Evidence:
The databases searched for this project include PubMed, EBSCO, and CINAHL. The key words ‘Reiki’, ‘stress management’, ‘Reiki and nurse’, ‘Reiki and stress management’, ‘Reiki and emergency medicine’, and ‘Reiki and critical care’ settings were used. Once the relevant literature was identified the articles were reviewed to ensure they were evidence-based and truly focused on the use of Reiki in nurses.

Critical Appraisal of the Evidence:
Each article was appraised for its level of evidence and the quality of the methods. This data will be summarized and recommendations relevant to clinical practice and future research will be stated. The results of this review will (1) inform the use of Reiki as an energy treatment provided to critical care nurses and (2) help shape our next steps as we formulate a research question.

Implications:
The evidence-based literature focusing on the technique of Reiki as a treatment for the critical care nurse is limited. Using the existing evidence to inform our next steps is critical. Building a body of evidence that informs our understanding of how Reiki impacts critical care nurses will potentially lead to positive outcomes both for the nurse and healthcare operations.
Use of Reiki to Enhance the Practice of Critical Care Nurses: A Critical Appraisal of the Literature
Delia Cox RN, BSN & Christopher Reeves RN, BSN

Statement of Problem
Critical care nurses practice in a high-stress and unpredictable environment. These high-stress environments can lead to burnout and compassion fatigue. Burnout and compassion fatigue can manifest in nursing staff as physiologic and/or emotional symptoms. Reiki is a form of energy therapy developed in Japan used to promote healing. This technique has been previously documented both objectively and subjectively to reduce stress, manage pain, and enhance well-being in patients, particularly in palliative and oncological settings.

Clinical Question
- P: Critical Care / Emergency Nurses
- I: Reiki
- C: Nurses who do not receive Reiki
- O: Job satisfaction and Self-efficacy

Search for Evidence

<table>
<thead>
<tr>
<th>TERMS</th>
<th>Reiki</th>
<th>Reiki AND Nurses</th>
<th>Reiki AND Management</th>
<th>Reiki AND Emergency Medicine</th>
<th>Reiki and Critical Care</th>
</tr>
</thead>
<tbody>
<tr>
<td>PubMed</td>
<td>2,186</td>
<td>161</td>
<td>9</td>
<td>4</td>
<td>25</td>
</tr>
<tr>
<td>Google Scholar</td>
<td>20,100</td>
<td>3,680</td>
<td>1,140</td>
<td>198</td>
<td>558</td>
</tr>
<tr>
<td>CINHAL</td>
<td>235</td>
<td>3</td>
<td>2</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

Presentation of the Evidence

<table>
<thead>
<tr>
<th>Author(s)</th>
<th>Year</th>
<th>Level of Evidence</th>
<th>Mernyck &amp; Fritsoul-Ovitt</th>
<th>Findings</th>
</tr>
</thead>
<tbody>
<tr>
<td>Diaz-Rodriguez et al</td>
<td>2011</td>
<td>II</td>
<td></td>
<td>Reiki sessions can produce immediate and statistical improvement in salivary IgA and diastolic blood pressure in nurses with burnout syndrome.</td>
</tr>
<tr>
<td>Cuneo et al.</td>
<td>2011</td>
<td>IV</td>
<td></td>
<td>Practicing Reiki can reduce perceived stress levels in nurses.</td>
</tr>
<tr>
<td>Diaz-Rodriguez et al.</td>
<td>2011</td>
<td>II</td>
<td></td>
<td>Focused primarily on health care professionals with burnout Reiki had immediate effects on the parasympathetic nervous system, lowering heart rate and increasing body temperatures.</td>
</tr>
<tr>
<td>Wardell et al.</td>
<td>2001</td>
<td>III</td>
<td></td>
<td>Found that Reiki decreased perceived anxiety while increasing signs of relaxation and immune function.</td>
</tr>
<tr>
<td>Vitale</td>
<td>2009</td>
<td>V</td>
<td></td>
<td>Themes that emerged from this phenomenological study included having a calming effect for the day and establishing a relationship between reverence, caring and nursing.</td>
</tr>
</tbody>
</table>

Critical Appraisal of the Evidence
- Very few research studies have been conducted addressing nursing in critical care environments
- Reiki has documented positive effects related to perceived stress and physiological markers of stress
- Limited research exists addressing effects of Reiki and the critical care nurse regarding: perceived stress, job satisfaction, reported self-efficacy

Implications for Clinical Practice
Additional well-designed research studies investigating the impact of Reiki on the job satisfaction and self-efficacy of critical care nurses continues to be needed. Building a body of evidence that informs our understanding of how Reiki impacts critical care nurses will potentially lead to positive outcomes both for the nurse, patients, and healthcare operations.

References
Improving Intravenous Fluid Delivery in Pediatric Septic and Hypovolemic Shock

Group Members: Katie Sultan, RN, BSN, CPEN

Statement of the Problem
Adherence to Pediatric Advance Life Support guidelines while caring for a patient who arrives at the emergency department (ED), especially with septic and trauma related hypovolemic shock decreases morbidity and mortality. Timely rapid intravenous (IV) fluid administration was identified as the most common barrier to guideline adherence in our ED setting as far as equipment issues were concerned. Attaching gravity tubing directly to the IV catheter often leads to loss of the “lifeline”, due to manipulation as well as increased exposure to air embolism and blood borne pathogens. The aim of this initiative is to improve the safety, timeliness and efficacy of IV fluid delivery during a pediatric resuscitation.

Clinical Question
In children requiring rapid fluid resuscitation in the emergency department; how does a standard smaller bore (diameter), 7 inch length (17.8cm /volume 0.3ml) IV extension connector compared to a larger bore, shorter 5.7inch length (14.5cm / volume 0.7ml) IV extension connector effect flow rate.

Search for the Evidence
The databases searched for this project include PubMed, Cochrane, CINAHL, and BMJ.com.pediatric. The key words “large bore IV”, “high flow IV device”, “fluid resuscitation rates in pediatrics,” “vascular access,” and “fluid resuscitation” were used. Once the relevant literature was identified the articles were reviewed to ensure they were evidence-based and applicable to IV fluid delivery. Clinical expertise: A local test was conducted by the BCH Trauma Nurse Leadership (TNL) group to compare the flow rate differences between the current small bore IV extension connector and the proposed larger bore extension connector. The TNL group hung two 500ml Normal Saline fluid bags attached to non-pressurized gravity IV tubing sets with Duo-Vent Spikes on IV poles, adjusted at a height of 6.5 feet. Fluid bag #1 utilized the standard small bore, 7inch long (17.8cm /volume 0.3ml) IV extension connector while bag #2 utilized a more expensive large bore, 5.7inch long (14.5cm / volume 0.7ml) IV extension connector. Using a stop watch, the fluids were simultaneously run via gravity and timed using 24, 22, and 20 gauge IV catheters.

Critical Appraisal of the Evidence
Strong evidence supports the Hagen-Poiseuille Law which holds that the flow of fluid through a cylindrical pipe is inversely proportional to the length of tubing, the viscosity of the fluid, proportional to the pressure drop across the IV catheter, and proportional to the fourth power of the IV catheter radius. A larger bore, shorter length catheter, and IV fluid tubing are preferable when large volume of fluids need to be infused rapidly. Peripheral IV catheter size, however, must be considered as it also effects flow rate. Local on-site testing revealed that a
larger bore, 5.7-inch long, intravenous catheter extension connector, increased flow rate by 68% when attached to gravity tubing, consistent with existing evidence.

**Implications**
Based on evidence from the literature and quality improvement pilot, IV fluid targets can be realized within the first hour with the use of large bore extension tubing. On January 2015, a change in practice was made. Use of a larger bore, 5.7-inch long, intravenous catheter extension connector was recommended as best practice for the patient in septic and hypovolemic shock when a Level One rapid infuser is not indicated. Findings were disseminated in all multidisciplinary forums and nurses and physicians operationalized this solution at the bedside.
Improving Intravenous Fluid Delivery in Pediatric Septic and Hypovolemic Shock
Kathleen Sultan RN, BSN, CPEN

Statement of Problem
Adherence to NPs and APN guidelines while caring for a patient who arrived at the emergency department (ED) with septic and trauma-related hypovolemic shock decreases mortality and morbidity. Ability to meet timely intravenous fluid administration targets (initiated within 5 minutes and up to 60 minutes within 20 minutes) was identified as the most common barrier to guideline adherence.

Clinical Question
When treating pediatric intravenous fluid resuscitation in the ED, how does the use of a larger bore (diameter), 7 Fr [inch], length (7.3cm in volume 0.3 ml) of IV extension connector compared to a smaller bore (diameter), 5 Fr [inch], length (1.8cm in volume 0.3 ml) of IV extension connector affect flow rate?

PICO Question
- P: Patients requiring rapid fluid resuscitation in the ED
- I: Use of a larger bore, shorter 5 Fr, length (1.8cm in volume 0.3 ml) IV extension connector
- C: Use of a standard smaller bore (diameter), 7 Fr, length (7.3cm in volume 0.3 ml) IV extension connector
- O: To improve the safety, timeliness and efficiency of IV fluid delivery during pediatric resuscitation

Presentation of the Evidence

Literature Review

<table>
<thead>
<tr>
<th>Author(s)</th>
<th>Year</th>
<th>Level of Evidence</th>
<th>Manojlovich &amp; Finnren/Overtolt</th>
<th>Findings</th>
</tr>
</thead>
</table>
| Harvey, J., Parker, M. | 2013 | Level 7 | Expert opinion/ commentary | Pediatric patients with septic shock receiving fluid resuscitation in the first hour of resuscitation in the Emergency Department were at a decreased mortality rate of 1%.

<table>
<thead>
<tr>
<th>Author(s)</th>
<th>Year</th>
<th>Level of Evidence</th>
<th>Manojlovich &amp; Finnren/Overtolt</th>
<th>Findings</th>
</tr>
</thead>
</table>
| Oliveira, Nogueira de Sa et al. | 2008 | Level 6 | Retrospective multicenter study | Evaluation of fluid resuscitation in pediatric patients with septic shock receiving fluid resuscitation in the first hour of resuscitation in the Emergency Department were at a decreased mortality rate of 1%.

<table>
<thead>
<tr>
<th>Author(s)</th>
<th>Year</th>
<th>Level of Evidence</th>
<th>Manojlovich &amp; Finnren/Overtolt</th>
<th>Findings</th>
</tr>
</thead>
</table>
| Reckitt, A. D., Henriot, L., & Motterson, W.C. | 2000 | Level 4 | Well designed uncontrolled study | Fluid resuscitation in pediatric patients with septic shock receiving fluid resuscitation in the first hour of resuscitation in the Emergency Department were at a decreased mortality rate of 1%.

<table>
<thead>
<tr>
<th>Author(s)</th>
<th>Year</th>
<th>Level of Evidence</th>
<th>Manojlovich &amp; Finnren/Overtolt</th>
<th>Findings</th>
</tr>
</thead>
</table>
| Linbauer. W., Shafman, A | 1999 | Level 4 | Well designed uncontrolled study | Fluid resuscitation in pediatric patients with septic shock receiving fluid resuscitation in the first hour of resuscitation in the Emergency Department were at a decreased mortality rate of 1%.

<table>
<thead>
<tr>
<th>Author(s)</th>
<th>Year</th>
<th>Level of Evidence</th>
<th>Manojlovich &amp; Finnren/Overtolt</th>
<th>Findings</th>
</tr>
</thead>
</table>
| Mattson, W. F., Thompson, T., Liou, J., Abrahamian, M. & Darm, J. | 1985 | Level 4 | Well designed uncontrolled study | Fluid resuscitation in pediatric patients with septic shock receiving fluid resuscitation in the first hour of resuscitation in the Emergency Department were at a decreased mortality rate of 1%.

<table>
<thead>
<tr>
<th>Author(s)</th>
<th>Year</th>
<th>Level of Evidence</th>
<th>Manojlovich &amp; Finnren/Overtolt</th>
<th>Findings</th>
</tr>
</thead>
</table>
| Fleisher, G., Overtolt. D. | 1985 | Level 4 | Well designed uncontrolled study | Fluid resuscitation in pediatric patients with septic shock receiving fluid resuscitation in the first hour of resuscitation in the Emergency Department were at a decreased mortality rate of 1%.

Search for Evidence

PubMed
- Pediatric Intravenous Fluid Therapy
- Pediatric IV Fluid Therapy

Search Terms
- Large bore IV
- High flow IV devices
- Catheter flow rates
- Fluid resuscitation protocols
- Venous access
- Fluid resuscitation

References

PROJECT POSTERS
Revitalizing & Energizing the RN Peer Review Process

Author(s): Samantha Killilea RN, MSN, CPN
Sharon Anderson RN, CNOR
Joan Kirk RN
Carol Walling BSN, RN
Karen Murphy BSN, RN

Purpose:
To rejuvenate the peer review process in the Satellite Peri-Operative setting. Using the synergy model in a new way enables RNs to provide each other with encouraging feedback to improve their professional nursing practice.

Method or Approach:
Evaluate our current process of peer review system and staff’s perception of the effectiveness of peer review. Trialed a new approach to RN peer review to produce more positive feedback for RN peers. Using SMART GOALS each RN staff member will be evaluated with the new RN peer review process.

Outcomes:
New process resulting in better communication among all staff, positive feedback and new interest in personal RN professional development.

Next Steps or Lessons Learned:
In the upcoming year evaluate the effectiveness of RN peer review SMART GOAL setting, in terms of goal achievement and RN and team satisfaction.
Revitalizing & Energizing the RN Peer Review Process

Samantha Killilea RN, MSN, CPN, Sharon Anderson RN, CNOR, Joan Kirk RN,
Carol Walling RN, BSN, Karen Murphy RN, CPN

Background:
- Peer Review process described by staff as being too long, lacking clarity and ineffective
- Staff were not excited or interested to participate
- Focus of peer review should be to provide feedback to support professional development not to highlight weak areas
- Current peer review process was stagnant and did not obtain positive feedback
- Comments were often paraphrased Synergy Model definitions with no specific pertinence to staff

Method or Approach:
- Evaluate current process of peer review system and staff's perception of the effectiveness of peer review
- Trialed a new approach to RN peer review to provide more positive feedback for RN peers 8/18 Staff Nurses have utilized trial Peer Review Process
- Using SMART GOALS each RN staff member will be evaluated with the new RN Peer Review Process
- Basic form was developed to help guide Peer Review Committee and staff through process to provide specific examples of goal achievement, SMART GOALS.
- Written Evaluation/ goals were submitted by Peer Review Committee to nurse manager to review as part of the Staff Nurse Performance Review

Purpose:
To trial a new way to rejuvenate the peer review process in the Satellite Peri-Operative setting. Using the Synergy Model in a new way enables RNs to provide each other with encouraging feedback to improve their professional nursing practice.

Outcomes:
New process resulting in better communication among all staff, positive feedback and new interest in personal RN professional development.

Next Steps or Lessons Learned:
In the upcoming year evaluate the effectiveness of RN Peer Review SMART GOAL setting, in terms of goal achievement and RN and team satisfaction.
- Continue to educate staff on new process, and roll out to Waltham
- Modify instrument to add structured questions for feedback and SMART GOALS
- Survey Monkey to evaluate staff benefits, concerns and effectiveness of trial Peer Review Process

Sample SMART Goals

Organize an informal in-service for staff by selecting a topic (Dr. Bartlett Grant News/RN//Tissue Expanders), email physician to set up date/verify date with nurse manager, notify staff by email of date of in-service, and after in-service share information with staff on bulletin board.

Publish Article for Nursing Journal reviewing topic and collected data, determining where to publish and look up requirements, write a draft and reach out to resources to help in application process.
Sharps Injury Prevention in the Pediatric Perioperative Setting

Author(s): Jon Boyer ScD
           Eleanor Torrey BS
           Janet Orr RN, CNOR
           Lori Arsenault MSN, RN, CNOR, NE-BC

Purpose:
Acute care hospitals have among the highest occupational injury & illness (OII) rates of all industries (US BLS, 2012). Exposure to contaminated sharps devices is often the largest proportion of hospital incident types (MA DPH 2010) and can result in emotional strain and potential side effects from post-exposure prophylaxis, life changing infections for affected employees and significant organizational disruptions. Pediatric hospitals are a specialized sub-sector that may present particular prevention challenges that have not been commonly evaluated in the literature. Over the past 10 years, perioperative settings have reported the largest proportion of employee sharps incidents compared to other departments at Boston Children's Hospital (BCH). Therefore, the objectives of this project were to increase participation in sharps safety by front line perioperative staff and leaders, assess and improve the culture of sharps incident reporting, institute a joint cause analysis process and identify prevention opportunities for reduction of perioperative incidence rates.

Method or Approach:
The Environmental Health & Safety (EH&S) department at BCH initiated a perioperative sharps injury prevention project in December of 2013. Sponsored by the Chief Surgeon, a multidisciplinary team of clinical and support services staff was recruited to participate. Process mapping, a risk perception and reporting survey, joint incident investigations, contaminated device handling audits, research of safety devices and best practices for operating room communication were employed.

Outcomes:
Review of meeting attendance rates (90%) and scheduled audit completions (85%) during calendar year (CY) 2014 indicated that project participation was sustained. Responses to the risk perception and incident reporting survey revealed that only 60% of participating perioperative staff reported sharps incidents 100% of the time, over the previous 12 months. Joint investigations, observations and audits revealed opportunities for prevention through improved passing and device handling behaviors, increased safety I.V device use by senior physicians, better hand-offs to central processing, and better management of disposable devices after use. Compared to CY 2013, reported sharps case counts, proportion of total reported BCH cases, and incidence rates increased by 44%, 40%, and 84%, respectively, in CY2014.
Next Steps or Lessons Learned:
Two important goals of traditional quality and safety programs in healthcare are improvement of process performance and reduction of negative health outcomes over time. Although these goals are sound, entrenched process inefficiencies and cultural safety barriers require realistic time frames for positive change. Error reduction methodologies from other industries, such as reliability science, have shown that quantitative measures of negative health outcomes are likely to increase before decreasing due to improvements in the culture of reporting. In this project, our team found that the culture of sharps incident reporting, sharps handing, staff communication and device disposal need improvement. However, our work also suggests that multidisciplinary sharps safety working groups can improve staff safety participation and awareness when coupled with senior leadership sponsorship in pediatric teaching hospitals. Increased incident rates are hypothesized to be due to the combined effects of existing hazards, decreased case volume and our focus on improved reporting and root cause investigation in 2014. This work will continue until we reach zero incidents.
Background and Purpose:
Adequate hospitals have among the highest occupational injury & illness (OII) rates of all industries (US BLS, 2021). Inadequate sharps devices are often the largest proportion of hospital incident types (MA DOH, 2018) and can result in emotional strain and potential side effects from post-exposure prophylaxis. By changing behaviors for affected employees and significant organizational disruptions. Pediatric hospitals are a specialized sub-sector that may present particular preventable challenges that have not been extensively evaluated in the literature. Although BWH sharps incidence rates are similar to benchmarked hospitals of similar size and service range in Massachusetts, perioperative settings have historically reported the largest proportion of sharps injuries. Our study compared to other departments at Boston Children’s Hospital (BCH) (Figure 1). Therefore, the objective of this project was to increase participation in sharps safety by front-line perioperative staff and leaders, assess and improve the culture of sharps incident reporting, and institute a post-incident analysis process and identify potential opportunities for reduction of perioperative incision rates.

Methods:
The Environmental Health & Safety (EH&S) department at BWH initiated a perioperative sharps injury prevention project in December of 2013. Sponsored by the Chief Surgeon, a multidisciplinary team of clinical and support services staff were recruited to participate. Process mapping (Figure 2), risk perception and reporting surveys, post-incident investigation, incident-handling audits, research of safety devices and best practices for operating room communication were employed.

Outcomes:
Review of trending attendance rates (2013) and scheduled audit completions (2013) during the calendar year (CY) 2014 indicated that project participation was sustained. Responses to the risk perception and incident reporting survey revealed that only 40% of participating perioperative staff received sharps training 100% of the time; over the previous 12 months. Joint investigation results (Fig 5) observations and audits revealed opportunities for enhancement through improved pass-on and device handling behaviors. Increased safety device use by senior physicians; better hand-offs in the OR, and better management of disposable devices after use. Compared to FY 2013, reported sharps cases, proportion of total reported BWH cases, and incidence rates (Fig 6) increased by 4%, 6%, 46%, and 3%, respectively, by CY2014.

Lessons Learned:
Two of the goals of traditional quality and safety programs are the improvement of process performance and attainment of specific quality improvements over time. Although these goals are sound, enhanced process performance and related safety outcomes require realistic time frames for positive change. Error reduction and performance improvement efforts require a long-term strategy. The most successful hospitals with high safety outcomes are likely to increase before decreasing due to improvements in the culture of reporting. In this project, our team found that the culture of sharps incident reporting, sharps handling, staff communication and device disposal improved. However, our work also suggests that the multidisciplinary sharps safety working groups can improve staff safety participation and, among nurses, when coupled with senior leadership sponsorship in pediatric operating rooms. Increased incident rates observed as hypothesized by the results to date:

- Improved communication in the workplace
- Improved sharps injury awareness training
- Improved incident reporting
- More thorough case investigations

Next Steps:
- Continued focus on principles of safety culture change and cause investigation through principles of high reliability organizations (HRO)
- Physical layout
- Reporting
- Device selection
- Incident response
- Safety device alternatives, communication in and around the field and safe disposal/distribution guided by the hierarchy of exposure controls (Figure 1)

Safety Needsles:
- Several different types of safety devices exist
- Most common types have retractable blades; or can be capped with one hand after use
- Protect staff after use and before disposal

Communication is Critical:
- Conduct needle counts throughout procedure
-十分 important for patient and staff safety
- While passing devices, keep needle/sharp side away from receiver

Safe Disposal:
- All sharps and syringes should be disposed of in a red sharps container after use
- Sharps containers should never be overfilled
- If necessary, is available for pick up
Integrating Research Into the Electronic Health Record to Improve Clinical Care

Author(s): Laura Connelly MSN, RN  
Gwendolyn Corr BSN, RN, CPN, CPHON®

Purpose:
To enhance the treatment of nausea within the oncology department, an in-depth review of literature was completed to evaluate nausea assessment tools. From this review, the Baxter Retching Faces Scale (BARF®), a validated pictorial 0-10 nausea assessment scale designed for pediatrics was chosen for a feasibility study on the inpatient oncology unit. During the feasibility study, a nursing satisfaction survey was completed to evaluate the usefulness of the BARF® scale within clinical practice. Of the nurses who completed the survey, all were in agreement that the tool was useful however many expressed the desire for the BARF® scale to be within PowerChart to help simplify and standardize the documentation process for nausea. This feedback propelled the idea to integrate this validated research tool into the electronic health record to improve the clinical care of pediatric patients with nausea at Boston Children’s Hospital.

Method or Approach:
The BARF® scale and the results of the feasibility study were presented to the Clinical Informatics Council. The council agreed with its usefulness and approved the development of the BARF® scale into PowerChart. Using the literature review that had been completed and Cerner management tools, a nurse informatics specialist created a nausea assessment tool for PowerChart which included the BARF® scale. This was accomplished by creating nomenclature, discrete task assays, and linked reference materials. Throughout the entire development process, collaboration occurred between the nurse informatics specialist and the oncology department to discuss the tool’s design, components, functionality and linked reference materials. Prior to the nausea assessment tool’s release into PowerChart, the nurse informatics specialist performed unit and integration testing to confirm functionality and ensure the tool did not cause / disrupt other areas of PowerChart. BARF® scale ID badges were created and distributed to staff nurses to help promote an understanding of the nausea assessment tool and aid in the ability of the staff nurse to obtain a BARF® score from a pediatric patient.

Outcomes:
As of February 2015, a select group of inpatient staff nurses and outpatient staff nurses have the ability to document a nausea assessment for their patients on the flowsheet within PowerChart if they choose to do so.

Next Steps or Lessons Learned:
Basic education surrounding the nausea assessment tool should be performed to ensure hospital staff nurses know what the BARF® scale is, how to use it, when to use it, and how to document it correctly within PowerChart. User acceptance testing must also be performed to
verify that the nausea assessment tool meets the needs of staff nurses who are trying to accurately identify and document pediatric patients who have nausea.

Reference:
Integrating research into the electronic health record to improve clinical care

Laura Connelly, MSN, RN and Gwendolyn Corr RN, BSN, CPN, CPHON

Purpose

• To enhance the treatment of nausea within the oncology department, an in-depth review of literature was completed to evaluate nausea assessment tools.

• From this review, the Baxterretching Faces Scale (BARF®), a validated pictorial 0-10 nausea assessment scale designed for pediatrics was chosen for a feasibility study on the inpatient oncology unit.

• During the feasibility study, a nursing satisfaction survey was completed to evaluate the usefulness of the BARF® scale within clinical practice.

• Of the nurses who completed the survey, all were in agreement that the tool was useful however many expressed the desire for the BARF® scale to be within PowerChart to help simplify and standardize the documentation process for nausea.

• This feedback propelled the idea to integrate this validated research tool into the electronic health record to improve the clinical care of pediatric patients with nausea at Boston Children’s Hospital.

Method

• The BARF® scale and the results of the feasibility study were presented to the Clinical Informatics Council.

• The council agreed with its usefulness and approved the development of the BARF® scale into PowerChart.

• Using the literature review that had been completed and Cerner management tools, a nurse informatics specialist created a nausea assessment tool for PowerChart which included the BARF® scale.

• Using Cerner tools, the nurse informatics specialist created nomenclature, discrete task assays, and linked reference materials.

• The nausea assessment tool design included the BARF scale, precipitating factors, clinical descriptive details, patient/parent participation, action taken, response to action and follow up.

• Throughout the entire development process, collaboration occurred between the nurse informatics specialist and the oncology department to discuss the tool’s design, components, functionality and linked reference materials.

• Prior to the nausea assessment tool’s release into PowerChart, the nurse informatics specialist performed unit and integration testing to confirm functionality and ensure the tool did not disrupt other areas of PowerChart.

Outcome

• As of February 2015, a select group of inpatient staff nurses and outpatient staff nurses have the ability to document a nausea assessment for their patients on the flowsheet within PowerChart if they choose to do so.

Next Steps

• Basic education surrounding the nausea assessment tool should be performed to ensure hospital staff understands what the BARF® scale is, when to use it, and how to document it correctly within PowerChart.

• User acceptance testing should be performed to verify that the nausea assessment tool meets the needs of staff who are trying to accurately identify and document pediatric patients who are experiencing nausea.

Hospital Length of Stay after Pediatric Renal Transplantation

Author(s): Camilla Cook RN, CPN
Theresa Pak MPH, RN
Michael JG Somers MD

Purpose:
Limited data exists as to factors influencing hospital length of stay (LOS) after pediatric kidney transplantation. We sought to both evaluate the effects of a standardized post-transplant care policy that by-passed mandatory post-transplant ICU admission on overall hospital LOS and to identify clinical factors predisposing to longer hospitalizations in all transplanted children.

Method or Approach:
We retrospectively reviewed consecutive kidney transplants performed during the 5-year period from January 2009 through December 2013. Pertinent clinical factors and admission characteristics from the time of kidney transplantation including patient (pt) age, gender, diagnosis, need for initial post-transplant ICU stay and its duration, and overall hospital LOS were abstracted.

Outcomes:
During the 5-year period following standardized policy implementation, 115 renal transplants occurred. Pt demographics included 56% boys; median age 12 yrs; 64% deceased donor transplant. Disease etiology included Congenital Abnormalities of the Kidney and Urinary Tract (CAKUT) 57%, nephrotic syndrome (NS) 20%, systemic lupus and vasculitis 7%, cystic disease 5%, hemolytic uremic syndrome 4%, and other diagnoses 7%. Median admission LOS was 10 days (range 6-107 days). Pts ≤5 yrs old had longer median LOS than older children (13 vs 9 days; p<0.001) whereas CAKUT and NS pts had shorter median LOS than other diagnoses (10 vs 13 days). 40% had immediate post-transplant ICU admission due to policy criteria for small size or cardiopulmonary co-morbidity. ICU admitted pts were younger (median 3 yrs old vs 14 yrs old;p<0.0001) with no differences in gender or disease etiology. Median ICU LOS was 1 day (range 1-18 days) with children < 3 yrs old and children with non-CAKUT etiology requiring significantly longer ICU stays. Despite the brief median ICU LOS, ICU-admitted pts had much longer hospital LOS than other transplanted children (13 vs. 8 days, p<0.0001).

Next Steps or Lessons Learned:
Our data suggests: 1)Younger children require longer hospital LOS, including longer ICU LOS if indicated; 2)Children with CAKUT require shorter hospital LOS, including ICU LOS if indicated; 3)ICU admission prolongs overall hospital LOS beyond duration of ICU stay alone; 4)Implementation of a standardized post-transplant care policy can decrease ICU admissions and shorten hospital LOS.

If this poster has been presented at a conference, which one: IPTA
Hospital Length of Stay After Pediatric Renal Transplantation
Camilla Cook, Theresa Pak, and Michael JG Somers
Division of Nephrology and Department of Nursing, Boston Children’s Hospital and Department of Pediatrics, Harvard Medical School, Boston, Massachusetts

Background
- Limited data exists as to factors influencing hospital length of stay (LOS) after pediatric kidney transplantation
- We sought to evaluate the effects of a standardized post-transplant care policy that bypassed mandatory post-transplant ICU admission on overall hospital LOS
- We sought to identify clinical factors predisposing to longer hospitalizations in all transplanted children

Methods
- We prospectively reviewed consecutive kidney transplants performed during the 3-year period from January 2009 through December 2012
- Pertinent clinical factors and admission characteristics from the time of kidney transplantation, including patient age, gender, diagnosis, need for initial post-transplant ICU stay and its duration, and overall hospital LOS were abstracted

Post-Transplant Care Policy

Demographics of Total Population
- 115 consecutive renal transplants:
  - Gender: 56% boys, 44% girls
  - Age: Median 12 years old
  - Most common ESRD etiology: Congenital abnormalities of kidneys and urinary tract (CAKUT)

Admission Data
- Total Admission LOS:
  - Median 10 days (range 6 – 187 days)
- Post-Transplant ICU Stay:
  - Median 1 day (range 1 – 18 days)

Comparison Longer vs Shorter ICU Stays
- We compared children admitted to the ICU immediately post-transplant who required longer than median stays in the ICU to the children who had shorter stays

<table>
<thead>
<tr>
<th>CHARACTERISTIC</th>
<th>Shorter ICU Stay</th>
<th>Longer ICU Stay</th>
<th>p value</th>
</tr>
</thead>
<tbody>
<tr>
<td>% Boys</td>
<td>60%</td>
<td>43%</td>
<td>0.04</td>
</tr>
<tr>
<td>Median Age</td>
<td>4 years</td>
<td>3 years</td>
<td>p=0.001</td>
</tr>
<tr>
<td>ESRD Etiology</td>
<td>58%</td>
<td>5%</td>
<td>p=0.02</td>
</tr>
</tbody>
</table>

Children with longer ICU stays were significantly younger and more likely to have a non-CAKUT ESRD etiology

Conclusions
- Younger children require longer hospital LOS, including longer ICU LOS if initially admitted post-transplant to ICU
- Children with CAKUT require shorter hospital LOS, including their ICU LOS if initially admitted post-transplant to ICU
- Children with a post-transplant ICU admission manifest overall hospital LOS that is longer and not explained by the duration of the ICU stay alone, likely underscoring their status as more medically complex children at time of transplant
- Implementation of a standardized post-transplant care policy can decrease ICU admissions and shorten hospital LOS
Purpose:
To increase awareness of International Volunteering. The purpose of international volunteering as a nurse is to help educate and provide direct patient care in developing countries. The global nursing community has been active for many years. Many of these developing countries have limited resources; nursing education is a way to help improve patient care. Collaboration among physicians, nurses and technicians to establish guidelines to improve surgical techniques. Volunteering as a nurse, brings both personal satisfaction and professional growth.

Method or Approach:
Identify personal and professional goals that are aligned with volunteering. Based on your nursing skill set, seek out organizations that are in need of expert nurses to volunteer and provide patient care. Apply and present justification for approval within your organization to participate in the trip.

Outcomes:
The impact of the trip on the nurse brings a sense of pride of sharing education with staff in developing countries. Improved patient care outcomes in relation to specific surgical procedures.

Next Steps or Lessons Learned:
- Utilization of resources at hand
- Perspective on health care
- Establish contacts and relationships with staff, patients and families for future visits
- Personal fulfillment in participating in efforts to improve global health
Awareness of International Volunteering: Waltham Nurses’ Global Impact

Elizabeth Dixit, BSN, RN, CNOR  David Brackett, RN, CNOR  Leslie Moore, BSN, RN

**Purpose**
- The purpose of international volunteering as a nurse is to help educate and provide direct patient care to developing countries.
- The global nursing community has been active for years.
- Many of these developing countries have limited resources.
- Nursing education is a way to help improve patient care.
- Collaboration among physicians, nurses and technicians establish guidelines which improves surgical techniques.
- Volunteering as a nurse, brings both personal satisfaction and professional growth.

**Method**
- Identify personal and professional goals that are aligned with volunteerism.
- Based on your nursing skill set, seek out organizations that are in need of expert nurses to volunteer and provide patient care.
- Apply and present justification for approval within your organization to participate in the trip.

**Organizations**
- Healing the Children
- International Volunteers in Urology
  "Teach one, Touch Many"

"We are all blessed with healthy children and felt we wanted to give back."

**Outcomes**
- Nurses achieve a sense of pride from providing education and support to staff in developing countries.
- Improved patient care outcomes in relation to specific surgical procedures.
- Contributes to improved surgical knowledge in a global setting.

**Lessons Learned**
- Utilization of resources at hand.
- Enhanced perspective on disparities in health care.
- Importance of establishing contacts and relationships with staff, patients and families for future visits.
- Personal fulfillment is gained from participating in efforts to improve global health.
DisCo: Patient-Centered Digital Communication After Discharge

Author(s): Kelly Dunn MS, RN, CPNP
Jayne Rogers MSN, RN, NEA-BC
Fabienne Bourgeois MD
Israel Green-Hopkins MD
Vincent Chiang MD

Purpose:
Hospital discharge is vulnerable period for pediatric patients and their caregivers; families are required to retrieve prescriptions, schedule follow up and coordination with primary care, and prepare to care for their child at home. This pilot evaluated the feasibility of an automated digital communication program to support communication between caregivers and inpatient nurse practitioners after hospital discharge.

Method or Approach:
The multidisciplinary team was awarded a BCH Innovation Acceleration Program (IAP) award for FastTrack Innovation in Technology (FIT) in 2012; this grant allowed the team to develop an automated digital communication program (text or email) with a response dashboard managed by an inpatient medicine pediatric nurse practitioner. The NP was able to identify and connect with families after discharge from a general medical unit via email or text.

Outcomes:
138 Families enrolled in the DisCo pilot. 69 caregivers responded to the text/ email, and 26% reported an issue. 5% of the enrolled patients required and received assistance from the PNP. Reasons for follow up included: concerns about new symptoms, questions about follow up with PCP or specialty providers, and questions about prescriptions.

Six participants had an unplanned re-presentation to the BCH ED or inpatient service within 1 week of discharge. Of these, five families did not respond to the three question survey prior to presentation.

In a follow-up survey, the majority (82%) of participants felt the tool was helpful

Next Steps or Lessons Learned:
The second phase of the DisCo pilot program is underway, and includes 9 East, 9 South, 7 West, and the GPU. We continue to enroll patients, and identify and assist those families who require additional assistance after hospital discharge.

If this poster has been presented at a conference, which one: submitted to AMIA
DisCo: Patient-Centered Digital Communication After Discharge

Kelly Dunn, MS, RN, CPNP; Jayne Rogers RN, MSN, NEA-BC; Fabienne Bourgeois, MD; Israel Green-Hopkins, MD; Vincent Chiang, MD

Supporting Safe Passage at Discharge

• Previously, a BCH nurse would phone parents at home following discharge from inpatient medical unit – felt to be an inefficient and unsustainable process
• Physician and nurse leadership acknowledged continued need for enhanced communication at care transition.
• Nurses are well positioned to utilize mobile technology to support patient care transitions
• Previous work demonstrated that 97% of families at urban pediatric medical centers have access to digital technology (DeMartini, Beck, Klein, and Kahn, 2012).

The Pilot
• The team was awarded BCH Innovation Acceleration Program award for FastTrack Innovation in Technology development team in 2012 to develop an automated digital communication program (text or email) dashboard with responses to triage phone outreach by nurse.
• Multidisciplinary team involved in design and execution of DisCo: software developers, product manager, physicians, and nursing.
• The PNP enrolled patients on a general medical service as part of daily routine.
• PNP conducted follow up and triage to patients.

Results

• 138 families enrolled in the DisCo pilot
  o 69 caregivers responded to the text/ email
  o 26% reported an issue
  o Seven families, or 5% of the enrolled patients, required and received assistance from the PNP.
  o Reasons for follow up included: concerns about new symptoms, questions about follow up with PCP or specialty providers, and questions about prescriptions.
  o Six participants had an unplanned representation to the BCH ED or inpatient service within 1 week of discharge. Of these, five families did not respond to the three question survey prior to presentation.
• In a follow-up survey, the majority (82%) felt the tool was helpful

Three Questions:
1. Do you have your child’s prescribed medications?
2. Do you have a scheduled follow-up appointment with your child’s pediatrician?
3. Do you have any new concerns that you would like to discuss?

REFERENCES:
Influences on New Graduate Nurse Transition: A Literature Review Using a Social Ecological Framework

Author(s): Patricia Dwyer PhD(c), RN

Purpose:
To identify factors that influence new graduate nurse transition and synthesize findings using constructs from social ecological theory.

Method or Approach:
A literature review was conducted to identify factors that influence new graduate nurse transition. Thirty-seven articles met the inclusion criteria. Data were extracted on the studies’ authors, date of publication, country of origin, design, sample, significant independent variables, outcome measures, and key findings. Subsequently, the significant variables were further synthesized and organized from a social ecological perspective. Significant independent variables were categorized to represent intrapersonal, interpersonal, and organizational levels of influence on new graduate nurse transition.

Outcomes:
The complex interplay between individual nurse characteristics, their workplace relationships, and their practice environment influenced transitional outcomes. A majority of the research studies identified organizational level influences on new graduation nurse transition.

Next Steps or Lessons Learned:
Transition programs provide intrapersonal and interpersonal level support. However, the literature review identified twenty-eight organizational level influences. Findings highlight the need to link existing support strategies with efforts to improve practice environments. Improving new graduate nurse transition necessitates an approach that addresses factors across all three levels of influence.
Influences on New Graduate Nurse Transition:
A Literature Review Using a Social Ecological Framework
Patricia Dwyer, PhD(c), RN, CNOR

Background
- New graduate nurses continue to experience difficulty transitioning into practice environments that have become increasingly more demanding.
- Unruh & Zhang (2014) report that 14% of new graduate nurses had definite plans to leave, 23% were thinking about leaving their jobs, and a notable 18% had left their first job within one year.
- High turnover contributes to fluctuations in staffing and increased patient workload.
- Instability in the nursing workforce negatively impacts patient safety and quality care (Beecroft et al., 2008).

Purpose
- Identify factors that influence new graduate nurse transition.
- Synthesize findings using constructs from social ecological theory.

Social Ecology Framework
- Social ecological theory proposes that individual experiences are influenced by surrounding environmental levels (Stokols 1996).
- In social ecological theory, the level of compatibility between a person and their surroundings is an important predictor of well-being (Stokols 1996).
- Intrapersonal, interpersonal, and organization levels from the Social Ecological Model were used to represent the levels of influence on new graduate nurse transition.

Influences

<table>
<thead>
<tr>
<th>Organizational Level Influences on New Graduate Nurse Transition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Effort/Reward</td>
</tr>
<tr>
<td>Empowerment</td>
</tr>
<tr>
<td>Hospital</td>
</tr>
<tr>
<td>Location</td>
</tr>
<tr>
<td>Size</td>
</tr>
<tr>
<td>Structure</td>
</tr>
<tr>
<td>Type</td>
</tr>
<tr>
<td>Unit</td>
</tr>
<tr>
<td>Intent to stay</td>
</tr>
<tr>
<td>Job control</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Interpersonal Level Influences on New Graduate Nurse Transition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Authentic leadership</td>
</tr>
<tr>
<td>Authentic preceptor</td>
</tr>
<tr>
<td>Incubility</td>
</tr>
<tr>
<td>Respect</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Intrapersonal Level Influences on New Graduate Nurse Transition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Assertiveness</td>
</tr>
<tr>
<td>Burnout</td>
</tr>
<tr>
<td>Core self-evaluation</td>
</tr>
<tr>
<td>Coping strategies</td>
</tr>
<tr>
<td>Critical thinking</td>
</tr>
<tr>
<td>Demographics</td>
</tr>
<tr>
<td>Age</td>
</tr>
<tr>
<td>Gender</td>
</tr>
<tr>
<td>Mental status</td>
</tr>
<tr>
<td>Race</td>
</tr>
</tbody>
</table>

References


I would like to thank Ellen Berts, BSN, RN and Doreen White, BSN, RN for their support in the development of this paper.

Method
- A search was executed in CINAHL, MEDLINE, and PsycINFO.
- Search terms used were "new graduate nurses", "newly graduated nurses", "newly licensed registered nurses", "novice nurses", or "new graduate nurses" transition.
- The title and abstract of 130 articles were screened for potential relevance.
- Ancestry searches of the reference lists were performed.
- The final sample included 37 articles.
- Data were extracted regarding key study components.
- Significant independent variables were synthesized and organized from a social ecological perspective.

Inclusion Criteria
- Published from January 1, 2001 to November 1, 2014.
- Published in a peer review journal in English.
- Quantitative research article.

Exclusion Criteria
- Study did not report reliability and validity of study instruments.
- Aim of the study was program evaluation.

Outcomes
- The complex interplay between individual nurse characteristics, workplace relationships, and their practice environments influenced transitional outcomes.
- Psychological capital (self-efficacy, hope, optimism, and resilience) is an emerging intrapersonal influence.
- Psychological capital positively influenced transition in four studies.
- Findings support that workplace relationships play an important role in new graduate nurse transition.
- A significant number of influences occurred at the organizational level (n=28).

Lessons Learned
- Improving new graduate nurse transition necessitates an approach that addresses factors across all three levels of influence.
- Transition programs provide intrapersonal and interpersonal level support.
- Findings highlight the need to link existing support strategies with efforts to improve practice environments.
The Need for Succession Planning in a Pediatric Operating Room: Development of a Perioperative New Graduate Program

Author(s): Pamela D. Gorgone MS, RN, CNOR, CPN
           Lori Arsenault MSN, RN, NE-BC

Purpose:
Provide a pipeline of nurses to address the aging workforce, for succession planning and anticipated retirements.

Method or Approach:
A team was designated to lead the project that included the appointed leader of the Perioperative New Graduate Nurse Program, the Director of Perioperative Programs and the Nurse Educator for Perioperative Programs. The team started with a literature search and although the literature was rich for New Graduate programs there was much less specifically addressing this process in the OR. The team utilized some of the literature and proceeded to develop the program.

An interview process was developed to meet the needs of a new graduate population with little knowledge of perioperative nursing and the OR. This included prescreening by the nurse recruiter, a 4 hour shadow experience with an experienced perioperative nurse who could provide feedback to the team on the initial impression, an interview with the nurse recruiter with resulting recommendation’s and finally an interview with the New Graduate Program team. Ultimately twelve candidates were selected.

The developed curriculum included hospital-wide new graduate classes, as well as AORN’s Periop 101 modules. Labs and simulation augmented the classes and pre OR rotations/experiences included time spent in Day Surgery, PACU, Pre-op Clinic, an inpatient surgical unit, Central Processing Department and our nurse-staffed family waiting area. Specified faculty facilitated the classes and preceptors were chosen based on experience and matching the new graduate with a nurse that faculty was deemed “a good fit”. The New Grads rotated to each specialty service with an assigned service specific preceptor proficient in that specific service. Many challenges were encountered as well as high points during the program and the need for flexibility to make change as feedback was received was acknowledged and acted upon.

Outcomes:
The 12 new graduates successfully completed the program and are currently practicing as part of the perioperative staff in the Main Operating Rooms of Boston Children’s Hospital. Two years from the start of the Program there is 100% retention.
Next Steps or Lessons Learned:
Implications for Perioperative nursing: The success and lessons learned during this process may provide insight for others who are met with the challenge of bringing new graduate nurses into the perioperative setting.

If this poster has been presented at a conference, which one: AORN Surgical Conference and Expo, 2015
The Need for Succession Planning in a Pediatric Operating Room: Development of a Perioperative New Graduate Program

Pamela D. Gorgone MS, RN, CNOR, CPN and Lori Arsenault MSN, RN, CNOR, NE-BC

Problem
- Aging Workforce of Operating Room (OR) staff in Main OR of Boston Children’s Hospital
- 51% of current staff eligible for retirement by 2024
- Limited number of experienced OR nurses available
- Limited experienced nurses desiring a career in the OR due to lack of OR inclusion in curriculum

Solution
- Develop Perioperative New Grad Program

Financial Considerations
- Budget Process
- Capital and Operating
- Dedication of monies to process (grant)
- FTE’s
- Vision for Outcome

Set-up for Success!
- Careful selection of candidates who will fit culture of BCH OR and willing to commit
- Commitment and support of Leadership
- Committed Faculty and Preceptors
- Buy-in from existing staff

Process and Operationalizing the Program
- Initial screen of candidates with Nurse Recruitment
- Interview, shadow, assess interest and commitment
- Two cohorts of 6 new graduates each (January/March)
- Develop Curriculum (includes BCH New Grad program, Periop 101 with didactic, and lab time), Pre OR rotations, service rotations
- Select and prep Faculty
- Consistent preceptors with preparation prioritized
- Prop staff to create positive environment (welcome meet and great for each group)
- Leadership and Faculty meet each week to review status of each New Grad and plan for the next week
- Computerized case logs, goal setting and evaluations

Outcome
- BCH Program after 2 years - 100% retention rate, Halfner & Graf (2006) state, “Within the first year of employment, new graduate nurse turnover ranges from 15-60%” (p. 256).
- The 12 new graduates successfully completed the program and are currently practicing as part of the perioperative staff in the Main Operating Rooms of Boston Children’s Hospital.

Obstacles
- Adequate staffing related to volume and case selection
- Pace of the individual learners
- Preceptor selection, availability and burnout
- Inconsistent clinical experience in relation to shift variability
- High acuity and complexity of patient population
- Summer Vacations

Lessons Learned
- Limit cohort to 4-6 participants
- Finish first cohort prior to start of second
- Extend CPD experience/no floor experience
- 8 hour shifts at start of orientation
- Increase number of labs for periop 101 modules

Acknowledgments

The “Team” with out whom success would not have been possible
- Anne Micheli, MS, RN, NE-BC
- Eileen Coyne, BSN, RN, CNOR
- Lisa Frement, BSN, RN, CHNOR
- Bryanne Harrington, MSN, BSN, RN, CNOR
- Kim O’Brien, RN
- The Staff and Preceptors in the BCH Main OR

The New Grads, our colleagues, their success makes us proud
- Tristie Aguila BSN, RN, Jessica Baxter, BSN, RN
- Caite Carter BSN, RN, Brianna DiRito BSN, RN
- Samantha Feta BSN, RN, Jennifer Hines BSN, RN
- Cameron Hughes ADN, RN, Nicole Joseph BSN, RN
- Jessica lehlin BSN, RN, Danielle Raja BSN, RN
- Katie Stabaursis BSN, RN, Elizabeth Tillman, BSN, RN
Cultivating Global Partnerships in Pediatric Critical Care Nursing: Reinvigorating the Medical Surgical Intensive Care Unit (MSICU) Sister Pediatric Intensive Care Unit (PICU) Project

Author(s): Brienne Johnson BSN, RN, CPON, CCRN
Emily Dray BSN, RN, CCRN
Aimee Lyons PhD(c), RN, CPNP, CCRN, NE-BE, CPHQ

Purpose:
As a leader in pediatric healthcare innovation, Boston Children’s Hospital (BCH) has recently reaffirmed its commitment to nurse-led globalization of healthcare. The existing nursing workforce in pediatric intensive care units (PICUs) located in resource-limited settings lacks the education, training, and ongoing support to meet international standards of high quality care. The nursing staff in the Medical-Surgical Intensive Care Unit (MSICU) at BCH is dedicated to establishing collaborative and innovative ways to improve child health around the world. Recognizing the critical role that nursing education and mentorship have in achieving this goal, BCH MSICU nurses established global partnerships with two developing PICUs in resource-limited settings. The purpose of these partnerships is to promote staff development, collaboration and knowledge sharing with these developing units so that they can benefit from the expertise of a leading pediatric institution and join as colleagues in the current state of the science. The present focus of this project seeks to expand upon these already established relationships in order to optimize growth and development of our colleagues in the developing world.

Method or Approach:
Two global partnership projects have been undertaken thus far. In 2009, the first formal MSICU Sister PICU relationship was established with the National Pediatric Hospital (NPH) in Phnom Penh, Cambodia, currently led by MSICU staff nurse Brienne Johnson. Between December 2009 and May 2012, teams with various backgrounds and skill sets including nurses, physicians and respiratory therapists completed a total of six bi-annual nurse-led mission trips. Recently, the MSICU Sister PICU Program expanded to include its newest branch at the Unidad Nacional de Oncologia Pediátrica (UNOP) in Guatemala City, Guatemala, led by MSICU staff nurse Emily Dray. Though two different sites have been established, they have the same goals, purpose, and mission and collaborate in all phases of the work. These two existing MSICU Sister PICU Project sites will continue to serve as pilot sites for implementing strategies and interventions with the goal of improving the quality of nursing care in these developing units. Some of the interventions include providing educational sessions on nursing process, critical thinking, and clinical decision-making. Teaching methods include formal didactic lectures and informal demonstration/mentoring at the bedside, during daily patient rounds, or case study discussions. Formal sessions may include the use of the OPENPediatrics® platform. In the near
future, outcomes from these interventions will be disseminated to assist other leading institutions in creating similar programs.

Outcomes:
Outcome measurement for this project is ongoing. BCH MSICU teams collected baseline data about NPH PICU nursing practice on visits in 2009 & 2010. A tool to audit 12 quality indicators (QIs) targeting standards of nursing care known to reduce mortality rates was developed. During trips from 2011-2012, BCH teams completed the audit tool daily through patient observation & chart review. Baseline data from the first two BCH visits to NPH found that less than 10% of patient care instances achieved the most rudimentary, yet critical measures. Following our educational and mentoring interventions, audit results in 2011-2012 showed that some of the nursing care indicators remained below standard; however, other indicators verified a significant improvement in nursing practice. A needs assessment and an evaluation of the quality of nursing care at UNOP in Guatemala are currently underway. We recognize that further research is needed to inform future interventions, identify barriers, validate the auditing tool and perform ongoing evaluation of our interventions and program as a whole.

Next Steps or Lessons Learned:
The MSICU Sister PICU Project is actively seeking funding to ensure the sustainability of the program. Our past experience has demonstrated that the project is not only feasible, but also effective. Therefore, once adequate funding is secured, future teams will be recruited to resume mission trips to both Sister PICU sites (Cambodia and Guatemala) two to three times per year.
Cultivating Global Partnerships in Pediatric Critical Care Nursing: Reinovating the Medical-Surgical Intensive Care Unit Sister Pediatric Intensive Care Unit (PICU) Project

Brienne Johnson BSN, RN, CPON, CCRN, Emily Dray BSN, RN, CCRN; Aimee Lyons PhD(c), CPNP, RN, CCRN, NE-BE, CPHQ

Background
- Nurse-led initiatives improve the standard and quality of pediatric healthcare.
- Pediatric nurses in resource limited settings lack the education, training, and ongoing support to meet international standards of high quality care.
- Boston Children’s Hospital (BCH), a premier teaching institution, can provide support and mentorship to staff in resource-limited settings.
- BCH Medical-Surgical Intensive Care Unit (MSICU) nurses are committed to education and mentorship.

Purpose
To establish a global partnerships with two Pediatric Intensive Care Units (PICUs) in resource-limited settings.

Mission:
- To establish global partnerships to improve the quality of nursing care of critically ill children worldwide.
- To enhance the professional growth of our colleagues in the developing world.

Goals:
To develop evidence based nursing practice that is tailored to the needs of each individual PICU to:
1. Promote staff development and teamwork.
2. Advance communication skills.
3. Improve critical thinking and assessment skills at the point of care.

Interventions focus on nursing process, critical thinking, and clinical decision-making.

Approach
Two sites selected for the global partnerships with the BCH MSICU.

Clinical Interventions:
- Formal didactic lectures
- Informal demonstration at the bedside or during daily rounds
- Case study discussions
- Utilization of OPENPediatrics® Platform

National Pediatric Hospital (NPH), Phnom Penh, Cambodia: 2009-Present
Team leader: Brienne Johnson, Staff Nurse II, MSICU
Site: Description: NPH is the only state run pediatric hospital in Cambodia. The 8-bed PICU opened in 2009 and is currently run on a team nursing model.
Summary: Between December 2009 and May 2012, with various backgrounds and skill sets including nurses, physicians and respiratory therapists completed a total of six bi-annual nurse-led mission trips.

Partnership Interventions:
- Mentoring Unit Leadership
- Establish System of Meaningful Recognition
- Development of Unit Infrastructure
- Engagement of Staff in Unit Initiatives

United Nacional de Oncologia Pediatrica (UNOP), Guatemala City, Guatemala: 2012-Present
Team leader: Emily Dray, Staff Nurse I, MSICU
Site: Description: UNOP 50-bed pediatric oncology hospital and is a leader in Central America in the diagnosis and treatment of pediatric cancer.
Summary: Since May of 2013, Ms. Dray has completed three trips to initiate the relationship, perform needs assessment, and identify institutional goals.

Outcome:
Outcome measurement is ongoing.

In Cambodia (NPH):
- Collected baseline data about nursing practice in 2009 & 2010.
- Less than 10% of patient care achieved the most rudimentary, yet critical measures of care.
- Educational & mentoring interventions provided in 2011-2012.
- Many nursing practice indicators had significant improvement.

In Guatemala (UNOP):
- Completed needs assessment and an evaluation of the quality of nursing care at UNOP in Dec 2014 and March 2015.
- Evaluation data from nursing education days on last mission trip are being analyzed.
- Pre- & Post-Testing of knowledge before and after nursing education days in March 2015 showed a 10% improvement.

We recognize that further research is needed to inform future interventions, identify barriers, and validate the auditing tool. We will continue to perform ongoing evaluation of our interventions and program as a whole.

Next Steps & Lessons Learned:
- Secure adequate funding to ensure program sustainability.
- Recruit future team to resume mission trips to both Sister PICU sites (Cambodia and Guatemala) two to three times per year.
- Outcomes and the interventions implemented will be disseminated to assist other leading institutions in creating similar global partnership programs.

Acknowledgements

Boston Children’s Hospital Cardiovascular and Critical Care Services

Brienne Johnson@childrens.harvard.edu
Bridging the Gap: Walking for Success on ECMO

Author(s): Susannah Taylor BSN, RN  
Megan Labriola BSN, RN  
Mary-Jeanne Manning MSN, APRN, BC-PNP, CCRN  
Stephanie Larsen BS, RRT, NPS

Purpose:
Extra corporeal membrane oxygenation (ECMO) is now being used as a bridge to organ transplantation here at Boston Children’s Hospital (BCH). The Medical/Surgical Intensive Care Unit (MSICU) has cared for several patients who required ECMO as a bridge to lung transplantation. Historically, pediatric patients receiving ECMO were heavily sedated, or even paralyzed to maintain ECMO flow and catheter integrity. This presented a problem for our lung transplant candidates who must be able to maintain full mobility and tolerate rehabilitation in order to qualify for transplantation. We were aware of cases in adult literature which demonstrated the potential to safely maintain a patient on ECMO while engaging in active physical rehabilitation (Abrams et al., 2014). We cared for two patients who were being supported on ECMO and required rehabilitation. This was an interdisciplinary effort that required nurses, respiratory therapists, and physical therapist to create a safe plan for the patient to safely ambulate while on ECMO.

Method or Approach:
An evidenced based approach was used to meet the needs of our patients. After review of the literature, we collaborated with the ECMO specialists, physical therapist, and medical team to create a safe, efficient way to allow these patients to ambulate while receiving this life saving treatment. Patients must first meet certain criteria to be considered eligible/safe for ambulating while receiving ECMO. The patient must be alert and able to actively participate in therapy. They must be physiologically stable and able to tolerate the level of activity. The patient must have a dual lumen ECMO cannula placed in the Internal Jugular vein in order to be a candidate for mobility therapy. After placement of the dual lumen cannula the interdisciplinary team strategized to create a patient specific plan to allow the patients to be awake, moving and ambulating in the MSICU while on ECMO.

Outcomes: Our interdisciplinary approach enabled us to offer this high-risk therapy to our sickest patients. Two of our patients have successfully ambulated while on ECMO. One patient went on to receive a lung transplant. This patient was able to maintain full mobility, getting out of bed and walking the halls around the unit multiple times a day. The culture has begun to change and we now assess patients for eligibility at, or soon after the time of cannulation to ECMO.

Next Steps or Lessons Learned:
We plan to continue to assess patients for eligibility and to actively rehabilitate those who qualify. Our experience has taught us how to safely institute this therapy in the MSICU. We
must educate our colleagues and create guidelines for staff in order to ensure continued safe and successful mobility therapy for patients on ECMO.

Reference:
Bridging the Gap: Walking for Success on ECMO

Susannah Taylor BSN, RN, Megan Labriola BSN, RN, Mary-Jeanne Manning MSN, APRN, BC-PNP, CCRN, Stephanie Larsen BS, RRT-NPS

Purpose

- Extracorporeal membrane oxygenation (ECMO) is being used as a bridge to organ transplantation at Boston Children’s Hospital (BCH)
- Historically, pediatric patients receiving ECMO were heavily sedated, or even paralyzed, to maintain ECMO flow and catheter integrity
- This element presented a problem for our lung transplant candidates who must be able to maintain full mobility and tolerate rehabilitation in order to qualify for transplantation
- This was an interdisciplinary effort that required nurses, respiratory therapists, ECMO specialists and physical therapists to create a plan for the patient to safely ambulate while on ECMO

Methods/Approach

- An evidence-based approach was used to meet the needs of our patients
- The interdisciplinary team consisted of ECMO specialists, physical therapist, and nurses
- Patient criteria includes:
  - Being alert and able to actively participate in therapy
  - Physiologic stability
  - Ability to tolerate the required level of activity
  - Must have a dual lumen ECMO cannula placed in the Internal Jugular vein
- Patient-specific plan to allow the patients to be awake, moving and ambulating in the MSCU while on ECMO

Case Example: Patient 1

Supported Ambulation while on ECMO

Outcomes

- Our interdisciplinary approach enabled us to offer these patients rehabilitation while utilizing a high-risk, life sustaining therapy
- Two of our patients have successfully ambulated while on ECMO
- One patient went on to receive a lung transplant
  - This patient was able to maintain full mobility, such as getting out of bed and walking the halls around the unit multiple times a day
- The culture has begun to change and we now assess patients for eligibility at or soon after the time of cannulation to ECMO

Next Steps / Lessons Learned

- Our experience has taught us how to safely institute this therapy in the MSCU
- We plan to continue to assess patients for eligibility and to actively rehabilitate those who qualify
- Through this interdisciplinary approach we have been able to identify safe guidelines to continue rehabilitation and mobility throughout the ECMO period in the MSCU
- We must continue to educate our colleagues and create guidelines for staff in order to ensure continued safe and successful mobility therapy for patients on ECMO

References

Martha Eliot Health and Safety Fair

Author(s): Edouard Marquis BSN, RN
Jane Burgess BSN, RN
Amanda Nakonechny BSN, RN
Robin Crowley BSN, RN
Manna Heshe BSN, RN
Dana Ostberg BSN, RN
Joanie Woodworth BSN, RN
Virginia Andradas BSN, RN
Laura Cardona BSN, RN

Purpose:
Provide community outreach and education.

Method or Approach:
Three hour Annual Community Health and Safety Fair coordinated by Boston Children’s at Martha Eliot Health Center which includes interactive educational safety exhibits, pediatric and youth health information and tools, live entertainment, and local community organization representation.

Outcomes:
Community engagement. Between 2,000 and 3,000 community participants will engage in activities, receive pertinent educational materials, learn about the programs and services provided by the health center and see Boston Children’s Primary Care at Martha Eliot as a significant community resource.

Next Steps or Lessons Learned:
Every year we look for more ways to engage the participants in listening to the health and safety information and learning something that will help them prevent injuries and accidents. We changed the time of day for the event as we realized that we had less participants at the start and an excess of people at the end. We also changed the time of year from September to May to encompass the safety piece with our patient population and community.
Increasing Awareness and Utilization of Adolescent Clinic Resources by Implementing a Patient Questionnaire

Author(s): Jude Teleau CA
Manna Heshe BSN, RN, CMCH
Dana Ostberg BSN, RN
Heidi Pena FPC
Sophie Allen deRichter MD

Purpose:
- To increase patient awareness and utilization of available resources offered through the Adolescent Clinic.
- To improve clinic flow by anticipating patient needs and facilitating referrals to available resources prior to patient seeing clinician.
- To promote multi-disciplinary collaboration.

Method or Approach:
We developed a questionnaire that can help a care team identify patient needs and connect them with the available resources in the Adolescent Clinic. We implemented a new clinic workflow where patients complete the questionnaire while being screened. Staff initiates the referral process to connect patients with appropriate resources prior to seeing clinician.

Outcomes:
More patients are aware of available resources.
More patients are requesting resources during their clinic visit.
Clinicians spend less time coordinating care amongst disciplines.
Prompt referral allowed for timely access to resources for young people.
Available resources are used more frequently.

Next Steps:
Assess questionnaires to determine which services are requested more frequently by patients.
Utilize data to advocate for increased services for patients. Create process for measuring completion of referrals and assessing patient satisfaction. Transition questionnaire to a computer-based system.

If this poster has been presented at a conference, which one: A version of this poster will be presented at Society for Adolescent Health and Medicine, March 2015
Same Day Motility in the Pediatric Population: Creating a Peri-Procedural Program for Outpatient Motility Studies

Author(s): Carol Shuman ADN, RN, CGRN
Susan Repucci BSN, RN
Patricia Longo BSN, RN, CPN
Christine Gangi ADN, RN

Purpose:
To provide motility services in the same day at the Waltham Satellite site.
To foster collaboration among Pre-Op, PACU, and Inpatient staff to enhance the motility patient’s experience.

Method or Approach:
We introduced this program with a focus on education of Pre-op, PACU, and Inpatient staff for the motility population. A core group of pre-op nurses were trained in the task of chart review, prep customization, and triaging of patients via a telephone health assessment. A designated group of OR nurses were trained to assist in endoscopic procedures and catheter placement. Additionally, specific inpatient staff shadowed the motility nurse to aid in the performance of motility studies and care for this specific population.

Outcomes:
Successful implementation of same day motility cases in the Waltham satellite.
Reduction of time patient spends at the hospital.

Next Steps or Lessons Learned:
• Numerous resources in education for nurses and families go into a program of this kind
• Evaluate case volume
• Develop a survey to evaluate patient satisfaction
• Collaborate in the future with the Gastroenterology Procedure Unit

If this poster has been presented at a conference, which one: To be presented at SGNA meeting May 15th
Same Day Motility in the Pediatric Population: Creating a Peri-Procedural Program for Outpatient Motility Studies

Carol Shuman, ADN, RN, CGRN, Susan Repucci, BSN, RN, Christine Gangi, ADN, RN, Patricia Longo, BSN, RN, CPN

BACKGROUND
- Antroduodenal and colonic manometry studies are utilized to evaluate how the muscles and nerves function in the stomach, small bowel and colon respectively.
- These studies help with the management of pediatric patients with severe constipation and when the diagnosis of pseudo-obstruction is contemplated.
- Historically, these studies were performed over a 2-day period: Day 1: an endoscopy or colonoscopy with catheter placement under general anesthesia was performed and subsequent admission to the hospital; Day 2: the motility study which lasts 3½ - 6 hours was performed.
- With the addition of a GI motility specialist to BCH and the changes in insurance, the advent of a same day study was born and its availability at the Waltham satellite.

PURPOSE
- To provide motility services in the same day at Waltham satellite site.
- To increase awareness of procedure availability in Waltham.
- To foster collaboration among the Pre-Op, PACU, and Inpatient staff to enhance the motility patient’s experience.

APPROACH
- We introduced this program with a focus on education of Pre-Op, OR/PACU, and Inpatient staff for the motility population. A core group of Pre-Op nurses were trained in the task of chart review, bowel prep customization, and triaging of patients via a telephone assessment. A designated group of OR nurses were trained to assist in endoscopic procedures and catheter placement. Additionally, specific inpatient staff shadowed the motility nurse to aid in the performance of motility studies and care for this specific population.

MOTILITY PROCEDURES
- After anesthesia in the OR, patients have their endoscopy or colonoscopy performed by the GI motility specialist.
- A water perfused motility catheter (chosen according to age and size) is placed under fluoroscopic guidance.
- The catheter is secured with special tape and each port is capped until connected to the MMS motility infuser.
- Patient is sent to PACU to recover; transfers to the floor once criteria are met.
- The motility nurse outlines the testing schedule and then connects the patient to the infuser.
- Areas monitored during study: vitals signs; pain; girth; retching/vomiting; stool output; catheter security; response to prekinetics/stimulants and meals, and motility tracing on computer.
- At the study’s conclusion, patient/family meet with physician to review results and plan. Specific recommendations are given; for instance, changes in current medication regimen or surgical consultation.

IMPLEMENTATION
- Several days before the procedure, chart review of outside medical records and telephone health assessment (including current meds) completed by the Pre-Op nurse to determine if the patient meets BCH anesthesia criteria for the satellite.
- Pre-op nurse receives clearance/orders from appropriate services; i.e. cardiology, endocrine, pulmonary and neurology, identification of the emotional and physiologic needs of patient/family occurs.
- Teaching regarding the study begins with family/patient. Dietary modifications, instructions to hold GI motility agents for 3 days, and the personalized bowel prep (if indicated) are reviewed.

IMPLICATIONS FOR NURSING PRACTICE
- Collaboration of Lexington GI, Anesthesia, Waltham OR/PACU and 3West staff.
- Transitioning of pre-procedure duties of motility nurse to Pre-Op nurses occurs.
- Education of Inpatient staff in performance of studies.

OUTCOMES
- Successful implementation of same day motility cases in the Waltham satellite.
- Reduction of time patient spends in the hospital.

NEXT STEPS/LESSONS LEARNED
- Numerous resources in education for nurses and families go into a program of this kind.
- Evaluate case volume of successful same day motility procedures.
- Develop a survey to evaluate patient satisfaction.
- Collaborate in the future with the Gastroenterology Procedure Unit.

ACKNOWLEDGEMENTS
Thank you Waltham Anesthesia, OR/PACU and 3West staff.
Alejandro Flores, MD
Using the EMR to Address the Needs of At-Risk Patients and Improve Safety

Author: Cheri Sinclair, BSN, RN-BC

Purpose:
Boston Children’s Hospital established a Behavioral Subject Matter Expert group to respond to growing concerns of workplace violence and develop strategies to identify patients at risk for agitation and aggressive behaviors. A workgroup was charged with finding a solution to ‘Flagging and/or communication of potential behavioral issues in order to meet the needs of child/family’. Workgroup goals were to assess feasibility of using the EMR to identify at-risk patients, develop an implementation plan, and to determine who will own upkeep of the systematized flagging.

Method or Approach:
A search of other facilities indicates that while some do not flag at risk patients due to concerns of stigmatizing patients, others are using ‘FYI’ flags to draw attention to high risk care plans or using other means to identify patients at risk for ‘Disruptive Behavior’. Input from BCH Ethics Committee, legal department and family advisory committee clarified the need to link the notification to a behavior plan to better meet the needs of the patient, family and staff. Some of the challenges faced were identifying a work flow which would function with two EMR systems that do not have a bidirectional interface, so that information could be seen by clinical and administrative staff.

Workgroup representation was expanded to include stakeholders who offered specific expertise to advance the project which included quality improvement consultation and input from the clinical informatics team. Final approval from Medical Staff Executive Committee assured institutional support.

A workflow was identified to place an order for ‘Precautions: B’ which is viewed on the patient level demographic Banner Bar. The order opens a form which is completed by a clinician with the patient/family to identify triggers, interventions and special accommodations.

Outcomes:
The order and form have been created in the EMR and are currently in testing with plans for rollout within the next few months. Plans are in place to finalize guidelines and develop strategies for education and enterprise wide implementation.
Since we have not completed our implementation, outcomes are not yet available.

Next Steps or Lessons Learned:
Plans are in place to finalize guidelines and develop strategies for education and enterprise wide implementation.
Monitoring after implementation will include number of patients with plans in place and outcomes of number safety events reports, patient and family satisfaction and staff feedback. A project of this magnitude required networking across the enterprise in order to have the right skill mix to complete the project and assure institutional support.

If this poster has been presented at a conference, which one: Poster will be presented at 2015 NENIC Annual Symposium April 30, 2015
Behavioral Precautions: Using the EMR to Address the Needs of At-Risk Patients and Improve Safety
Cheri Sinclair, BSN, RN-BC

Problem

- Patient agitation and aggression posed risks for patient care as well as patient, staff, and visitor safety.
- Unawareness of patients’ behavioral needs left staff unprepared to provide necessary accommodations.

Background

- The Boston Children’s Hospital (BCH) multidisciplinary Behavioral Subject Matter Expert (SME) group was established in 2012.
- The SME group was charged with responding to the needs of patients at risk for agitation and aggressive behaviors in inpatient and outpatient settings.
- A subgroup was formed to develop a patient- and family-centered notification and planning system within the Electronic Medical Record (EMR) for patients with behavioral needs.

Methods

- Project goals were to assess feasibility, design a workflow, and develop an implementation plan for the new system.
- A survey of processes at other facilities revealed inconsistent practices for flagging these patients and concerns surrounding the associated stigma.
- Internal input from the BCH Ethics Committee, Legal Department and Family Advisory Council helped drive the project in a patient- and family-centered direction.
- Parents were in support of a notification which linked to a behavioral plan.
- Workgroup membership evolved to include stakeholders who offered specific expertise to advance the project, including quality improvement and informatics specialists.
- Final approval from the Medical Staff Executive Committee assured institutional support.

Workflow & Operationalization

- The EMR workflow centered on an order for ‘Precautions: B’ which is viewed on the patient demographic Banner Bar.
- The order is linked to a behavioral plan which contains patient-specific triggers, behaviors, accommodations, and interventions.
- The workflow has been created and tested with plans for staff education and rollout in late Spring 2015:
  - Precautions and Behavioral Plan cross all patient encounters.
  - Precautions can be removed from patient’s Banner Bar by placing a new order to discontinue.
  - Behavioral Plan can be edited, inactivated, or re-activated at any time.
  - Behavioral Plan can be viewed as a Clinical Document.

Next Steps

- Finalize workflow for notification in Scheduling EMR system.
- Develop educational materials for clinical staff.
- Conduct rollout throughout the BCH enterprise.
- Conduct impact and outcome assessment 6 months post-rollout:
  - Number of patients with behavioral precautions and plans in place.
  - Number of safety events reported before and after rollout.
  - Patient and family satisfaction before and after rollout.
  - Staff feedback.

Obstacles

- The idea of flagging patients with behavioral needs was initially controversial.
- Creating a behavioral plan that was user-friendly but able to meet the needs of specific patient populations proved challenging.
- Working with different EMR and Scheduling systems that does not have a bi-directional interface posed additional workflow challenges.

Lessons Learned

- Executive-level institutional support from the outset proved critical to mission.
- Initial design work was most efficient with a small group.
- Workgroup membership and expertise evolved to match the needs of each project phase.
- Involvement of clinical and administrative leadership at a Department level was essential in the later phases of design and testing.
- A project of this magnitude required networking across the enterprise in order to have the right skill mix to meet the project’s multifaceted demands.
Ergonomics- Keeping Staff safe at work!

Author(s): Maryellen Dee RN
Deb Eaton RN
Jan Sullivan RN
Jeannine Marr CA

Purpose:
Increased work place injuries led to the evaluation of work environment. Concerned staff reached out to Environmental Health & Safety (Jon Boyer, ScD) to find way to create a safer work environment using better body mechanics, modifications to equipment and practice.

Method or Approach:
Set up monthly meetings with Environmental Health & Safety (Jon Boyer, ScD) to discuss possible problems in the work environment. Established a work group email to share information with staff regarding their concerns. Prioritized problems and developed trials for solutions.

Outcomes:
Changes in the work environment to make a safer work environment using better body mechanics, modifications to equipment and practice. Ongoing evaluation.

Next Steps or Lessons Learned:
- Work environment needs to be evaluated on a regular basis for safety
- Increased/open communication among staff to support changes
- Identify resources to present update information to staff on proper body mechanics.
**Ergonomics- Keeping Staff Safe at Work!**

Maryellen Dee, RN; Deb Eaton, RN, Jan Sullivan, RN Jeannine Marr, CA; Jon Boyer, ScD

**Purpose:** A linen-related injury and elevated staff concerns led to an ergonomic evaluation of the Lexington perioperative work environment. Concerned staff reached out to the Environmental Health & Safety Department to improve work environment safety through training, work practices and equipment.

**Method or Approach:** Set up monthly meetings with Environmental Health & Safety to discuss and identify problems in the work environment. Established a work group email for staff to communicate with the group regarding their concerns. Prioritized problems and developed trials for solutions.

<table>
<thead>
<tr>
<th>Issue Identified</th>
<th>Ergonomics Committee Solution</th>
</tr>
</thead>
<tbody>
<tr>
<td>Problems moving patients</td>
<td>Lexington did not have slider boards. Utilize slider boards to help move patients to avoid injury.</td>
</tr>
<tr>
<td>Linen/ Waste Removal</td>
<td>Determine physical work load. Bags should be emptied when half full to avoid injury.</td>
</tr>
<tr>
<td>Height of Laptop work station</td>
<td>Purchased computer stands with more options for adjustment to individual height to avoid injury.</td>
</tr>
<tr>
<td>Repositioning of Equipment</td>
<td>Thermometers and scales in pre-op were placed in an assessable location to avoid injury.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Questions</th>
<th>Staff Response</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Do you find the change in practice of filling laundry bags half full beneficial ergonomically?</td>
<td>94.44%</td>
<td></td>
</tr>
<tr>
<td>Have you incorporated the use of the slide board in your practice?</td>
<td>58.82%</td>
<td>Have not had the opportunity to use slideboards.</td>
</tr>
<tr>
<td>Did the changes in equipment placement in Pre-op prove to be ergonomically friendly?</td>
<td>100%</td>
<td></td>
</tr>
<tr>
<td>Thermometer Placement?</td>
<td>82.35%</td>
<td></td>
</tr>
<tr>
<td>Scale?</td>
<td>64.71%</td>
<td></td>
</tr>
<tr>
<td>Linen Cart?</td>
<td>50%</td>
<td>Awkward, height and depth better, cumbersome</td>
</tr>
</tbody>
</table>

**Overall, how would you rate the Lexington Work Environment?**

- Safe
- Unsafe

**Next Steps or Lessons Learned:**
- Work environment needs to be evaluated on a regular basis for safety.
- Increased/open communication among staff to support changes.
- Identify resources to present updated information to staff on proper body mechanics.
- Follow up with safety concerns.
RNSAFE: A Remote Way to Witness High Risk Medications

Author(s): Stephanie Altavilla MSMI, RN
            Sara Gibbons MSN, RN-BC, CPN
            Jowell Sabino MSN, RN, CPNP
            Jennifer Taylor M.Ed, BSN, RN-BC, CPN

Purpose:
Medications errors (wrong drug, dose, route, concentration, and/or rate) are the largest source of errors within the hospital and providing the ability to remotely witness while in a distraction free zone will help alleviate the need to find an additional resource and ensure safe medication administration.

Methods:
The administration of certain high-risk medications requires an independent double check for verification. This witness/double check requires engaging a second nurse to independently calculate dose and volume, visually inspect the label, review pump settings and reconcile lines, which can be very time consuming and takes the second nurse away from patient care. It is often difficult to find an additional nurse during busy medication administration times. These issues have led to inconsistency in the quality of double checks and they do not always occur. As a result, medication errors, including wrong dose, wrong rate, and wrong medication have happened. Medication/fluid errors continue to be the largest type of errors seen. During Morbidity and Mortality Rounds in 2013, a team peer-reviewed a case in which a patient received the incorrect medicine, despite a process that required two nurses to conduct safety checks. This error inspired a group of nurses to develop RNSafe, a telehealth-based solution. Using a “fast-track” Innovation Technology Grant from Boston Children’s the team developed an application using a camera-equipped, tablet-like device for nurses to use at the bedside that allows another nurse to remotely conduct the second safety check.

RNSAFE (Remote Nurse Witness Supporting Medication Administration For Efficient Care) allows the administering nurse the ability to consult with a remote nurse to carry out the visualization and double check using a webcam or mobile device. This would provide the administering nurse with a second nurse immediately, without having to pull a colleague from the bedside. Additional safety benefits of having a remote nurse include lack of interruption and/or distraction for the witnessing nurse.

Outcomes:
By using Apple iPods for the bedside nurse and Microsoft Surfaces for the witnessing nurse and providing bedside nurses access to Microsoft Lync 2013, testing of this prototype has begun. The project aims to decrease time to medication administration and provide more time at the bedside for Nurses as well as to increase patient safety by decreasing adverse drug events.
Next Steps or Lessons Learned:
The team foresees that having a remote nurse available will be useful in situations in which an in-person nurse is not immediately available or when there are many distractions near the bedside. The team is building options for scheduled remote checks as well as emergent cases, which will move to the top of the request queue.

If this poster has been presented at a conference, which one: Poster will be presented at 2015 NENIC Annual Symposium April 30, 2015
**Introduction/Background**

Medication errors (wrong drug, dose, route, concentration, and/or rate) are the largest source of errors within the hospital. The administration of certain high-risk medications requires an independent double-check for verification. High-alert medications are those that are associated with high risk of serious harm if administered improperly. A witnessed double check requires engaging a second nurse to independently calculate dose and volume, visually inspect the label, review pump settings and reconcile lines, which can be very time consuming and takes the second nurse away from patient care. Reliance on a second person has led to inconsistency in the occurrence and quality of double checks. As a result, medication errors, including wrong dose, wrong rate, and wrong medication have happened. During Morbidity and Mortality Rounds at Boston Children’s Hospital, a team peer-reviewed a case in which a patient received the incorrect medication, despite a process that required two nurses to conduct safety checks. This error inspired a group of nurses to develop RNSAFE, a tele-health-based solution.

The project aims to decrease time to medication administration and provide more time at the bedside for nurses as well as to increase patient safety by decreasing adverse drug events.

**Methods**

- Fast-track Innovation grant awarded
- RNSAFE (Remote Nurse Witness Supporting Medication Administration For Efficient Care) allows administering nurse ability to consult with remote nurse to carry out visualization and double check using webcam/mobile device
- Development of application using camera-equipped, tablet-like device for nurses to use at the bedside to allow another nurse to remotely conduct the second safety check
- Provided administering nurse with second nurse immediately, without having to pull colleague from clinical care
- Apple iPad for bedside nurse and Microsoft Surface for witnessing nurse
- Communication via Microsoft Lync 2013®

**Results**

- Primary safety benefits of having remote nurse are:
  - Focus on double check
  - Lack of interruption/distraction for witnessing nurse
  - Testing of prototype with design team:
    - Focus, detailed camera for the iPad is required in order to see small-volume e.g., “1 ml” or smaller syringes
    - Verbal communication between nurses is still needed
  - Needs for bedside nurse (identified):
    - Use of iPad, Lync 2013®
    - Educational materials created to assist bedside nurse
    - Units throughout hospital have volunteered to serve in pilot
    - Innovation has been showcased at multiple venues
    - Encouraged nurses to be innovators

**Discussion/Conclusion**

The team foresees that having a remote nurse available will be useful in situations in which an in-person nurse is not immediately available or when there are many distractions near the bedside. The team is building options for scheduled remote checks as well as emergent cases. Emergent cases will move to the top of the request queue. While RNSAFE is a tele-health solution, it does not take away the importance of verbal nurse-to-nurse communication.

**Implications/Next Steps**

- Complete testing of devices and process to ensure usability
- Pilot RNSAFE on small unit with large volume of high-risk medications
- Track medication errors and adverse drug events
- Assess nursing satisfaction with RNSAFE process
- Make adjustments to RNSAFE based on feedback from staff
- Scale RNSAFE to entire hospital

---

**Special Thanks to the Boston Children’s Hospital Innovation Team**
The Impact of a Support Team for the MyChildren’s Patient Portal

Author(s): Elizabeth Bennett BA
Irene Chen BA
Lee Williams PhD(c), RN-BC

Purpose:
MyChildren’s (MYC) is an online patient portal that provides online access to health records, as well as a connection to clinical and administrative staff. MYC gives patients and families easy access to labs, diagnostic reports, immunizations, measurements, clinic visit notes, and visit summaries. MYC users can also send secure messages to their providers, request and cancel appointments, and pay bills. The current version of MYC was launched in 2013, and currently supports over 36,000 users. The MYC platform is supported by dedicated support staff that serves both the end user community (patients and families), as well as hospital staff throughout the BCH enterprise. The support staff assists users through registration and demonstration of the functionality of the site. End users also have the opportunity to provide feedback to the support team related to portal. MYC is a platform that satisfies Meaningful Use requirements in the hospital setting. To guide clinicians to meet this goal, the support team educates various hospital staff members on the benefits and enrollment process of MYC.

Methods or Approach:
The MYC support team consists of two frontline staff members who work closely with the patient/family community. The support team provides remote assistance to families with a direct phone line, email communication, as well as an online submission form. In person patient/family support occurs throughout various parts of the hospital including inpatient patient rooms, ambulatory clinic waiting rooms, and the Center for Families during designated times. In order to expand the enterprise wide knowledge, the support team has built relationships with patient relations, child life specialist, volunteer services, outpatient front line staff, inpatient educators, inpatient family resource staff, and clinicians. The support team works closely the ISD teams that support the technical functionality of the portal. Other key members of the portal team include project and program managers, the physician liaison for patient facing applications, and the Clinical Education and Informatics Team. The legal department is also consulted as needed for questions related to patient privacy.

Outcomes:
With over 36,000 MYC user accounts, this increase in enrollment has reinforced the need to implement the direct support phone line. The phone line has streamlined contact directly to the support staff for patients and families. Increased patient prompted questions to the hospital staff has led to an increased demand for education related to the portal. The relationships built throughout the organization have led to the observation of portal engagement by clinicians and increase in requests for ongoing education for staff. As services provided in the portal expand,
the need for the support team continues to be validated as evidenced by an increased volume of incoming requests and questions by the patients, families, and staff.

**Next Steps or Lessons Learned:**
Having a designated support staff has led to the identification of portal enhancements and increased marketing engagement. Some of the future portal enhancements include secure messaging to clinical groups to include clinicians and administrative staff, a mobile application for on the go access, and creating functionality for users to share their portal accounts with other caregivers of their choice. In order to continue to increase the number of portal users, the team will work with marketing to identify appropriate strategies. As user base expands, the support team is working on identifying a sustainable education process related to the portal with the development of a Super User group representative of the enterprise.
The Impact of a Support Team for the MyChildren’s Patient Portal
Elizabeth Bennett BA, Irene Chen BA, Lee Williams PhD(c), RN-BC

Purpose:
MyChildren’s (MYC) is an online patient portal that provides online access to health records, as well as a connection to clinical and administrative staff. MYC gives patients and families easy access to labs, diagnostic reports, immunizations, measurements, clinic visit notes, and visit summaries. MYC users can also send secure messages to their providers, request and cancel appointments, and pay bills.

The MYC platform is supported by dedicated support staff that serves both the end user community (patients and families), as well as hospital staff throughout the BCH enterprise. The support staff assists users through registration and demonstration of the functionality of the site. End users also have the opportunity to provide feedback to the support team related to portal. MYC is a platform that satisfies Meaningful Use requirements in the hospital setting.

Approach:
The MYC support team consists of two frontline staff members who work closely with the patient/family community.

- Provides remote assistance to families with a direct phone line, email communication, as well as an online submission form.
- Provides in person patient/family support:
  - Inpatient patient rooms
  - Ambulatory clinic waiting rooms
  - Center for Families during designated times
- Maintains relationships with patient relations, child life specialist, volunteer services, outpatient front line staff, inpatient educators, inpatient family resource staff, and clinicians.

Outcomes:
- Over 36,000 MYC user accounts
- The increase in enrollment has reinforced the need to implement the direct support phone line
  - Has streamlined contact directly to the support staff for patients and families.
- Increased patient prompted questions to the hospital staff has led to an increased demand for education related to the portal.
- As services provided in the portal expand, the need for the support team continues to be validated as evidenced by an increased volume of incoming requests and questions by the patients, families, and staff.

Next Steps:
Having a designated support staff has led to the identification of portal enhancements and increased marketing engagement. Some of the future portal enhancements include secure messaging to clinical groups to include clinicians and administrative staff, a mobile application for on the go access, and creating functionality for users to share their portal accounts with other caregivers of their choice. In order to continue to increase the number of portal users, the team will work with marketing to identify appropriate strategies. As user base expands, the support team is working on identifying a sustainable education process related to the portal with the development of a Super User group representative of the enterprise.
Retirement of a Custom Legacy Application While Promoting the Enterprise EHR Solution

Author(s): Lauren Danforth BSN, RN, CCRN
Dennis Doherty MSN, RN, CCRN
Brian Gagnon BA
Sara Gibbons MSN, RN-BC, CPN
Cassandra Hunter MSN, RN, CPNP
Phillip Machnik BA, MM
Cassandra Mombrun MSN, RN
Tim O’Connor-Crowe CPhT, MPH, MSHI
Lee Williams PhD(c), RN-BC

Purpose:
Prior to the hospital’s Electronic Health Record (EHR) implementation in the 2000s, there was a home grown product implemented in the 1990s, Electronic Clinical Documentation (ECD). ECD was used to document electronic notes by way of dictation or direct typing while allowing for multi-contributor notes, custom templates, and distribution of authenticated notes to outside providers. Once the hospital implemented the current EHR, ECD was enhanced to pull discrete data from the EHR into notes and have authenticated ECD notes viewable within the EHR. The EHR and ECD were accessed separately; with duplicate log ins. Hospital leadership identified a need to retire ECD. Hospital resources needed to maintain and further enhance the application were limited. Hospital leadership desired streamlined documentation in one single EHR, which in turn would promote the use and future enhancements of the current EHR.

Method or Approach:
The retirement of ECD involved multiple teams including a steering committee, various ISD support staff, clinical education staff, and members of medical records. ECD integrated with many systems; therefore, an assessment occurred to identify the potential impact of ECD retirement. Clinic workflows were assessed, which influenced the note authentication process that varied based on clinical position. Standardization of documentation was led by guiding principles. Education, provided to groups and individuals included documentation, authentication, and new non-ECD functionality. Education was supplemented with printed and web based education material. Ongoing support post-live continues in order to sustain clinic engagement.

Outcomes:
The transition led to positive engagement of the full EHR user community. Wide variations in user knowledge and skill level within the enterprise EHR were identified. Some end users had suboptimal access, which prevented them from completing documentation required by their job. End users questioned the internal and external distribution of provider documents. The enterprise EHR relies on a more cumbersome electronic distribution versus ECD which was not
well liked. However, clinic based decision making models were established related to the use of the EHR which led to improved buy-in of the end users. The project allowed for the standardization of provider documentation in terms of quality and consistency while not removing the ability for user-level individuality.

**Next Steps or Lessons Learned:**
A clear project launch must be coordinated including the Executive Leadership team. A comprehensive analysis should be performed to capture the unique workflows of both the current state and systems that have the potential to be impacted. The assessment and analysis phase of the project should be completed prior to confirming a go live (or targeted go live) date. Much of these previous items are achieved through a more clearly defined role and thus greater expectations of all team members. Part of this is having a clear scope and goal identified and maintaining the focus on that goal for a timely and successful implementation. There needs to be improved transparency to the end users throughout the entire process, and the project team should maintain ongoing engagement of the end-users to ensure the trust in their new system.
Introduction/Background
Prior to the hospital's Electronic Health Record (EHR) implementation in the 2000s, there was a home grown product implemented in the 1990s, Electronic Clinical Documentation (ECD). ECD was used to document electronic notes by way of dictation or direct typing while allowing for multi-contributor notes, custom templates, and distribution of authenticated notes to outside providers.

- The EHR and ECD were accessed separately
- A need to retire ECD.
- Hospital resources strain.
- Hospital leadership desired streamlined documentation in one single EHR.

Methods
- Interdisciplinary collaboration between:
  - Information Services Department
  - Clinical Education and Informatics
  - Clinical Leadership
  - Health Information Management
  - Clinical Staff
- Workflow assessment to identify clinic practice variation.
- Guiding principles developed to standardize documentation.
- 1:1 and small group education provided:
  - Live education supplemented with print and web-based materials.
  - Education content focused on current EHR functionality and new workflow processes.

Results
- Challenges:
  - Variation in knowledge and skill level
  - EHR access issues identified.
  - User apprehension with new workflows.

Positive outcomes:
- User engagement.
- Full EHR user community.
- Established clinic based decision making models.
- Improved quality and consistency of provider documentation.

Discussion/Conclusion/Lessons Learned:
- Clear Project Launch from Executive Leadership
- Comprehensive Analysis.
- Consider current workflows and systems that may be impacted.
- Clearly defined roles and expectations of all team members.
- Ongoing engagement and transparency to end-users.
Creative Staffing Solutions: A Cross-Training Program for In-Patient Cardiac Nurses to the Cardiac Intensive Care Unit (CICU)

Author(s): Annette Imprescia BSN, RN, CCRN
Michael Greenlee BSN, RN, CCRN
Ruth Brediger MSN, RN, CCRN
Lauren Danforth BSN, RN, CCRN
Julisa Burgos BSN, RN
Susan Reidy MS, RN, NE-BC
Mary O’Brien BSN, RN, CCRN
Jason Thornton MSN, RN, CPHQ, NE-BC

Purpose:
In 2012, the clinical nurse educators from the cardiac intensive care unit (CICU) and cardiac intermediate care unit collaborated on a creative staffing initiative. The goal of the collaborative was to create a replicable program to train nurses from the cardiac intermediate care unit with the skills and knowledge to cross cover in the cardiac intensive care unit.

Method or Approach:
The group identified targeted areas for education and created a two day class curriculum focused on pediatric cardiac intensive critical care nursing. Topics included: airway management, arterial blood gas analysis, emergency situations, hemodynamic and cardiac output assessment, transitioning patients out of the ICU, pharmacology, infection control, care of premature infants, and arrhythmia review and management. One class day includes a two hour high fidelity simulation session to practice hand ventilation, suctioning, blood gas analysis, extubation, and airway skills. Selection of candidates is done by cardiac intermediate care unit manager and clinical nurse educator responsible for cross training.

During orientation, two team meetings are scheduled with CICU educators, orientee, and preceptor to assess progress. Orientation is validated by completion of unit based competencies specific to CICU nursing orientation.

Outcomes:
To date, 13 RNs have completed the cross training program. Cross trained nurses are regularly requested to float to the CICU to meet staffing needs for the cardiovascular critical care program. Feedback from staff in both the CICU and intermediate care units is positive.
Creative Staffing Solutions: A Cross-Training Program for In-Patient Cardiac Nurses to the Cardiac Intensive Care Unit (CICU)

Annette Imprescia BSN, RN, CCRN, Michael Greemlee BSN, RN, CCRN, Ruth Breddiger MSN, RN, CCRN, Lauren Danforth BSN, RN, CCRN, Julita Burgos BSN, RN, Suzanne Reiley MS, RN, NE-BC, Michelle Hurig MSN, RN, Mary O'Brien BSN, RN, CCRN, Jason Thornton MSN, RN, CPITQ, NE-BC

Purpose
- In 2012, the clinical nurse educators from the cardiac intensive care unit (CICU) and cardiac intermediate care unit collaborated on a creative staffing initiative
- The goal of the collaborative was to create a replicable program to train nurses from the cardiac intermediate care unit with the skills and knowledge to cross cover in the cardiac intensive care unit

Method
- The group identified targeted areas for education and created a two day class curriculum focused on pediatric cardiac intensive critical care nursing
- Topics included: airway management, arterial blood gas analysis, emergency situations, hemodynamic and cardiac output assessment, transitioning patients out of the ICU, pharmacology, infection control, care of premature infants, and arrhythmia review and management
- One class day includes a two hour high fidelity simulation session to practice hand ventilation, suctioning, blood gas analysis, intubation, and airway skills
- Selection of candidates is done by cardiac intermediate care unit manager and clinical nurse educator responsible for cross training
- During orientation, two team meetings are scheduled with CICU educators, orientee, and preceptor to assess progress
- Orientation is validated by completion of unit based competencies specific to CICU nursing orientation

Outcomes
- To date, 13 RNs have completed the cross training program
- Cross trained nurses are regularly requested to float to the CICU to meet staffing needs for the cardiovascular critical care program
- Feedback from staff in both the CICU and intermediate care units is positive and has enhanced collaborative practice

<table>
<thead>
<tr>
<th>Date &amp; Time</th>
<th>Class</th>
</tr>
</thead>
<tbody>
<tr>
<td>0730-0830</td>
<td>Introduction to CICU</td>
</tr>
<tr>
<td>0830-0930</td>
<td>Array Management</td>
</tr>
<tr>
<td>0930-1030</td>
<td>Arterial Blood Gas Analysis</td>
</tr>
<tr>
<td>1030-1200</td>
<td>Mechanical Ventilation</td>
</tr>
<tr>
<td>1200-1300</td>
<td>LUNCH</td>
</tr>
<tr>
<td>1300-1500</td>
<td>Simulation</td>
</tr>
<tr>
<td>1500-1600</td>
<td>Infection Control within the CICU</td>
</tr>
<tr>
<td>1600-1900</td>
<td>Emergency situations</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Date &amp; Time</th>
<th>Class</th>
</tr>
</thead>
<tbody>
<tr>
<td>0830-0930</td>
<td>Pharmacology in the CICU</td>
</tr>
<tr>
<td>0930-1030</td>
<td>Arrhythmia review</td>
</tr>
<tr>
<td>1130-1200</td>
<td>Card of the premature infant</td>
</tr>
<tr>
<td>1200-1300</td>
<td>LUNCH</td>
</tr>
<tr>
<td>1300-1500</td>
<td>De-intensifying</td>
</tr>
<tr>
<td>1500-1600</td>
<td>Pain management within the CICU</td>
</tr>
<tr>
<td>1600-1900</td>
<td>Clinical discussion</td>
</tr>
</tbody>
</table>

Next Steps
- Create a plan to maintain competency and skills for cross trained nurses that includes a plan to schedule shifts nurses to work in the CICU to maintain skills and comfort with caring for CICU patients
- Recommendations are for 2 scheduled shifts every 8 weeks
- Retrospectively review utilization of cross trained staff as a creative staffing initiative and its effect on overtime hiring practices
- Define nursing characteristics and qualifications to enter this training program
- Prepare and schedule ongoing courses throughout the year
- Establish a group of cross trained nursing staff to develop a core team of nurses to provide comprehensive care to patients in a defined transitional care unit between the CICU to the in-patient cardiac ward
Use of Electronic Tool for Perioperative Patient Handoff

Author(s): Ellen Hiney, RN-BC, CNOR

Purpose:
Patient handoff is the transfer of responsibility between healthcare providers to ensure patient safety and continuity of care. Communication of pertinent information is necessary to safeguard against errors. Ineffective handoffs can result in gaps in care as well as patient safety errors. Standardized handoff processes are recommended to mitigate communication lapses and encourage a smooth transfer of care. Handoffs of post-operative patients pose a particular challenge because of the dynamic, intense environment combined with patient complexity and the involvement of multiple caregivers. Pertinent patient information from the operating room nurse, anesthesia provider and surgeon is transferred to the post-anesthesia care nurse either in the Post-Anesthesia Care Unit (PACU) or Intensive Care Unit (ICU).

Method or Approach:
Boston Children’s Hospital (BCH) developed an electronic handoff tool to be used in conjunction with the standardized handoff process for post-operative patients. A view-only display within the electronic medical record pulls information from a variety of sources and provides a snapshot of the patient’s intraoperative experience. Pre-operative assessments, intraoperative care, and surgical data are updated in real-time on the electronic view. The perioperative handoff tool is also used by operating room nurses for shift and break handoff.

Development of the tool began with assembling a team of subject matter experts including OR, PACU, and ICU nurses as well as an anesthesia provider representative. Paper handoff tools were analyzed to find commonalities as well as identifying common elements required for patient safety. Identified data elements were mapped to the electronic medical record and organized within the hospital-wide IPASS communication format.

The Perioperative Clinical Information Systems Specialist provided functional specifications to the technical application analysts and acted as a link between the technical team and clinical subject matter experts to hone the view. Integrated testing was performed and further refinement was done over time. The Clinical Information Systems Specialist demonstrated the handoff page to end-user stakeholders with a favorable reaction.

Outcomes:
Feedback has been generally positive from perioperative staff. Staff have provided suggestions for improvements that are being incorporated.

Next Steps or Lessons Learned:
BCH perioperative programs are developing a standardized approach to patient handoff and identifying ways to incorporated the electronic tool into a variety of workflows. Data will be capture to identify improvements. Additions to the electronic tool are being incorporated to provide a better picture of the patient’s perioperative course.
Use of Electronic Tool for Perioperative Patient Handoff
Ellen Hiney, RN-BC, CNOR

**Patient handoff is the transfer of responsibility between healthcare providers to ensure patient safety and continuity of care.**

Handoffs of perioperative patients pose a particular challenge due to the dynamic, intense environment combined with patient complexity and involvement of multiple caregivers.

- Communication of pertinent information
- Safeguard against errors
- Standardized processes recommended
- Mitigate communication lapses
- Provide opportunity for synthesis and questions

**Effective Handoff**

- Potential gaps in patient care
- Potential for errors
- Lapse in communication

**Ineffective Handoff**

**A snapshot of the patient’s intraoperative experience**

- Read-only view
- Pulls information from multiple sources:
  - Intraoperative record
  - Pre-operative assessment
  - Anesthesia record
- Updates in real-time
- IPASS communication format
- Additional element to standardized verbal handoff
- Accessible in patient electronic record by all perioperative and postoperative caregivers

**IPASS Elements in Handoff Tool**

- Fitness
  - Severity
  - Post-op diagnosis
- Patient Summary
  - History
  - Surgical Procedure
  - Pre-op findings
  - Labs
- Medication
  - Blood bank
  - Drains & Tubes
  - Significant events
- Action List
  - Link to post-operative orders
- Situational Awareness
  - Verbal discussion
- Synthesis

Boston Children’s Hospital developed an electronic tool to aid in patient handoff for post-operative patients which provides:

1. Efficient communication
2. Standardized processes
3. Mitigation of errors
4. Enhanced patient safety
5. Improved patient outcomes
Next Steps or Lessons Learned:
To maintain competency and skills, create a plan to schedule shifts for cross trained nurses to work in the CICU to maintain skills and comfort with caring for patients in the CICU.
### Are We Ready for Ebola?

**Project Team:** Leah Abecassis MSN, RN, CCRN  
Paula Conrad BSN, RN, CCRN  
Joanne Kinlay BSN, RN, MMedSci(Epi), CIC

**Objective(s):**
The objective of this quality improvement project was to determine whether health care providers (HCPs) felt adequately prepared in PPE use, should a suspected or confirmed case of EVD present to our hospital for care.

**Background/Significance:**
Adherence to special precautions while caring for patients with potential Ebola Virus Disease (EVD) is vital to preventing spread of the virus. We developed a training program using personal protective equipment (PPE) in compliance with CDC guidelines.

**Methods:**
An online survey of 49 HCPs working in the medical intensive care unit was conducted. The 10 question survey, using the Likert scale, assessed comfort level with PPE training and care of the EVD patient.

**Findings:**
There was a 67% response rate to the survey (n=33). Prior to receiving PPE training, 4 (12%) of HCPs indicated they were comfortable with caring for an EVD patient, while 17 (52%) stated they were uncomfortable. Following training, 9 (27%) HCPs were comfortable with caring for an EVD patient, while 8 (24%) were uncomfortable. 21 (65%) HCPs practiced donning and doffing PPE between 3-5 times. 6 (18%) had practiced 6 or more times. 18 (55%) staff members felt that they had adequate practice using the PPE.

**Implications/Next Steps:**
Understanding the factors that contribute to the willingness of health care providers to provide care during an Ebola outbreak is critical to emergency preparedness. One of these factors is the comfort level with the PPE. Frequent, supervised training sessions using the latest practice guidelines are vital to staff preparedness. In the next iteration of our survey, we should include more questions that lead us to understand the background behind the discomfort that staff have, and how to improve their comfort level.
Are We Ready For Ebola?
Leah Abecassis MSN, RN, CCRN, Paula Conrad BSN, RN, CCRN, Joanne Kinlay BSN, RN, MMEdSci(Epi), CI

Background
- Adherence to special precautions while caring for patients with potential Ebola Virus Disease (EVD) is vital to preventing spread of the virus.
- We developed a training program using personal protective equipment (PPE) in compliance with CDC guidelines.

Objective
- To determine whether health care providers (HCPs) felt adequately prepared in PPE use, should a suspected or confirmed case of EVD present to our hospital for care.

Methods
- An online survey of 49 HCPs working in the medical intensive care unit was conducted.
- A 10-question survey, using the Likert scale, assessed comfort level with PPE training and care of the EVD patient.

Findings

<table>
<thead>
<tr>
<th>RN/MD Survey Response Rates</th>
<th>Response to Survey</th>
<th>Total Surveys Sent</th>
<th>Percentage Response</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nurses</td>
<td>29</td>
<td>42</td>
<td>65%</td>
</tr>
<tr>
<td>Physicians</td>
<td>4</td>
<td>7</td>
<td>57%</td>
</tr>
<tr>
<td>Total</td>
<td>33</td>
<td>49</td>
<td>67%</td>
</tr>
</tbody>
</table>

Provider Years of Practice
- 24% under 5
- 27% 5 to 10
- 49% More than 10

Initial Comfort Level

<table>
<thead>
<tr>
<th>Level of comfort</th>
<th>Very uncomfortable</th>
<th>Uncomfortable</th>
<th>Neutral</th>
<th>Comfortable</th>
<th>Comfortable</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-3 Don/Doff</td>
<td>2</td>
<td>3</td>
<td>7</td>
<td>4</td>
<td>3</td>
</tr>
<tr>
<td>&gt;3 Don/Doff</td>
<td>1</td>
<td>4</td>
<td>2</td>
<td>2</td>
<td>1</td>
</tr>
</tbody>
</table>

Do you feel you have had adequate practice with PPE?
- Yes: 13
- No: 10
- P-value = 0.04

Comfort Level After Training

<table>
<thead>
<tr>
<th>Level of comfort</th>
<th>Very uncomfortable</th>
<th>Uncomfortable</th>
<th>Neutral</th>
<th>Comfortable</th>
<th>Very comfortable</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-3 Don/Doff</td>
<td>1</td>
<td>4</td>
<td>3</td>
<td>3</td>
<td>0</td>
</tr>
<tr>
<td>&gt;3 Don/Doff</td>
<td>0</td>
<td>1</td>
<td>1</td>
<td>2</td>
<td>0</td>
</tr>
</tbody>
</table>

Level of comfort in donning/doffing skills

<table>
<thead>
<tr>
<th>Level of comfort</th>
<th>Very uncomfortable</th>
<th>Uncomfortable</th>
<th>Neutral</th>
<th>Comfortable</th>
<th>Very comfortable</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-3 Don/Doff</td>
<td>1</td>
<td>2</td>
<td>1</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>&gt;3 Don/Doff</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

Implications & Next Steps
- Understanding the factors that contribute to the willingness of health care providers to provide care during an Ebola outbreak is critical.
- In order for people to be more comfortable and prepared, there need to be frequent training sessions.
- Smaller volunteer team with more hours of practice may be in the best solution to who should care for these patients.
- Plan to include more questions to understand the background behind the discomfort that staff have and how to improve their comfort level.

Boston Children’s Hospital Cardiovascular and Critical Care Services
Initiative to Prevent EEG Lead-Related Pressure Ulcers

Project Team: Carole Atkinson MS, PPCNP-BC, CNRN  
Sandy Quigley MSN, CWOCN, CPNP-PC  
Susan Hamilton MS, RN, CCRN, CWOCN  
Maria Gabriel REEGT, CMET, MBA  
Sheryl Manganaro R. EEG T., B.S.  
Maria DeBurgo  
Jack Connolly BSIT, R. EEG T.  
Victoria Fruh BS, MPH

Objective(s):
1. To develop a process for prevention of skin breakdown in patients undergoing continuous EEG monitoring.
2. To initiate routine interventions in the management of patients on continuous EEG monitoring.

Background/Significance:
Availability of medical technology to support clinical care can lead to increase usage and in some cases extending the duration of continuous electroencephalogram monitoring. In some instances monitoring is interrupted for testing, such as MRI, and resumed thereafter. Adverse effects of prolonged testing and the removal and reapplication of leads, are pressure ulcers and other skin-related issues.

Findings:
In response to a pressure ulcer event, a multidisciplinary team, now referred to as the “EEG Skin Task Force”, convened to review prior adverse event reports and current practice. The group determined the guideline for managing patients on EEG monitoring could be revised to include more specific steps the technologist, nurse and physician could institute to prevent skin injury while maintaining the quality of studies. A policy and procedure was adopted and hospital-wide education was rolled out with the support of the Skin SME and EEG Skin Task Force. Communication has improved through the use of a Power Form tool in the patients’ electronic medical record.

Implications/Next Steps:
The change in practice has improved awareness in the clinical providers of the vulnerability of patients on continuous monitoring. The number of EEG lead skin-related events has decreased. A 100% review of all continuous EEG monitoring is done weekly for adherence to the updated policy and shared with the staff. A risk cause analysis is done on all reports of EEG lead skin issues. The technologists continue to explore available products and setup techniques. And as a team, thoughtful review of extended studies is discussed. The EEG Skin Task force will continue to meet quarterly.
References:

Improving the Hospital Experience for Individuals with Intellectual Disabilities

Project Team: Deborah Shiers MSN, RN, CNRN, NE-BC  
Candice Marti CPNP, CNRN  
Lora Pixley CPNP, CNRN  
Natasha Massiah, Epilepsy LTM and New Patient Program Coordinator  
Sheryl Manganaro R. EEG T., B.S.  
Megan Leibovitz BS, CCLS  
Sally Nelson M.Ed., RN, NEA-BC  
Carole Atkinson MS, PPCNP-BC, CNRN

Objective(s):
1. Development of a process to proactively prepare not only the care team, but the patient and family for the medical experience.
2. Initiate a preadmission screening for patients identified by the provider as aggressive or possibly behavioral.
3. Formulate and institute an individualized plan of care.

Background/Significance:
An increasing number of cognitively challenged and impaired children, including children on the autism spectrum, are electively admitted to our Inpatient Neuroscience and Epilepsy Monitoring Unit to facilitate diagnostic evaluation. Our response to behavioral issues was crisis intervention mode.

Methods:
The admission coordinator who activates the request notifies the outpatient clinical team and a chart review is completed. The information obtained at this phase is shared with a core inpatient clinical team and triaged for a telephone interview by either the behavioral response team (BRT) or child life specialist (CLS). This contact establishes a relationship with the caregivers and a mutually developed behavioral plan, as well as a crisis management plan for the duration of the hospitalization is prepared and entered into the EMR.

Findings:
Understanding unique triggers and de-escalation techniques for the individual has improved the patient experience in the medical environment. Although the intensity of resources and additional preparation and training to care for this patient population was identified by the care team of nurses (RN), technologists and CLS, our success rate accomplishing the goals for admission have improved substantially.
Implications/Next Steps:
For the program, this quality improvement project developed a process to proactively prepare not only the care team, but patients with intellectual disabilities and their family, for the medical experience. The process has improved patient and staff safety, improved the overall hospital experience and resulted in staff and family satisfaction.
Utilizing time study data to expand the nursing role in the CCS Clinic

Project Team: Regina Band BSN, RN, CPN
Pam Schubert Bob MSN, RN

Objective(s):
1. Determine how much time the nurse spends doing non nursing tasks.
2. Determine what tasks can be delegated, and who to delegate to in a small clinic
3. Ongoing expansion of nursing role to better meet the needs of our patients

Background/Significance:
The outpatient Complex Care Service clinic (CCS Clinic) follows patients who have a combination of neurodevelopmental or functional disabilities in addition to three or more medical problems. The CCS outpt clinic is a relatively small clinic. We have 1 full time physician and 5 part time physicians. We have one fellow who works with CCS 4 hours every other week, 1.1 NP FTE, 2 AA’s, one nurse and 0.5 FTE Clinical Assistant. We also have one social worker who works with both our inpt and output services. The CCS providers see pts in Boston, Lexington, Waltham, and also in the Cerebral Palsy and Myelodysplasia clinics. We follow approximately 800 individual pts in our main CCS Clinic in Boston, and approximately 3,000 pts in all of our clinics combined. Approximately 20-30% of our patients are international pts. CCS clinic assists pts and families in identifying gaps in care, makes referrals to specialty providers, helps with facilitating communication between providers, assists with transferring specialty care to BCH, and assists with medical management when care becomes too complex for the PMD to manage without support. CCS also functions as the primary care provider for the international pts followed in our clinic. In 2008, when I started working in CCS Clinic, I spent most of my time sitting at a desk, triaging phone calls, writing prescriptions with LOMN’s, and taking intake information for new referrals for review by our team. We saw a very small number of pts (about 12 pts per week) in clinic. I would meet each family while the child was having vital signs done and find out what issues the family was looking for our help with. We now can see 12 or more pts in a 4 hour morning clinic. After being in CCS Clinic for about a year I developed a 3 page nursing intake form, and if time permitted I would obtain this information prior to the patient being seen by the provider. During the course of the past 6 years, there were 2 years when we had a second half time RN in clinic as a result of grant funds. When the grant money ran out we went back to 1 full time nurse. So at this point we have less nursing hours to support the clinic, while the patient and provider volume grows. Also, over the course of the past 6 years the medical complexity of our patient population has increased, as many of our complex patients are now living longer and have more complex day to day care in their home settings. In addition to increased volume and complexity of our patient population we have also started offering flu shots to all of our patients, and have begun vaccinating our international patients. So the nursing role in triaging phone calls as well as during clinic hours has become more involved.
Methods:
2. Development of tools to increase efficiency
3. Develop new roles for ancillary staff (AA, CA)

In 2010 I created a time study data collection tool. I then tracked my time spent in eight categories for three weeks. The data showed that I was spending an average of 94 minutes each day doing administrative work and 56 minutes each day assisting in some way with appointments needed. 2.5 hours of my 8 hour day was spent doing non nursing tasks. This study also showed that I spent an average of 93 minutes per day writing DME prescriptions, with associated LOMN’s and filling out insurance forms for these items. As a result of this time study we decided to promote our lead AA (Violet) to sit beside me and manage the non-nursing tasks that come through the nursing office. Since this was only about 2.5 hrs per day, we then further developed this role to include writing prescription proposals with attached LOMN’s for most of our DME supplies. Violet and I developed a system for writing our DME prescriptions which makes it very easy for any provider at BCH to renew these yearly as needed. We do not put the child’s age on the LOMN, and we write the vendor and fax number on the LOMN. Leaving the child's age off is one less change to make when renewing the prescription. Adding the vendor information adds extra time the first time the presc is written, but when the provider signs the presc proposal, and the presc is printed out it is clear where it should faxed to. Often families will call with questions about their supplies but don’t know the name of their vendors, so this information is very important. Violet also writes most of the letters that our families need. She also triages the phone calls that come through the nursing office as many of these have to do with non-nursing issues that she can assist with.

In addition to adding and developing a new AA role and a more efficient way of writing DME presc proposals, the old 3 page nursing intake form was redeveloped into a handout for families to fill out in the waiting room. We also created a new referral intake form for referring providers to fill out. Also about 6 months ago we hired a clinical assistant to work 4 hours per day in CCS clinic, so the RN did not have to do vital signs when the clinic was short staffed for CA’s. (we only have morning clinics in CCS clinic daily in Boston). This also helps to get our pts into rooms faster, and as our CA then has some down time, we are being creative in developing this position further. Our CA also makes confirmation calls for appts, and can enter immunization history into Power Chart for our international pts. She is also available to pick up the billable immunizations needed from the central pharmacy. She checks and restocks our supply drawer weekly and she checks that we have full oxygen tanks each morning, and that our suction machine is in place and being charged.

Findings:
The data from the time studies shows a significant decrease in time spent by the RN doing non-nursing tasks, such as administrative and appointment issues, as well as writing DME prescriptions, letters of medical necessity and filling out insurance forms for DME supplies. RN time spent each day doing these things went from an average of approximately 4 hours per day to an average of approximately 45 minutes per day, from 2010 to 2014. The data does not show a significant decrease in time spent obtaining information for and reviewing new
referrals. So this is a process that will need more thought. It shows a drop to almost 0 in time spent with the RN obtaining vital signs after we hired our own clinical assistant. The newest data shows much more time spent with pts in clinic. This is mainly due to my newer role in immunizing our international pts and our offering flu shots to all our pts. The data also shows more time spent on the phone with non-urgent calls. Some of this is because our providers are having the RN do more follow up calls after a clinic visit or discharge. These are positive changes for our patients, and would not have been possible in our older mode of functioning.

**Implications/Next Steps:**
Continue to do data collection for time study every 6 months as CCS Clinic is growing rapidly at this time. The original data collection tool listed case-management as a category. This was defined as writing for DME supplies as well as managing school and home care issues and orders. When the tool was revised in 2014, we eliminated the label of case-management and listed each item separately. The RN will continue to use the revised tool to compare data going forward. The new referral triage tool needs some minor changes that may help obtain the information we need without further phone calls to the referring provider or family. This past week I started calling families who were in the ED the day before to see if they need our assistance with ongoing issues. I am gradually adding to my role as other tasks are delegated or simplified. We will need to continue to reevaluate the roles for RN, AA and CA to be able to be as effective as possible in assisting our families with their complex needs. It may be helpful for our AA and CA to do a similar time study at some point. We are a small clinic and need to use each role wisely as our clinic grows.
Utilizing time study data to expand the nursing role in the Complex Care Service Ambulatory Program

Regina Band BSN, RN, CPN Pam Schubert MHA, RN, NE-BC,CPN Christopher Baker BS Laurie Glader M.D.

Background

The Complex Care Service (CCS) follows patients who have a combination of neurodevelopmental and functional disabilities in addition to three or more chronic medical conditions. Many are dependent on technology.

- **Clinical staff:** 2.8 FTE, 0.5 FTE, 0.9 FTE, 2.0 FTE, 0.3 CA FTE, and 1.0 FTE social worker.

Patients are seen in Boston, Lexington, Waltham, CP Clinic and Myelodysplasia clinic.

Approximately 850 patients are followed in the main CCS Clinic in Boston, and approximately 2500 patients are followed in all clinics combined. Approximately 35% of our patients are international pts.

CCS:
- Assists the PMD and specialists with medical management and developmental concerns.
- Functions as PMD for our international patients.
- Identifies gaps in care.
- Facilitates communication between providers.
- Assists with transferring specialty care to BCH.

Over the past 5 years:
- Clinic volume has grown dramatically.
- Patients living at home have increasing complexity.
- Clinic nurse hours have decreased.

Objectives

1. Determine how much time the nurse spends doing non-nursing tasks.
2. Determine what tasks can be delegated and to whom.
3. Ongoing expansion of nursing role to better meet patient needs.

Methods

Comparative RN time studies done in 9/2010 and 11/2014:
- Shifts in RN duties and responsibilities.
- Development of new roles for ancillary staff.
- Development of tools to increase efficiency.

Table 1: Time study results from 2010 and 2014. RN average daily time spent.

<table>
<thead>
<tr>
<th>Tasks</th>
<th>2010</th>
<th>2014</th>
</tr>
</thead>
<tbody>
<tr>
<td>Admin</td>
<td>96 min</td>
<td>4 min</td>
</tr>
<tr>
<td>Appointments</td>
<td>56 min</td>
<td>5 min</td>
</tr>
<tr>
<td>DME requests</td>
<td>53 min</td>
<td>37 min</td>
</tr>
<tr>
<td>Time spent with patient</td>
<td>96 min</td>
<td>166 min</td>
</tr>
<tr>
<td>General pt, management</td>
<td>98 min</td>
<td>150 min</td>
</tr>
<tr>
<td>RX/VNs</td>
<td>26 min</td>
<td>31 min</td>
</tr>
<tr>
<td>New referral intake</td>
<td>30 min</td>
<td>32 min</td>
</tr>
</tbody>
</table>

Pre-visit Form:

New Referral Intake Form:

Results

2010 RN time study:
- 4 hours each day: administration and appointments.
- Writing durable medical equipment (DME) prescriptions, letters of medical necessity (LOMNs), insurance forms for DME supplies.

In response to these results, the following changes were implemented:
- **Staffing changes:**
  - One of two AAs was promoted to sit next to the RN and assist with non-nursing tasks.
  - A RN was hired at 0.5 FTE.
- **Shift responsibilities for non-nursing tasks:**
  - AA assists with DME prescription proposals, LOMNs and insurance forms for most DME supplies, as well as writing/initiating most letters.
  - AA does vital signs and is first call to assist with clinical needs during clinic, triaging to nursing as needed.

2014 comparative time study:
- 45 minutes each day spent by RN doing tasks that took 4 hours of RN time daily in 2010.
- Marked increase in time spent with patients in clinic.
- Increase in time spent on general patient management, particularly patients not physically in clinic (phone calls etc).
- A drop in almost 0% RN time spent obtaining vital signs.

Clinical expansion as a direct result of these changes:
- Flu vaccine to all CCS patients who need it in clinic.
- Immunizations for our international population.
- Increased time on phone for clinical matters, including non-urgent issues pertaining to general care.
- Early systems development of post-ED visit follow-up phone calls.

Going Forward

- Development of process for post-ED visit follow-up phone calls.
- Minor revisions of new referral triage form.
- New referral form continues with rapid growth.
- Utilize future data to reassess/advance roles of RN, AA and CA.
Population Management: Defining the Population

Project Team:
- Linda Haynes MS, PPCNP-BC, AE-C
- Madeline Beauregard BA
- Sheila Petrosino BSN, RN, AE-C
- Patricia Glidden MS PPCNP-BC
- Susan Sommer MSN, RN, WHCNP, AE-C
- Elizabeth M Klements MS, PPCNP-BC, AE-C
- Amanda Nakonechny BSN, RN
- Manna Heshe BSN, RN, CMCH
- Colleen Mulcahy BSN, RN
- Jason Dick BA
- Tatiana Cadet
- Ana Jiminian
- Faye Holder-Niles MD, MPH

Objective(s):
To expand the population management pilot at Primary Care Longwood to create a new chronic disease model of care for children with asthma across the 3 primary care sites.

Background/Significance:
Asthma is the leading chronic disease among children in the US. High healthcare utilization costs are associated with asthma due to fragmented care, poor patient education about disease management, and the compounding of social and environmental factors that adversely affect patient health. With current changes in healthcare, innovative approaches to care and management of populations with diseases like asthma, is imperative and will be central to improving efficiency and controlling health care costs. The initial step to managing our patient populations involved defining the population of asthma patients receiving care at Primary Care at Longwood, Primary Care at Martha Elliot and the Division of Adolescent/Young Adult Medicine. We then further delineated high risk patients based on hospital admissions and emergency room visits.

Methods:
An inter-professional multi-site asthma team was formed to provide team based care in 3 clinic sites. We worked to enhance patient identification and tracking using patient 360 and were able to identify active (receiving care within the past 48 months) patients with a diagnosis code of asthma. We then further defined patients as high risk if they were seen in the emergency room or had a hospitalization for asthma within the previous 12 month period.

Findings:
Asthma populations in the 3 clinics sites consisted of:
- Primary Care at Longwood: Total 2069, High Risk 403
Primary Care at Martha Elliot  Total 668  High Risk 121
Division of Adolescent/Young Adult Medicine  Total 544  High Risk 63

**Implications/Next Steps:**
Our next steps in population management will be to design systems for enhancing patient care. This will include expansion of our inter-visit nursing follow-up for high risk patients, implementing proactive preventative services and tracking patient outcomes measures including emergency room visits and asthma hospitalizations.
Asthma Population Management: Defining the Population


Objective:
- Expand population management pilot at Primary Care at Longwood

- Implement population management across 3 primary care sites: Primary Care at Longwood, Primary Care at Martha Eliot, Division of Adolescent/Young Adult Medicine

Background:
- Asthma is the leading chronic disease among children in the US

- Fragmented care, lack of knowledge, and social and environmental factors result in high healthcare utilization costs and an increased number of ED visits and hospitalizations

- Innovation in care delivery is needed to improve efficiency, cost, and patient outcomes

- In order to best improve care, clinical teams must clearly define the patient population

- It is crucial to identify patients most at risk and design care plans to address risk level

Methods:
- An inter-professional multi-site asthma team was formed to implement care at Primary Care at Longwood

- Primary Care at Martha Eliot Division of Adolescent/Young Adult Medicine

- Identified “active” clinic patients with asthma diagnosis using Patient 360

- Determine high risk patients ≥1 emergency room visit and/or hospitalization

Preliminary Results:

Asthma Clinic Population

- 587 High Risk Population

- 2694 Total Population

High Risk Population

- 63 Division of Adolescent/Young Adult Medicine

- 121 Primary Care Martha Eliot

- 403 Primary Care at Longwood

Next Steps:

- Design systems for monitoring patient benchmarks toward preventative care goals

- Expand inter-visit nursing care for follow-up of high risk patients

- Track patient outcome measures, including emergency room utilization and hospitalizations
Consistency of Care in the Cardiac Catheterization Lab: Heart Transplant and Pulmonary Vein Stenosis (PVS) Patients

Project Team: Brenda Brawn BSN, RN, CCRN
Karen Hinsley BSN, RN, CCRN
Carol Larson MPH
Sandra Mott PhD, BC-RN, CPN
Jean A. Connor PhD, RN, CPNP

Objective(s):
The objective of this project is to improve consistency of care for patients requiring frequent cardiac catheterization due to heart transplant or PVS through a systems-level approach.

Background/Significance:
New heart transplant patients are seen frequently for clinic visits and diagnostic studies in the first three years post-transplant. A transplant patient without rejection, infection or failure will have approximately 21 clinic visits in the first six months and nine cardiac catheterizations for biopsy within the first year. Surveillance will then consist of a cardiac catheterization every six months until three years post-transplant. After four years, provided everything is progressing well they are followed yearly for biopsy. Similarly, children with the diagnosis of PVS require frequent assessment, testing, and the invasive intervention of pulmonary vein dilation in the cardiac catheterization lab.

Methods:
Phase 1: Using a six question open-ended survey, staff were invited to share their experiences caring for these patient populations and the use of a consistency of care model. Staff were then involved in creating templates that will be used to gather patient/family information. Family members and patients have provided input through discussion and evaluation of these templates. Survey results and information gathered will be used to inform Phase 2.
Phase 2: An electronic application is under development to capture patient and family preferences related to pre and post cardiac catheterization care. In addition, clinician input of care preferences and care given will be captured. The application will be created with patient, family, and clinician input. The application will be evaluated for patient, family, and clinician satisfaction.

Findings:
Phase 1: 13 of 18 staff members responded to the survey (72% response rate). Staff reported that a consistency of care model would benefit patients, especially related to sedation/anesthesia preferences; would help patients and families feel more comfortable; assist with developing a trusting relationship and help staff provide individualized care. Challenges in caring for heart transplant/PVS patients were also identified, including difficulties
during busy assignments and knowing each patient’s preferences and how best to proceed with the procedure.

**Implications/Next Steps:**
Nursing staff perceive that a consistency of care model is important, especially for heart transplant/ PVS patients whose care is frequent, chronic, and complex. Consistency of care is important to both staff and patients/families to improve the care experience. An electronic application may be an effective method for communication preferences and improving consistency of care regardless of the care provider. An electronic application tentatively titled “My Hospital Bio” is under development to provide an interactive bridge between healthcare providers and heart transplant/PVS patients and families. The application will be tailored to the patient’s developmental age and will be accessible by all providers to improve consistency of care. This consistency of care tool will be used as a forum to empower patients and families about preferences, healthcare and person health information.

If this poster has been presented at a conference, which one: Poster presented at the 2014 Northeast Pediatric Cardiology Nurses Association Annual Conference, Boston, MA, October 2014; 15th Annual International Symposium on Congenital Heart Disease, St. Petersburg, FL, February 2015.
Consistency of Care in the Cardiac Catheterization Lab: Heart Transplant and Pulmonary Vein Stenosis (PVS) Patients

Brenda Brawn BSN, RN, CCRN, Karen Hinsley BSN, RN, CCRN, Sandra Mott PhD, BC-RN, CPN, Jean Connor PhD, RN, CPNP

Background

- New heart transplant patients are seen frequently for clinic visits and invasive diagnostic studies in the first 3 years post-transplant.
- The typical schedule of visits post-transplant is shown below:
  - 21 clinic visits in the first 6 months
  - 9 cardiac catheterizations within the first year, then one every 6 months for 3 years post-transplant
  - Annual cardiac catheterizations after 4 years
- Children with the diagnosis of pulmonary vein stenosis (PVS) similarly require:
  - Frequent assessment and testing
  - Invasive intervention of pulmonary vein dilation in the catheterization lab

Purpose

To improve consistency of care within the cardiac catheterization lab for heart transplant and PVS patients through a systems-level approach

Methods

Phase I

- A six question open-ended survey was distributed to staff.
- Staff were invited to share thoughts and experiences in caring for heart transplant and PVS patients and their experience with a consistency of care model.

Phase II

- Development of an electronic tool to capture patient preferences related to pre and post-cath care
- Testing and evaluation of the tool for patient, family, and nursing staff satisfaction

Phase I Findings

- 18 surveys distributed; 13 completed (72% response rate)
- Staff Findings:
  - Benefits of implementing a consistency of care model:
    - "They do better with consistency, especially with sedation/anesthesia."
    - "patients and families feel more comfortable"
    - "develop a trusting relationship"
    - "able to give better, well rounded care"
- Challenges in caring for heart transplant and PVS patients:
  - "when you don't care for them often, you don't know their preferences"
  - "busy assignment"
  - "knowing their quirks about what they like and how they want to proceed with the procedure"

Conclusions

- Nursing staff perceive that a consistency of care model is important, especially in the setting of heart transplant and PVS patients whose care is chronic and complex
- Consistency of care is important to both staff and patients/families to improve their care experience.
- An electronic tool may be an effective method for improving consistency of care regardless of care provider.

Figure 1. Consistency of Cardiac Cath Care

Cardiovascular and Critical Care Nursing Science

Brenda Brawn (cardio.chboston.org)
An Assessment of the Current Practice and Care of Pediatric Congenital Heart Patients Post Cardiac Catheterization

Project Team:
Loren Brown BSN, RN, CCRN
Karen Hinsley BSN, RN, CCRN
Michelle Hurtig MSN, RN NE-BC
Cheryl A. O’Connell MBA, RN, NE-BC, CPHQ
Jean Connor PhD, RN, CPNP
Lisa Bergersen MD, MPH

Objective(s):
To describe the current state of post cardiac catheterization management as it pertains to patients across the life span, with congenital heart disease

Background/Significance:
In 2012, nurses within this cardiac catheterization unit questioned the current practice related to the assessment and management of pediatric congenital heart patients post procedure. An assessment of the practice across the institution identified variations in both practice and interpretation of the hospital policy. Closer review of the hospital policy revealed opportunity for clarification of a number of nursing care practices, including frequency of vital signs, access site assessment, distal pulse assessment, and a clearer definition of the initiation of bed rest. Further investigation into the origination of the policy revealed that the guidelines were based on expert opinion and post anesthesia care guidelines defined by Association of periOperative Registered Nurses (AORN), which were current at the time of the policy creation, but had since changed. A review of the literature offered little evidence to help define practice specific to the care required post cardiac catheterization beyond the anesthesia recovery. Inquiry into practice at other like institutions revealed similar questions and inconsistencies. This identified both an opportunity and need to establish evidence in this area.

Methods:
As part of a nurse-led, interdisciplinary quality improvement effort, a 36 question survey, including fixed choice and open ended questions was developed. Prior to distribution the survey was piloted among internal staff and two outside programs to establish reliability and validity. The final questionnaire was sent as a web-based survey to the Congenital Cardiovascular Interventional Study Consortium Listserv with representation from 113 institutions. The Congenital Cardiovascular Interventional Study Consortium is a not-for-profit organization dedicated to the advancement of the science and treatment of infants, children, and adults requiring surgical / interventional procedures for the treatment of congenital heart disease. Responses were collected through REDCap.
Results:
Of the 113 institutions invited to participate, 59 institutions (52%) responded to the survey. Respondents included both pediatric free-standing facilities (71%) and combined pediatric and adult facilities (29%) as well as facilities from all geographical areas of the United States and three international facilities. The majority (64%) of the facilities do not test an activated clotting time (ACT) prior to sheath removal and heparin reversal is not standard practice. In addition, 62% of the facilities do not have an established protocol to achieve hemostasis. Of those who have an established protocol, 45% apply pressure until hemostasis is achieved. Pressure dressings (gauze and surgical foam tape) are used by 63% of the facilities. Length of time for bed rest varies with the most common being six hours for arterial access and four hours for venous access. The majority of patients are recovered post catheterization in a general PACU (50%) or a cath lab recovery room (39%). The length of stay in the area where patients immediately recover varies with 37% indicating one hour and 18% responding that the length of stay is determined by the patient’s return to baseline based on Aldrete score or similar post sedation assessment.

Implications/Next Steps:
There is little evidence to define practice for post catheterization care in the pediatric congenital heart patient population. This survey provides a description of the current practice and a place to begin creating evidence to support and clarify the management of congenital heart patients post cardiac catheterization. There remains variability in practice with few standard protocols for achieving hemostasis, required time of immobilization and standardized assessment. Practice differences and lack of standardized care support the need for research to establish evidence-based practice. This survey describes the current practice and provides a point of reference for future research and quality improvement related to the post cardiac catheterization management of patients with congenital heart disease across the life span.

References:
An Assessment of the Current Practice and Care of Pediatric Congenital Heart Patients Post Cardiac Catheterization

Loren Brown BSN, RN, CCRN, Karen Hinsley BSN, RN, CCRN, Michelle Hurtig MSN, RN NE-BC, Cheryl A. O’Connell MBA, RN, NE-BC, CPHQ, Jean Connor PhD, RN, CPNP, Lisa Bergersen MD, MPH

Background/Significance
- In 2012, an assessment of the practice across the institution identified variations in both practice and interpretation of the hospital policy.
- There was a lack of research on this population to support evidence-based practice.
- An opportunity for clarification of a number of nursing care practices:
  - Frequency of vital signs
  - Access site assessment
  - Distal pulse assessment
  - Definition of the initiation of bed rest

Objective
- To describe the current state of post cardiac catheterization management as it pertains to patients across the lifespan with congenital heart disease.

Methods
- A 36 question survey, including fixed choice and open ended questions was developed.
- Prior to distribution, the survey was piloted among internal staff and two outside programs to establish reliability and validity.
- The final questionnaire was sent as a web-based survey to the Congenital Cardiovascular Interventional Study Consortium (CCIS) with international representation from 113 institutions.
- Congenital Cardiovascular Interventional Study Consortium is a not-for-profit organization dedicated to the advancement of the science and treatment of infants, children, and adults requiring surgical/interventional procedures for the treatment of congenital heart disease.
- Responses were collected through REDCap.

Findings

Demographics
- 113 institutions invited to participate
- 59 institutions (52%) responded to the survey
  - Pediatric free-standing facilities (71%)
  - Combined pediatric and adult facilities (29%)

Practice
- 64% of the facilities do not test an activated clotting time (ACT) prior to sheath removal.
- Heparin reversal is not standard practice.
- 62% of the facilities do not have an established protocol to achieve hemostasis.
  - Of those who have an established protocol, 45% apply pressure until hemostasis is achieved.
  - Pressure dressings (gauze and surgical foam tape) are used by 63% of the facilities.
- Length of time for bed rest varies with the most common being six hours for arterial access and four hours for venous access.
- Majority of patients are recovered post catheterization in a general PACU (50%) or a cath lab recovery room (30%)
- The length of stay in the area where patients immediately recover varies.
  - 37% indicating one hour
  - 18% determined by the patient’s return to baseline based on Adrile score or similar post sedation assessment

Implications/Next Steps
- Variation existed in a number of practices such as:
  - Achieving hemostasis
  - Required time of immobilization
  - Assessment
- This foundational data highlights a number of opportunities for standardization of practice.
Increasing Pediatric Advanced Care Team Consultation in the Neonatal Intensive Care Unit

Objective(s):
To assist Neonatal Intensive Care Unit (NICU) staff with identifying patients and families that could benefit from Pediatric Advance Care Team (PACT) services.

Background/Significance:
PACT provides palliative care support to children with life threatening illnesses. This care is aimed at optimizing quality of life, promoting healing and providing comfort to children. Previously, PACT consultation within our NICU varied greatly.

Methods:
The quality improvement group met with members of PACT to discuss project goals and identify NICU patients that would benefit most from consultation. NICU staff were educated on the role of PACT as well as the newly designed PACT decision tree in a staff meeting and via email. A pre/post survey was developed and sent to NICU staff to assess knowledge surrounding PACT consultation before and after the educational initiative. Patient charts were retrospectively reviewed over a three month time period before and after the educational initiative to determine candidacy for PACT and if a consultation was generated. Pre/post data measurement was performed by two reviewers. Reviewers utilized the same criteria for patient eligibility and cross checks were conducted to limit discrepancies.

Findings:
Pre and post intervention staff surveys (N=76 and 50 respectively) revealed that nearly 60% of respondents had worked with PACT in the last six months. Staff demonstrated a better understanding of family/team refusals and time limits on PACT involvement. Retrospective chart reviews demonstrated less infants post education qualified for PACT, but the overall percentage of PACT referrals increased. This finding supports the systematic re-education of staff and the development of a standardized decision tree to increase referrals to important patient care services such as PACT.
Implications/Next Steps:
PACT provides important palliative care services that are underutilized in our NICU. The use of an educational initiative and decision tree has increased PACT referrals. In turn, this may help staff and family members cope and process their infant's chronic or life limiting illness. We plan to continue our education initiative with staff to ensure all infants and family members receive palliative care services. Moving forward we plan to assess the appropriate timing of PACT referrals for our patients and their families.

If this poster has been presented at a conference, which one: Pediatric Evidence-Based Practice Conference 2014 in Cincinnati, OH
Increasing Pediatric Advanced Care Team Consultation in the Neonatal Intensive Care Unit

Nadine Spiegel, BSN, RN, CCRN, Donna Armstrong, MSN, CAGS, RN, CCRN, Mary Ann Olbash, RN, CCRN, Erin St. Jean, RN, CCRN,
Judith Tordiglione, BSN, RN, CCRN, Zoe Kallas, BSN, RN, CCRN, Kristen Leeman, MD, Denise Casey, MS, RN, CCRN, CPNP

Background

- The Pediatric Advance Care Team (PACT) provides palliative care support to children with serious illnesses and their families.
- Inconsistencies in PACT consultation were noted in the Neonatal Intensive Care Unit (NICU).

Objective

- To assist NICU staff in identifying patients and families that could benefit from PACT services.

Methods

- The quality improvement group met with members of PACT to discuss project goals and identify NICU patients that would benefit most from consultation.
- NICU staff were educated by a PowerPoint presentation on the role of PACT as well as the newly designed PACT decision tree in a staff meeting and via email.
- A pre/post survey was developed and sent to NICU staff to assess knowledge surrounding PACT consultation before and after the educational initiative.

- Patient charts were retrospectively reviewed over a 3-month time period before and after the educational initiative to determine candidacy for PACT and if a consultation was generated.
- Pre/post data measurement was performed by two reviewers.
- Reviewers utilized the same criteria for patient eligibility and cross checks were conducted to limit discrepancies.

Results

- Nearly 60% of respondents had worked with PACT in the 6 months prior to and following the initiative (Table 1).
- Staff demonstrated a better understanding of family/team referrals and time limit on PACT involvement (Table 1).
- After the initiative, there was an increased number of referrals to PACT by parent/team (Figure 3).
- Retrospective chart review revealed less infants post education qualified for PACT, but the percentage of infants that had a PACT referral increased.

Conclusions

- PACT provides important palliative care services that are underestimated in our NICU.
- The use of an educational initiative and decision tree has increased PACT referrals. This in turn may help staff and family members cope and process their infant's chronic or life-limiting illness.
- We plan to continue our education initiative with staff to ensure all infants and family members receive palliative care services.
- Moving forward, we plan to assess the appropriate timing of PACT referrals for our patients and their families.

Acknowledgements

Many thanks to all of the PACT QI group who helped develop this initiative and improve the delivery of care to infants in our NICU. Thank you to Cheryl Todd & Rebecca Kristoff for developing the ideas for these projects and providing leadership, support and encouragement.

Table 1: Pre/Post Survey Results

<table>
<thead>
<tr>
<th>Survey Questions</th>
<th>Pre-Survey Results N=56</th>
<th>Post-Survey Results N=59</th>
</tr>
</thead>
<tbody>
<tr>
<td>What are your current credentials?</td>
<td>RNs: 55%</td>
<td>RNs: 62%</td>
</tr>
<tr>
<td></td>
<td>MD: 25%</td>
<td>MD: 9%</td>
</tr>
<tr>
<td></td>
<td>NPs: 25%</td>
<td>NPs: 9%</td>
</tr>
<tr>
<td></td>
<td>LKC: 7.8%</td>
<td>N: 7.8%</td>
</tr>
<tr>
<td></td>
<td>U: 7.8%</td>
<td>U: 7.8%</td>
</tr>
<tr>
<td>When was the last time you worked?</td>
<td>0-6 mos: 56%</td>
<td>0-6 mos: 50%</td>
</tr>
<tr>
<td></td>
<td>&gt;6-12 mos: 25%</td>
<td>&gt;6-12 mos: 10%</td>
</tr>
<tr>
<td>With PACT in the last 3 years?</td>
<td>0-6 mos: 25%</td>
<td>&gt;12 mos: 15.8%</td>
</tr>
<tr>
<td></td>
<td>&gt;12 mos: 25%</td>
<td>&gt;12 mos: 10%</td>
</tr>
<tr>
<td>Why did you work with PACT?</td>
<td>Ethically Medically Complex: 45%</td>
<td>Ethically Medically Complex: 60%</td>
</tr>
<tr>
<td></td>
<td>Parent/Team Request: 15%</td>
<td>Parent/Team Request: 30%</td>
</tr>
<tr>
<td>Can a family/team refuse PACT?</td>
<td>Yes: 65%</td>
<td>Yes: 94%</td>
</tr>
<tr>
<td></td>
<td>No: 4%</td>
<td>No: 2%</td>
</tr>
<tr>
<td></td>
<td>Unsure: 12.5%</td>
<td>Unsure: 4%</td>
</tr>
<tr>
<td>IS PACT utilized only for end of life?</td>
<td>Yes: 100%</td>
<td>No: 98%</td>
</tr>
<tr>
<td></td>
<td>No: 0%</td>
<td>Unsure: 4%</td>
</tr>
<tr>
<td>Is there a time limit on how long it can be involved?</td>
<td>Yes: 0%</td>
<td>Yes: 0%</td>
</tr>
<tr>
<td>PACT can be involved?</td>
<td>No: 75%</td>
<td>No: 97%</td>
</tr>
<tr>
<td></td>
<td>Unsure: 12.5%</td>
<td>Unsure: 4%</td>
</tr>
<tr>
<td>Once PACT is involved curative treatment cannot be continued?</td>
<td>True: 0%</td>
<td>True: 0%</td>
</tr>
<tr>
<td></td>
<td>False: 87.5%</td>
<td>False: 94%</td>
</tr>
<tr>
<td></td>
<td>Unsure: 2.6%</td>
<td>Unsure: 2%</td>
</tr>
</tbody>
</table>

Figure 2: Pediatric Advanced Care Team (PACT) Consultation Decision Tree

Figure 3: PACT Consultations Pre/Post Educational Initiative

Denise Casey@childrens.harvard.edu
Implementation of a Sepsis Triage Trigger Tool

Project Team: Molly Connolly BSN, RN
Samantha Covelle BSN, RN
Matthew Eisenberg MD
Julie George BSN, RN
Karen Jones BSN, RN
Elliot Melendez MD
Carolyn Riker BSN, RN

Objective(s):
To develop a tool to help improve recognition of sepsis in Emergency Department patients and ultimately improve outcomes in pediatric sepsis.

Background/Significance:
Sepsis has a high potential for mortality. The Sepsis Quality Improvement Group (SQI) in the Emergency Department (ED) previously implemented an orderset and series of educational initiatives to improve adherence to PALS sepsis guidelines. As the work of the SQI group has shown over the past few years, rapid and aggressive management of these patients with fluid management, antibiotics, and vasopressors when necessary has decreased ICU stays and sepsis mortality. In order to further improve sepsis outcomes, this phase of the project focused on improving time to recognition of sepsis via a triage screening tool, developed as part of a Children’s Hospital Association (CHA) collaborative.

Methods:
Over the course of several months last spring, the sepsis team ran six PDSA cycles using the sepsis triage trigger tool on patients during various times of the day. In PDSA cycle six, which ran from May 12-24th 2014, the tool was used on all patients who presented to the ED with concern for infection, and therefore risk of sepsis. Once the form was completed, the triage RN notified the ED attending about the patient’s score and the ED attending then decided whether to initiate the septic shock intervention bundle. Staff feedback regarding use of tool was collected during each cycle and form adapted to meet staff recommendations and improve feasibility of tool.

Findings:
355 patients presented to emergency department with a chief complaint of fever or a temperature > 38 C at triage. 146 completed forms were returned. 119 of the forms from this trial were filled out correctly. 9 of forms were completed for no concern of infection and 18 of the forms were incompletely filled out. According to the triage-scoring tool, 108 patients (91%) screened negative while 11 patients (9%) screened positive. Of the patients who screened positive using the triage tool, the septic shock bundle was initiated on 3 and 1 patient ultimately met criteria for severe sepsis or septic shock.
Implications/Next Steps:
Although 10/11 patients who screened positive for potential sepsis were not found to be septic, the staff identified patients who were ill and patients benefited by earlier interventions. These PDSA cycles showed the tremendous impact a screening tool could have on identifying patients who might develop sepsis. Currently the SQI group is working with the CHAMPS team on full electronic implementation of the tool.

Various educational methods have been implemented to improve staff’s knowledge of the tool, including a Netlearning for nursing. Over the next couple of months, the group plans to complete chart audits of patients with concern for sepsis and potentially identify obstacles in completing the triage trigger tool.
Implementation of a Sepsis Trigger Tool

Molly Connolly RN BSN, Samantha Covelle RN BSN, Matthew Eisenberg MD, Julie George RN BSN, Karen Jones RN BSN, Elliot Melamed MD and Carolyn Riker RN BSN

Objective

Develop a tool to improve recognition of sepsis in the Emergency Department and ultimately improve outcomes in pediatric sepsis.

Background/Significance

- Sepsis has a high potential for mortality.
- Rapid and aggressive management of these patients with fluids, antibiotics, and vasopressors when indicated as decreased ICU stays and sepsis mortality.
- To further improve sepsis outcomes, this phase of the project focused on improving the time to recognition of sepsis using a triage screening tool.

Methods

- Last spring, the QI group ran 6 PDSA cycles using a sepsis trigger tool.
- In PDSA cycle 6, the tool was used on all patients who presented with concern for infection and, therefore, concern for sepsis.
- Once the form was completed, the triage RN notified the ED attending of the patients score and the ED attending decided whether to initiate the septic shock intervention bundle.
- Staff feedback regarding the use of the tool was collected during each cycle and the form was adapted to meet staff recommendations and improve feasibility of the tool.
- Multiple educational methods have been implemented to improve the staff’s knowledge of the tool, including a NetLearning module for nursing.

Sepsis Trigger Tool

- Patient with fever or concern for infection:
  - CRITICALLY ILL or HYPOVENTILATIVE/INITIATE SEPTIC SHOCK PATHWAYS
  - SEVERE SCORES > 2 with high risk factors (e.g., age > 65, malignancy, device, end stage liver disease, solid organ transplant)
  - Any patient who is seen dead on arrival
  - Any patient who is admitted for evaluation at triage
  - Any patient who was sent from another hospital and is connected to a pump or ventilator

Implications for Clinical Practice

- 3% of patients screened positive for sepsis which speaks to the practicality and feasibility of the trigger tool.
- Although 10/11 patients who screened positively for potential sepsis were NOT found to be septic, the ED staff identified patients who were ill and these patients benefited from earlier interventions

Next Steps

- Currently, the QI group is working with the CHAMPS team on the development and full implementation of the tool in FirstNet electronic documentation.
- The QI group plans to complete chart audits of patients with concern for sepsis and potentially identify obstacles in completing the triage trigger tool.

Findings from PDSA Cycle 6

- Of 119 Patients screened, 3 positive screens were identified.

Conclusions

- The implementation of a Sepsis Triage Trigger Tool leads to early identification of potentially septic patients.
- By improving the time to the recognition of sepsis, patient outcomes will ultimately improve.
Reducing Medication Errors with a Hospital-Wide Red Zone Medication Safety Initiative

Project Team:  
Jean Anne Connor PhD, RN, CPNP  
Jeanne P. Ahern MHA, BSN, RN, CCRN  
Barbara Cuccovia MSN, RN, CPON  
Kara Western BA  
Carol Larson MPH  
Alana Arnold Pharm D  
Roger Dionne Pharm D  
Patricia Hickey PhD, MBA, RN, FAAN

Objective:  
The objective of this initiative is to implement methods for establishing distraction-free cognitive workspace to reduce adverse events using teamwork and communication to empower nurses and staff.

Background/Significance:  
The incidence of medication errors remains a major concern across the spectrum of healthcare. Preventing the cause of these errors is challenging and approaches to averting medication errors and implementing a culture of safety are a key focus for most institutions. Implementation of a distraction-free cognitive workspace through directed communication and collaboration across disciplines can lead to a reduction in adverse events related to distraction.

Methods:  
The Red Zone Medication Safety Initiative was formed to improve patient safety, reduce medication errors and decrease staff vulnerability by limiting distractions. This is achieved through teamwork, communication, staff empowerment and creating distraction-free spaces. Two process improvement tools, Six Sigma and Change Acceleration Process (CAP), were engaged to develop and implement a hospital wide quality improvement process for the practice of medication safety. Four key strategies were used to facilitate the success of the initiative: 1) development of a core presentation reclaiming safety as a top priority for the healthcare team, 2) identification of unit members for each patient care area who serve as ambassadors for medication safety, 3) specific unit-based strategies, and 4) development of an evaluation plan. In the spring of 2010, the Red Zone Medication Safety Initiative was operationalized and piloted in the cardiac intensive care unit (CICU). As of 2012, all cardiovascular and critical care inpatient areas had implemented this initiative. Medication event data for each area are collected on a quarterly basis from the hospital’s adverse event reporting system to track events over time.
Findings:
Since implementation there has been an average reduction in the medication event rate of 25% across all units, with some units achieving a medication event rate reduction of 47%. This includes several months with 0 reportable medication events. In January 2014, the Red Zone was identified as a hospital-wide program and the initiative has expanded to the medical and surgical programs as well as Boston Children’s Hospital Waltham. Since March 2014, quality dashboards have been used to guide the evaluation of the Red Zone initiatives by utilizing the quarterly data collected from the adverse event reporting system. The distraction-free methodology is now being applied to other high-risk practices such as endotracheal tube re-positioning and blood product administration.

Implications/Next Steps:
The Red Zone initiative has proven transferrable across the cardiovascular and critical care programs with similar decreases in medication events. The unit based approached can be tailored to each unique program including non-critical care areas, and the ongoing success of the initiative has warranted expansion throughout the hospital and into satellite locations.

If this poster has been presented at a conference, which one: Poster presented at the 15th Annual International Symposium on Congenital Heart Disease, St. Petersburg, FL, February 2015
Reducing Medication Errors in the Cardiac ICU with a Hospital-Wide Red Zone Medication Safety Initiative

Jean Anne Connor PhD, RN, CPNP; Jeanne P. Ahern MHA, BSN, RN, CCRN; Barbara Cuccovia MSN, RN, CPON; Kara Western BA; Alana Arnold Pharm D; Roger Dionne Pharm D; Patricia Hickey PhD, MBA, RN, FAAN

Background
- The incidence of medication errors remains a continued concern across the spectrum of healthcare.
- Although preventing the cause of these errors is challenging, approaches to averting medication errors and implementing a culture of safety are a key focus for most institutions.
- In the spring of 2010, the Red Zone Medication Safety Initiative was operationalized and piloted in the Cardiac Intensive Care Unit (CICU).
- As of 2014, the initiative has been implemented across all inpatient areas.

Aim
- To reduce the occurrence of medication errors, develop and implement a measurable and sustainable hospital-wide practice of medication safety with the Red Zone Medication Safety Initiative.

Methods
- Key Driver Diagram guided initiative (Figure 1).
- Each nursing unit leadership established a Red Zone Ambassador group for their inpatient unit.
- The Red Zone Ambassador group participated in a unit level assessment and identified opportunities to enhance a distraction free environment.
- All inpatient nursing staff received Red Zone ID cards (Figure 3).
- Red Zone signage was placed in patient rooms, pysis machines, and medication rooms.
- For each unit, the total number of reported events, medication event rate and averted events are calculated and reported monthly (Figure 2).

Red Zone Medication Safety Operationalized

Figure 1: Red Zone Key Driver Diagram

Figure 2: Example of Quality Dashboard for Medication Errors

Figure 3: Red Zone ID Badge

Results
- Since implementation, there has been a 25% average reduction in the medication event rate across Cardiovascular and Critical Care Units (as high as 47% in some units).
- In the CICU since implementation:
  - Total number of medication events has decreased by 53%.
  - Medication event rate has decreased by 47%.
  - 46% of reported events were averted prior to reaching the patient.

Continued Implementation
- Red Zone implementation has expanded to procedure and ambulatory areas.
- “Red Zone in the Home” has expanded the safety net across the care continuum.

Expanding Principles of Distraction Free Practice
- The Red Zone principles have expanded to include:
  - Administration of blood products
  - Re-taping endotracheal tubes
  - Line placement

*Supported by Boston Children’s Hospital Program Patient Safety and Quality

Jean Connor@childrens.harvard.edu
Filling in the Gaps in Health Care-Creating a Community Based Center of Excellence for Patient and Family Centered Care Coordination in the Primary Care Setting

Project Team: Tami Chase RN
Robin Crowley BSN, RN, CPN, CLC
Elise Gottesman LICSW
Katherine Plapinger LCSW
Kim Wilson MD, MPH
Alexandra Epee-Bounya MD
Ellen Reisinger MBA
Alyssa Stetson BA
Casey Fee S.M.

Objective(s):
1. Describe the comprehensive team based approach to enhancing the quality of our primary care services through patient and family focused care coordination in a community based medical home model.
2. Demonstrate how streamlined systems of care, population management, and enhancements to the electronic medical record were developed; improving our patient’s access to specialty care, unmet resource needs and referrals for appropriate services.
3. Describe the development of the Patient Centered Plan of Care , its use to promote patient and family empowerment, and to develop an integrated approach to care planning across patients’ care teams.

Background/Significance:
Children with complex medical and mental health issues require streamlined coordination in the primary care setting in order to access needed care and services. However, primary care centers often lack the organizational structure and resources necessary to give families the best care possible, leading to gaps in care and unmet needs. Children with special health care needs living in underserved communities are more likely to report unmet health needs (Flores, 2009). Based on the literature, we implemented a multi-disciplinary care coordination team including Registered Nurses, Physicians, Social Work, Patient Navigator, Newborn Coordinator, and a Nutritionist to address this gap in services and improve care.
Methods:
- Utilizing the Epic scheduling system, the work flow was redesigned to ensure team based visits and improve screening and advocacy for medical, social, mental health, nutritional, and educational needs.

- Implementing registries and tracking systems for population management to increase rates of timely annual physical exams, immunizations, including Flu vaccination, and appropriate medication management. The systems ensure that lapses in medical care, services and supplies are minimized.

- Nurse inter-visit calls and education in our Mental Health Department were put into practice. Integration of a Mental Health Care Coordination Measurement Tool in the electronic medical record is being used to capture preventable outcomes through a nurse-psychiatrist model of care delivery.

- A Patient Centered Plan of Care was developed to better capture the needs of the patients and promote patient advocacy in their care (? Empower patients in to participate in their care?).

- In collaboration with our Neurology sub specialty team and the Integrated Care Program, we are utilizing the plan of care to improve communication and foster accountability across the care team.

Findings:
Key lessons learned

1. Establishing inclusion criteria, a registry and a multidisciplinary Care Coordination team has improved identification of patient needs, tracking, and communication with primary care providers.
2. Partnering with clinical care teams to delivery just in time services to KASA patients during their PE’s has improved care coordination, access to specialty services, and advocacy to meet social, mental health and educational needs.
3. Completion of care plan and shared visit are time intensive and may be difficulty to scale to entire clinic.
4. Care plans are an extremely valuable tool for tracking patients goals and needs, and coordinating care with specialists. Challenges are that are time intensive to complete and need to be incorporated into the EMR.

Implications/Next Steps:
The development of a Comprehensive Care Coordination program has identified improvement areas in managing the medically complex patient in a primary care setting. We addressed these improvement areas by transforming our approach to care, creating registries for tracking
medical needs, developing a patient centered plan of care, and enhancing and supporting patient and caregiver advocacy.

These systems ensure that lapses in medical care, services and supplies are minimized.

We continue to collaborate with subspecialty practices and the Integrated Care Program at Boston Children’s Hospital to improve the quality of the handoff between primary and subspeciality care in preparation for upcoming patient encounters. This work looks to improve patient care and experience while decreasing costs through ensuring key information is shared across the entire care team and the potential for duplicative care is reduced. We hope to utilize the information collected to improve institution wide systems.

Reference

If this poster has been presented at a conference, which one: AAACN 4/17/15
Filling in the Gaps in Health Care—Creating a Community Based Center of Excellence for Patient and Family Centered Care Coordination in the Primary Care Setting

Tami Chase, R.N., Robin Crowley, R.N. (BSN, CPN, CLC), Elise Gottesman, LCSW, Katherine Plapinger, LCSW, Alexandra Epee-Bounya, M.D., Alyssa Stelton, BA, Casey Fee, S.M., Mariam Naloyan, B.S., Ellen Reisinger, MBA, Kim Wilson, M.D., MPH

Boston Children’s Primary Care at Martha Eliot has been an essential part of the community for more than 40 years. We are a medical home providing primary and preventive care for children, adolescents, and young adults. We provide compassionate programs and services that keep our community healthy and strong. Since its humble beginnings as a makeshift “well-baby” clinic in a woodworking room serving families of its neighboring low-income housing development, Boston Children’s Primary Care at Martha Eliot has been solely committed to providing compassionate, high-quality care to families of Boston. Martha Eliot is proud to serve a diverse patient population. We have 8,162 unique patients. In 2014, Martha Eliot’s patient visits totaled 25,446.

Background/Significance

- Children with complex medical and mental health issues require streamlined coordination in the primary care setting in order to access needed care and services. However, primary care centers often lack the organizational structure and resources necessary to give families the best care possible, leading to gaps in care and unmet needs. Children with special health care needs living in underserved communities are more likely to report unmet health needs (Flores, 2003).
- Based on the literature, we implemented a multi-disciplinary care coordination team including Registered Nurses, Physicians, Social Work, Patient Navigator, Newborn Coordinator, and a Nutritionist to address this gap in services and improve care.
- KASA “Kids and Adolescents with Special Abilities,” utilizing inclusion criteria, we created a registry to manage our most medically complex patient population.

Objectives

Through our KASA Program, we aim to improve the quality of care. Improve quality of life and promote family empowerment for children with special health care needs in our primary care practice in a traditionally underserved population. Our specific aims include:

1. Strengthen family partnerships, self-advocacy and home management capabilities
2. Increase access to care coordination
3. Streamline access to appropriate and timely home-based services, including medications and DME supplies
4. Improve the delivery of quality primary care services
5. Improve access to specialty care
6. Improve identification of social stressors, mental health issues, and unmet resource needs and increase referrals to appropriate services and supports
7. Improve educational advocacy to maximize healthy development
8. Implement transition planning for adolescents

Interventions

1. Appointment Redesign
   - Utilizing the Epic scheduling system, the work flow was redesigned to ensure team-based visits and improve screening and advocacy for medical, social, mental health, nutritional, and educational needs

2. Population Management
   - Established registry and tracking systems for well-childcare and immunizations, DME needs, specialty referrals

3. Nurse visit telephone calls and implementation of the Care Coordination Measurement Tool
   - Inter-visit nursing telephone calls were implemented in our Mental Health Department. Implementation of a Mental Health Care Coordination Measurement Tool in the electronic medical record is being used to capture preventable outcomes through a nurse- psychiatrist model of care delivery

4. Patient Centered Plan of Care
   - A comprehensive patient and family centered care plan was developed to function as a repository and encompass up to date medical information necessary for care. It also serves as a tool to accompany the patient’s entire care team as well as unexpected emergency room visits

5. Patient Empowerment
   - As a medical home, we strive to strengthen family partnerships, self-advocacy and home management capabilities. A section of the Patient Centered Plan of Care is specific to establishing annual patient centered health goals at their yearly well exams

6. Transition
   - A large focus of our 16-24 year old patients has been improving the transition planning to Adult Care

7. Creating High Quality Handoffs
   - In an effort to improve care integration across a patient’s care team, we are conducting an initiative to measure and improve the quality of the handoff between a patient’s primary and subspecialty care team members prior to a patient encounter.

Findings/Key Lessons Learned

- Establishing inclusion criteria, a registry and a multidisciplinary Care Coordination team has improved identification of patient needs, tracking, and communication with primary care providers.
- Partnering with clinical care teams to deliver “Just In Time” services to KASA. Patients during their annual physical exams has improved care coordination, access to specialty services, and advocacy to meet social, mental health and educational needs.
- Care plans are an extremely valuable tool for tracking patients’ goals and needs, and coordinating care with specialists.
- Challenges are that they are time intensive to complete and need to be incorporated into the EMR.
- A Patient Experience Survey conducted early in the program development to assess patient experience with care coordination, access to services, support for psychosocial and educational needs, inclusion and empowerment.
- We are developing the tools necessary to assess our patient’s capacity for self-care and independence as we transition them to adult care.

Next Steps

The development of a Comprehensive Care Coordination program has identified improvement areas in managing the medically complex patient in a primary care setting. We addressed these improvement areas by transforming our approach to care, creating registries for tracking medical needs, developing a patient centered plan of care, closing the loop with subspecialty care, enhancing and supporting patient and caregiver advocacy. These systems ensure that delays in medical care, services and supplies are minimized.
The Expansion of the Nursing Role in Primary Care

Project Team: Pamela Schubert-Bob MHA, RN, NE_BC, CPN
Christine Doherty BSN, RN, CPN
JoAnn English BSN, CPN
Joanne Cox MD
Kathleen Conroy MD
Jenny Chan MSPH

Objective(s):
1. Describe three changes that could occur to increase the Registered Nurse’s role in the Primary Care setting
2. Identify two projects that showed improvement in the care of our patients
3. List one project that improved by just sending out email reminders.

Background/Significance:
Our Primary Care Center is a pediatric urban community health center that offers care to a culturally diverse, inner city population. Care is delivered by almost 100 MD’s including the residency training program, and over 30 nursing personnel. We are the largest pediatric clinic in the state, delivering 42,000 visits per year. We provide well-child care, urgent care, specialty care visits, as well as services through the social work and child protection teams. Our many specialty program include a nutrition and exercise program, a school function program and a young parent program.

About 70% of our families are living at or below the poverty level and receive some form of financial support. Despite this support, acute life-stressors including homelessness, domestic violence, transportation issues, and single parent status often cause our patients to miss appointments putting their health at risk.

Our nursing staffing numbers were so tight with the multiple staffing cuts that nurses were spending most of their time being reactive rather than reactive. Nurses felt that they were just giving vaccinations and not caring for the whole patient and family.

Methods:
The clinic utilized a brainstorming concept called TCAB (transforming care at the bedside) to identify areas where the nursing role could be expanded and where non-clinical staff could support the medical and nursing role.

The first change implemented was the development of three care teams (red, yellow and blue teams) composed of physicians, nurses, social workers, clinical assistants, administrative staff and patient navigators. Working closely on a specific team allows for enhanced communication between physicians and nurses. Physicians in turn developed trust in the nurses’ level of
expertise. Physicians increasingly valued the role of the nurse in education. Nurses were able to support the physician in delivering exceptional care.

We have instituted a team based message center which allows staff to enter a message into the team pool. Examples of pool messages include: non urgent calls from families, requests from physicians for follow up, phone call on lab results. In turn, the team nurses respond to individual messages in a timely manner and communicate back to physicians and other team members. This system facilitates communication between our patients and families. The time the nurse spends talking with the patients and families on the phone provides them with the teaching to avoid unnecessary urgent or emergency room visits.

Another change was the implementation of a checklist called the green sheet. Included on the green sheet is a check off for the CAT (caries risk assessment tool), and ACT score (asthma control test). The green sheet improved communication from CA to RN to MD on patient needs. It brought the nurse to the bedside prior to the physician entering the room. This allowed for the nurse to critically think about the patient needs and allowed the nurse to begin the process of educating patients and families.

A time flow study project was done by the research assistants to identify the areas where the flow was clogging. We rotated nursing staff through well child care, urgent care and phone triage resulting in more global expertise. We developed nurse protocols such as treatment of febrile and asthmatic patients resulting in decreased wait times on interventions.

**Findings:**
By clearly defining the role and responsibilities of the nurse, our providers are more frequently utilizing nursing staff to offer follow up, check on worrisome patient situations, and support families between visits. The use of the nurse protocols allows the clinic nurse to take initiative to provide interventions and education in a timely manner. The nurses have expressed increased job satisfaction with these changes.

**Implications/Next Steps:**
We have been given extra nursing and clinical assistant FTEs to offset the extra volume we have committed to supporting. The opportunities are incredibly exciting as we identify ways we can improve care, continue to expand the nursing role and allow the providers to focus on the medical priorities of each child. We hope to start a group visit for our parents of two week olds to allow bonding, support through peers, and reinforce healthy choices for these young infants.
The Expansion of the Nursing Role in Primary Care

Christine Doherty BSN, RN, CPN, JoAnn English BSN,CPN, Pamela Schubert-Boo MHA RN, NE-BC. CPN, Joanne Cox MD, Kathleen Conroy MD, Jenny Chan MSPH

Assess the Caries Risk
- 9 months to 4 years
- Offer education on oral hygiene
- Order and apply fluoride varnish
- Offer dental referrals

Who are we?
- Urban community health center at Boston Children’s Hospital
- Over 100 physicians including a residency training program
- 30 registered nurses
- 2 licensed practical nurses
- 6 clinical assistants
- 50 administrative staff
- 7 social workers
- 3 patient navigators
- 2 resource specialists

What we do?
- Physical exams and preventive care, including immunizations
- Urgent care for episodic illness, available 7 days a week
- Services for children with special health care needs
- Multi-disciplinary teams to support patients and families

Development of nurse protocols
- Developed febrile and asthma protocols for nurse initiation of treatment
- Developed diagnostic protocols including rapid strep POCT testing and ordering of X-rays

Green checklist
- Oral health by clinical assistant and completed by nurse
- Caries risk assessment (CAT) and Asthma Control Test (ACT)
- Nurse provides education and anticipatory guidance
- Given to physician prior to seeing patient
- Communicates needs of patient

Motivational Interviewing for HPV vaccine
- Discuss with parents and children 3 years and older the HPV vaccine
- Place a co-sign needed order for current HPV dose
- Facilitate proper scheduling of second and third vaccine

How was the role of the primary care nurse expanded?
- Enhanced communication with primary care providers through use of Green checklist
- Implemented assessment of caries risk for children 9 months to 4 years
- Standardized asthma control screening
- Institution of nurse driven protocols
- Utilization of team pools
Effectiveness of the Trauma Nurse Leader Education Initiative to Improve Nursing Documentation for Pediatric Patients Meeting Trauma Stat and Alert Criteria

Project Team: Maria McMahon MSN, RN PNP AC/PC
Denise Downey MSN, RN, CPEN
Francine Falvo BSN, RN, CPEN, ATCN
Denise Barry BSN, RN, CPEN
Suzanne Niro BSN, RN
Alexis Schmid MSN, RN, CPNP-PC/AC, CPEN, CCRN
Andrea Ciombor RN, BSN, CPEN
Kathleen Sultan RN, BSN, CPEN
Kimberly Chandler RN, BSN, CPEN

Objective(s):
- Describe the role of the Trauma Nurse Leader (TNL) in the pediatric emergency department
- Describe the TNL education initiative to improve documentation for the pediatric trauma patient
- Demonstrate the impact of the education on nursing documentation for the pediatric trauma patient

Background/Significance:
Boston Children’s Hospital has been verified as a Level 1 Pediatric Trauma Facility by the American College of Surgeons (ACS) since 1996. As a Level 1 facility, the hospital is a regional resource trauma center that has the capability of providing leadership and total care for every aspect of injury. In order for the institution to maintain this verification, patient-specific documentation audits are conducted by the ACS every three years as an integral component of the verification renewal process. Therefore, nursing documentation for the trauma patient must meet the ACS requirements and must demonstrate an accurate portrayal of the patient condition over time. While conducting routine chart audits, the TNL’s identified a deficiency in the consistency of nursing documentation for the trauma patient’s vital signs and neurologic status especially during the first or the “golden” hour. In an effort to standardize this nursing documentation, the TNL’s began an educational initiative in the Emergency Department to reinforce the documentation expectations for all pediatric trauma patients meeting the “STAT” and “ALERT” criteria. This initiative included but was not limited to specific instruction on vital signs and neurologic assessment documentation.
Method/Design:
A retrospective chart review of 40 patients meeting the trauma stat and alert criteria over a 4-year period beginning in July 2010 through June 2014 was conducted. This review was specific for evaluating the documentation of the patient’s vital signs and neurologic status for the first hour in the emergency department both pre- and post-education. The TNL’s initiated the documentation education in March 2012 which consisted of the following:

- Completing chart audits in real-time with feedback given directly to the documenting nurse
- Posting chart audit templates on the computer-on-wheels in the trauma room
- Conducting brief small group educational “blitz” sessions for the nurses in the clinical area
- Assigning a mandatory Net Learning module with post-test to the nursing staff
- Distributing pen lights with pupil size reference to staff
- Posting the Check Point Assessment Tool in the trauma room
- Awarding gift cards monthly to the staff RN with the most outstanding documentation (excluding the TNL group)

Findings:
A retrospective chart review for forty patients meeting the trauma stat and alert criteria from the scene between July 2010 and June 2014 was conducted. Prior to the education provided by the TNL group, a sample size of twenty chart reviews revealed that documentation of the patient’s vital signs and neurologic status was not consistent within fifteen minute intervals for the first hour after arrival to the ED. The TNL’s conducted the education initiative for the nursing staff in March 2012. Chart reviews for twenty more patients who were treated in the ED after the education initiative revealed that 80% of these had consistent documentation of the patient’s vital signs and neurologic status every fifteen minutes during the first hour after arrival. Therefore, the education provided by the TNL’s had a positive impact on standardizing nursing documentation of the vital signs and neurological status for pediatric trauma patients for the first hour after arrival into the ED.

Implications/Next Steps:
Documentation is an important component of Boston Children’s Hospital’s review process to maintain verification as a pediatric level 1 trauma center by the American College of Surgeons. The chart audits completed by the TNL group for trauma patients revealed a deficiency in consistent frequency of documentation of vital signs and neurologic status during the first hour after arrival to the ED. In response, the TNL group developed an effective teaching strategy to promote consistent and standardized documentation expectations for this patient population with regard to these elements. This teaching strategy has been shown to have a positive impact on promoting change and should therefore be implemented to improve other key elements of nursing documentation in the future.
Effectiveness of the Trauma Nurse Leader Educational Initiative to Improve Nursing Documentation for Pediatric Patients Meeting Trauma Stat and Alert Criteria

Denise Downey MSN, RN, CPEN, Francine Falbo BSN, RN, CPEN, ATCN, Maria McMahon MSN, RN, FNP ACPC, Denise Barry BSN, RN, CPEN, ATCN, Suzanne Niro BSN, RN, Alexis Schmid MSN, RN, CPNP PC AC, CPEN, CCRN, Andrea Ciombor BSN, RN, CPEN, Kathleen Sullivan BSN, RN, CPEN, ATCN, Kimberly Chandler BSN, RN, CPEN, ATCN

Background
• Boston Children’s Hospital (BCH) has been verified as a Level I Pediatric Trauma Facility by the American College of Surgeons (ACS);
• Verification is confirmation that BCH is a regional resource trauma center that has the capability of providing leadership and total care for every aspect of injury;
• Certificate of verification is renewed every three years;
• Renewal process includes documentation audits for pediatric trauma patients treated in the Emergency Department (ED)
• Nursing documentation must meet ACS requirements by accurately portraying the patient’s condition with complete vital signs;
• Documentation audits conducted by the Trauma Nurse Leaders (TNLs) identified a lack of consistency in the frequency of nursing documentation of vital signs and neurologic status during the first hour after arrival to the ED;
• TNLs began an educational initiative to reinforce trauma documentation expectations for the nursing staff in order to comply with ACS requirements and to reflect best nursing practice.

Role of the Trauma Nurse Leader
• Trauma Nurse Leader Program began in 2007 with a core group of ED RNs with a special interest in pediatric trauma nursing who received additional education in pediatric trauma care;
• Currently, there are eight TNLs enrolled in the program;
• Responsibilities of the TNLs include:
  - Assuming leadership role in care of the trauma patient by providing oversight and ongoing evaluation of the patient;
  - Assuring completion of the medical record by conducting chart audits and providing feedback to the documenting RN;
  - Providing trauma-related education to other staff members;
  - Participating in trauma research activities;
  - Participating in monthly interdisciplinary trauma morbidity and mortality reviews;
  - Offering recommendations for policy and procedure updates, equipment upgrades, and educational opportunities;
  - Facilitating monthly ED Trauma Forum Seminars and monthly TNL Meetings.

TNL Education Strategy
• Discourage the expectation of documenting vital signs and neurologic status at least every fifteen minutes for the first hour for trauma patients after arriving to the ED from the scene;
• Distribute pen lights with pupil size reference to staff;
• Complete chart audits in real-time with feedback given directly to the documenting RN;
• Post-chart audit templates on the computer-on- wheels in the trauma room as a visual prompt;
• Conduct brief small group educational “bites” sessions for the RNs in the clinical area;
• Assign a mandatory Net Learning module with posted to the nursing staff;
• Post the Trauma Checklist Point Cue Sheet in the trauma room as a visual reference;
• Award monthly gift cards to the RN with the most outstanding documentation (excluding the TNL group).

Method/Design
• Retrospective chart review of 40 patients meeting the trauma stat or alert criteria (60% of the sample size) over a 4-year period beginning in July 2010 through June 2012 was completed;
• The educational initiative on documentation expectations for the first hour after patient arrival into the ED was conducted by the TNL group for the nursing staff in March 2012;
• Twenty patient records dated prior to the educational initiative and twenty patient records dated post-education were audited for documentation frequency of these elements: temperature, heart rate, respiratory rate, blood pressure, oxygen saturation, pupil assessment, and Glasgow Coma Scale.

Findings
• Twenty charts from the time period prior to the education revealed that the frequency of documentation of the patients’ vital signs and neurologic status was not consistent within fifteen minute intervals for the first hour after arrival to the ED;
• Twenty charts from the time period post-education revealed that 80% of these had consistent frequency of documentation of vital signs and neurologic status at least every fifteen minutes during the first hour after arrival to the ED.

Implications/Next Steps
• Documentation is an important component of the verification review process to maintain Level I status for pediatric trauma facilities;
• Chart audits are conducted by the ACS for pediatric trauma patients treated in the ED at BCH as part of the review process;
• Nursing documentation for these trauma patients must be complete;
• The teaching strategy used by the TNL group to improve nursing documentation has been shown to have a positive impact for pediatric trauma patients in the ED;
• This teaching strategy should therefore be implemented to improve other key elements of nursing documentation in the future.
Financial Health of Families with Hospitalized Infants: A Quality Improvement Initiative

Project Team:
Judith Carter RN, CCRN, project leader
Noël Dwyer MBA, RN, CCRN
Kathryn Gustafson BSN, RN, CCRN
Julie Roselund AS
Karen Cote MSN, RN
Phoebe Chase MSW, LICSW
Jessica Tan BSN, RN, CCRN
Kathleen Martorana RN
Michele DeGrazia PhD, RN, NNP-BC

Objective(s):
Parent members of our Neonatal Intensive Care Unit (NICU) Family Advisory Council revealed they were unaware of the financial support personnel available to assist them at Boston Children’s Hospital (BCH). This quality improvement initiative was undertaken with the purpose of expediting referrals to the Health Benefits Coordinator (HBC), to reduce the financial burden on NICU families who have infants with medically complex needs.

Background/Significance:
Recent changes in health care have led to large, sometimes exorbitant bills, following prolonged hospitalizations. Insured families are now paying for health care in a variety of ways including health care premiums, deductibles, co-pays, and co-insurance. In 2013, the Kaiser Family Foundation reported that 61% of covered workers have co-insurance payments for a hospital admission; those payments average 18% of the cost of the hospital stay. HBC services can enable parents to better manage financial responsibilities associated with their infant’s hospital stay.

Methods:
Utilizing the Plan-Do-Study-Act quality improvement framework, we revised our current system for HBC referrals. The updated system consists of the following interventions: 1. creation of a patient care referral letter that describes the available financial resources, 2. inclusion of the patient care referral letter in the information packet given to parents upon admission, 3. development and implementation of a needs assessment tool for HBC referral completed by the admitting nurse, and 4. development of a team review process of the completed needs assessment to ensure referrals are expedited, including a social worker, case manager and HBC associate.

Findings:
Pre-implementation and post-implementation data was compared to evaluate the success of our QI initiative. We estimated the number of families eligible for referral and measured the
number of actual referrals in four-month cycles. The implementation of a clear and systematic process to identify families who qualify for coordination of benefits has led to a significant increase in the number of referrals to the HBC. A collaborative, multidisciplinary approach was instrumental to the success of our initiative.

**Implications/Next Steps:**
Financial resources that can help with some of the costs associated with hospitalization are available for families. However, families may not be aware of them until late in their infant’s hospitalization, leading to escalating, non-reimbursable out-of-pocket-expenses. Timely access to these resources enables parents to better understand available resources and maximize their benefits. The initial data from this quality improvement initiative shows a significant increase in the utilization of the HBC. Moving forward, we plan to review financial data to determine the estimated savings to our NICU families and BCH.

If this poster has been presented at a conference, which one: Pediatric Evidence Based Practice 2014 Conference: Evidence Implementation for Changing Models of Pediatric Health Care, Cincinnati, OH, September 2014
Family-Centered Care: Facilitating Financial Health of Families with Medically Complex Infants

Judith Carter RN, CCRN, Noël Dwyer MBA, RN, CCRN, Kathryn Gustafson BSN, RN, CCRN, Julie Roselund AS, Karen Cote MSN, RN, Phoebe Chase MSW, LICSW, Jessica Tan BSN, RN, CCRN, Kathleen Martorana RN, Michele DeGrazia PhD, RN, NNP-BC

Background

- Parent members of our Neonatal Intensive Care Unit (NICU) Family Advisory Council revealed they were unaware of the financial and support resources available to assist them at Boston Children's Hospital.
- These services could enable parents to better manage financial responsibilities associated with their infant’s hospital stay.
- Hospitalization costs can rise quickly, as the cost per day in the NICU is approximately $5,000.
- The purpose of this Quality Improvement (QI) initiative was to expedite referrals to the Health Benefits Coordinator (HBC) reducing the financial burden on families of infants in the NICU with medically complex needs.

Aim

- Determine whether a systematic process supporting timely implementation of patient care referral initiatives to the HBC will result in increased utilization of the program by families in the NICU.

Methods

- With the support of unit-based leaders, we revised our current system for HBC referrals utilizing the Plan-Do-Study-Act quality improvement framework.

Plan

- Selection of QI topic by leadership group based on NICU Family Advisory Council feedback.
- Developed a summary statement inclusive of project plan.
- Created a referral letter for families describing financial resources.
- Formulated a needs-based assessment tool for HBC referral.

Do

- Educated staff on project goal and methods.
- Implemented project information distributed and evaluated for all admissions.
- Conducted four month roll out with continuous evaluation and revision.
- Refined process, clarified roles and modified tool based on feedback.

Study

- Systematically reviewed data to establish consensus on criteria for HBC referral.
- Identified criteria including state residency, primary insurance, gestational age, diagnosis of chronic illness and length of stay.
- Retrospective review of patients pre-implemented to determine eligible referrals.
- Compared data for 4 month periods pre and post implementation.

Act

- Implemented as standard of care in NICU.
- Continue to evaluate outcomes and compliance.
- Disseminate findings internally and externally.
- Consideration for institution-wide.

Results

- Referrals to Health Benefits Coordinator:

<table>
<thead>
<tr>
<th>Month</th>
<th>Pre-Implementation</th>
<th>Post-Implementation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Jan.</td>
<td>2</td>
<td>10</td>
</tr>
<tr>
<td>Feb.</td>
<td>2</td>
<td>15</td>
</tr>
<tr>
<td>Mar.</td>
<td>1</td>
<td>8</td>
</tr>
</tbody>
</table>

- Significant increase in the number of referrals made to the HBC when comparing 4-month measurement cycles pre-implementation and post-implementation.

Conclusions

- Implementation of a clear and systematic process to identify families who can qualify for coordination of benefits has significantly increased the number of referrals to the Health Benefits Coordinator.
- A collaborative, multidisciplinary approach was instrumental to the success of our initiative.

Next Steps

- Going forward, we plan to review financial data to determine estimated savings for NICU families and Boston Children’s Hospital.

Acknowledgements

The authors wish to thank the following people for their contributions to and support of this project: Drivehaver, Kristine Taylor, Michelle Lazo, Checking Seabass, Ivan M. Kowalski, and Cindy Macleod.

Cardiovascular and Critical Care Nursing Science
Implementation of an Inpatient Cardiology Anticoagulation Monitoring Program (I-CAMP)

Project Team: Margaret Evans-Langhorst MS, RN, CPNP
Beth Hawkins MSN, RN, FNP-C
Amy Hellinger PharmD, BCPS
Christina VanderPluym MD
Cheryl O’Connell MBA, RN, NE-BC, CPHQ

Objective(s):
To improve thrombotic event monitoring and anticoagulation practices for patients with cardiac disease to the inpatient setting by instituting a multidisciplinary inpatient Cardiac Anticoagulation Management Program (iCAMP)

Background/Significance:
Currently, Boston Children’s Hospital has a well-established comprehensive outpatient cardiology anticoagulation (CAMP) monitoring program with designated nurse practitioners, an attending, a nurse, a nutritionist, a pharmacist, and an administrative assistant that could extend its coverage to include consulting on patients on 8 East and 8 South.

Methods:
CAMP nurse practitioners would round daily on the cardiology inpatients on therapeutic anticoagulation and document indications for anticoagulation, goals of monitoring, target ranges of therapy and duration of therapy. CAMP nurse practitioner would ensure continuity of antithrombotic care strategies upon transfer from 8S to 8E. CAMP nurse practitioners and pharmacy would provide discharge education which would improve continuity of care once discharged. Data will be collected daily in a REDCap database to identify adverse events associated with patients on anticoagulation.

Findings:
The following data elements will be tracked over time: time to therapeutic range, time patients spent in therapeutic range and the number of total adverse events.

Implications/Next Steps:
Results from this study may contribute to improved standardization of anticoagulation practices across the cardiovascular program.
Implementation of an Inpatient Cardiology Anticoagulation Monitoring Program (I-CAMP)

Margaret Evans-Langhorst MS, RN, CPNP, Beth Hawkins MSN, RN, FNP-C, Amy Hellingner PharmD, BCPS, Christina VanderPluym MD, Cheryl O'Connell MBA, RN, NE-BC, CPHQ

Background

- In 2009, Boston Children’s Hospital established a comprehensive interdisciplinary outpatient cardiology anticoagulation monitoring program (CAMP).
- The team consisted of designated nurse practitioners, an attending, an administrative assistant with part-time support from a nurse, a pharmacist, and physician (Figure 1).
- The CAMP team has been successful in achieving a time in therapeutic range (TTR) which is consistently well above the national standards set by US Joint Commission National Patient Safety Goals (Figure 2).

Objective

- To improve thrombotic event monitoring and anticoagulation practices for patients with cardiac disease in the inpatient setting by instituting an interdisciplinary, inpatient Cardiac Anticoagulation Management Program (I-CAMP).

CAMP Expansion Methods

Developing an Interdisciplinary Working Group

- A working group will be formed, including 8 East and 8 South attendings, CV surgery, clinical nurses, nurse managers, inpatient NPs and CNS teams as well as current CAMP attending, nurse practitioners and the outpatient nursing director (Figure 3).
- Working group will establish:
  - naming practices
  - standardized monitoring practices for all anticoagulation medications including heparin

Evaluation of I-CAMP

- Patient Evaluation:
  - Time to therapeutic range
  - Time in therapeutic range
  - Adverse events such as bleeding events
  - Readmission for bleeding

- Education Assessment:
  - Staff from inpatient cardiovascular areas will be asked to complete baseline and six-month educational assessments of anticoagulation and management practices.

CAMP Expansion

- Results from this initiative may lead to further standardization of inpatient anticoagulation practices across the cardiovascular program as well as delivery of optimal patient centered care and excellent outcome metrics.
- Write a proposal to present to cardiology operations requesting the additional personnel necessary to implement I-CAMP.

Figure 1. CAMP Development and Expansion

Figure 2. CAMP Outpatient Outcomes

Figure 3. Multidisciplinary Working Group Structure

Next Steps

- Identify the need for an inpatient monitoring program (I-CAMP)
- Develop a comprehensive monitoring system to capture thrombotic events occurring in the inpatient setting
- Write a proposal to present to cardiology operations requesting the additional personnel necessary to implement I-CAMP
Time is of the Essence: Overcoming Barriers to Expedited Treatment of Chlamydia

Project Team:  Amy Federico RN BSN
               Larissa Wenren BS

Objective(s):
To decrease time from diagnosis to treatment of chlamydia

Background/Significance:
Chlamydia is the most common sexually transmitted infection (STI) among males and females and is often present in the absence of symptoms. Left untreated, serious complications may arise such as PID, chronic pelvic pain, and infertility for females, and epididymitis and sterility for males. Adolescents seen at Boston Children’s Primary Care at Longwood can be screened for STIs. However, once a positive screening is received, many barriers exist that can delay treatment; prior to August 2012, the mean treatment time for chlamydia was nearly 10 days. To address this, a nursing quality improvement project was initiated in August 2012 to decrease the time to treatment.

Methods:
Nursing staff first identified barriers to expedited chlamydia treatment: (1) lack of documented confidential number; (2) delayed treatment until notice of the final positive result; (3) absence of nursing protocol to initiate treatment; (4) availability of nursing staff expert in caring for sexually active teens. A formal nursing protocol for tracking and communication was then implemented. Nursing staff reviewed any preliminary positive chlamydia results through a daily report sent electronically from the bacteriology and virology labs. If no confidential number was documented in the chart, the ordering provider was notified. Nursing staff then took responsibility to call patients on day 1 of a preliminary positive result instead of waiting until a confirmed final positive as before. Nurses educated patients on the high accuracy of preliminary results, encouraged immediate treatment, and offered same-day appointments to receive treatment. All positive results were documented in a STI registry and treatment time tracked, along with information on documentation of confidential number, outreach method, treatment place, expedited partner treatment, and final lab result.

Findings:
From August 2012 to February 2015, primary care nurses reviewed 128 preliminary positive chlamydia results. The mean time for treatment from when the nurse received the initial report was 2.4 days, compared to 9.6 days prior to the intervention. Sixty-five percent of patients had a documented confidential phone number.

Implications/Next Steps:
Since August 2012, nursing staff has dramatically reduced the time to treat for chlamydia infections. Improved documentation of confidential phone numbers contributed to decreased
treatment time. Nurses have now established an effective chlamydia protocol, eliminated other barriers to treatment, and are able to outreach to and educate the patient. The decrease in treatment time could have an effect on future fertility issues as well as chronic pelvic pain and other effects of untreated chlamydia. The next steps of this initiative are to improve documentation and occurrence of expedited partner treatment at visits and expansion of the current STI registry.
**Background**

- Chlamydia is the most common sexually transmitted infection (STI) among males and females and is often present in the absence of symptoms.
- Left untreated, serious complications may arise such as PID, chronic pelvic pain, and infertility for females, and epididymitis and sterility for males.
- Adolescents seen at Boston Children’s Primary Care at Longwood can be screened for STIs.
- However, once a positive screening is received, many barriers exist that can delay treatment.
- Prior to August 2012, the mean treatment time for chlamydia was nearly 10 days.
- To address this, a nursing quality improvement project was initiated in August 2012 to decrease the time to treatment for chlamydia.

**Methods**

- Nursing staff first identified barriers to expedited chlamydia treatment:
  1. lack of documented confidential number;
  2. delayed treatment until notice of the final positive result;
  3. absence of nursing protocol to initiate treatment;
  4. availability of nursing staff expert in caring for sexually active teens.
- A formal nursing protocol for tracking and communication was then implemented.
- Nursing staff reviewed any preliminary positive chlamydia results through a daily report sent electronically from the bacteriology and virology labs.
- If no confidential number was documented in the chart, the ordering provider was notified.
- Nursing staff then took responsibility to call patients on day 1 of a preliminary positive result instead of waiting until a confirmed final positive as before.
- Nurses educated patients on the high accuracy of preliminary results, encouraged immediate treatment, and offered same-day appointments to receive treatment.
- All positive results were documented in a STI registry along with information on treatment time, documentation of confidential number, outreach method, treatment place, expedited partner treatment, and final lab result.

**Results**

- **Characteristics of Patients After Intervention Implemented (Aug 2012-Feb 2015)**

<table>
<thead>
<tr>
<th>Category</th>
<th>N (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Preliminary positive chlamydia</td>
<td>128</td>
</tr>
<tr>
<td>results</td>
<td></td>
</tr>
<tr>
<td>Final inconclusive cases</td>
<td>5 (4%)</td>
</tr>
<tr>
<td>Untreated cases</td>
<td>3 (2%)</td>
</tr>
<tr>
<td>Unique patients</td>
<td>144</td>
</tr>
<tr>
<td>Mean age in years (SD)</td>
<td>18.3 (2.5)</td>
</tr>
<tr>
<td>Gender: Female</td>
<td>101 (75%)</td>
</tr>
<tr>
<td>Co-infection of gonorrhea</td>
<td>10 (8%)</td>
</tr>
<tr>
<td>Repeat chlamydia infection</td>
<td>18 (14%)</td>
</tr>
</tbody>
</table>

- **Average Time to Treatment for Chlamydia**

  - Baseline average: 9.6 days
  - Intervention average: 2.4 days

- **Confidential Phone Number Documented in Medical Chart**

  - No Confidential Phone Number Documented: 11%
  - Confidential Phone Number Documented: 89%

  - Confidential Phone Number Documented: 75%

  - Confidential Phone Number Documented: 25%

  - Confidential Phone Number Documented: 50%

**An Area for Future Improvement**

- **Experienced Partner Treatment (EPT) Documented During Chlamydia Treatment**
- **Patients with Repeat Chlamydia Infections**

**Conclusions & Implications**

- Since August 2012, nursing staff has dramatically reduced the time to treat chlamydia infections from an average of 9.6 days to 2.4 days.
- Improved documentation of confidential phone numbers contributed to decreased treatment time.
- Nurses have now established an effective chlamydia protocol, eliminated other barriers to treatment, and are able to outreach to and educate the patient.
- The decrease in treatment time could have an effect on future fertility issues as well as chronic pelvic pain and other effects of untreated chlamydia.
- The next steps of this initiative are to improve documentation and occurrence of expedited partner treatment at visits and expansion of the current STI registry.
Improving the Use of Sterile Water for Oral Care and Tube Flushes in Pediatric Intensive Care Units

Project Team: Kathleen A. Flaherty MT (ASCP), BS, CIC
Thea Brennan-Krohn MD
Joanne Kinlay BSN, RN, MMedSci CIC
Patricia Scanlon MPH, RN, CIC
Gail Potter-Bynoe BS, CIC
Thomas J. Sandora MD, MPH

Objective(s):
Identify variation in practice related to the use of sterile water for oral care that could result in the transmission of infectious organisms.

Background/Significance:
From June to July 2014, four patients in our intensive care units (ICUs) grew *Elizabethkingia meningoseptica* from respiratory cultures. Investigation of the cluster included a review of products that could serve as potential sources, including sterile water. Our policy calls for sterile water for oral care in ICU patients and for discarding opened bottles within 24 hours.

Methods:
We cultured 20 environmental sources and products, including 1 unopened and 2 in use sterile water bottles. Patient isolates underwent pulse field gel electrophoresis (PFGE) to determine relatedness.
We conducted an anonymous on line survey of all nurses in 4 ICUs (pediatric medical /surgical, medical, cardiac, and neonatal) regarding use of sterile water for oral care and flushing enteral tubes.

Findings:
PFGE of the isolates revealed unique chromosomal patterns. No non-clinical cultures grew *E. meningoseptica*. Two in-use water bottles grew four other organisms.

Of 509 eligible nurses, 166 (33%) completed the survey; 69% reported at least 6 years in critical care nursing. Nearly all used sterile water for oral care and flushing medications through enteral tubes; 52% also used it for cleaning suction catheters. 21 (13%) respondents using sterile water for oral care reported dipping a toothbrush into the bottle; of these, 4 (19%) reported having done so after use in the patient's mouth. 55 (30%) respondents using sterile water in enteral tubes reported putting the syringe into the bottle; of these, 11 (20%) reported having done so after flushing a tube. 69% reported always labeling an opened bottle with date/time, and 35% reported always performing hand hygiene before opening a bottle.
Implications/Next Steps:
Improvements are needed to standardize sterile water use in pediatric ICUs and should focus on hand hygiene, labeling bottles, and not putting items into bottles after patient use. Contamination of in-use water bottles could serve as a source of outbreaks.

If this poster has been presented at a conference, which one: to be presented at the Annual conference of Association of Professionals in Infection Control and Epidemiology, Nashville June 2015
Use of Healthcare Social Media by Patients and Parents

Project Team: Kathryn Franklin BSN, RN, CNOR
Sandra Mott PhD, RN-BC, CPN
Jason Thornton MSN, RN, CCRN, CPHQ
Courtney L. Porter MPH
Jean A. Connor PhD, RN, CPNP

Objective(s):
The objective of this preliminary study is to understand how patients facing congenital heart surgery and their families use social media to address healthcare needs.

Background/Significance:
When patients and families have healthcare questions or uncertainties they may turn to social media. At the basic level, social media is exchange of news, information, and ideas with others in virtual communities. The mix of context and technology provide a completely new way for people to communicate. Unfiltered communication and unedited information is becoming more prevalent than official health-related websites. It is also becoming a primary resource for information and support in all aspects of life, including healthcare. In 2014, the PEW research center found that 32% use social media for healthcare, 41% use online health rankings and 15% use social media to share their health information. A review of literature confirmed that social media is exploding, has few guidelines to assess accuracy, and little data describing how or why patients/parents use social media or what they learn from this unfiltered and unedited source. For social media to contribute to positive patient outcomes its current use by patients/parents needs to be understood.

Methods:
In August 2014, we conducted a pilot study to assess the feasibility of having patients/parents share their thoughts about social media and learn their perceptions and use of social media in acquiring medical information, interacting with the healthcare team, and receiving anticipatory guidance and psychosocial support. A 29-item survey with a mix of dichotomous and open-ended questions was distributed to 20 families attending a cardiovascular pre-procedure clinic.

Findings:
Results indicated that 65% of them use social media for healthcare. Thirty-five to 40% of use it following a diagnosis or visit with their healthcare provider. Fifty percent use it for emotional and/or financial support. Sixty percent were positive about using social media; however 45% had no opinion about its reliability.

Implications/Next Steps:
The survey results are a step towards understanding the current use of social media and potential for supportive and informative nursing interventions. A larger study is planned to better understand the why and how of their use related to pre-procedural experience. This
research study will add to our knowledge base and direct development of standardized communication guidelines around social media for staff to use during pre-procedural interactions. It will assist pre-procedural nurses in communicating with patients and families as well as facilitate nursing interactions and educational interventions to improve the patient and family’s perioperative experience.

If this poster has been presented at a conference, which one: Poster presented at the 15th Annual International Symposium on Congenital Heart Disease, St. Petersburg, FL, February 2015; Association of periOperative Registered Nurses’ Surgical Conference and Expo, Denver, CO, March 2015
Social Media Use, Cardiovascular Patients, Their Parents and Nursing

Kathryn Franklin BSN, RN, CNOR, Sandra Mott PhD, BC-RN, CPN, Jason Thornton MSN, RN, CCRN, CPHQ, NE-BC, Courtney Porter MPH, Jean Connor PhD, RN, CPNP

Background

- Access to information via social media continues to rise
- 2014 PEW survey reported 63% of people use the Internet
  - 32% use social media for healthcare
  - 41% use online health rankings
  - 15% use social media to share their health information
- Little evidence about how and why patients/families access social media is available
- Patients/families facing congenital heart surgery have numerous questions and uncertainties regarding their child’s healthcare needs
- This exploration is a first step in learning the potential use of social media to facilitate perioperative nursing interactions, interventions, and education

Purpose

- To understand how patients facing congenital heart surgery and their families use social media to address healthcare needs

Methods

- 29-question survey was developed focusing on:
  - Perioperative cardiovascular patient/parental use of social media
  - Impact of social media on their healthcare and the healthcare of their child
  - Use of social media as a support
  - Convenience sample of 20 patients and families seen at the cardiovascular pre-operative program

Results

- Used Social Media for Medical/Healthcare-Related Purposes (n=15)
- Has Not Used Social Media for Medical/Healthcare-Related Purposes (n=7)
- Minimal Use (n=5)
- Moderate Use (n=4)
- No Use (n=1)
- Interest in Use (n=2)
- Poweruser (12-14 hours per day) (n=4)
- Uses – Not for Medical Purposes (n=3)

Table 1. Respondent Demographics

<table>
<thead>
<tr>
<th>Respondent Demographics (N = 26)</th>
<th>Mean (Range)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age of Respondent</td>
<td>38.2 years (23 – 55 years)</td>
</tr>
<tr>
<td>Level of Education</td>
<td></td>
</tr>
<tr>
<td>High School</td>
<td>4 (21.1%)</td>
</tr>
<tr>
<td>Associate’s Degree</td>
<td>2 (10.5%)</td>
</tr>
<tr>
<td>Bachelor’s Degree</td>
<td>5 (26.3%)</td>
</tr>
<tr>
<td>Master’s Degree</td>
<td></td>
</tr>
<tr>
<td>Not Available</td>
<td>2 (10.5%)</td>
</tr>
</tbody>
</table>

- 65% of respondents use social media for medical and healthcare purposes (Figure 1)
- 35 - 40% access social media after receiving information on their or their child’s diagnosis or following a visit (Figure 2)
- 50% utilize social media for support (Figure 2)
- 60% reported a positive feeling using social media (Figure 3)
- Of note, 50% had no opinion or felt medical information on social media was unreliable (Figure 4)

Conclusions

- This exploratory assessment portrays the usage of social media by patients/families preparing for congenital heart surgery
- Patients and families use social media for healthcare information as well as support
- Opportunities for utilization of social media to facilitate perioperative nursing interactions as well as interventions/education may be feasible

Cardiovascular and Critical Care Nursing Science

Kathryn.Franklin@childrens.harvard.edu
Bone Health QAPI Project for Pediatric Lung Transplant Patients

Project Team: Dawn Freiberger MSN, RN
Julianna Bailey MS, RD, LDN
Joanne Lee Pharm D

Objective(s):
To improve increase bone health in pediatric lung transplant patients

Background/Significance:
Decreased bone mineral density is a known complication of solid organ transplant. Pediatric lung transplant recipients are at increased risk for osteopenia and fractures due to pre-existing bone disease and chronic glucocorticoid use. Additionally, low vitamin D levels have been associated with increased risk of acute rejection and infection following lung transplant. The aim of this project was to establish a multidisciplinary bone health protocol for pediatric lung transplant recipients in order to track and improve bone health parameters post-transplant, particularly rate of fractures.

Methods:
A protocol to assess bone health for post lung transplant recipients at Boston Children’s Hospital was developed in the fall of 2013 based on updated Cystic Fibrosis management guidelines and input from endocrine and multidisciplinary subject matter experts. Defined parameters were established for vitamin D levels, supplementation of vitamin D, frequency of bone density studies and use of bisphosphonates to assess overall bone health. Fractures post-transplant were tracked. A retrospective analysis was then preformed on lung transplant patients both before and after the protocol was implemented.

Findings:
The average number of vitamin D levels drawn on an individual patient almost doubled from 2012 to 2013. As a result of more frequent monitoring and timely supplement adjustments, therapeutic vitamin D levels increased dramatically. In 2012 therapeutic levels were 38%, 50% in 2013 and 77% in 2014. There was also a large improvement in bone density testing. We have not seen a dramatic increased use of bisphosphonates, however, the main reason for this is in was either not indicated or it was a medical contraindication.

Implications/Next Steps:
Increased monitoring and tracking of vitamin D levels has led to quicker supplement adjustments and overall higher vitamin D levels. Yearly bone density testing assures that bisphosphonates are started on patients as medically indicated. Over time, the hope is that there will be a lower incidence of post-transplant fractures.

If this poster has been presented at a conference, which one: international pediatric transplant association (IPTA), March 2015.
Background:
Decreased bone mineral density is a known complication to solid organ transplant. Lung transplant recipients are at increased risk for developing osteopenia and fractures due to pre-existing bone disease with end stage pulmonary disease and chronic glucocorticoid use. Vitamin D deficiency contributes to low bone mineral density and is common in patients with end stage lung disease, particularly in cystic fibrosis. Additionally, one recent study found an association between low vitamin D and an increased risk of acute rejection and infection following lung transplant. The aim of this QAPI project was to establish a bone health protocol for pediatric lung transplant recipients in order to track and improve bone health parameters post-transplant, particularly rate of fractures.

Methods:
A multidisciplinary team including endocrine, lung transplant, nutrition and pharmacy, developed a bone health protocol for post lung transplant patients based on updated Cystic Fibrosis guidelines. Parameters were established for vitamin D levels, supplementation of vitamin D and calcium, frequency of bone density scans and use of bisphosphonates to assess overall bone health. Bone Fractures were also tracked. A retrospective analysis was then performed on lung transplant patients both before and after the protocol was implemented.

Results:
As a result of more frequent monitoring and timely supplemental adjustments, therapeutic vitamin D levels have increased dramatically. Levels increased from 36% in 2012 to 47% in 2013 and to 77% in 2014.

Less patients required vitamin D modifications over time because of higher overall vitamin D levels.

Compliance with yearly bone density studies is overall very good, however, there is room for improvement. Barriers to getting these done is both insurance issues as well as the lack of ability to do scans for patients who are admitted to the hospital for long periods of time.

While many patients had abnormal bone density studies, we have not had an increase in bisphosphonates used despite better monitoring and need. The reason for this is because of medical contraindications to the use of bisphosphonates. Between 67% and 83% of our patients who could benefit from bisphosphonate therapy were not medically eligible to receive this therapy.

Discussion:
Increased monitoring and tracking of vitamin D levels has led to quicker supplement adjustments and overall higher vitamin D levels. While dexametan scanning monitoring has over all increased, there are many medical contraindications as to why patients do not qualify for bisphosphonates. Thus, therapeutic vitamin D levels are even more important in this patient population and is the primary treatment for bone health in many patients.
Creation of a Vascular Access Team in the Operating Room (OR)

Project Team: Pamela Garavano RN, CPUI
Karen Sakakeeny BSN, RN, CNOR, CPN CPUI

Objective(s):
1. Peripherally Inserted Central Catheters (PICC) insertion while under general anesthesia
2. Improve the process of Vascular Access in Peri-Operative area
3. Better adherence to Standards of Clinical Practice

Background/Significance:
Our Inquiry stemmed from the significant increase in vascular access requests within the Peri-Operative setting.

Methods:
Hospital wide Subject Matter Experts (SME) group formed for a collective knowledge base
Introduction of new products to improve vascular access process
Collaboration with Director of Peri-Operative services; Department of Anesthesia; and Director of Vascular Access to develop OR PICC service

Findings:
- Staff efficiency and Improved patient outcomes
- Decreased patient stress and discomfort
- Improved patient and family satisfaction

Implications/Next Steps:
These results demonstrate the importance of a vascular access service dedicated solely to the Peri-Operative department. Future endeavor is to protect and maintain this valuable service.

If this poster has been presented at a conference, which one: AORN
Creation of a Vascular Access Team in the Operating Room
Pamela Garavano RN, CPUI and Karen Sakakeeny BSN, RN, CNOR, CPN CPUI

Spirit of Clinical Inquiry
The ongoing process of questioning and evaluating practice conveys advanced knowledge and skills needed to address problems arising in practice and improves patient outcomes.

Incentives for Development of Peripheral Insertion Central Catheter (PICC) Team in Operating Room (OR)
1. Increase number of PICC requests both hospital wide and in OR settings
2. Insertion while under general anesthesia
   • Efficiency and improved patient outcomes
   • Decreased patient stress and discomfort
   • Improved patient satisfaction
3. Better adherence to Standards of clinical practice

Evolution of OR PICC Service
• Collaboration with Director of Peri-Operative services; Department of Anesthesia; and Director of Vascular Access to develop OR PICC service
• Collaboration between the Director of Vascular Access and hospital wide IV team to ensure standards and competencies were maintained.
• Hospital wide Subject Matter Experts (SME) group formed for a collective knowledge base


2001 -2009: Informal team initiating PICC placement in OR

2010 - present: Creation of formal PICC service

Today’s OR Vascular Access Team
• Placement of ultra sound guided PICC lines
• Assists Anesthesia Team with difficult IV access and Arterial lines (using ultrasound)
• PICC, Brovias, Port-a-Cath access and dressing changes
• Draw necessary pre-op lab work while leaving IV in place for surgery
• IV access patients that need DDAVP or fluid challenge

PICC Team’s Evidence Based Practice advances that become hospital’s standards of care
• Introduction of needleless system that delivers buffered lidocaine topically for painless insertion of IV’s.
• Introduction of “brown powder” to control bleeding at insertion site and deliver antiseptic component
• Introduction of securement device to prevent PICC tip migration
• PICC SME group creates informed PICC consents; OR pilots them for the hospital; results in one year successful trial with subsequent consents printed in 5 languages
Can It Be Done? Can One Busy Urban Primary Care Program Increase the Role of the Registered Nurse to Better Meet the Complex Needs of our Patient Population

Project Team: Michele Gerhart BSN, RN  
Kristen Page BSN, RN, CPN  
JoAnn English BSN, CPN  
Pamela Schubert-Bob MHA, RN, NE_BC, CPN  
Ellen Reisinger MBA  
Jenny Chan MPH  
Kathleen Conroy MD, MS,

Objective(s):
1. Describe three changes that could occur to increase the Registered Nurse’s role in the Primary Care setting
2. Identify three options to gather the data to demonstrate a need for change
3. Utilizing the top of the license, describe three new options for how to care for the complex patients.

Background/Significance:
Our Primary Care Center is a pediatric urban community health center that offers interprofessional care to a diverse socio-economically disadvantaged population. This clinic serves not only as an adjunct to a training program for medical students, but also serves as a medical home for many specialty programs affiliated Boston Children’s Hospital. Staffing almost 100 physicians, and over 30 nursing personnel, we are the largest pediatric clinic in Massachusetts, delivering 42,000 visits per year. We offer well-child care, episodic illness care, specialty care visits, as well as services through social work and the child protection team. About 70% of our families are living at or below the poverty line, and almost all of our patients receive some type of financial assistance or routinely utilize public. Despite this support, acute life-stressors often cause our patients to miss appointments, and subsequently their health is comprised. With high volume and limited space, our waiting room is usually “standing room only”, which is frustrating for families. Our ability to identify and meet the patient/family’s needs in between visits has been challenging given the high patient volume and high acuity issues.

Methods:
Over the past two years we have focused on improving the role of the RN in our Pediatric Primary Care practice. We streamlined the role, reassessed the work being done by all care members and focused on working to the top of our license. In 2014, we spoke at the National Conference about this work and demonstrated many various results that occurred as a result of our efforts. We have continued to raise expectations even higher as we expand to focus on inter-visit care and the
Patients who are currently falling through the cracks and offer follow up education and support through the use of a Care Coordinator role. We have focused on the newborn patient panel, patients coming into Urgent Care three or more times in the past month, individualized follow-up care of our asthmatic patients and identified huge needs for our complex patients. Data has indicated that nursing has and will continue to be instrumental in this process while building supportive relationships and a positive rapport with all. This poster will showcase some of the results, successful and unsuccessful, of this work over the past year.

Findings:
Having the time to call parents to answer questions and support their medical needs, nursing can make a huge difference preventing patients from falling through the cracks, utilizing the Emergency Department unnecessarily, and creating healthier medical choices for our patients.

Implications/Next Steps:
Our next focus is looking at our patients that are going to the ED and opportunities to decrease their volume of ED visits. We are also just beginning to call our patients that have been discharged following an inpatient stay and seeing if we can identify areas to support the patient staying out of the hospital and decrease readmission rates.

This work is possible through the generous gift from the Heartstone foundation.

If this poster has been presented at a conference, which one: AAACN 2015
Expanding the Nursing Role: Piloting and Implementing Intervisit Care Calls in an Urban Primary Care Pediatric Practice

Michele Gerhart, BSN, RN, Kristen Page, BSN, RN, CPN, Suzanne Ianelli, MAT, BSN, RN, AE-C, Pamela Schubert-Boo, MHA, RN, NE-BC, CPN, Ellen Reisinger, MBA, Kathleen Conroy, MD, MS, Jenny Chan, MS, MPH

Background
- Boston Children’s Primary Care at Longwood (PCL) is a high-volume urban academic clinic that provides well-child care and urgent care to approximately 15,000 patients.
- PCL serves a socioeconomically vulnerable population; acute life-stressors often cause our patients to miss appointments, and subsequently their health is comprised.
- Identifying and meeting patients’ needs is crucial in between visits to ensure high-quality care.

Objectives
- Working to the top of the license, expand the nursing role in PCL to include making intervisit calls to specific patient populations to provide education and follow-up on care plans.
- Looking at the outreach done to date, understand the volume, content of the calls, and whether the calls provide effective preventative care for PCL patients.

Methods
- Our pilot began in July 2013, with calls made to parents of newborns 3 weeks and 6 weeks of age.
- We identified additional populations over time, focusing on critical moments of care when nurses could be instrumental in reviewing care plans set in place or providing education to families in between visits.
- In November 2014, we were able to dedicate close to 1 FTE time to intervisit calls and expanded this role to the entire nursing staff, providing nurses with protected time off the floor to make these calls.

Interventions
- Newborn (NB) Calls: Outreach to newborns at 3 weeks and 6 weeks of age, providing support and education on expected growth and development and preventive health care.
- Urgent Care (UC): 3+ Calls: Outreach to patients who have visited our urgent care in a given week and two additional times in the past month with similar or the same diagnoses, following-up with the patient to see how they are currently doing and determine if additional follow-up is needed.
- Asthma Calls: Outreach to asthma patients whose most recent asthma Control Test (ACT) score was under 20 (defined as “uncontrolled”), reviewing the asthma action plan and providing education over the phone.
- Emergency Department (ED) Calls: Outreach to patients who have visited the ED 24-48 hours prior for low acuity visits, following-up on the ED visit and reminding them of our urgent care hours and availability of an on-call nurse over the phone (currently, a pilot with one care team).

Current Findings

Number of Nurse Outreach Calls Since Project Inception

<table>
<thead>
<tr>
<th>Call Type</th>
<th>Calls Attempted</th>
<th>Calls Completed</th>
</tr>
</thead>
<tbody>
<tr>
<td>NB (Jul'13-Mar'14)</td>
<td>133</td>
<td>71</td>
</tr>
<tr>
<td>UC 3+ (Jun’13-Mar’14)</td>
<td>535</td>
<td>250</td>
</tr>
<tr>
<td>Asthma (Jun’13-Mar’14)</td>
<td>180</td>
<td>79</td>
</tr>
<tr>
<td>ED (Mar’14-Mar’15)</td>
<td>94</td>
<td>40</td>
</tr>
</tbody>
</table>

Nurses are able to reach families at least half the time.

Main Topics of NB Calls (sample of 57 calls)

- Illness
- Crying
- Elimination
- Feeding
- Weight
- Not Recorded

The majority of these calls are about feeding, and a third address illness.

Outcomes of NB Calls (sample of 117 calls)

<table>
<thead>
<tr>
<th>Outcome of Call</th>
<th>n</th>
<th>% of Total Calls Attempted</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes, call completed</td>
<td>97</td>
<td>44.88%</td>
</tr>
<tr>
<td>Scheduled necessary visit</td>
<td>19</td>
<td>26.35%</td>
</tr>
<tr>
<td>Avoided unnecessary visit</td>
<td>5</td>
<td>6.70%</td>
</tr>
<tr>
<td>Avoided calls to ED</td>
<td>3</td>
<td>3.95%</td>
</tr>
<tr>
<td>None apply</td>
<td>0</td>
<td>0.00%</td>
</tr>
<tr>
<td>Left voice message</td>
<td>36</td>
<td>29.92%</td>
</tr>
<tr>
<td>No, calls not attempted</td>
<td>9</td>
<td>7.65%</td>
</tr>
<tr>
<td>No, insufficient contact information</td>
<td>6</td>
<td>4.72%</td>
</tr>
</tbody>
</table>

Total | 127 | 100.00%

A quarter of calls completed prevented unnecessary visits or calls to primary care.

Next Steps
- Continuing the NB, UC3+, and Asthma intervisit calls, and expanding the ED calls to the entire clinic.
- Starting post-impact discharge follow-up calls with patients with a focus on our Rainbow patients (complex care).
- Beginning to call patients with iron-deficiency anemia.
- Additional in-depth analyses of current intervisit calls, particularly their impact on our patients’ overall health and utilization of clinic resources.

Acknowledgments

This work made possible through a generous gift from the Heartstone Foundation.

*Intervisit calls have significantly benefitted our patients in primary care. Nurses feel satisfaction in being able to take the time to provide education and emotional support to our patients and families during these calls. Many families have also expressed satisfaction, stating how appreciative they are for the follow-up calls.“*

- Tracy Myers, RN, BSN, CPN, AE-C
To Keep, Toss or Decrease...Methods for Decreasing Costs

Project Team:  
Hadinet Hagos  
Jean Eddy Calixte  
Maurice Elliot  
Efrangely De la Cruz  
Susan Hamilton MS, RN  
Heslandia Carvalho Ramos  
Patricia Meehan MSN, RN, CCRN

Objective(s):  
To create an organized, efficient and comprehensive supply system that augments the delivery of quality patient care while reducing costs in the Medical Surgical Intensive Care unit (MSICU)

Background/Significance:  
The MSICU staff provides care for a patient population that is diverse in age, diagnosis, and service. Therefore, a vast number of supplies must be available at all time. The unit has three supply rooms in which over 22,000 items are stocked. The supply rooms are usually in a constant state of chaos with personnel running in and out retrieving items needed for patient care; at times specific items are required for emergent interventions to save a child’s life. A moment’s delay in finding an item can have negative consequences. Because children in the unit are critically ill with acute and wide-ranging diagnoses, it is essential that all supply items be in stock each day. The necessity of this requirement translates into an increase in the expense of supplies. In addition, since the patient population in the MSICU represents many and varied diagnoses spanning multiple disciplines, there is an expectation that it serves as a repository for other units since it stocks the most items needed for patient care.

Methods:  
To address the dual concern of having a comprehensive supply of care-related items and being cost efficient, a multidisciplinary group consisting of nursing staff, patient services assistants and administrative staff was organized. The group used process improvement and root-cause analysis tools to scrutinize the issues and root cause. Applying the information gained from the root cause analysis we decided to cohort products related to product classifications. Therefore we rearranged the supply rooms according to the needs of the clinical staff and patients. All items were reviewed and placed in groups. Certain items were separated and labeled as “problem items” because they were overstocked or out of stock, depleted or had “walked away” from the rooms. They were sorted and placed in one of four groups: 1) Par stock items, 2) Formulas, 3) Skin care supplies, or 4) Cables, modules, EKG leads, ear sat and clip sat cables, bedside recorders, temperature modules/cables, regulators, Value link, cardiac output, thermometers Patient bedside tables, yellow gown carts, transport monitors.
Findings:
We decreased overall supply cost by 5% from 2012-2014 and we remained under budget in 2013 and 2014.

Par stock items (kitchenette orders)
- Decreased amount of items ordered to bare essentials for an ICU
- Decreased overall budget by 31%

Formulas
- Consulted with nutritionist to reduce variation of formula ordered.
- Organized formula area
- Reduced stock to JIT

Skin care supplies
- Reduced variation of products
- Created ordering algorithm with CNS for special patient items
- Centralized and organized supplies for easy accessibility

Cables, modules, EKG leads, ear sat and clip sat cables, bedside recorders, temperature modules/cables, regulators, Valuelink, cardiac output, thermometers
- Created Par Levels for each item
- Increased Inventory
- Weekly Par level checklist
- Centralized and locked items
- Essential supplies no longer missing

Implications/Next Steps:
Better organization and management of supplies was instrumental in controlling costs. The hospital retired the Pyxis system in May 2014 and based on experience, we were instrumental in working with the supply team to reorganize our supply room. In the spring of 2015, the unit will migrate to a weighted Par Ex system and again we will have to work diligently to ensure proper installation and organization to ensure efficiency of the supply system and to maintain the cost of supplies. We will utilize the Six Sigma process and continue to monitor costs and efficiency.
Keep, Toss or Decrease... Method for Decreasing Costs
Hadinet Hagos, Clinical Administrative Coordinator, Jean Eddy Calliste, Patient Services Assistant, Maurice Elliot, Patient Services Assistant, Efrangely De La Cruz, Patient Services Associate II, Susan Hamilton MS, RN, CCRN, CWOCN, Hesandria Carvalho Ramos, Patient Services Administrator II, Patricia Meenan MSN, RN, CCRN

**Background**
- The Medical Surgical Intensive Care Unit (MSICU) provides care for a diverse patient population both in age and diagnoses who require a vast number of supplies.
- The unit has three stock rooms in which we stock over 22,000 items. The supply rooms are usually in a constant state of chaos with staff running in and out of the rooms, at times needing emergent items to save a child’s life.
- A moment’s delay in finding a supply can negatively impact care.
- Due to the acute and varied nature of the unit, there is a need to have all the items in stock each day, leading to an increase in the supply expense.
- The MSICU is also a repository for other units because we are interdisciplinary and we stock the most items needed for patient care.

**Objective**
- To create an organized, efficient and comprehensive supply system that augments the delivery of quality patient care while reducing costs in the MSICU.

**Methods**
- We first created an interdisciplinary group consisting of nursing, patient services assistants and administrative staff.
- Used process improvement and root-cause analysis tools to look at the issues and root cause.
- Armed with information from the root cause analysis, we decided to cohort products related to product classifications. This led us to rearrange our supply rooms to meet the needs of the clinical staff and patients. We reviewed the items and placed them in groups.
- We decided to work on the “problem items” such as overstock or out of stock items, duplicated or even items that walked away from the rooms. We reviewed the following items: Par stock items, formulas, skin care supplies, cables, modulcs, EKG leads, ear, nasal, clip, sat, cables, bedside recorders, temperature modules/cables, regulators, value link, cardiac output, and thermometers.

**Findings**
- We decreased overall supply cost by 5% from 2012-2014 and we remained under budget in 2013 and 2014.

**Par stock items** (kitchenette orders)
- Decreased amount of items ordered to bare essentials for an ICU
- Decreased overall budget by 31%

**Formulas**
- Consulted with nutritionist to reduce variation of formula ordered
- Organized formula area
- Reduced stock to 12

**Skin care supplies**
- Reduced variation of products
- Created ordering algorithm with CNS for special patient items
- Centralized and organized supplies for easy accessibility

**Cables, modules, EKG leads, ear sat, clip sat cables, bedside recorders, temperature modules/cables, regulators, value link, cardiac output and thermometers**
- Created Par Levels for each item
- Increased Inventory
- Weekly Par level checklist
- Centralized and stocked items
- Essential supplies no longer missing

**Implications & Next Steps**
- The hospital retired the Pyxis system in May 2014 and we worked with the supply team to reorganize our supply room.
- In the spring of 2015 the unit will migrate to a weighted Par system and again we will have to work diligently to ensure proper installation, organization and efficiency of the supply system to maintain cost and efficiency in all the supply rooms.
- We will utilize the Six Sigma process and continue to monitor costs and efficiency.
Reducing Non-Emergent Emergency Department Visits: A Quality Improvement Study

Project Team: Pam Schubert Bob MSN, RN
Jenny Chan MSPH
Gregory Zhang
Erin Halpin BSN, RN, CPN
Claire McCarthy MD
Kathleen Conroy MD, MS

Objective(s):
To reduce rates of non-emergent emergency department utilization by patients of Boston Children’s Primary Care at Longwood through education regarding 1) reasons to seek emergency care, and 2) ways of accessing urgent care services.

Background/Significance:
Utilizing the Emergency Department (ED) for non-emergent care is a significant source of unnecessary health care spending, inefficient utilization of resources, and medical consequences resulting from discontinuous and uncoordinated care. Services for most non-emergent visits have been shown to be provided in the primary care setting at a lower cost and in a more effective manner. Caregivers’ misperceptions of their child’s condition and lack of knowledge about primary-care based urgent care services have been shown to impact decisions to seek care in an emergency setting.

Methods:
In order to inform our quality improvement project, we determined our definition of unnecessary ED visits (nurse triage score of 4 or 5) and defined rates and patterns of these visits among patients at Boston Children’s Primary Care at Longwood. Our baseline data analysis informed our 4-part project design, which includes 1) nursing outreach to newborns at 3 weeks and 6 weeks of age, 2) nursing calls to patients who have visited the ED for non-urgent reasons, 3) a clinic welcome conducted at the first newborn visit in primary care, and 4) nurse education conducted at the 4 month well child visit on common conditions.

In November 2014 we implemented a nursing outreach initiative for our newborn population. Calls have been made to families of newborns at age 3 and 6 weeks to provide support and education about common newborn complaints and to remind families of availability of urgent care and on call nurses in an effort to shift low-acute ED visits to CHPCC urgent-care hours. The nursing outreach list is populated using BostonChildrens360, and the nurses record information on ability to contact the family, topics discussed during the call, outcome of the call, and time spent. Descriptive analyses have been conducted on the outcome of the calls.
Findings:
Baseline data collected between July 2013 and January 2015 indicate that, on average, all patients at Boston Children’s Primary Care at Longwood visit the ED regardless of acuity level at a rate of 35.8 visits per 1000 patients every month. On average per month, 53.5% of those ED visits were for low-acuity visits which could have been handled in primary care.

Preliminary analysis of a sample set of nursing calls to newborns revealed that nursing was contact the family within 2 attempts 45% of the time. Of these completed calls, 24.5 % prevented unnecessary visits or calls to primary care, and 26% resulted in nurses scheduling visits for patients who needed to be seen in primary care.

Implications/Next Steps:
In the next months, other components of our quality improvement project will be implemented. We will continue to collect the monthly ED visit rate and the monthly low acuity visit rate, and evaluate the impact of our study on the rates. Both sets of data will be stratified by age, with a focus on our patients under 3 years of age.

We will implement targeted phone outreach to families of patients who have visited the ED for non-emergent reasons, prioritizing patients who are birth to 3 years old. This outreach initiative will involve nurses calling these patients within 48-72 hours of a non-emergent visit with a discussion on the most ED recent visit, the child’s current health, and a focus on what conditions can be managed by urgent care instead of the ED. Implementation will begin with one care team and then be spread to the other care teams.

In addition, we will implement initiatives to educate our patients at two different visits. At the newborn visit, administrative assistants will provide a brief, structured discussion about the clinic, reviews the urgent care hours, and the clinic’s 24-hour nursing phone number. At the 4-month physical, a nurse will conduct a brief training with families, focusing on acute-care conditions that drive many ED visits: fever, upper respiratory infections, and vomiting or diarrhea. The education will focus on the symptoms that can be cared for at home. In addition, nurses will review of reasons to seek care in the clinic and what symptoms constitute an emergency. We hope that this educational intervention will help parents better manage low-acuity symptoms at home as well as encourage a habit of calling primary care for any medical concerns.
Reducing Non-Emergent Emergency Department (ED) Visits: A Quality Improvement Study
Pamela Schubert-Bob, RN, Jenny Chan, MSPH, Gregory Zhang, Erin Halpin, BSN, RN, CPN, Claire McCarthy, MD, Kathleen Connolly MD, MS

Background
- Using the Emergency Department (ED) for non-urgent conditions leads to unnecessary healthcare spending, inefficient resource usage, and discontinuous and uncoordinated care
- Caregivers’ misperceptions of their child’s condition and lack of knowledge about primary-care based urgent care services have been shown to impact decisions to seek care in an emergency setting
- Boston Children’s Primary Care at Longwood (PCL) is a high-volume urban academic clinic that provides both well child care and urgent care to approximately 15,000 patients
- ED utilization patterns of patients at PCL indicate the majority of those visits are low acuity visits (ED triage acuity levels 4 and 5)

Objective
To reduce rates of non-emergent ED utilization by our patients through education regarding 1) reasons to seek emergency care, and 2) ways of accessing urgent care services

Methods
- ED utilization rates of our patients have been collected from July 2013-January 2015
- Baseline data on the ED utilization rate of our patients informed our 4-part project design:
  Part 1: Nursing outreach to newborns at 3 weeks and 6 weeks of age
  Part 2: Nursing visits to patients who have visited the ED for non-urgent reasons
  Part 3: A clinic welcome conducted at the first newborn visit
  Part 4: Nursing education conducted at the 4-month well child visit on common conditions (vomiting, diarrhea, URI, fever)
- In November 2014, we implemented Part 1 with the purposes of 1) providing support and education about common conditions, and 2) reminding patients of urgent care hours and the availability of on-call nurses
- Descriptive analysis has been conducted on the outcome of these calls based on documentation from nurses

Preliminary Results

Findings to Date
- Baseline data collected between July 2013 and January 2015 indicate that, on average, patients at PCL visit the ED at a rate of 35.8 visits per 1000 patients every month
- On average per month, 53.5% of ED visits were for low-acuity visits which could have been handled in primary care
- Patients under 3 years old visited the ED at a rate of 80.3 visits per 1000 patients every month, which is approximately 2.2 times the rate of all patients regardless of age
- In Part 1 of our intervention to date, nurses were able to contact the family within 2 attempts 45% of the time
  - 24.5% prevented unnecessary visits or calls to primary care
  - 26% resulted in nurses scheduling visits for patients who needed to be seen in primary care

Future Directions
- Continuing Part 1 of our project, and additional analysis of these calls to understand their effects on patient knowledge and use of primary care services
- Implementing and evaluating the three other parts of the quality improvement study
- Further following of the monthly ED utilization rates to assess the impact of our interventions
Using Pressure Ulcer Prevalence (PUP) Survey Data to Identify Opportunities to Improve Pressure Ulcer Prevention Strategies

Project Team: Susan Hamilton RN, MS, CWOCN
Lauren Hartwell BA
Karen Conwell MSN, RN, CPNP
Sandy Quigley MSN, RN, CPNP-PC, CWOCN
Skin SME Group

Objective(s):
To identify and quantify the most common MDRPU’s in order to develop appropriate prevention and intervention strategies to address this category of pressure ulcers.

Background/Significance:
Pressure ulcers have historically been thought of as a problem related to immobility, with most risk assessment scales and prevention strategies focused on this category of pressure ulcers. However, trends in survey data at our hospital indicate that medical device related pressure ulcers (MDRPU) account for a higher percentage of pressure ulcers then those related to immobility.

Methods:
National Database for Nursing Quality Indicators (NDNQI) Quarterly Prevalence Survey data from August 2010 through November 2014 was reviewed for the prevalence of MDRPU’s. MDRPU’s were further broken down by device. The Skin Subject Matter Expert (Skin SME) Committee reviewed this data and developed plans to implement educational and practice interventions to address the most common MDRPU’s.

Findings:
Eighteen quarterly surveys (N=5552 patients) were completed between August 2010 and November 2014. 392 pressure ulcers were documented. Sixty six percent (N=259) of the pressure ulcers documented were MDRPU. Twenty one different medical devices were identified as the cause of these pressure ulcers. The most frequent medical devices sited were oxygen saturation probes, non-invasive ventilation masks and orthopedic devices. To date, interventions have been put into place to address sat probe and non- invasive mask related pressure ulcers with a steady decline seen in the rates of these MDRPU’s.

Implications/Next Steps:
MDRPU’s account for two thirds of all pressure ulcers in our hospital. Medical devices and monitoring equipment secured to the skin or mucosal membranes are now being recognized as risk factors for pressure ulcer development. The Skin SME Group has developed initiatives to address pressure ulcers resulting from O2 sat probes, non-invasive ventilation devices and EEG
leads. Based on most recent data we will continue to focus on opportunities for improvement related to EEG leads and removable orthopedic devices.

If this poster has been presented at a conference, which one:
Emerging Trends Impacting Acute/Critical Care Nursing Leaders Conference, Greater Boston Chapter of the AACN, Regis College, Weston, MA.

References:
Using Pressure Ulcer Prevalence (PUP) Survey Data to Identify Opportunities to Improve Pressure Ulcer Prevention Strategies in a Pediatric Hospital

Susan Hamilton RN, MS, CCRN, CWOCN, Lauren Hartwell BA, Karen Conwell RN, MSN, CPNP, Sandy Quigley MSN, RN, CPNP, CWOCN

Background

- Pressure ulcers are historically thought of as a problem related to immobility, with most risk assessment tools and prevention strategies focused on this category of pressure ulcers.
- Trends in PUP survey data over 4.5 consecutive years at Boston Children’s Hospital (BCH) indicate that medical device related pressure ulcers (MDRPU) account for a higher percentage of pressure ulcers than those related to immobility.

Objectives

- Review BCH’s Pressure Ulcer Prevention (PUP) data to identify and quantify MDRPUs and develop appropriate prevention and intervention strategies addressing the most common devices.

Methods

- NDNQI Pressure Ulcer Prevalence Surveys are completed on all inpatient nursing units on a quarterly basis at BCH.
- Survey data from August 2010 – February 2015 were reviewed quarterly for the prevalence of MDRPUs. MDRPUs were further categorized by individual device.
- The hospital wide Skin Subject Matter Expert (Skin SME) Committee reviewed data with plans to implement prevention and intervention strategies to address the most commonly identified MDRPUs.

Findings

- Nineteen quarterly surveys (N=5882 patients) were completed between August 2010 and February 2015. 404 total pressure ulcers were documented.
- Sixty six percent (N=268) of pressure ulcers documented between November 2011 to February 2015 were MDRPUs (see Figure 1), with 21 different medical devices identified as the cause for these MDRPUs (see Figure 2).
- The most frequent medical devices that interventions were created for are O2 sat probes, non-invasive ventilation masks, orthopedic devices and EEG leads (see Figure 3).

Figure 1: Prevalence of MDRPUs at BCH

Figure 2: Common Medical Devices

Figure 3: Targeted Device Related Interventions

Implications

- Medical devices and monitoring equipment secured to the skin are now recognized as risk factors for pressure ulcer development in the pediatric population.
- Targeted interventions to address the most common devices associated with MDRPUs at BCH have been successful in decreasing the prevalence rate of these MDRPUs.

Next Steps

- Continue multidisciplinary evaluation of the most common MDRPUs identified at BCH to decrease prevalence and provide targeted preventative and intervention strategies to improve patient outcomes.
- Partner within national pediatric hospital initiatives to benchmark our MDRPU prevalence with like pediatric institutions and collaborate to develop best practices to decrease occurrence of these PUs.
- Work with Clinical Education and Informatics (CEI) to create enhanced EMR documentation fields for medical device removal and rotation and all associated care.

BCH Skin SME Committee Members

- Leah Ackerman RN
- Kristen Anderson RN
- Jennifer Anderson RN
- Dorothy Able RN
- Catherine Calabrese RN
- Karen Conwell RN
- Caroline Cosentino RN
- Sarah Demers RN
- Megan Gray RN

*Skin SME Committee Co-Chairs
**Monitor Bradfield Nursing Executive Council sponsor

*National Database for Nursing Quality Indicators (NDNQI), a proprietary database of the American Nurses Association (ANA) administered by the University of Kansas School of Nursing.
Improving Bone Health in Children Supported on Ventricular Assist Devices (VAD)

**Project Team:**
- Beth Hawkins MSN, RN, FNP-C
- Janelle Nobrega MSN, RN, CPNP
- Suzanne Reidy MS, RN
- Francis Fynn-Thompson MD
- Christina VanderPluym MD

**Objective(s):**
To describe the incidence of fractures in children with a VAD and report our multidisciplinary approach to improved bone health.

**Background/ Significance:**
Children supported with ventricular assist devices (VAD) may be at increased risk for fractures as a result of immobility, nutritional insufficiencies and medication effects.

**Methods:**
For this quality improvement project we retrospectively reviewed all children who underwent VAD implantation from 2005-14. Demographic data was collected. Bone fractures were identified during VAD support and up to 1-year post transplant.

**Findings:**
Throughout the 10 years of data collection, 40 children (26 female), aged 6.7 ± 6.0 (median 4.6, 0.02 to 17.5 yrs) underwent implantation of 43 VADs (7 HeartWare, 25 Berlin Heart, 4 Rotaflow, 7 Abiomed BVS 5000). Diagnosis included; cardiomyopathy (27) and congenital heart disease (13). During a total of 2471 days of VAD support (median 26.5, range 1 to 342 days), 2 patients had fractures, and an additional 3 patients had 5 separate long bone fractures within the first year post transplant. Of the 5 patients who had fractures, 4 were non-weight bearing, all were on loop diuretics >3 months and had received > 3 months of unfractionated or low molecular weight heparin. One patient was transitioned from heparin to fondaparinux, a synthetic factor Xa inhibitor as an alternate anticoagulant to prevent bone absorption inherent to other heparins. She received a total of 60 day of heparin, 88 days of enoxaparin, and 23 days of fondaparinux, and was successfully transplanted, with no increase in clotting events after transition to fondaparinux. Dedicated assessment of bone health was instituted for all VAD recipients with focus on high risk patients; infants and toddlers, non-weight bearing, failure to thrive, loop diuretic dependence and anticoagulation use >3 months. Weekly multidisciplinary meetings with pharmacy, nutrition, physiotherapy and nursing were held to review modifiable risks for bone health, and to develop a tailored plan to improve patient mobilization, minimize medications with effects on bone, including transition to novel anticoagulation (fondaparinux), hyper-alimentation of vitamin D and calcium, and efforts to ensure special handling precautions.
Implications/ Next Steps:
Fractures occurred in 12.5% of children supported with VADs, attributable to poor bone health. It is imperative that programs address bone health and modifiable risks as part of comprehensive VAD and post-transplant care.
Improving Bone Health in Children Supported on Ventricular Assist Devices
Beth Hawkins MSN, RN FNP-C, Janelle Nobrega MSN, RN, CPNP, Suzanne J. Reidy MS, RN, NE-BC, Francis Fynn-Thompson MD, Christina VanderPluym MD

Background
- Children supported with Ventricular Assist Devices (VADs) may be at increased risk for fractures as a result of immobility, nutritional insufficiencies and medication effects.

Objectives
- Describe the incidence of fractures in children with VADs at Boston Children’s Hospital
- Compare baseline characteristics between VAD recipients who developed fractures and those who did not
- Illustrate case of a patient on VAD support anticoagulated with fondaparinux in an effort to improve bone health
- Discuss the implementation of an interdisciplinary team to improve bone health

Methods
- Retrospectively reviewed charts on all children who underwent VAD implantation from 2006-2014 at Boston Children’s Hospital
- Demographic data was defined at time of VAD implantation
- Identified patients who suffered a bone fracture anytime during VAD support and up to 1 year post heart transplant

Findings

Table 1. Baseline Demographics

<table>
<thead>
<tr>
<th></th>
<th>All Patients (N=10)</th>
<th>Patients with Fracture (N=6)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Female Sex</td>
<td>6 (60%)</td>
<td>5 (83%)</td>
</tr>
<tr>
<td>Age</td>
<td>6.7 ± 3.6 (median 4.6, 0.02 to 17.5 years)</td>
<td>3.4 ± 3.6 (median 2.2, 1.5 to 10 years)</td>
</tr>
<tr>
<td>VAD Type</td>
<td></td>
<td></td>
</tr>
<tr>
<td>HeartWare</td>
<td>7 (17.5%)</td>
<td>1 (16.7%)</td>
</tr>
<tr>
<td>Berlin Heart</td>
<td>25 (62.5%)</td>
<td>3 (50%)</td>
</tr>
<tr>
<td>Retriever</td>
<td>4 (10%)</td>
<td>2 (33.3%)</td>
</tr>
<tr>
<td>Abiomed BVS 5000</td>
<td>7 (17.5%)</td>
<td>0</td>
</tr>
<tr>
<td>Diagnosis</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Congenital Heart</td>
<td>13 (32.5%)</td>
<td>3 (50%)</td>
</tr>
<tr>
<td>Cardiomyopathy</td>
<td>27 (67.5%)</td>
<td>3 (50%)</td>
</tr>
</tbody>
</table>

Figure 1. Incidence and Type of Fracture

- 40 patients = 2471 days of VAD support
- 34 patients without fracture
- 6 patients with fracture
- 3 other fractures: Spinal, R middle toe, Vertebro compression
- 8 long bone fractures: 5 femur, 3 humerus
- 1 patient transitioned to fondaparinux

Case Study: Patient Transitioned to Fondaparinux
- 2 year old female with dilated cardiomyopathy post BVAD-BiVAD Berlin Heart with complicated post op course.
- Patient specific risk factors:
  - 174 days of BH EXCOR, BVAD support
  - Non weight bearing due to stroke
  - Poor nutrition due to inability to tolerate GT feeds
  - Medication effects
    - 60 days of heparin
    - 88 days of enoxaparin
    - 23 days of fondaparinux
  - Calcium wasting durianics

Right femur fracture and right middle toe fracture

Figure 2. Management and Evaluation of Optimal Bone Health

Implications
- Fractures occurred in 13% of children supported with VADs, attributable to poor bone health.
- It is imperative that programs address bone health and modifiable risks as part of comprehensive VAD and post-transplant care.

Next Steps
- Prospective ongoing monitoring of our process measures and impact on outcome
- Further analysis to look at factors predictive of bone fracture in this complex patient population
- Identify high risk patients for more intensive therapy

Boston Children’s Hospital Cardiovascular and Critical Care Services

Beth.Hawkins@childrens.harvard.edu
Monitoring the Health of the Work Environment with a Daily Assessment Tool: The REAL (Relative Environment Assessment Lens) Indicator

**Project Team:**
Karen Hinsley BSN, RN, CCRN  
Audrey Marshall MD  
Michelle Hurtig MSN, RN  
Jason Thornton MSN, RN, CCRN, CPHQ  
Cheryl O’Connell MBA, BSN, RN, NE-BC  
Jean A. Connor PhD, RN, CPNP  
Patricia Hickey PhD, MBA, RN, FAAN

**Objective(s):**
The objectives of this initiative are to assess the health of the work environment with a daily tool (Relative Environment Assessment Lens (REAL) Indicator) and to identify opportunities to improve clinical operations and teamwork in a timely fashion in two procedural areas of a larger pediatric cardiovascular program.

**Background/Significance:**
Evidence shows that the health of the work environment impacts staff satisfaction, interdisciplinary communication, and patient outcomes. The American Association of Critical Care Nurses (AACN) has identified six evidence-based standards for establishing and sustaining a healthy work environment and an annual survey. However, strategies to evaluate the impact in patient care units on a daily basis are limited.

**Methods:**
A daily assessment survey tool (REAL Indicator) was developed using a consensus-based method to evaluate the health of the work environment and identify opportunities for improvement from the front line staff. A visual scale using emoticons was linked with a written description of feelings about their work environment that day. The rating scale associates the highest number with the most positive experience. Using concepts of Appreciative Inquiry, staff were asked to identify "What is going well" and "What can be improved". Face validity was established by seeking feedback and agreement with staff.

**Findings:**
From July 2013 to April 2014, results from the REAL Indicator in the cardiac catheterization laboratory indicated an overall good work environment. The goal of 80% reporting their work environment to be "Great", "Good", or "Satisfactory" was met each month. From July 2013 to April 2014, the goal of 80% of cardiovascular operating room (CVOR) staff reporting their work environment to be "Satisfactory" or above was met four times. On average, 72.7% of CVOR staff reported their work environment to be "Great", "Good", or "Satisfactory". Common themes
related to "What is going well" and "What could be improved" were similar for the cardiac catheterization laboratory and cardiovascular operating room. Universally, when staff described what is going well or what needs to be improved, three common themes arose in both areas: 1. Communication, 2. Teamwork and 3. Mutual Respect. These themes directly align with the six standards of the AACN Healthy Work Environment Assessment Survey.

Implications/Next Steps:
The REAL Indicator has become a valuable tool in assessing the specific issues of the clinical area and identifying opportunities for improvement. Given the feasibility and positive response of this tool in the cardiac catheterization laboratory, it is now being used in many other patient care areas where staff and leaders believe they need to understand the health of the environment in a more specific and frequent timeframe. The accessibility of the tool has been extremely valuable when clinical areas are challenged by periods of high volume, acuity, and stress amongst the interdisciplinary staff. It provides a forum for discussion and a process for creating solutions.

If this poster has been presented at a conference, which one: Poster presented at the 15th Annual International Symposium on Congenital Heart Disease, St. Petersburg, FL, February 2015.
Monitoring the Health of the Work Environment with a Daily Assessment Tool: The Relative Environment Assessment Lens (REAL) Indicator

Karen Hinsley BS, BSN, CCRN; Michelle Hurtig MSN, RN; Jason Thornton MSN, RN, CPHQ, NE-BC; Cheryl O’Connell MBA, BSN, RN, NE-BC; Audrey Marshall MD; Jean Anne Connor PhD, RN, CPNP; Patricia Hickey PhD, MBA, RN, FAAN

Background
- American Association of Critical-Care Nurses (AACN) has identified six evidence-based standards for establishing and sustaining a healthy work environment.
- An assessment tool was created based on these standards:
  - Developed for the purposes of periodic, large-scale evaluation to monitor trends over time.
  - As such, it cannot support daily evaluation of the work environment.

Purpose
- To develop an assessment tool to evaluate the health of the work environment in real-time across the cardiovascular program.

Methods
- Relative Environment Assessment Lens (REAL) Indicator, a daily assessment tool, was developed using a consensus-based method by interdisciplinary staff (Fig. 1).
- A visual scale using emoticons is linked with a written description of feelings about the work environment that day.
- Highest number corresponds to the most positive experience.
- Face validity was established by seeking feedback from staff.
- REAL Indicator tool was implemented first in the cardiovascular catherization laboratory.
- Subsequently implemented in the:
  - Cardiologist Operating Room (CVR)
  - Cardiac Intensive Care Unit (CICU)
  - Acute Care Cardiac Unit

Results
- From July to December 2014, an average of 84% respondents (range 46.7% to 85.4%) indicated they felt their work environment was great, good, or satisfactory (Fig. 2).
  - Respondents’ feelings towards their work environment varied considerably from month to month.
  - Universally, when staff described what is going well or what needs to be improved, three common themes arose:
    1. Communication
    2. Teamwork
    3. Mutual respect
- Targeted initiatives implemented:
  - Effective decision-making: capacity initiative utilizing length of stay data and predictive modeling to address challenges with CICU census and CVOR scheduling
  - Meaningful recognition: provision of increased learning opportunities and staff education
  - Authentic leadership: new CVOR leadership structure implemented, including the addition of a clinical coordinator

Conclusions
- REAL Indicator has become a valuable tool in assessing the specific issues of the clinical area and identifying opportunities for improvement.
- Themes of communication, teamwork, and mutual respect directly align with the six standards of the AACN Healthy Work Environment Assessment Survey.
- The accessibility of the tool has been extremely valuable when clinical areas are challenged by periods of high volume, acuity, and stress amongst the interdisciplinary staff.
- It provides a forum for discussion and a process for creating solutions.

Next Steps
- Healthy Work Environment is now a corporate goal at Boston Children’s Hospital.
- Continue to implement the REAL Indicator across the cardiovascular program and throughout the hospital.

Cardiovascular and Critical Care Nursing Science

Jason Thornton@childrens.harvard.edu
Male Nurses, Do They Experience Discrimination in Assignments?

Project Team: Joshua Jansen BSN, RN
Dennis Doherty MSN, RN

Objective(s):
To explore the perceptions of male nurses in a (PICU) setting regarding gender bias and its role in patient care assignments and effect on career progression.

Background/Significance:
The nursing profession has been charged by the Institute of Medicine to increase diversity of its nurses in order to create a work force prepared to meet the needs of our diverse patient populations. In our Pediatric Intensive Care Unit (PICU) recruitment of male nurses has been one method to increase diversity and meet patient needs. Critical care is one specialty attracting greater numbers of male nurses. Although we have been successful in recruiting male nursing staff, the experience of our male nurse staff needed to be better understood in areas of patient assignment and perceived discrimination.

Methods:
Qualitative guide consisting of five questions was used to facilitate interviews with male PICU staff nurses. These questions elicited feedback regarding the individual’s perception of in-patient care assignments with regards to gender. Interviews were conducted face to face and audio-recorded. Using content analysis, two investigators utilized notes and audio recording to develop themes and categories for analysis. Data was further ranked in order of prevalence.

Findings:
Age of participants ranged from 23-46 years old. All participants (7/7) reported assignment changes believed to be related to gender. Reasons for assignment changes included parent preference, patient preference, charge nurse preference, and cultural reasons. All patients involved were reportedly female ages 6 years to 18 years old. Occurrence of such events ranged from 0-2 times per male nurse in the last 12 months. Descriptors reported by the participants include “deflated” and “frustrated” although the consensus of the group was this practice did not prove to be a barrier to professional growth. All reported an understanding and acceptance of this practice.

Implications/Next Steps:
This quality improvement project sheds light on the perceptions of men working as nurses in the PICU. While all participants have reported reassignment of patients, all report acceptance of this practice indicating a value on patient/family centered care. PICU nursing leadership will report findings of this project to unit charge nurses who make patient assignments. In addition, the PICU welcome packet will address patient/parental preference in nursing by inviting
patients and families to seek out nursing leadership upon admission. The investigative team seeks to replicate this project in other critical care departments within institution.
Male Nurses: Do They Experience Bias In Clinical Assignments?

Joshua Jansen BSN, RN, Dennis Doherty MSN, RN, CCRN

Background
- In recent years there has been increased focus on increasing diversity in the nursing profession
- One strategy has been to recruit more males into nursing
- In 2000 the American Assembly for Men in Nursing (AAMN) introduced the 20 x 20 Campaign - the goal to 'dodge gender' nursing (Figure 1)
- Acute and critical-care areas have attracted male nurses
- Male nurses in the Pediatric Intensive Care Unit (PICU) report anecdotal instances of bias in clinical assignments

Methods
- 6 Question Guide used to elicit feedback regarding individuals perceptions of patient care assignment as it relates to gender (Table 1)
- One on One Interviews were audio recorded
- Two investigators independently listened to audio recordings of interviews taking notes on content
- Notes used to develop themes and rank in order for prevalence
- Investigators confirm themes and ranking of prevalence

Results
- 100% of participants reported assignment changes believed to be related to gender
  - Reasons for assignment changes include:
    - Parent preference
    - Patient preference
    - Charge nurse preference
    - Cultural reasons

- Occurrence of such events ranged from 0-2 times in the last 12 months per male nurse

- All patients involved were female
  - Age of the patient ranged from 6 to 10 years old

- Majority of participants did not believe this practice was a barrier to professional growth
  - However participants reported feelings of:
    - Dufulation
    - Frustration
    - As well as understanding and acceptance

Purpose
- To explore the perceptions of male nurses in a PICU setting regarding gender bias and its role in patient care assignments and its effect on career progression

Table 1. Interview Questions
1. Have you ever been removed from an assignment because of your gender?
2. If yes to the question above, how often has this happened?
3. How did this make you feel?
4. Do you think this type of event could impact the progression of your practice?
5. Age of the patient?
6. Age of the nurse?

Table 2. Participant Demographics
<table>
<thead>
<tr>
<th>Sample</th>
<th>7</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender</td>
<td>100% male</td>
</tr>
<tr>
<td>PICU Experience</td>
<td>1 - 12 years</td>
</tr>
<tr>
<td>Age</td>
<td>23 - 46 years</td>
</tr>
</tbody>
</table>

Implications
- Insight to perceptions of male nurses working in the PICU
- While all participants have reported reassignment of patients, all report acceptance of this practice indicating a value on family centered care
- Findings shared with PICU leadership and charge nurses
- PICU welcome packet will address patient/parental preference in nursing by inviting patients and families to seek out nursing leadership upon admission
- Test transferability by replicating in other acute/critical care areas within the institution

Figure 1. AAMN Recruitment Poster

Boston Children’s Hospital Cardiovascular and Critical Care Services
Joshua.Jansen@childrens.harvard.edu
Barriers to the use of face protection for standard precautions by health care workers.

Project Team: Joanne Kinlay BSN, MMSc, CIC
Kathleen Flaherty MT, CIC
Patricia Scanlon MPH, RN, CIC
Preeti Mehrotra MD
Gail Potter-Bynoe BS, CIC
Thomas J. Sandora MD, MPH

Objective(s):
To improve compliance with use of face protection (mask with eye protection or face shield) for standard precautions (it is not consistent).

Background/Significance:
In December 2013 we distributed a survey to staff to identify barriers to the use of face protection while suctioning, so that targeted interventions could be designed and implemented.

Method:
188 people completed the survey. 82% of respondents were registered nurses, 9% were respiratory therapists and 9% were a nursing assistant or student, nurse practitioner or medical staff. 44% had been working in their discipline for over 10 years. A minority of respondents reported regularly using face protection during suctioning (Figure). The most common reason cited for not wearing face protection was the lack of accessibility (not in the room or nearby, 53% of respondents), followed by not being a priority in an emergency (47%), not necessary (27%), perceived protection from prescription eyeglasses (14%), uncomfortable to wear (8%), and eye protection impeding vision (7%). Respondents reported that face protection is available in the patient’s room or on precaution carts outside room (53%), or in the clean supply room (47%). 70% indicated that face protection should be available either in the patient’s room or just outside the room. 37% reported they would use it if it were more accessible and 35% reported being in a situation in which they regretted not wearing face protection while suctioning.

Findings/Implications/Next Steps:
Access to face protection supplies is inconsistent within our hospital. We learned we need to identify standard locations to store masks and eye protection, as improved accessibility may increase use by staff. Most staff would like face protection to be available either inside or directly outside of the room. Continuing education is needed regarding situations in which face protection is indicated for standard precautions.
Barriers to the Use of Face Protection for Standard Precautions by Health Care Workers

Joanne Kinlay1, Kathleen Flaherty1, Patricia Scanlon2, Preeti Mehrotra2, Gail Potter-Bynoe3, Thomas J. Sandora2,3

1Infection Prevention and Control, Boston Children’s Hospital; 2Division of Infectious Diseases, Boston Children’s Hospital; 3Harvard Medical School, Boston MA

Issue
- Compliance with the use of face protection (mask with eye protection or face shield) while suctioning is inconsistent at our hospital.
- In response to several concerns raised by staff after exposure to a patient with Neisseria meningitidis, we wondered why staff were not following standard precautions and protecting themselves while suctioning.

Project Design
- In December 2013 we administered a survey both electronically and on paper, asking staff to identify barriers to the use of face protection while suctioning a patient.

Results
- 211 people responded to the survey.

<table>
<thead>
<tr>
<th>Role</th>
<th>Proportion of Total Respondents</th>
</tr>
</thead>
<tbody>
<tr>
<td>Registered Nurse</td>
<td>81%</td>
</tr>
<tr>
<td>Respiratory Therapist</td>
<td>9%</td>
</tr>
<tr>
<td>Physician Attending</td>
<td>3%</td>
</tr>
<tr>
<td>Nursing Student</td>
<td>3%</td>
</tr>
<tr>
<td>Clinical Assistant</td>
<td>3%</td>
</tr>
<tr>
<td>Nurse Practitioner</td>
<td>1%</td>
</tr>
<tr>
<td>Medical Resident</td>
<td>1%</td>
</tr>
</tbody>
</table>

How many years clinical experience have you had?
- Less than one year: 3%
- Between one and five years: 28%
- Between six and ten years: 26%
- Greater than 10 years: 38%

Have you ever regretted not wearing face protection while suctioning a patient?
- Yes: 54%
- No: 66%

Would you use face protection if it was more accessible?
- Sometimes: 49%
- Yes: 37%
- No: 14%

Additional survey comments:
- “Face protection should be at every bed space. It should be as available as gloves are.”
- “It should be more accessible, as you never know when you are going to need it.”
- “Like the glove dispensers, they should be within the patient’s room and easily accessible.”

Lessons learned
- Access to face protection supplies is inconsistent within our hospital.
  - Identifying standard locations to store masks and eye protection may increase their use by staff.
  - Most staff would like face protection to be available either inside or directly outside the room.
  - Continuing education is needed regarding situations in which face protection is indicated for standard precautions.
Inappropriate *Clostridium difficile* Testing in Pediatric Patients Receiving Laxatives or Stool Softeners

Project Team: Joanne Kinlay BSN, RN, MMSc, CIC
Mary Ellen Green BSN, RN, CPN
Thomas J. Sandora MD, MPH

**Background/Significance:**
Positive *C. difficile* tests are reported to the Massachusetts Department of Public Health. Guidelines recommend testing only patients with clinically significant diarrhea for *C. difficile* infection (CDI). Pediatric patients frequently receive laxatives or stool softeners while hospitalized. We assessed whether children tested for *C. difficile* at our hospital had received these medications prior to testing.

**Method:**
Retrospective cohort study of patients ages 1-26 who met the National Healthcare Safety Network surveillance definition for healthcare-facility onset, healthcare-facility associated (HO-HFA) CDI between September 1, 2013 and August 31, 2014. We recorded demographic variables and administration of laxatives or stool softeners within 2 days prior to a positive *C. difficile* test. Outcomes included proportion of patients with exposure to these medications and proportion treated for CDI.

**Findings:**
Fifty patients met the criteria for HO-HFA CDI. The median age was 7 years and the most common underlying diagnoses were hematology/oncology (n=18, 36%) and neurologic (n=13, 26%) conditions. Twenty-two (44%) had received laxatives or stool softeners (3 in the 2 calendar days prior to testing, 9 the day before, and 10 the day of testing). Of these 22 patients, 13 (59%) received one and 5 (23%) received 2 bowel medications prior to testing. The number of doses administered in the 2 days prior to testing ranged from 1 to 12 (median 3).

All of the 22 patients administered laxatives or stool softeners received antibiotic therapy for CDI after the positive test.

**Implications/Next Steps:**
Hospitalized children who receive laxatives or stool softeners are frequently tested for CDI within the subsequent 2 days, and those who test positive are treated for CDI. Some positive tests in this context may reflect colonization rather than CDI. Waiting 48 hours after discontinuing laxatives and stool softeners to determine whether diarrhea resolves before sending a *C. difficile* test may reduce unnecessary antibiotic exposure in children.
Inappropriate *Clostridium difficile* Testing in Pediatric Patients Receiving Laxatives or Stool Softeners

Joanne Kinlay BSN MMSc CIC, Mary Ellen Green BSN, Gail Potter-Bynoe BSc CIC, Thomas J. Sandora MD MPH

1Infection Prevention and Control Department, 2Nursing-Patient Care Services, 3Division of Infectious Diseases

**Background**

- Healthcare-facility onset, healthcare-facility associated (HO-HFA) *Clostridium difficile* infection (CDI) is reported to the National Healthcare Safety Network (NHSN).
- Hospitalized children may be asymptptomatically colonized with *C. difficile*. Guidelines recommend testing only patients with clinically significant diarrhea for CDI.
- Pediatric patients frequently receive stool softeners or laxatives while hospitalized.
- Positive tests for *C. difficile* from children receiving stool softeners or laxatives may reflect colonization rather than CDI and may lead to inappropriate antibiotic treatment.

**Objectives**

- To assess the proportion of patients at our facility who receive laxatives or stool softeners prior to *C. difficile* testing.
- To evaluate the frequency with which patients receiving bowel medications who test positive for *C. difficile* are treated for CDI.

**Methods**

- Retrospective cohort study of patients aged 1-26 who met the NHSN surveillance definition for HO-HFA CDI between September 1, 2013 and August 31, 2014 at Boston Children’s Hospital.
- We recorded demographic variables and administration of laxatives or stool softeners within 2 days prior to a *C. difficile* test being sent.
- Outcomes included the proportion of patients with exposure to these medications and the proportion treated for CDI.

**Results**

- Fifty patients met the criteria for HO-HFA CDI.
- Median age was 7 years and the most common underlying diagnoses were hematology/oncology (n=18, 36%) and neurologic (n=13, 26%) conditions.
- Twenty-two (44%) had received laxatives or stool softeners within 2 days prior to testing.
- All 22 of these patients received antibiotic therapy for CDI.

**Implications**

Testing for *C. difficile* should only be performed on patients with unformed stool. At our facility, nearly half of hospitalized children who met the criteria for HO-HFA CDI had received laxatives or stool softeners in the 2 days before the testing was sent, and in some cases, multiple doses. All of these children were then prescribed and administered antibiotics to treat CDI.

Rates of colonization with *C. difficile* in hospitalized adults and children are as high as 20% and increase with length of stay. Stool softeners and enemas are predictors of asymptomatic *C. difficile* carriage. Waiting 48 hours after discontinuing bowel medications to determine whether diarrhea resolves before sending a *C. difficile* test may reduce unnecessary antibiotic exposure in children.

**Next Steps**

Future efforts at our facility will be directed towards educating staff to consider whether bowel medications could be the cause of diarrhea before testing for CDI, and evaluating the appropriateness of *C. difficile* testing and treatment.

**References:**

Association Between Storage Interval and Contamination of Reprocessed Flexible Endoscopes in a Pediatric Gastrointestinal Procedural Unit

Investigators: Patricia Scanlon MPH, RN, CIC
Kathleen Flaherty BS, MT (ASCP), CIC
Erik Reilly M.Ed, RN, CGRN, CPN, CHES, CFER
Ellen Barth RN, CORN
Maria Morrissey BSN, RN
Carol Walling BSN, RN
Nancy Wilson CSPM
Gail Potter-Bynoe BS, CIC
Jeff Cardini MS, RN, CPN NE-BC
Alexander J. McAdam MD, PhD
Ann Marie Riley BS, MT (ASCP)
Thomas J. Sandora MD, MPH

Background/Significance:
The maximum safe storage interval after endoscope reprocessing remains unknown. We sought to assess the association between storage interval and scope contamination to inform the need for scope reprocessing prior to patient use.

Methods:
We conducted a study in two phases. First, we cultured 9 gastrointestinal (GI) endoscopes (6 gastrosopes, 2 duodenoscopes, 1 colonoscope) that had been in storage for >7 days since reprocessing. Each scope had 3 cultures: the external surface (using a sterile swab moistened with sterile saline for the suction/biopsy ports and scope handle); the insertion tube (using sterile gauze moistened with sterile saline); and the internal channels (flushed with sterile saline, then brushed with a sterile brush). Second, after reprocessing these scopes, we hung and cultured them prospectively in a similar fashion at 1, 2 and 4 week intervals without patient use. All specimens were cultured for bacteria and fungi. We defined clinically relevant contamination as >100 CFU/mL.

Findings:
In phase 1, the median hang time was 69 days (range, 8-555). Three of 27 cultures (11.1%) from 3/9 scopes were positive, all with nonpathogenic flora at ≤100 CFU/mL (10 CFU/mL coagulase-negative staphylococcus [CoNS] from biopsy/suction ports at 69 days, 100 CFU/mL Micrococcus from surface insertion tube at 69 days, 100 CFU/mL CoNS from channel flush/brush at 85 days). Median hang time was not statistically different between scopes with positive and negative cultures (P=0.68). In phase 2, 4 of 69 prospective cultures (5.8%) from 3 scopes were positive, all at ≤100 CFU/mL. At 7 days, 1/27 (3.7%) was positive (90 CFU/mL CoNS from biopsy/suction
ports); at 14 days, 2/27 (7.4%) were positive (100 CFU/mL CoNS from surface insertion tube and 10 CFU/mL *Candida albicans* from flush/brush); at 28 days, 1/15 (6.7%) grew 3 organisms (10 CFU/mL CoNS, 10 CFU/mL viridans streptococi, 10 CFU/mL *Neisseria subflava*) from biopsy/suction ports.

**Implications/Next Steps:**
No endoscopes demonstrated clinically relevant contamination at hang times ranging from 7-555 days, and most scopes remained uncontaminated up to 28 days after reprocessing. Our data suggest that properly cleaned and disinfected GI endoscopes could be stored safely for at least 4 weeks, and potentially longer, before patient use.
Association between Storage Interval and Contamination of Reprocessed Flexible Endoscopes in a Pediatric Gastrointestinal Procedural Unit

Patricia Scanlon, RN MPH CIC, Kathleen Flaherty, MT (ASCP), BS, CIC, Erik Reilly, M Ed RN CGRN CPN CHES CFER, Ellen Barth, RN CORN, Carol Walling, RN BSN, Maria Morrissey, RN BSN, Nancy Wilson CSPM, Gail Potter-Byrne, BS CIC, Jeff Cardini, RN MS CPN NE-BC, Alexander J. McAdam, MD PhD, Ann Marie Riley, BS MT (ASCP), Necole Davidson, Thomas J. Sandora, MD MPH

Boston Children’s Hospital, Boston, MA, USA

Background

- The maximum safe storage interval after endoscope reprocessing remains unknown. We sought to assess the association between storage interval and scope contamination to inform the need for scope reprocessing prior to patient use.

Methods

- We conducted a study in 2 phases. First, we cultured 9 gastrointestinal (GI) endoscopes (6 gastrosopes, 2 duodenoscopes, 1 colonoscope) that had been in storage for > 7 days since reprocessing. Each scope had 3 cultures; the external surface (using a sterile swab moistened with sterile saline for the suction/biopsy ports and scope handle); the insertion tube (using sterile gauze moistened with sterile saline); and the internal channels (flushed with sterile saline, then brushed with a sterile brush). Second, after reprocessing these scopes, we hung and cultured them prospectively in similar fashion at 1, 2, 4, 6 and 8 week intervals without patient use. All specimens were cultured for bacteria and fungi. We defined clinically relevant contamination as > 100 CFU/ml.

Results

- Results: In phase 1, the median hang time was 69 days (range, 8-555). Three of 27 cultures (11.1%) from 3/9 scopes were positive, all with nonpathogenic flora at ≤100 CFU/ml. [10 CFU/ml coagulase-negative staphylococcus (CoNS) from biopsy/suction ports at 69 days, 100 CFU/ml Micrococcus from surface insertion tube at 69 days, 100 CFU/ml CoNS from channel flush/brush at 85 days]. Median hang time was not statistically different between scopes with positive and negative cultures (p=0.68). In phase 2, 7 of 131 prospective cultures (5.3%) from 6/9 scopes were positive, all at ≤100 CFU/ml. At 7 days, 1/27 (3.7%) was positive (90 CFU/ml CoNS from biopsy/suction ports); at 14 days, 2/27 (7.4%) were positive (100 CFU/ml CoNS from surface insertion tube and 10 CFU/ml Candida albicans from flush/brush); at 28 days, 1/26 (3.8%) grew 3 organisms (10 CFU/ml CoNS, 10 CFU/ml viridans streptococci, 10 CFU/ml Neisseria subflava from biopsy/suction ports); at 42 days, 2/27 (7.4%) were positive (100 CFU/ml CoNS from biopsy/suction ports and 10 CFU/ml Bacillus species from flush/brush); at 56 days, 1/24 (4.1%) was positive (100 CFU/ml Bacillus species from biopsy/suction ports).

Conclusions

- Conclusion: No endoscopes demonstrated clinically relevant contamination at hang times ranging from 7-555 days, and most scopes remained uncontaminated up to 56 days after reprocessing. Our data suggest that properly cleaned and disinfected GI endoscopes could be stored safely for at least 8 weeks, and potentially longer, before patient use.
Objective(s):
The evaluation of efficiency and success of PICC insertion procedures performed by two RNs vs. one RN from the IV Team.

Does use of 2 PICC-certified RNs for PICC insertion procedure increase success rate and improve procedural efficiency for bedside PICC placements by the IV Team?

Background/Significance:
PICC placement procedures are currently performed by 1 RN from the IV/PICC Team. PICC RNs for the IV Team are experienced clinicians who maintain certification in ultrasound PICC placement (CPUI). A review of overall team success rates for single-RN placement shows 86–91% success each month with an average of 1–1.38 attempts per successful insertion and there is variation in the amount of time per procedure from 45 minutes to 2 hours.
In the past year, a few of the PICC nurses have begun performing some PICC procedures with a second PICC nurse assisting with anecdotal evaluation of both more efficient and more successful procedures.
Benchmarking with other pediatric institutions shows some variation in practice related to PICC insertion procedures. Common practice models include the current BCH method of 1 PICC RN, a hybrid model with 1 PICC RN and a technician for set up/assistance and an all RN model with 2 PICC RNs performing the procedure.
Current literature speaks to time limits for PICC insertion procedures to decrease post-procedural complications¹, but does not make recommendations regarding the appropriate number of proceduralists, or use of supportive personnel.

Methods:
PICC metrics for success rate, number of attempts per insertion and length of time of procedure are compared between single-RN PICC insertion procedures and 2-RN PICC insertion procedures.

Findings:
Analysis still underway.

¹ Tsai, Ming-Horng MD, et al. Complications Associated with 2 Different Types of Percutaneously Inserted Central Venous Catheters in Very Low Birth Weight Infants, Infect Control Hosp Epidemiol 2011;32(3):258-266
Implications/Next Steps:
Evidence to support a practice model of 2 PICC RNs for PICC insertion would impact the current workflow, staffing and efficiency of PICC insertions at Boston Children’s Hospital. This could have implications for a performance improvement initiative for the PICC team that would increase first-attempt success rate and decrease wait times for insertion procedures. The implication for shortening procedure time with a 2-RN model would also meet current EBP recommendations to decrease complications during use of PICC lines by limiting the length of procedural time.

Additional outcome improvements could impact cost-effectiveness of care by addressing the PICC Team’s ability to meet the needs of our more complex patients at bedside and decrease referrals to IR/OR.
Emergency Department Abscess Follow-up Program

**Project Team:**  
Ann Lucitt BSN RN  
Marie Nolan BSN RN  
Lauren Pfeifer MSN BSN RN

**Objective(s):**  
To implement a standardized clinical follow-up program in the emergency department for all patients treated for an abscess. Emergency department case managers provide a follow-up call to patients on day 3 and day 10 following their visit. The objective of these calls is to gather data related to symptom progression, primary care follow-up, medication compliance and qualitative perceptions of the emergency department visit. The calls also provide the case manager with the opportunity to provide education and answer any questions that the family may have regarding abscess management and treatment.

**Background/Significance:**  
Across the United States, there has been a significant increase in the number of abscesses seen among all soft tissue infections in the pediatric population. Emergency departments across the nation have seen a nearly three-fold increase in skin and soft tissue infection visits rates (Mistry, Shapiro, Goyal, Zaoutis, Gerber, Liu, Hersh, 2014, p.1). Thus, it is imperative that health-care providers work to better understand how to manage and treat abscesses and prevent further complications from arising. It is believed that the microorganism, Staphylococcus aureus, has significantly contributed to the rise in abscesses seen in emergency departments. One study had identified that in treated cases, methicillin-resistant S aureus (MRSA) had increased from 21% in 2003 to 42% in 2008 (Agrawal, Wright, Mehta, Zhu, Lindholm, Lee, & Emran, 2014, p.1). Given the increase in skin and soft tissue infections seen and the known complications that clinically arise with Staphylococcus aureus, it is critical that pediatric patients be closely followed once treated for an abscess. It is believed that by following up with patients on Day 3 and 10 after initial treatment, that potential complications can be avoided and more effective treatment plans can be implemented.

**Methods:**  
The case managers provide a follow-up phone call to enrolled patients on day 3 and 10 after they are treated in the ED. On Day 3, the case manager calls the family and gathers data related to the patient’s symptom progression, their primary care follow-up and medication compliance. The case manager asks if the patient has any new pain, has developed a fever and what clinical follow-up has transpired. If any concerning clinical red flags are identified, the case manager intervenes and recommends scheduling an appointment to be seen by their primary care provider or to return to the Emergency Department. Families are educated by the case manager about the importance of taking any antibiotics prescribed and scheduling follow up with their primary care provider. Any concerns are also addressed and documented.

10 days after the initial visit, a second phone call is made to the family. The case manager
inquires as to whether the abscess has decreased in size, if the patient required any overnight stays at the hospital since their initial visit, if any new abscesses have developed, if a fever occurred during the healing process and if the abscess is still draining. The case manager also asks the family if they have any other concerns or questions about the abscess or treatment.

Collected data for the day 3 and 10 call is written down on a program questionnaire form.

**Findings:**
The initiative began in 2012. Over 237 patients have enrolled thus far. Since October 2013, the success rates of contacting families for abscess follow-up are 76% on day 3 (54/71 patients reached) and 77% on day 10 (55/70 patients reached). When asked on day 3, 16 families reflected that they had questions or concerns regarding their child’s care, providing the case manager with the direct opportunity to intervene if clinically indicated and provide education. The case managers have found that the program has served as an excellent method of tertiary prevention, and that most families appreciate the follow-up education and call.

**Implications/Next Steps:**
The follow-up phone call serves as a method of tertiary prevention, aiming to prevent disease related complications from the abscess and providing the family with education to reduce the risk of potential consequences.

In the future, the case managers plan to review the qualitative data collected. During phone conversations with families, if a concern or question is expressed to the case manager, it is written down and recorded on the program questionnaire form. The case managers intend to review the forms and evaluate if there are any common themes, questions or concerns that frequently arise. Once this information is assessed, additional educational or intervention programs for abscess care and management may be hypothesized.
Emergency Department Abscess Follow-up Program

Ann Lucitt BSN RN, Marie Nolan BSN RN and Lauren Pfeifer MSN BSN RN

Objectives
- To implement a standardized clinical follow-up program in the emergency department for patients treated for an abscess.
- Emergency department case managers call enrolled patients on day 3 and 10 following their visit.
- The objective of these calls is to gather data related to symptom progression, primary care follow-up, medication compliance and qualitative perceptions of the emergency department visit.

Methods
- The case managers provide a follow-up phone call to enrolled patients on day 3 and 10 after they are treated in the ED.
- Day 3: the case manager gathers data related to the patient’s symptom progression, their primary care follow-up and medication compliance. The case manager asks if the patient has any new pain, has developed a fever and what clinical follow-up has transpired.
- Day 10: the case manager gathers data related to size of the abscess, drainage, any new abscesses, fever or hospital admissions since the initial visit.
- If any concerning clinical red flags are identified, the case manager intervenes and recommends scheduling an appointment to be seen by their primary care provider or to return to the emergency department.
- Families are educated about the importance of taking any antibiotics prescribed and scheduling follow-up with their primary care provider.
- The case manager asks the family if they have any concerns or questions about the abscess or treatment.

Findings
- Since 2012, over 257 patients have enrolled.
- Since October 2013, the success rates of contacting families for follow-up are 76% on day 3 (54/71 patients reached) and 77% on day 10 (55/70 patients reached).
- When asked on day 3, 16 families reflected that they had questions or concerns regarding their child’s care, providing the case manager with the direct opportunity to intervene if clinically indicated and provide education.

Background
- Emergency departments across the nation have seen a three-fold increase in skin and soft tissue infection visits rates (Mistry, Shapiro, Goyal, Zaatzis, Gerber, Liu, Hersh, 2014, p.1).
- Clinicians need to better understand how to manage and treat abscesses to prevent further complications from arising.
- *Staphylococcus aureus* has contributed to the rise in abscesses seen in emergency departments.
- By following up with patients on Day 3 and 10, potential complications can be avoided and more effective treatment plans can be implemented.

Clinical Implications
- The follow-up phone call serves as a method of tertiary prevention.
- The follow-up phone call aims to prevent disease related complications from the abscess and provides the family with education to reduce the risk of future issues.
- Concerns and questions expressed to the case managers during phone calls are written down and recorded on the program questionnaire form.
- Case Managers intend to review the forms and evaluate common themes, questions and concerns that frequently arise.
- Case managers also will analyze how *Staphylococcus aureus* impacts patient treatment and complications.
And the Survey Says... Improving our ICU Mentor Program through a Qualitative Survey Design

Project Team: Mary-Jeanne Manning MSN, APRN, PNP-BC, CCRN
Diane MacAleer MS, RN, CCRN
Sonja Ziniel PhD
Jean Anne Connor PhD, RN, CPNP

Objective(s):
To evaluate the effectiveness of the mentoring program in the Medical-Surgical Intensive Care Unit (MSICU) and assess areas for improvement.

Background/Significance:
Healthcare institutions and their nurse leaders are looking for creative ways to retain staff and promote professional growth among nurses. Many are turning to mentorship programs to help new staff grow professionally, as well as gain confidence at the bedside and to improve retention. The MSICU has had an active mentor program since 2007. Last year the MSICU hired 19 new staff nurses. The program was last evaluated in 2008. The members of the 7 South mentor group felt it was time to re-evaluate our program to ensure that we are providing our many new staff with the support they need to succeed and feel confident in our very busy and challenging ICU environment.

Methods:
An electronic survey was to ascertain the effectiveness of the unit based mentorship program. The survey focused on three domains. The domains were defined from a list of questions the mentors chose for the survey. The domains include: utilization of the current mentor program, criteria of a good mentor, and satisfaction with the mentorship program. The final part of the survey collected demographics. We chose to divide the survey into two parts based on whether or not the participant was still actively utilizing their mentor.

Findings:
A total of 31 participants responded (67% response rate). 55% reported their nursing experience to be 0-5 years with 45% noting all of their clinical experience had been at Boston Children’s Hospital. Most participants (70%) were introduced to the program at the end of orientation and 57% chose a mentor before the end of orientation. The most common trait that participants considered when choosing a mentor was personality (69%) followed by clinical experience (52%) and level of education (31%). 31% (9) of participants were currently utilizing their mentor at the time of the survey. Of those currently utilizing a mentor 44% communicate with their mentor 2-3 times per month. 89% of these did not have an established schedule to meet. We found 44% of the participants to be very satisfied with the method and frequency of communication.
Twenty participants (65%) were no longer utilizing their mentor. Of these, 55% communicated with their mentor less than once a month. 95% did not have an established schedule to meet
with their mentor. Their satisfaction with the method of communication (35%) and the frequency of communication (25%) were considerably less. Only 14% of participants said they were very satisfied with the program while 79% were neutral to satisfied.

Feedback obtained from the open ended questions suggested that the participants liked having someone to support and look out for them. They appreciated the confidentiality of the relationship and feedback from an experienced staff. Areas they felt needed improvement included introducing the mentor program earlier during orientation, adding more structure to the program, and adding social events outside of work to foster the mentor/mentee relationships.

**Implications/Next Steps:**
The results of the survey were shared with the mentor group in November of 2014. The results show a slight increase in the satisfaction with the method and frequency of communication. There was a slight increase in the number of participants who had an established schedule to meet with their mentor. The group is in the process of creating an action plan to address the areas that require improvement. Alignment with our unit Recruitment and Retention Council will facilitate opportunities to engage staff on their “first day” in unit as well as implementing a number of social and networking events.
And the Survey Says... Improving our ICU Mentor Program Through a Qualitative Survey Design

Mary-Jeanne Manning MSN, APRN, PNP-BC, CCRN, Diane McAleer MSN, RN, CCRN, CPN, Sonja Ziniel PhD; Jean Anne Connor PhD, RN, CPNP

Background / Significance
• Medical-Surgical Intensive Care Unit (MSICU) has had an active mentor program since 2007
  – The program was last evaluated in 2008
• Goals of Mentorship Program:
  – Retain staff
  – Promote professional growth
  – Increase confidence level of new staff
  – Improve staff satisfaction
• With 19 new hires this past year, the mentors felt it was time to reevaluate our program to ensure that we were meeting the needs of the new staff (Figure 1)

Objective
• To evaluate the effectiveness of the mentoring program in the Medical-Surgical Intensive Care Unit (MSICU) and assess areas for improvement

Methods
• Qualitative survey design
• Electronic survey sent to both current and former participants in the Mentorship Program
• The survey focused on three domains
  DOMAINS:
  – Utilization of the current mentor program
  – Criteria of a good mentor
  – Satisfaction with the mentorship program

Table 1: Demographics of Participants
<table>
<thead>
<tr>
<th></th>
<th>N=29</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>29-34 years</td>
</tr>
<tr>
<td></td>
<td>35-47 years</td>
</tr>
<tr>
<td>Education</td>
<td>BSN Degree</td>
</tr>
<tr>
<td>Years of Experience</td>
<td>0-2 years</td>
</tr>
<tr>
<td></td>
<td>3-5 years</td>
</tr>
<tr>
<td></td>
<td>6-10 years</td>
</tr>
<tr>
<td></td>
<td>11-15 years</td>
</tr>
<tr>
<td>Years at Boston Children's Hospital</td>
<td>0-2 years</td>
</tr>
<tr>
<td></td>
<td>3-5 years</td>
</tr>
<tr>
<td></td>
<td>6-10 years</td>
</tr>
</tbody>
</table>

Evaluation 2014:

- Communication Frequency
  - Once a Month: 21%
  - Once a Week: 22%
  - Twice a Month: 22%
  - Once a Year: 35%

- Methods of Communication
  - Email: 45%  
  - Text message: 24%  
  - Phone: 21%  
  - In-person meetings: 14%  
  - Other: 0%

- Overall Satisfaction of Mentor Program
  - Very Satisfied: 100%
  - Satisfied: 97%
  - Neutral: 0%
  - Dissatisfied: 0%
  - Very Dissatisfied: 0%

Findings
• Total of 31 participants responded (67% response rate)
• The most common trait that participants considered when choosing a mentor was personality (83%) followed by clinical experience (52%) and level of education (31%)
• We found 44% of the participants to be very satisfied with the method and frequency of communication

Implications / Next Steps
• Results shared with mentor groups
• Action plan being devised
• Aligning with Recruitment and Retention Council to engage staff
Identification of Nutritional Challenges in the Neonate with Complex Congenital Heart Disease

Project Team:  Megan J Matiasek MSN, RN, CPNP-PC/AC  Marcy L Lamonica MSN, RN, CPNP  Ravi R Thiagarajan MBBS, MPH  Nancy J Braudis MS, RN, CPNP

Objective(s):  
Describe and compare the nutritional challenges in neonates with single and biventricular cardiac physiology.

Background:  
Neonates with complex congenital heart disease are at risk for poor nutritional outcomes and increased length of stay. Although the implementation of a standardized feeding protocol reduced the time to achieve goal calories, decreased utilization of TPN, and decreased the incidence of NEC, nutritional challenges persist in this population.

Methods:  
A retrospective review of nutritional outcomes of all neonates with HLHS or D-TGA admitted to the CICU over a six month period. Data were gathered related to length of stay, enteral intake in the pre and post-operative period, day of first oral feed, calories achieved in the ICU, and incidence of NEC. Feeding issues were further identified related to poor oral intake, gastric distress, esophageal reflux, and chylous effusions.

Findings:  
A comparison of the two diagnosis groups demonstrated that 30% of all infants with D-TGA had feeding issues related to poor PO intake, gastric distress, and esophageal reflux. Of the infants with HLHS, greater than 70% were found to have similar issues. None of the neonates with D-TGA required a G-tube, while 10% of the neonates with HLHS had G-tube placement.

Implications / Next Steps:  
Neonates requiring single ventricle palliation and those undergoing complete repair are at risk for poor nutritional outcomes that may increase their risk of co-morbidities and length of stay. Further study is underway to evaluate the effects of pre-operative feeding in all neonates, the liberalization of fluids in the post-operative period to improve caloric intake, and an early evaluation of oral motor skills by a specialized feeding team.

This poster was presented at the Pediatric Cardiac Intensive Care Society (PCICS) conference on December 13, 2014
Identification of Nutritional Challenges in the Neonate with Complex Congenital Heart Disease
Meghan J. Matiasek MS, RN, CPNP-AC, Marcy Lamonica MS, RN, CPNP, Ravi R. Thiagarajan MD, MPH, Nancy J. Braudis MS, RN, CPNP

Background

- Neonates with complex congenital heart disease are at risk for poor nutritional outcomes and increased length of stay
- The implementation of a standardized feeding protocol reduced the time to achieve goal calories, decreased utilization of TPN and decreased the incidence of NEC
- Despite the implementation of a standardized algorithm, nutritional challenges persist in this population

Methods

- A retrospective review of nutritional outcomes of all neonates with HLHS or D-TGA admitted to the CICU over a 6 month period (Fig. 1)
- Data collected:
  - length of stay
  - enteral intake in the pre and post-operative periods
  - day of first oral feed
  - calories achieved in the ICU
  - incidence of NEC
- Feeding issues identified:
  - poor oral intake
  - gastric distress
  - esophageal reflux
  - chylothous effusions

Conclusions

- Neonates requiring single ventricle palliation and those undergoing complete repair such as with D-TGA are at risk for suboptimal nutritional outcomes that may increase risk of co-morbidities and length of stay
- Further investigation is underway to evaluate the effects of pre-operative feeding in all neonates and development of a standardized approach for current feeding issues

<table>
<thead>
<tr>
<th></th>
<th>D-TGA</th>
<th>HLHS</th>
</tr>
</thead>
<tbody>
<tr>
<td>N</td>
<td>13</td>
<td>11</td>
</tr>
<tr>
<td>Age on admission</td>
<td>1</td>
<td>&lt;1</td>
</tr>
<tr>
<td>LOS - CICU</td>
<td>19</td>
<td>18</td>
</tr>
<tr>
<td>LOS - hospital</td>
<td>18</td>
<td>29</td>
</tr>
<tr>
<td>Enteral feed pre-op (PO or NG)</td>
<td>11</td>
<td>0</td>
</tr>
<tr>
<td>First oral feed (DOL)</td>
<td>4</td>
<td>14</td>
</tr>
<tr>
<td>calories/kg/day on transfer to floor</td>
<td>88</td>
<td>86</td>
</tr>
<tr>
<td>Necrotizing Enterocolitis (NEC)</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Feeding issues</td>
<td>30%</td>
<td>73%</td>
</tr>
</tbody>
</table>

Figure 1. Patient Population

Results

- A comparison of the 2 groups demonstrated that 30% of all infants with D-TGA had feeding issues related to poor PO intake, gastric distress and esophageal reflux (Fig. 2)
- Greater than 70% of the infants with HLHS were found to have similar feeding issues
- None of the neonates with D-TGA required a G-tube, while 10% of the neonates with HLHS had G-tube placement

Next Steps

- Evaluation of oral motor skills of all infants in the Cardiac ICU by a specialized feeding team
- Liberalization of fluids in the post-operative period for infants in order to improve caloric intake
- Pre-operative PO/NGT feeding for neonates on PGE1
- Development of a standardized feeding protocol for infants with chylothous effusions
Fire in the MSICU: What do we do?

Project Team: Patricia Meehan MSN, RN, CCRN
Allison Haskell
Aimee Lyons PhD(c), RN, CPNP, CCRN, NE-BE, CPHQ
Catherine Allen MD

Objective(s):
1. To increase staff understanding of Fire Response responsibilities
2. Re-familiarize the Charge nurse to the responsibilities of the position in charge (PIC) role
   a. Increased knowledge of role
   b. Decrease anxiety associated with the role
3. Analysis challenges encountered during the evacuation of complex patients
4. Improve code red response scores

Background/Significance:
Although typically designated as the Person in Charge (PIC) during code red activations, senior leadership nurses in the MSICU remain apprehensive about performing this critical safety role. Even after multiple practice code reds no one has yet had a perfect score on the evaluation tool used for each practice session. There is no consistency with this vital role as each time a different charge nurse is involved. The MSICU has had two real code red activations and therefore know the importance of being comfortable in this role as it is the lead safety mechanism to ensure patient, family and staff safety.

Methods:
To provide a safe environment to demonstrate and process code red activation, we used simulation. We recreated a real MSICU code red and videoed the PIC response. We had a pre-education session prior to running the simulation to review, discuss, and analyze the roles and responsibilities of the PIC. Participants in the simulation were staff members who had never actively participated in a code red. A debriefing was held following the initial simulation to review how the participants processed events and made decisions, how obstacles were defined and how the PIC responded to challenges encountered. After the debrief another replication of the first scenario was completed with volunteers from the group. All charge nurses observed this second scenario thus ensuring that all had the opportunity to be involved.

Findings:
Participants verbalized less anxiety, increased knowledge and comfort in the PIC role. The simulation empowered the charge nurses to engage themselves in the scenario, and be the person in charge thus validating their expertise to perform this crucial role. Feedback from this session was overwhelmingly positive from all participants.
Implications/Next Steps:
Approximately six months following the initial simulation another code red simulation will be conducted with the same group of charge nurses to evaluate retention of the learned role. Evaluation of code red score cards will be used to evaluate the simulation education session and whether it is a successful method for increasing expertise in crisis management.
Fire in the MSICU: What Do We Do?

Patricia Meehan MSN, RN, CCRN, Allison Haskell, Alimee Lyons PhD(c), RN, CPNP, CCRN, NE-BE, CPHQ,
Catherine Allen MD

Background

- Although typically designated as the Person in Charge (PIC) during code red activations, senior leadership nurses in the MSICU remain apprehensive about performing this critical safety role.
- Even after multiple practice code reds, no one has yet had a perfect score on the evaluation tool used for each practice session.
- There is no consistency with this vital role as each time a different charge nurse is involved.
- The MSICU has had two real code red activations and therefore know the importance of being comfortable in this role as it is the lead safety mechanism to ensure patient, family, and staff safety.

Objectives

1. To increase staff understanding of Fire Response responsibilities
2. Re-familiarize the Charge nurse to the responsibilities of the position in charge (PIC) role
   a. Increased knowledge of role
   b. Decrease anxiety associated with the role
3. Analyze challenges encountered during the evacuation of complex patients
4. Improve code red response scores

Methods

- To provide a safe environment to demonstrate and practice code red activation, we used simulation. We recreated a real MSICU code red and filmed the PIC response.
- We had a pre-education session prior to running the simulation to review, discuss, and analyze the roles and responsibilities of the PIC.
- Participants in the simulation were staff members who had never actively participated in a code red.
- A debriefing was held following the initial simulation to review how the participants processed events and made decisions; how obstacles were defined and how the PIC responded to challenges encountered.
- After the debrief another replication of the first scenario was completed with volunteers from the group. All charge nurses observed this second scenario thus ensuring that all had the opportunity to be involved.

Findings

- Participants verbalized less anxiety, increased knowledge and comfort in the PIC role.
- The simulation empowered the charge nurses to engage in the scenario, and be the person in charge thus validating their expertise to perform this crucial role.
- Feedback from this session was overwhelmingly positive from all participants.

Implications & Next Steps

- Approximately six months following the initial simulation, another code red simulation will be conducted with the same group of charge nurses to evaluate retention of the learned role.
- Analysis of code red score cards will be used to evaluate the simulation education session and whether it is a successful method for increasing expertise in crisis management.
Roles for Nursing in Value-Based Care: CHICO High Risk Care Management Program

Project Team: Jeanne Mongillo BSN, RN, MPH  
Gwendolyn Wright BSN, RN  
Patti Newell BSN, RN  
Barry Zallen MD  
Ann Suny MBA  
Vijeta Bhambhani MS, MPH  
Laura Chandhok MPH

Objective(s):
To demonstrate a model of nursing care management for high-risk pediatric patients in a value-based care arrangement.

Background/Significance:
Value-based care is grounded in using innovative approaches to controlling costs of populations and improving healthcare quality. One of the areas in which nurses play a leading role is through innovative care management models for high-risk patients. At Boston Children’s Hospital, the Children’s Hospital Integrated Care Organization (CHICO) developed and implemented a Pediatric High Risk Care Management Program for many of the most medically complex patients covered under a value-based care arrangement. The goal of the program is to improve the lives of children with complex conditions by helping them remain as stable as possible and avoid clinical de-compensation, yielding improved health outcomes and quality of life, a better patient experience, and preventing hospitalizations and ED visits.

Methods:
Patients who are identified as potential candidates for the program are Blue Cross Blue Shield (BCBS) HMO patients who meet at least one of the three criteria noted in the table below, and whose primary care provider (PCP) is affiliated with Boston Children’s Hospital or the Pediatric Physicians Organization at Children’s (PPOC). Each PPOC practice has between 1 and 32 patients who meet one of these criteria.

<table>
<thead>
<tr>
<th>Criteria</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>High cost (2 years)</td>
<td>TME &gt;$20,000 each year for the last 24 months</td>
</tr>
<tr>
<td>Neuromuscular condition</td>
<td>Had an ICD-9 code for a neuromuscular complex chronic condition (CCC)</td>
</tr>
<tr>
<td>Technology assisted</td>
<td>Had an ICD-9 code for technology for the last 12 months</td>
</tr>
</tbody>
</table>
The CHICO High-Risk Care Management Program team reviews the list of patients meeting these criteria with the Primary Care Medical Home (PCMH) team to identify appropriate patients for outreach. Once a patient is enrolled in the program, a Nurse Care Manager (NCM) works with the patient’s family to arrange for a home visit and completes a comprehensive assessment.

**Findings:**

Patients who met the above criteria:

- Account for 1.25% of the overall BCBS risk population and 17% of Total Medical Expenses (TME)
- Have 3.5 times more ED visits and 20 times more admissions than the general BCBS risk population
- Average total yearly health care cost is $50,000/patient (vs. $3,000 for the general BCBS risk population)

The pilot phase included two primary care practices: Longwood Pediatrics and the Children’s Hospital Primary Care Center (CHPCC). As of September 30th, 2014, 51 patients in these two practices were identified via the above criteria and 1 patient was identified via recommendation by the PCP. Thirty-three of the identified patients (63.5%) were from Longwood Pediatrics and 19 (36.5%) were from CHPCC. Twenty-eight patients were approved by the PCMH for outreach, and of those, twenty-four patients (86%) were successfully contacted by the NCM. Fourteen patients (58.3%) consented to enroll in the program, and all fourteen (100%) received an initial comprehensive assessment by the NCM.

**Implications/Next Steps:**

A more comprehensive program evaluation is planned to assess relevant clinical outcomes for patients participating in the program. In FY2015, the program is continuing to expand to additional PPOC practices. Phase 1 will include Hyde Park Pediatrics, Greater Lowell Pediatrics, Bridgewater Pediatrics, and Framingham Pediatrics. Phase 2 consists of Holliston Pediatrics, Lexington Pediatrics, and Wareham Pediatrics.
Roles for Nursing in Value-Based Care: CHICO High Risk Care Management Program

Jeanne Mongillo, RN, BSN, MPH; Gwendolyn Wright, RN, BSN; Patti Newell, RN, BSN; Barry Zallen, MD; Ann Suny, MBA; Vijeta Bambhani, MS, MPH; Laura Chandhok, MPH

Objective
To demonstrate a model of nursing care management for high-risk pediatric patients in a value-based care arrangement.

Background/Significance
Value-based care is grounded in using innovative approaches to controlling costs of populations and improving healthcare quality. One of the areas in which nurses play a leading role is through innovative care management models for high-risk patients.

At Boston Children’s Hospital, the Children’s Hospital Integrated Care Organisation (CHICO) developed and implemented a Pediatric High Risk Care Management Program for many of the most medically complex patients covered under a value-based care arrangement.

Program Goal: To improve the lives of children with complex conditions by helping them remain as stable as possible and avoid clinical de-compensation, yielding improved health outcomes and quality of life, a better patient experience, and preventing hospitalizations and ED visits.

Methods
Patients who are identified as potential candidates are Blue Cross Blue Shield (BCBS) HMO patients who meet at least 1 of the criteria noted below, and whose primary care provider (PCP) is affiliated with Boston Children’s Hospital or the Pediatric Physicians Organization at Children’s (PPOC).

<table>
<thead>
<tr>
<th>Criteria</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>High cost</td>
<td>&gt;$20,000 annually for the last 24 months</td>
</tr>
<tr>
<td>Neuro muscular condition</td>
<td>Had an ICD-9 code for a neuromuscular complex chronic condition</td>
</tr>
<tr>
<td>Technology assisted</td>
<td>Had an ICD-9 code for technology for the last 12 months</td>
</tr>
</tbody>
</table>

The CHICO Care Management Program team reviews the list of potential patients with the Primary Care Medical Home (PCMH) team to identify appropriate patients for outreach. Once patients enrolled in the program, a Nurse Care Manager (NCM) works with the patient’s family to arrange for a home visit and complete a comprehensive assessment.

Case Study: Meet Sam
Sam is a 13 y/o male diagnosed with Duchene Muscular Dystrophy, a genetic disorder characterized by progressive muscle degeneration and weakness, and Autistic-Pervasive Developmental Disorder. He has been non-ambulatory and using a power wheelchair since age 9. He is an only child and lives with his involved and supportive parents.

The CHICO Nurse Care Manager (NCM) met with Sam’s parents in their home and identified multiple issues:

- Sam’s problems with mobility
  - NCM determined Sam needed a lift for the chair to ease moving from wheelchair to bed
  - NCM collaborated with Sam’s physical therapist from BCH neurology to submit the necessary paperwork to Sam’s insurance carrier for approval for the lift.

- Sam’s parents felt that some major renovations were needed in their bathroom to create easier wheelchair and shower access for Sam

- NCM identified need for Sam to obtain a slide board to aid in safe transfer from wheelchair to tub.

- NCM found a web resource specializing in affordable disability accessibility modification services.

- Sam’s need for additional PT and OT at home due to progressive upper extremity weakness
  - PT and OT provided a home safety evaluation to assist the family to manage Sam’s unstable mobility
  - NCM contacted BCBS to confirm Sam’s eligibility to receive this service
  - NCM collaborated with Sam’s PCMH Medical Home practice staff to initiate the necessary referral to activate the services.

- NCM facilitated locating a home care vendor to provide the additional home therapies

The NCM empowered Sam’s family with the tools to gain increased self-efficacy to improve the management of their son’s chronic illness. The NCM also collaborated with the care team to report findings and provide updates.

Sam remains stable at home, with no ED visits or hospitalizations related to his immobility issues, resulting in an improvement in quality of life.

Findings
The program launched with a pilot phase including two practices: Longwood Pediatrics and the Children’s Hospital Primary Care Center (CHPCC). Initial meetings with these two practices occurred during Spring/Summer 2014.

- Patients identified as potential candidates by algorithm
- Patients with agreement of CM Program and PCMH for outreach
- Patients consenting to participate in CM Program
- Comprehensive Assessment by NCM
- Active CM Program Patients (as of 10/1/2014)

52
28
16
18
14

Implications/Next Steps
A more comprehensive program evaluation is planned to assess relevant clinical outcomes for patients participating in the program. In FY2015, the program is continuing to expand to additional PCMH practices. The CHICO Care Management program is also looking at expanding the target population to include Medicaid patients.

Acknowledgements
The authors would like to thank the following individuals for their support: Nora Boukus (CHICO), Michele Sasso (CHICO), Ilana Zarrilla (CHICO Care Management Program), and the providers and medical home care coordinators from the pilot practices.
Ensuring Timely Refills of Baclofen Pumps: Importance, Implications and Measures

Project Team: Ann Morgan CPNP
Kristin Buxton CPNP
Sangeeta Mauskar MD
Jayne Rogers MSN RN

Objective(s):
1. To prevent baclofen pump patients from missing their pump refill, and prevent complications.
2. Monitor all patients’ alarm dates to ensure refill is performed well before the pump will become empty.
3. Present monthly tracking data to hospital QI committee.

Background/Significance:
The Intrathecal Baclofen Pump is an implanted device that requires refilling with Intrathecal baclofen at dose dependent intervals of every 1-6months. If a patient misses his refill, the abrupt discontinuation of IT baclofen will likely cause acute life threatening withdrawal. BCH has managed cases of baclofen pump withdrawal when patients have missed refill. Most of these admissions for withdrawal were patients managed by a non BCH provider. These admissions required lengthy ICP/ICU admissions.

Our program is lead by 2 PNP’s that are solely responsible for the management of baclofen pumps; with a goal of 100% timely pump refills. QI program suggested we make this our QI project.

Methods:
1. Only the 2 NP’s make dose adjustments to and refill the pumps, limiting ownership to the refills to us alone. Both of us share access to tracking data and keep this updated at all times.
2. Families are provided with written documentation each time a change is made to their pump. This documentation of the pump’s telemetry has the low reservoir alarm date reviewed and circled or highlighted. This is the date there will be 2ml left in the pump based on the current volume and dose.
3. We have established clinic visits at various BCH clinic sites, and use 3 satellites.
4. Appointment is made for next refill prior to leaving clinic.
5. We call families if they are 30 minutes late for a visit, and continue to call until we reach them to either ensure they are en route or to reschedule the missed visit. We document all attempts of contact.
6. Family will be reached by local police if we are unable to contact the family in a reasonable time frame to reschedule the refill appointment.
7. NPs review data and send results to QI program.
Findings:
Our Baclofen Pump Program patients managed here at BCH have not had a missed pump refill since 2010. The patients managed by us are now close to 120. Having 2 NPs lead the program with 24/7 coverage via pager has provided accountability, prevented admissions and adverse complications of missing a pump refill. (chart with data will be presented)

Implications/Next Steps:
Quarterly submission to QI committee.
Continued growth of program will require diligent maintenance and up keep of data.
Expand clinic space and resources to ensure access for patients and timely refill appointments.
Ensuring Timely Refills of Baclofen Pumps: Importance, Implications and Measures
Ann Morgan, CPNP, Kristin Buxton, CPNP, Sangeeta Mauskar, MD, Jayne Rogers, RN, MS

**Objective(s):**
1. Ensure timely refill of pump, thereby limiting complications.
2. Track all patients’ alarm dates to ensure refill is performed well before the pump will become empty.
3. Present monthly tracking data to hospital QI committee.

**Background/Significance:**
The Intrathecal Baclofen Pump is an implanted device that requires refilling at dose dependent intervals (every 1-6 months). If a refill is missed, the abrupt discontinuation of IT baclofen will likely cause acute life threatening withdrawal.

BCH has managed cases of baclofen pump withdrawal for many different reasons. These admissions require lengthy ICP/ICU admissions.

Baclofen Pump Program at BCH is lead by 2 PNPs that are solely responsible for the management of baclofen pumps; with a goal of 100% timely pump refills.

**Methods:**
1. Only the 2 PNPs make dose adjustments and refill the pumps, limiting ownership to the refills. Both share access to tracking data and keep this updated.
2. Families are educated and provided with written documentation re: date for next refill.
3. Program has established clinic visits at various Longwood clinic sites, and utilizes 3 satellites.
4. Appointment made for next refill before leaving clinic.
5. If patient is >30 minutes late for a visit, we continue to call until we reach them to ensure they are en route or to reschedule the missed visit.
6. If we are unable to contact the family in a reasonable time frame to ensure the refill is scheduled on time, we will utilize local police to assist in reaching the family.
7. NPs review data and send results to QI program.

**Findings:**
Our Baclofen Pump Program patients managed here at BCH have not had a missed pump refill since 2010. The patients managed by us are now close to 120. Having 2 NPs lead the program with 24/7 coverage via pager has provided accountability, prevented admissions and adverse complications of missing a pump refill. (chart with data will be presented)

**Implications/Next Steps:**
1. Quarterly submission to QI committee
2. Continued growth of program will require diligent maintenance and up keep of data.
3. Expand clinic space and resources to ensure access for patients and timely refill appointments.
From Worst to First: Journey to Medication Scanning Compliance in a Pediatric Emergency Department

Project Team: Michele Morin MSN
Shannon Manzi PharmD

Objectives:
1. Describe the implementation and evolution of medication scanning in the Pediatric Emergency Department (ED)
2. Identify medication error rates in the ED
3. Demonstrate compliance of medication scanning in the ED
4. List interventions that improved compliance with medication scanning in the ED

Background/Significance:
Safe medication administration is necessary to ensure quality healthcare. Nurses must administer medications according to the Five Rights – Right patient, Right Medication, Right Dose, Right Route and Right Time. Barcode medication administration systems were developed to assist nurses in reducing drug administration errors and the related costs and to improve patient safety. The effect of barcode-assisted medication administration (BCMA) with electronic medication administration record (eMAR) technology on the occurrence of medication administration errors was evaluated in the pediatric emergency department. One of the major factors found to contribute to the occurrence of medication errors was nursing compliance with performing BCMA at the bedside. Several interventions were implemented in the Emergency Department to improve nursing compliance with BCMA. Following these interventions, the rate of compliance of medication scanning in the Emergency Department has been above the recommended 90%. As a result, the rate of occurrence of medication errors in the Emergency Department has decreased since the introduction of barcode scanning.

Methods
- Hardwired Medication Scanners on COWS were converted to Wireless Scanners
- Information Technology Department has assisted in providing connectivity throughout the Emergency Department
- Education initiative on the proper use of scanners was provided to all RN’s
- Nursing staff was surveyed to identify barriers with medication scanning at the bedside
- Collaboration with ED Pharmacy Staff to investigate specific meds that were not readable by the scanning devices
- Individual feedback was provided to RN’s when their individual compliance fell below 80% during a given month
- Weekly reports of individual scanning compliance were posted for the entire ED nursing staff to see
Findings:
Since the interventions were initiated, medication scanning compliance by the nursing staff has reached the recommended 90% compliance on a sustained basis. The rate of actual medication errors in the Emergency Department has decreased and the rate of potential errors or “good catches” has increased. Therefore, the interventions used to promote compliance around the use of BCMA have had a positive impact on patient safety within the pediatric emergency department.

Implications/Next Steps:
- Continue to monitor BCMA compliance among the nursing staff
- Maintain feedback to individuals if their compliance rating falls below 90%
- Continue to publish weekly reports that identify nurses demonstrating both exceptional compliance and those needing to improve

References:
From Worst to First: Journey to Medication Scanning Compliance in a Pediatric Emergency Department
Michele Morin MSN, RN, CPEN, Shannon Manzi, Pharm D, NREMT

Objective(s):
- Describe implementation and evolution of medication scanning in the Emergency Department
- Identify trends in medication error rates compared with medication scanning rates in the Emergency Department
- Demonstrate compliance of medication scanning in the Emergency Department
- List interventions that improved compliance with medication scanning in the Emergency Department

Background/Significance:
- Safe medication administration is necessary to ensure quality healthcare
- Barcode medication administration systems were developed to assist nurses in reducing drug administration errors and the related costs and to improve patient safety
- Following these interventions, the rate of compliance of medication scanning in the Emergency Department has been above the recommended 90%
- As a result, the rate of occurrence of medication errors in the Emergency Department has decreased since the introduction of barcode scanning.

Methods:
- Wired Medication Scanners to Wireless
- IT consulted and entire Emergency Department was evaluated for connectivity
- Education of all RN’s
- Surveyed RN’s
- Collaborated with ED Pharmacy Staff, review of medications not scanned and bar code issues
- Acetaminophen/Ibuprofen pre-drawn syringes

Implications/Next Steps:
- Continue to monitor
- Maintain feedback to individuals
- Publish weekly compliance reports

References:
Beneficial Outcomes of Nursing Assessment for Caries Risk using an Electronic Caries Risk Assessment Tool in the Primary Care

Project Team: Tracy Myers BSN, RN, CPN, AE-C  
Michelle Fleck BSN, RN  
Jane Burgess BSN, RN  
Jenny Chan MS, PH  
Tami Chase RN  
Jennifer Cheng MD, MPH  
Abiola Faniyan MB, BS, MPH  
Man Wai Ng DDS, MPH

Objective(s):  
Describe how a nursing run program can decrease the risk of caries for the patients.  
Define methods that can assist in educating families in oral health.

Background/Significance: Early childhood caries (ECC) is the most common chronic condition among children in the United States. In recent years, the prevalence of ECC has increased from 15% to 28% among children 2 to 5 years old and nearly half of all children have experienced cavities before entering kindergarten. ECC disproportionately affects minority and low-income children who are also less likely to use oral health services, especially preventive dental care. Additionally, diet, oral hygiene practices and fluoride exposure impact children’s oral health. Yet, dental caries is a largely preventable disease if children are provided with early and consistent care. Families often do not access dental care for their children until they are 3 years old, at which point an opportunity for primary prevention has been missed. Primary care providers may see children as often as 13 times by their fourth birthday. Therefore, nurses have an opportunity to assess a child’s risk for caries cavities, offer preventive counseling during these well child visits, and potentially lower the prevalence of ECC.

Nursing staff at Boston Children’s Hospitals two primary care locations have been assessing caries risk during well-child visits. Primary Care at Longwood has been assessing children age 9 months to 3.99 years, While Primary Care at Martha Eliot Health Center has been assessing children age 9 months to 4.99 years. Both by completing a custom designed electronic nursing caries risk assessment tool (N-CAT) Nurses have been counseling families on caries prevention, applying fluoride varnish to medium and high caries risk children, and referring high risk children to dentistry. Assessment at two primary health care center locations started in September 2013. Nursing assessment using the N-CAT, educating families, has improved healthy behavior has improved patient risk of early childhood caries (ECC)
Method
Data from the N-CAT was retrieved through monthly automatic reporting. Caries risk assessment scores from patients with subsequent visits will be reviewed by chart audit using data extracted from an electronic medical record query system.

We will look at the overall score to see if there was improvement (lower score) and if so to see what behaviors had been modified since the patients last visit (i.e., decrease in juice consumption or brushing habits have changed) We will also look at demographic data about the patients and whether that has a statistically significant effect on the different in N-CAT results.

Findings:
Data was gathered from April 2013-December 2104 in one of the primary care locations and July 2013-December 2014 in the other. Data revealed that 1333 patients’ age 9 months to 4.99 years had at least two N-CATs performed at their well child visits, yielding 3297 visits. During the study period, we saw improvements in caries risk, with mean CRA1 values of 6.05 (SD=5.35, n=1202), CRA2 values of 4.04 (SD=4.94, n=1258), CRA3 values of 3.47 (SD=4.61, n=469), and CRT4 values of 3.01 (SD=4.91, n=122).

Further quantitative and qualitative analysis will be conducted to look at overall change in caries risk score, and what specific components of the N-CAT changed over time for individual patients.

Implications/Next Steps:
Nursing assessment using the N-CAT, educating families, applying fluoride varnish when at risk and referrals to dentistry has improved oral health habits and decreased patient risk of early childhood caries (ECC) at both primary care locations. We will continue to seek opportunities to improve the oral health of our patients, perhaps by developing a second N-CAT to screen for the oral risk of children greater than 4.99 years of age. We also look forward to publishing our work.

If this poster has been presented at a conference, which one: Poster presented at AAACN Conference Florida April 14, 2015
Beneficial Outcomes of Nursing Assessments for Caries Risk using an Electronic Caries Risk Assessment Tool in Primary Care

Tracy Myers BSN, RN, CPN, AE-C; Michelle Fleck BSN, RN; Jane Burgess RN, BSN; Tammy Chaser RN; Jennifer Cheng MD, MPH; Min-Ying DDS, BS; Akila Faizyan MBBS; MPH, Jenny Chan, MSPH; Kathryn Williams, MS

OBJECTIVES

- To describe the methods employed by a nursing run primary healthcare program to decrease caries risk in patients
- To define methods demonstrated to assist in educating families on oral health

BACKGROUND/SIGNIFICANCE

- Early childhood caries (ECC) is the most common chronic condition among children in the United States.
- The prevalence of ECC has increased from 10% to 28% among children aged 2 to 5 years old and nearly half of all children have experienced cavities before entering kindergarten.
- ECC disproportionately affects minority and low-income children.
- Diet, oral hygiene practices and fluoride exposure have been shown to positively impact children’s oral health.
- Dental caries are largely preventable if children are provided with early and consistent care.
- Families often do not access dental care for their children until they are 3 years old. At this point, an opportunity for primary prevention has been missed.
- Primary care providers may see children as often as 15 times before their fourth birthday. Therefore, nurses have an opportunity to assess a child’s risk for caries early, offer preventive counseling during these well child visits, and potentially lower the prevalence of ECC.

METHOD/DESIGN

- Automated monthly reports provided N-CAT data on visit-to-visit changes in Caries Risk Scores.
- Caries risk assessment scores from patients with subsequent visits will be reviewed by chart audits using data extracted from an electronic query system.
- Changes in caries risk scores will be studied to determine trends, improvements, determined by lower scores with subsequent visits, will be further analyzed to determine which behavioral changes may have resulted in decreases to the N-CAT scores.

RESULTS

Data gathered from April 2013 to December 2014 revealed 1333 patients aged 9 months to 4.99 years had at least 2 visits.

- Caries risk assessment and family teaching by nursing staff during WC visits result in significantly improved caries risk (as reflected in lower N-CAT scores, p<0.001) at subsequent visits.
- Nursing assessment using the N-CAT, educating families, applying fluoride varnish when at risk and referrals to dentistry has improved oral health habits and decreased patterns of early childhood caries (ECC) at both primary care locations.
- With each additional caries risk assessment and family teaching by nursing staff, parents report significantly improved oral hygiene habits (p<0.001).

DISCUSSION

- Caries risk assessment and family teaching by nursing staff during WC visits result in significantly improved caries risk (as reflected in lower N-CAT scores, p<0.001) at subsequent visits.
- Nursing assessment using the N-CAT, educating families, applying fluoride varnish when at risk and referrals to dentistry has improved oral health habits and decreased patterns of early childhood caries (ECC) at both primary care locations.
- With each additional caries risk assessment and family teaching by nursing staff, parents report significantly improved oral hygiene habits (p<0.001).

CONCLUSION

Nursing interventions show promise for promoting preventative dental health and improving oral hygiene for our patients in primary care.

Next Steps:

- Next steps will involve analyzing patient demographic and insurance data to determine whether these factors have statistically significant effects on the difference in N-CAT results.
- We will continue to seek opportunities to improve the oral health of our patients, perhaps by developing a second N-CAT to screen for the oral risks of children greater than 4.99 years of age.
- We look forward to publishing our work.
Quantifying and Qualifying Care Coordination in the Boston Children’s Hospital Ambulatory Cardiology Clinics

Project Team: Cheryl O’Connell MBA, RN, NE-BC, CPHQ
Richard Antonelli MD, MS
Hillary Bishop Kuzdeba MPH
Patricia Hickey PhD, MBA, RN, NEA-BC, FAAN
Jean Anne Connor PhD, RN, CPNP

Objective(s):
The primary objective of this project was to quantify and qualify care coordination in the cardiology ambulatory setting through the development of a standardized assessment tool.

Background/Significance:
Driven by a desire to reduce costs, cardiovascular nursing leadership and staff sought to identify the most efficient model of care coordination, both from a hospital and payer perspective. Ambulatory care nurses are challenged by the numerous direct and indirect activities that constitute their workload. Direct time caring for the patient is only one of the varied responsibilities to be considered when quantifying and qualifying the workload.

Methods:
In October 2009, the leaders and staff modified and piloted a tool originally developed for tracking care coordination in general pediatric practices. The tool was modified to capture care coordination activities specific to patients with cardiac problems, with a linkage to outcomes. In January 2011, the final version of the Cardiology Ambulatory Care Coordination Measurement Tool (CCMT) was implemented. The tool consists of 13 questions eliciting patient demographics and cardiac complexity, type of care coordination performed, level of competency required to perform coordination, the outcome, as well as anything which was prevented as a result of the care coordination. We also measured total time spent, and an assessment by staff of meeting the family’s needs. Reliability testing was conducted through the use of a series of vignettes with staff in the ambulatory area. For each of the content areas reliability was ≥.80.

Findings:
Each quarter data are collected for a 5-day period. Between November 2012 and September 2014, there were six data collection periods that captured 495 care coordination events. Each care coordination event (call) lasted approximately 15 minutes (range: 0-120). The cardiac complexity of the majority of patients was classified as mild (44%) or moderate (42%). Clinical management was the most common focus of the call (53%), while many focused on receiving lab results (18%) or prescriptions (20%). Staff reported that the most common outcomes were prevented visits to the emergency room (9%), scheduling of urgent appointments (17%), and
medication errors (10%). As a result of care coordination efforts, an estimated charge of $424,736 was averted.

**Implications/Next Steps:** Care coordination in ambulatory care is a critical component of optimizing patient outcomes and resource utilization. Evidence to inform hospital and payer stakeholders is necessary to implement and sustain effective and efficient staffing models to support indirect ambulatory care. Further examination will focus on care coordination linked outcomes and opportunities to improve utilization of care.

If this poster has been presented at a conference, which one: Poster presented at the 15th Annual International Symposium on Congenital Heart Disease, St. Petersburg, FL, February 2015.
Quantifying and Qualifying Care Coordination in Ambulatory Cardiology Clinics at Boston Children’s Hospital

Cheryl O’Connell MBA, RN, BSN, Richard Antonelli MD, Patricia Hickey PhD, MBA, RN, FAAN
Jean Anne Connor PhD, RN, CPNP

Background
- Care coordination has been defined as “a patient and family-centered, assessment-driven, team-based activity designed to meet the needs of children and youth while enhancing the caregiving capabilities of families.”
- Driven by a desire to reduce costs, cardiovascular nursing leadership and staff sought to identify an efficient model of care coordination from both a hospital and payer perspective.
- Inconsistent frameworks and care models in the ambulatory setting inhibit development of standardized practice.

Objective
- To develop a tool to quantify and qualify care coordination in the cardiology ambulatory setting.

Methods
- October 2009: A tool was developed for tracking coordination of care in a consistent format. The tool was used by staff as a pilot. Based on this experience, it was modified to describe care coordination with a linkage to outcomes.
- January 2011: The final version of the Cardiology Ambulatory Care Coordination Tool was implemented (Figure 5).
- 13 questions elicit patient demographics and cardiac complexity, type of coordination performed, level of competency required to perform coordination, the outcome and what was prevented as a result of the coordination, total time spent, and an assessment by staff of meeting the family’s needs.

Tool Validation
- In 2013, the tool was validated through the use of three “signatures” developed and evaluated by expert clinicians in the cardiology clinic.
- The expert evaluations were considered the “gold standard” and served as the comparison for the tools completed by staff.
- Validation revealed 86% agreement between the “gold standard” and staff on care coordination items.

Outcomes
- 496 care coordination events were assessed between November 2012 and September 2014.
- 44% of encounters were classified as mild and 52.3% as moderate or severe complexity.
- Clinical management was the most common focus with lab results/tests and prescriptions accounting for the majority of other calls (Figure 1).
- 76% of encounters met patient needs (Figure 2).
- 42% of encounters resulted in “preventable outcomes” (Figure 4).
- The most common preventable outcomes include: visits to the emergency room, scheduling of urgent appointments, and medication errors (Figure 4).
- Approximately $424,736 in patient charges was avoided due to care coordination (Figure 4).

Strategic Impact
- The measurement of care coordination in the ambulatory cardiology program is an important strategy to support and ensure optimal patient outcomes.
- The care coordination tool has enabled ongoing assessment of patient and family needs.
- Examining resource use and preventable outcomes has enabled us to measure the value of care delivery across the continuum for this complex population.
Improving Nurse-to-Nurse Handover of Care in the NICU Utilizing a Modified I-PASS Sheet

Project Team:
Deborah O’Dowd RN, CCRN
Julie Briere BSN, CCRN
Marie Bennet BSN, CCRN
Celeste Chandonnet BSN, CCRN
Laura Desilets BSN, CCRN
Tracie Howland BSN, CCRN
Kate McEachern BSN, CCRN

Objective(s):
To determine if using a revised I-PASS tool and providing standardized education regarding the tool will improve consistent professional communication in shift-to-shift handover of care between nurses

Background/Significance:
A failure in communication during transfer of patient care could directly threaten patient safety. The largest risk for miscommunication occurs during nurse-to-nurse handover of patient care. Implementation of a standardized model/template for patient care handover is a National Patient Safety Goal. The illness severity, patient summary, action list, situational awareness, and synthesis tool (I-PASS) was selected as the preferred method for patient care handover in our institution. Nurses identified lack of familiarity and extra time needed to complete the form as reasons for not using the I-PASS tool. This quality improvement project was undertaken to assess if the revised I-PASS tool and standardized education improved communication as measured by nurse evaluation and time spent in handover of patient care.

Methods:
With support from nurse leadership, all NICU nurses participated in this mandatory improvement activity using a modified I-PASS tool for patient care handover. Using the Plan-Do-Study-Act framework, we completed three cycles of I-PASS tool modifications, staff education, and measurement. Measurements during each cycle included nurse evaluation using a questionnaire and time spent, in minutes, during patient care handover. Covert measurements of pre and post shift-to-shift handover times were compared to assess impact of revised I-PASS tool on time spent in report.

Findings:
The use of the I-PASS tool decreased shift report times and nurse evaluation of the tool for handover of care has shown improved satisfaction with the tool. The modified I-PASS is now positively viewed by most nurses in our unit.
Implications/Next Steps:
Implementing the modified I-PASS tool improved our process for nurse-to-nurse handover of care. Quarterly measurements will determine if these findings can be sustained over time. Our future goal is to transition to an electronic version of the I-PASS tool. The electronic I-PASS tool will allow for the automatic transfer of patient data onto the form.

If this poster has been presented at a conference, which one: To be presented at the 2015 American Association of Critical Care Nurses’ National Teaching Institute and Critical Care Exposition, San Diego, CA, May 2015.
Improving Nurse-to-Nurse Handover of Care in the NICU Utilizing a Modified I-PASS Sheet

Deborah O’Dowd RN, CCRN, Celeste Chandonnet BSN, CCRN, Tracie Howland BSN, CCRN, Laura Desilets BSN, CCRN, Marie Bennet BSN, CCRN, Julie Briere BSN, CCRN, Kate McEachern BSN, CCRN

Background

- The illness severity, patient summary, action list, situational awareness, and synthesis tool (I-PASS) was selected as the preferred method for patient care handover at our institution.
- Lack of familiarity and extra time needed to fill out the I-PASS tool were identified by nurses as the reasons for not using the tool.

Purpose

- To assess if the revised I-PASS tool and a standardized education for the I-PASS tool could improve patient care handover as measured by nurse evaluation and time spent in minutes during shift report.

Methods

- With support from nursing leadership, all NICU nurses participated in this mandatory improvement activity using a modified I-PASS tool for patient care handover.
- Using the Plan-Do-Study-Act framework, we completed three cycles of I-PASS tool modifications, staff education, and measurement.
- Measurements during each cycle included:
  - Nurse evaluation using a questionnaire
  - Time spent, in minutes, during patient care handover
- Pre and post questionnaires were compared to assess nurse satisfaction.
- Covert measurements of pre and post patient care handover times were compared to assess the impact of revised I-PASS tool on time spent in report.

Findings

- The revised I-PASS tool has decreased shift report times and has improved the staff satisfaction with the tool.

Conclusions & Next Steps

- The modified I-PASS is now positively viewed by most nurses in our unit.
- Implementing the modified I-PASS tool improved our process for nurse-to-nurse handover of care.
- Quarterly measurements will determine if these findings can be sustained over time.
- Ultimate goal is to transition to an electronic version which will allow for the automatic transfer of patient data onto the electronic I-PASS tool.
- 72% of staff surveyed (51 out of 71) would like to utilize an electronic I-PASS tool.
Improving HPV Immunization Rates among Adolescent Boys and Girls

Project Team: Pamela Schubert-Bob MHA, RN  
              Tami Chase RN  
              Joanne Cox MD  
              Ingrid Katz MD MHSc  
              Yingna Liu AB  
              Taruna Banerjee MPH  
              Jenny Chan MSPH  
              Alexandra Epee-Bounya MD  
              Kathy Goggin PhD  
              Inyand Isong MD, MPH, SM  
              Ronald Samuels MD, MPH  
              Chong-Min Fu ScM  
              Aleixa Zonfrelli BS  
              Laura Bogart PhD  
              Mark Schuster MD, PhD

Objective(s):
1. Describe one way a clinic can improve the rates of their patients receiving HPV
2. List two improvements that can be done by any staff to increase the patients receiving the HPV by 14.

Background/Significance:
The HPV vaccine 3-dose series is recommended for children ages 11–12, and as early as age 9. In the U.S., HPV vaccine use is low. Only 37.6% of girls and 13.9% of boys aged 13–17 have completed the series.

Methods:
We developed an intervention that involved changing clinic systems and creating tools to improve patient-provider communication and patient knowledge about the vaccine. Components included posters and pamphlets, educating providers on communication strategies (e.g., motivational interviewing to address patient ambivalence about the vaccine), starting the vaccine at age 9 (when it competes with fewer vaccines), increasing evening shot visits, developing checkboxes in the EHR for ordering and establishing standing orders for administering doses 2 and 3, instituting appointment reminder cards, and building a system for tracking and reminding/rescheduling patients. We measured monthly rates of completion by the 14th birthday.
**Findings:**
We measured completion rates for 2,339 patients aged 13.00–13.99 years from 1/2013–9/2014. We established a mean rate of 29.8% (see Figure). From 1/2013–9/2013, there were 9 consecutive months in which significantly lower proportions of patients had the full series (special cause variation indicated by 9 points below the mean). Since 10/2013, the proportion increased and stabilized until 7/2014, after which, significantly higher proportions of patients had the full series (special cause variation indicated by 2 of 3 points beyond 2 standard deviations).

**Implications/Next Steps:**
By making changes at the patient-, provider-, and systems-levels, we had substantial improvements in HPV immunization rates. Our goal is to improve the completion rates over the next year.
Improving HPV Immunization Rates among Adolescent Boys and Girls

Background
- The HPV vaccine is recommended for children ages 11–12, and as early as age 9.
- In the U.S., only 37.6% of girls and 13.9% of boys aged 13–17 have completed the 3-dose series.
- Black and Latino adolescents and lower-income adolescents are more likely to initiate the vaccine than are White adolescents and those of higher income.
- Black adolescents are less likely and Latino adolescents are more likely to complete all 3 doses than are White adolescents.

Objectives
- To develop and implement a multi-component clinic intervention to improve HPV immunization rates among adolescent boys and girls at Boston Children’s Primary Care Clinics at Longwood and Martha Eliot.

Phase 1: Qualitative Work
- To learn about adolescent, parent, and provider perspectives on barriers to HPV immunization and possible interventions.
- 18 semi-structured interviews with nurses and focus groups (2) with 18 physicians.
- Semi-structured interviews with 24 parent/adolescent pairs (48 individual interviews).
- 12 Black and 12 Latino adolescents 12–17 years old and their parents.
- Within each racial/ethnic group, 6 boys and 6 girls.
- Half of Latino-parent interviews were in Spanish.

Table 1. Preliminary Themes from Phase 1

<table>
<thead>
<tr>
<th>Parent Barriers to HPV Immunization</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Financial concerns related to vaccine costs.</td>
</tr>
<tr>
<td>2. Lack of awareness or knowledge about HPV and its vaccine.</td>
</tr>
<tr>
<td>3. Lack of perceived need or importance of vaccination.</td>
</tr>
<tr>
<td>4. Fear of side effects or adverse reactions.</td>
</tr>
</tbody>
</table>

Phase 2: Develop and Implement Intervention
- We used qualitative findings to develop the intervention.

Table 2. Intervention Components from Phase 2

<table>
<thead>
<tr>
<th>Component</th>
</tr>
</thead>
</table>
| Increase knowledge and awareness of parents:
  - Educational handouts in English and Spanish
  - Posters in waiting areas, exam rooms, and suggesting areas
| Education providers:
  - Training on motivational interviewing to non-confrontational education
  - Addressing immunization and standard vaccination language
| Decrease physician barriers:
  - Clinic guidelines to simplify and standardize HPV screening and vaccination
  - Increase access:
  - Monthly reminders via clinic
  - Improve ordering of charts:
  - Vaccine order form for 2nd and 3rd doses in ORL
  - Improve scheduling, appointment planning:
  - Prompt reminders for doses
  - Patient tracking spreadsheet
  - Non-automated patient reminder calls
  - Phone calls for unscheduled missed appointments
| Monitor and implement follow-up:
  - Standing orders for adolescents who have not completed the series
  - Track clinic progress:
  - Implement quality measures and feedback data to clinics

Results
- We are tracking rates of HPV vaccine completion before the 14th birthday at both clinics.

Figure: Rate of HPV Vaccine Completion by 14th Birthday

1/2014: 1.6% of 9-year-olds who had a well-child visit received a dose of the HPV vaccine.

2/2014: After adopting the clinic-wide practice to start the series at age 9, 31.4% received a dose.
Optimizing Needle Pain Procedures: Collaboration between Nursing, Phlebotomy, and Child Life

Project Team: Lauren Smizer BS, CCLS  
Stephanie AbiAssaf BSN, RN  
Eliane Oliveira-Goncalves  
Suzanne Reidy MS, RN

Objective(s):
To determine the effectiveness of the 8 East approach to the hospital’s Needle Pain Management Protocol, which includes: treatment room use for blood draw, topical and oral medications for analgesia, and behavioral distraction techniques (BDT) for pediatric patients at Boston Children’s Hospital.

Background/Significance:
The 8 East approach to the Needle Pain Protocol requires that one staff phlebotomist, one clinical assistant, and one child life specialist collaborate at the beginning of the day shift to facilitate morning labs. Children receive oral and/or topical medications, 30-45 minutes prior to their blood draw, according to their developmental and biological age. Patients and families are escorted to the treatment room for the procedure. The clinical assistant provides holding techniques and the child life specialist provides coping and behavioral distraction techniques while the phlebotomist performs the lab draw procedure.

Methods:
For this quality improvement initiative, participants were chosen based on clinical requirements for morning lab draws as per inpatient cardiology medicine procedures. The effectiveness of the 8 East approach has been measured by analysis of a number of different variables. The variables considered were patient age, utilization of topical agent/analgesic, use of treatment room, time in treatment room, phlebotomy time, child life support, and parental presence. Data collection consisted of time patients spent in the treatment room, time the phlebotomist required to perform the procedure as well as what Needle Pain Protocol services were provided for the lab draw including use of topical medication, use of BDT, and parental support. Support for patients sometimes included preparation for the procedure as well as developmentally appropriate explanation of topical medications, and the use of comfort holds.

Findings:
391 patient encounters were recorded over three months. Participants were patients aged 0 days to 54 years who were patients admitted to 8 East that required morning lab draws from phlebotomy during the testing period. Identifying information was not obtained from participants. Average time in the treatment room was 5.8 minutes. Total average phlebotomy time was 2.4 minutes. 83% of patients required only a single stick.
Implications/Next Steps:
The findings support continuation of this initiative on 8 East. The project team is currently piloting a survey for parents/guardians to gain their perspective on the process for needle pain procedures on 8 East.
Optimizing Needle Pain Procedures: Collaboration Between Nursing, Phlebotomy, and Child Life

Lauren Smizer BS, CCLS, Stephanie AbiAssaf BSN, RN, Eliane Oliveira-Goncalves, Suzanne Reidy MS, RN, NE-BC

Background

- In 2010 the Inpatient Acute Care Cardiac Unit (8East) established a new approach to the hospital’s Needle Pain Management Protocol, which includes:
  - Treatment room use for blood draws
  - Topical and oral medications for analgesia
  - Behavioral distraction techniques (BDT)

Purpose

- To optimize the patient and family experience with blood draw procedures on 8East by providing holistic care, pain management, and empowering patients and their parents
- To combine productivity and efficiency with patient- and family-centered focus

Methods

- 8East team approach: RNs, clinical assistants, phlebotomist, child life specialist (CLS)
- All patients and families receive option for oral or topical medication to assist with pain management
  - Toctin
  - LMX (Topical Lidocaine)
  - Synera (Lidocaine Tetracaine)
- Patients transported to treatment room accompanied by CLS or clinical assistants
- Support for patients includes:
  - Preparation/Education for procedure
  - Behavior Distraction Techniques
    - Assorted Visuals
    - Breathing Techniques
    - Comfort Measures
    - Diversional Talk
- 8East approach was tracked (Fall 2013) by the following variables:
  - Patient age
  - Utilization of topical agent/analgesic
  - Use of treatment room/ time in treatment room
  - Length of procedure
  - Child life support and parental presence

Findings

- 391 patient encounters were recorded over a 3 month period
  - Included patients admitted to 8 East that required morning lab draws from phlebotomy during the testing period
  - No identifying information was recorded
- Participants ranged in age from 0 days to 54 years
- 82.6% of patients over 6 months of age received topical
- 78.8% of patients received sucrose
- 81.7% of patients received support from CLS
- Average treatment room time: 5.8 minutes (without care cluster)
  - Average treatment room time: 6.1 minutes (with care cluster)
  - Average length of procedure: 2.4 minutes
- 83% of patients required only a single stick

Implications / Next Steps

- Findings support continuation of this initiative on 8East
- The project team is currently piloting a survey for parents/guardians
  - To gain their perspective on the process for needle pain procedures on 8East
- Survey is measuring the following:
  - Child’s previous experience
  - Parental Presence
  - Satisfaction with oral and topical medications
  - Satisfaction with components of 8 East approach
  - Overall satisfaction
  - Comments
Predictors of Infection in Proximal Tibia Allograft and Allograft-Prosthesis Composite Reconstructions

Project Team: Santiago Lozano-Calderon MD, PhD
Sara Swaim BSN, RN
Amy Federico PNP
Christian Sampson MD
Megan Anderson MD
Mark Gebhardt MD

Objective(s):
Reconstruction of the proximal tibia after wide resection is challenging. Advocates argue advantages include bone preservation, biological reconstruction that facilitates reattachment of the extensor mechanism and other soft-tissue structures, metallic prosthesis use delay, and distal femoral growth plate preservation. Complications are numerous, infection being the most common. It is believed that infection correlates with the poor soft-tissue coverage seen in this area.

Background/Significance:
This investigation evaluates our experience with 32 patients, analyzing incidence and management of infection.

Methods:
32 patients (17 males, 15 females), average age 13 years old (2-18) who underwent 33 allograft proximal tibia reconstructions were evaluated for occurrence of infection. Potential predictors of infection, categorized as pre and perioperative factors, were analyzed in terms of risk for developing allograft infection.

Findings:
Twenty-three patients had Osteosarcoma and the remaining 9 patients had Ewings sarcoma. Most reconstructions (21) were osteoarticular allografts. Fifty percent of patients had flap coverage at the index procedure. Allograft survival rate was 73% at 4.6 years. Allograft infection rate was 15%. Two patients were converted to a metallic endoprosthesis, 2 to a new allograft, and 1 to a knee disarticulation. Most common complications were wound dehiscence (48%), non-unions (33%) and allograft fractures (24%). No predictors of infection could be identified. A trend of lower WBC was noted in patients who developed infections; however not statistically significant. All patients who developed infections had a previous wound dehiscence. 56% of wound dehiscences had a positive bacterial culture. However, only 30% progressed to allograft infection.
Implications/Next Steps:
Despite being unable to identify predictors of infection, we recommend nutritional and immunological optimization of patients before surgery and a low threshold for flap coverage at the index surgery. Wound dehiscence is a common complication for which aggressive surgical treatment is recommended to avoid progression to allograft infection. Allograft infection reduction rate as high as 25% can be attained with this approach.

If this poster has been presented at a conference, which one: International Society of Paediatric Oncology (SIOP), which was held in Toronto, Canada, October 22-25, 2014.
PREDICTORS OF INFECTION IN PROXIMAL TIBIA ALLOGRAFT AND ALLOGRAFT-PROSTHESIS COMPOSITE RECONSTRUCTIONS

Lozano-Calderon, SA; Swalm, SO; Federico, A; Sampson, C; Anderson, ME; Gehart, MC

Introduction
Reconstruction of the proximal tibia after wide resection of malignant tumors is challenging. Advocates of reconstruction argue advantages to include: 1) bone preservation, 2) biological reconstruction that facilitates rematuration of the extensor mechanism and other soft-tissue structures, 3) metallic prosthesis increase in size, and 4) iliac femoral growth plate preservation in the pediatric population. However, complications are numerous, infection being the most common. It is believed that infection correlates with the poor soft-tissue coverage seen in this area. This investigation evaluates our experience with 22 patients, analyzing incidence and management of infection as well as predictors of infection in this population.

Materials and Methods
Under IRB approved protocol, 22 patients (17 males, 15 females, average age 13 years old (2-18 years old) who underwent 22 proximal tibia allograft reconstructions were evaluated for occurrence of infection. Potential predictors of infection categorized as pre-and post-operative factors were analyzed in terms of risk for developing allograft infection.

Pre- and Post-operative Information

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Body Mass Index (BMI) at diagnosis</td>
<td>21.44 (Range: 14 – 25.5)</td>
</tr>
<tr>
<td>Body Mass Index (BMI) at resection</td>
<td>21 (Range: 10.1 – 25)</td>
</tr>
<tr>
<td>Pre-operative Albumin</td>
<td>4.1 mg/dl (Range: 3.1 – 6.8 mg/dl)</td>
</tr>
<tr>
<td>Pre-operative WBC</td>
<td>5.65 x 10^3 (Range: 1.5 – 10.2 x 10^3)</td>
</tr>
<tr>
<td>Patients with 2 or more Medications for pre-operative chemotherapy</td>
<td>21/22 (56%)</td>
</tr>
<tr>
<td>Patients with 4 or more Medications for pre-operative chemotherapy</td>
<td>12/22 (24%)</td>
</tr>
<tr>
<td>Surgical time</td>
<td>7.73 hours (Range: 5 – 11 hour)</td>
</tr>
<tr>
<td>Estimated Blood Loss</td>
<td>497.8 ml (Range: 150 – 1300 ml)</td>
</tr>
<tr>
<td>Average Days to resume Chemotherapy</td>
<td>21.2 days (Range: 12 – 46 days)</td>
</tr>
<tr>
<td>Patients with 2 or more Medications for post-operative Chemotherapy</td>
<td>19/22 (57%)</td>
</tr>
<tr>
<td>Patients with 4 or more Medications for post-operative Chemotherapy</td>
<td>14/22 (42%)</td>
</tr>
</tbody>
</table>

Results
Twenty-three patients had Osseous CT as the primary disease (4 metastatic at presentation). The remaining 9 patients had Ewing’s sarcoma (2 metastatic at presentation). Most reconstructions (21) were performed allografts. Fifty percent of patients had flap coverage at the index procedure. Allograft survival rate was 72% at 4.8 years. Allograft infection rate was 15%. Two patients were converted to a metallic endoprosthesis, 2 to a new allograft, and 1 to a knee disarticulation. Most common complications were wound dehiscence (44%), non-union (32%) and allograft fractures (14%). No predictors of infection could be identified due to the number of infections. There was an expected trend of lower WBC in patients who developed infections; however, not statistically significant. All patients with wound infections had a previous wound dehiscence. 50% of cultures from dehisced wounds had a positive bacterial culture. However, only 30% progressed to allograft infection.

Complications

<table>
<thead>
<tr>
<th>Complication</th>
<th>No Wound Dehiscence</th>
<th>Wound Dehiscence</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wound dehiscence</td>
<td>27</td>
<td>25</td>
</tr>
<tr>
<td>Non-union</td>
<td>16</td>
<td>26</td>
</tr>
<tr>
<td>Allograft fracture</td>
<td>14</td>
<td>12</td>
</tr>
</tbody>
</table>

Conclusions
Despite being unable to identify predictors of infection, based on our experience, we recommend nutritional and immunological optimization of patients before surgery and a low threshold for flap coverage at the index surgery. Wound dehiscence is a common complication for which we recommend aggressive surgical treatment to avoid progression to allograft infection. Allograft Infection reduction rate as high as 25% can be attained with this approach.
Optimizing Outcomes: Improving the Health of the Work Environment in the Cardiovascular Program

Project Team:  
Jason Thornton MSN, RN, CCRN, CPHQ  
Michelle Hurtig MSN, RN  
Cheryl O’Connell MBA, BSN, RN, NE-BC  
Courtney Porter MPH  
Jean A. Connor PhD, RN, CPNP  
Patricia Hickey PhD, MBA, RN, FAAN

Objective(s):  
The objectives of the project were: to assess the health of the work environment in the cardiovascular program and to identify areas requiring initiatives based on survey results.

Background/Significance:  
The American Association of Critical Care Nurses (AACN) has identified systemic behaviors that maintain patient safety, ensure optimal outcomes, and support excellence in nursing practice. These behaviors are organized into six evidence-based standards: skilled communication, true collaboration, effective decision making, appropriate staffing, meaningful recognition, and authentic leadership.

Methods:  
In 2010, 2013 and 2014, four areas across the cardiovascular program (cardiac intensive care unit, cardiac operating room, catheterization laboratory, ambulatory clinic, acute cardiac unit) distributed an electronic survey to interdisciplinary (RN, MD, administrative) staff. The survey developed by the AACN provides a quantitative assessment based on the six standards of the AACN’s healthy work environment (HWE) framework. An overall score was provided as well as standard-specific scores. Scoring guidelines ranged from 1-2.99 Needs Improvement, 3-3.99 Good, to 4.00-5.00 Excellent.

Findings:  
In 2010, the median HWE score for the cardiovascular program was 3.60 with a range of 3.50 to 4.00. In 2013, the median HWE score was 3.38 with a range of 2.81 to 3.63. The 2013 median scores for skilled communication and true collaboration were 3.31 (range: 2.48, 3.76) and 3.40 (range: 2.69, 3.49). For effective decision making and appropriate staffing, scores were 3.79 (range: 3.14, 3.83) and 3.56 (range: 3.50, 4.08). In 2013, the meaningful recognition and authentic leadership median scores were 2.98 (range: 2.31, 3.20) and 3.69 (range: 2.76, 3.89). In the most recent survey in 2014, the median HWE score was 3.49 with a range of 2.93 to 3.73. The median scores were 3.43 (range: 2.49, 3.66) for skilled communication and 3.47 (range: 2.64, 3.55) for true collaboration. For effective decision making and appropriate staffing, the median scores were 3.84 (range: 3.26, 3.93) and 3.38 (range: 3.26, 4.07). The median scores
were 3.16 (range: 2.72, 3.55) for meaningful recognition and 3.21 (range: 3.23, 3.93) for authentic leadership.

**Implications/Next Steps:**
Overall, staff perceived the health of the work environment in the Cardiovascular Program to be “Good” and sustained across time. Opportunities for improvement were identified in the standards of skilled communication and meaningful recognition. Targeted responses continue to be implemented to address areas requiring improvement, especially in skilled communication and meaningful recognition. Our results highlight that maintaining and sustaining a healthy work environment is a continuous process and an activity for which all health care team members are accountable. Maintaining a culture of health in the work environment will continue to be a priority within cardiovascular programs as it is critical to ensuring optimal patient outcomes.

If this poster has been presented at a conference, which one: Poster presented at the 15th Annual International Symposium on Congenital Heart Disease, St. Petersburg, FL, February 2015.
Optimizing Outcomes: Monitoring the Health of the Work Environment in the Cardiovascular Program

Jason Thornton MSN, RN, CPHQ, NE-BC; Michelle Hurtig MSN, RN; Cheryl O’Connell MBA, BSN, RN, NE-BC; Courtney Porter MPH; Jean Anne Connor PhD, RN, CPNP; Patricia Hickey PhD, MBA, RN, FAAN

Background
- The American Association of Critical Care Nurses (AACN) has identified systemic behaviors that maintain patient safety, ensure optimal outcomes, and support excellence in nursing practice.
- These standards represent evidence-based and relationship-centered principles of professional performance.

Purpose
- To assess the health of the work environment in the cardiovascular program.
- To identify areas requiring initiatives based on survey results.

Methods
- AACN web-based survey provides a quantitative assessment based on the six standards of the Healthy Work Environment (HWE) framework (Fig. 1).
- Consists of 18 questions.
- Provides an overall aggregate score of the six standards.
- Aggregate scores for each standard.
- Individual scores for the three items within each standard.
- The mean average of each score offered is on a scale of 1-5:
  - 1-2.59 Needs Improvement
  - 3-3.99 Good
  - 4-5.00 Excellent

Survey was electronically mailed in 2010, 2013, and 2014 to five areas across the cardiovascular program.
- Cardiac Intensive Care Unit, Cardiac Operating Room, Catheterization Laboratory, Ambulatory Clinic, Acute Care Cardiac Unit.
- Interdisciplinary staff were invited to complete the survey.

Results
- In 2010, the median HWE score for the cardiovascular program was 3.50 (range: 3.50 - 4.00) (Fig. 2).
- In 2013, the median HWE score was 3.38 (range: 2.81 - 3.65).
- In 2014, the median HWE score was 3.49 (range: 2.93-3.73).

- Targeted initiatives implemented:
  - Skilled Communication: New distribution lists were created to increase and streamline communication between NPs, sedation nurses, and echo schedulers.
  - Appropriate Staffing: Added ~42 Full-Time Employees (FTE) across the cardiovascular program.
  - Meaningful Recognition: All areas submitted candidates quarterly for the hospital-wide Employee of the Month award.
  - Within the last year, three staff in the cardiovascular program have received this award.
  - Meaningful Recognition: Nurses' Week events are organized in ways determined to be meaningful by nursing staff.

Conclusions
- Overall, staff perceived the health of the work environment in the cardiovascular program to be "Good" and sustained across time.
- Targeted responses continued to be implemented to address areas requiring improvement, especially skilled communication and meaningful recognition.
- Results highlight that maintaining and sustaining a healthy work environment is a continuous process and an activity for which all health care team members are accountable.
- Maintaining a culture of health in the work environment will continue to be a priority within the cardiovascular program as it is critical to ensuring optimal patient outcomes.

Next Steps
- Healthy Work Environment is now a corporate goal at Boston Children's Hospital.
  - As such, the survey was implemented hospital-wide in 2014.
- The cardiovascular program and across the hospital will be re-surveyed in spring 2015.
HWE: Listening to Our Constituents

Project Team: Charlene Waryasz BSN, RN
               Corey McManus BSN, RN
               Lauren Bombardier RN

Objective(s):
The objectives for this quality improvement project are fourfold: 1) to enhance the health of
the work environment; 2) to improve retention of staff nurses in the Medical Surgical Intensive
Care Unit (MSICU); 3) to increase staff morale; and 4) to support new staff nurses during
transition into the MSICU.

Background/Significance:
The MSICU is a challenging and stressful environment for a newly hired nurse. Complexity of
patient care emanates from the critical conditions of patients, the involvement of highly
stressed parents, the presence of family members during a time of critical illness and the high
paced workflow demands of each nurse’s assignment. The MSICU has a staff of over 150 nurses
with differing backgrounds, styles of communication, and expertise. Fitting in as a new staff
member is difficult as there is much to learn before assuming responsibility for the care of a
critically ill patient in a new environment. The expectations could be overwhelming. We knew
that we had to examine the situation and design strategies to retain new staff nurses while
easing their transition and not scaring them away during the first month of orientation.

Methods:
The staff of the MSICU completed the AACN’s Healthy Work Environment (HWE) survey.
Although the unit’s score indicated good health, staff members wanted to know the reasons for
the score. An outside researcher facilitated focus groups to explore the how and why of
responses provided by the staff. These conversations were audio-recorded and transcribed
verbatim. Analysis of the data was completed by the outside researcher and shared with the
Recruitment and Retention (R & R) committee. In the MSICU, the R & R committee is
responsible to design creative interventions to help improve the HWE scores related to
satisfaction and to help create an all-inclusive unit.

Findings:
The data showed that nurses placed a high degree of importance on being appreciated and
respected as a bedside nurse. The three concerns most frequently verbalized were: 1) the lack
of recognition of staff members by both management and peers, 2) management personnel not
visible on the unit, especially during the off-shift, and 3) the tight staffing numbers.

R & R Committee Actions:
The first concern the R & R committee addressed was to increase recognition of peers by
incorporating the Way to Shine Employee Recognition program, instituting the MSICU Nursing
Recognition Award, and most recently, adding the MSICU Employee of the month award.
Another strategy introduced to show appreciation and recognition of the staff’s hard work was the ice cream socials and pizza parties each weekend of the month. These were self-funded by the R & R’s Sunshine fund.

The second concern addressed was the off-shift visibility of management. Once management was informed of the concern, they instituted evening office hours and regularly scheduled off-shift walk rounds. These initiatives have enhanced the communication between the staff and management.

The third concern prompted a thoughtful review of staffing needs and numbers. Each of the vacancies was filled, travelers were engaged to fill some positions and LOAs, and seasonal incentive programs were established. Finally, additional staff was hired to accommodate staff members waiting to reduce their hours.

R & R On-going Activities to Support Staff:
1. A Buddy system was created to facilitate the transition to the unit. Each new staff member is assigned a buddy that serves as a liaison between new and current staff, a companion for lunch, a resource when questions arise, and guide for attending events. The Buddy provides the new member a MSICU survival pack that contains a calculator, pen, Chap Stick, gum, and other essential tools.
2. Each spring the committee organizes a Spring Social to allow staff to interact with each other outside the work environment. These events help to facilitate a cohesive team.
3. Oversee the Sunshine fund that was established to remember staff during a difficult time such as; illness, surgery, or loss of a close family member. The Sunshine fund is maintained by quarterly bake sales, sunshine snack drawer, MSICU apparel sold ($1 from each item sold goes to the fund), and raffles at events.

Implications/Next Steps:
The R & R committee will complete another survey within the next year to ensure that the initiatives are producing desired results and that no additional issues have exist that require attention.
Healthy Work Environment: Listening to Our Constituents

Charlene P. Waryasz BSN, RN, CCRN, Lauren Bombardier RN

Background/Significance
- Medical-Surgical Intensive Care Unit (MSICU) is a challenging and stressful environment for a newly hired nurse
- Complexity of patient care emanates from:
  - Critical conditions of patients
  - Involvement of highly stressed parents
  - Presence of family members during a time of critical illness
  - High-paced workflow demands of each nurse's assignment
- MSICU has a staff of over 150 nurses with diverse backgrounds, styles of communication and expertise
- Fitting in as a new staff member is difficult as there is much to learn before assuming responsibility for the care of a critically ill patient in a new environment
  - Expectations could be overwhelming
- We knew that we had to examine the situation and design strategies to retain new staff nurses while easing their transition

Objectives
- To enhance the health of the work environment
- To improve retention of staff nurses in the MSICU
- To increase staff morale
- To support new staff nurses during transition into the MSICU

Methods
- MSICU staff completed the American Association of Critical-Care Nurses’ Healthy Work Environment (HWE) survey
- Although the unit's score indicated good health, staff members wanted to know the reasons for the score
- An outside researcher facilitated focus groups to explore the how and why of responses provided by the staff
  - Those conversations were audio-recorded and transcribed verbatim
- Analysis of the data was completed by the outside researcher and shared with the Acuity and Transition (R & R) committee
- In the MSICU, the R & R committee is responsible to design creative interventions to help improve the HWE scores related to satisfaction and to help create an all-inclusive unit

Findings
Three Concerns Most Frequently Verbalized:
1. The lack of recognition of staff members by both management and peers
2. Management personnel not visible on the unit during the off-shift
3. Tight staffing numbers

R & R Committee Actions
- Increase recognition of peers by incorporating:
  - Way to Shine Employee Recognition Program
  - MSICU Nursing Recognition Award
  - MSICU Employee of the Month Award
- To show appreciation and recognition of the staff's hard work, ice cream socials and pizza parties were done on a weekend of the month
- Self-funded by the R & R's Sunshine fund
- Management was informed of the concern
- Instituted evening office hours and regularly scheduled off-shift walk rounds
- These initiatives have enhanced the communication between staff and management
- Thoughtful review of staffing needs and numbers
  - Each of the vacancies was filled
  - Travelers were engaged to fill LDAs
  - Seasonal incentive programs were established
  - New staff was hired to accommodate staff members waiting to reduce their hours

On-going Activities to Support Staff
- Buddy system was created to facilitate the transition to the unit
  - Each new staff member is assigned a buddy that serves as a liaison between new and current staff a companion for lunch, a resource when questions arise and guide for attending events
- Each spring the committee organizes a Spring Social to allow staff to interact with each other outside the work environment
  - Helps to facilitate a cohesive team
- Overseas the Sunshine fund that was established to remember staff during a difficult time such as illness, surgery, or loss of a close family member
  - Maintained by quarterly bake sales, sunshine snack drawer and MSICU apparel sales

Implications / Next Steps
- R & R committee will complete another survey within the next year to ensure that the initiatives are producing desired results and that no additional issues have exist that require attention

Boston Children’s Hospital Cardiovascular and Critical Care Services
Charlene.Waryasz@childrens.harvard.edu
Standardizing New Tracheostomy Education Across the Continuum

Project Team: Sara Wells MSN, RN, CPN, CWOCN  
Daphne Munhall RRT, NPS  
Susan Hamilton MS, RN, CCRN, CWOCN  
Tracheostomy SME Group

Objective(s):  
Develop a standardized process to provide comprehensive discharge education for patients and families of children with a newly placed tracheostomy.

Background / significance:  
Discharging patients home with a new tracheostomy is the responsibility of the nurse and other key multidisciplinary staff. Our goal is to ensure that patients/families have all of the necessary equipment and education to facilitate a safe transition back into the home. A lack of standardization in the process of new tracheostomy care teaching as well as the resources available needed to effectively educate patients and families was identified. We identified a need for system improvements for new tracheostomy teaching across the continuum.

Methods:  
The Tracheostomy Subject Matter Expert (SME) Group was established emulating the model of other successful SME groups within the institution. The group membership includes CNSs, APNs, Respiratory Therapists, Inpatient RN’s from units that care for new tracheostomy patients, ORL Clinic RNs and Clinical Education and Informatics (CEI) representatives. The group first inventoried and reviewed all existing documents. Some documents were updated and new educational materials and resource documents were created. A dedicated tracheostomy web site was then created to house all of the information and teaching materials in one place. Trach champions from each unit were identified. Education was completed with these champions who then educate staff on their units. A chart audit of documentation of discharge education was completed by members of the SME Group on all patients discharged since the new process has been in place to assess the effectiveness of the new process.

Findings:  
Fourteen patients have been discharged home from Boston Children’s Hospital with a new tracheostomy between January 2014 and February 2015. Patients transferred to another facility prior to discharge were not included in the data collection. Nine major components of discharge education and preparation were audited. Documentation of education of suctioning, self-inflating bag use, tracheostomy care, tracheostomy change, ventilator management, CPR and final “dress rehearsal” were all > 90% compliant. Documentation of travel off the unit and car seat challenge when applicable were 67% and 80% compliant respectively.
Implications/Next Steps:
The results of the chart audits indicate that the key components of new tracheostomy education were successfully completed and documented in a majority of all discharged patients. There continues to be opportunities for documentation improvements. Next Steps for the Tracheostomy SME Group include: making improvements to the website to enhance navigation of care and teaching materials, provide more targeted education for staff, and develop a measurement plan to audit 7 and 30 day re-admissions of newly trached patients.
Standardizing New Tracheostomy Education Across the Continuum
Sarah Wells MSN,RN,CPN,CWO CN, Daphne Munhall RRT, NPS, Susan Hamilton MS, RN, CCRN, CWO CN

Background
- On average, the hospital encountered 405 tracheostomy days per month and 133 tracheostomy per day (see figure 1).
- Patients with a new tracheostomy require in-depth education prior to discharge.
- Our goal is to ensure that patient/families have all the necessary equipment and education to facilitate a safe transition back into the home.
- A lack of a standardized process and educational resources to educate patients and families was identified within the inpatient programs.

Objective
- Develop a standardized process to provide comprehensive discharge education for patients and families of children with a newly placed tracheostomy.

Methods
- Established a Tracheostomy Subject Matter Expert (SME) Committee with membership that includes CNGs, APNs, Respiratory Therapists, Inpatient RNs, ORL clinic RNs, MDs, and Clinical Education and Informatics (CEI).
- Reviewed all existing tracheostomy-related documents.
- All documents were updated and new educational and resource documents were developed. New resources were introduced in all inpatient areas.
- A Tracheostomy Website within eLibrary was created to easily access all educational materials (see figure 2).
- Chart audits of all patients discharged home since January 2014 were completed to assess documentation compliance of new tracheostomy teaching process.

Figure 1. Daily Trach Patients

<table>
<thead>
<tr>
<th>Date</th>
<th>Monday</th>
<th>Tuesday</th>
<th>Wednesday</th>
<th>Thursday</th>
<th>Friday</th>
</tr>
</thead>
<tbody>
<tr>
<td>01/01/2014</td>
<td>10</td>
<td>12</td>
<td>15</td>
<td>18</td>
<td>20</td>
</tr>
<tr>
<td>01/02/2014</td>
<td>8</td>
<td>10</td>
<td>13</td>
<td>15</td>
<td>17</td>
</tr>
<tr>
<td>01/03/2014</td>
<td>6</td>
<td>8</td>
<td>11</td>
<td>13</td>
<td>15</td>
</tr>
</tbody>
</table>

Figure 2. Tracheostomy Website

Figure 3. DC Audit Compliance

Findings
- 14 patients have been discharged from BCH with a new tracheostomy between January 2014 and February 2015.
- Nine major components of discharge education and preparation were audited (see figure 3).
- Documentation of education of suctioning, self-inflating bag use, tracheostomy care, tracheostomy change, ventilator management, CPR, and final “dress rehearsal” were all >90% compliant. Documentation of travel unit and car seat challenge when applicable were 67% and 80% compliant.

Implications/Next Steps
- There continues to be opportunities for documentation improvements.
- Next steps for the Tracheostomy SME Committee include:
  - Make improvements to the website to enhance navigation of care and teaching materials.
  - Provide more targeted education for staff.
  - Develop a measurement plan to audit 7 and 30-day re-admissions of newly trached patients.
  - Work with CEI to develop a discharge education documentation grid in EMR.

Tracheostomy SME Committee

<table>
<thead>
<tr>
<th>Name</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>Smith, Amy</td>
<td>RN</td>
</tr>
<tr>
<td>Doherty, Tim</td>
<td>RN</td>
</tr>
<tr>
<td>Munhall, Daphne</td>
<td>RRT</td>
</tr>
<tr>
<td>Wells, Sarah</td>
<td>MSN, RN, CPN</td>
</tr>
<tr>
<td>Hamilton, Susan</td>
<td>MS, RN, CCRN</td>
</tr>
<tr>
<td>Caswell, Lisa</td>
<td>RN</td>
</tr>
<tr>
<td>Inspection, Marie</td>
<td>RN</td>
</tr>
<tr>
<td>Beatty, Jeremy</td>
<td>RN</td>
</tr>
<tr>
<td>Carlson, Holly</td>
<td>RN</td>
</tr>
<tr>
<td>Smith, Morgan</td>
<td>RN</td>
</tr>
<tr>
<td>Thompson, Claire</td>
<td>RN</td>
</tr>
<tr>
<td>Callan, Emily</td>
<td>RN</td>
</tr>
<tr>
<td>McFarland, Maria</td>
<td>RN</td>
</tr>
<tr>
<td>Smith, Megan</td>
<td>RN</td>
</tr>
<tr>
<td>Belau, Sarah</td>
<td>RN</td>
</tr>
</tbody>
</table>

* Tracheostomy SME Committee Co-Chairs
Emergency Medical Identification for Patients at Risk for Bladder Rupture: A Boston Children’s Hospital Quality Improvement Initiative

Project Team: Vivian Williams MSN, RN, MT(ASCP), CPNP
Michelle McDonald MSN, RN
Rosemary Grant RN
Emilie Johnson MD
Manneh Ghazarians MS
Caleb Nelson MD

Objective(s):
1. To develop a formal process to increase involvement of high risk urology patients in care with an EMI bracelet program.
2. To gain an understanding of the patient’s experience, increase education and give them ownership of their urologic condition.

Background/Significance:
Emergency medical identification (EMI) medical alert bracelets are a tool used with pediatric patients diagnosed with adrenal insufficiency and life threatening food allergies, as a means to improve parental education and medical provider awareness. In pediatric urology, patients who have had closure of the bladder neck, implantation of an artificial urinary sphincter, or augmentation cystoplasty are an at risk population not currently wearing EMI. However, these patients could potentially benefit from utilizing this form of identification. If an attempt is made at accessing the bladder in patients who have had closure of the bladder neck, there is a risk for damage to the closure and infection. Without deactivation of an artificial urinary sphincter when attempting to access the bladder, urethral damage may occur and the risk for severe, life-threatening infection is increased. Patients who have had augmentation cystoplasty are at an increased risk for bladder perforation. Signs of bladder perforation may be subtle, especially in patients with concomitant medical issues such as spina bifida. Delay in the diagnosis of bladder perforation may lead to severe illness and even death. If emergency medical providers are aware of these possible issues in urology patients, the potential exists to improve timely care in an urgent situation, and even prevent catastrophic complications.

Methods:
After consulting with medical experts, a patient experience survey was created to capture the patient’s diagnosis, frequency of wearing the bracelet, and suggested improvements. EMI bracelets were disseminated to high risk patients and feedback was collected by electronic quality improvement survey 6 weeks after receiving the bracelet.
Findings:
Of the 18 qualifying patients, 10 successfully responded to the survey administered through RedCap, a secure, web-based application hosted at BCH. The responses highlighted that patients are aware of their specific diagnosis and that the bracelet, although helpful, is uncomfortable to wear.

Implications/Next Steps:
We will continue surveying patients at scheduled time points in the coming year and evaluate the long-term impact of the EMI bracelet. In the future, outcomes of this project may be expanded to additional diagnoses and clinics, and used to assess the impact on infection rates, catheterizations, and/or delayed diagnosis of bladder perforation.

References
Emergency Medical Identification for Patients at Risk for Bladder Rupture: A Boston Children’s Hospital Quality Improvement Initiative
Vivian Williams, MSN, RN, MTA(ASCP), CPNP; Michelle McDonald, MSN, RN, CPNP; Rosemary Grant, RN; Emilie Johnson, MD; Manneh Ghaizarians, MS; Caleb Nelson, MD

Background:
In pediatric urology, patients who have had closure of the bladder neck, implantation of an artificial urinary sphincter, or augmentation cystoplasty are at risk for bladder rupture. These patients could potentially benefit from utilizing this form of identification.

Serious consequences can occur if these patients are not managed appropriately in an urgent situation. For example:

- If an attempt is made at accessing the bladder in patients who have had closure of the bladder neck, there is a risk for damage to the closure and infection.
- Without deactivation of an artificial urinary sphincter when attempting to access the bladder, urethral damage may occur and the risk for severe, life-threatening infection is increased.
- Patients who have had augmentation cystoplasty are at increased risk for bladder perforation. Signs of bladder perforation may be subtle, especially in patients with concomitant medical issues such as spina bifida. Delay in the diagnosis of bladder perforation may lead to severe illness and even death.

Methods:
- EMI bracelets were disseminated to high risk patients and feedback was collected by electronic quality improvement survey 6 weeks, 3 months, and 6 months after receiving the bracelet.

Findings:
- Of the 33 qualifying patients, 16 successfully responded to the survey administered through RedCap, a secure, web-based application hosted at BCH.
- The responses highlighted that patients are aware of their specific diagnosis and that the bracelet, although helpful, is uncomfortable to wear.
- Patient responses were equally split between never wearing the bracelet and wearing it every day.
- However, patients reported that they would recommend the bracelet to a friend with a similar medical condition.

Objectives:
- To develop a formal process to increase involvement of high risk urology patients in care with an emergency medical identification (EMI) bracelet program.
- To gain an understanding of the patient’s experience, increase education, and give ownership of their urologic condition.

Patient Population:
Patient populations include patients with:
- Bladder neck closure
- Artificial urinary sphincter
- Augmentation cystoplasty

Implications:
- We will continue surveying patients at scheduled time points in the coming year and evaluate the long-term impact of the EMI bracelet.
- In the future, outcomes of this project may be expanded to additional diagnoses and clinics, and used to assess the impact on infection rates, catheterizations, and/or delayed diagnosis of bladder perforation.
Vascular Access Management in the Neonate with Congenital Heart Disease awaiting Cardiac Surgery

Project Team: Michael Greenlee BSN, RN, CCRN
Jean Connor PhD, RN, CPNP

Objective(s):
The purpose of the study was to analyze the approach to vascular access in neonates born with congenital heart disease with the focal point being on the time frame before cardiac surgery. The primary goal of the study was to determine if there is a significant difference in peripheral access utilization in patients who do not have central access before cardiac surgery.

Background/Significance:
Vascular access in the pediatric cardiac intensive care unit is imperative for drug administration and diagnostics. The neonate with congenital heart disease awaiting cardiac surgery has many vascular access needs before surgery, therefore, many vascular access sites are utilized. Acquiring vascular access in the neonate with congenital heart disease is a frequent challenge; the challenge becomes greater as more sites are utilized, leaving less vascular access available through the course of the patient’s hospital stay. The CICU does not have formal criteria or recommendations for the type of access a neonate requires while waiting for cardiac surgery. Hospital policy recommends use of central lines for patients who require certain medications or continuous infusions, but do not have requirements for central access based upon other vascular access demands.

Methods:
A retrospective electronic medical record search and data collection of 26 patients with variable congenital heart diseases awaiting cardiac surgery was conducted. The following variables were measured: diagnosis, number of peripheral IV and venous access attempts, presence of central and arterial lines, CAMEO score, length of stay, average days waited until surgery, birth weight, and central line infection data.

Findings:
Among the 26 patients studied in the pediatric cardiac intensive care unit, patients who did not have a central venous line or arterial line before placed before cardiac surgery had significantly more peripheral vascular access attempts. Patients without a central venous line or arterial line were 95% more likely to have a venous puncture. The incidence of phlebotomy attempts was 20 times greater for patients without a central line or arterial line. Diagnosis, birth weight, CAMEO scoring, or length of stay were not predictive of vascular access management for the studied patients.
Implications/Next Steps:
Acuity based or diagnostic criteria for vascular access management would help to ensure a more consistent approach to patient care. The short and long term impact of sub-optimal peripheral venous preservation and utilization on patient outcomes, their families, resources, and costs need to be measured.
Vascular Access Management in the Neonate with Congenital Heart Disease awaiting Cardiac Surgery

Michael R. Greenlee BSN, RN, CCRN, Jean A. Connor PhD, RN, CPNP

Background
- Vascular access in the pediatric cardiac intensive care unit is imperative for drug administration and diagnostics.
- The neonate with congenital heart disease awaiting cardiac surgery has many vascular access needs before surgery.
- The Cardiovascular Intensive Care Unit (CICU) does not have formal guidelines for neonatal vascular access.
- Hospital policy recommends use of central lines for patients who require certain medications or continuous infusions, but does not have requirements for central access based on other vascular access demands.

Objective
- To describe vascular access in neonates born with congenital heart disease prior to cardiac surgery.
- To determine if there is a significant difference in peripheral access utilization in patients who do not have central access before cardiac surgery.

Methods
- A retrospective review of 26 patients with variable congenital heart diseases awaiting cardiac surgery was conducted.

Results
- Patients without a central venous line or arterial line were 95% more likely to have a venous puncture.
- The incidence of phlebotomy attempts was 20 times greater for patients without a central line or arterial line.
- Patient wait time before surgery was not significantly different between the two groups.
- Diagnosis did not impact presence of an arterial line or central venous line.
- Patient birth weight was not significantly different among the groups: average difference = 0.3 kg.
- Average CAMEO scores were not significantly different among the groups.
- Average length of stay was 9.1 days higher in patients without a central or arterial line.

Limitations
- Study was performed retrospectively.
- Failed phlebotomy attempts are rarely recorded in the Electronic Medical Record (EMR).
- Failed IV insertion attempts are inconsistently recorded in the EMR.

Conclusions
- Among the 26 patients studied in the CICU, patients who did not have a central venous line or arterial line placed before cardiac surgery had significantly more peripheral vascular access attempts.
- Diagnosis, birth weight, CAMEO scoring, and length of stay were not predictive of vascular access management for the studied patients.

Future Implications
- Acuity based or diagnostic criteria for vascular access management would help ensure a more consistent approach to patient care.
- The short and long term impact of sub-optimal peripheral venous preservation and utilization on patient outcomes, their families, resources, and costs need to be measured.

Table 1. Patients With and Without Central Venous or Arterial Lines

<table>
<thead>
<tr>
<th>Procedure</th>
<th>N</th>
<th>Patients With a Central Venous Line or Arterial Line</th>
<th>Patients Without a Central Venous Line or Arterial Line</th>
</tr>
</thead>
<tbody>
<tr>
<td>HLI, Single Venous Line</td>
<td>13</td>
<td>6</td>
<td>7</td>
</tr>
<tr>
<td>Coarctation of the Aorta</td>
<td>4</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>Transposition of the Great Arteries</td>
<td>2</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Trans-Aortico</td>
<td>1</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>OA with Ventricular Septal Defect</td>
<td>2</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>Shone’s Critical Aortic Stenosis, Sub Aortic Stenosis</td>
<td>3</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>Tetralogy of Fallot with Pulmonary Atresia</td>
<td>1</td>
<td>0</td>
<td>1</td>
</tr>
</tbody>
</table>

Table 2. Comparison of Peripheral Vascular Access Attempts

<table>
<thead>
<tr>
<th>Procedure</th>
<th>Patients With a Central Venous Line or Arterial Line</th>
<th>Patients Without a Central Venous Line or Arterial Line</th>
<th>Average Difference</th>
</tr>
</thead>
<tbody>
<tr>
<td>Average No of Peripheral Vascular Access Attempts</td>
<td>3.8</td>
<td>3.4</td>
<td>0.4</td>
</tr>
<tr>
<td>Average No of Phlebotomy Attempts</td>
<td>0.9</td>
<td>0.9</td>
<td>0.0</td>
</tr>
<tr>
<td>Average No of Attempts</td>
<td>3.0</td>
<td>3.6</td>
<td>0.6</td>
</tr>
<tr>
<td>Average Days From Admission to Surgery</td>
<td>3.6</td>
<td>3.6</td>
<td>0.0</td>
</tr>
</tbody>
</table>

Figure 1. Variables Studied

- Diagnosis
- Average Days Waited until Surgery
- Number of Peripheral IV Attempts
- Total Number of Peripheral Vascular Access Attempts
- Presence of a Central Line
- Presence of an Arterial Line
- CAMEO Score
- Birth Weight
- Length of Stay
- Central Line Infection Date

Figure 2. Average Number of Peripheral Sites Utilized

- Patients With a CVP or Art Line
- Patients Without a CVP or Art Line

Boston Children’s Hospital Cardiovascular and Critical Care Services

Michael Greenlee@childrens.harvard.edu
Reduce Time to IV Antibiotic Administration in Patients Diagnosed with Probable Sepsis – A Lean Six Sigma Green Belt Project

Project Team: Jennifer Treseler MSN, RN, CPN
Kate Donovan PhDc, MBA, BS
Elliot Melendez MD
Patti Mantell MSN, RN, NE-BC, CPHQ
Gabriella Howard BS
Jean Gouthro RN, CPN
Kristin Bedard RN
Jill Hark RN
Jim Ceurvels PharmD

Define Phase
This process improvement project analyzed antibiotic administration to the septic patient utilizing the **Lean Six Sigma DMAIC** (Define, Measure, Analyze, Improve, Control) process. The Lean Six Sigma Process states that, for success, it is critical to **brainstorm** with the multidisciplinary team, it is valuable to get the **voice of the customer**, and it is important to utilize Lean Six Sigma tools, such as **SIPOC, top down, cause and effect, fishbone**. It is also essential to go to the **Gemba** (place where the action happens).

Hospitalized patients are at risk for sepsis and with progression could develop hypotension/shock. Mortality rates can be negatively impacted if there are delays in recognition and administration of antibiotics. Children who receive IV antibiotics <60 minutes from recognition of shock show improved survival, decreased length of stay, and decreased potential for transfer to a higher level of care.

**Goal statement:** to decrease the amount of time from order to administration of IV antibiotics in patients with sepsis by 20% within 4 months on MPS units

Measure and Analyze Phase
We measured antibiotic delivery time by reviewing sepsis events via ICU evals and STATs on 7W, 9E, 9S for a year prior to the project with the mean time from antibiotic order to administration being 68 minutes. The team also identified a **Quick Win** and added IM ceftriaxone to the sepsis order set. Staff identified delivery of STAT meds to the floor as a possible barrier so we performed a detailed review of the pharmacy processes regarding STAT meds. After tracking 16 couriers delivering STAT meds on various shifts, our results showed a mean delivery time of 37secs. We also decided that we needed to educate staff RNs and residents about sepsis and the importance of timely antibiotic delivery.
Improve Phase
We reached out to nurse leaders on each unit as well as the chief resident. With the help of nursing leadership, we recruited sepsis champions on each unit. We provided educational inservices to the floor RNs and residents by providing in-services and one-on-one education. The residents were shown the sepsis order set which pharmacy had helped us develop. We also highlighted the sepsis trigger tool – which we had piloted on one of the units for 2 months.

Three months after we implemented our improvement strategies, we analyzed the data and which showed a 26% decreased in time from antibiotic order to administration with a mean time of 50 minutes.

Control Phase
- **Ongoing educational inservices** to the wards regarding trigger tool, sepsis huddle and sepsis order set
- **Ongoing education to MDs**
- **Feedback to** the wards regarding their improvement
- **Feedback from** the wards regarding their experience with the trigger tool, sepsis huddle and sepsis order set
- **Hospital-wide rollout** of trigger tool and sepsis huddle
Background:
Hospitalized patients are at risk for sepsis and with progression could develop hypotension/shock. Mortality rates can be negatively impacted if there are delays in recognition and administration of antibiotics. Children who receive IV antibiotics <60 minutes from recognition of shock show improved survival, decreased length of stay, and decreased potential for transfer to a higher level of care.

**MEASURE AND ANALYZE PHASES:**

A measurement of antibiotic delivery time was performed by reviewing sepsis events via ICU evaluations and STATs on 7 West, 9 East, and 9 South for a year prior to the project with the mean time from antibiotic order to administration being 68 minutes.

Staff identified delivery of STAT meds to the floor as a possible barrier so we performed a detailed review of the pharmacy processes regarding STAT medications.

The team also identified a Quick Win and added IM ceftriaxone to the sepsis order set.

**IMPROVE PHASE:**

Three months after we implemented our improvement strategies, we analyzed the data and which showed a 26% decreased in time from antibiotic order to administration with a mean time of 50 minutes. Antibiotics ordered STAT increased to 70%.

**CONTROL PHASE:**

- Ongoing educational in-services to the wards regarding trigger tool, sepsis huddle, and sepsis order set.
- Ongoing education to MDs feedback to the wards regarding their improvement.
- Feedback from the wards regarding their experience with the trigger tool, sepsis huddle, and sepsis order set.
- Hospital-wide rollout of trigger tool and sepsis huddle.

**Goal statement:** To decrease the amount of time from order to administration of IV antibiotics in patients with sepsis by 20% within 4 months on Medicine Patient Services Units at Boston Children’s Hospital.

This process improvement project analyzed antibiotic administration to the septic patient utilizing the Lean Six Sigma DMAIC (Define, Measure, Analyze, Improve, Control) process. The Lean Six Sigma Process states that, for success, it is critical to brainstorm with the multidisciplinary team, it is valuable to get the voice of the customer, and it is important to utilize Lean Six Sigma tools, such as SIPOC, top down, cause and effect, fishbone. It is also essential to go to the Gemba (place where the action happens).
RESEARCH POSTERS
Consortium for Congenital Cardiac Care Measurement of Nursing Practice (C4-MNP): Phase 1

Investigators: Jean Anne Connor PhD, RN, CPNP
Sandra Mott PhD, RN, CPNP
Patricia Hickey PhD, MBA, RN, FAAN

Purpose/Question/Aims:
The primary purpose of the Consortium for Congenital Cardiac Care Measurement of Nursing Practice (C4-MNP) is to conduct a four phase process to identify national pediatric cardiovascular nursing measurement. The second purpose is to assemble a group of researchers, administrators and clinicians with expertise in pediatric congenital heart disease (CHD) nursing to participate in benchmarking quality nursing care activities that contribute to improved outcomes in pediatric cardiac patients. The aim of phase I is to describe the current state of pediatric cardiovascular nursing measurement (structure, process, and outcome measurement) in free-standing children’s hospitals across the country.

Background/Significance:
Little work currently quantifies nurses’ contribution to safe, effective, efficient, equitable and timely patient/family centered care. Quality nursing care is critical for children as their care encompasses unique developmental/physiological needs that require specialized expertise. Children with CHD exemplify this fact. Although nursing care costs are major hospital expenses, little attention has been given to examining and measuring nursing activities that contribute to patient outcomes.

Methods:
Phase 1 used a qualitative descriptive method interviewing nursing leaders from 22 centers. Each interview lasted approximately 1 hour and data saturation was achieved. Data were analyzed using conventional content analysis.

Results:
All sites reported participating in external quality collaboratives. All used some type of measurement to evaluate patient care and agreed that cardiac ICU nursing care is unique. Currently, global nursing metrics initially designed for adults are being adapted for use in pediatric cardiac units. These include sternal wound infection, readmission to ICU, medication events, pressure ulcers, and nutrition. Leaders concurred that cardiovascular nurses possessed unique attributes and capability to interpret and respond sensitively to both overt and covert changes in status. The leaders listed the following traits as ones that characterized their nurses: “being knowledgeable about defects and usual course,” “able to anticipate...be proactive,” “critically think and act,” “able and willing to deliver highly skilled nursing care,” “engaged...heightened awareness of meaning of subtle change,” “understand fragility of patient and rapidity of decompensation,” “act autonomously,” “heightened ability to synthesize the situation and be proactive.” In addition, they noted that nurse satisfaction and retention
rates in the CICU were consistently higher than in other areas of the hospital. All the leaders enthusiastically supported the concept of a dashboard of quality metrics for nursing in the pediatric cardiovascular program.

**Implications:** Information generated from this study is guiding the development of a quality dashboard measuring outcomes affected by nursing care. Seven key topic areas have been identified for measurement: clinical deterioration, care of the adult CHD patient, family/patient centered care, nutrition, pain management, prevention of pressure ulcers (device and non-device related) and healthy work environment for nursing staff. These measures will be tested and used for benchmarking across institutions in Spring 2015. The ability to identify key performance measures and to articulate and benchmark the value of care delivered by nurses in the health care environment is central to improving quality patient/family centered care and reducing cost.

If this poster has been presented at a conference, which one: Poster presented at the 2014 Northeast Pediatric Cardiology Nurses Association Annual Conference, Boston, MA, October 2014
Consortium for Congenital Cardiac Care
Measurement of Nursing Practice (C4-MNP) - Phase I

Jean Connor PhD, RN, CPNP, Sandra Mott PhD, RN-BC, CPN, Angela Green PhD, APN, Carol Larson MPH, Patricia Hickey PhD, MBA, RN, FAAN

Background

- The majority of nurse sensitive outcome indicators relate to adult care.
- Process of understanding, examining, and measuring caring behaviors that are safely nursing and that contribute to positive patient/family outcomes has been minimal.
- Children’s health care encompasses unique developmental and physiological variables, suggesting the need for specialized expertise.
  - Children born with congenital heart disease exemplify this fact explicitly.

Purpose

- To establish a national identification of pediatric cardiovascular nursing measurement with a goal of benchmarking nursing care activities that contribute to improved outcomes in a highly complex environment and population of patients.
- To bring together a community of pediatric researchers, administrators, and clinicians with expertise in the nursing care of children with congenital heart disease to form a strong network committed to rigorous measurement of quality care.

Phase I Aim

- Describe the current state of pediatric cardiovascular nursing measurement (structure, process, and outcome measurement) in freestanding children’s hospitals across the country.

Methods

- Qualitative descriptive study
  - Nurse leaders from freestanding children’s hospitals in the United States with active (annual volume of 50 or more congenital heart surgeries) pediatric cardiovascular programs

Data Collection/Analysis

- The nurse leader and colleagues from 22 sites participated in one phone interview lasting 90-70 minutes.
- All data was transcribed verbatim and without identifying information.
- Following confirmation of the written transcript, the data was analyzed using conventional content analysis.

Phase I Findings

N=22 Cardiovascular Programs

- Current state of cardiovascular quality measures
  - Among the 22 centers, all programs described ongoing measurement.
  - Some programs described a long standing program of measurement at the unit level. Many described increased activity over the last 2-3 years.
  - Many programs were now moving to using dashboards to reflect quality measures.

- Participation in national collaboratives central to ensuring quality nursing care
  - “Quality of nursing care means looking at those nurse sensitive measures. But also, what was our contribution to the improvement of patient care outcomes?”

Cardiovascular nurses are unique and hold attributes of being

“knowledgeable about defects and usual course”

“able to anticipate...be proactive”

“able to critically think and act”

“able and willing to deliver highly skilled nursing care”

“engaged...heightened awareness of meaning of subtle change”

“able to understand fragility of patient and rapidity of decompensation”

“able to act autonomously”

The health of the work environment and retention of nurses plays a critical role in supporting quality nursing care

“For quality...[low] turnover and engagement of leadership...the more leadership becomes engaged with the bedside, the better things seem to move.”

“If the communication is better, the understanding becomes better.”

Ongoing data collection

- Participants described variation in how quality data was collected.
- Few programs reported hospital appointed quality improvement staff who organized and supported collection.
- Most units described a combined approach with some hospital level support, but most of the data collection is occurring through unit staff.

Characteristics of Quality in Pediatric Cardiovascular Programs (CVP)

- Healthcare Delivery
  - Structure
  - Process
  - Outcome

- Evaluation of Care
  - CVP Based
  - Unit Based

Phase II – Metric Development

June - August 2013

- Utilizing the information gained from phase I work, 20 programs agreed upon measurement in 7 topic areas.

<table>
<thead>
<tr>
<th>Topic Area</th>
<th>Structure</th>
<th>Process</th>
<th>Outcome</th>
<th>Balancing</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nutrition</td>
<td>X</td>
<td>X</td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>Pressure Injury</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Work Environment</td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Clinical Deterioration</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pain</td>
<td></td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Patient/Family-Centered Care</td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Adult Congenital Heart Disease (ACHD)</td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Fall 2014

- Phase III (pilot testing) of 11 measures across 11 pediatric cardiovascular programs

*Funded by Boston Children’s Hospital Program for Patient Safety and Quality and the American Association of Critical Care Nurses

Jean.Connor@childrens.harvard.edu
Complexity Assessment and Monitoring to Ensure Optimal Outcomes (CAMEO) Acuity Across Cardiovascular Nursing

Investigators:  
Jean Anne Connor PhD, RN, CPNP  
Christine LaGrasta MSN, RN, CPNP-PC/AC  
Courtney Porter MPH  
Carol Larson MPH  
Patricia Hickey PhD, MBA, RN, FAAN

Purpose/Question/Aims:  
The objective of this study was to develop an efficient tool that comprehensively measures complex care performed by pediatric cardiac intensive care (CICU) and acute care cardiac nurses.

Background/Significance:  
Efforts to capture nursing workload have focused on quantifying the number of nursing activities and the time required to perform these tasks. Existing tools do not account for many of the “invisible” activities comprising critical thinking and clinical decision making, leading to an incomplete assessment of the cognitive workload of bedside nurses. Past efforts to measure workload focused on adult care and do not encompass activities unique to pediatric nursing care in intensive care units. As a result, there is a need for assessments that effectively capture the cognitive workload of nurses as it pertains to the care of critically ill infants and children.

Methods:  
The Complexity Assessment & Monitoring to Ensure Optimal Outcomes (CAMEO) was developed to measure the cognitive workload of pediatric intensive care nursing: the intellectual processing of patient information that drives performance and decision-making. Cognitive workload is quantified by level of complexity: the skill, concentration, and level of surveillance required of nurses and physicians to provide care to a patient or group of patients. The CAMEO consists of 15 domains of care, each including a number of care items representing nursing assessment, monitoring, and management. The total score from the domains is used to classify the complexity of nursing care. Classifications range from I to V. In Classification I nursing assessment, monitoring and management are focused on maintaining goal hemodynamics and coordination of care/teaching/anticipatory guidance for transition to non-ICU level care. Classification V patients require intensive care nursing assessment, monitoring and management. A number of interventions/procedures may be necessary to achieve/maintain goal hemodynamics. Coordination of care/teaching/anticipatory guidance requires medical/surgical team consults, patient/family teaching and support to foster a family centered care environment. Patient is hemodynamically unstable and outcome is uncertain.

The length of the original tool limited the ability for sustained daily use. Thirty-five care items on the CAMEO were identified as standard of care for all patients admitted to the Cardiac
Intensive Care Unit (CICU) and Acute Care Cardiac Unit. Standard of care complexity level scores were totaled to establish a baseline score. During March to August 2014, the CAMEO was used daily and completed once per shift by the bedside RN. Nurses identified nurse-specific patient care activities conducted over the course of their shift.

**Results:**
Between March – August 2014, 10,739 CAMEOs were completed (2,216 for CICU; 8,523 for Acute Care Cardiac Unit). During the observation period, the percentage of CAMEOs ≥3 rose by 19% for the CICU (from 62.9% to 81.9%) and by 19.9% for the Acute Care Cardiac Unit (from 49.7% to 69.6%).

**Implications:**
CAMEO is a nursing measurement tool focusing on the complexity of cognitive workload of nursing care for patients and their families. Use of the CAMEO for pediatric cardiovascular patients revealed a consistently complex level of nursing care across the cardiovascular program.

If this poster has been presented at a conference, which one: Poster presented at the 15th Annual International Symposium on Congenital Heart Disease, St. Petersburg, FL, February 2015.
Complexity Assessment & Monitoring to Ensure Optimal Outcomes (CAMEO)™
Acuity Across Cardiovascular Nursing

Jean Connor PhD, RN, CPNP, Christine LaGrasta MS, RN, CPNP-PC/AC, Courtney Porter MPH, Carol Larson MPH, Patricia Hickey PhD, MBA, RN, FAAN

Background Significance
Complexity Assessment & Monitoring to Ensure Optimal Outcomes (CAMEO)™
- Measures cognitive workload: the intellectual processing of patient information that drives performance and decision making.
- Quantifies the complexity of pediatric nursing care: the skill concentration, and level of surveillance required of nurses and physicians to provide care to a patient or group of patients.

CAMEO Domains of Care
1. Monitoring
2. Interventions Medications
3. Vasoactive IV Medications
4. Continuous IV Medications
5. Ventilatory Support
6. Nursing Assessment
7. Procedures/Testing in the ICU
8. Reeducation
9. ADLs/Self-Adopted Care
10. Transfers/Admissions/Transport
11. Inpatient Coordination of Care/Teaching/Anticipatory Guidance
12. Discharge Planning/education

Methods
- Thirty-five items on the CAMEO were identified as standard of care for all patients admitted to the 29-bed Cardiac Intensive Care Unit (ICU) and 41-bed Acute Care Cardiac Unit.
- Standard of care complexity level scores were totaled to establish a baseline score.
- March – August 2014:
  - Used daily
  - Completed once per shift by bedside RN
  - Nurses identified nurse-specific patient care activities conducted over the course of their shift.

Cardiovascular and Critical Care Nursing Science

Results
- Between March – August 2014, 10,739 CAMEO’s were completed:
  - 2,216 for Cardiac ICU
  - 8,523 for Acute Care Cardiac Unit
- During the observation period, the percentage of CAMEO’s rose by:
  - 19% for Cardiac ICU (from 62.9% to 81.9%)
  - 19.9% for Acute Care Cardiac (from 49.7% to 69.8%)

Conclusions
- CAMEO is a nursing measurement tool focusing on the complexity of cognitive workload of nursing care for patients and their families.
- Use of the CAMEO for pediatric cardiovascular patients revealed a consistently complex level of nursing care across the cardiovascular program.

Impact on Practice
- Standardize communication regarding pediatric nursing care.
- Inform staffing projections and daily staffing assignments.
- Internal and external benchmarking.

Jean Connor@childrens.harvard.edu

Copyright 2014

* Funded by Boston Children’s Hospital Program for Patient Safety and Quality
Integrating Complexity of Nursing Care Using the CAMEO

Investigators:
Jean Anne Connor PhD, RN, CPNP
Christine LaGrasta MS, RN, CPNP PC/AC
Courtney Porter MPH
Carol Larson MPH
Jason Thornton MSN, RN, CCRN, CPHQ
Mary O’Brien BSN, RN
Patricia Hickey PhD, MBA, RN, FAAN

Purpose/Question/Aims:
The objective was to demonstrate integration of CAMEO with other unit measures to inform staffing models.

Background/Significance:
The Complexity Assessment & Monitoring to Ensure Optimal Outcomes (CAMEO) was developed to measure the cognitive workload of pediatric intensive care nursing: the intellectual processing of patient information that drives performance and decision-making. The cognitive workload is then quantified by level of complexity: the skill, concentration, and level of surveillance required of nurses and physicians to provide care to a patient or group of patients.

Methods:
CAMEO is implemented on a daily basis (once per shift) by bedside nurses in the 29-bed Cardiac Intensive Care Unit (CICU). Nurses identify nurse-specific patient care activities conducted over the course of their shift. These activities are categorized into 15 domains of care. Each nursing activity is assigned a specific score based on cognitive complexity. Points assigned to each activity are tallied to create an overall CAMEO score. Scores are assigned to CAMEO Complexity Classifications (I-V) based on predetermined threshold scores. Class I patients are considered hemodynamically stable, with near transfer out of the CICU while class V patients are hemodynamically unstable with outcome uncertain, requiring advanced intensive care nursing, monitoring and management.

Results:
CAMEO data is summarized monthly and integrated into the cardiovascular quality dashboard. Also included in the quality dashboard is data on daily census and bed turnover, medication event rate, and length of stay. In addition, CAMEO is in use across intensive care (medical-surgical, medicine, cardiac, and neonatal). Unit and program level reports are generated monthly to support staffing projections. Use of the CAMEO has created a standardized communication of “complexity” of nursing care.
Implications:
CAMEO has been implemented in practice and used to articulate contemporaneous nursing care across the cardiovascular programs as well as ICU areas. The CAMEO continues to be implemented across non-ICU areas at Boston Children’s Hospital.

If this poster has been presented at a conference, which one: Poster presented at the 15th Annual International Symposium on Congenital Heart Disease, St. Petersburg, FL, February 2015.
Integrating Complexity of Nursing Care Using the CAMEO®

Jean Connor PhD, RN, CPNP, Christine LaGrasta MS, RN, CPNP-PC/AC, Courtney Porter MPH, Carol Larson MPH
Jason Thornton MSN, RN, Mary O’Brien BSN, RN, Patricia Hickey PhD, MBA, RN, FAAN

Background/Significance

- Complexity assessment & monitoring to ensure optimal outcomes (CAMEO)
  - Measures cognitive workload, the intellectual processing of patient information that drives performance and decision making
  - Quantifies the complexity of pediatric nursing care: the skill, concentration, and level of surveillance required of nurses and physicians to provide care to a patient or group of patients

Purpose

- To demonstrate integration of CAMEO with other unit measures to inform staffing models

Methods

- CAMEO is implemented on a daily basis (once per shift) by bedside nurses in the 29-bed Cardiac Intensive Care Unit (CICU)
  - Nurses identify nurse-specific patient care activities conducted over the course of their shift
  - Nurse-specific patient care activities are categorized into 15 domains of care
  - Each nursing activity is assigned a specific score based on cognitive complexity
  - Points assigned to each activity are tallied to create an overall CAMEO score

Cardiac Intensive Care Unit Quality Dashboard

- Cardiac ICU CAMEO Classifications by Month

- Cardiac ICU Medication Event Rate

- Cardiac Intensive Care Unit Length of Stay

Current Uses

- CAMEO data integrated into cardiovascular dashboard
- CAMEO in use across intensive care (medical-surgical, medicine, cardiac, neonatal)
- Standardized communication of “complexity” of nursing care
  - Unit and program level reports generated monthly to support staffing projections

Impact

- CAMEO has been implemented in practice and used to articulate contemporary nursing care across the cardiovascular programs as well as ICU areas
- The CAMEO continues to be implemented across non-ICU areas at Boston Children’s Hospital

* Copyright 2014
** Funded by Boston Children’s Hospital Program for Patient Safety and Quality

Cardiovascular and Critical Care Nursing Science

Jean Connor@childrens.harvard.edu
Prevention and Management of Narcotic and Benzodiazepine Withdrawal in the Pediatric Intensive Care Unit

Investigators: Paula Conrad BSN, RN, CCRN, CPN
Sandra Mott PhD, RN-BC, CPN
Kristen Rauschnot BSN, RN, CCRN
Jon Whiting BSN, BA, RN, CCRN
Jean Anne Connor PhD, RN, CPNP

Purpose/Question/Aims:
The purpose of this study was to determine the occurrence of narcotic and benzodiazepine withdrawal symptoms in a pediatric medical intensive care unit. Patient characteristics were examined, withdrawal assessment data were reviewed, and signs and symptoms associated with possible narcotic and benzodiazepine withdrawal were described. The goal of the study was to determine the scope of the problem to guide further work to improve the assessment and management of withdrawal symptoms.

Background/Significance:
Adequate pain management and optimal sedation are a vital part of pediatric intensive care; therefore, opioids and benzodiazepines are routinely administered to critically ill pediatric patients. The use of these agents, while vital to providing the necessary care, can result in the development of tolerance and subsequent withdrawal symptoms. Prompt recognition of these symptoms by the bedside nurse can potentially minimize significant patient discomfort and family distress.

Methods:
A retrospective chart review was completed of all patients admitted to the Medicine Intensive Care Unit (MICU) at Boston Children’s Hospital in 2012 who received continuous infusions of opioids and/or benzodiazepines for sedation and analgesia. A total of 60 patients were included in the study. Characteristics such as admitting diagnosis and the presence or absence of comorbidities were identified. Patient symptoms and corresponding Withdrawal Assessment Tool-1 (WAT-1) scores during the weaning period were extracted from the electronic medical record. Descriptive statistics were used to summarize the abstracted data.

Results:
Among the cohort of 60 patients, the median age was 3.5 years (1 month-29 years). 48/60 (80%) patients were admitted for respiratory-related illness. 53/60 (88%) were noted to have at least one co-morbidity. 60% experienced some type of symptom of withdrawal. These included gastrointestinal, cardiovascular, neurologic and respiratory. 15% had a reported WAT-1 score of 1-2 while 31.7% had a WAT-1 score of 3-8. Twenty-nine patients (48%) required treatment for symptoms, including rescue dosing, increase in continuous infusion or a cessation of weaning.
Implications:
The data indicate that the WAT-1 prevalence of withdrawal is significant at 31.7%; however, 60% of patients exhibited symptoms often associated with withdrawal. Many patients with complex medical issues exhibit neurologic, cardiovascular, respiratory, and GI symptoms at baseline. This can make assessment for withdrawal in this population more challenging. Next steps will include evaluation of the WAT-1 tool in patients with co-morbidities.

If this poster has been presented at a conference, which one: Poster presented at the 8th Annual Program for Patient Safety and Quality Grant Presentations, Boston Children’s Hospital, Boston, MA, March 2015.
Prevention and Management of Narcotic and Benzodiazepine Withdrawal in the Pediatric Intensive Care Unit
Paula Conrad BSN, RN, CCRN, CPN, Sandra Mott PhD, RN-BC, CPN,
Kristen Rauschnot BSN, RN, CCRN, Jon Whiting BSN, BA, RN, CCRN, Jean Anne Connor PhD, RN, CPNP

Background
- Adequate pain management and opioid toleration may involve a pain control protocol.
- Children in the critical care setting require opioids and benzodiazepines for a multitude of reasons, including:
  - Pain control
  - Reduction of anxiety
  - Maintenance of invasive devices such as endotracheal tubes
  - Optimization of mechanical ventilation
- The use of these agents, while critical to providing the necessary care, can result in the development of narcotic and/or benzodiazepine tolerance and withdrawal symptoms

Evidence-Based Review

Methods
- Retrospective review of 60 patients admitted to Medicine Intensive Care Unit (MICU)
  - From January 1, 2012 to December 31, 2012
  - Received continuous infusion of morphine and midazolam for sedation and analgesia
- Patient characteristics and clinical symptoms were summarized

Table 1. Patient Characteristics (N=60)

<table>
<thead>
<tr>
<th>Age</th>
<th>Mean Age</th>
<th>Median Age</th>
<th>Most Frequent Age</th>
<th>Range</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>8.3 years</td>
<td>3-5 years</td>
<td>3 years</td>
<td>5 weeks - 29 years</td>
</tr>
</tbody>
</table>

Gender
- Female 34 (56.7%)
- Male 26 (43.3%)

Respiratory-Related Diagnosis
- Present in 48 (80.3%)

Presence of Co-Morbidities
- 63 (80.3%)

Table 2. Days on Continuous Infusion of Morphine and Midazolam

<table>
<thead>
<tr>
<th>Variable</th>
<th>Mean Number of Days</th>
<th>Median Number of Days</th>
<th>Most Frequent Number of Days</th>
<th>Range of days</th>
</tr>
</thead>
<tbody>
<tr>
<td>History of Opiate/Enza Exposure</td>
<td>6.2 days</td>
<td>4 days</td>
<td>1 day</td>
<td>12 hrs – 36 days</td>
</tr>
</tbody>
</table>

Table 3. Clinical Symptoms (N=60)

<table>
<thead>
<tr>
<th>Symptom</th>
<th>N (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Max WAT-1 Score</td>
<td></td>
</tr>
<tr>
<td>1-2</td>
<td>9 (15.0%)</td>
</tr>
<tr>
<td>3-8</td>
<td>19 (31.7%)</td>
</tr>
<tr>
<td>Treatment Required</td>
<td></td>
</tr>
<tr>
<td>29 (48.3%)</td>
<td></td>
</tr>
<tr>
<td>Adjunct Medications</td>
<td></td>
</tr>
<tr>
<td>Given 29 (48.3%)</td>
<td></td>
</tr>
</tbody>
</table>

Results
- The median age of patients was 3.5 years (Range: 5 weeks to 29 years) (Table 1).
- 89.0% of patients had a respiratory-related diagnosis and 88.3% had at least one co-morbidity.
- 55.0% (33 patients) had a history of opiate or benzodiazepine exposure (Figure 1).
- Of the 60 patients reviewed, 30 patients (50.0%) experienced signs and symptoms commonly associated with withdrawal (Figure 2).

Prevention of Withdrawal Rounds
- Began pilot Prevention of Withdrawal rounds (POW) in October 2014.
  - Rounding with nurses at the bedside of each patient who is on or has been on sedation and analgesia drips
  - Renewing the following:
    - Opioid use
    - Weaning plans
    - Use of the WAT-1 scoring tool
    - Rescue dosing
    - Adjunct medications
    - Signs/symptoms of withdrawal

Next Steps
- Use results of the pilot phase to develop and guide the formal POW rounds process.
- Better understand nurses’ use of the WAT-1 tool and interpretation of the scores.
- Develop and validate a standardized data-driven approach to withdrawal prevention and management in the MICU population.

Funded by Boston Children’s Hospital Program for Patient Safety and Quality
Paula.Conrad@childrens.harvard.edu
The Healthy Work Environment: Assessment, Initiatives, and Outcomes in a Pediatric Intensive Care Unit

Investigators: Dennis Doherty BSN, RN, CCRN
Sandra Mott PhD, BC-RN, CPN
Aimee Lyons PhD(c), CPNP, CCRN
Jean Anne Connor PhD, RN, CPNP

Purpose/Question/Aims:
To gain a comprehensive understanding of Medical Surgical Intensive Care Units (MSICU) interdisciplinary staff perceptions of the health of the work environment.

Background/Significance:
In 2010 the MSICU has adopted the American Association of Critical-Care Nurse’s (AACN) Healthy Work Environment (HWE) Framework to assess and analyze the MSICU work environment. The framework establishes six evidence-based standards which influence the health of the work environment. The six standards are: skilled communication, effective decision making, true collaboration, appropriate staffing, meaningful recognition, and authentic leadership. The AACN Healthy Environment Assessment Tool (HWEAT) is an 18 question web-based assessment tool which allows areas to assess the health of their work environment. This tool provides an overall aggregate score of the six standards as well as aggregate scores for each standard.

Methods:
After completing a baseline assessment in 2010 the unit continued with follow up assessments in 2012 and 2014. Interdisciplinary staff were again invited to complete the HWEAT to obtain general information about the health of the work environment. In 2010 and 2012 HWEAT was followed up with focus group sessions in order to better understand staff responses to the HWEAT survey while learning their ideas about strengths and opportunities for improvement.

Results:
Survey response rate was 46% (96/209) in 2012 and 39% in 2014. Overall score for the MSICU was 3.75 in 2012 and 3.76 in 2014 which indicating staff perceived the health of the work environment to be “Good”. In 2010 and 2012 the multi-method approach allowed for a comprehensive picture which facilitated implementation of targeted initiatives aimed at improving HWE scores. To date the 2014 assessment has not been followed up with focus groups. The health of the MSICU work environment has remained stable over three qualitative assessment points.
Implications:
Over the three data collection points the MSICU HWE scores have indicated that interdisciplinary staff believe the health of the work environment to be “good”. Data from focus groups provides more in-depth information about the staff’s perceptions of the work environment. Work groups collaborated with MSICU nursing leader to develop target initiatives to address healthy work environment scores.

If this poster has been presented at a conference, which one: This will be presented as part of the PPSQ Patient Safety Week presentations on 3/10

This is an update to work presented at AACN’s NTI and Critical Care Expo 2014 and Boston Children’s Hospital 2014 Nurses Week
The Healthy Work Environment:
Assessment, Initiatives, and Outcomes in a Pediatric Intensive Care Unit
Dennis Doherty BSN, RN, CCRN, Sandra Mott PhD, BC-RN, CPN, Aimee Lyons PhD(c), CPNP, CCRN,
Jean Anne Connor PhD, RN, CPNP

Background

• In 2010 the Medical Surgical Intensive Care Unit (MSICU) staff completed the AACN Healthy Work Environment Assessment Tool (HWEAT).
• Next they participated in focus groups to explore the reasons behind assessment responses.

Objectives

1) Describe and compare the state of the 2012 and 2014 work environments to 2010 baseline state
2) Explore staff perception of the 2010 targeted initiatives in response to the 2010 health of the work environment assessment

Methods

Phase I: Survey Assessment

• In 2012 and 2014, interdisciplinary staff were again invited to complete the 18 question, web-based HWEAT to obtain general information about the health of the work environment.
• Tool provides an overall aggregate score of the six standards.
  - Aggregate scores for each standard
  - Individual scores for the three items within each standard
• The mean average of each score offered is on a scale of 1-5: 1 = 2.99 Needs Improvement, 3 = 3.99 Good, 4 = 5.00 Excellent

Phase II: Interdisciplinary Focus Groups

• Used to better understand:
  - Staff responses to the HWEAT survey
  - Their ideas about strengths and opportunities for improvement
  - Perception of the 2010 targeted initiatives
• Facilitated by Nurse Scientist
• Session audio taped, transcribed verbatim, de-identified
• Transcripts analyzed using conventional content analysis for emerging themes

Results

Phase I: Survey Assessment

• Survey response rate was 65% (96/150) in 2012
  - In 2014, response rate was 39%
• Overall score for the MSICU was 3.76 in 2012
  - In 2014, the overall score was 3.76
  - Indicating staff perceived the health of the work environment to be “Good”

Phase II: Interdisciplinary Focus Groups

• A multi-method approach allowed for a comprehensive picture
• Data from the focus groups coalesced into three main categories:
  - Timely meaningful recognition is lacking
  - Efficient and effective communication from leadership
  - Appropriate number and skill of staff at bedside

Initiatives in Development

• Working groups were created to develop and implement initiatives focusing on skilled communication, true collaboration, and meaningful recognition
  - Collaboration between clinical assistants (CA) and nurses to enhance communication including CA liaison on the Nursing Leadership Council
  - Development opportunities for both administrative and nursing staff to better support each other’s unique role in the unit in order to improve team collaboration, communication and patient/family experience
  - New staff buddy: pairing new staff with recruitment and retention council members to serve as social mentors to the unit including guiding them on unit-specific guidelines around scheduling, vacation, etc.

Conclusions

• The healthy work environment project facilitated a comprehensive understanding of the work environment and identifying areas requiring targeted initiatives
• Health of the work environment remained stable over two points in time

Next Steps

• Begin implementing new HWE initiatives
• Future exploration of relationships between health of the work environment and patient-related outcomes as well as staff turnover rate

Cardiovascular and Critical Care Nursing Science

Funded by Boston Children’s Hospital Program for Patient Safety and Quality

Dennis.Doherty@childrens.harvard.edu

Figure 1. The Healthy Work Environment: Median Summary Scores Across All Standards

Figure 2. Healthy Work Environment: Median Summary Scores Across All Standards

Table 1. Interdisciplinary Focus Group Results

<table>
<thead>
<tr>
<th>Standards</th>
<th>2012 Assessment Experience</th>
</tr>
</thead>
<tbody>
<tr>
<td>Skilled Communication</td>
<td>Communication between staff and leadership improved. Feedback from leadership was more positive and balanced.</td>
</tr>
<tr>
<td></td>
<td>Staff nurses felt empowered and supported to speak up within the multidisciplinary team.</td>
</tr>
<tr>
<td>Aggregate score: 3.72</td>
<td>Opportunity to enhance communication and access information with new staff and shift staff so they are better integrated into the team.</td>
</tr>
<tr>
<td></td>
<td>True collaboration on the unit continues to be good. Collaboration among the interdisciplinary MSICU team has potential to be even better.</td>
</tr>
<tr>
<td>Aggregate score: 3.73</td>
<td>Staff recognized efforts to improve meaningful recognition. Staff perceived an improvement in recognition by leadership. Unit-based and institution-wide recognition was appreciated though not sufficient. Staff felt the most meaningful recognition was in real time between colleagues. There is an opportunity for improvement in this area.</td>
</tr>
<tr>
<td>Meanings Recognition</td>
<td>Staff expressed frustration with the removal of prior awards, specifically financial incentives for leadership roles, institutional awards for years of service, and opportunities to use earned time.</td>
</tr>
<tr>
<td>Aggregate score: 3.69</td>
<td>Fafed by Boston Children’s Hospital Program for Patient Safety and Quality</td>
</tr>
</tbody>
</table>
Relationship of Health-Related Quality of Life to Neurodevelopmental Function in Fontan Adolescents

Investigators: Carolyn Dunbar-Masterson BSN, RN
               Christian Stopp MS
               David C. Bellinger PhD, MSc
               Dana L. Bernson MPH
               David R. DeMaso, MD
               Michael J. Rivkin, MD
               Jane W. Newburger, MD, MPH.

Purpose/Question/Aims:
For adolescents after the Fontan procedure, to
Compare the psychosocial and physical health as measured by the Child Health Questionnaire-Parent Form 50 (CHQ-PF50) to a normative sample.
Explore the demographic and medical factors that predict psychosocial and physical health.
Explore the relationships of neurodevelopmental outcomes to psychosocial and physical health.

Background/Significance:
Health-related quality of life (QOL) in Fontan patients has been shown to be related to patient and medical characteristics as well as to parent-reported problems with learning and behavior. However, no studies have examined the relationships of QOL to specific neurodevelopmental (ND) domains measured with concurrent in-person testing during adolescence.

Methods:
Parents of 152 Fontan patients (14.5±2.9y) and 107 local referent subjects (15.3±1.8y) completed the Child Health Questionnaire, generating summary scores for psychosocial (PsS) and physical (PhS) functioning. Subjects also underwent concurrent in-person testing with a battery of ND tests.

Results:
Fontan patients, compared to referents, had lower PsS scores (48.2±11.1 vs. 57.1±4.4, P<0.001) and PhS scores (45.3±11.1 vs. 56.0±4.5, P<0.001). Even those without known genetic abnormality had lower PsS and PhS scores than referents (P<0.001 each). Lower PsS scores were highly associated with worse executive function (Behavior Rating Inventory of Executive Function, parent, r=−0.71, P<0.001) and attention (Conners ADHD T-score, parent, r=−0.68, P<0.001) after adjusting for concurrent social status, genetic abnormality, and previous Norwood procedure. Lower PsS scores were also related to lower measures of intelligence (Wechsler Intelligence Scale, Full-Scale IQ, r=0.25, P=0.002), achievement (Wechsler Individual Achievement Test, math, r=0.24, P=0.003), memory (Children’s Memory Scale, r=0.37, P<0.001; Wechsler’s Memory Scale, composite, r=0.38, p=0.03), and visual-spatial skills (Test of Visual-Perceptual Skills, composite, r=0.22, P=0.04) as well as to greater indices of depression (Child...
Depression Inventory Total Score, \( r=-0.39, P<0.001 \), anxiety (Revised Children’s Manifest Anxiety Scale, \( r=-0.29, P<0.001 \)) and autism (Autism Spectrum Quotient, \( r=-0.31, P<0.001 \)). Lower PhS scores were associated with few ND outcomes.

**Implications:**
Worse psychosocial health in Fontan adolescents is highly related to worse ND performance. The strong correlations of worse psychosocial health with executive dysfunction and ADHD suggest the importance of interventions targeted to these domains.
Parent Perception of their Role in the Pediatric Cardiac Intensive Care Unit (PCICU)

**Investigators:**
- Anna C. Fisk BSN, RN, CCRN
- Jean A. Connor PhD, RN, CPNP
- Sandra Mott PhD, RN-BC, CPN

**Purpose/Question/Aims:**
The objective of the research was to explore and better understand the experience of parents in the pediatric cardiac intensive care unit within a patient/family-centered care model.

**Background/Significance:**
Despite the breadth of literature on parent presence during procedures and critical events plus nearly nationwide adoption of 24-hour pediatric visitation, little research exists about how parents perceive their role in pediatric cardiac intensive care units (PCICU). Based on a literature review in fall 2012, only one article entitled “I wish you knew...” described the parental perspective while in a pediatric intensive care unit. These parents’ internal dialogue set the stage for this further exploration of the phenomenon.

**Methods:**
This is a qualitative descriptive study consisting of multiple one-on-one interviews with parents of children from birth through 18 years of age that are currently admitted as an inpatient in the PCICU. Participants are asked broad, open-ended questions followed by probes to explore their experiences and perceptions of their parental role in the PCICU environment. The research design is based on naturalistic inquiry and is used to describe, not interpret, parental experiences using their own words. Conventional content analysis is being used for data analysis. Two researchers read and reread transcripts to gain an understanding of the participant’s description of their experience.

**Results:**
Eight interviews were completed and transcribed verbatim. Preliminary data analysis has occurred concurrently with data collection. The sample included parents of children with a variety of surgical complexity and frequency of admissions. Minor changes in the phrasing of the initial open-ended question were made that enhanced parental understanding of the term ‘role.’ In spite of that change, the description of the parent role did not change. Parents stated their role was to “be there” for their child in whatever context was needed. Concepts such as advocating for their child’s needs or collaborating with the interdisciplinary team were not cited as a role.
Implications:
Our goal was to learn from parents their expectations, their perceived role and what they believe would be helpful from staff. This information will be used to form an effective team approach to the practice of patient family centered care that truly improves the care for both patients and families. Contrary to frequent articles and commentaries promoting the parent’s role as an advocate for their hospitalized child, parents depicted their role as to “just to be the parent.”

If this poster has been presented at a conference, which one: Poster presented at the 2014 Northeast Pediatric Cardiology Nurses Association Annual Conference, Boston, MA, October 2014; 15th Annual International Symposium on Congenital Heart Disease, St. Petersburg, FL, February 2015.
Parents’ Perception of Their Role in the Pediatric Cardiac Intensive Care Unit

Anna C. Fisk BSN, RN, CCRN, Jean A. Connor PhD, RN, CPNP, Sandra Mott PhD, CPN, RN-BC

Background

- Congenital heart disease (CHD) occurs in 6-10 patients per 1,000 live births.
- CHD requires complex care and monitoring and often includes multiple admissions over a lifetime.
- Positive response to parent presence has led to widespread adoption of 24-hour pediatric visitation including intensive care units.
- However, satisfaction studies concerning change in visiting have focused on healthcare providers. Few studies have asked parents about their perceptions and experience with 24-hour visitation.

Objective

- The purpose of this study was to explore and better understand the experience of parents in a patient and family centered care model.

Methods

- Qualitative descriptive study.
- Based on naturalistic inquiry and used to describe, not interpret, participant experiences using their own words.
- One-on-one interviews with parents of children from birth through 21 years of age.
- Participants were asked broad, open-ended questions to explore their perceptions and experience of parenting in the pediatric cardiac intensive care unit (PCICU) environment.

Interview Questions

- What did you anticipate as your role/job while your child is in the PCICU?
- What roles did you play in the PCICU (e.g., comforter, caregiver, advocate)?
- Were the roles the ones you expected?

Basic Role: To Be the Parent

Providing for Emotional Needs

Mother, when her daughter was a newborn:

“My role was sitting and talking to her.”

Now that her daughter is a toddler:

“...she's two and a half, she's so busy, she gets sick, she wants her Mom.”

Father of a newborn:

“I had no expectations, you know, coming and making sure this is done or that was done, just letting the staff do their job. I'm grateful to be there with my son.”

Mother of a 1 year old:

“I think mostly we're just there to comfort him, and learn more about taking care of him...”

Mother of a newborn hospitalized for 3 months:

“...we can't take care of him the way we traditionally would. I'm not sure there are little things we can do and we're not wanted to be there.”

Providing for Physical Needs

Mother of a newborn:

“We found out at 3 weeks...we flew out here as quickly as we could to meet with the doctor.”

Mother of a 2 1/2 year old:

“I'm trying harder to get to know the nurses...so they sort of understand when she's awake, we always do this or that, just to give them a feel. I want them to know how loved she is and...that she's this feisty, crazy child.”

Father of a 3 year old:

“...just trying to think about the long-term, I mean, the overall effects of it.”

Mother of a 3 year old:

“I'm a nurse person, I watch his blood pressure constantly. He used to have high blood pressure. I'm here for his support...they're the doctors, they're the nurses. They know the medicine, but I know him.”

Interview Process

- Interviews consisted of 11 parents from 7 families.
  - 3 interviews were with the mother.
  - 3 were with both parents.
  - 1 couple chose to be interviewed separately.
- All children were currently admitted to the PCICU at the time of the interview.
- Interviews were held in a private consult room in the PCICU.
- Interviews were audio recorded and transcribed verbatim.

Reflections on “Being a Parent”

- The overriding theme expressed by all the parents was that their role was “to be the parent.”
- Being a good parent meant doing whatever it took to be present for their child.
- Being focused and motivated to provide comfort.
- Convey aspects of the child's personality.
- Advocating for their child’s medical care was rarely cited and only if asked by interviewer.
- Some parents view self-care as a necessity to being a good parent, others chose to stay with child continually.
- Though parent behaviors were different, their goal was the same: to care for their child.

Implications

- Parents only wanted to be with their child, providing comfort and “being the parent.”
- Parents do not feel burdened by their increased and active role in the PCICU.
- These results can be used to present an effective team approach to support parents in their parenting role while in the PCICU.
Critical Care Nursing Experience and Education are Associated with Outcomes Following Pediatric Cardiac Surgery: An Analysis of the STS Congenital Heart Surgery Database

Investigators: Patricia A. Hickey PhD, MBA, RN, FAAN
Sara K. Pasquali MD, MHS
J. William Gaynor MD
Xia He MS
Kevin D. Hill MD, MS
Jean A. Connor PhD, RN, CPNP
Kimberlee Gauvreau ScD
Marshall L. Jacobs MD
Jeffrey P. Jacobs MD
Jennifer C. Hirsch-Romano MD

Purpose/Question/Aims:
The objective of this research was to examine specific nursing and organizational characteristics that are associated with pediatric cardiac surgery outcomes such as complications and mortality.

Background/Significance:
The Institute of Medicine’s (IOM) report on the Future of Nursing recommends an increase in the proportion of registered nurses (RNs) with a baccalaureate degree to 80% by 2020. While evidence in adult nursing care has linked nursing education and patient outcomes, little is known about the relationship between critical care nursing characteristics and pediatric cardiac surgery outcomes. We evaluated the association of nursing education and experience with outcomes in a large multi-institutional cohort of children undergoing cardiac surgery.

Methods:
Nursing survey data from Children’s Hospital Association members were linked to clinical data from the STS Congenital Database for children undergoing cardiac surgery (2010-11). Nursing education and years of clinical experience were assessed to examine their association with in-hospital mortality, complication rate and failure-to-rescue rate (FTR). Multivariable logistic regression models were used to account for within-center clustering and adjust for differences in case mix and patient characteristics across hospitals.

Results:
A total of 15,463 patients (29 hospitals) were included in the analysis. The in-hospital mortality rate was 2.8%, post-operative complications occurred in 42.4% and the FTR rate 6.4%. In
adjusted analysis, units with a higher proportion of nurses with a Bachelor of Science (BSN) or higher had lower complication rates (OR 10% increase = 0.85, 95% CI 0.76-0.96, p<0.01). Units with a higher proportion of nurses with ≤2 years of experience had higher mortality rates (OR 10% increase=1.09, 95% CI 1.01-1.18, p=0.025). Results were similar when controlling for center volume, suggesting that the relationship of these nursing characteristics with outcome is independent of volume.

**Implications:**
This is the first known study to demonstrate that higher levels of nursing education and experience are significantly associated with fewer complications following pediatric cardiac surgery and aligns with previous data on their association with reduced mortality. These results provide useful data for pediatric hospital nurse executives and administrative leaders. These data may inform executive decisions about resource allocation and reinforce the importance of organization-wide mentoring strategies for new nurses and retention strategies for experienced nurses. Information from this study further informs and supports the IOM’s *Future of Nursing campaign* to implement recommendations.

If this poster has been presented at a conference, which one: Poster presented at the 15th Annual International Symposium on Congenital Heart Disease, St. Petersburg, FL, February 2015.
Critical Care Nursing Experience and Education Are Associated With Outcomes

Following Pediatric Cardiac Surgery: An Analysis of the STS Congenital Heart Surgery Database

Patricia A. Hickey PhD, MBA, RN, FAAN, Sara K. Pasquali MD, MHS, J. William Gaynor MD, Xia He MS, Kevin D. Hill MD, MS, Jean A. Connor PhD, RN, CPNP, Kimberlee Gauvreau ScD, Marshall L. Jacobs MD, Jeffrey P. Jacobs MD, Jennifer C. Hirsch-Romano MD

Background

- Little is known about the relationship between nursing characteristics and pediatric cardiac surgery outcomes
- We evaluated the association of critical care nursing education and experience with outcomes in a large multi-center cohort of children undergoing cardiac surgery

Methods

- Data from Children’s Hospital Association members participating in a nursing survey were linked to clinical data from the Society of Thoracic Surgeons (STS) Congenital Database for children (0-18 yrs) undergoing cardiac surgery (2010-2013)
- Level of nursing education and years of clinical experience were assessed for nurses in the unit caring for post-operative cardiac patients
- Association of these variables with outcomes was examined using multivariable logistic regression models accounting for within-center clustering and differences in case mix and patient characteristics across hospitals
- Outcomes included: in-hospital mortality, complication rate, and failure-to-rescue rate (mortality in those with a complication)

Table 1. Nursing and Hospital Characteristics

Table 2. Patient Characteristics Across Hospitals

Table 3. Overall Unadjusted Outcomes

Table 4. Adjusted Outcomes

Results

- In adjusted analysis, units with a higher proportion of nurses with a Bachelor of Science in nursing (BSN) education had lower complication rates (Table 4)
- OR for 10% increase = 0.95, 95% CI 0.87-0.99, p<0.01
- Units with a higher proportion of nurses with >2 years of experience had lower mortality rates (Table 4)
- OR for 10% increase = 0.92, 95% CI 0.85-0.99, p=0.025
- Results were similar when center volume was added to the models
- Suggests that the relationship of these nursing characteristics with outcomes is independent of volume
- No other education or experience was associated with FTR in our analysis

Conclusions

- This study demonstrates that higher levels of critical care nursing education are associated with fewer complications following pediatric cardiac surgery
- Confirms the results of previous analyses demonstrating the association of higher nursing education and experience with lower mortality
- This data may help to inform decisions about nursing resource allocation and retention strategies to optimize outcomes for this complex population
Newly Licensed Nurses’ Experiences with Death and Dying in the Pediatric Intensive Care Unit

Investigators:  Maureen Hillier DNP(c), RN, CCRN  Sandra Mott Ph.D, RN

Purpose/Question/Aims:
The purpose of this phenomenological research study will be to explore the newly licensed nurse’s experience with death and dying in the Pediatric Intensive care Unit (PICU) setting.

Objectives:
To understand what newly licensed nurses identify as stressful and to identify what strategies newly licensed nurses perceive to be helpful during the death and dying process in the PICU.

Background/Significance:
There is abundant literature on the care giving experiences of expert nurses on adult oncology or critical care units at the time of death and dying; however, there is a paucity of information related to the newly licensed nurses’ experience with death and dying in the PICU. Nurse educators concur that there is a dearth of curricular content on death and dying in undergraduate nursing programs (Delaney, 2003; Puia, Lewis & Beck, 2013). Newly licensed nurses have had neither education nor experience to deal with the stress associated with death and dying and experience a wide range of emotions including being scared, sad, helpless, trapped, and useless (Beck, 1997).

Methods:
An expedited IRB approval was obtained from Boston Children’s Hospital (BCH) to interview newly licensed nurses about their experiences with death and dying in the PICU setting. Thirty-five nurses met inclusion criteria of less than 3 years experience as a nurse, employed in a PICU, and cared for a child who was dying or had died. Each received an email inviting them to participate in an audio-recorded 45-60 minute 1:1 interview about their experience. The interviewer will be the instrument and the interview will be the tool. The interviewer has no supervisory or evaluative role and the participants will not be identified. Each interview will take place in a private office or conference room and transcribed verbatim with all identifiers removed. All data will be reported in aggregate. The data analysis will follow Colaizzi’s 7-step method (1979) to assure credibility, trustworthiness, reliability and potential replication.

Results:
Data currently being analyzed. We anticipate that the results of this qualitative research study will serve to enlighten our understanding of the experiences of the newly licensed nurses with death and dying in the PICU. To date, the nursing research literature has not addressed this unique topic. It is hoped that a better understanding of this phenomenon will guide curriculum changes at the undergraduate level as well as provide information for the new graduate staff nurse orientation class.
Implications:
The final results from this study will be important as many newly licensed nurses now seek to start their career in the PICU setting. In addition, newly licensed nurses are being given preference in employment as they are less expensive for an institution to hire than an experienced nurse. This research will better prepare newly licensed PICU nurses for the experience of caring for the dying child while also honoring and supporting the family.
Newly Licensed Nurses’ Experiences with Death and Dying in the Pediatric Intensive Care Unit

Maureen Hillier DNP (c), RN, CCRN, Sandra Mott PhD, RN-BC, CPN, Margaret Oot-Hayes, PhD, RN

Purpose
The purpose of this phenomenological research study will be to explore the newly licensed nurse’s experience with death and dying in the Pediatric Intensive Care Unit (PICU) setting.

Background
There is abundant literature on the care giving experiences of expert nurses on adult oncology or critical care units at the time of death and dying; however, there is a paucity of information related to the newly licensed nurses’ experience with death and dying in the PICU. Nurse educators concur that there is a dearth of curricular content on death and dying in undergraduate nursing programs (Delaney, 2003; Pula, Lewis & Beck, 2013). Newly licensed nurses have had neither education nor experience to deal with the stress associated with death and dying and experience a wide range of emotions including being scared, sad, helpless, trapped, and useless (Beck, 1997).

Methods
An expedited IRB approval was obtained from Boston Children’s Hospital (BCH) to interview newly licensed nurses about their experiences with death and dying in the PICU setting. Thirty-five nurses met inclusion criteria of less than 3 years experience as a nurse, employed in a PICU, and cared for a child who was dying or had died. Each received an email inviting them to participate in an audio-recorded 45-60 minute 1:1 interview about their experience. The interviewer will be the instrument and the interview will be the tool. The interviewer has no supervisory or evaluative role and the participants will not be identified. Each interview will take place in a private office or conference room and transcribed verbatim with all identifiers removed. All data will be reported in aggregate. The data analysis will follow Colaizzi’s 7-step method (1979) to assure credibility, trustworthiness, reliability and potential replication.

Results
Data currently being analyzed. The results of this qualitative research study will serve to enlighten our understanding of the experiences of the newly licensed nurses with death and dying in the PICU. We anticipate that the results will help us to understand what newly licensed nurses perceive to be helpful during the death and dying process in the PICU. To date, the nursing research literature has not addressed this unique topic. It is hoped that a better understanding of this phenomenon will guide curriculum changes at the undergraduate level as well as provide information for the new graduate staff nurse orientation class.

Outcomes & Implications
The final results from this study will be important as many newly licensed nurses now seek to start their career in the PICU setting (Brewer, et al., 2011). In addition, newly licensed nurses are being given preference in employment as they are less expensive for an institution to hire than an experienced nurse. This research will better prepare newly licensed PICU nurses for the experience of caring for the dying child while also honoring and supporting the family.

References

Cardiovascular and Critical Care Nursing Science

Maureen.Hillier@childrens.harvard.edu
“Undergraduate Nursing Student Responses to the TEDx Talk ‘On Being Present, Not Perfect’”

Investigators: Maureen Hillier DNP(c), RN, CCRN
Elaine C. Meyer PhD, RN

Purpose/Question/Aims:
To analyze undergraduate nursing student responses to the TEDx video “On Being Present, Not Perfect”.

Background/Significance:
With the advent of the internet, TEDx talks allow speakers to present their most innovative ideas, in 20 minutes or less, in a manner that most people can understand. The TEDx video “On Being Present, Not Perfect” is free, available in public domain and offers a pathway for nurse educators to deliver a contemporary teaching model to millennial learners. The importance of reflective listening and empathic presence is embedded throughout the video. The Wizard of Oz metaphor–courage, brains and heart –is provided to highlight key ingredients of honest, effective health care communication.

Methods:
Students were asked to independently view the TEDx video 24 hours prior to the three hour pediatric lecture on communication. Students were asked to write a brief reflection guided by the two following questions. First, what was the most meaningful part of the video? And second, what resonates with you personally and professionally? The video was viewed a second time in class supported by The Facilitators User’s Guide which functioned as a springboard to discuss general principals of communication. Participants were 23 first semester junior nursing students enrolled in a pediatric nursing course in a private four year BSN program in the northeast. Data collection involved an expedited IRB. An informed consent to qualitatively analyze student responses was obtained after the assignments were submitted. Responses were de-identified and analyzed for themes.

Results:
This was a non-graded, non-required assignment completed by 23 out of 25 (92%) of the class of which 100% provided consent to participate in the study. The qualitative thematic analysis identified the following key themes for the nursing students: the Value of Communication; Empathic Presence; and Professional Role Development. In addition, the video was described as a unique learning experience that offered inspiration, commitment and empowerment to the nursing students. When incorporated into the 3 hour lecture, the 19 minute video and accompanying Facilitators Guide generated a lively discussion that was considered time well spent.
Implications for Practice:
The research demonstrated that the TEDx video had a powerful impact and was a transformational learning experience for junior level students. The power of the TEDx video lies in the “flipping” function wherein content is initially introduced outside of class, thus better utilizing time during lecture to enhance application of course content. As nursing programs compete with online and open course-ware, TEDx talks offer a way to provide meaningful indispensable content for free. It can be easily integrated into class lecture, discussion and online activities. Nursing students identified it as an inspirational teaching tool that emphasizes the inherent value of presence in the patient-provider relationship. The TEDx talk Facilitator Guide provides faculty with additional strategies that encourage the novice health care professional to critically reflect and incorporate effective communication skills, prior to entry into practice.
Undergraduate Nursing Student Responses to the TEDx Talk: “On Being Present, Not Perfect”

Maureen Hillier DNP (c), RN, CCRN and Elaine Meyer PhD, RN

Purpose
To analyze undergraduate nursing student responses to the TEDx video “On Being Present, Not Perfect.”

Background
With the advent of the internet, TED talks allow speakers to present their most innovative ideas in 20 minutes or less, in a manner that most people can understand (TED.com). The TEDx video “On Being Present, Not Perfect” is free and available in public domain. With the dissolution of boundaries in the standard lecture, the combination of media, narrative, and practices allows knowledge to be brought to life (Friese, 2011). The video offers a pathway for nurse educators to deliver an interactive, contemporary teaching model to millennial learners.

The importance of reflective listening and empathic presence is embedded throughout the video. The Wizard of Oz, metaphor of courage, brains, and heart - is provided to highlight key ingredients of honest, effective health care communication (Meyer, 2014).

Methods
Students were asked to independently view the TEDx video 24 hours prior to the three-hour pediatric lecture on communication. Students were asked to write a brief reflection guided by the following questions: first, what was the most meaningful part of the video? Second, what resonates with you personally and professionally? The video was viewed a second time in class supported by The Facilitators’ User’s Guide which functioned as a springboard to discuss general principles of communication.

Participants were 22 first semester junior nursing students enrolled in a pediatric nursing course in a private four-year BSN program in the northeast. Data collection involved an expedited IRB. An informed consent to qualitatively analyze student responses was obtained after the assignments were submitted. Responses were de-identified and analyzed for themes.

Results
This was a non-graded, non-required assignment completed by 13 out of 25 (52%) of the class of whom 100% provided consent to participate in the study. The qualitative thematic analysis identified the following key themes for the nursing students: the Value of Communication, Empathic Presence, and Professional Role Development. In addition, the video was described as a unique learning experience that offered inspiration, commitment, and empowerment to the nursing students. When incorporated into the 3-hour lecture, the 10-minute video and accompanying Facilitators Guide generated a lively discussion that was considered time well spent.

Table 1: Nursing Student Demographics in Aggregate

<table>
<thead>
<tr>
<th>Program type</th>
<th>Private 4 year BSN</th>
</tr>
</thead>
<tbody>
<tr>
<td>Geographical location</td>
<td>Northeastern United States</td>
</tr>
<tr>
<td>Student level</td>
<td>First semester junior</td>
</tr>
<tr>
<td>Gender</td>
<td>24 Female, 1 Male</td>
</tr>
<tr>
<td>Course title</td>
<td>Nursing Care of Children</td>
</tr>
<tr>
<td>Objective of video</td>
<td>Preparation for Communication Lecture</td>
</tr>
<tr>
<td>Reflective Essay</td>
<td>Classroom discussion</td>
</tr>
<tr>
<td>Viewed video prior to class</td>
<td>92% (23/25 students)</td>
</tr>
<tr>
<td>Provided informed consent</td>
<td>100% (23/25 students)</td>
</tr>
</tbody>
</table>

Faculty Comments
“Nursing students should see this before starting clinical rotations.”

“The real-life example of the importance of proper communication seem to resonate with the students more than just using a PowerPoint style lecture.”

“The students were very engaged in the discussion after the video and wanted to share their experiences with peers.”

“Great way to ‘Flip the Classroom’! The video link was posted on Blackboard and students were asked to write a reflective essay. This truly promotes the lived experience of a nursing student.”

Student Comments
Worried of Communication
“As new nurses, we find ourselves rushing around to make sure tasks get done. We easily forget that just being there to talk and listen to a patient or family is so important. Taking 5 minutes can leave a huge impression on a patient or family member’s day.”

Emphatic Presence
“At the hospital I have had moments where patients are so upset and I have no idea how to respond. As a backup, I have held their hand because I don’t know any other way better way to respond. It makes me feel better that a patient could see that action as caring and not remember me being awkward and nervous.”

Professional Role Development
As students, we need to remember that you do not always need to be thinking of the perfect thing to say or the perfect way to comfort someone, but you do need to be there.

Unique Learning Experience
“The ‘One-Room Schoolhouse’ idea tells us to leave our badges at the door and brings all of us together as health care workers.”

“The Wizard of Oz analogy was so meaningful to me. As nurses we need to have a heart to listen to people and be passionate about our profession and never underestimate our power and courage.”

Inspiration and Commitment
“We have a lot of power as nurses and we can provide strength to those who may feel it in times of trouble.”

“A genuinely hope member of our fields in healthcare follow suit in Meyer’s movement; I think it will make medical care as much mere humane.”

Outcomes & Implications
The research demonstrated that the TEDx video had a powerful impact and was a transformational learning experience for junior level students. The power of the TEDx video lies in the “flipping” function wherein content is initially introduced outside of class, thus better utilizing time during lecture to enhance application of course content. As nursing programs compete with online and open course ware, TEDx talks offer a way to provide meaningful, indispensable content for free. It can be easily integrated into class lecture, discussion, and on-line activities. Nursing students identified it as an inspirational teaching tool that emphasizes the inherent value of presence in the patient-provider relationship. The TEDx talk Facilitator Guide provides faculty with additional strategies that encourage the novice health care professional to critically reflect and incorporate effective communication skills prior to entry into practice.

References
https://www.childrens.harvard.edu/sites/default/files/online_library_file/ Cardiovascular and Critical Care Nursing Science Maureen.Hiller@childrens.harvard.edu
Quality of Life (QOL) in Children Dying of Cancer: The State of the Science

Investigators: Ijeoma Julie Ogunlade MSN, FNP-BC, CPON, Doctoral Candidate
Jacqueline Fawcett PhD, FAAN, RN
Teri Aronowitz PhD, APRN, FNP-BC

Purpose/Question/Aims:
The purpose of this systematic scoping literature review is to identify the gaps in the literature addressing QOL in children dying of cancer.

Background/Significance:
Approximately 30% of children with cancer die from their disease, with 72% dying in hospital while receiving cancer-directed therapy. They experience impairments in QOL dimensions including pain, fatigue, dyspnea, and uncontrolled anxiety. The purpose of this review is to identify the gaps in the literature addressing QOL in children dying of cancer. The Roy Adaptation Model guided this systematic scoping literature review.

Methods:
CINAHL, PubMed and Academic Premier were searched for research findings using the terms: childhood cancer, end of life, pediatric palliative care, QOL, cancer, and health-related QOL published between January 2004 and September 2014 in English language. Exclusion criteria were non-research articles, literature reviews, and participants > 18 years old. Data were extracted from included studies and content analyses were done to synthesize the results of the review.

Results:
Sixteen articles met the inclusion criteria. All studies focused on aspects of QOL including physical, psychosocial, social, and spiritual functioning in children who were dying of cancer. However, most studies emphasized physical and psychosocial functioning more than other dimensions. The most commonly negatively correlated QOL domain was physical functioning; specifically fatigue, pain and dyspnea. Children who died due to treatment-related symptoms experienced disproportionate pain, vomiting, sleepiness, weight loss, poor appetite, and physical fatigue than children who died of progressive disease. Children who received more intensive therapies (stem cell transplant) suffered more than those who received less intensive therapies (chemotherapy with surgery, chemotherapy with radiation or chemotherapy alone).

Implications:
This scoping literature review indicated that children with terminal cancer experienced changes in QOL related to treatment approach. Impairments in two QOL dimensions, physical and psychosocial functioning, were most often associated with decreased QOL. Prevalent symptoms (pain, dyspnea, and fatigue) impacted the physiological mode and were associated with lower
QOL scores. Poor social adjustment due to aggressive therapies was associated with lower QOL scores and impacted the self-concept mode of adaptation. Terminally ill children’s adaptation was ineffective, which indicates that QOL was compromised. Strategies facilitating adaptive responses and enhancing QOL are needed.

If this poster has been presented at a conference, which one: Will be presented April 2015 at ENRS conference.
Predicting Immobility-related and Medical Device-related Pressure Ulcer Risk in Pediatric Patients: Validating the Braden Q+ Device Study

Investigators: Lindyce A. Kulik MS, RN, CWON, CPNP, CCRN
Sandy M. Quigley MSN, RN, CWOCN, CPNP
Margaret A. McCabe PhD, RN, PNP
Martha A.Q. Curley PhD, RN, FAAN
for the Braden Q+D Study Group

Purpose/Question/Aims:
This study will test the predictive validity of the 1) Braden Q Scale for the development of immobility-related pressure ulcers and 2) Braden Q+D Scale for the development of medical device-related pressure ulcers in pediatric patients cared for in the acute care environment. The Braden Q Scale and the Braden Q+D Scale will demonstrate adequate sensitivity and specificity to predict immobility-related (Braden Q) and medical device-related (Braden Q+D) pressure ulcers in the pediatric acute care environment.

Background/Significance:
Hospital-acquired pressure ulcers from immobility and medical devices represent a serious iatrogenic injury in the acute care environment. The first step in pressure ulcer prevention is accurate risk assessment. Proper securement of medical devices are a particular concern in young active patients or those with developmental impairment therefore, clinicians may tightly secure devices to the skin to avoid inadvertent dislodgement. Pressure ulcers can add morbidity and human suffering, leading to additional resource utilization and healthcare costs.

Methods:
The research design is a multicenter, prospective cohort study enrolling a convenience sample of at least 600 pediatric patients on bedrest with a medical device in place from all inpatient areas in eight separate pediatric hospitals. To avoid selection bias, subjects are enrolled in sequence using a randomization strategy that includes the hospital inpatient units and the last digit of the patient’s medical record number. To ensure adequate sampling of at risk groups across the inpatient units, subject enrollment is stratified by age group from premature neonates to 21 years of age, respiratory status (intubated/not intubated) and patient type (medical/surgical and cardiac). After obtaining informed consent, two separate teams of nurses, blind to the other’s assessments, assess subject risk and interventions in use (Team 1) and assess for the presence of pressure ulcers (Team 2). All pressure ulcers are photographed to allow full description and adjudication between hospitals.

Results:
Enrollment in Boston began 04/09/2013 and all sites are still enrolling subjects to date. Preliminary data from 02/17/2015: all sites have screened a total of 7924 patients, with 619
subjects enrolled. The Boston site has screened 2974 patients with 115 subjects enrolled. From all sites 52 subjects developed 89 pressure ulcers: 62 medical device-related and 27 immobility-related.

Acknowledgements: BCH Research Nurse Team: Cathy Noonan-Caillouette, Susan Hamilton, Sarah Wells, Rosella Micalizzi, Carolyn Costello, Jane Murphy, Janelle Pepin, Sonia Almeida, Catherine Dowling; Research Support: Hillary Kuzdeba

Disclosures: This work was conducted with support from: 1) The Harvard Clinical and Translational Science Center (National Institutes of Health Award UL1 TR001102)*, 2) Boston Children’s Hospital Program for Patient Safety & Quality (PPSQ)*, 3) Center for Clinical Investigation (CCI) of the WOCN® Society*, 4) American Pediatric Surgical Nurses Association (APSNA)*, and 5) American Association of Critical Care Nurses (AACN)^, key: *Boston site ^All sites
Predicting Immobility-related and Medical Device-related Pressure Ulcer Risk in Pediatric Patients: Validating the Braden Q + Device Study

Lindyce A. Kulik, MS, RN, CWON, CPNP, CCRN; Sandy M. Quigley, MSN, RN, CWOCN, CPNP; Margaret A. McCabe, PhD, RN, PNP; Martha A.Q. Curley, PhD, RN, FAAN for the Braden Q-D Study Group

Introduction

- Hospital-acquired pressure ulcers (HAPUs) from immobility and medical devices represent a serious nosocomial injury in the acute care environment. The first step in pressure ulcer prevention is accurate risk assessment.
- Pediatric patients of all ages are at risk for developing pressure ulcers.
- Prepar-operative and post-operative patients are of particular concern in young active patients; those with developmental impairment, therefore, clinicians must closely secure devices to the skin to avoid inadvertent dislodgement.
- Pressure ulcers can add morbidity and human suffering, leading to additional resource utilization and healthcare costs.

Study Purpose & Hypothesis

The study will test the predictive validity of the:
1. Braden Q Scale for the development of immobility-related pressure ulcers
2. Braden Q-D Scale for the development of medical device-related pressure ulcers in pediatric patients cared for in the acute care environment.

The Braden Q Scale and the Braden Q-D Scale will demonstrate adequate sensitivity and specificity to predict immobility-related (Braden Q) and medical device-related (Braden Q-D) pressure ulcers in the pediatric acute care environment.

Sample

- Patients from all inpatient units are eligible to be enrolled
- A randomization strategy using hospital unit and last digit of MRN is being used to decrease selection bias.
- The sample is stratified by age (3 groups), respiratory status (mechanically ventilated and not ventilated and patient type (medical/surgical and cardiac).
- Inclusion Criteria:
  1. Age 18 years or younger
  2. Bed rest for at least 24 to 48 hours from hospital admission or following a procedure requiring deep sedation
  3. Presence of a medical device that is attached to or transverse the skin
- Exclusion Criteria:
  1. Patients with community-acquired or pre-existing pressure ulcers (immobility or device-related)
  2. Patients with an active “do not resuscitate” order

Data Collection

- Two nursing teams work in tandem, blind to the other’s assessments. Team I collects data on subject assessment, intervention, medical device use and completes the Braden Q – D Risk Assessment and Team II completes a head-to-toe skin assessment.
- Subjects are assessed up to 3 times per week (M-W-F) for 2 full weeks then weekly for 2 weeks.
- Subjects are discharged from study at hospital discharge or study day 28, whichever occurs first.
- Nurses use iPads or desktop computer to enter Case Report Form data directly into REDCap through a secure server.
- Enrollment started April 2013 and is still in progress.

Preliminary Data

<table>
<thead>
<tr>
<th>SUBJECTS</th>
<th>IMMobilized</th>
<th>PReSsure ULCERS</th>
<th>Device RELATED</th>
<th>IMmobility RELATED</th>
</tr>
</thead>
<tbody>
<tr>
<td>ALL</td>
<td>7014</td>
<td>69</td>
<td>80</td>
<td>42</td>
</tr>
<tr>
<td>BOSTON</td>
<td>3294</td>
<td>31</td>
<td>44</td>
<td>22</td>
</tr>
</tbody>
</table>

* n is subjects

Acknowledgements


Disclosures

This work was conducted with support from:
1. The Harvard Clinical and Translational Science Center (National Institutes of Health Award UL1 TR001110)
2. Boston Children’s Hospital Program for Patient Safety & Quality (PSQI)*
3. Center for Clinical Investigation (CCI) of the WOONS® Society*
4. American Academy of Paediatric Nurses Association (AAPN)*
5. American Association of Critical Care Nurses (AACN)*

* Boston site  All sites
Experience from Surveying Parental Motivation for Enrolling or Declining Participation in Pediatric Anesthesia Clinical Research: An Assessment of Randomized and Non-Randomized Clinical Studies

Investigators: Izabela Leahy MS, BSN, RN
Amanda Whipple MPH
Michelle Anderson BSN, RN
Rachel Bernier MPH
Vanessa Young BA, RN
Christine Dube MS, BSN, RN
Rachel Dabek BA
Brenda Barton BSN, RN

Purpose/Question/Aims:
The aim of this study is to determine the factors that influence a parent or guardian’s choice to allow or decline their child’s participation in randomized and non-randomized anesthesia clinical research studies. The project also aims to identify possible reasons for accepting or declining participation related to ACRU consenting behavior such as communication skills, location/time of consenting and information presentation techniques. The identification of these reasons will be utilized to improve the consenting process for patients and their parents and will assist with increasing future enrollment rates.

Background/Significance:
Informed consent prior to enrollment in research is a fundamental ethical prerequisite in the process of conducting clinical research. Obtaining consent involves informing subjects about their rights, the study’s purpose and procedures, and the potential risks and benefits of participation [1]. Subjects who are vulnerable due to their age or cognitive disability need a higher level of protection when included in clinical research [2,3]. Since children are considered incapable of giving informed consent to participate in research, regulations require researchers to obtain permission from parents or legally authorized representatives. The American Academy of Pediatrics published a policy statement in 1995 on the legal concept of informed consent in paediatric practice [4], and this has evolved over the years to become more formalized [5]. Clinical research nurses (CRN) and clinical research coordinators (CRC) from the Anesthesia Clinical Research Unit (ACRU) recruit and enroll subjects for all anesthesia-related research studies. Enrollment involves conducting informed consent, whereby a CRN,CRC, or other investigator discusses the study in-depth with potential subjects, assesses understanding, answers questions, and obtains a formal, written agreement from the subject to participate in research.
Methods:
After Institutional Review Board approval, the ACRU team initiated a prospective study to investigate parental motivation for participating, or not participating, in research via the method of disseminating a survey to the parent or legal guardian of a potential subject. An ACRU team member explained to the subject’s parent/guardian the purpose of the “consent” study immediately after the subject’s parent/guardian had been approached for consent for one of the anesthesia clinical research protocols. Both parents/guardians who opted to enroll their child, as well as those who declined enrollment, were asked to complete the survey. The survey consisted of 12 to 14 research-related statements. These statements identified potential reasons why a parent may agree or decline to have their child participate in research. The surveys also contained questions regarding demographic information. The final study sample consisted of 110 subjects. The total number of subjects who completed the survey can be broken down by study type and enrollment as follows:
- Consented to research: 63 non-randomized and 25 randomized surveys were collected
- Did not consent to research: 6 non-randomized and 16 randomized surveys were collected

Results:
Of 110 subjects who completed the questionnaire 88 (80%) consented to participate in anesthesia research and 22 (20%) declined to enroll their child in anesthesia research. According to consenters who completed the survey, the most important factors in favor of giving consent to participation were if the parent believed that the research was of benefit to the child (55/88, 62.5%); if they received enough information about the research from the research staff (86/88, 97.7%); and if they trusted the person who approached them about the anesthesia research (87/88, 98.8%). The incentives and compensations to participate were rated as follows: not applicable (54/88, 60.2%), liked incentives (26/88, 29.5%), did not like incentives (2/88, 2.2%) and were impartial to incentives (7/88, 7.9%).
We found that the parents of consented children were older, in age groups as follows: 19-25 years (3/88, 3.4%) 26-35 years (17/88, 19.3%), 36-45 years (40/88, 45.4%), over 46 (26/88, 29.5%) with 2 subjects who did not identify their age. In our sample the percentage of parents with a college or post graduate degree was 62%, next to 17% with two year college and 21% with a high school diploma.
We acknowledge the limitations of our study, one of which was the low response rate of parents who did not consent to participate in anesthesia research. Due to the small sample size, parents who completed the survey who did not enroll in anesthesia research were excluded from this analysis. We are planning to revise the survey administered and focus our next study on parents who refuse to consent for anesthesia research studies.

Implications:
The factors widely considered by parents who consented to involve their child in research were: if the research was believed to be beneficial to the child, getting enough explanation/information about the research study, and if the parent trusted the person who approached them about anesthesia research. Additionally, we found that the parents who decided to enroll their child in a study were older, with a higher level of education.
References:

Surveying Parental Motivation for Enrolling or Declining Participation in Pediatric Anesthesia Clinical Research: An Assessment of Randomized and Non-Randomized Clinical Studies

Izabela Leahy, MS, BSN, RN; Amanda Whipple, MPH; Michelle Anderson, RN, BSN; Rachel Bernier, MPH; Vanessa Young, RN, BA; Christine Dube, MS, BSN, RN; Rachel Dabeck, BA; Brenda Barton, RN, BSN

Purpose/Aims:
The aim of this study is to determine the factors that influence a parent or guardian's decision to allow or decline their child's participation in anesthesia-related clinical research. The project also aims to identify possible reasons for accepting or declining participation related to research-team consenting behavior such as communication skills, location/time of consenting and information presentation techniques. The identification of these reasons will be utilized to improve the consenting process for patients and their parents and will assist with increasing future enrollment rates.

Background:
Informed consent prior to enrollment in research is a fundamental ethical prerequisite in the process of conducting clinical research. Obtaining consent involves informing subjects about their rights, the study’s purpose and procedures, and the potential risks and benefits of participation [1]. Since children are considered incapable of giving informed consent to participate in research, regulations require researchers to obtain permission from parents or legally authorized representatives. Clinical research nurses (CRN) and clinical research coordinators (CRC) from the Anesthesia Clinical Research Unit (ACRU) recruit and enroll subjects for all anesthesia-related research studies. Enrollment involves conducting informed consent, whereby a CRN or CRC discusses the study with potential subjects, assesses understanding, answers questions, and obtains a formal, written agreement from the subject to participate in research.

Methods:
After Institutional Review Board approval, the ACRU team initiated a prospective study to investigate parental motivation for participation, or not participating, in research via the method of disseminating a survey to the parent or legal guardian of a potential subject. An ACRU team member explained the purpose of the “consent” study immediately after the subject’s parent/guardian had been approached for consent for one of the anesthesia clinical research protocols. Both parents/guardians who opted to enroll their child, as well as those who declined enrollment, were asked to complete the survey. The survey consisted of 12 to 14 research-related statements. These statements identified potential reasons why a parent may agree or decline to have their child participate in research. Demographic information was also surveyed. The final study sample consisted of 110 subjects. The total number of subjects who completed the survey can be broken down by study type and enrollment as follows:

<table>
<thead>
<tr>
<th>Study Type</th>
<th>Number of Subjects</th>
</tr>
</thead>
<tbody>
<tr>
<td>Complete</td>
<td>110</td>
</tr>
<tr>
<td>Decline</td>
<td>12</td>
</tr>
<tr>
<td>Total</td>
<td>122</td>
</tr>
</tbody>
</table>

Table 1. Parent and child demographic data

<table>
<thead>
<tr>
<th>Table 1. Parent and child demographic data</th>
<th>Number (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Parent relationship to child</td>
<td></td>
</tr>
<tr>
<td>Mother</td>
<td>77</td>
</tr>
<tr>
<td>Father</td>
<td>8</td>
</tr>
<tr>
<td>Patient</td>
<td>2</td>
</tr>
<tr>
<td>Not specified</td>
<td>1</td>
</tr>
<tr>
<td>Race</td>
<td></td>
</tr>
<tr>
<td>Asian</td>
<td>1</td>
</tr>
<tr>
<td>Native Hawaiian or other Pacific Islander</td>
<td>5</td>
</tr>
<tr>
<td>White</td>
<td>80</td>
</tr>
<tr>
<td>Other</td>
<td>2</td>
</tr>
<tr>
<td>Level of education</td>
<td></td>
</tr>
<tr>
<td>College or post graduate degree</td>
<td>55 (62.5%)</td>
</tr>
<tr>
<td>Two-year college</td>
<td>13 (17%)</td>
</tr>
<tr>
<td>High school diploma</td>
<td>15 (17%)</td>
</tr>
<tr>
<td>Not specified</td>
<td>3 (3.4%)</td>
</tr>
<tr>
<td>Parent’s age</td>
<td></td>
</tr>
<tr>
<td>19-25 years</td>
<td>3 (3.4%)</td>
</tr>
<tr>
<td>26-35 years</td>
<td>37 (19.3%)</td>
</tr>
<tr>
<td>36-45 years</td>
<td>40 (19.3%)</td>
</tr>
<tr>
<td>Over 46 years</td>
<td>26 (25.5%)</td>
</tr>
<tr>
<td>Not specified</td>
<td>2 (2.2%)</td>
</tr>
</tbody>
</table>

Results:
Of 110 subjects who completed the survey, 88 (80%) consented to participate in anesthesia research and 22 (20%) declined to enroll their child. The most important factors in favor of permitting participation were: if the parent believed that the research was of benefit to the child (55/88, 62.3%), if they received enough information about the research from the research staff (60/88, 97.7%), and if they trusted the person who approached them about the anesthesia research (87/88, 98.8%). The incentives and compensations to participate were rated as follows: not applicable (54/88, 62.2%), liked incentives (24/88, 29.5%), did not like incentives (2/88, 2.2%) and were impartial to incentives (7/88, 7.9%). We found that the parents of consented children were older, in age groups as follows: 19-25 years (26/88, 30%), 26-35 years (17/88, 19.3%), 36-45 years (40/88, 45.4%), over 46 (26/88, 29.5%) with 2 subjects who did not identify their age. In our sample the percentage of parents with a college or post graduate degree was 62%, next to 17% with two year college and 21% with a high school diploma.

Implications:
The factors widely considered by parents who consented to involve their child in research were: if the research was believed to be beneficial to the child, getting enough explanation/information about the research study, and if the parent trusted the person who approached them about anesthesia research. Additionally, we found that the parents who decided to enroll their child in a study were older, with a higher level of education. Ultimately, these results are consistent with other published studies: subjects and their parents must be able to trust the individual seeking their consent and must have a good understanding of the study in order to agree to participate in clinical research.

We acknowledge the limitations of our study, one of which was the low response rate of parents who did not consent to participate in anesthesia research. Due to the small sample size, parents who completed the survey who did not enroll in anesthesia research were excluded from this analysis. We are planning to revise the survey administered in our next study on parents who refuse to consent for anesthesia research studies. Additionally, we plan to extend the study in order to recruit a larger population of non-consenters.

References:
Assessment of Vitamin B12 Status in Pediatric Intestinal Failure Patients: Is Methylmalonic Acid a Reliable Biomarker?

Investigators: Danielle Stamm FNP-BC  
Brittany Tellier RD LDN  
Christopher Duggan MD MPH

Purpose/Question/Aims:  
To describe the relationship between serum methylmalonic acid (MMA) concentrations and exposure to enteral antibiotics in pediatric intestinal failure patients being treated for vitamin B12 deficiency.

Background/Significance:  
Vitamin B12 (cyanocobalamin) deficiency is a common complication of short bowel syndrome due to a variety of factors including postsurgical anatomy and gastric acid blockade (1-2). The clinical outcomes of vitamin B12 deficiency are significant and may include anemia, pancytopenia, paresthesias, peripheral neuropathy, irritability, dementia, depression, psychosis and possibly increased risk of cardiovascular disease (3). The establishment of sensitive and specific measures for monitoring vitamin B12 status in this at risk population continues to be a topic of interest. The use of homocysteine (HCY) and methylmalonic acid (MMA) as markers of vitamin B12 status have been identified as more sensitive measures of vitamin B12 status than serum levels of cyanocobalamin (4). However, MMA must be interpreted with caution in patients with short bowel syndrome due to excessive MMA production in the setting of small bowel bacterial overgrowth, which may overwhelm metabolism capacity even in the setting of vitamin B12 sufficiency (5).

Methods:  
A retrospective chart review was performed on 3 children with intestinal failure and a history of terminal ileal resection. All were on stable regimens of parenteral cyanocobalamin as treatment for previous biochemical evidence of vitamin B12 deficiency.

Results:  
Patient 1 was a 7 year old girl with segmental volvulus and ileocolonic anastomosis. Patient 2 was a 4 year old boy with necrotizing enterocolitis and an ileocolonic anastomosis. Patient 3 was a 3 year old girl with necrotizing enterocolitis with a jejunalcolonic anastomosis. All had terminal ileum resection, none were receiving acid blockade, and none had clinical evidence of small bowel bacterial overgrowth. All had previously been started on parenteral cyanocobalamin in response to biochemical evidence of vitamin B12 deficiency, with subsequent improvement in biochemical measures of vitamin B12 status. All 3 later developed increased MMA concentrations in the setting of normal serum B12 and total homocysteine (tHcy) concentrations. They were treated with metronidazole (10 mg/kg/dose twice daily for 7
days) and underwent repeat laboratory testing within 2 weeks. Table 1 shows serum markers of vitamin B12 status before and after enteral antibiotics. Abnormal elevations in MMA (with concurrently normal levels of vitamin B12 and tHcy) were noted in each patient, and resolved following metronidazole treatment.

Table 1: Serum Markers of Vitamin B12 Status Before and After Treatment with Metronidazole

<table>
<thead>
<tr>
<th></th>
<th>MMA µmol/L</th>
<th>tHcy µmol/L</th>
<th>Vitamin B12 pg/mL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Normal Range</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>&lt;0.9</td>
<td>&lt;10</td>
<td>190-778</td>
</tr>
<tr>
<td>Patient #1 Before Metronidazole</td>
<td>1.54</td>
<td>7.7</td>
<td>415</td>
</tr>
<tr>
<td>After Metronidazole</td>
<td>0.31</td>
<td>7.48</td>
<td>577</td>
</tr>
<tr>
<td>Patient #2 Before Metronidazole</td>
<td>6.3</td>
<td>6.7</td>
<td>820</td>
</tr>
<tr>
<td>After Metronidazole</td>
<td>&lt;0.1</td>
<td>5.7</td>
<td>811</td>
</tr>
<tr>
<td>Patient #3 Before Metronidazole</td>
<td>2.5</td>
<td>6.5</td>
<td>336</td>
</tr>
<tr>
<td>After Metronidazole</td>
<td>0.2</td>
<td>6.5</td>
<td>398</td>
</tr>
</tbody>
</table>

Implications:
MMA may not be a reliable marker of vitamin B12 status in pediatric intestinal failure. The use of enteral antibiotics to reduce gut bacterial load should be considered when evaluating patients with elevated MMA in this population, even in those without overt signs of small bowel bacterial overgrowth.

References:

If this poster has been presented at a conference, which one: NASPGHAN 2014 (North American Society for Pediatric Gastroenterology, Hepatology and Nutrition)
Assessment of Vitamin B12 Status in Pediatric Intestinal Failure Patients: Is Methylmalonic Acid a Reliable Biomarker?

Danielle Stamn FNP MSN, Brittany Tellier, RD, Christopher Duggan MD MPH

1Division of Gastroenterology, Hepatology and Nutrition, 2Department of Surgery, Center for Advanced Intestinal Rehabilitation, All at Boston Children’s Hospital, Harvard Medical School, Boston, MA

BACKGROUND

• Normal absorption of Vitamin B12 (cobalamin) is accomplished in the terminal ileum after binding to intrinsic factor in the stomach.

Figure 1: Vitamin B12 Absorption

• Vitamin B12 deficiency is a common problem in intestinal failure, particularly in patients with a history of terminal ileum resection.

• Methylmalonic acid (MMA) has been proposed as a sensitive marker of vitamin B12 status. 2

Figure 2: The Role of Vitamin B12 in Methylmalonic Acid Metabolism 3

AIM

• To explore whether MMA concentrations are a suitable measure of vitamin B12 status in pediatric intestinal failure patients.

• To describe the relationship between serum MMA concentrations and exposure to antibiotics in a series of pediatric intestinal failure patients being treated for vitamin B12.

METHODS

• A retrospective chart review was performed on 3 children with intestinal failure and a history of terminal ileum resection and who were on stable regimens of parenteral cyanocobalamin as treatment for previous biochemical evidence of vitamin B12 deficiency.

• Information about markers of vitamin B12 status both before and after a course of enteral metronidazole was collected.

RESULTS

Table 2: Serum Markers of Vitamin B12 Status Before and After Treatment with Metronidazole

<table>
<thead>
<tr>
<th>Patient</th>
<th>MMA (mmol/L)</th>
<th>Cy (mmol/L)</th>
<th>Vitamin B12 (ng/mL)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Patient #1</td>
<td>&lt;0.9</td>
<td>1.9-13.9</td>
<td>599-778</td>
</tr>
<tr>
<td>Patient #2</td>
<td>1.5</td>
<td>7.7</td>
<td>115</td>
</tr>
<tr>
<td>Patient #3</td>
<td>1.0</td>
<td>6.1</td>
<td>177</td>
</tr>
<tr>
<td>Patient #4</td>
<td>4.3</td>
<td>6.8</td>
<td>111</td>
</tr>
<tr>
<td>Patient #5</td>
<td>2.5</td>
<td>6.5</td>
<td>136</td>
</tr>
<tr>
<td>Patient #6</td>
<td>0.2</td>
<td>6.3</td>
<td>199</td>
</tr>
</tbody>
</table>

Table 1: Baseline Demographic Data for 3 Patients with Vitamin B12 Deficiency Receiving Parenteral Cyanocobalamin

<table>
<thead>
<tr>
<th>Patient</th>
<th>Age</th>
<th>Sex</th>
<th>Diagnosis</th>
<th>Clinical symptoms of small bowel bacterial overgrowth?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Patient #1</td>
<td>6 years</td>
<td>Female</td>
<td>Sequential episodes with intermittent symptoms</td>
<td>No</td>
</tr>
<tr>
<td>Patient #2</td>
<td>4 years</td>
<td>Male</td>
<td>Non-healing ulcerative colitis with microscopic evidence</td>
<td>No</td>
</tr>
<tr>
<td>Patient #3</td>
<td>5 years</td>
<td>Female</td>
<td>Non-healing ulcerative colitis with microscopic evidence</td>
<td>No</td>
</tr>
</tbody>
</table>

CONCLUSIONS

• MMA may not be a reliable marker of vitamin B12 status in pediatric intestinal failure.

• The use of enteral antibiotics should be considered when evaluating patients with elevated MMA in this population, even in those without overt signs of small bowel bacterial overgrowth.

References

Use of Ceftaroline to Treat Pulmonary Exacerbations for Patients with Cystic Fibrosis (CF) with Methicillin Resistant Staphylococcus Aureus (MRSA) Infection

Investigators: Sullivan, K
Wong, A
Sawicki, G

Purpose/Question/Aims:
To assess the safety, tolerability, and efficacy of intravenous (IV) ceftaroline to treat pulmonary exacerbations in hospitalized patients with CF.

Background/Significance:
There is an increased prevalence of MRSA infections in patients with CF. MRSA has been associated with increased morbidity and mortality. Current IV therapies, such as IV vancomycin, available for MRSA infection have significant side effect profiles. Ceftaroline is a broad-spectrum antibiotic currently approved for the treatment of complicated skin and skin structure infections and community acquired pneumonia in adults due to MRSA. The use of ceftaroline to treat CF pulmonary exacerbations could be a novel approach, but has little Food and Drug Administration (FDA) guidance for dosage recommendations.

Methods:
A retrospective chart review was performed for patients with CF colonized with MRSA that were hospitalized between May 2013 to May 2014 for a pulmonary exacerbation and received IV ceftaroline as part of their therapy. Data were collected to assess pulmonary function, serum creatinine, white blood cell (WBC) count, C-reactive protein (CRP), and liver function testing (LFT). Other measures collected were duration of therapy, concomitant antibiotic administration, and adverse reactions. Patients initiating therapy in the hospital, but completing IV therapy at home were excluded.

Results:
7 patients with CF ages 6 to 49 years received IV ceftaroline as an inpatient. Four patients had multiple courses over the year (n=16 total treatment courses). All patients received doses starting at 15mg/kg (maximum 600mg) every 8 hours. All patients received other IV antibiotics during their treatment, all targeting Pseudomonas or other CF pathogens. No other anti-MRSA IV antibiotics were used concurrently. The average length of IV ceftaroline therapy was 17 days (average 44 doses). Discontinuation of therapy was due to completion of IV therapy for the CF exacerbation. No patients had any adverse event resulting in discontinuation of therapy. No patients had either an elevation of serum creatinine or abnormalities in LFTs during the treatment periods. All patients had decreased inflammatory markers (WBC count and CRP) during their treatment. Of the 11 sets of lung function studies assessed before and after IV
ceftaroline treatment periods, 3 sets had decreased or no change in FEV1. Among those that had lung function improvement, there was a range of 1-9% improvement in FEV1.

**Implications:**
Ceftaroline appears to be a viable option for the treatment of pulmonary exacerbations in patients with CF and MRSA infection. In this small population, this therapy was safe and tolerable, and appears to be effective in contributing to improved clinical outcomes during hospitalization. Further research into the use of IV ceftaroline, including appropriate dosing and duration of therapy, in CF is warranted.

If this poster has been presented at a conference, which one: Presented at the North American Cystic Fibrosis Conference in Atlanta, GA; October 2014
Use of ceftaroline to treat pulmonary exacerbations for patients with cystic fibrosis (CF) with methicillin resistant staphylococcus aureus (MRSA) infection

Keri J. Sullivan, MS, RN, CPNP1,3; Alanna Wong, PharmD., BCPS2; Gregory S. Sawicki, MD, MPH3
1. Medicine Patient Services 2. Department of Pharmacy 3. Division of Respiratory Diseases
Boston Children’s Hospital | Boston, MA 02115

Background
- There is an increased prevalence of MRSA infections in patients with CF.
- MRSA has been associated with increased morbidity and mortality.
- Current IV therapies, such as vancomycin, available for MRSA infection have significant side effect profiles.
- Ceftaroline is a broad-spectrum antibiotic currently approved for the treatment of complicated skin and skin structure infections and community acquired pneumonia in adults due to MRSA.
- Ceftaroline could be a novel approach to treat CF pulmonary exacerbations but has little FDA guidance for dosage recommendations.

Objectives
- Assess the safety, tolerability, and efficacy of IV ceftaroline to treat pulmonary exacerbations in hospitalized patients with CF.

Methods
- Prior to commencement, this study was approved by Boston Children’s Hospital Institutional Review Board.
- Design: Retrospective chart review.
- Time period: May 2013 to September 2014.
- Inclusion criteria: All CF patients colonized with MRSA that completed IV therapy through an entire inpatient admission.
- Exclusion criteria: Patients initiating therapy in the hospital but completing IV therapy at home.
- Collected objective data: Pulmonary function testing (PFTs), serum creatinine, white blood cell (WBC) count, C-reactive protein (CRP), and liver function testing (LFT).
- Other measures collected: Duration of therapy, concomitant antibiotic administration, and adverse reactions.
- All patients received doses starting at 150mg/kg (maximum of 600 mg) every 8 hours infused over 60-120 minutes.

Results
- 9 distinct patients with CF were identified, with a total of 23 inpatient treatment courses.
- All patients received other IV antibiotics during their treatment, all targeting Pseudomonas or other CF pathogens.
- No other anti-MRSA IV antibiotics were used concurrently.
- No patients had any adverse events resulting in discontinuation of therapy.
- No patients had either an elevation in serum creatinine or abnormalities in LFTs during their treatment courses.

Demographics and Clinical Characteristics

<table>
<thead>
<tr>
<th>Number of treatment courses</th>
<th>23</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean Age (years)</td>
<td>19.25 ± 10.87</td>
</tr>
<tr>
<td>Mean Start FEV1 (% predicted)</td>
<td>38.07 ± 12.56</td>
</tr>
<tr>
<td>Mean Weight (kilograms)</td>
<td>40.77 ± 12.85</td>
</tr>
<tr>
<td>Gender</td>
<td>M: 4/9 (44%), F: 5/9 (56%)</td>
</tr>
<tr>
<td>Infusion Time (minutes)</td>
<td>60 (3 courses), 120 (20 courses)</td>
</tr>
<tr>
<td>Mean Length of Stay (days)</td>
<td>29.9 ± 29.18</td>
</tr>
<tr>
<td>Mean Total Length of Therapy (days)</td>
<td>17 ± 8</td>
</tr>
</tbody>
</table>

Summary
- Ceftaroline appears to be a viable option for the treatment of pulmonary exacerbations in patients with CF and MRSA infection.
- In this small population, this therapy was safe and tolerable, and appears to be effective in contributing to improved clinical outcomes during hospitalization.

Limitations
- Limited pediatric sample with patients with moderate to severe lung disease only.
- Limited published information on administration and dosing guidelines in pediatrics.
- Patients also received treatment for other organisms, which may have contributed to overall response to therapy.

Future Direction
- Further research into the use of IV ceftaroline, including appropriate dosing and duration of therapy, in CF is warranted.

Disclosures
Authors of this presentation have no disclosures related to this presentation. Partial funding for this work was provided by the CF Foundation.
Pediatric Oncology Nurses' Attitudes about Children Participating in Oncology Clinical Trials

Investigators: Lucinda Williams DNP, MSN, RN, PNP, NE-BC
Laura Flesch MSN, RN, CRN
Bethany Trainor BSN, RN

Purpose, Question(s)/Aims:
Specific Aims: 1. Investigate pediatric oncology nurses’ attitudes about childhood cancer patients participating in oncology clinical trials 2. Identify pediatric oncology nurse characteristics that are predictive of positive attitudes toward cancer clinical trials

Background/Significance:
Pediatric oncology nurses play many important roles in caring for children enrolled onto oncology clinical trials. The existing literature acknowledges that parents/children seek information from nurses about clinical trials participation. Nurses may provide information that alters or influences parents’/a child’s decision(s) to participate in a clinical trial. An approach to assessing nurses’ actions towards patients is to investigate nurses’ attitudes.

Methods:
This cross sectional, descriptive pilot study investigated pediatric oncology nurses’ attitudes about children’s participation in oncology trials as well as nurse characteristics associated with positive attitudes toward clinical trials participation. A convenience sample of 503 pediatric oncology nurses from two pediatric academic medical centers were approached to participate in a 53-question paper and pencil survey, The Nurses’ Attitudes Survey, that took 10 minutes to complete.

Results:
1. Overall, pediatric oncology nurses had positive attitudes about childhood cancer patients participating in oncology clinical trials
2. Only one (of 6 possible) nurse characteristics, inpatient bone marrow transplant, was statistically significant for predicting positive attitudes about children participating in clinical trials

Implications:
Understanding pediatric oncology nurses’ attitudes about children participating in oncology clinical trials may serve to inform future interventions for nurses such as the development of a curriculum about clinical research and oncology clinical trials. Interventions such as development of a curriculum about clinical research may influence nurses’ intentions to engage parents/children in discussions about participation in clinical trials; the long term benefit being improved nursing care for childhood cancer patients.
Pediatric Oncology Nurses’ Attitudes about Children Participating in Oncology Clinical Trials: A Pilot Study

Lucinda Williams, DNP, MSN, RN, PNP, NE-BC, Laura Flesch, MSN, RN, CRNP, Bethany Trainor, BSN, RN

Background
Improvement in outcomes for childhood cancer patients has in large part been attributed to the high enrollment of children onto clinical trials. It is estimated that upwards of 65% of childhood cancer patients are enrolled on a clinical trial (Shaw, Ritchey, 2007).

Pediatric oncology nurses play a major role in the care of children enrolled onto oncology clinical trials.

Decision making in clinical trials has been studied but focused on patient, community and physician attitudes and understanding of trials. However, the role that nurses play in children’s participation in clinical trials has not been studied completely.

The existing literature acknowledges that parents/patients seek information from nurses about clinical trials participation.

Parents/children may receive information from a nurse that contributes to or alters their decision to enroll their child on a clinical trial.

An approach to assessing nurses’ actions toward patients is to investigate nurses’ attitudes.

Study Purpose
Investigate pediatric oncology nurses’ attitudes about children participating in oncology clinical trials and explore nurse characteristics that predictive of positive attitudes about clinical research.

Specific Aims
1. Survey pediatric oncology nurses’ attitudes about childhood cancer patients participating in oncology clinical trials
2. Identify pediatric oncology nurse characteristics that are predictive of positive attitudes toward clinical research

Data Collection/Analysis
Descriptive statistics, summed scores, t-tests, ANOVA and multiple regression analysis were used for data analyses.

All data was entered into a Redcap database & data was analyzed using SAS version 9.3

Findings
Overall, pediatric oncology nurses had positive attitudes about clinical research.

Pediatric nurses working in the setting of inpatient Bone Marrow Transplant had statistically significantly more positive attitudes about clinical research than nurses working in other settings (inpatient oncology, outpatient oncology or outpatient BMT (p = 0.02)

Methods/Design
A non-experimental, cross sectional, descriptive pilot study

Survey Instrument:
Modified Nurses’ Attitude Survey (Burnett, 2001)

53-question paper and pencil self-report survey

Sample
A convenience sample of 503 pediatric oncology nurses from two pediatric academic medical centers working part-time or full-time were approached to participate.

Response rate: 20% (100 nurse participants)

Implications for Practice
Understanding nurses’ attitudes about children participating in clinical research may serve to inform future interventions such as the development of a curriculum about clinical research for pediatric oncology nurses.

Nurses better informed about clinical research through participating in activities such as a curriculum about clinical research may ultimately be more willing to engage families in discussions about participation in clinical trials; the long-term benefit of which is to improve nursing care to pediatric oncology patients.

References

INDEX OF AUTHORS
# Index

## A

<table>
<thead>
<tr>
<th>Name</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Abecassis</td>
<td>126</td>
</tr>
<tr>
<td>Ablassaf</td>
<td>243</td>
</tr>
<tr>
<td>Adrian</td>
<td>69</td>
</tr>
<tr>
<td>Ahern</td>
<td>151</td>
</tr>
<tr>
<td>Allen</td>
<td>219</td>
</tr>
<tr>
<td>Allen deRichter</td>
<td>104</td>
</tr>
<tr>
<td>Altavilla</td>
<td>112</td>
</tr>
<tr>
<td>Anderson</td>
<td></td>
</tr>
<tr>
<td>Megan</td>
<td>246</td>
</tr>
<tr>
<td>Michelle</td>
<td>19, 302</td>
</tr>
<tr>
<td>Sharon</td>
<td>78</td>
</tr>
<tr>
<td>Andras</td>
<td>103</td>
</tr>
<tr>
<td>Antonelli</td>
<td>234</td>
</tr>
<tr>
<td>Armstrong</td>
<td>145</td>
</tr>
<tr>
<td>Arnold</td>
<td>151</td>
</tr>
<tr>
<td>Aronowitz</td>
<td>297</td>
</tr>
<tr>
<td>Arsenault</td>
<td>80, 94</td>
</tr>
<tr>
<td>Atkinson</td>
<td>128, 130</td>
</tr>
<tr>
<td>Audain</td>
<td>53</td>
</tr>
<tr>
<td>Audette</td>
<td>58</td>
</tr>
</tbody>
</table>

## B

<table>
<thead>
<tr>
<th>Name</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bailey</td>
<td>177</td>
</tr>
<tr>
<td>Baldwin</td>
<td>8</td>
</tr>
<tr>
<td>Band</td>
<td>132</td>
</tr>
<tr>
<td>Banerjee</td>
<td>240</td>
</tr>
<tr>
<td>Barajas</td>
<td>50</td>
</tr>
<tr>
<td>Barry</td>
<td>161</td>
</tr>
<tr>
<td>Barth</td>
<td>206</td>
</tr>
<tr>
<td>Barton</td>
<td>19, 302</td>
</tr>
<tr>
<td>Baxter</td>
<td>10</td>
</tr>
<tr>
<td>Beauregard</td>
<td>136</td>
</tr>
<tr>
<td>Bedard</td>
<td>264</td>
</tr>
<tr>
<td>Bellinger</td>
<td>283</td>
</tr>
<tr>
<td>Bennet</td>
<td>237</td>
</tr>
<tr>
<td>Bennett</td>
<td>115</td>
</tr>
<tr>
<td>Bergersen</td>
<td>142</td>
</tr>
<tr>
<td>Bernier</td>
<td>302</td>
</tr>
<tr>
<td>Bernson</td>
<td>283</td>
</tr>
<tr>
<td>Bhumhani</td>
<td>222</td>
</tr>
<tr>
<td>Bishop Kuzdeba</td>
<td>234</td>
</tr>
<tr>
<td>Bogart</td>
<td>240</td>
</tr>
<tr>
<td>Bolg</td>
<td>23</td>
</tr>
<tr>
<td>Bombardier</td>
<td>252</td>
</tr>
</tbody>
</table>

## C

<table>
<thead>
<tr>
<th>Name</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bourgeois</td>
<td>90</td>
</tr>
<tr>
<td>Boyer</td>
<td>80</td>
</tr>
<tr>
<td>Bracket</td>
<td>88</td>
</tr>
<tr>
<td>Braudis</td>
<td>217</td>
</tr>
<tr>
<td>Brawn</td>
<td>139</td>
</tr>
<tr>
<td>Brediger</td>
<td>121</td>
</tr>
<tr>
<td>Brennan-Krohn</td>
<td>172</td>
</tr>
<tr>
<td>Briere</td>
<td>237</td>
</tr>
<tr>
<td>Brown</td>
<td></td>
</tr>
<tr>
<td>L</td>
<td>31</td>
</tr>
<tr>
<td>Loren</td>
<td>142</td>
</tr>
<tr>
<td>Burgess</td>
<td>103, 231</td>
</tr>
<tr>
<td>Burgos</td>
<td>121</td>
</tr>
<tr>
<td>Buxton</td>
<td>225</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Name</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cadet</td>
<td>136</td>
</tr>
<tr>
<td>Calixte</td>
<td>184</td>
</tr>
<tr>
<td>Cardini</td>
<td>206</td>
</tr>
<tr>
<td>Cardona</td>
<td>103</td>
</tr>
<tr>
<td>Carter</td>
<td>164</td>
</tr>
<tr>
<td>Carvalho Ramos</td>
<td>184</td>
</tr>
<tr>
<td>Casey</td>
<td>145</td>
</tr>
<tr>
<td>Ceuvels</td>
<td>264</td>
</tr>
<tr>
<td>Chan</td>
<td>158, 181, 187, 231, 240</td>
</tr>
<tr>
<td>Chandhok</td>
<td>222</td>
</tr>
<tr>
<td>Chandler</td>
<td>161</td>
</tr>
<tr>
<td>Chandonnet</td>
<td>237</td>
</tr>
<tr>
<td>Chase</td>
<td></td>
</tr>
<tr>
<td>Phoebe</td>
<td>164</td>
</tr>
<tr>
<td>Tami</td>
<td>154, 231, 240</td>
</tr>
<tr>
<td>Chen</td>
<td>115</td>
</tr>
<tr>
<td>Cheng</td>
<td>231</td>
</tr>
<tr>
<td>Chiang</td>
<td>90</td>
</tr>
<tr>
<td>Ciombor</td>
<td>161</td>
</tr>
<tr>
<td>Clark</td>
<td>12, 13</td>
</tr>
<tr>
<td>Connelly</td>
<td>83</td>
</tr>
<tr>
<td>Connolly</td>
<td></td>
</tr>
<tr>
<td>Jack</td>
<td>128</td>
</tr>
<tr>
<td>Kelly</td>
<td>31</td>
</tr>
<tr>
<td>Molly</td>
<td>148</td>
</tr>
<tr>
<td>Connor</td>
<td>139, 142, 151, 174, 196, 214, 234, 249, 249, 261, 268, 271, 274, 277, 280, 285, 288</td>
</tr>
<tr>
<td>Conrad</td>
<td>126, 277</td>
</tr>
<tr>
<td>Conroy</td>
<td>158, 181, 187</td>
</tr>
<tr>
<td>Conwell</td>
<td>190</td>
</tr>
<tr>
<td>Cook</td>
<td>86</td>
</tr>
<tr>
<td>Cooley Carlson</td>
<td>60</td>
</tr>
<tr>
<td>Name</td>
<td>Page Numbers</td>
</tr>
<tr>
<td>-----------------------</td>
<td>-----------------------</td>
</tr>
<tr>
<td>Corr</td>
<td>83</td>
</tr>
<tr>
<td>Cote</td>
<td>164</td>
</tr>
<tr>
<td>Covelle</td>
<td>148</td>
</tr>
<tr>
<td>Cox</td>
<td></td>
</tr>
<tr>
<td>Delia</td>
<td>72</td>
</tr>
<tr>
<td>Joanne</td>
<td>158, 240</td>
</tr>
<tr>
<td>Crawford</td>
<td>209</td>
</tr>
<tr>
<td>Crook</td>
<td>12, 13</td>
</tr>
<tr>
<td>Crowley</td>
<td>103, 154</td>
</tr>
<tr>
<td>Cuccovia</td>
<td>151</td>
</tr>
<tr>
<td>Curley</td>
<td>299</td>
</tr>
<tr>
<td>Cutler</td>
<td>10</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>D</td>
<td></td>
</tr>
<tr>
<td>Dabek</td>
<td>302</td>
</tr>
<tr>
<td>Danforth</td>
<td>118, 121</td>
</tr>
<tr>
<td>De la Cruz</td>
<td>184</td>
</tr>
<tr>
<td>DeBurgo</td>
<td>128</td>
</tr>
<tr>
<td>Dee</td>
<td>110</td>
</tr>
<tr>
<td>DeGray</td>
<td>15, 17</td>
</tr>
<tr>
<td>DeGrazia</td>
<td>164</td>
</tr>
<tr>
<td>DeMaso</td>
<td>283</td>
</tr>
<tr>
<td>Desilets</td>
<td>237</td>
</tr>
<tr>
<td>Dick</td>
<td>60, 136</td>
</tr>
<tr>
<td>Dionne</td>
<td>151</td>
</tr>
<tr>
<td>Dixit</td>
<td>88</td>
</tr>
<tr>
<td>Doherty</td>
<td></td>
</tr>
<tr>
<td>Christine</td>
<td>158</td>
</tr>
<tr>
<td>Dennis</td>
<td>118, 199, 280</td>
</tr>
<tr>
<td>Donovan</td>
<td>264</td>
</tr>
<tr>
<td>Downey</td>
<td>161</td>
</tr>
<tr>
<td>Dray</td>
<td>97</td>
</tr>
<tr>
<td>Dube</td>
<td>19, 302</td>
</tr>
<tr>
<td>Duggan</td>
<td>306</td>
</tr>
<tr>
<td>Dunbar-Masterson</td>
<td>283</td>
</tr>
<tr>
<td>Dunn</td>
<td>90</td>
</tr>
<tr>
<td>Dwyer</td>
<td></td>
</tr>
<tr>
<td>Noel</td>
<td>164</td>
</tr>
<tr>
<td>Patricia</td>
<td>21, 92</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>E</td>
<td></td>
</tr>
<tr>
<td>Eaton</td>
<td>110</td>
</tr>
<tr>
<td>Eisenberg</td>
<td>148</td>
</tr>
<tr>
<td>Elliot</td>
<td>184</td>
</tr>
<tr>
<td>Elliott</td>
<td>23</td>
</tr>
<tr>
<td>English</td>
<td>158, 181</td>
</tr>
<tr>
<td>Epee-Bounya</td>
<td>154, 240</td>
</tr>
<tr>
<td>Erekson</td>
<td>42</td>
</tr>
<tr>
<td>Evans-Langhorst</td>
<td>167</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>F</td>
<td></td>
</tr>
<tr>
<td>Falvo</td>
<td>161</td>
</tr>
<tr>
<td>Fanjyan</td>
<td>231</td>
</tr>
<tr>
<td>Farrington</td>
<td>69</td>
</tr>
<tr>
<td>Fawcett</td>
<td>297</td>
</tr>
<tr>
<td>Federico</td>
<td>169, 246</td>
</tr>
<tr>
<td>Fee</td>
<td>154</td>
</tr>
<tr>
<td>Fischer-Rothman</td>
<td>46</td>
</tr>
<tr>
<td>Fisk</td>
<td>285</td>
</tr>
<tr>
<td>Flaherty</td>
<td>172, 202, 206</td>
</tr>
<tr>
<td>Fleck</td>
<td>231</td>
</tr>
<tr>
<td>Flesch</td>
<td>312</td>
</tr>
<tr>
<td>Franklin</td>
<td>174</td>
</tr>
<tr>
<td>Freiberger</td>
<td>177</td>
</tr>
<tr>
<td>Fruh</td>
<td>128</td>
</tr>
<tr>
<td>Fu</td>
<td>240</td>
</tr>
<tr>
<td>Fynn Thompson</td>
<td>34</td>
</tr>
<tr>
<td>Fynn-Thompson</td>
<td>193</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>G</td>
<td></td>
</tr>
<tr>
<td>Gabriel</td>
<td>128</td>
</tr>
<tr>
<td>Gagnon</td>
<td>118</td>
</tr>
<tr>
<td>Gangi</td>
<td>105</td>
</tr>
<tr>
<td>Garavano</td>
<td>179</td>
</tr>
<tr>
<td>Gartner</td>
<td>26</td>
</tr>
<tr>
<td>Gauvreau</td>
<td>288</td>
</tr>
<tr>
<td>Gaynor</td>
<td>288</td>
</tr>
<tr>
<td>Gebhardt</td>
<td>246</td>
</tr>
<tr>
<td>George</td>
<td>148</td>
</tr>
<tr>
<td>Gerhart</td>
<td>181</td>
</tr>
<tr>
<td>Ghazarians</td>
<td>258</td>
</tr>
<tr>
<td>Gibbons</td>
<td>112, 118</td>
</tr>
<tr>
<td>Glidden</td>
<td>136</td>
</tr>
<tr>
<td>Goggin</td>
<td>240</td>
</tr>
<tr>
<td>Gorgone</td>
<td>94</td>
</tr>
<tr>
<td>Gottesman</td>
<td>154</td>
</tr>
<tr>
<td>Gouthro</td>
<td>264</td>
</tr>
<tr>
<td>Graham</td>
<td>47</td>
</tr>
<tr>
<td>Grant</td>
<td>258</td>
</tr>
<tr>
<td>Green</td>
<td>50, 204</td>
</tr>
<tr>
<td>Green-Hopkins</td>
<td>90</td>
</tr>
<tr>
<td>Greenlee</td>
<td>121, 261</td>
</tr>
<tr>
<td>Grimani</td>
<td>29</td>
</tr>
<tr>
<td>Gustafson</td>
<td>164</td>
</tr>
</tbody>
</table>

316 | Page
H

Hagos ................................................................. 184
Halpin ............................................................... 187
Hamilton ......................................................... 128, 184, 190, 255
Hark ................................................................. 264
Harrington ......................................................... 31
Hartwell ............................................................. 190
Haskell ............................................................... 219
Hawkins ............................................................ 34, 167, 193
Haynes .............................................................. 136
He ....................................................................... 288
Hellinger ............................................................ 167
Heshe ................................................................. 103, 104, 136
Hickey .............................................................. 151, 196, 234, 249, 268, 271, 274, 288
Hill ................................................................. 142, 196, 249
Hillier ................................................................. 291, 294
Hines ................................................................. 10
Hiney ................................................................. 123
Hinsley ............................................................... 139, 142, 196
Hirsch-Romano .................................................. 288
Holder-Niles ...................................................... 136
Houlahan ........................................................... 50
Howard ............................................................... 264
Howland ........................................................... 237
Huang ................................................................. 36
Hunter ............................................................... 118
Hurtig .................................................................

I

Imprescia .......................................................... 121
Isong ................................................................. 240

J

Jacobs
Jeffrey ............................................................... 288
Marshall ........................................................... 288
Jansen ............................................................... 199
Jenkins ............................................................. 38
Jiminiian ........................................................... 136
Johnson
Brienne ........................................................... 97
Emilie .............................................................. 258
Jones
Karen ............................................................. 148
Nancy .............................................................. 38
Judge DeLong .................................................... 58

K

Kadehjian ............................................................. 38
Kallas ............................................................... 145
Katz ................................................................. 240
Keough ............................................................ 15, 17
Killilea .............................................................. 78
Kinlay ............................................................... 126, 172, 202, 204
Kirk ................................................................. 78
Klein ............................................................... 40
Klemens ........................................................... 42, 136
Kulik ................................................................. 299

L

Labriola .............................................................. 100
LaGrasta .......................................................... 271, 274
Lamagna ........................................................ 209
Lamonica ........................................................ 217
Laramie ........................................................... 31
Larsen ............................................................. 100
Larson ............................................................. 139, 151, 271, 274
Leahy .............................................................. 19, 26, 302
Lee ................................................................. 177
Leeman ........................................................... 145
Leibovitz ........................................................ 130
Leonard ........................................................... 21
Liu240 ..............................................................
Longo .............................................................. 105
Lozano-Calderon ............................................... 246
Lucitt ............................................................. 211
Lulloff ............................................................. 69
Lyons ............................................................. 97, 219, 280

M

MacAleer .......................................................... 214
Machnik .......................................................... 118
Malsch ............................................................ 44
Manganaro ....................................................... 128, 130
Manning ........................................................ 100, 214
Mansoor ........................................................ 46
Mantell ........................................................... 264
Manzi ............................................................. 228
Marquis .......................................................... 103
Marr .............................................................. 110
Marshall ........................................................ 196
Mart ............................................................... 130
Martorana ...................................................... 164
<table>
<thead>
<tr>
<th>Name</th>
<th>Page Numbers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nolan</td>
<td>130</td>
</tr>
<tr>
<td>Nobrega</td>
<td>217</td>
</tr>
<tr>
<td>Newell</td>
<td>225</td>
</tr>
<tr>
<td>Newburger</td>
<td>206</td>
</tr>
<tr>
<td>McCabe</td>
<td>299</td>
</tr>
<tr>
<td>McCarthy</td>
<td>187</td>
</tr>
<tr>
<td>McCarty</td>
<td>42</td>
</tr>
<tr>
<td>McDonald</td>
<td>258</td>
</tr>
<tr>
<td>McEachern</td>
<td>237</td>
</tr>
<tr>
<td>McGovern</td>
<td>31</td>
</tr>
<tr>
<td>McNamara</td>
<td>161</td>
</tr>
<tr>
<td>McManus</td>
<td>252</td>
</tr>
<tr>
<td>Mead</td>
<td>31, 47, 62</td>
</tr>
<tr>
<td>Meehan</td>
<td>184, 219</td>
</tr>
<tr>
<td>Mehrotra</td>
<td>202</td>
</tr>
<tr>
<td>Melendez</td>
<td>148, 264</td>
</tr>
<tr>
<td>Meyer</td>
<td>294</td>
</tr>
<tr>
<td>Mintor</td>
<td>50</td>
</tr>
<tr>
<td>Mombrun</td>
<td>118</td>
</tr>
<tr>
<td>Mongillo</td>
<td>222</td>
</tr>
<tr>
<td>Moonan</td>
<td>49</td>
</tr>
<tr>
<td>Moore</td>
<td>88</td>
</tr>
<tr>
<td>Morgan</td>
<td>225</td>
</tr>
<tr>
<td>Morin</td>
<td>228</td>
</tr>
<tr>
<td>Morrissey</td>
<td></td>
</tr>
<tr>
<td>Lisa</td>
<td>50</td>
</tr>
<tr>
<td>Maria</td>
<td>206</td>
</tr>
<tr>
<td>Mott</td>
<td>139, 174, 268, 277, 280, 285, 291</td>
</tr>
<tr>
<td>Mulcahy</td>
<td>136</td>
</tr>
<tr>
<td>Munhall</td>
<td>255</td>
</tr>
<tr>
<td>Murphy</td>
<td>62, 78</td>
</tr>
<tr>
<td>Myers</td>
<td>231</td>
</tr>
<tr>
<td>Nakonechny</td>
<td>103, 136</td>
</tr>
<tr>
<td>Necchi</td>
<td>53</td>
</tr>
<tr>
<td>Nelson</td>
<td></td>
</tr>
<tr>
<td>Caleb</td>
<td>258</td>
</tr>
<tr>
<td>Sally</td>
<td>12, 13, 130</td>
</tr>
<tr>
<td>Newburger</td>
<td>283</td>
</tr>
<tr>
<td>Newell</td>
<td>222</td>
</tr>
<tr>
<td>Ng</td>
<td>231</td>
</tr>
<tr>
<td>Nico</td>
<td>161</td>
</tr>
<tr>
<td>Nixon</td>
<td>69</td>
</tr>
<tr>
<td>Nobrega</td>
<td>34, 193</td>
</tr>
<tr>
<td>Nolan</td>
<td>211</td>
</tr>
<tr>
<td>Noriega</td>
<td>50</td>
</tr>
</tbody>
</table>

**O**

<table>
<thead>
<tr>
<th>Name</th>
<th>Page Numbers</th>
</tr>
</thead>
<tbody>
<tr>
<td>O'Brien</td>
<td>121, 274</td>
</tr>
<tr>
<td>O'Connell</td>
<td>34, 142, 167, 196, 234, 249</td>
</tr>
<tr>
<td>O'Connor-Crowe</td>
<td>118</td>
</tr>
<tr>
<td>O'Dowd</td>
<td>237</td>
</tr>
<tr>
<td>O'Leary</td>
<td>62</td>
</tr>
<tr>
<td>O'Melina</td>
<td>31</td>
</tr>
<tr>
<td>Ogunlade</td>
<td>297</td>
</tr>
<tr>
<td>Olbash</td>
<td>145</td>
</tr>
<tr>
<td>Oliveira-Goncalves</td>
<td>243</td>
</tr>
<tr>
<td>Orr</td>
<td>80</td>
</tr>
<tr>
<td>Ostberg</td>
<td>103, 104</td>
</tr>
</tbody>
</table>

**P**

<table>
<thead>
<tr>
<th>Name</th>
<th>Page Numbers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Page</td>
<td>181</td>
</tr>
<tr>
<td>Pak</td>
<td>86</td>
</tr>
<tr>
<td>Palmieri</td>
<td>31</td>
</tr>
<tr>
<td>Paradise</td>
<td>31</td>
</tr>
<tr>
<td>Pasquali</td>
<td>288</td>
</tr>
<tr>
<td>Pelletier</td>
<td>55</td>
</tr>
<tr>
<td>Pena</td>
<td>104</td>
</tr>
<tr>
<td>Penny</td>
<td>15, 17</td>
</tr>
<tr>
<td>Petrosino</td>
<td>136</td>
</tr>
<tr>
<td>Pfeiffer</td>
<td>211</td>
</tr>
<tr>
<td>Pignataro</td>
<td>49</td>
</tr>
<tr>
<td>Pixley</td>
<td>130</td>
</tr>
<tr>
<td>Plapinger</td>
<td>154</td>
</tr>
<tr>
<td>Porter</td>
<td>174, 249, 271, 274</td>
</tr>
<tr>
<td>Potter-Bynoe</td>
<td>172, 202, 206</td>
</tr>
</tbody>
</table>

**Q**

<table>
<thead>
<tr>
<th>Name</th>
<th>Page Numbers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Quigley</td>
<td>128, 190, 299</td>
</tr>
</tbody>
</table>

**R**

<table>
<thead>
<tr>
<th>Name</th>
<th>Page Numbers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rauschnot</td>
<td>277</td>
</tr>
<tr>
<td>Reeves</td>
<td>72</td>
</tr>
<tr>
<td>Reidy</td>
<td>121, 193, 243</td>
</tr>
<tr>
<td>Reilly</td>
<td>206</td>
</tr>
<tr>
<td>Reisinger</td>
<td>154, 181</td>
</tr>
<tr>
<td>Repucci</td>
<td>105</td>
</tr>
<tr>
<td>Riker</td>
<td>148</td>
</tr>
<tr>
<td>Riley</td>
<td>206</td>
</tr>
<tr>
<td>Rivkin</td>
<td>283</td>
</tr>
<tr>
<td>Rogers</td>
<td>90, 225</td>
</tr>
</tbody>
</table>

318 | Page
Back Cover page