Patient Provider Communication: AAC in ICU and Acute Care and Changing Role of the Speech Language Pathologist

John M. Costello
Speech-Language Pathologist
Boston Children’s Hospital
Director, Augmentative Communication Program
http://childrenshospital.org/acp

Based in part on:

* AAC-RERC sponsored issue

Agenda

- Communication Vulnerability and risks to care
- Children’s Understanding of illness, pain and discomfort
- Cycle of Stress
- Patient Profile and clinical considerations
- Children’s Hospital Boston Model of AAC Intervention in the ICU
- Pre-operative Assessment and instruction including vocabulary selection message banking
- Fast Review Domains of Assessment for ICU
Augmentative Communication Program

Outpatient (Waltham campus)

Inpatient (Longwood campus)
Communication Vulnerability

What is communication vulnerability?
• Vision so poor that the patient is unable to read/see, even with corrective lenses*
• Inability to understand loud speech, even with hearing aids*
• Inability to produce speech that is intelligible to the team*
• Altered mental status*
• Inability to speak or understand the language of the medical team

Patients with communication vulnerability

- Congenital conditions
- Acquired conditions
- Degenerative conditions
- Condition related to medical intervention (surgery)
- Condition related to medical treatment

Guidelines for admission to Pediatric ICU
American Academy of Pediatrics and the Society of Critical Care Medicine
Pediatrics, V 103, No. 4 April 1999.

A. Severe or potentially life threatening Pulmonary or airway disease requiring:
   - Endotracheal intubation and potential mechanical ventilation
   - Rapid progressing pulmonary disease with risk of respiratory failure
   - High supplement of oxygen

B. Children with severe, life threatening or unstable cardiovascular conditions
   - Includes Children with high risk cardiovascular procedures
Guidelines for admission to Pediatric ICU
American Academy of Pediatrics and the Society of Critical Care Medicine
Pediatrics, V 103, No. 4 April 1999

C. Neurological conditions or seizures
   - spinal cord compressions
   - Head trauma
   - Progressive neuromuscular dysfunction

D. Hematology/oncology disease:
   tumors or masses compressing (or threatening to compress):
   - vital vessels
   - airway
   - nerves of the face

E. Endocrine/metabolic disease
   - inborn error of metabolism and acute deterioration requiring respiratory support
   - acute dialysis management of intracranial hypertension

Costello, J.M. Boston Children’s Hospital
© 2013
In general, these conditions include

- airway patency/mangement of air gasses
- Muscle function, strength and coordination
- Neuro-cognitive/neuro-linguistic impairment

Communication vulnerability may be related to one or all of these

Why is this topic timely in the United States?

Changes to hospital standards for accreditation that address communication vulnerability in 2011 (measured as of 2012 July).

Increased focus nationally and internationally on the impact of communication vulnerability on patient care.

Increased focus on the Joint Commission International Standards of Care
Importance of communication and potential impact on patient outcomes is recognized by:

- American Association of Critical Care Nurses
- Society for Critical Care Medicine
- National Institute of Health
- The Joint Commission

WHAT IS “EFFECTIVE COMMUNICATION”?

"the successful joint establishment of meaning wherein patients and healthcare providers exchange information, enabling patients to participate actively in their care from admission through discharge, and ensuring that the responsibilities of both patients and providers are understood" (The Joint Commission, 2010b, p. 91).
Monitor changes in the patient’s communication status …”
the patient has developed new or more severe communication impairments during
the course of care and contact the Speech Language Pathology Department, if
available. Provide AAC resources, as needed, to help during treatment.”

Patients may have hearing or visual needs… or be unable to speak due to
their medical condition or treatment. Additionally, some communication needs
may change during the course of care. Once the patient’s communication needs
are identified, the hospital can determine the best way to promote two-way
communication between the patient and his or her providers in a manner that
meets the patient’s needs”

Examples of communication needs include the need for personal
devices such as hearing aids
or glasses, language
interpreters, communication
boards and devices…”

New Standard PC.02.01.21 (cont’d)
COMMUNICATION VULNERABLE PATIENTS

Individuals with
1. Pre-existing hearing, speech, cognitive disabilities who may (may not) have access to communication tools/supports
2. Recent communication difficulties occurring as a result of their disease/illness/accident/event
3. Communication difficulties that occur as a result of medical treatment (e.g., intubation, sedation)
4. Linguistic differences
5. Limited health literacy
6. Limited ability to read/write
7. Cultural differences

Communication vulnerable populations in the U.S.

- People with hearing or speech disabilities: 43 million
- People with communication difficulties: 76 million
- People with cultural, health/literacy issues: 90 million
- People with unknown communication needs: 15 million

Communication

http://www.patientprovidercommunication.org/
The Importance of Patient-Provider Communication: “That’s not what I’m saying!”

Poor Communication Impacts Patient Safety

Communication vulnerable patients are at increased risk for:
- Serious medical events (Cohen et al., 2005)
- Sentinel events (The Joint Commission, 2007)
- Poor medication compliance/ adherence (Andrus et al., 2002; Flores et al., 2003)
The presence of physical communication problems was significantly associated with an increased risk of experiencing a preventable adverse event.

We found that patients with communication problems were three times more likely to experience preventable adverse events than patients without such problems.

Risk for Serious Medical Events

- Twice more likely to experience medical physical harm
- Increased risk of non-adherence to medication
- Misreported abuse
- Decreased access to medical care
- Decreased use of medical care
- Increased diagnosis of psychopathology
- More likely to leave hospital against medical advice
- Asthmatics more likely to receive intubation
- Less likely to return for follow-up appointments after Emergency Room visits
Risk for Serious Medical Events

Communication-vulnerable patients are:
- Higher rates of hospitalization
- Higher rates of drug complications
- Highest use of resources to provide care
- Lowest levels of satisfaction with care
- Increased risk of delayed care
- Increased failure to treat and prevent devastating disease states and death
- Increased risk of malpractice
- Increased length of hospital stay

Effective Communication is not supported by Health Care Systems

- No standardized system in place to identify communication needs
- Lack of supporting resources, training, and time needed to effectively communicate
- Limited evidence and awareness of best practice

Impact of Addressing Communication Needs

- Patients taught to use communication tools such as picture boards, word boards or simple communication devices, reported improved satisfaction and comfort when compared to care without communication support.
  (Stovsky, Rudy & Dragonette, 1988; Costello, 2000)
- Communication boards can also significantly reduce patient frustration.
- Provision of professional interpreter services is associated with improved clinical care and increased quality of care to LEP (Limited English Proficiency) patients.
  (Kutner et al. 2000)
Call to Action

- Improve clinical practice to incorporate a systematic & methodological approach to patient-provider communication
- Optimize institutional availability and use of auxiliary services/increase frequency of referrals to specialists for "COMMUNICATION" purposes
- Educate health care providers
- Revise health care policy and standards to set performance expectations for health care providers on patient-provider communication

Formalize a Process to Manage Patient-Provider Communication at the Patient-Level

- Assess the Patient’s Communication Need
- Refer to Communication Specialist
- Select a Communication Intervention
- Evaluate the Effectiveness of the Intervention
- Monitor for Changes in the Effectiveness of the Intervention


Patient Video or Photo

Intensive Care Unit Experience: through the Eyes of a Child
Children’s reaction to pain

Toddlers and preschoolers (2-5 yr):
- Experience pain but can not always identify the source or location
- “Magical thinking” may lead child to believe their pain is punishment for real or imagined misbehavior…they believe the pain is someone’s fault.

Communication needs:
At this stage, children may view procedures as punishment for bad behavior
This makes it particularly important to communicate: fear, anxiety and solicit parents and loved ones for comfort, explanation and protection.

Children’s reaction to pain

School age (6 - 12 years):
- Can tell the location of pain
- know that illness is caused by germs and believe that staff’s response depends on how well they express pain

Brewster, Arlene B. Chronically Ill Hospitalized Children's Concepts of Their Illness
PEDIATRICS Vol. 69 No. 3 March 1982, pp. 355-362
School age (6 - 12 years)

Communication Needs:

Children need to be able to effectively communicate matters of comfort and pain.

Children’s reaction to pain
Adolescents (13 and older)

- Begin to understand that there are multiple causes of illness, that the body may respond to many different factors and illness is caused by physical weakness or susceptibility.
- Children understand that different interventions may be needed to address illness and that staff act with necessary intent and empathy.

Perrin, Ellen C., Gerrity P. Susan, There’s a Demon in Your Belly: Children’s Understanding of Illness PEDIATRICS Vol. 67 No. 6 June 1981, pp. 841-849

Adolescents (13 and older)

Communication need:

At this more mature stage, a child may be particularly anxious to be able to ask questions, interact with staff and understand the intent of intervention.
Impact of communication vulnerability:

Impact on the child

- challenges and needs of patient
- Powerlessness
- Loss of Control
- Disconnection from loved ones
- Inability to participate in own care
- Inability to ask questions, express needs, fears, PERSONALITY, etc.
Stress of the nonspeaking condition reaches beyond the child
**Family/Primary Care Providers**

- Parents have expressed fear of their child’s inability to communicate basic needs
- Fear that child may feel abandoned and not be able to call for parents
- Parents feel helpless to assist child who is going through distress

**Communication vulnerability: Impact on Family**

- Stress for parents (Costello, 2000), fear child will feel abandoned as can not solicit loved one and has no way of advocating for self
- (Hurtzig and Dowden 09) parents, although completely exhausted, refuse to leave or sleep due to their concern that their child will require assistance and no one will be there to interpret the child’s efforts to get help

Patient Video or Photo
Patient Video or Photo

My son’s ability to communicate, allowed me to advocate for him

Post heart-transplant, a mother’s perspective

Medical Staff

- The need to identify appropriate means to communicate with intubated/vent dependent patients identified as a high research priority
- Because of duties, medical staff must limit the time available to interpret
- Nurses have reported patients becoming angry and then abandoning attempts due to inability to interpret
Communication Vulnerability: Impact on staff

1. Quality of care issue—all patients who described good communication with their providers told us they were treated in a caring, concerned and respectful manner—Duclos, et. Al. 2005 International Journal of Quality in Health Care v 17 # 6 page 483

2. Patients inability to communicate has a negative impact on the nurse/doctor's tendency to communicate with them, (Ashworth, 84)

Patient Video or Photo

What does this mean for the Speech-Language Pathologist?

An increased demand for expertise in AAC with acute and intensive care patients

This will require increased training to prepare SLPs to provide AAC services for patients who are communication vulnerable in the medical setting.

There will be an increased need for AAC tools and strategies to be readily available for assessment and intervention.
What strategies (if any) are used when a patient cannot speak?

Nurses rely on lip reading
Have a familiar family member interpret
Gestures
Pen and paper
Alphabet board
Hand drawn pictures
Medical staff ask yes/no questions

Profile/Phases of Communication
Vulnerable Patient

Phase 1: Emerging from Sedation

Phase 2: Increased wakefullness

Phase 3: Need for broad and diverse communication access

Phase 1
Emerging from Sedation

• Yes - no - I don’t know
• Call for nurse/modified nurse call
• Gain attention of loved ones/staff with simple voice output
### Phase 2
**Increased wakefulness**

- Require all of phase 1 strategies
- Require more relevant vocabulary
- Picture boards
- Alphabet boards
  - ABC
  - QWERTY
- Multi-message voice output devices
- Digitally recorded messages ****
- Voice amplification

### Phase 3
**Broad and Diverse Communication Access**

- All options from phase 1 and 2
- Generative communication with alphabet and sophisticated page sets
- Word and grammar prediction
- Encoding strategies
- Music and video files
- Internet access
- Telephone

### Potential Candidates for AAC

- Communication Vulnerable at Baseline
- Acute Onset of Communication Vulnerability
- At Risk for Communication Vulnerability
- Palliative Care and End of Life
Role of the SLP

Baseline communication vulnerability:
- Assess use of current AAC system in hospital
- Adjust current system as appropriate for vocabulary, mounting, physical access
- Develop new system that is used only in hospital environment when current system cannot be used.
- Adapted nurse call and tool for attention

Role of the SLP

Acute onset communication vulnerability
- Bedside screening of communication, motor, cognitive, sensory skills.
- Create tools that meet need of patient (refer to phases)
- Design and construct new communication supports
- Mount, train and assure access to communication tool/strategy
- Inservice communication partners
- Adapted nurse call and other access

Role of the SLP

At risk for communication vulnerability
- BCH Model of Preoperative AAC
- Message Bank when possible
Role of the SLP
Palliative Care and End of Life
- Introduce broad range of AAC tools and strategies to support:
  - Expression of needs
  - Social connectedness
  - Comfort
  - Nurse call

Impact of AAC
Patients taught to use communication tools such as picture boards, word boards or simple communication devices, reported improved satisfaction and comfort when compared to care without communication support.

(Patak et al. 2007, Costello 2000, Stowsky, Rudy & Dragonetti, 1988)

First: getting the referral

KEY:
staff recognizing communication vulnerability and then recognizing that it is NOT alright

* Huge opportunity for nurse/staff training by SLP
Many hospital admissions may have a known/expected non-speaking condition
Who might have a Temporary Nonspeaking condition?

Some non-speaking conditions may be anticipated before surgery

- Maxillofacial/Orofacial surgery
- Organ transplantation (lung, heart)
- Disorders of the airway requiring tracheolaryngeal or tracheoesophageal reconstruction
- Oncology related interventions
- Scheduled ventilation supports
- Tracheostomy

Potential conditions leading to nonspeaking condition:

- Airway problems
- Lung problems
- Other
  - Respiratory disorders
  - Neuromuscular diseases
  - Head injuries
  - Spinal cord injuries
Neuromuscular Diseases Affecting Respiration

- Arnold Chiari Malformation
- Cerebral palsy
- Muscular dystrophy
- Myasthenia gravis
- Spinal muscular atrophy

What do we know?
We know that not being able to speak in the ICU/hospital is extremely stressful to the patient, family and medical staff.

We know that positive correlation has been suggested between the inability to communicate and poorer recovery time in the hospital setting.

We know positive correlation has been suggested between a patient’s ability to communicate and the quantity and quality of communication interactions with the nursing staff.

We know that some patients in the hospital have planned operative procedures and a nonspeaking condition was anticipated before hospital admission.

Stress to patient, family and medical staff
Inability to communicate correlated with poorer recovery time.

Correlation between ability to communicate and interaction with nurse
Nonspeaking condition anticipated before getting to hospital

Patient Video or Photo
The Temporary Nonspeaking Condition in the ICU = High Emotional Distress Coupled with a Sense of Loss

ICU stay in an inopportune time for new learning:

RESULT:
Ineffective processing of new information

Researchers have reported:

Anxiety, fear, insecurity, anger all result from ineffective information processing and the inability to speak and contribute to interference with sleep

Mentzel, 1984
It is recognized that sleep patterns of persons in the ICU are highly irregular and disturbed - sometimes leading to ICU Psychosis.

It is suggested that all of this may have an influence on:

• Medical recovery
• Pain management
• Length of hospital stay

Christiano and Tarbell (1998)

Children with the lowest pain scores were given relevant information in significantly more preoperative intervals than children with higher pain scores.

This suggests that preoperative training may assist patients to cope with pain management issues better than those without preoperative training.
The Children’s Hospital Boston Model of AAC Intervention in the ICU

Preoperative Intervention
Postoperative Intervention
Discharge Intervention

Historically, primary communication interventions include:

- Alphabet board
- Picture boards
- Small typing systems
- Paper and pen
- Magic slate
- Electrolarynx
- Eye gaze systems

Preoperative Intervention

- Patient expectations/education
- Initial introduction to communication tool
- Vocabulary selection
- Brief review of sensory/motor and literacy skills.
- Introduction to symbols
- Review of mounting and positioning options
- Voice and message banking****
Vocabulary

'Legacy' messages
Core vocabulary
Fringe vocabulary

Without patient involvement, having meaningful vocabulary is as likely as finding a...

Patient Video or Photo
After the setup...

I knew that he would need the device to talk, but I think I am getting more benefit out of it than he is because I can hear his voice talk to me!

Mother of 2.8 year old A.K.
Programmed devices awaiting patient admission

Postoperative Intervention

- Bedside screening of awareness, sensory and motor skills
- Mounting of AAC device
- Assessment of functional use of communication tools
- Family and staff inservicing

Studies reveal that nurse communication with patient is positively correlated with the patient’s ability to give feedback.

Ashworth (1984)
Ashworth (1978) reported a study from five established ICUs:

- 32% of verbal communication was short term info (I’m going to suction you).
- 38% were commands or requests (lift your arm).
- 21% were questions (most related to physical care).
- 7% longer information such as teaching or orienting.

Tracked interaction between nurses and patients with endotracheal tubes.

Patient reports in literature relative to lack of communication:

- Exhaustion (Hafsteindottir 1996)
- Isolation (Belitz 1983, Villarie 1995)
- Lack of control (Stovsky 1988)
- Fear and Anxiety (Borsig & Stenach 1982)
- Poor recollection (Hafsteindottir 1996)
- Frustration, sleep disturbances (Petak, Gawinski, Fung, Doering & Berg 2004)

What are some of the AAC assessment considerations when a patient is “Communication Vulnerable”? 
Introduce tools and strategies, and learn.....

Can learn much about motor skill and access, neuro-cognition and overall communication skills.

OKAY....

BUT it is NOT all about technology.

It could be NO technology!

Second: considerations particular to Pediatrics

• Play - for some, gets you acceptance
• Understanding of pain/sickness
• Magical thinking
• May need 'permission' to advocate for self
• The FAMILY is integral in all steps of the process

Patient Video or Photo
Questions to ask/consider at admission

questions to ask:
– Does the patient currently have difficulty communicating and participating in the admission process?
– Does the patient have an existing augmentative communication device or strategy that he/she employs for expressive and/or receptive language?
– Is a process or procedure during hospitalization expected to induce communication vulnerability?
– Will hospitalization make the use of current and needed vision or hearing aids not possible?

Whirlwind review:

Assessment Domain
CORE Assessment considerations
Impact on system selection and feature matching.

May be a VERY dynamic process with status changing regularly

Cognitive status:

• Alertness
• Awareness
• Orientation
• Pre-morbid status
Cognitive Assessment considerations:

- Often status is first reported by bedside care providers
- Observe patient’s wakefulness and fatigue (impact participation and length of assessment)
- Patient’s ability to follow simple directions
- Patient’s ability to respond to simple questions
  - (yes/no/don’t know response)

Cognitive Assessment considerations:

- Potential presence of delirium
- Impact of medications (example: Versed)
- Quality and quantity of sleep
- Potential presence of dementia

Feature match/intervention considerations

- Will determine if assessment happens over time, postponed or continued.
- May need to re-assess often and adjust recommendations frequently
- May require range of supports to be used at different times of day
- Will impact complexity of instructional language and strategies introduced
- May suggest selection of memory book or orientation strategies through visuals, visual schedule
- Use of symbols versus written word
Sensory domain:

- Vision
- Hearing
- Comparison to pre-morbid status?

Sensory Assessment considerations

- Does s/he wear glasses? If yes, are they here?
- Does s/he have hearing aids? If yes, are they here?
- If physical status will not support glasses or hearing aids (swelling, incision site, etc.), what accommodations can be made?
- Have C.I.? Available?

Sensory Assessment considerations

- Patient Video or Photo

If using ventilation mask, what type of mask (impact on vision/binocularity and positioning of materials)
Feature match/intervention Considerations (sensory)

- F.M. trainer to provide focused auditory input
- Remove one or both arms of the glasses
- Ubi Duo for wireless patient-provider text based communication

Feature match/intervention Considerations (sensory)

- Consideration for communication with family/friends via phone:
  - http://ip-relay.com OR TTY
- Use of web cam/Skype video for sign communication with family/friends

Feature match/intervention Considerations (sensory)

- Use of voice output technology if minimal/no hearing
- Feedback loop of speech generating device
- Use of auditory scan component
- Use of tactile markers and keyguards

Patient Video or Photo
Feature match/intervention
Considerations (sensory)

- Symbol set/representation selection
- Characteristics of text
- Size of targets
- Color contrasts
- Complexity of layout
- Use of symbols versus text
- System that supports keyguard
- System that supports tactile markers
Motor Domain

- Use of gestures/pantomime
- Control/access
- Physical positioning
- Direct selection (hand, eyes, other?)
- Ability to write/draw

Assessment considerations

- Ability to point with hand
- Ability to point with eyes
- Ability to point with head light
- Use of splints to support pointing
- Indirect access through scanning
- Indirect access through partner assist
- Access changed by positioning?

Feature match/intervention Considerations (motor)

- Inventory of natural gestures
- Basic sign language
- Adapted nurse call system
- Keyboard
- Paper and pen
- Use of keyguard
- Single switch access to technology
- Partner assisted scanning
- Eye gaze/Etran - Eye Linking
- Eye tracking
Costello, J.M. Boston Children’s Hospital
© 2013
Eye tracking

* Feature matching consideration: Meds (ex: Baclofen)

Fracture of third and fourth cervical vertebrae, leaving him paralyzed

Patient Video or Photo
Patient Video or Photo

Adapted Nurse Call System: "Without it there's no independence"
http://www.vidatak.com/
Eye Linking

Resource: http://www.cini.org

* Sue Russell & Loc line
Patient Video or Photo

Example Apps:
- Assistive Chat
- Predictable
- Talk Assist
- Touch Chat
- Sounding Board
- Proloquo2Go
- SonoFlex
- GoTalk Now

iPad

© 2013 Boston Children’s Hospital

Costello, J.M.
Communication applications

Full featured symbol based apps:
- Picture symbols and text-to-speech

- Proloquo2Go
- TouchChat
- SonoFlex

positioning

Cuff inflation may vary by positioning and impact need for AAC vs. ability to use speech.
Access skill may change with physical positioning (in bed/in chair) and require different strategies or mounts.
Medical procedure may impact positioning which will impact feature match
  - Example: spinal fusion/rod insertion
  - reconstruction surgery with tissue graphing

Language Comprehension Domain

Native language?
Comprehension
Ability to follow directions
Able to answer yes/no questions
### Feature match/intervention Considerations (language)

Post how patient indicates yes/no in obvious space in room
- Examples: thumbs up/down
- Squeeze eyes or blink eyes
- Squeeze hand once or twice

### Feature match/intervention Considerations (language)

- Use of visuals (symbols, photos, text)
- Intervention may focus on simple single message output devices
- May focus on strategies to support control and impact on environment

### Feature match/intervention Considerations (language)

- ALWAYS use QUALIFIED MEDICAL INTERPRETER services when patient does not speak English/uses ASL
- Use of digitally recorded communication aids for communication in native language and English (approved by qualified medical interpreter)
iPad (or itouch) and iASL

Patient Video or Photo

Collaboration with Interpreter services
Communication Boards with Language Translation

- Vietnamese
- Spanish

Feature match/intervention Considerations (language)

Selection of tools/strategies with transparent organization versus requiring meta understanding of navigation/organization *
* may change rapidly with medical status change

Selection of sophisticated tools and integrated features for environmental control, web access, etc.

Literacy Domain Feature Match considerations

- Use of written words
- Use of alphabet for generative communication
- Encoding strategies
- Use of keyboard based systems
- Keep pen and paper at bedside along with easily accessible strategy to request (simple voice output tool)
Literacy Domain Feature Match considerations

• Use of cell phone/text messaging for communication
• Use of letter cues/topic cues
• ***Note: good decoding skills and reading comprehension does not mean patient has good encoding skills
  – May be able to use canned text but not generate novel text.
**Topic Cue board**

<table>
<thead>
<tr>
<th>People</th>
<th>Food</th>
<th>Emotions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Places</td>
<td>Colors</td>
<td>Questions</td>
</tr>
<tr>
<td>Animals</td>
<td>Entertainment</td>
<td>Body</td>
</tr>
<tr>
<td>School</td>
<td>Home</td>
<td>Community</td>
</tr>
</tbody>
</table>

---

**Speech Production**

Reduced volume?
Tracheostomy
- Why?
- Type (cuffed/cuffless)?
- Airleak?
- Changes with positioning?
- Candidate for speaking valve?
- Tolerance of valve?

---

**Speech Production**

- Moderately compromised intelligibility?
- Severely compromised intelligibility?
- Type of intubation/ cannula ?
- Impacted by cpap/bipap mask and type of mask?
- Impacted by fixation or other hardware?
Voice Amplification or use of Electrolarynx

Vocabulary Selection

- Patient needs
- Patient personality
- Patient’s developmental status
- Patient interest
- Address medical, personal and psychosocial needs

Comparison of MessageMate

Costello, J.M. Boston Children’s Hospital
© 2013
Domain of Assessment: Environmental

- Lighting
- Noise (including noise from vent and other medical equipment)
- Available real estate/furniture for Mounting/access
- Nurse route of access maintained

Electromagnetic Interference (EMI)

- Current evidence based data demonstrates Electromagnetic Interference (EMI) affects medical devices. Currently, types of wireless devices include but are not limited to:
  - all cell phones
  - hand held messaging devices (Blackberry, itouch, ipad, etc.)
  - multi-communication devices that combine the use of Wi-Fi, Blue tooth and cellular-capable computers (Kindle, blue tooth ear pieces, etc.)
  - Integrated SGD’s
Electromagnetic Interference (EMI)

The Emergency Care Research Institute (ECRI) addresses the issue of whether the use of cell phones should be restricted in health care facilities because of problems concerning EMI with medical devices.

**Recommended Practice:**

When using a wireless device, a minimum distance of at least 1 meter, an “arm’s length” from medical devices is recommended. Cell phones should be prohibited in highly instrumented clinical areas and should be powered off by patients and visitors in these areas.

---

**Electromagnetic Interference (EMI)**

EMI events have included:

- Loss of control of dialysis machines,
- Ventilator malfunctions,
- Infusion pump shutdowns and rate changes

---

Patient Video or Photo