



MEASUREMENT OF QUALITY OF NURSING PRACTICE IN CONGENITAL CARDIAC CARE

By Jean Anne Connor, RN, PhD, CPNP, Sandra Mott, RN, PhD, Angela Green, PhD, APN, Carol Larson, MPH, Patricia Hickey, RN, MBA, PhD

Background The impact of nursing care on patients' outcomes has been demonstrated in adult and pediatric settings. However, limited attention has been given to standardized measurement of pediatric nursing care. A collaborative group, the Consortium for Congenital Cardiac Care Measurement of Nursing Practice, was formed to address this gap. The purpose of this study was to assess the current state of measurement of the quality of pediatric cardiovascular nursing in freestanding children's hospitals across the United States.

Methods A qualitative descriptive design was used to assess the state of measurement of nursing care from the perspective of experts in pediatric cardiovascular nursing. Nurse leaders from 20 sites participated in audiotaped phone interviews. The data were analyzed by using conventional content analysis.

Results Each level of data coding was increasingly comprehensive. Guided by Donabedian's quality framework of structure, process, and outcome, 2 encompassing patterns emerged: (1) structure and process of health care delivery and (2) structure and process of evaluation of care. Similarities in the structure of health care delivery included program expansion and subsequent hiring of nurses with a bachelor of science in nursing and experienced nurses to provide safety and optimal outcomes for patients. Programs varied in how they evaluated care in terms of structure, measurement, collection and dissemination of data.

Conclusion External factors and response to internal processes of health care delivery were similar in different programs; evaluation was more varied. Seven opportunities for measurement that address both structure and process of nursing care were identified to be developed as benchmarks. (*American Journal of Critical Care*. 2016;25:128-135)

By 2014, the impact of nursing care on patients' outcomes had routinely been demonstrated in adult and pediatric settings.¹⁻⁹ Furthermore, evidence had linked specific nursing characteristics to patients' outcomes of morbidity and mortality across the age continuum. The numerous studies¹⁰⁻¹⁶ highlighting the effect of nursing care on patients' satisfaction and outcomes contrast sharply with the limited attention given to measuring nurses' actions/behaviors in terms of care that is safe, effective, efficient, equitable, timely, and centered on patients and patients' families.

The paucity of measurement of nursing care is of great concern for pediatric nursing care because most of the available standardized nurse-sensitive outcome indicators are related to adult care.¹⁷⁻²² These indicators, such as fall prevalence or failure to rescue, lack validity when applied globally to children or subpopulations of children.^{23,24} It can be argued that high-quality nursing care is especially important in children's health care because the etiology, epidemiology, and trajectory of illness are often different in children than adults, and these differences have critical implications in the long term.^{17,25-30} Children born with congenital heart disease exemplify this fact explicitly. In response to this gap in the literature and the documented need for measurement specific to pediatric nursing, we formed a collaborative group named the Consortium for Congenital Cardiac Care Measurement of Nursing Practice (C4-MNP).

The overall aim of C4-MNP is to establish a national collaborative to identify nursing care actions/behaviors for measurement in the highly complex environment of pediatric cardiovascular care. The first step toward accomplishing this broad objective was to learn the current state of measurement of pediatric cardiovascular nursing care (structure, process, and outcome measurement) in 20 freestanding children's hospitals across the country.

About the Authors

Jean Anne Connor is director of nursing research, Cardiovascular and Critical Care Services, Department of Nursing Patient Services, Boston Children's Hospital, Boston, Massachusetts, and clinical instructor of pediatrics, Harvard Medical School, Boston, Massachusetts. **Sandra Mott** is a nurse scientist research consultant, Boston Children's Hospital. **Angela Green** is vice president of performance improvement, Arkansas Children's Hospital, Little Rock, Arkansas. **Carol Larson** is a quality improvement consultant, Department of Cardiology, Boston Children's Hospital. **Patricia Hickey** is vice president, Cardiovascular and Critical Care Services, associate chief nursing officer, Department of Nursing Patient Services, Boston Children's Hospital, and assistant professor of pediatrics, Harvard Medical School.

Corresponding author: Jean Anne Connor, RN, PhD, CPNP, Farley 135.7, Boston Children's Hospital, 300 Longwood Ave, Boston, MA 02115 (e-mail: jean.connor@cardio.chboston.org).

Methods

Study Design

A qualitative descriptive design was chosen to assess the status of nursing measurement from the perspective of experts in the field of pediatric cardiovascular nursing. Qualitative description is a distinct method of naturalistic inquiry that uses broad open-ended questions and low inference interpretation to describe the experience in the everyday language of the participants.³¹ Participants contribute their insight and understanding of the phenomenon of interest by sharing fresh perspectives and thoughts.³² After getting approval from the institutional review board, the principal investigator (J.A.C.) initiated the interviews, which consisted of open-ended questions and related probes (Table 1). The co-principal investigator (S.M.) was present during the interview to ask follow-up questions and take field notes.

Data Collection

The nurse leader and designated colleagues from each site participated in an audiotaped phone interview that was then transcribed verbatim, omitting any identifying information. Following confirmation of the written transcript, the data were analyzed by using conventional content analysis, a technique widely used in qualitative descriptive research.^{33,34}

Data Analysis

The process of data analysis consisted of reading and rereading the data to fully understand the participants' words and intent. First-level codes materialized directly from the data and were chosen because of emphasis, repetition, significance, or perceptiveness of comment. These codes were continuously reviewed, revised, and modified as new insights and ways of understanding the data emerged.

Next, similar first-level codes were clustered into categories and relabeled. Further work with the categories revealed that they represented 2 major

Most of the available standardized nurse-sensitive outcome indicators are related to adult care.

Table 1
Guiding questions for interviews

1. Please describe your program's evaluation of quality nursing care.
2. Please describe any cardiac-specific measure of cardiac nursing care.
3. From your experience, please tell me what do you identify as unique about providing quality nursing care for pediatric cardiovascular patients? (What makes it special? How is it different?)
4. Please comment on what aspects of this nursing care make a difference in patients' outcomes.
5. Which of these aspects might be measurable, and how might that be accomplished?
6. How have you or are you collecting data on these nurse-sensitive measures?
7. Please comment on the resources you have in place (or wish you had in place) to collect and/or support data collection.
8. Is there anything else you would like to share with me regarding providing quality nursing care for pediatric cardiovascular patients?

Table 2
Data analysis coding example

Code	Category	Pattern	Framework
Adequate staffing/hires Appropriate education Experienced Staff retention	Nursing workforce	Health care delivery	Structure
Situational awareness Expansion/growth Merger New technology Increased complexity	New structures		
Nurse-sensitive measures Hospital wide Adapted to cardiac unit	Regulatory requirements	Evaluation of care	Structure
Unique characteristics Nurses, cognitive skills Population of patients	Complexities of patients and patients' families		

patterns (Table 2). Additional exploration of this discovery and referencing Donabedian's framework of structure, process, and outcomes and the Institute of Medicine's quality domains enabled the team to organize and synthesize the data for the final report.^{15,31}

Prolonged engagement, peer debriefing, and member checking were employed to enhance the credibility of the study.³⁵⁻³⁷ Prolonged engagement included interviewing leaders from 20 pediatric cardiovascular programs (medical and surgical cardiac care) to ensure data saturation. Rich data and multiple nuances were shared as the clinically experienced interviewers easily gained a trusting relationship with the participants, which facilitated discussion and reflection about measurements specific to pediatric cardiovascular nursing practice.

After each interview, the principal investigator and the co-principal investigator did peer debriefing to ensure that the research data analysis remained true to the participant's words.

During data analysis, detailed quotes from the participants were used to substantiate coding decisions. The quotes also assisted an independent reader in confirming the accuracy of the researchers' analysis, thus further authenticating the study's credibility.³⁶ A group of 6 institutions was selected to carry out member checking, which included reading a direct quote or statement made by the participant followed by the team's coding of the statement. This process afforded transparency and transferability of the study.

According to Lincoln and Guba,³⁸ just as there can be no validity without reliability, there can be no credibility without dependability. Dependability and confirmability of this research were established by audit trails. Dependability was achieved through an inquiry audit of the process to certify that the process was acceptable, professional, legal, and ethical. Confirmability was achieved through a confirmability audit, which examined the product (data), findings, interpretations, and recommendations attesting that the findings were supported by the data. In addition, dependability and confirmability were ensured through consultation with an external research methodologist who has extensive experience with qualitative descriptive research.

Results

In a 6-month period, nursing administrative leaders from 20 pediatric cardiovascular programs were interviewed. The programs' median annual volume for repair of a congenital heart defect was 279 cases (range, 107-806 cases). Following data analysis, Donabedian's quality framework of structure, process, and outcome guided the final synthesis of data.^{39,40} Two encompassing patterns facilitated communication of data: (1) the structure and process of health care delivery and (2) the structure and process of evaluation of care (Figure 1). An integral part of each interview was the nurse leader's review of the local, regional, and national external and internal pressures that influence the quality of care. These were multiple, embedded in the codes, and are specified in Figure 2.

Structure of Health Care Delivery

Each nurse leader referred to some type of external environmental factor that influenced the quality of care for patients with congenital heart disease. A major external pressure was the demand to grow and be recognized as a program of excellence, such as improving a program's standing in the *US News*

and *World Report's* rankings of best pediatric hospitals and/or cardiovascular programs. Increases in size and census were the constant response to this demand, as evidenced in transition to a new institution, a new building, a new cardiac-specific unit, merger of cardiovascular programs across organizations, or expansion of existing cardiac units. As one nurse leader remembered,

We split off from the PICU [pediatric intensive care unit] in 2005 . . . we had to actually onboard a lot of people in order to get up and running . . . ensuring quality care was a big issue, as far as making sure that things were being done correctly in providing care.

The risk of expansion affecting quality was further echoed by another leader.

One of the things we really noticed in the CVICU [cardiovascular intensive care unit] was that we expanded so rapidly that of course we didn't have the nursing to keep up. We went from a 12 bed, to 16, to 21, all within a year and a half. That was huge, and I [was] onboarding staff as fast as I could. And that means that there are some deficits in training.

In many interviews, tension related to reorganization of leadership at the hospital, cardiovascular program, or unit level was evident. As stated by one nurse leader,

We certainly have had challenges over the past year where there are several hospitals which have restructured . . . We had a major restructuring of the entire nursing department, which really did increase our turnover significantly. And I do think that has an effect on quality.

The continual structural change in the environment led to uncertainty and impinged on patients' outcomes. Much of the nurse leader's time was focused on building and retaining the nursing team to ensure quality of care. Many nurse leaders described the need to hire new staff and the stress of finding nurses with a bachelor of science in nursing and experienced nurses. For many, staffing requirements meant taking the risk of hiring new graduates directly into the intensive care environment. One nurse leader described the balance between degree and experience:

We have some unique challenges . . . in that there are actually several diploma programs that are up and running and generate many nurses a year. There is a challenge . . . to hire only bachelor's-level

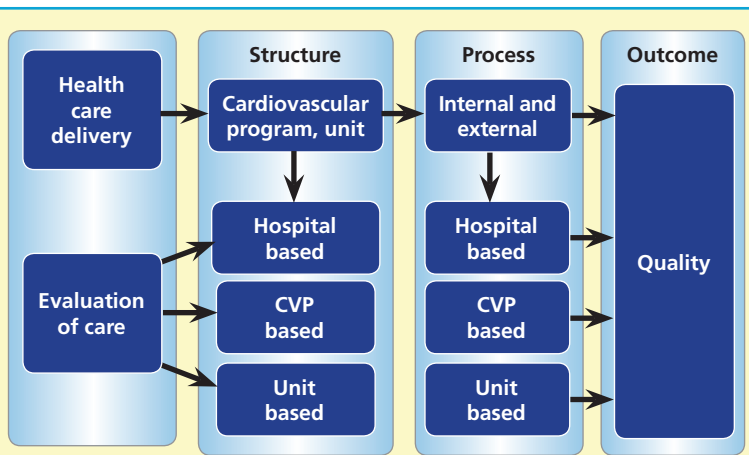
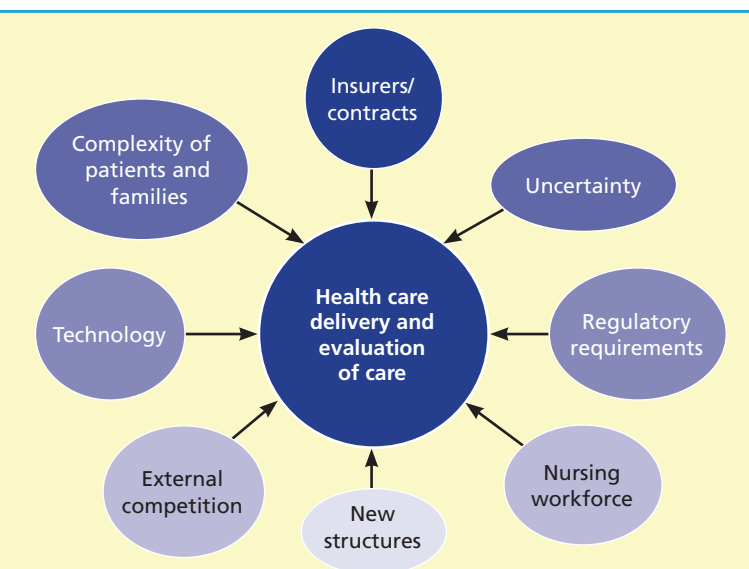


Figure 1 Quality in pediatric cardiovascular programs (CVPs).



The following environmental influences influence health care delivery and care evaluation:

- Insurers/contracts:** Reimbursement for services
- Uncertainty:** Potential change in government/insurance coverage for services rendered
- Regulatory requirements:** Increasing requirements of The Joint Commission and Centers for Medicare and Medicaid Services
- Nursing workforce:** Ensuring a workforce that is adequate in numbers, academically prepared at bachelor of science in nursing level or higher, and experienced in caring for patients
- New structures:** Physical changes within the unit such as number of beds, moving to a new cardiac-specific unit, or moving to a new building structure
- External competition:** National, state, and regional rankings (eg, *US News and World Report*)
- Technology:** Increasing amount of technology used in nursing care
- Complexity of patients and families:** Focus on patient- and family-centered care, especially those with unique needs related to culture, religious beliefs, comorbid conditions, extended or frequent hospitalizations

Figure 2 Impact of external environment on quality of care.

nurses. I have been able to hire at the new-graduate level, but have not done as well at the experienced-nurse level. The market is pretty much saturated with associate and diploma degree nurses.

Another nurse leader described the choice between hiring baccalaureate nurses and having enough nurses:

We didn't hire anything but BSN [bachelor's-level nurses] until . . . 7 years ago, when we grew so fast that we just couldn't find a nurse. . . . But, we do really highly encourage them to get their BSN [bachelor of science in nursing], through reimbursement and so forth.

To offset the lack of experience and/or academic preparation, leaders described a number of strategies they put in place such as engagement of leadership, mentoring programs, rotation of experienced staff to nights, longer orientations, cross-training, and enhanced educational programs. As one nurse leader summarized,

We . . . engage them right out of orientation. I meet with the orientees . . . new grad group, orientation up to 6 months . . . experienced group, 4 or 5 months . . . our group started a mentoring program where they'll put an experienced nurse on nights, because that was the deficit shift. And they'll take assignments, but they're just there to be eyes and ears for assessment, and so that the younger nurses can have them on board.

Another leader echoed the importance of a mentorship program.

The mentor program is the key to success. The people who have 20+ years . . . all those critical thinking skills and techniques, and . . . value in those nurses' brains is worth a lot . . . the mentor program has increased the quality of care.

Others also emphasized the importance of leadership and engagement.

The more leadership becomes engaged with the bedside, the better things seem to move. If the communication is better, the understanding becomes better.

In addition, cross-training and certification were identified as strategies to support continued education and ensure high-quality care across cardiovascular programs.

Because we believe that in order to be successful with your outcomes, you need to have a strong foundation, both educationally and in practice.

Certification is a focus . . . something to be said about . . . expanding your knowledge and feeling like you really do know something when you pass the test.

Process of Health Care Delivery

The nurse leaders described key external processes in place to ensure the safety net and stay current with quality care initiatives such as participation in national collaboratives through the Children's Hospitals Association, National Association of Children's Hospitals and Related Institutions (NACHRI), and Nursing Database of Nursing Quality Indicators. Internal processes included practice-based activities such as standardized communication and handoffs, use of nursing clinical practice guidelines, and distraction-free areas. As one nurse leader summarized the processes,

Our various handoffs . . . [are under] a lot of scrutiny . . . [we want to] be sure we don't miss anything . . . we saw medication errors [in] some serious events that took place . . . [so we] created this safety checklist, where the oncoming and offgoing nurse have a checklist that they go through when they give reports, specific to double-checking all the drips [infusions], the rates, the medication, the right concentration, and . . . daily rounds. We look at line [catheter] days and who needs to be extubated. . . . We put in place . . . a bar-coding system for breast milk.

Structure of Evaluation of Care

The structure of how care was evaluated varied across institutions from a hospital-level quality program to a cardiovascular program to a unit-level committee. Those reporting at the hospital level verbalized the inability to focus measurement on cardiovascular issues. In most instances, all disciplines collaborated on quality evaluation.

A similarity was noted in measurement concerning infection, pressure ulcer, unplanned extubation, and medication events. Interestingly, when asked about cardiovascular nursing measurement, all reported no specific measurement. Some discussion addressed the attribution of bloodstream infections associated with central catheters and of open chest infections to nursing care.

Nurse leaders gave thoughtful responses when asked to portray the unique attributes of cardiovascular nursing care. Almost all described the cardiovascular nurse as knowledgeable about congenital heart disease conditions and treatment:

Well, certainly there is a different assessment skill set that a cardiovascular nurse

needs. You need that knowledge based on that defect or whatever the disease state is . . . the technology, and understanding how all of that works, the . . . sequence . . . the chronicity of it.

Nurse leaders also characterized cardiovascular pediatric nurses as having a necessary level of assertiveness, confidence communicating the patient's clinical status, and skill in educating families.

Understanding the importance of verbalizing subtle changes early . . . nurses that come from the adult cardiac world . . . are almost unnerved being here . . . it is completely different . . . it's the subtle changes.

Another leader concurred, "Certainly the strong element of critical thinking, strong communication skills, because probably our families need more education and communication [about] what is going on than others [do]."

Nurse leaders emphasized that the cardiovascular nurse had to have a commitment to lifelong learning, as innovation was a constant.

There is so much going on . . . I don't know of any subspecialty of nursing that is where team members are on the cutting edge . . . particularly . . . with all of the VADs [ventricular assist devices]. . . mobile ECMO [extracorporeal membrane oxygenation], all of these kind of things . . . doing the first thing for the first time ever in an institution.

Pediatric cardiovascular nursing care has expanded to premature infants and also to adults with congenital disease and subsequent morbidity. Providing care for the adult population was a growing issue, and how to address the needs of patients and nursing was not clear.

So, we've dealt with the entire spectrum. We have a very big adult congenital population . . . they present themselves with comorbidities . . . that we're not used to . . . the aging population coming back with different relationships . . . There's no mom and dad now. It's a husband or a wife. And children . . . it's challenging.

Many programs described a growing commitment to quality education onsite.

Well, they are educated in orientation about quality indicators, and what we track . . . and what to report. And we try to do a yearly; I don't know if you call it competency or education, about quality indicators, about what we're watching.

Table 3
Topic areas for measurement development

Topic area	Type of measure			
	Structure ^a	Process ^b	Outcome ^c	Balancing ^d
Nutrition		X	X	X
Pressure ulcers			X	
Work environment	X	X	X	
Clinical deterioration		X	X	
Pain management		X	X	X
Patient- and family-centered care		X	X	
Adults with congenital heart disease	X	X	X	

^a Measures the organization's capacity and the conditions in which health care is provided by looking at factors such as staff or facilities.
^b Measures how health care is provided.
^c Measures the results of the health care.
^d Measures ensuring that if changes are made to one part of the system, they do not have unintended consequences on another part of the system.⁴¹

Dissemination of quality data occurred in the setting with use of dashboards, electronic boards, and posted displays. New information was routinely presented at staff meetings.

Process of Evaluation of Care

The process of how care is evaluated also varied. For many programs, nurse leaders reported a combined effort at the hospital and unit level to support data collection and report generation. Much of the data collection depended on unit leadership and staff. This arrangement provided staff the experience of evaluating the quality of their care.

My standing rule . . . is that the bedside nurses do the audits . . . the staff has to know what is expected of them. Doing the audits is the only way that they know . . . that half of our IV [intravenous] tubings are not labeled.

Some nurse leaders linked quality outcomes to employee performance and evaluation:

One of the things that we have been working on in the NACHRI is our bloodstream infections . . . they did not meet their goal. So, they all received a below in that particular area . . . they're like, "That's really not fair." And I'm like, "Did you hold your peer accountable when you saw them enter a line without doing a scrub for 15 seconds?" . . . That's how you make an impact. . . I'm expecting you to hold each other accountable.

A number of opportunities for measurement were identified and were believed to be critical to moving the field of pediatric cardiovascular nursing

forward (Table 3). Included were nutrition, device-related ulcers, clinical deterioration, pain management, care of adults with congenital heart disease, the work environment, and patient- and family-centered care. These 7 areas address both the structure and process of nursing care with linkage to outcomes. All agreed that collaboration is important, especially in a specialty setting; however, no current efforts are specific to pediatric cardiovascular nursing.

Limitations

Although information was garnered from 20 freestanding pediatric cardiovascular programs, we cannot generalize the status of quality measurement to all programs in the United States.

Discussion

Information from this study portrays the current landscape of delivery and evaluation of pediatric care in highly specialized and acute care environments. Similarities across institutions were notable in terms of program expansion requiring hiring of nurses with a bachelor of science in nursing and of experienced nurses to provide safety and optimal outcomes for patients. Nurse leaders verbalized the importance of measurement focused on cardiovascular nursing to help justify optimal staffing models in the current environment of reorganization and growth. Measures encompassing competency, experience, education, and retention were perceived as key for establishing benchmarks. The quality of the work environment, adult-based care, and patient- and family-centered care were additional items highlighted for measurement.

For many nurse leaders, the inability to justify an optimal staffing model was related to the paucity of evidence and measurement linking the process of nursing care to patients' outcomes.¹⁷⁻²² This gap limited their ability to define quality care for their pediatric cardiovascular population, hence their greater attention to structural issues.^{23,24}

Programs varied in how evaluation of care was conducted in terms of structure, measurement, and the collection and dissemination of data. Quality of nursing care was a clear goal, and all nurse leaders agreed that cardiac-specific nursing care measures are essential; however, very few sites had measures, and none had used external benchmarks.

Conclusion

In many instances, the health care delivery experiences of nurse leaders were similar in external factors and response to internal structure and process approaches. How quality was evaluated varied

across centers. Potential measures specific to cardiovascular nurses were identified.

A national community of researchers, administrators, and expert clinicians has come together to form a strong network committed to rigorous measurement of quality nursing care to achieve optimal outcomes for children with cardiac disease. Nurses' ability to identify key performance measures and to articulate the value of those measures in the delivery of care is central to improving quality, establishing benchmarks, and reducing cost.

Next Steps

Information from this study will be used to inform development of measurements and benchmarks. Using the 7 identified target areas for measurement, the C4-MNP members will identify and develop measures and linkages to patients' outcomes. These measures will then be pilot tested across a smaller number of centers before they are used for setting benchmarks for all participating programs.

FINANCIAL DISCLOSURES

This work was supported by Boston Children's Hospital Program for Patient Safety and Quality Research Grant Award 2011 and American Association of Critical-Care Nurses (AACN) Impact Research Grant 2012.

eLetters

Now that you've read the article, create or contribute to an online discussion on this topic. Visit www.ajconline.org and click "Submit a response" in either the full-text or PDF view of the article.

REFERENCES

1. Aiken LH, Clarke SP, Sloane DM, Lake ET, Cheney T. Effects of hospital care environment on patient mortality and nurse outcomes. *J Nurs Adm.* 2008;38(5):223-229.
2. Aiken LH, Clarke SP, Sloane DM. Hospital restructuring: does it adversely affect care and outcomes? *J Health Human Serv Res.* 2001;23(4):416-442.
3. Aiken L. Good nursing care = lower death rates. *N J Nurse.* 1994;24(8):1.
4. Hickey PA, Gauvreau K, Curley MAQ, Connor JA. The effect of critical care nursing and organizational characteristics on pediatric cardiac surgery mortality in the United States. *J Nurs Adm.* 2013;43(12): 637-644.
5. Blegen MA, Goode CJ, Park SH, Vaughn T, Spetz J. Baccalaureate education in nursing and patient outcomes. *J Nurs Adm.* 2013;43(2): 89-94.
6. Tourangeau AE, Doran CM, McGillis Hall L. Impact of hospital nursing care on 30-day mortality for acute medical patients. *J Adv Nurs.* 2006;57:32-44.
7. Estabrooks CA, Midodzi WK, Cummings GG. The impact of hospital nursing characteristics on 30-day mortality. *Nurs Res.* 2005;54:74-84.
8. Aiken LH, Clark S, Cheung R. Educational levels of hospital nurses and surgical patient mortality. *JAMA.* 2003;289:1617-1623.
9. Aiken LH, Cimiotti JP, Sloane DM. Effects of nurse staffing and nurse education on patient deaths in hospitals with different nursing work environments. *Med Care.* 2011;49: 1047-1053.
10. Beck SL, Weiss ME, Ryan-Wenger N, Donaldson NE, Aydin C, Towsley GL, Gardner W. Measuring nurses' impact on health care quality progress, challenges and future directions. *Med Care.* 2013;51(4):S15-S22.

11. Burston S, Chaboyer W, Gillespie B. Nurse-sensitive indicators suitable to reflect nursing care quality: a review and discussion of issues. *J Clin Nurs*. 2013;23:1785-1795.
12. Bostick JE, Riggs CJ, Rantz MJ. Quality measurement in nursing: an update of where we are now. *J Nurs Care Qual*. 2003;18(2):94-104.
13. Riehle A, Hanold L, Sprenger S, Loeb J. Specify and standardizing performance measures for use at a national level: implications for nursing-sensitive care performance measures. *Med Care Res Rev*. 2007;64(2):64S-81S.
14. Dubois C, D'Amour D, Pomey M, Girard F, Brault I. Conceptualizing performance of nursing care as a prerequisite for better measurement: a systematic and interpretive review. *BMC Nurs*. 2013;12:7.
15. Institute of Medicine. *The Future of Nursing Leading Change, Advancing Health*. Washington DC: National Academies Press; 2011.
16. Smith AP. Nursing-sensitive care measures: a platform for value and vision. *Nurs Econ*. 2007;25(1):43-46.
17. Beal A, Co JP, Dougherty D, Jorsling T, Kam J, Perrin J, Palmer H. Quality measures for children's health care. *Pediatrics*. 2004;113(1):199-203.
18. Lacey SR, Klaus SF, Smith JB, Cox KS, Dunton NE. Developing measures of pediatric nursing quality. *J Nurs Care Qual*. 2006;21(3):210-222.
19. Curley MA, Hickey PA. The Nightingale metrics. *Am J Nurs*. 2006;106(10):66-70.
20. Alexander GR. Nursing sensitive databases: their existence, challenges, and importance. *Med Care Res Rev*. 2007;64(2):44S-63S.
21. Naylor MD. Advancing the science in the measurement of health care quality influenced by nurses. *Med Care Res Rev*. 2007;64(2):144S-169S.
22. Needleman J, Kurtzman ET, Kizer KW. Performance measurement of nursing care: state of the science and the current consensus. *Med Care Res Rev*. 2007;64(2):10S-43S.
23. Clarke SP, Aiken LH. Failure to rescue. *Am J Nurs*. 2003;103(1):42-47.
24. Schwalenstocker E, Bisarya H, Lau S, Adebimpe O. Nursing Sensitive Indicators for Children's Hospital Care Quality. Pediatric Data Quality Systems Collaborative. September 2007. <http://www.childrenshospitals.net/AM/Template.cfm?Section=Home&Template=/CM/ContentDisplay.cfm&ContentID=29730>. Accessed April 28, 2014.
25. Seid M, Varni J, Kurtin P. Measuring quality of care for vulnerable children: challenges and conceptualization of a pediatric outcome measure of quality. *Am J Med Qual*. 2000;15:182-188.
26. Kuhlthau K, Mistry K, Forrest C, Dougherty D. Advancing the science of measurement in pediatric quality of care. *Acad Pediatr*. 2014;14:S1-S3.
27. Miller M, Schwalenstocker E, Wietecha M. The importance of the pediatric quality measurement program in advancing children's health care: a view from children's hospitals. *Acad Pediatr*. 2014;14:S12-S14.
28. Mistry K, Chesley F, Llanos K, Dougherty D. Advancing children's health care and outcomes through the Pediatric Quality Measures Program. *Acad Pediatr*. 2014;14:S19-S26.
29. Forrest C, Silber J. Concept and measurement of pediatric value. *Acad Pediatr*. 2014;14:S33-S38.
30. Forrest CB, Simpson L, Clancy C. Child health services research challenges and opportunities. *JAMA*. 1997;277:1787-1793.
31. Sandelowski M. Focus on research methods: whatever happened to qualitative description. *Res Nurs Health*. 2000;23:334-340.
32. Kearney M. Focus on research methods: levels and application of qualitative research evidence. *Res Nurs Health*. 2001;24:145-153.
33. Hsieh HF, Shannon SE. Three approaches to qualitative content analysis. *Qual Health Res*. 2005;15(9):1277-1288.
34. Milne J, Oberle K. Enhancing rigor in qualitative description. *J Wound Ostomy Continence Nurs*. 2005;32(6):413-420.
35. Hockenberry-Eaton M, Minick M. Living with cancer: children with extraordinary courage. *Oncol Nurs Forum*. 1994;21(6):1025-1031.
36. Norwood S. *Research Strategies for Advanced Practice Nurses*. Upper Saddle River, NJ: Prentice-Hall; 2000.
37. Munhall P, Boyd C. *Nursing Research: A Qualitative Perspective*. 2nd ed. Sudbury, MA: Jones and Bartlett; 2000.
38. Lincoln YS, Guba EG. *Naturalistic Inquiry*. Newbury Park, CA: SAGE Publications; 1985.
39. Donabedian A. Evaluating the quality of medical care. *Milbank Q*. 1966;44:691-729.
40. Donabedian A. The quality of care: how can it be assessed? *JAMA*. 1988;260:1743-1748.
41. Performance Management and Measurement. US Department of Health and Human Services Health Resources and Services Administration. Published June 26, 2012. <http://www.hrsa.gov/quality/toolbox/508pdfs/performanceandmeasurement.pdf>. Accessed December 14, 2015.

To purchase electronic or print reprints, contact American Association of Critical-Care Nurses, 101 Columbia, Aliso Viejo, CA 92656. Phone, (800) 899-1712 or (949) 362-2050 (ext 532); fax, (949) 362-2049; e-mail, reprints@aacn.org.

Copyright of American Journal of Critical Care is the property of American Association of Critical-Care Nurses and its content may not be copied or emailed to multiple sites or posted to a listserv without the copyright holder's express written permission. However, users may print, download, or email articles for individual use.