

Communication in Pediatric Critical Care Units: A Review of the Literature

Melissa L. Hallman, DNP, BA, RN, APRN, CCRN, FNP-BC
Lanell M. Bellury, PhD, RN, AOCNS, OCN

TOPIC Current communication styles in pediatric critical care units do not often consider the needs of providers, patients, or family members.

CLINICAL RELEVANCE The Child Hospital Consumer Assessment of Healthcare Providers and Systems score has begun real-world testing and soon will be mandatory and tied to reimbursement. Poor communication in pediatric critical care units can lead to reduced continuity of care, escalated or unnecessary care, and poor outcomes for patients and hospitals. Improving communication in pediatric critical care units is imperative.

PURPOSE OF PAPER Extant literature was reviewed to assess communication in pediatric critical care from the provider, parent, and patient perspectives. Communication tools were also reviewed.

CONTENT COVERED Twenty-eight articles met inclusion criteria and were analyzed according to study focus (provider, parent/caregiver, patient, or tool). This review links communication to outcomes related to providers, parents, and patients. Current tools are reviewed to evaluate their effectiveness in addressing communication barriers and to guide future research in communication. Findings indicate that effective communication is challenging in intensive care units despite robust evidence that effective communication improves patient outcomes and quality metrics. Repeated and varied forms of communication, especially written reinforced with verbal communication, seem to have the strongest effect and show promising results. Common barriers nurses face on their units are identified, and solutions are suggested. This review adds to current knowledge by linking communication to measurable outcomes and examining communication barriers and needs specific to pediatric critical care populations from the provider, parent, and patient perspectives. (*Critical Care Nurse*. 2020;40[2]:e1-e15)

Pediatric critical care is a complex and ever-evolving specialty within health care. Pediatric critical care in hospitals has evolved from single all-purpose intensive care units (ICUs) to multiple specialized units that care specifically for neonatal, pediatric, cardiac, and technology-dependent patients or combinations of these.¹ Because of advances in surgery, technology, pharmacotherapy, and practice, critical care patients require some of the most complex medical care that hospitals can provide. Their physical care has become more complex and time intensive, and the social domains of care are also changing; often family members and patients develop deep and lasting relationships with providers and each other. Family members of children with similar diagnoses increasingly communicate and share

information via social networks, at appointments, and during inpatient stays. This sharing is especially evident in cardiac ICUs, where patients, many with congenital heart disease, will require multiple surgical interventions and hospital stays over their lifetime.

Multidisciplinary teams that include specialists in genetics, advanced practice nursing, palliative care, and other disciplines will be needed to care for children with congenital heart disease as we move forward in providing care.² Pediatric ICUs have similar requirements for multidisciplinary care and directions for care delivery growth.¹ Given the increasing number of people involved, the complexity of care required to sustain pediatric patients in critical care units, and the increasing reliance on technology for communication channels, communication with team members, parents, and patients has become more challenging.

Communication was not often considered a priority until the 2006 introduction of the Hospital Consumer Assessment of Healthcare Providers and Systems (HCAHPS) survey.³ In this patient satisfaction survey, communication can account for 25% of a hospital's total score and can increase or decrease revenue by 1.5% to 2% because low scores can result in reduced reimbursement.⁴ A children's version of the HCAHPS (C-HCAHPS) survey recently

entered real-world testing and is poised to become a requirement for pediatric

The increasing reliance on technology for communication with team members, parents, and patients has become more challenging.

hospitals that receive revenue from the Centers for Medicare & Medicaid Services and the Children's Health Insurance Program.⁵ While examining relatives' perspectives on ICU care in adults, van Mol and colleagues⁶ found that communication and involvement were significant predictors of quality of care scores. Their analysis of a

hospital satisfaction survey demonstrated that communication and involvement were strongly correlated with the total quality care score.⁶ In a similar study in pediatric populations examining parental perceptions of care, Co and colleagues⁷ found that improving communication may be the single most important thing a hospital can do to increase satisfaction scores. With care becoming more complex and reimbursement being tied to quality measures, it is increasingly important that the care team adequately communicate diagnoses, plans, and follow-up information when families and patients are available and before they go home.

This literature review assesses the state of the science surrounding communication and the tools used to enhance communication between providers, patients, and family members in pediatric critical care settings to improve quality of care and outcomes for pediatric critical care patients. Our purpose is to evaluate the barriers and facilitators surrounding the understanding and execution of the patient's diagnosis, treatment, and plan among providers (nurses, physicians, and other care team members), patients, and family members. We also examine tools developed to improve communication and their effectiveness within a pediatric critical care setting and specific outcomes that may improve quality metric scores.

Methods

We searched the CINAHL Plus and MEDLINE databases with the search strings *pathway* OR *algorithm* OR *care plan* and *neonatal* OR *pediatric* OR *cardiac* OR *technology* AND *ICU*. We conducted an additional search with the terms *communication* and *ICU* and/or *outcomes*. These searches returned 172 articles. Inclusion criteria were articles published after 2007, peer reviewed, and available in English. We selected the year 2007 to ensure that communication and its interaction with evolving technology would be a primary focus in this review. Also, studies published after the introduction of HCAHPS (which was implemented in October 2006 and first reported in March 2008) were considered most appropriate for this review.³ We screened article titles for inclusion by selecting articles specifically related to caregiver decision-making (pediatric); communication with caregivers (adult or pediatric); communication with critically ill children (pediatric); outcomes for pediatric populations in critical care (pediatric); physicians', nurse practitioners', or registered nurse providers' skills and communication

Authors

Melissa Hallman is a senior instructor at Emory University, Atlanta, Georgia. She founded NP2ME, LLC.

La nell M. Bellury is an associate professor at Georgia Baptist College of Nursing, Mercer University, Atlanta, Georgia.

Corresponding author: Melissa L. Hallman, MSN, BA, RN, APRN, CCRN, FNP-BC, 701 Highland Ave NE #2202, Atlanta, GA 30312 (email: melissa.lee816@gmail.com).

To purchase electronic or print reprints, contact the American Association of Critical-Care Nurses, 27071 Aliso Creek Rd, Aliso Viejo, CA 92656. Phone, (800) 899-1712 or (949) 362-2050 (ext 532); fax, (949) 362-2049; email, reprints@aacn.org.

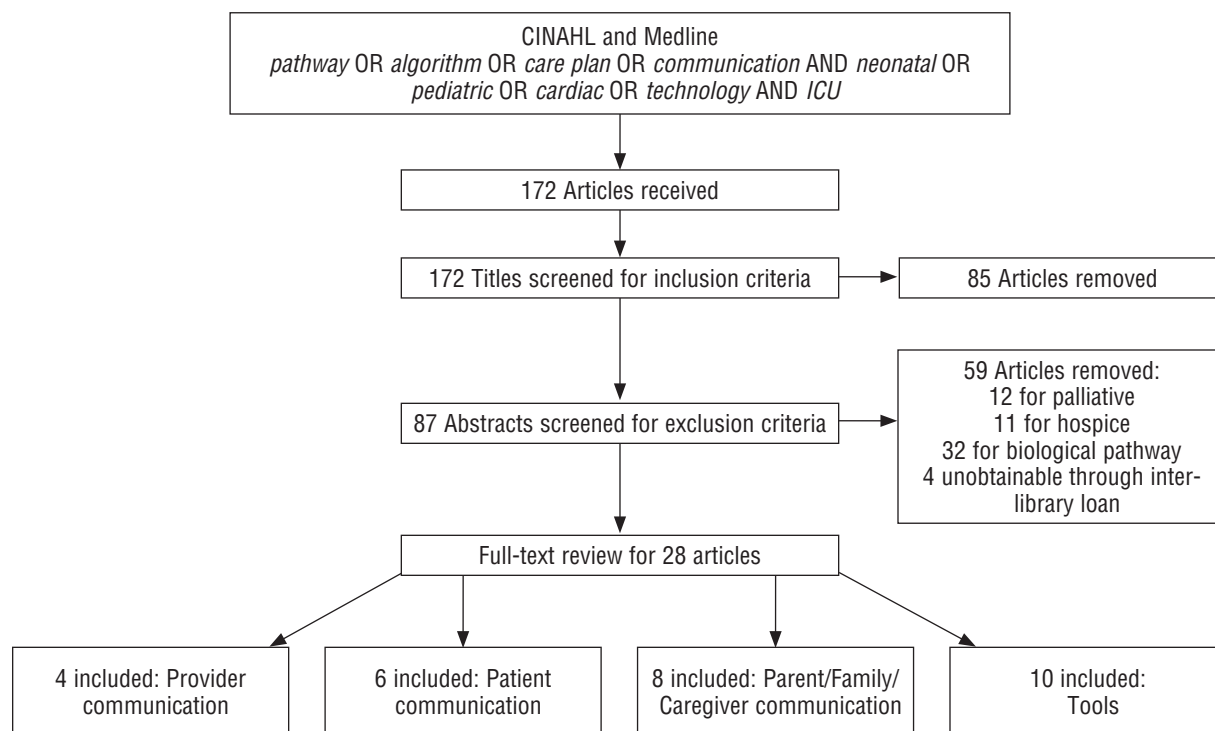


Figure Flow diagram reflecting search terms, results, screening, inclusion and exclusion, and 28 included articles by identified categories.

with the health care team (pediatric); and tools developed to improve communication in critical care units. Communication with caregivers was the only category for which we included studies of adult as well as pediatric populations because the roles caregivers face in this situation are similar.

Title screening resulted in removal of 85 articles. We reviewed the abstracts of the remaining 87 articles for exclusion criteria. We excluded 32 articles about biological pathways, 12 about palliative care, and 11 about hospice care, leaving a total of 32 articles (see Figure). We were not able to locate 4 articles published outside the United States after consulting with the library services department and having no success with interlibrary loans. We conducted a full text review on the remaining 28 articles, reading them in their entirety for content and again for analysis.

We entered all articles into a matrix (Table 1) to facilitate understanding across the studies. We identified each study's focus (provider, parent, patient, or tool) and synthesized findings across studies according to role and content. Studies that reported outcomes related to multiple stakeholders and tools were classified according to

their main foci. We rated each study's strength of evidence and quality according to the Johns Hopkins Nursing Evidence-Based Practice tool, which has a strength of evidence rating scale ranging from level I (experimental studies and meta-analysis) to level V (nonresearch evidence).³² Article quality was ranked as high, good, or low.³²

Results

Of the 28 included articles, 2 were deemed to be low quality but were included because of lessons learned during their implementation.^{30,31} Of the 26 remaining studies, 16 were deemed high quality^{1,2,6,7,8,10-12,14,18,22-28} and 10 were considered good quality.^{9,13,15-17,19-21,26,29} Eight studies reported significant results related to increased communication, satisfaction, and compliance.^{6,7,11,20,22-24,28} In the examination of level of evidence, 16 articles were deemed to be level III, which includes nonexperimental studies, qualitative studies, and meta-synthesis.^{7,9,10,12,14-19,22-25,29,30} One study, a systematic review, was deemed to be level IV, which includes expert consensus in systematic reviews and clinical practice guidelines.²⁶ The remaining 11 studies were level V and included quality improvement

Table 1 Methods and quality ratings of selected articles by provider, patient, and tool categories^a

Source	Study purpose	Design	Sample size and sites
Riley et al, ¹ 2013	Evaluate the model of PICU care delivery	Descriptive review	NA
Triedman and Newburger, ² 2016	Establish and discuss emerging trends in congenital heart disease care	Literature review	NA
van Mol et al, ⁶ 2014	Develop a questionnaire to assess relative perception of quality of care	Cross-sectional	211 relatives
Co et al, ⁷ 2003	Describe the quality of pediatric inpatient care as perceived by parents of patients and correlate associated hospital characteristics	Cross-sectional	6030 parents from 38 different hospitals surveyed
Allen, ⁸ 2014	Evaluate parental decision-making in infants with medically complex problems	Integrative literature review	31 articles
Schoormans et al, ⁹ 2011	Examine the needs of patients with CHD and evaluate whether their needs are met	Cross-sectional	1109 adult patients with CDH attending 1 of 8 Dutch hospitals
Boss et al, ¹⁰ 2016	Analyze and describe real-time conversations in which the family of a NICU patient needed to make a major medical decision	Prospective conversation analysis	19 conversations
Justice et al, ¹¹ 2016	Evaluate goal agreement and parent satisfaction when goals are written down and displayed during rounds	Quality improvement	Varied during project; all patients admitted to CICU
Hickey et al, ¹² 2013	Identify organizational factors that influence in-hospital patient mortality	Case series	38 children's hospitals in the United States
Jones and Tucker, ¹³ 2016	Describe education and critical thinking skills required in CICU nurses	Descriptive review	NA
Trotman-Beasty et al, ¹⁴ 2009	Identify the synergy between identified treatment pathways for patients in cardiac rehabilitation and general practices	Cross-sectional	50 nurses in general practice randomly selected, 40 returned questionnaires
Whelchel et al, ¹⁵ 2013	Evaluate use and nurses' awareness of quality bundles	Prospective mixed methods	423 patients and 180 nurses

Downloaded from http://aact-az.silverchair.com/ccnonline/article-pdf/40/2/e1126206/e1.pdf by guest on 09 April 2024

Key findings	Outcomes	Study focus	Quality rating ^a
Processes that support physicians and staff in protecting patients include daily goal sheets, daily rounds with all subspecialties, huddles, bundles, and diagnosis-specific care pathways and protocols.	Intensivist sole care does not improve patient outcomes compared with nonintensivist sole care if communication with other providers does not happen.	Provider	V, high
Parents will be more involved with each other than ever before with social media and online outcome data. Multiple factors indicate growth for treatment of CHD as well as survival into adulthood.		Parent Patient	V, high
Conflicting information was the top concern for relatives. Health care providers often underestimated relatives' need for information and many relatives felt they were not taken seriously.	Communication and Involvement were strongly correlated with the total quality care score ($r=.82$; $P<.001$). Communication items accounted for the bulk of this correlation.	Parent	V, high
Patients rated care as very good but information to the child and coordination of care had the highest reported problem rates (33% and 30%, respectively). Improving the quality of communication may have the most positive impact on the quality care rating.	All problem areas except physical comfort had problem scores of >20%, (ie, information to parent, information to child, partnership, confidence and trust, coordination, continuity, and transition). Overall ratings of care were most closely correlated with improved communication with parent and coordination of care ($r=-0.49$). Academic health centers reported more problems than those without a residency or teaching program.	Provider	III, high
Parents struggle to understand information during shocking times (diagnosis and critical interventions). Limited interaction between parents and physicians occurs. Written and electronic forms of communication are beneficial. Information should be repeated multiple times with limited jargon. Shared decision-making decreases parental stress.		Parent	V, high
Those with increased use of health care services had poor function and increased contact.		Patient	III, good
Very few questions were asked, making it impossible to assess full understanding from the perspective of the provider or patient.	56% of physician time was devoted to medical information. Parents and physicians asked questions only 5% of the time. Providers and physicians spoke 65% of the time.	Parent Provider	III, high
Increased communication and focusing on care plan goals at the end of rounds led to the outcomes shown.	Physician agreement on treatment plan rose from 62% to 87.6%. Parental satisfaction and understanding rose from 19% to 75% of parents selecting the highest possible response. Family survey results rose from 4.6 to 5.7.	Tool Provider	V, high
PCCUs that used quality benchmarking had improved outcomes. BSN, higher volume, and CCRN certification were associated with decreased mortality.	Presence of $\geq 20\%$ of RNs with ≤ 2 years clinical experience significantly increased odds of inpatient mortality. Increased percentage of nurses with ≥ 11 years of experience was associated with improved outcomes. PCCUs that used quality benchmarking had improved outcomes.	Provider	III, high
Patients with complex conditions require knowledgeable staff.		Provider	V, good
Program use is inconsistent. Current mandates are underused and not received by general care nurses.	All respondents stated they were aware of the program. Less than 50% followed the program appropriately.	Tool	III, high
Quality bundles were known to nurses but were also difficult to complete on time.	144 clinical nurses (80% of respondents) were most of the time or always aware of bundles. 133 clinical RNs (74%) replied that they could complete bundles on time. Critical care patients were assigned the most quality bundles (mean, 2.83 per patient). Overall, patients were assigned a mean of 1.7 bundles per patient (range, 0-6 bundles).	Tool	III, good

Continued

Table 1 *Continued*

Source	Study purpose	Design	Sample size and sites
Giambra, et al, ¹⁶ 2014	Identify parental perceptions and experiences in communication with TICU nurses	Qualitative	11 parents who identified as the caregivers were interviewed by the researcher using the grounded theory method
Caffin et al, ¹⁷ 2007	Evaluate the addition of a PICU nurse liaison	Mixed methods	1197 patients visited, 115 nursing surveys completed, 200 parent surveys completed
Baker-Smith et al, ¹⁸ 2011	Understand care outcomes for patients with stage 1 palliation for single-ventricle surgery	Cross-sectional	100 participants from 21 sites in NPC-QIC registry
Lyndon et al, ¹⁹ 2014	Identify parental perceptions of safety in the NICU	Cross-sectional	46 completed parental questionnaires; 10 interviews with 14 parents (4 were couple interviews)
Blankenship et al, ²⁰ 2015	Implement family bundle to invite to morning rounds	Quality improvement	Varied through project, all patients in CICU
Jawahar and Scarisbrick, ²¹ 2009	Evaluate parental perceptions of cardiac fast-track surgery	Retrospective cross-sectional	42 of 138 questionnaires
Melnyk et al, ²² 2014	Verify the NICU PBS rating scale concerning parental beliefs and understanding of their role in the NICU	Cross-sectional	245 mothers, 143 fathers
Fletcher et al, ²³ 2017	Examine medical and developmental concerns of parents of premature infants	Qualitative	Parents of 60 children completed survey
Apers et al, ²⁴ 2013	Define the relationship between sense of coherence and outcome variables in adolescents with CHD	Cross-sectional	498 adolescents with CHD in Belgium
Luyckx et al, ²⁵ 2012	Identify determinants for quality of life for adolescents with CHD	Cross-sectional	498 adolescents with CHD in Belgium
Snookes et al, ²⁶ 2010	Identify cognitive and motor outcomes in infants undergoing cardiac surgery	Systematic review	25 studies
Winch et al, ²⁷ 2016	Evaluate current early extubation practice and the factors surrounding it as a plan of care	Quality improvement	461 patients, 234 extubated in operating room

Downloaded from <http://aao-nz.silverchair.com/online/article-pdf/40/2/e1126206/e1.pdf> by guest on 09 April 2024

Key findings	Outcomes	Theme	Quality rating ^a
Parents believed they needed to engage in all communication behaviors to reach shared communication with nurses (questioning, listening, explaining, and advocating).		Provider Parent	III, good
Staff nurses could identify an area where they were helpful, "good communicators and vital."	98.5% of staff members believed that a liaison nurse made a valuable impact on transfers. 99% of parents agreed that the liaison nurse was "a good idea." 85% of parents agreed it helped them transition to the unit environment. Readmission rates decreased from 5.4% to 4.8%.	Tool	III, good
Type of surgical procedure performed, HLHS subtype, and site were associated with the highest variability. Significantly higher rates of postoperative complications occurred with sites that had the longest ICU LOS.	87% of patients received milrinone, 64% received dopamine, and 62% received epinephrine. The most common complications included neurological injury, infection, and arrhythmia. ICU LOS varied (range, 5-68 days; mean, 11 days) but postoperative care was similar.	Patient	III, high
Parents focus on developmental needs, physical injuries, and medical harm. Emotional health was correlated with trusting providers, having access to information, and being able to parent their infant. Parents have a significant understanding of safety and should collaborate in care.	The highest percentage of concern surrounded intravenous catheters (38%), medications (28%), and feeding (26%).	Parent	III, good
The goal was to invite parents to rounds, and invitations increased significantly.	Invitation to participate in rounds was increased significantly from 73% to 94%. 57% of parents were present to receive the invitation. 5 parents were interviewed and 4 of 5 found rounds helpful.	Tool	V, good
Parents require close contact with physician and nurse team.	80.5% expected to be present when their child woke up, and 75.8% were present. Parents overestimated ICU LOS (expected ICU LOS, 2.3-6.4 days; actual ICU LOS, 1.5-4.4 days; $P < .05$).	Parent	V, good
Cognitive beliefs can be influenced with an educational-behavioral intervention verified by the NICU PBS scale from time 1 (4-8 days after admission) to time 2 (4 days before discharge). High parental confidence is protective against stress, depression, and anxiety. There is a strong need to assess parenting knowledge as well as beliefs and confidence.	Reliability coefficients for Cronbach α ranged from 0.79 to 0.93. Parental role confidence increased from 26.12 to 29.23. Parent-baby interaction score was 27.85-30.67. Knowledge about the NICU score was 9.92-11.45.	Tool Parent	III, high
Many parental concerns were not supported by their child's diagnosis. Parents of high-risk infants and low- to moderate-risk infants did not vary significantly in their concerns.	47% of parents appropriately anticipated developmental patterns. 62% of parents could not report the corrected age of their child within 1 month and could not anticipate developmental patterns.	Parent	III, high
Providers can identify opportunities to improve QOL for CHD patients by empowering patients to be a part of their decision-making. A sense of coherence was positively related to lowering treatment anxiety and communication.	Sense of coherence was a predictor of QOL rating ($P < .001$).	Patient	III, high
Health status was not synonymous with QOL. Peer support is not a predictor of QOL.	Sense of coherence and perceived health status correlated with QOL ($P < .001$). Parental support correlated with QOL ($P < .01$).	Patient	III, high
Studies found consistent cognitive and motor delay in children after cardiac surgery.	All studies reviewed showed motor/cognitive delays greater than 1 SD from the mean for cardiac surgery patients.	Patient	IV, good
The results indicate continued support for early extubation on the basis of previously identified factors. Increased pain and sedation monitoring is needed.	In 10 of 22 patients requiring reintubation, the need for reintubation was related to agitation and increased pain and sedation.	Patient	V, high

Continued

Table 1 Continued

Source	Study purpose	Design	Sample size and sites
Tarrago et al, ²⁸ 2014	Identify outcomes after implementing a checklist in a PICU	Quality improvement	660 patients, 120 nurses, 8 pharmacists, and 100 respiratory therapists
Singh et al, ²⁹ 2007	Evaluate the outcomes for a burn care pathway	Cross-sectional	80 control patients, 53 patients were treated with pathway
Kodali et al, ³⁰ 2015	Measure the effects of a family-centered care pathway on family satisfaction	Quasi-experimental	Patients' parents responded to a mailed survey
Higby and Pye, ³¹ 2009	Improve discharge for pediatric cancer patients	Quality improvement	None given

Abbreviations: BSN, bachelor of science in nursing; CHD, congenital heart disease; CICU, cardiac intensive care unit; EMR, electronic medical record; HLHS, hypoplastic left heart syndrome; ICU, intensive care unit; LOS, length of stay; NA, not applicable; NICU, neonatal intensive care unit; NPC-QIC, National Pediatric Cardiology Quality Improvement Collaborative; PBS, Parental Belief Scale; PCCU, pediatric critical care unit; PICU, pediatric intensive care unit; QOL, quality of life; RN, registered nurse; TICU, technology-dependent intensive care unit.

^a Level I indicates experimental study/randomized controlled trial or meta-analysis of a randomized controlled trial; level II, quasi-experimental study; level III, nonexperimental study, qualitative study, or meta-synthesis; level IV, opinion of nationally recognized experts based on research evidence or expert consensus panel (systematic review, clinical practice guidelines); and level V, opinion of individual expert based on nonresearch evidence (includes case studies, literature review, and organizational experience [eg, quality improvement and financial data, clinical expertise, or personal experience]).⁵

projects and descriptive reviews.^{1,2,6,8,11,13,20,21,27,28,31} Of the included studies, 4 focused on provider communication, 8 focused on parent/caregiver communication, 6 focused on patient communication, and 10 focused on communication tools.

Provider Communication

For the purposes of this review, providers are defined as physicians, nurses, and advanced practice providers. Provider communication includes intra- and interprofessional communication, provider-patient communication, and provider-parent/family communication. Patients with elevated acuity and multiple interventions and their families need increased opportunities for communication from their providers.^{8,9} However, research has shown that a myriad of barriers to provider-family communication exists.

Physicians' decisions often guide treatment of the patient, but several studies have indicated that effective communication from physicians is not common during hospitalization.^{1,9-11} When physicians were evaluated during difficult conversations with parents, such as discussions about escalating care, physicians spoke 65% of the time, even when other providers were present, and 56% of that time was delivering biomedical information. Physicians posed questions to the family only 5% of the

time.¹⁰ This pattern of communicating without adequately assessing how well the recipients comprehend the information may prevent the parents and care team from fully understanding the patient's condition. Additionally, Riley et al¹ examined provider-provider communication and found that merely having an intensivist oversee care did not improve outcomes, especially if communication between the intensivist and the team was impaired. Communication and agreement issues also exist between providers. Justice and colleagues¹¹ showed that physician agreement on patient treatment decisions was only 62% at baseline. Several barriers, including time constraints, lack of communication training, different medical treatment styles, and personal experience, contribute to the lack of communication from physicians.^{1,2,9,10} However, research also supports the use of tools like communication pathways¹¹ and processes like closed-loop communication, training in personal communication style, and a standard format for provider communication to reduce barriers to physician communication with all parties and ultimately improve patient outcomes.^{1,7,11}

Several studies focused on the quality and experience of nursing providers (bedside registered nurses unless otherwise noted). Patients with complex medical conditions receiving critical care need effective communication from

Key findings	Outcomes	Theme	Quality rating ^a
Survey of staff indicated satisfaction with the EMR in safety, communication, and collaboration. Patient laboratory test reductions saved a mean of \$565/d.	Clinicians stated the checklist significantly improved patient safety (80%), communication (95%), collaboration (80%), and ongoing intensivist inconsistencies (55%). Calculated daily savings averaged \$173 on 2010 Medicare cost-charge ratios. Significant ($P < .001$) improvements were noted in almost all areas studied.	Tool	V, high
An evidence-based pathway was used to treat burns.	Compliance with swabbing increased from 43% to 80%. Use of prophylactic antibiotics increased from 39% to 82%.	Tool	III, good
Results indicated dissatisfaction with physicians, satisfaction with nurses, and poor physician buy-in. Not all members of team communicated. Results showed a nonsignificant increase in family satisfaction.		Tool	III, low quality
Written discharge checklist States it seemed to have improved the DC process Discharge process formalized and auditable		Tool	V, low quality

nurses who have completed robust orientation and have a strong knowledge base related to the specific care of these patients.^{1,12,13} One study found that a nursing staff in which 20% or more of the nurses have 2 years or less of experience in a cardiac ICU increased the odds of patient mortality. However, the use of quality benchmarks, presence of nurses with bachelor of science in nursing degrees and CCRN certification, high-volume units, and a high percentage of nurses with 11 or more years of experience significantly improved outcomes and decreased mortality.¹² These findings reveal the knowledge and skill nurses need to provide comprehensive care for pediatric patients receiving intensive care and illustrate that nurses face the same difficulties as physicians: lack of training, different communication styles, and personal experience.

Nurses' communication also suffers from time and knowledge barriers. Although nurses' responsibilities differ from those of physicians or nurse practitioners, nurses often have primary responsibility for 1 or 2 patients in an ICU. Nurses have additional patient-specific tasks and benchmarks required for evidence-based care, and sometimes these multiple tasks are barriers to communication.¹⁵ For example, record keeping related to quality bundles requires considerable time away from patients to comply with quality measures.^{13,15} Additional tasks

include providing high-quality bedside care and monitoring, coordinating care with the multiple services that intensive care patients require, providing education to family members, and documenting the education.^{13,15} By reducing time spent in task-oriented decision-making, nurses could increase the time devoted to communication with families and providers. A lack of understanding of effective communication components may also be a barrier. For example, a study in a technology-dependent ICU showed that nurses have difficulty communicating well with families.¹⁶ Nurses who engaged in the communication behaviors of questioning, listening, explaining, and advocating received enhanced respect from parents, and parents believed they needed to engage in all communication behaviors to reach shared communication with nurses.¹⁶ A transfer nurse liaison has sometimes been used with success to fill the communication gap, but to engage fully in these behaviors nurses and physicians may need more time and training.¹⁷ We found very little research specifically addressing communication among advanced practice providers in pediatric ICUs.

Within the provider communication literature we identified consistent barriers related to time constraints, ineffective communication styles, and differences in experience, role, and specialization. Recommendations for mitigating barriers included team- or role-focused

communication training, faculty and staff buy-in for interventions, and cultural foci of quality and safety through effective communication.

Parent/Caregiver Communication

Parents and family caregivers are integral to the safety and security of pediatric critical care patients. Parents/caregivers are the best patient advocates at the bedside and are also the resident experts in the social and cultural preferences of the child and family. Additionally, parents are often the child's proxy and complete the hospital satisfaction survey after discharge. In a survey

of over 6000 parents and 38 hospitals, ratings of the quality of hospital care were most

Without a working understanding of their child's diagnosis before leaving the hospital, parents may seek health care information from less reliable sources and have heightened anxiety.

closely correlated with communication and coordination of care.⁷ This finding is increasingly important as hospitals, especially ICUs, aim to improve their HCAHPS or satisfaction scores and thus their reimbursement.⁴ In the survey, most parents rated overall satisfaction with the unit or hospital as good. However, significant problems were reported in several dimensions of care, including information given to the parent, information given to the child, partnership, confidence and trust, coordination, continuity, and transition.⁷ Additionally, coordination of care was most problematic for academic health centers (those with teaching and/or fellowship programs), which also reported lower satisfaction on average than hospitals not associated with an academic medical center.⁷ Some academic health centers performed better than others, suggesting that institutional variations, such as process or culture changes, could improve scores.

Improving communication is a struggle for all involved because the ICU is a stressful environment for parents/caregivers and is not conducive to learning and processing information.^{8,10,19,20} Nevertheless, there are indications that parents/caregivers have a sophisticated holistic view of their child's needs even in an inpatient setting.^{8,19,21,22} Therefore, parents/caregivers could have strong, relevant contributions to care but may not be comfortable enough with providers or the setting to communicate effectively.

Parent/caregiver communication needs are dynamic within inpatient settings, varying across times and

situations. Because of these variations, repeated communication best helps family members understand and process information in pediatric critical care.^{8,10,20} For example, during discussions about escalation of care in a neonatal ICU, parents/caregivers asked questions only 5% of the time, making it difficult for physicians to truly assess family members' understanding of the condition and treatment options.¹⁰ Parents often feel overwhelmed during crisis times and are unsure how to make the right decisions.^{8,10} Melnyk and colleagues²² reported that during noncrisis times in the pediatric ICU, high parental confidence was protective against parental stress, anxiety, and depression. They also found that cognitive beliefs can be influenced by an educational-behavioral intervention. A note of caution: parental knowledge must be assessed because beliefs and confidence were not always correlated.²²

The stress for parents/caregivers does not end when the patient leaves the ICU. In one survey, 85% of respondents reported that during changes such as transitions to a lower level of care, a transfer nurse liaison helped reduce transitional stress by explaining plans and processes and being available to family members as they assumed more of their child's care.¹⁷ Furthermore, in the neonatal ICU, parents may not fully understand their child's diagnosis after discharge from the hospital. At follow-up appointments, 62% of parents could not report the corrected age of their child or anticipate developmental patterns.²³ Without a working understanding of their child's diagnosis before leaving the hospital, parents may seek health care information from less reliable sources and have heightened anxiety. Additionally, parental concerns did not often align with the diagnosis, suggesting a lack of knowledge related to the hospital admission.²³

Parents of patients in the technology-dependent ICU often provide most of the care for their children. Parents are often very confident in their ability to care for their children in this area. In one study, parents felt they had to question, listen, explain, and advocate for their children while they stayed in the technology-dependent ICU.¹⁶ When parents and nurses engaged in effective communication behaviors, both groups reported having higher satisfaction and feeling more respected.¹⁶

Parent/caregiver barriers to communication are certainly case and/or unit specific, but in the literature we found commonalities related to low parental confidence, stressors in the environment, poor emotional

health (eg, anxiety and depression), and lack of knowledge. Recommendations for practice improvements included varied and repeated forms of communication, roles focused on care coordination, and educational-behavioral interventions.

Patient Communication

Regarding patients specifically, the literature review revealed several findings relevant to communication about mortality and morbidity, anxiety, quality of life, development, and pain and sedation. An increased risk of death following discharge was associated with low socioeconomic status, nonwhite race, comorbidities, age (depending on type of surgical procedure), and postoperative arrhythmias. This increased mortality risk may be related to poor understanding of patients' conditions and required care.^{2,18}

For adolescent patients, an increased understanding of their disease and a sense of coherence in their life reduced anxiety and increased the ability to communicate.^{24,25} Health status was not related to quality of life, but parental support and the adolescent's perception of the disease correlated with improved quality of life, indicating that communication to encourage parental support and patient understanding is important.²⁵ Children younger than 6 months have consistent cognitive and motor delays after surgery and may need additional therapy to combat those delays while in the hospital, a need that may be addressed with appropriate parent communication and education.²⁶

Physical symptoms such as pain, agitation, and sedation, which are common in children receiving critical care, also limit communication. Winch and colleagues²⁷ found that patients on an early extubation track must be carefully monitored for pain and sedation requirements; in 10 of 22 patients requiring reintubation, the need for reintubation was directly related to agitation and increased pain. Decreasing the frequency of venipuncture for laboratory tests may also reduce patients' pain.²⁸ Expert symptom management is required not only for patient comfort but also for improved communication. For patients of all ages and conditions, consistent and effective communication is indicated in order to include patients in treatment planning when appropriate, to improve quality of life, and to increase patients' understanding of their condition and treatment. Communication should continue into adulthood. Adults with congenital heart disease indicated that they needed

more communication and contact, especially if they had poor function and increased use of the health care system.¹⁴

In summary, patient-related barriers to communication are related to age, knowledge, and physical comfort and/or status (eg, pain, agitation, and discomfort). Age-appropriate education and expert symptom management have been recommended for practice improvement.

Communication Tools

Communication tools developed and used within ICU settings include rounds and visual and written tools. Written patient goals, a visual display of goals on whiteboards, and a structured discussion about the plan of care during provider team rounds improved provider agreement on the treatment plan from 62% to 87.6% and increased parent/caregiver satisfaction from 19% to 75%.¹¹ Including parents in rounds and writing down information increased understanding and satisfaction with patient treatment goals for both parents and providers.^{11,20} Daily checklists have been found to increase positive patient outcomes.²⁸ Tarrago and colleagues²⁸ originally used written daily goals but eventually converted to goals entered in the electronic medical record to increase provider buy-in. However, this provider-centric focus may have left parents and patients unable to contribute as fully as possible. The varied forms of communication used (rounds, visual and written displays, and electronic medical record checklists) substantiate findings that parents prefer multiple forms of communication to better understand their children's conditions.^{8,10,11,19,28}

Bundles or care pathways are other communication tools used to facilitate care, but support for them is ambiguous. Quality care bundles are often used to promote evidence-based care at the bedside, and critical care patients generally are assigned the most bundles.¹⁵ Compliance with evidence-based treatment of pediatric burns increased after a care pathway was implemented.²⁹ In contrast, a family-centered care pathway resulted in minimal increase in parent/caregiver satisfaction but also had poor physician buy-in and did not specifically define rounds or family conference interventions.³⁰ Nurses are often aware of treatment pathways but may not always employ them because they are confusing and have multiple iterations.¹⁵ Whelchel and colleagues¹⁵ found that most nurses were aware of care bundles but that significantly fewer nurses reported completing the assigned bundles. These findings are consistent with

barriers related to time constraints and communication struggles. Studies suggest that building on the strengths of nurses as communicators and using a single pathway for specific patient types may improve quality of care.¹⁴

An intervention with the potential to improve communication and coordination of care is creation of a nurse liaison role. Nurse liaisons are nurses who visit patients and answer questions about patient care and the unit when the primary nurse is unavailable. Caffin and colleagues¹⁷ found that 98.5% of floor nurses deemed nurse liaisons an important and vital part of the care team. Additionally, nurse liaisons could be used to communicate with staff members and parents, highlighting the fact that nurses may need more time to communicate with patients, families, and the interprofessional team to provide the highest quality care.^{16,17}

For communication tools to be effective, all members of the treatment team must use them consistently and collaboratively, and the tools must be integrated into the normal workflow. The effectiveness of communication tools has been demonstrated for episodic communication, such as handoffs and time-outs, but not for day-to-day communication.³³⁻³⁵

Because of the need for effective communication, the use of communication tools is an essential part

of the evolving model of pediatric critical care delivery.¹ Two studies found that improv-

For communication tools to be effective, all treatment team members must use them consistently and collaboratively, and the tools must be integrated into the normal workflow.

ing the quality of communication may have the biggest impact on quality care ratings.^{6,7} It is paramount that team members communicate well to provide the best care and reduce misunderstanding. Process flow for the use and integration of tools needs to be evaluated regularly to increase buy-in and use. Some examples of proposed key processes and tools are daily rounds, daily written goal sheets, bundles for high-risk interventions, care pathways, and condition-specific protocols.¹ Improving processes and using communication tools within pediatric ICUs has the potential to overcome communication barriers, especially in busy units with changing staff, and to increase satisfaction with all involved.^{1,6,7,11,28}

In one study, investigators found that communication efforts were related to cost savings. By using a checklist

to reduce unnecessary costs, pain, and tests, one hospital saved a mean of \$565 per patient day.²⁸ To be effective, tools must address barriers to communication and consider providers', parents', and patients' needs. An effective and efficient communication tool in pediatric critical care should address all parties equally, demonstrate multiple and varied forms of communication, and be user-friendly and time conscious.

Discussion

We reviewed the available body of evidence surrounding communication in pediatric critical care settings by investigating the needs of providers, patients, and families and by evaluating tools that have been developed. Our findings, which are consistent with those of other research reports, indicate that communication is highly important and predictive of other quality benchmarks, such as reduced patient costs, improved patient outcomes, and reduced hospital-acquired infections.^{6,7} However, little has been done to verify that the suggested communication tools improve communication or are used properly, especially in pediatric critical care. Our findings indicate a notable lack of rigorous research to support the use of tools to improve communication in pediatric critical care settings.

Accompanying verbal communication with written information that can be repeatedly reviewed may fulfill the need for multiple forms of communication and may increase communication between all interested parties.²³ Parents prefer varied, repeated forms of communication to allow them to process information at their own pace, and written forms of communication have been shown to increase satisfaction.^{6,14,32} For example, using written goals on a whiteboard and focused discussions about the treatment plan at the bedside increased physician agreement on the treatment plan and increased parental satisfaction, demonstrating effective use of varied forms of communication to meet the needs of providers and parents.¹¹ To increase compliance with a treatment plan, other researchers also used a written form of communication in a pathway that addressed providers' lack of time and guided decision-making.^{21,29} In one study, researchers found that written daily checklists successfully increased positive outcomes such as safety and costs for patients by simply asking if the endotracheal tube was in place or if the patient was ready for oral medications, but when the written records were converted to

Table 2 Communication barriers and recommendations for practice and tool development

Communication barriers	Recommendations for practice	Tool development characteristics
Time constraints	Standard safety checks Integration into workflow Reduce wasted time verifying orders, plans, etc	EMR Standardized, consistent practice Identification of roles in rounds
Ineffective communication style	Communication training Standardized tool	Discussion of goals at each rounding period Consistent use of tool across all practitioners Identification of roles in rounds
Information processing	Multiple, repeated, varied forms of communication	Written communication (eg, whiteboards, EMR access for parents, print outs) Verbal communication in patient's and family member's primary language Demonstration if possible (eg, visualize unit, draw defect) Collaborative use of these forms in a consistent way for each provider and family need
Treatment style	Clearly and consistently addressing of the patient's plan of care Treatment team buy-in to reach goals	Evidence-based bundles, pathways, and protocols to standardize practice
Personal experience/bias	Evaluation of self Communication training	Treatment team buy-in to reach goals Consistent practice
Stressful environment	Change of culture to emphasize safety and communication Attention to patient and caregiver stress, emotional status, and physical needs	Debrief sessions, discussions, pauses for safety and communication Repeated communication

Abbreviation: EMR, electronic medical record.

electronic medical records, the communication loop between parents and providers was possibly impaired.²⁰ Without proper buy-in, a communication tool can be ineffective.²⁰ Extensive work should be done to encourage and educate provider teams to use communication tools when implemented.²⁶

Implications

As patient care in pediatric critical care becomes increasingly complex, all parties involved must have a strong understanding of the care plan. To facilitate consensus, pediatric ICU nurses should employ varied, repeated forms of communication; clear, consistent messages about the plan of care; communication integration into the workflow pattern; communication training for the interdisciplinary team; staff buy-in for planned interventions; a culture of safety and communication; and vigilant assessment and interventions related to patient and family/caregiver information needs, emotional status, and well-being. Table 2 presents examples of common barriers and suggested solutions based on this review. We gathered the information in this review from current literature related to pediatric, cardiac, and neonatal ICU settings, and each of these settings may benefit from the information presented.

Results from several studies showed that communication was tied to improved scores and ratings.^{1,6,7,11,28} Without proper buy-in, the tools become just another task that does not facilitate proper flow of information.^{30,31} Follow-up with a new tool, redevelopment of the tool, and audits of the tool's use may be required to fully benefit from tool implementation.

Tools will not always work in every situation. Providers using communication tools need to ensure that all parties are reaching mutual understanding through additional forms of verification such as verbal discussion and teach-back methods.^{8,10,11} Further rigorous research is needed to develop and test communication tools and their outcomes to establish best practices for pediatric critical care environments, providers, and patients.

Limitations

This literature review was limited to English-language publications and did not include a review of gray literature. Therefore, some important evidence may not have been captured. Additionally, unintentional bias may be present because a single researcher conducted the search, reviewed and classified the articles, and analyzed the findings. Bias, however, was minimized by multiple readings of the articles, continuous comparison of findings, and

peer review. The included studies represent similar populations, have predominantly good to high evidence ratings, and have level III to level V quality ratings, supporting the findings.

Conclusion

Communication is clearly one of the most important things we can do to protect our patients and our revenues. Many pediatric ICUs have the same problems, such as time limitations, lack of communication training, heavy acuity, and the need to develop varied and effective communication styles. The language of health care is often foreign to patients and family members. Although formal provider education may foster better communication, the educational benefit is constrained by staffing realities including constant changes in staff and decreasing staff numbers. An interdisciplinary approach that remains consistent for each patient every day may facilitate understanding among providers, ICU patients, and family members.

A communication tool that places safety at the forefront, standardizes the summary of rounds and plans, creates a written record for review throughout the day, and is adapted to the workflow of each individual ICU will likely result in a reduction in patient cost, an increase in satisfaction, and an increase in reimbursement based on eventual C-HCAHPS scores. An interdisciplinary intervention of this nature will need point people who care strongly about communication and will need buy-in from the team to be successful. During rounds, identification of roles, including that of the leader, is vital to team cooperation. Providers are at substantial risk for being oversaturated with data during rounds and may miss vital information. Nurses have functioned as communicators, translators, and care coordinators within hospital settings and are also at patients' bedsides around the clock every day. Although this review shows that no one-size-fits-all communication tool exists, future research should identify whether nurse-led rounds in which data are presented in a concise and consistent manner, perhaps using a well-developed tool that contains cognitive prompts for safety and quality, can transform the care provided at the bedside. **CCN**

Financial Disclosures
None reported.

See also

To learn more about communication in the critical care setting, read "Improving Health Care Provider Communication in End-of-Life Decision-Making" by Wilson et al in *AACN Advanced Critical Care*, 2017;28(2):124-132. Available at www.aacnconline.org.

References

1. Riley C, Poss WB, Wheeler DS. The evolving model of pediatric critical care delivery in North America. *Pediatr Clin North Am*. 2013;60(3):546-562.
2. Triedman JK, Newburger JW. Trends in congenital heart disease: the next decade. *Circulation*. 2016;133(25):2716-2733.
3. CAHPS hospital survey: about the survey. HCAHPS website. <http://www.hcahpsonline.org/#aboutthesurvey>. Published 2018. Updated January 10, 2020. Accessed April 5, 2018.
4. Letourneau R. Better HCAHPS scores protect revenue. <http://www.healthleadersmedia.com/finance/better-hcahps-scores-protect-revenue#>. Published September 28, 2016. Accessed April 5, 2018.
5. CAHPS child hospital survey. Agency for Healthcare Research and Quality website. https://www.ahrq.gov/cahps/surveys-guidance/hospital/about/child_hp_survey.html. Published October 2014. Accessed April 5, 2018.
6. van Mol MM, Bakker EC, Nijkamp MD, Kompanje EJO, Bakker J, Verhaeren L. Relatives' perspectives on the quality of care in an intensive care unit: the theoretical concept of a new tool. *Patient Educ Couns*. 2014;95(3):406-413.
7. Co JP, Ferris TG, Marino BL, Homer CJ, Perrin JM. Are hospital characteristics associated with parental views of pediatric inpatient care quality? *Pediatrics*. 2003;111(2):308-314.
8. Allen KA. Parental decision-making for medically complex infants and children: an integrated literature review. *Int J Nurs Stud*. 2014;51(9):1289-1304.
9. Schoormans D, Sprangers MA, Pieper PG, et al. The perspective of patients with congenital heart disease: does health care meet their needs? *Congenit Heart Dis*. 2011;6(3):219-227.
10. Boss RD, Donohue PK, Larson SM, Arnold RM, Roter DL. Family conferences in the neonatal ICU: observation of communication dynamics and contributions. *Pediatr Crit Care Med*. 2016;17(3):223-230.
11. Justice LB, Cooper DS, Henderson C, et al. Improving communication during cardiac ICU multidisciplinary rounds through visual display of patient daily goals. *Pediatr Crit Care Med*. 2016;17(7):677-683.
12. 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.
13. Jones MB, Tucker D. Nursing considerations in pediatric cardiac critical care. *Pediatr Crit Care Med*. 2016;17(8 suppl 1):S383-S387.
14. Trotman-Beasty A, McKenna J, Ingle L. An evaluation of a primary and secondary care cardiac rehabilitation service pathway. *Br J Cardiac Nurs*. 2009;4(4):178-184.
15. Whelchel C, Berg L, Brown A, Hurd D, Koepping D, Stroud S. What's the impact of quality bundles at the bedside? *Nursing*. 2013;43(12):18-21.
16. Giambra BK, Sabourin T, Broome ME, Buelow J. The theory of shared communication: How parents of technology-dependent children communicate with nurses on the inpatient unit. *J Pediatr Nurs*. 2014;29(1):14-22.
17. Caffin CL, Linton S, Pellegrini J. Introduction of a liaison nurse role in a tertiary paediatric ICU. *Intensive Crit Care Nurs*. 2007;23(4):226-233.
18. Baker-Smith CM, Neish SR, Klitzner TS, et al. Variation in postoperative care following stage I palliation for single-ventricle patients: a report from the Joint Council on Congenital Heart Disease National Quality Improvement Collaborative. *Congenit Heart Dis*. 2011;6(2):116-127.
19. Lyndon A, Jacobson CH, Fagan KM, Wisner K, Franck LS. Parents' perspectives on safety in neonatal intensive care: a mixed-methods study. *BMJ Qual Saf*. 2014;23(11):902-909.
20. Blankenship BA, Harrison S, Brandt S, Joy B, Simsic JM. Increasing parental participation during rounds in a pediatric cardiac intensive care unit. *Am J Crit Care*. 2015;24(6):532-538.
21. Jawahar K, Scarisbrick AA. Parental perceptions in pediatric cardiac fast-track surgery. *AORN J*. 2009;89(4):725-731.
22. Melnyk BM, Oswalt KL, Sidora-Arcoleo K. Validation and psychometric properties of the neonatal intensive care unit parental beliefs scale. *Nurs Res*. 2014;63(2):105-115.
23. Fletcher L, Pham T, Papaioannou H, Spinazzola R, Milanaik R, Thibeau S. Parental perception of risk associated with their premature infant. *Adv Neonatal Care*. 2017;17(4):306-312.
24. Apers S, Luyckx K, Rassart J, Goossens E, Budts W, Moons P. Sense of coherence is a predictor of perceived health in adolescents with congenital heart disease: a cross-lagged prospective study. *Int J Nurs Stud*. 2013;50(6):776-785.

25. Luyckx K, Missotten L, Goossens E, Moons P; i-DETECT Investigators. Individual and contextual determinants of quality of life in adolescents with congenital heart disease. *J Adolesc Health*. 2012;51(2):122-128.
26. Snookes SH, Gunn JK, Eldridge BJ, et al. A systematic review of motor and cognitive outcomes after early surgery for congenital heart disease. *Pediatrics*. 2010;125(4):e818-e827. doi:10.1542/peds.2009-1959
27. Winch PD, Staudt AM, Sebastian R, et al. Learning from experience: improving early extubation success after congenital cardiac surgery. *Pediatr Crit Care Med*. 2016;17(7):630-637.
28. Tarrago R, Nowak JE, Leonard CS, Payne NR. Reductions in invasive device use and care costs after institution of a daily safety checklist in a pediatric critical care unit. *Jt Comm J Qual Patient Saf*. 2014;40(6):270-278.
29. Singh T, Arbuthnot JE, Stevenson H, Brown L. The impact of introducing a care pathway for the treatment of minor paediatrics burns. *J Wound Care*. 2007;16(2):79-81.
30. Kodali S, Stametz R, Clarke D, et al. Implementing family communication pathway in neurosurgical patients in an intensive care unit. *Palliat Support Care*. 2015;13(4):961-967.
31. Higby C, Pye K. Improving discharge from the paediatric oncology unit. *Paediatr Nurs*. 2009;21(4):30-32.
32. Dang D, Dearholt SL. *Johns Hopkins Nursing Evidence-Based Practice: Model and Guidelines*. 3rd ed. Indianapolis, IN: Sigma Theta Tau International; 2017.
33. Abraham J, Kannampallil T, Patel VL. A systematic review of the literature on the evaluation of handoff tools: implications for research and practice. *J Am Med Inform Assoc*. 2014;21(1):154-162.
34. Acorda DE, Villalta M. Clinical practice: should they stay or should they go? A checklist approach to improving patient safety. *J Pediatr Nurs*. 2016;31(5):560.
35. Starmer AJ, Schnock KO, Lyons A, et al. Effects of the I-PASS Nursing Handoff Bundle on communication quality and workflow. *BMJ Qual Saf*. 2017;26(12):949-957.