Objectives and posttest can be found on page 60.

30-Second Head-to-Toe Tool in Pediatric Nursing: Cultivating Safety in Handoff Communication

Debbie Popovich

Efforts to improve handoff practices among providers during shift changes are needed to augment patient safety, particularly among pediatric patients. To this aim, nurse faculty developed and enhanced a tool to standardize a thinking process for students during their pediatric clinical experience. The 30-Second Head-to-Toe checklist allows for rapid assessment of a child's condition and environment. It offers both students and nurses a consistent system for reducing errors attributable to incomplete or inaccurate information during this critical transition. Students completed checklists for 352 pediatric patients over a period of two years. Identified discrepancies were analyzed. Findings confirmed the importance of a standardized system during shift changes to reduce errors and achieve accurate, consistent communication. Students also reported that using the tool and reviewing it with instructors helped them overcome initial feelings of anxiety and fostered confidence.

Handoffs in patient care occur at a variety of routine and non-routine times. A handoff in care occurs when accountability and responsibility for a patient are transferred from a) one health care provider to another (such as shift-to-shift report or cross-coverage for staff breaks), b) one service or program to another (such as inpatient to medical service or diagnostic areas), or c) one organization to another (such as tertiary center to a community facility) (Streitenberger, Breen-Reid, & Harris, 2006). The function of the handoff is to communicate patient information to provide safe, continuous care. In the hospital pediatric setting, continuity of care is particularly important because children are generally unable to provide nurses with important or even critical details about their symptoms. Thus, pediatric nurses communicate to each other about children's progress via a report at shift's end.

Communication During Handoffs: Root Cause Of Error

Following an Institute of Medicine (IOM) report of an unprecedented number of preventable medical errors in U.S. hospitals (IOM Committee on the Quality of Health Care in America, 2001), widespread national attention was focused on improvement of patient safety and quality of care. As part of a groundswell effort to reduce errors, the Joint Commission (formerly Joint Commission for Accreditation of Healthcare Organizations [JCAHO]) has for more than 15 years evaluated reportable medical errors and stratified root causes from which recommendations for improvement have been made. With more than 4800 sentinel events analyzed, the Joint Commission identified communication as the top contributing factor to medical error, with handoffs playing a "role in an estimated 80% of serious preventable adverse events" (The Joint Commission, 2010a, b).

Based on the review and recommendations from the 2006 Sentinel Event Advisory Group, the Joint Commission implemented the National Patient Safety Goals, with the most recent revision in January 2011 (The Joint Commission, 2011). Goal 2 focuses on improved communication effectiveness among caregivers because ineffective communication was cited as the most frequent root cause of sentinel events. Goal 2 calls for communication that is timely, accurate, completely unambiguous, and understood by the recipient. The expectation is that these improvements will reduce error and result in improved patient safety.

Effective communication and handoff responsibility is a fundamental component of nursing practice and clinical nursing education. It is essential to cultivate a culture of safety in nursing students' routines that will continue throughout their careers. At the time of transferring care from shift to shift or from nurse to student nurse, careful attention to details must be communicated. Various techniques to enhance safety during these transfers have been reported in the literature. One particular method involves a systematic review of information being transferred (Elm, 2004). This is done by the nurse coming on who performs a routine baseline assessment immediately following report to confirm consistency in communication during the handoff and conditions associated with safety of the patient.

Critical Nature of Handoffs

According to Streitenberger and colleagues (2006), handoffs increase risks for vulnerable hospitalized patients and even more so for children, given their physiologic differences and reduced ability to advocate for themselves. Handoffs also occur at busy times with multiple distractions and time constraints. Despite these factors, improved safety of handoff practices has only recently been addressed with evidence-based techniques (Benson, Rippin-Sisler, Jabusch, & Keast, 2007; Pothier, Monterio, Mooktiar, & Shaw, 2005).

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Table 1.
Strategies Used in Handoff Coordination and Communication

• Process uses face-to-face verbal updates with interactive questioning.
• Additional update from practitioners other than the one being replaced is included.
• Interruptions during update are limited.
• Topics are initiated by incoming as well as outgoing.
• Initiation of operator actions during update is limited.
• Outgoing team's stance toward changes to plans and contingency plans is included.
• Information is read back to ensure it was accurately received.
• Outgoing writes summary before handoff.
• Incoming assesses current status.
• Information is updated in the same order every time.
• Incoming scans historical data before update.
• Incoming receives primary access to the most up-to-date information.
• Incoming receives paperwork that includes handwritten annotations.
• It is made clear to others at a glance which personnel are responsible for which duties at a time.
• Outgoing oversees incoming's work following update.
• The transfer of responsibility is delayed when there is concern about status/stability of process.

Source: Patterson et al., 2004.

Given the high degree of patient safety risks and consequences for errors, important lessons may be learned from another area of research in which handoff practices are critical – Space Shuttle Mission Control. Here, the goal of shift change handover (handoff) is to preserve consistency in the flow of all processes and activities monitored by flight controllers. In a study by Patterson and Woods (2001), a total of 21 handoff communication and coordination strategies were directly observed at times of personnel change. Patterson, Roth, Woods, Chow, and Gomes (2004) studied strategies employed during successful handoffs in four settings with high consequences for failure: a) NASA Johnson Space Center, b) a nuclear power generation plant, c) a railroad dispatch center, and d) an ambulance dispatch center. Among objectives related to improving handoff efficiency and effectiveness, one strategy included requiring the incoming person to assess the current status of the environment or system. See Table 1 for strategies related to nursing handoffs.

Strategies for Improving Handoffs

Applied to the hospitalized pediatric patient, the strategy of assessing the current status of the environment or system by Patterson at al. (2004) involves a process in which the nurse assuming responsibility for the child also verifies that child's surrounding. This calls for not only a rapid determination of the child's condition and current/pending treatments, but it prompts the nurse to ensure crib safety and armbands, as well as identify obstacles hazardous to health care, and provides day/date/RN information. Patterson et al. (2004) also recognized there were potential benefits to handoffs. For example, the person accepting responsibility has a fresh perspective, and this provides a point of verification and opportunity to increase detection of errors using simple techniques such as those described by Keyes (2000). These techniques include accountability of completing important aspects of patient care, and communicating clinical findings and relevant test results.

Nurses are always exploring ways to streamline activities to ensure safety, efficiency, and quality of care. In a hospital in South Florida, medical-surgical staff nurses were concerned about emergency department transfers to their unit. Safety issues (such as lack of armbands and emergent orders not completed prior to transfer) resulted in staff nurses' complaints and incident reports. The clinical educator for emergency services implemented a bedside report at shift change. The goal was to improve patient safety and enhance previous shift accountability/responsibility for care, which would allow the next shift nurse to address any issues or concerns related to the patient's care. Both outgoing and incoming nurses verified that armbands/allergy bands were correct and in place, intravenous fluid rates were accurate, and cardiac monitors were functioning within the proper parameters. The clinical educator believed staff morale improved because nurses were working together to ensure patient safety rather than blaming each other for mistakes and errors of omission ("Stop Errors," 2006).

Gregory (2006) calls for identifying times when handoffs take place (or are needed) and assessing the process to determine effective approaches in diverse situations. A scripted handoff should communicate details to standardize the process and eliminate missing information (Gregory, 2006). Checklists and scripts are used routinely in the aviation industry to reduce variability and enhance coordination, particularly during periods of increased activity or stress (Degani & Wiener, 1990). Similarly, in the health care industry, a handoff checklist serves as a guide for remembering and documenting (Streitenberge et al., 2006), increases confidence that necessary and accurate information has been communicated, and minimizes risk associated with human error. In this vein, the 30-Second Head-to-Toe (HTT) checklist, along with a structured follow-up process, teaches students the importance of using a standardized process when assuming responsibility for pediatric patients; its value is certainly not limited to students.

The 30-Second Head-to-Toe Tool (HTT)

Over time, the clinical faculty perception of what constitutes a 30-Second HTT was quite different from students' perceptions. To avoid perpetual frustration with this lack of congruence, a checklist was developed for students to complete. Initial development of the HTT was based on literature that detailed common mistakes in pedi-

Figure 1.
30 Second Head-to-Toe
(Lined Items Are to Be Completed)

ABCs **Student:** _____ **Room Number:** _____ **Age:** _____

Y N Identification Band is *on the patient*, appropriate size, and non-restrictive.
Y N EDR is posted at bedside (emergency drug reference with current and accurate weight).

Intravenous Fluids NA (fill in all lines as appropriate)

Y N NA _____ 1. Ordered IV fluids (what is ordered is what is hanging).
Y N NA _____ 2. Date and time IVF bag is due to be changed.
Y N NA _____ 3. Date and time IV tubing is due to be changed.
Y N NA _____ 4. Date and time IV medication pump tubing is due to be changed.
Y N NA _____ 5. Rate of IV fluids is set correctly.
Y N NA _____ 6. Total volume status cleared to 0 at 0600.
Y N NA _____ 7. Volume to be infused is appropriate.
Y N NA _____ 8. TPN has a filter.
Y N NA _____ 9. Lipids volume to be infused is correct.
Y N NA _____ 10. Site is without infiltration/phlebitis.
NA _____ 11. Date PICC/CVL/IP dressing is due to be changed.
Y N NA _____ 12. Filter on all children under 2 years old or cardiovascular diagnosis.
NA _____ 13. Heparin lock concentration/vol/schedule you add to MAR for:
PIV _____ PICC/CVL/IP Lumen #1_____Lumen #2_____

Oxygen NA

Y N _____ 1. Flowmeter is set correctly. IMC: Ambu bag, connection and correct sized mask.
Y N 2. Oxygen is humidified.
Y N 3. Nasal cannula is taped securely.
Y N 4. Nasal mucosal irritation noted.

NGT NA

Y N _____ 1. Suction setting correct. IMC: Suction canister, tubing, wall suction machine.
Y N 2. Suction is working.
Y N 3. Mini canister drainage emptied at 0600.
Y N 4. Sump tube blue pigtail patent.
Y N _____ 5. Replacement fluids ordered. If not, WHY?

NG/GT Feed NA

Y N _____ 1. Date and time kangaroo bag or buretrol due to be changed.
Y N _____ 2. Rate is set correctly.
Y N/NA _____ 3. Dose is set correctly.
Y N _____ 4. Volume received makes sense.

AB Monitor NA

Y N 1. Parameters are correct: High/Low HR_____, High/Low RR_____ Apnea Delay____
Y N 2. Parameters are age appropriate.

Oxygen Saturation Monitor or Telemetry with Pulse Ox NA

Y N 1. Parameters are correct: High/Low Sat_____, High/Low HR_____, Alarm Secs_____
Y N 2. Parameters are diagnosis and age-appropriate.
3. Record O_2 Sat and RR Q4h.

Other

Y N NA Other equipment attached to patient as indicated on Kardex: Foley, VAC dressing, sequential SCD, drains, dressings, etc.).

Y N Crib check and supplies available at bedside as indicated: gloves for diaper change, diapers, wipes, formula, nipples, suction catheters, bulb syringe, etc.

Y *Update team information on the wall white board with comments as necessary.*

atrics, along with established best practices related to activities such as labeling intravenous lines and tubes. The tool was then revised and refined to make the process efficient and inclusive. Finally, over time, it evolved to include hospital policy, student recommendations, and areas of care frequently overlooked (see Figure 1).

Over the past two years, the HTT evolved from a tool for teaching students routine assessment to a valuable inclusive tool for use by both nurses and students to ensure that accurate, consistent communication occurred during handoffs. The HTT is based on evidence of frequent pediatric errors in the literature and institutional policy practice routines. For example, it is currently routine practice to highlight and post preprinted weight-based pediatric resuscitation drug forms at each child's bedside. This practice was first described by Gammage (1984), who was in charge of an Air Force hospital pediatric intensive care unit. Erasable laminated boards with resuscitation drugs and dosages calculated for each child were posted at the bedside. The current modified technique has been streamlined and augments practice to ensure safety, efficiency, and quality of care on the pediatric clinical unit.

With a simple baseline activity to assure accurate transfer of information at report from the outgoing shift to the new nurse, the student nurse performs a validation exercise to enhance care and safety of the patient at handoff. This technique mirrors strategies described by Patterson et al. (2004) in maintaining safe operations in potentially high-risk environments, such as transfer of responsibility in Space Shuttle Mission Control and nuclear power plants (see Table 1, # 9 and #15). The potential for serious errors in pediatrics can be viewed as equally critical, considering that one failed interpersonal communication can result in catastrophic outcomes. If students are initially socialized to ensure clear communication/handoffs through the use of a standardized tool, they are more apt to make an important contribution to the culture of safety in hospital environments in the future.

In the author's setting, students also received a handoff report from the night shift nurse and were then expected to go directly to the bedside to assess the child and environment. In the past, this process has been described as "doing your 30-Second Head-to-Toe." Information learned by students in report had to match what they evaluated in the child's room during brief interaction and systematic observation. Examples of observable features in students' assessments included correct intravenous (IV) fluids, rate, expiration date, time labels, and IV pump settings; oxygen humidified the appropriate percent; and no nasal mucosal irritation. After assessments were completed, the clinical day commenced for students.

Benefits of Using the HTT

Educational benefits were demonstrated as the faculty member and students reviewed the HTT in pediatric clinical orientation. The rationale for each item was identified and discussed. To assess relevance and outcomes of the checklist process, each student performed the HTT immediately after receiving change of shift report. For four consecutive semesters, at least two times per week, each student submitted at least one HTT form on which appropriate items at the time of transfer were checked off and discrepancies from report noted. Safety benefits for patients were demonstrated as these discrepancies were illuminated for both students and nurses. A discrepancy is defined as a lack or contradiction regarding what was verbalized at report or was on orders/chart related to labels, settings, reminders, or calculations, and what the student observed firsthand at the bedside. Frequencies of discrepancies for each item were calculated, and descriptive data were collated.

The HTT checklist is easy to use, efficient, and confined to one page. Students are made aware that initially completing the checklist will require approximately 5 to 10 minutes due to their novice status as health care providers and depending on the complexity of the clinical situation. They receive patient assignments the day prior to clinical and are encouraged to review the checklist that night. Once complete, they must submit it to the instructor by 8:00 a.m., usually 30 minutes after they receive report. At that time, the student and faculty member review the HTT together, and corrections are made as necessary.

Additional Advantages Of the HTT

In addition to protecting students who will assume responsibility for continuity of care for a pediatric patient, and for students handing off the child's care, the HTT has several other advantages. Students calculate safe dosages on all patients' medications and submit them to the clinical instructor the afternoon prior to clinical. This allows for safe and efficient medication administration because the instructor can supervise all medications and knows what dosages are safe. Likewise, once the HTT checklist is complete and reviewed at the start of a shift, the instructor is reassured of the safe status of the child and environment, and that all associated equipment is appropriate and operable. Safety issues are corrected, and unfamiliar aspects of care are addressed. Daily repetition enhances students' assessment abilities, calls their attention to the potential for repeat safety errors, and based on missing checklist items, encourages them to be proactive in planning care. By their own testimony, all students believed the HTT diluted their initial anxiety and impression of chaos, and helped foster a sense of calm, confidence, and organization.

Errors Identified

Over four semesters, students cared for 352 children and completed an HTT on each child. Findings confirmed the importance of focusing attention on safety of the child and environment during shift change with a standardized checklist and instilling this routine in students' clinical experience. Results included:

- Errors in 30% of the HTT were identified (n = 106).
- Of the HTT forms with errors, 29% were related to inline 0.22 micron filters required by hospital policy to be used with all children under 2 years of age or with a cardiovascular diagnosis.
- Of the HTT forms with errors, 36% were related to children without an identification band on the body.
- Of the HTT forms with errors, 14% did not have an Emergency Drug Reference with Current and Accurate Weight posted at the child's bedside, as required by hospital policy for all children under 50 kg.
- Other errors included intravenous fluids or tubing not labeled with expiration date and time, infusion pumps with incorrect settings, apnea/bradycardia and oxygen saturation monitor parameters set incorrectly and/or not age-appropriate, and physician-ordered interventions not at the bedside (for example, incentive spirometers and sequential compression devices).

All errors were corrected by students within the first 30 minutes of care.

Rationale for Change

Dracup (2008) states that "although some of the elements [may be] challenging because of our sometimes chaotic physical environments...it is critical that we adopt practices used religiously in other high-risk settings" (p. 97). She points to strategies used by NASA to teach students how to conduct safe handoffs before they arrive at the clinical arena with structured information. Along with helping students identify potential errors with the fresh perspective described by Patterson et al. (2004), the HTT has been useful as an organizing structure for students who frequently perceive first handoff encounters with pediatric patients as chaotic. Using a standardized system to attend to basic safety issues during shift changes helps all nurses, particularly student nurses, to accurately document and effectively communicate critical aspects of care while augmenting efforts to engage multidisciplinary personnel for complete care continuity.

In short, HTT empowers students to better plan for and provide competent, focused, quality care by addressing specific pediatric risk factors related to fluid volume status, intravenous access and patency, oxygen administration, monitors, and age-appropriate parameters. It verifies the transfer of information at handoff and provides a fresh perspective that can intercept potential problems at the beginning of a shift. The large number of errors identified in this process reinforces the need for a systematic checklist method that can be used at time of shift change.

Human factors, such as stress, distraction, and communication problems, increase the risk of errors during routine shift changes; therefore, it is critical for nurses to employ strategies ensuring timely communication of complete and accurate patient information. It seems obvious this is essential for reducing errors and patient harm associated with this daily transitional fact of nursing life. Teaching students techniques for verifying information at the time of handoff can raise their awareness of potential errors attributable to incomplete or inaccurate information. The HTT offers a common language and a standardized routine system for reducing errors during handoffs, and is based on hospital policy. These attributes have contributed to incorporation of the 30-Second Head-to-Toe into orientation of all new pediatric nurses in a large teaching hospital in North Central Florida.

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