Using Simulation to Improve CLABSI Prevention in Pediatrics

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Objectives

• Discuss pediatric CLABSI prevalence and the impact on patients and families.

• Identify benefits of simulation in pediatric blood stream infection education.

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Duke Children’s Hospital

• Hospital-within-a-hospital

• 190 inpatient beds

• 28 subspecialties

http://www.dukechildrens.org/about_us/overview/facts

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Discovering the Problem

- Duke Children’s Performance Improvement Oversight Committee (PIOC)
  - Readmission rates
  - Most common cause for readmission
Questions, Questions, Questions

- What are we teaching our families when they are discharged from the hospital?
- How do we evaluate the education we’ve provided?
- What is the scope of our problem?

Simulation

What is Simulation?

- “The technique of imitating the behavior of some situation or process (whether economic, military, mechanical, etc.) by means of a suitably analogous situation or apparatus, especially for the purpose of study or personnel training.”

http://dictionary.oed.com
Improving Safety and Outcomes in High Risk Industries

- Complex “realistic” simulations in OR-like setting
- Simulation training has been shown to:
  - improve acquisition and retention of knowledge
  - decrease unplanned errors
  - improve correction of problems


Simulation in Nursing

PRE-LICENSE
• Initial skill acquisition
• Patient assessment
• Safety training
• Enhances teaching

STAFF DEVELOPMENT
• Further development of critical thinking
• Familiarization with core competencies
• Skills revalidation
• Team training
• Mock codes
• Architecture
• RCAs

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Literature Tells Us...

• Agreement regarding use of simulation
  – Academic settings
  – Practice settings

• Simulation plus debriefing builds confidence and performance

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What Can We Simulate?

• Technical skills
  – Psychomotor

• Non-technical skills
  – Decision-making
  – Cognitive rehearsal
  – Teamwork
  – Situational awareness
  – Communication

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Types Of Simulation

• Low Fidelity
  – Role Play
  – Mannequins

• High Fidelity
  – HPS

Part-Task Trainers

Laerdal – 1960's - present

Simulation: Past
**Potential applications of simulation**

- Routine basic training of individuals and teams
- Practice of complex clinical situations
- Rehearsal of serious and/or rare events

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**Potential applications cont.**

- Rehearsal of planned, novel or infrequent interventions
- Design and testing of new clinical equipment
- Performance assessment of staff at all levels

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**Advantages/Benefits**

- Safe learning environment
- Student-focused – may be individualized
- Patient safety not compromised
- Immediate structured feedback
- Flexible teaching methodology
Disadvantages

• High capital cost
• Staff development intensive
• Mechanical, environmental and psychological limitations
  – Suspension of disbelief
  – Hyper-vigilance
• Evidence in practice?

Simulation: Present

• Neonatal Resuscitation
• Using Simulation to treat Oncologic Emergencies
• Critical Thinking
• ACLS – Mega Code Teach/Testing
• Critical Care Core Classes
• Preceptor Development classes
• Unit-Based Initiatives

High Fidelity Simulators
Implications For Practice

- Recommendations from the IOM report:
  - Use simulators to ensure that clinical training is safe for patients
  - Develop simulators for use in skills assessment
  - Use simulation technology to improve individual and team performance through interdisciplinary team training
  - Use simulation for problem solving and recovery from problems — “crisis management”

To Err is Human: Building a Safer Health System, Institute of Medicine, Committee on Quality, National Academy Press, 1999

Another Potential Application

- Patient Education!

Patient and Family Education
The Role of the Nurse

- Florence Nightingale (Nightingale, 1860)
- Virginia Henderson (Henderson & Nite, 1960)
- National League for Nursing Education (1918)
- American Nurses Association (1975)

Challenges

- External
  - Changes in health care delivery
  - Adequacy of resources
- Internal
  - Nurse’s values and beliefs
  - Patient’s and caregiver’s values and beliefs
  - Educational level
  - Teaching and learning styles

Teaching the Family

- Patient education in pediatrics
- Special considerations
  - Environment
  - Workload
  - Resources
  - Learning Process
Theories of Learning

- **Condition – Behavioristic**
  - B.F. Skinner

- **Apperception**
  - J.F. Herbart, E.B. Titchener

- **Interpersonal – Social Learning**
  - A. Bandura

Future Implications

- Incorporate patient and family education into the mission and strategic priorities

- Create an environment that rewards patient and family education efforts and outcomes

- Create a structure that supports patient and family education

- Incorporate patient, family and staff education into policies and procedures

Implications for Nursing Practice

- Motivate staff nurses and experts to teach

- Promote recognition and documentation of patient and family learning outcomes

- Streamline teaching protocols

- Promote a team approach
Need for Innovation

- Present challenges to patient and family education
- ?

Caregiver Education Using Simulation

Background

- Inequities accidentally created
- Caregiver anxiety and fear
Significance

• Printed education material (PEM)
• Simulation as a valid teaching-learning strategy
• Readiness for discharge

The Team

• Vascular Access Team Coordinator
• Staff Educators
• Hospitalists
• Pediatric Intensivists
• Pediatric BMT Attending
• Clinical Nurse Educators
• Nurse Managers
• Clinical Operations Director
• Clinical Nurses
• Clinical Practice Council
• Infection Control Nurse

Setting the Expectations

• Review of our current practice
• Standardizing practice
• Setting the policy
**Change Management**

- Getting the clinical staff involved
- Unit-based champions
- Collaborative meetings

**Education**

- Collaboration with Clinical Nurse Educator
  - Lesson plan
  - Measures of success
- 2 Mini-Expert Training Sessions

**Role of the CVAD Mini-Expert**

- Change management
- Expert knowledge
- Just-In-Time training for staff nurses
- Provide the staff with updates to policy and practice
Role of the Infusion nurse

- Content expert for best practices
- Leadership for identifying complications and trends
- Setting the research agenda to improve the specialty body of knowledge

Measuring Success

- Balanced Score Card
- Infection Control Surveillance
- Routine unit-based audits
- Routine organizational-level audits

Future Implications

- Engage multi-disciplinary team members
- Expand to other areas of Children’s
- Embed education into core curriculum
- Research!
Central Venous Access Device (CVAD) Discharge Teaching Randomized Control Trial

Design

- Randomized controlled trial, compared to case-matched controls using prior CVAD content

Arms

Arm 1: current caregivers of children who received CVAD teaching based on old content and unit-based delivery methods.

Arm 2: caregivers of children who will receive CVAD teaching based on the new CVAD protocol. Delivery of content is unit-based.

Arm 3: caregivers of children who will receive CVAD teaching based on the new CVAD protocol. Delivery of content is structured using PEM and a task-simulator.
Research Question 1

• What is the difference in BSI rates between individuals who have received the content from the previous Central Venous Line Management Protocol for Pediatrics and the individuals randomized to Arm 2 and Arm 3?

Research Question 2

• What is the difference in re-admission rates between individuals who have received the content from the previous Central Venous Line Management Protocol for Pediatrics and the individuals randomized to Arm 2 and Arm 3?

Research Question 3

• How do Readiness for Discharge and Post-Discharge Coping Difficulty scores differ between individuals in Arm 2 and Arm 3?
Instruments

• Weiss Readiness for Discharge Parent Form (RHDS)

• Weiss Post-Discharge Coping Difficulty Scale – Parent Form

• Pre- and Post-Test Knowledge Assessment

Subject Selection

INCLUSION
• Parents or caregiver(s) of a patient on any pediatric service
• > 18 years old
• CVAD must be a PICC/implanted port/tunneled catheter
• Consent given related to treatment plan
• English-speaking
• Able to complete education prior to discharge

EXCLUSION
• Vascath/perm-a-cath, PIV
• Patients under the care of a governmental agency
• Patients whose time of departure does not allow completion of either intervention

Next Steps

• Form the Research Team
• Institutional Review Board
• Recruit Participants
• Collect Data
• Analyze Data
Our Vision

• To provide our patients, their families and their loved ones with excellent discharge preparation
  – Evidence-Based
  – Safe
  – Sustainable

It Takes A Team...

• Britt Meyer, RN, MSN, CRNI, VA-BC
• Kathleen Little, BS, RN
• Julia Aucoin, DNS, RN-BC, CNE
• Duke Vascular Access Team
• Duke Clinical Practice Council
• Clinical Education and Professional Development
• Duke Children’s Nursing

Thank You!