LESSONS FOR NURSING FROM THE AHRQ PATIENT SAFETY INDICATOR VALIDATION PILOT PROJECT

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Purpose

To qualitatively review the findings from the first five indicators evaluated as part of the Agency for Healthcare Research and Quality (AHRQ) Patient Safety Indicator (PSI) Validation Pilot Project in the context of nursing practice.

Patient Safety Indicators (PSIs)

- Initially developed through a contract with UC-Stanford Evidence-based Practice Center
- Set of quality indicators
- Identify potentially preventable adverse events
- Readily available inpatient hospital discharge data (ICD-9-CM codes)
- Little is known about the criterion validity

AHRQ PSI Validation Pilot

- Gather evidence on the criterion validity of the PSIs based on medical record review
- Improve guidance on interpretation & use
- Evaluate potential refinements to the specifications
- Develop medical record abstraction tools
- Develop mechanisms for conducting validation studies on a routine basis

Methods

- Retrospective cross-sectional study
- US volunteer sample of 47 hospitals from 29 states
- Sampling based on administrative data
- Sampling probabilities assigned using AHRQ QI software to generate desired sample size nationally

Data Collection

- Each hospital identified chart abstractors
- Training occurred via webinars
- Medical record abstraction tools & guidelines
  - Pretested in the Sacramento area
  - Targeted the **ascertainment of the event, risk factors, evaluation & treatment, and related outcomes**

Timeline

- 10 indicators- divided into 2 phases of 5 each
- **Phase I review-**
  - **Training early 2007**
  - **Chart review 4 month process**
  - **4th Qtr 2005, 2006, & 1st Qtr 2007**
- Phase II review – in progress
- Phase III (sensitivity determination) -in progress

Patient Safety Indicators

Phase I	Phase II
Accidental puncture and laceration	Foreign body left in during procedure
Selected infection due to medical care	Postoperative hemorrhage or hematoma
Postoperative pulmonary embolism or deep vein thrombosis	Postoperative physiologic and metabolic derangement
Postoperative sepsis	Postoperative respiratory failure
Iatrogenic pneumothorax	Postoperative wound dehiscence

Medical record sample

Phase I	Hospitals	Sample
Accidental puncture and laceration	43	249
Iatrogenic pneumothorax	38	205
Postoperative PE/DVT	37	155
Selected Infection due to Medical Care	37	194
Postoperative Sepsis	33	164
Overall	47	967

Selected Infection due to Medical Care (SIMC)

- Targets infections and inflammatory reactions due to vascular devices, implants, and grafts (ICD-9-CM 996.62) and infection following an infusion, injection, transfusion, or vaccination (999.3)
- Positive predictive value 61% (95% CI; 51-70%)
- Of the 39% false positive cases, 7% had an exclusionary diagnosis, 20% had an infection that was POA, and 12% had no clear documentation of a qualifying infection.

Selected Infection due to Medical Care (SIMC)

- Majority of cases were related to central lines (74), representing more serious infections
  - Femoral catheters (7/74)
  - Subclavian (16/74)
  - Internal jugular (22/74)
  - PICC (19/74)
- In positive cases, the abstractor was often unable to determine line type (n=24), central line catheter type (12/74), insertion site, and dwell time (due to lack of insertion or discontinued date).

SIMC Opportunities

- Better documentation of catheter type, insertion and removal dates, and catheter need
- Improved site selection based on national guidelines
- Inexpensive tracking of cases that are not limited to the intensive care units
  - Recently renamed “Central line related blood stream infection”
  - New ICD-9-CM code 999.31 targeting central line infection

SIMC Opportunities Cont.

- Increased recognition and/or documentation of signs and symptoms of suspected and confirmed infection, and related interventions
  - CDC definitions were broad and included local and systemic infection, as well as surveillance and clinical definitions
    - No documentation of systemic symptoms (n=73)
    - Unable to determine how diagnosis was made (n=29)
    - Comments regarding negative blood cultures

Iatrogenic Pneumothorax (IP)

- Positive predictive value 78% (95% CI 73-82%)
- Majority associated with CVC placement (72%).
- Invasive procedures on or near the neck of chest wall, including feeding tube placement, were associated with an additional 40% of cases and mechanical ventilation 5%.
- Low usage of ultrasound/other real-time imaging

IP Opportunities

- Central line site selection
- Need to include the ED and OR in policy
- Review how procedures such as feeding tubes and central line placement may be improved (procedural adjuncts such as ultra-sound for line placement)
- Examine barotrauma associated cases for potential improvements in ventilator management.
- Educate staff on early recognition of IP, especially in patients at increased risk.

Postoperative DVT or PE

- Lack of prophylaxis based on the of Chest Physicians guidelines (58.9%)
- Using median percentages, there were delays in early recognition of DVT (20.5%), recognition of PE (16.7%), intervention of DVT (20.0%), and intervention for PE (16.7%)
- Many false positive were associated with PICCs
- Compared to non-cases, new DVT/PE were discharged home on self-care at nearly half the rate, were twice as likely to be discharged to rehabilitation or skilled nursing, and were nearly four times as more likely to die.

Postop DVT/PE Opportunities

- Implement system changes such as pre-printed order sets, physician feedback, and monitors for adherence to national prophylactic guidelines as seen in the higher performing hospitals.
- Improve medication adherence and safe transitions at discharge.
- Improve processes of care in order to facilitate earlier recognition and treatment.
- Evaluate PICC practice and care

Postoperative Sepsis

- Targets those who have an elective surgical procedure and then develop sepsis
- Positive Predictive Value = 41% (95% CI; 28-54%)
- False positives (59%)
  - Majority of the false positive cases were associated with skin infections POA that required surgery, complications from previous hospitalizations, and non-elective cardiac surgeries.

Postoperative Sepsis

- Razors were used 25% of the time in skin preparation.
- Signs of organ dysfunction included low urine output (50%), systolic blood pressure ≤ 95 mm hg (92%), highest temperature >100.1 (92% with an average of 101.9 F), and elevated blood sugar greater than 180 mg/dL (61%).
- Patient's avg. temperature was lower in the PACU (average=96.7^{o} F) than in the OR
- Most but not all received pre-operative AB within 1=hr

Sepsis opportunities

- Timely administration of preoperative antibiotics to all
- Avoid razors in skin preparation
- Improved peri-operative temperature control
- Standardize measurement scales in all clinical areas
- Evaluate the potential for tighter postoperative glucose management.
- Earlier recognition and treatment of sepsis

Accidental puncture or laceration (APL)

- Positive predictive value = 91% (95% C.I. 88-94%)
- Targets complications that arise due to technical difficulties in medical care, specifically those resulting in an accidental puncture or laceration
- Most, if not all, events here performed by physicians and occurred in the operating room (n=203 or 90%)
- Majority of cases were associated with procedures that occurred in the abdomen/pelvis (160 or 71%) followed by the spine (37 or 16%), and chest (23 or 10%)

APL Opportunities

- Patients at greatest risk of not having the event identified at the time of occurrence included abdominal cases performed by laparoscopy and bladder injuries associated with gynecological procedures

- Nursing surveillance for timely recognition of post-procedural complications.

Common Trends

- High BMI is a risk factor for many complications and is required in the safe administration of some medications. Yet there were a large number of charts with no documentation of height and/or weight.

- Lack of preoperative assessments including baseline vital signs; poor peri-operative temperature documentation (suggesting poor temperature management), and use of different scales of measurement between patient care units.

Recognizing limitations

- Data elements available via chart review
- Time constraints (burden on collaborators)
- Inter-hospital variation
- Volunteer sample

Implications

- Opportunities to improve adherence to national guidelines
- PSIs studied appear to be influenced by nursing
- PSIs may provide an additional source of inexpensive and readily available information for evaluating the quality of nursing care
- Additional research is needed

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