Nursing Sensitive Quality Indicators: 
*Impact on Quality of Care and Outcomes*

Charlotte Thomas-Hawkins, PhD, RN
Associate Professor, School of Nursing
Director, Center for Healthcare Quality

Objectives
You will have some understanding of

- History of quality indicators in healthcare
- History of nursing sensitive quality indicators
- Evidence of impact of nursing personnel and care processes on patient outcomes
- Implications for nephrology nursing

"Burden of harm…of our healthcare quality problems is staggering"  
Institute of Medicine (IOM)  

Quality of Care
“The degree to which health services for individuals and populations increase the likelihood of desired health outcomes and are consistent with current professional knowledge.”
IOM, 2001
“Health care in the United States is not as safe as it should be—and can be.”  
IOM, 1999

Policy responses to IOM reports
- Define and collect quality indicators
- Public reporting
- Financial incentives and accountability
  - Pay-for-performance (e.g. Leapfrog Group)
  - Non-payment for poor performance (e.g. CMS)

Quality indicators in health care
Measurable indicators of the performance of individual clinicians, clinical delivery teams, health care delivery organizations, or health insurance plans in the provision of care to patients or enrollees, which are supported or enhanced by evidence demonstrating that they make care better or worse.

Agency for Healthcare Research and Quality
Classification of quality indicators

Structure → Process → Outcomes

Uses of quality indicators

- Quality Improvement
- Accountability
- Research

Endorses evidence-based consensus standards for performance improvement

Ensures that health care performance data are publicly available

NQF-endorsed performance measures help to
- Make care safer
- Achieve better health care outcomes
- Strengthen chronic care management
- Hold down healthcare costs
Kane et al. (2007). AHRQ Publication No 07-E005

Higher RN hours associated with lower:
- patient mortality rates
- rates of failure to rescue
- rates of hospital-acquired pneumonia

Higher direct care RN hours associated with:
- shorter lengths of stay

Higher total nursing hours associated with:
- lower hospital mortality and failure to rescue rates
- shorter lengths of stay

- Prevalence of BSN-prepared nurses associated with lower mortality rates
- Higher RN job satisfaction and satisfaction with workplace autonomy associated with lower mortality rates
- Higher rates of nurse turnover associated with higher fall rates

Nursing-Sensitive Quality Indicators

“Measures and indicators that reflect the impact of nursing personnel and their actions on outcomes”

ANA, 2004

Classification of nursing-sensitive quality indicators

Nursing processes
- Methods of patient assessment
- Nursing interventions

Nursing structures
- Nursing staff supply, skill level, education, certification
- Practice environment attributes

Nurse-sensitive outcomes
National Database of Nursing Quality Indicators

- Established by ANA in 1998
- Large, longitudinal database
- Comparative data for benchmarking and quality improvement
- Provides data to examine relationships between nursing structure, process, and outcome indicators

NDNQI Indicators

*NQF-Endorsed

Nursing Structure Indicators
- Nursing hours/patient day*
- RN education/certification
- Skill mix*
- Voluntary nurse turnover*
- Nurse vacancy rate
- Nurse practice environment attributes*

Nursing Process Indicators
- Pediatric pain assessment, intervention, reassessment cycle

Nursing-Sensitive Outcomes
- Patient falls with injury*
- Pediatric peripheral IV infiltration rate
- Pressure ulcer prevalence*
- Psychiatric physical sexual assault rate*
- Restraint prevalence*
- RN satisfaction
- Nosocomial infections

Nurse staffing is consistently linked to nurse-sensitive outcomes

Outcomes
- Urinary tract infection*
- UGI bleed
- Hospital-acquired pneumonia
- Shock/cardiac arrest
- 30-day inpatient mortality*
- Failure to rescue*
- Pressure ulcers*
- Patient falls*
- Hospital readmission*
- Patient satisfaction*

* value-based outcome
The practice environment of nurses has a significant impact on patient outcomes.

Nurse practice environment attributes that facilitate or constrain professional nursing practice

Hallmarks of a Professional Nursing Practice Environment
American Association of Colleges of Nursing
- Emphasis on quality, safety, collaboration, continuity of care, professional accountability
- Contributions of nurses' knowledge & expertise are recognized
- Promotes executive level nursing leadership
- Empowers nurse participation in decision-making
- Nurse clinical advancement and professional development
- Collaborative relationships among members of the health team
- Use of advances in clinical care and information systems
Supportive practice environments associated with positive outcomes

<table>
<thead>
<tr>
<th>Study</th>
<th>Environment Type</th>
<th>Outcomes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aiken et al. (2011). (hospitals)</td>
<td>Supportive work environments associated with lower mortality rates in hospitals</td>
<td></td>
</tr>
<tr>
<td>Flynn et al. (2014). (nursing homes)</td>
<td>Supportive practice environments a/w lower pressure ulcer rates</td>
<td></td>
</tr>
<tr>
<td>Jarrin et al. (2014). (home care)</td>
<td>Supportive practice environments a/w lower hospital admission rates</td>
<td></td>
</tr>
<tr>
<td>Kutney-Lee et al. (2015). (hospitals)</td>
<td>Magnet recognition associated with lower inpatient mortality rates compared to non-magnet hospitals</td>
<td></td>
</tr>
</tbody>
</table>

The practice environment of nurses may have a greater impact than nurse staffing on outcomes.

Hospital readmission rates by practice environment and nurse staffing

Overall rating of care by practice environment and nurse staffing

- Mean patient rating of care = 4.62
- Low RN staffing: Unsupportive = 4.3, Mixed = 4.5, Supportive = 4.8
- High RN staffing: Unsupportive = 4.1, Mixed = 4.5, Supportive = 4.7

If you quit on the process, you are quitting on the results
Idowu Koyenikan, Author

Nursing Structures
- Nurse staffing
- Nurse practice environment

Nursing Processes
- Missed care

Nursing-sensitive outcomes

Missed care predicts patient outcomes
- Increased risk for hospital readmission for every 10% increase in missed nursing care; nurses less apt to miss care in hospitals with more supportive work environments
  Brooks et al. 2015
- Failure to administer medications on time and provide adequate patient surveillance was significantly associated with UTIs in nursing home patients
  Nelson & Flynn, 2015
- At hospitals where nurses missed more care, 2.2% fewer patients rated the hospital highly
  Lake, et al., 2015
- Missed care is an independent predictor of heart failure readmissions
  Carthon et al., 2015
Lessons Learned
• Nursing-sensitive quality indicators
  • have been carefully developed, have been vetted, and are in use.
  • provide a standardized, evidence-based approach to measuring impact of nursing.
• Patient outcomes improve with better nurse staffing and work environments
• Strong business care for scrutinizing nurse staffing and optimizing nurse work environments

What about dialysis and other nephrology settings?

Nursing structures and care processes have been examined in dialysis settings
**Patient-to-RN ratio in quartiles in outpatient dialysis units**

Thomas-Hawkins, Flynn, Clarke, 2008

<table>
<thead>
<tr>
<th>Quartile</th>
<th>Up to 4</th>
<th>5 to 8</th>
<th>9 to 12</th>
<th>&gt; 12</th>
</tr>
</thead>
<tbody>
<tr>
<td>Percentage</td>
<td>24.9</td>
<td>24.6</td>
<td>19.2</td>
<td>31.3</td>
</tr>
</tbody>
</table>

**Nursing staff skill mix in dialysis facilities**

Yoder et al. (2013). Patient care staffing levels and dialysis facility characteristics in U.S. hemodialysis facilities. AJKD.

**Perceptions of staffing in nephrology settings**


- We have enough staff to handle the workload: 52%
- Staff in this unit work longer hours than is safe for patient care: 67%
- I often feel rushed when working with patients: 67%

-% of personnel who agreed with statement:
  - Direct Care RNs
  - Managers/Administrators
RN perception of workload in outpatient dialysis units
Flynn, Thomas-Hawkins, Clarke, WJNR, 2009

Unable to take 30 min. break during shift: 21.3%
Most days my workload is unreasonable: 28.6%
My workload will cause me to look for a new position: 23.3%
My workload causes me to miss important changes in patients' status: 46.8%
I have voiced concerns to management about my workload: 55.6%

Nursing practice environment support in dialysis units
Thomas-Hawkins, Flynn, Clarke, 2008

Not supportive: 25%
Mixed: 50%
Supportive: 25%

Evidence suggests nursing structures are associated with dialysis patient outcomes

Nursing Structures
- Nursing staff
- Practice environment support

Nursing Processes
- Outcomes
  - Skipped & Short Rx
  - Hep C prevalence
  - Patient safety
  - Patient shift change safety
**RN staffing associated with patient outcomes**

- **Saran et al. (2003), Kidney Int. (DOPPS)**: For every 10% more nursing hours in a dialysis unit, the patients were 16% less likely to skip dialysis treatments ($p<.05$).

- **Fissell et al. (2003), Kidney Int. (DOPPS)**: Hepatitis C prevalence was significantly lower in dialysis units with a higher proportion of RN staffing ($p<.001$).

- **Thomas-Hawkins et al. (2008), NNJ**: High patient-to-RN ratios (12 or more patients) associated with increased odds of skipped and shortened dialysis treatments ($p<.001$), bleeding from vascular access ($p<.05$).

- **Thomas-Hawkins et al. (2015)**: Nurses with high patient-to-RN ratios associated with 65% less likely to report safe patient transitions; effect attenuated when adjusted for unsupportive work environment.

**Unsupportive practice environments associated with negative outcomes in dialysis units**

- **Gardner et al. (2007), NNJ**: Unsupportive practice environments associated with increased patient hospitalizations ($p<.05$).

- **Thomas-Hawkins et al. (2008), NNJ**: Unsupportive practice environments associated with higher odds of frequent shortened treatments ($p<.001$), patient complaints ($p<.001$), medication errors ($p<.01$), vascular access problems ($p<.01$).

- **Thomas-Hawkins et al. (2015), Research & Theory in Nursing Practice**: Nurses who reported unsupportive practice environments were 65% less likely to report that patient shift change was safe ($p<.01$).

- Nurses who reported unsupportive practice environments were 92% less likely to rate overall patient safety in dialysis unit as positive ($p<.01$).

**Some evidence links missed care with patient outcomes**

- **Nursing Processes**: Missed care

- **Outcomes**: Skipped & Short Rx, Hypotension, Patient complaints, Patient safety, Patient shift change safety

*School of Nursing*
Percent of nurses reporting tasks left undone

- 60% - Important patient/family teaching undone
- 50% - Talk/comfort patients undone
- 26% - Important documentation undone
- 25% - Adequate supervision of technicians undone
- 20% - Adequate monitoring of dialysis treatments undone
- 15% - Adequate patient surveillance undone
- 12% - Coordinating patient care undone

Total care tasks left undone on last day worked

- 25
- 15
- 24
- 36

Missed care associated with outcomes in dialysis units
Thomas-Hawkins et al. (2008). *NNJ*

- Nurses who reported ≥ 3 tasks left undone were more likely to report frequent hypotension, skipped or shortened treatments, patient complaints (p<.01)

Thomas-Hawkins et al. (2015). *Research & Theory in Nursing Practice*

- Nurses who reported ≥ 3 tasks left undone were 76% less likely to report patient shift change safety (p<.001)
Lessons Learned

- Nephrology nursing sensitive quality indicators under-developed and minimally standardized
- Gaps exist in fully understanding impact of nursing sensitive quality indicators in nephrology settings

Are ESRD quality indicators sensitive to nursing structures and processes in dialysis units?

Nephrology Nursing-Sensitive Quality Indicators (NNSQI)
ANNA Nephrology Nursing Sensitive Quality Indicator Task Force

Defined NNSQI
Nephrology nursing sensitive quality indicators are measures that reflect the structure, processes, and outcomes of care influenced by RN.

Recommendations
- Selection of NNSQI should be based on scientific evidence
- Identify initial set from well-vetted NDNQI indicators
- Focus research agenda on testing relationship of these indicators to selected ESRD QIP and other outcomes
- Stakeholder education
### Challenges
- Facility-level data on nursing staffing and practice environment ratings are needed to explain complex relationships.
- Dialysis unit nurse staffing data not publicly reportable or accessible.
- Need for a business case for RN value
  - Staff nurses are a fixed cost, not revenue-generating.

### Unit-level implications
- Benchmark nursing structure, process, and outcome data.
- Determine how nursing care processes linked to patient outcomes on your units.
- Set strategies to improve quality of care and work environments when indicated.
- Develop strategic plans for advocacy related to nephrology nursing sensitive quality indicators.

### Questions/Discussion
- What outcomes are sensitive to nursing care in your setting?
- What is it about nursing in your units that may lead to adverse outcomes?
- What are the solutions?