National Institutes of Health
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# Quality and Safety in Inpatient Cancer Care: Perspectives on Patient Acuity and Nursing Staffing

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# Disclosure/Conflict of Interest

- The opinions expressed in this presentation are those of the author alone and do not necessarily reflect the views of the Department of Veterans Affairs, National Institutes of Health, Public Health Service, or Department of Health and Human Services.

- I have no conflicts of interest to report.

# Acknowledgements


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- Post-doctoral work
  - Veterans Affairs National Quality Scholars Program

# Presentation Outline

- My background & story
  - Patient acuity
  - Quality improvement and patient safety
- Nurse staffing models
  - State of the science
  - Factors to consider (e.g., nurse staffing “bundle”)
- Broader quality and safety topics in cancer care
  - Institute of Medicine
  - Oncology Nursing Society
  - National Quality Forum
  - American Association of Hospice & Palliative Medicine
  - Hospice & Palliative Nurses Association

# Objectives

- At the end of this presentation, attendees will be able to:
  - Define patient acuity & its relevance to nurse staffing decisions
  - Describe two conceptual models/frameworks:
    - Holzemer's Outcomes Model for Healthcare Research and
    - The Integrated Framework for a Systems Approach to Nurse Staffing Research
  - Identify nurse staffing models/approaches and important factors to consider when developing them
  - List key priorities of various professional organizations in the United States regarding quality in cancer care

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www.emapsworld.com

# NIH Mission


- To seek fundamental knowledge about the nature and behavior of living systems and the application of that knowledge to enhance health, lengthen life, and reduce illness and disability.

# NIH Clinical Center

**Mission**

The NIH Clinical Center provides a model environment for:

- clinical research
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- training

**Vision**

- As America's research hospital, we will lead the global effort in training today's investigators and discovering tomorrow's cures

http://clinicalcenter.nih.gov/about/welcome/mission.shtml

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# Current position

- Clinical Center Nursing Department (CCND)
  - Research and Practice Development Section
- Program Director for Outcomes Management
  - Lead quality improvement and patient safety initiatives
  - Patient acuity & outcomes research
  - Nurse Practitioner, Pain and Palliative Care Service
- Improving systems of care

FRANCES PAYNE BOLTON SCHOOL OF NURSING
CASE WESTERN RESERVE UNIVERSITY

Cleveland, Ohio

1998-2002:

- Bachelor of Science in Nursing Program
- Nurse Externship




www.emapsworld.com; www.fpb.case.edu; www.city-data.com

# 2002: First nursing position, Cleveland, OH

**Staffing & Geography**

- Hematology/oncology/ bone marrow transplant unit
- Primary nursing model
  - Primary, secondary, tertiary patients
  - Continuity
- Acuity tool
- 12- and 8-hour shifts
- Patient care assistants or technicians, unit clerk
- “L”-shaped unit with three “pods”

**RN:Patient Ratios**

- 30 beds
- Day: 8 to 9 nurses, each caring for 3 to 5 patients
- Evening: 6 to 7 nurses, each caring for 5 to 7 patients
- Night: 4 to 5 nurses, each caring for 8 to 9 patients

| | 1 | 2 | 3 |
|---|---|---|---|
| **Teaching** | Reinforcement teaching | Initial teaching for treatment modalities | |
| **Treatments** | Drsg change to: single tube care-drains, chest tube, foley, CVC VRB Precautions | Trach care, multiple tube care, tubing feedings | Complicated and/or multiple dressings, frequent incontinence |
| **Safety** | Falls precautions, fall < 72 hrs | Posey for confusions, neuro checks q4 hrs, severe neutropenia | Restraint monitoring, mental status changes, active bleeding, severe neutropenia with frequent fever work-ups |
| **Special Meds** | Continuous chemo, uncomplicated Ampho, heparin gtt, monitoring PCA pump | Vesicant chemo through Broviac, Ampho with rigors, high-dose chemo, triple chemo regimens, subsequent doses IVIG, ATG, Venoglobulin without reactions | Vesicant chemo through peripheral IV, insulin gtt with CS, test dose Ampho, first doses IVIG, ATG, Venoglobulin known to have reactions |
| **Condition Changes** | New onset febrile episode with workup, mild to moderate pain, documented emotional support | GI bleed, hypotensive crisis, intractable pain, respiratory distress, neuro changes | Potential unit transfer or arrest |
| **IV Fluids** | 1-2 infusions, including IVF, electrolytes, dopamine, CSA, MSO4 gtt | 3-4 IV infusions | >4 IV infusions |
| **Blood Products** | 5-10 units of PLT, FFP, cryo | 1-2 units PRBCs or PRBCs and PLT | PBSCT, BM return, granulocyes, > 2 units PRBCs & PLT |
| **Tubing Changes** | Making or hanging 1-2 tubing changes | Making or hanging 3-4 tubing changes | Making or hanging >4 tubing changes |
| **Miscellaneous** | Pre-op teaching, leading team meeting or ID rounds, CVC blood draws | Pt. Discharge, including teaching and procedures | If pt has multiple items from one category, may rank as next higher rating |

# 2003: Second nursing position New York City

http://www.history.com/topics/new-york-city

# Thoracic Oncology Unit

**Staffing & Geography**

- 60% surgical, 40% medical
- Long-term ventilator patients
- Staffing
  - By room number, some continuity
  - 12-hour shifts
  - High staff turnover
- New manager
- No acuity system; interest in developing one for unit

**RN:Patient Ratios**

- 42 beds
- Day: 6 to 7 nurses each caring for 6 to 7 patients, up to 10 in one shift
- Night: 4 to 5 nurses each caring for 8 to 12 patients

# ACUITY RATING

**Date:_____** **Room#:_____**

| | 1 | 2 | 3 | Score |
|---|---|---|---|---|
| **Teaching** | Reinforcement Teaching<br>Emotional Support | Discharge | Initial or Discharge Teaching:<br>New post-op<br>Newly Diagnosed<br>New Admit<br>SQ Injections<br>Pleurex/Pnuemostat<br>Diabetic | |
| **Treatments IV Fluids** | Dressing Changes to:<br>CVC/CT<br>Foley Care<br>Isolation Precautions<br>Preventative Skin Care<br>1-2 Continuous IVF | Trach/PEJorG care<br>Tube Feeds<br>Stage 1-2 breakdown<br>Bronchoscopy<br>CT insertion-Assist<br>Frequent Incontinence<br>NGT/CT Care | Stage 3-4 breakdown<br>Complex dressing:<br>Eloesser<br>Pleurodesis | |
| **Safety Special Medications** | Fall Precautions<br>Intermittent Cardiac<br>IVPB medications<br>PCA pump monitoring<br>Epidural | Confusion/Agitation<br>Neuro Checks<br>1:1 Companion<br>Cardizem Drips | Restraints<br>Mental Status Changes | |
| **Condition Changes** | Fever<br>Mild to Moderate Pain<br>Sedation | Hypotension<br>Intractable pain<br>Actively dying<br>ICU Transfer in<br>Vented<br>Actively Bleeding<br>Low Urine Output | Not Accepted ICU<br>transfer Out<br>Code<br>New onset A-fib<br>Respiratory Distress | |
| **Post-Operative Management** | CT with air leak<br>Chest PT<br>Ambulation with Equipment | CT to Emerson<br>O2 Face Mask<br>Ambulation with RN assistance<br>Telemetry Monitoring | Non-Rebreather | |

**TOTAL:_____**

# 2004-2010: Graduate School

- Acuity measurement – focus area for doctoral work
- Started graduate school in New York City
- Returned to Cleveland, Ohio to finish graduate school at Case Western Reserve University
  - Validated acuity tool used in first nursing position

FRANCES PAYNE BOLTON SCHOOL OF NURSING
CASE WESTERN RESERVE UNIVERSITY

JAN JOURNAL OF ADVANCED NURSING

THEORETICAL PAPER

# Patient acuity: a concept analysis

Caitlin W. Brennan & Barbara J. Daly

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BRENNAN C.W. & DALY B.J. (2009) Patient acuity: a concept analysis. *Journal of Advanced Nursing* 65(5), 1114–1126.
doi: 10.1111/j.1365-2648.2008.04920.x

# Concept Analysis

- Holzemer's Outcomes Model for Health Care Research

| | Structure | Process | Outcome |
|---|---|---|---|
| **Patient** | Severity<br>• psychological<br>• physical | | |
| **Provider (Nurse)** | Intensity<br>• nursing care needs<br>• workload<br>• complexity | | |
| **System** | | | |

- Definition: Patient acuity is a measure of the severity of illness of patients and the intensity of nursing care patients require.

(Brennan & Daly, 2009; Donabedian, 2003; Holzemer, 1994; Holzemer & Reilly, 1995)

*Journal of Nursing Measurement, Volume 20, Number 3, 2012*

# The Oncology Acuity Tool: A Reliable, Valid Method for Measuring Patient Acuity for Nurse Assignment Decisions

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*Case Western Reserve University*

**Jeffrey Van Der Meulen, ND, RN, OCN**
*University Hospitals Case Medical Center*

# Acuity Validation Study (dissertation)

- Oncology Acuity Tool
- 10 domains
- Indicators of care within each domain
  - 0, 1, 2, or 3 points
- Prospective measurement every shift
- Total score for each patient, 2 to 14 points
- Total score for each nurse, 20 to 40 points
  - Goal is for each nurse to be within a few points of each other → balanced nursing workload

(Brennan, et al, 2012)

# Psychometric Assessment

- Inter-rater reliability
- 3 types of validity
  - Content
  - Concurrent
  - Predictive

- Conclusion: Overall, the OAT demonstrated sufficient reliability and validity in this population

(Brennan, et al, 2012; Brennan, et al, 2014)

# Patient Acuity & Nurse Staffing

- Nurse staffing research
  - Increasing focus on assessing patient demand for care (Needleman, 2011)
  - Patient acuity measurement is one way of doing this

- Acuity-based staffing theoretically allows for efficient allocation of supply of nurses with patients on unit
  - Supply (RNs) & demand (patient acuity) matched

# Background: Nurse Staffing

- Seminal work that demonstrated an association between nurse staffing and:
  - Falls, pressure ulcers, failure to rescue, infections, etc
  - (Aiken, et al, 2002; Needleman, Buerhaus, et al, 2002)

- If I am a hospital administrator or nurse manager, how do I make nurse staffing decisions today? Next year?
- What does the literature say with regard to my type of patient care unit or patient population?

# State of the Science: The Relationship Between Nurse Staffing and Patient Outcomes

Caitlin W. Brennan, Barbara J. Daly and Katherine R. Jones

*West J Nurs Res* 2013 35: 760 originally published online 26 February 2013
DOI: 10.1177/0193945913476577

# State of the Science paper

- "Meta-review" → review of reviews
- 29 reviews → 6 systematic, 23 reviews of literature
- Findings: inconsistencies across studies, inconclusiveness of results
  - Defining & measuring variables, design
  - Difficult to compare results across studies
- Lack of/implicit theoretical foundation to studies
  - Rare for studies to include system factors
- No clear recommendations for staffing guidelines on the unit level
- Need to focus on processes of care, system factors, & unit-level context

(Brennan, Daly, & Jones, 2013)

# Theoretical Framework

**Building from Holzemer's Outcomes Model for Health Care Research…**

| | Structure | Process | Outcome |
|---|---|---|---|
| Patient | | | |
| Nurse | | | |
| Unit/Ward | | | |
| System | | | |

- Integrated Framework for a Systems Approach to Nurse Staffing Research (IFSANSR)
- Stratifies structures, processes, & outcomes of care
- Patient, nurse, unit, and system levels

(Brennan, Daly, & Jones, 2013)

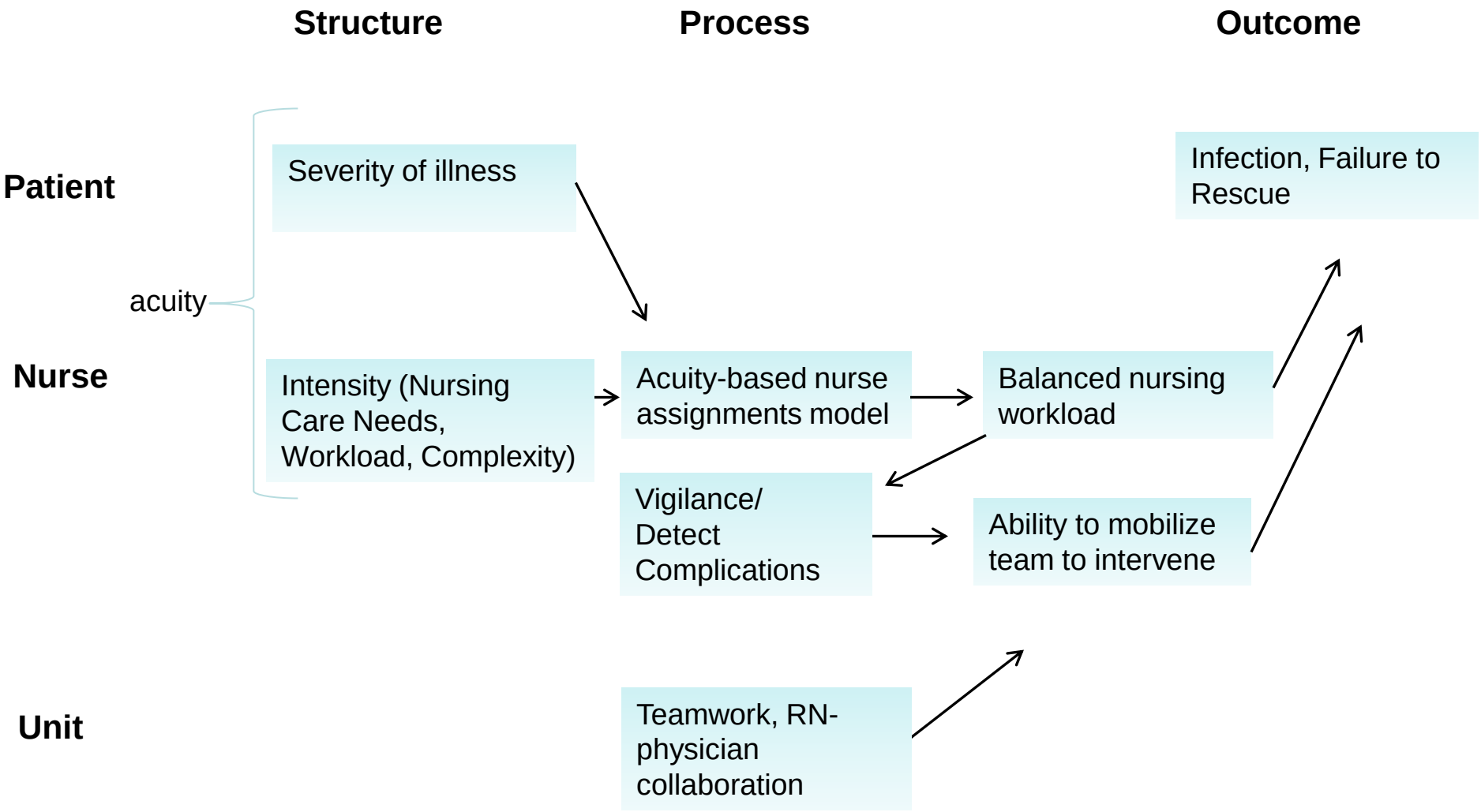
| | Structure | Process | Outcome |
|---|---|---|---|
| Patient | Age, comorbidities[a] | Interactions with hospital caregivers | Mortality, satisfaction, quality of life |
| Nurse | Education, experience, shift rotation | Surveillance, vigilance, professional judgment | Burnout, fatigue |
| Unit | Organizational climate & culture | Communication, workflow | Turnover, retention |
| Organization/System | Size, patient volume, use of technology and computerized provider order entry systems | Patient flow | Cost |

**Figure 2.** The Integrated Framework for a Systems Approach to Nurse Staffing Research.

[a]See Table 3 for a list of potential structures, processes, and outcomes to consider at the patient, nurse, unit, and organization/system levels of analysis.

(Brennan, Daly, & Jones, 2013)

# Sample Conceptual Model (using IFSANSR)



Published in final edited form as:
*Med Care*. 2011 December ; 49(12): 1047–1053. doi:10.1097/MLR.0b013e3182330b6e.

# The Effects of Nurse Staffing and Nurse Education on Patient Deaths in Hospitals With Different Nurse Work Environments

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# Unit-Level Context

**A Case-control Study of Patient, Medication, and Care-related Risk Factors for Inpatient Falls**

*Melissa J. Krauss, MPH,[1] Bradley Evanoff, MD, MPH,[1] Eileen Hitcho, MS,[1] Kinyungu E. Ngugi, BS,[1] William Claiborne Dunagan, MD,[1,2] Irene Fischer, MPH,[1] Stanley Birge, MD,[1] Shirley Johnson, RN, MS, MBA,[3] Eileen Costantinou, MSN, RN,[3] Victoria J. Fraser, MD,[1]*
[1]Department of Medicine, Washington University School of Medicine, St. Louis, MO, USA; [2]BJC HealthCare, St. Louis, MO, USA; [3]Barnes-Jewish Hospital, St. Louis, MO, USA.

- Likelihood of a patient falling was:
  - 3 times higher for patients whose nurse was caring for 4 to 6 patients
  - 7 times higher for patients whose nurse was caring for 7 or more patients
  - Compared with patients whose nurse was caring for 3 or fewer patients

(Krauss, et al, 2005)

# Nurse Staffing "Bundle"

- Acuity
  - Patient demand for care conceptualized separately from supply (nurse staffing)
- Nursing model of care
  - Primary nursing
  - Continuity (shorter length of stay)
- Geographic location on unit
- System factors: e.g., unit work environment (Practice Environment Scale of the Nursing Work Index)
  - Nurse participation in hospital affairs
  - Nursing foundations for quality care
  - Nurse manager ability, leadership, and support of nurses
  - Staffing/resource adequacy
  - Nurse-physician relationships

(Lake, ET, 2002 & 2007)

# Nurse Staffing Models

- England: National Institute for Health and Care Excellence (NICE) guidelines (2014)
  - Patient factors
    - Individual patient's nursing needs (acuity/dependency)
    - Other factors based on holistic assessment (e.g., risk for deterioration)
  - Ward factors (turnover of patients)
  - Nursing staff factors
    - Communication with family, other healthcare staff
    - Managing nursing team/ward
    - Mentoring & supervision
    - Audits, staff appraisal, performance reviews

(NICE, 2014)

# American Nurses Association

- Staffing Recommendations (2014)
  - Recognizes unique settings, times of day
  - Patient acuity/intensity
  - Unlicensed personnel
  - Skills, education, and training within specific settings
  - Number of admissions, discharges, transfers
  - Unit layout
  - Availability of resources (assistive personnel, technology)

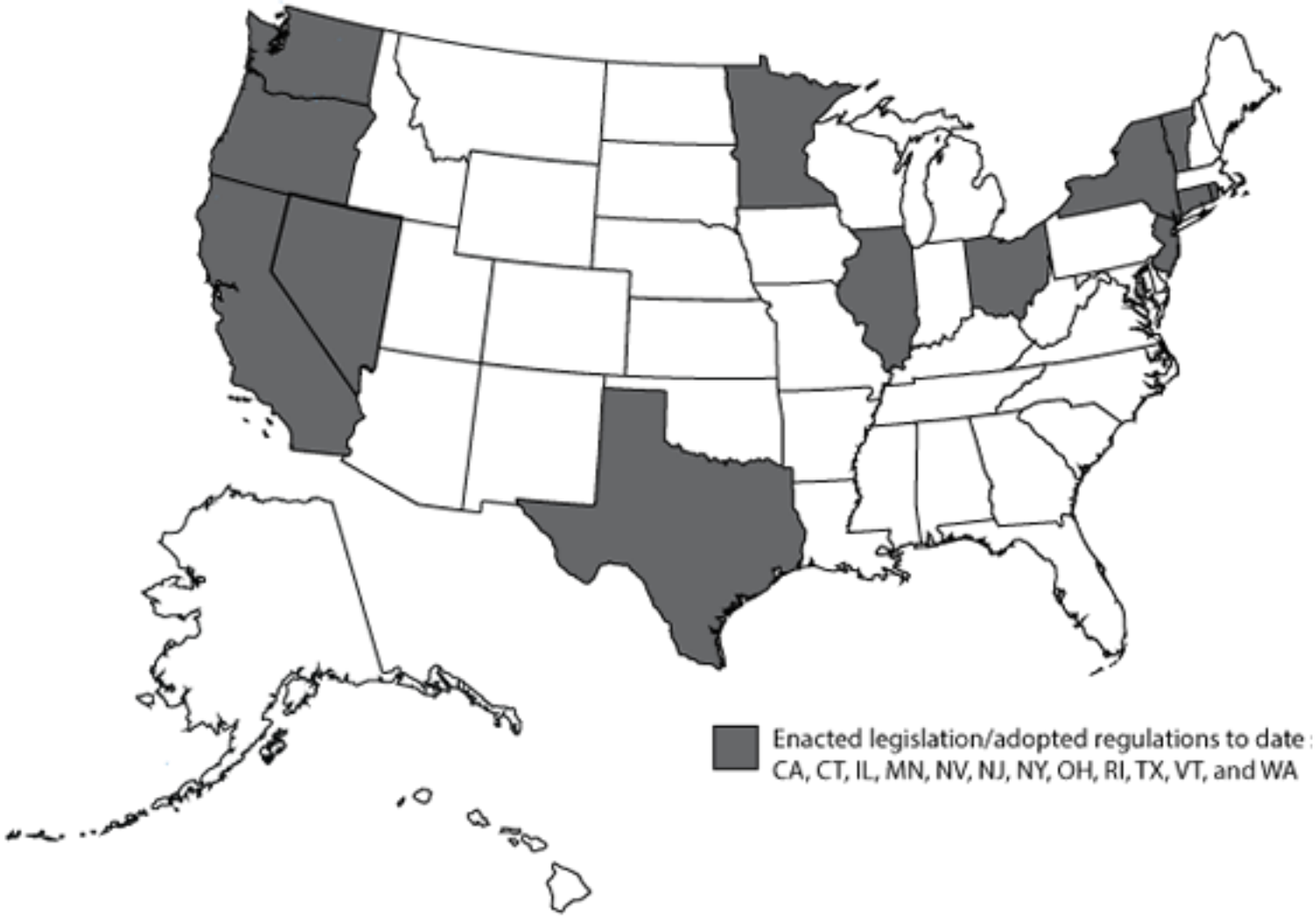
(ANA, 2014a & b)

# American Nurses Association

- Registered Nurse Staffing Act (federal)
- State laws
- 3 main categories
  - Nurse driven staffing committee
    - CT, IL, NV, OH, OR, TX, WA
    - MN (chief nursing officer or designee)
  - Mandate specific nurse-to-patient ratios
    - CA
    - MA (ICU only)
  - Disclose staffing levels (public reporting)
    - IL, NJ, NY, RI, VT

(ANA, 2014a & b)

# States with legislation/regulations




ANA, 2014b

# Nurse Staffing "Bundle" (revised)

| | Structure | Process | Outcome |
|---|---|---|---|
| Patient | • Acuity<br>• Other factors (holistic assessment) | | • Mortality<br>• Failure to rescue<br>• Morbidity (infection, pulmonary embolism) |
| Nurse | • Skills, education, training, experience | • Nursing model of care<br>• Indirect care<br>  • Communicating<br>  • Mentoring, supervising<br>  • Managing | • Burnout<br>• Turnover<br>• Retention<br>• Satisfaction<br>• Surveillance, vigilance<br>• Missed care |
| Unit/Ward | • Layout<br>• Shift-specific<br>• Resources (unlicensed assistive personnel; technology) | • Turnover of patients<br>• Work environment | • Efficiency<br>• Throughput |
| System | • Setting-specific<br>• Overall number of staff needed<br>• Mandated ratios | • Committee decides policies<br>• Disclose staffing levels | • Costs |

# Importance of Measurement

- Before nurse staffing bundle can be tested, need reliable, valid measures for various concepts:
  - Acuity, other factors
  - Indirect care
  - Surveillance, vigilance
  - Missed care

- Similarly, need quality & outcome measures in oncology and palliative care

# Postdoctoral Fellowship: 2010-2013

- Veterans Affairs Quality Scholars Program
- Quality improvement & patient safety content
- Systems approach
- Interprofessional teamwork
- Concurrently, completed Master of Science in Nursing degree & worked as Adult Nurse Practitioner
  - Oncology and Palliative Care Master of Science degree
    - Case Western Reserve University, 2011
  - Saw patients in palliative care (20% effort, ~1 day/week)
- How do we evaluate the quality of cancer care?

www.vaqs.org

# Quality of Cancer Care

- Institute of Medicine (IOM)
  - "…independent, nonprofit organization that works outside of government to provide unbiased and authoritative advice to decision makers and the public."
  - Interdisciplinary (physicians, nurses, researchers, pharmacists, public health experts, foreign associates, etc)
  - IOM reports:
    - Topics that are timely & important for healthcare
    - Objective advice for decision-makers, public
    - Evidence-based
    - Collaborative process
    - Consensus from experts

(IOM, 2013a & b)

# Institute of Medicine Report

- **"Delivering High-Quality Cancer Care: Charting a New Course for a System in Crisis"**
  - **"Cancer care is often not as patient-centered, accessible, coordinated, or evidence based as it could be."**
- Aging population
- Reliance on family caregivers
- Rising costs of care & complexity
- Majority of cancer diagnoses, deaths, & survivors are older adults

(IOM, 2013c, pg 5)

# Institute of Medicine Report

- Focus on patient-centered care
  - Asking patients' preferences
  - Using decision tools & visual aids for treatment plans
- Importance of:
  - Measurement, quality indicators
  - Integration of palliative care concepts into cancer care

(IOM, 2013c)

# Institute of Medicine Report

**Conceptual Framework**

1. Engaged Patients
2. Adequately staffed, trained, and coordinated workforce
3. Evidence-based cancer care
4. A learning health care Information Technology (IT) system for cancer
5. Translation of evidence into clinical practice, quality measurement, and performance improvement.
6. Accessible, affordable cancer care

(IOM, 2013c, pg 11)

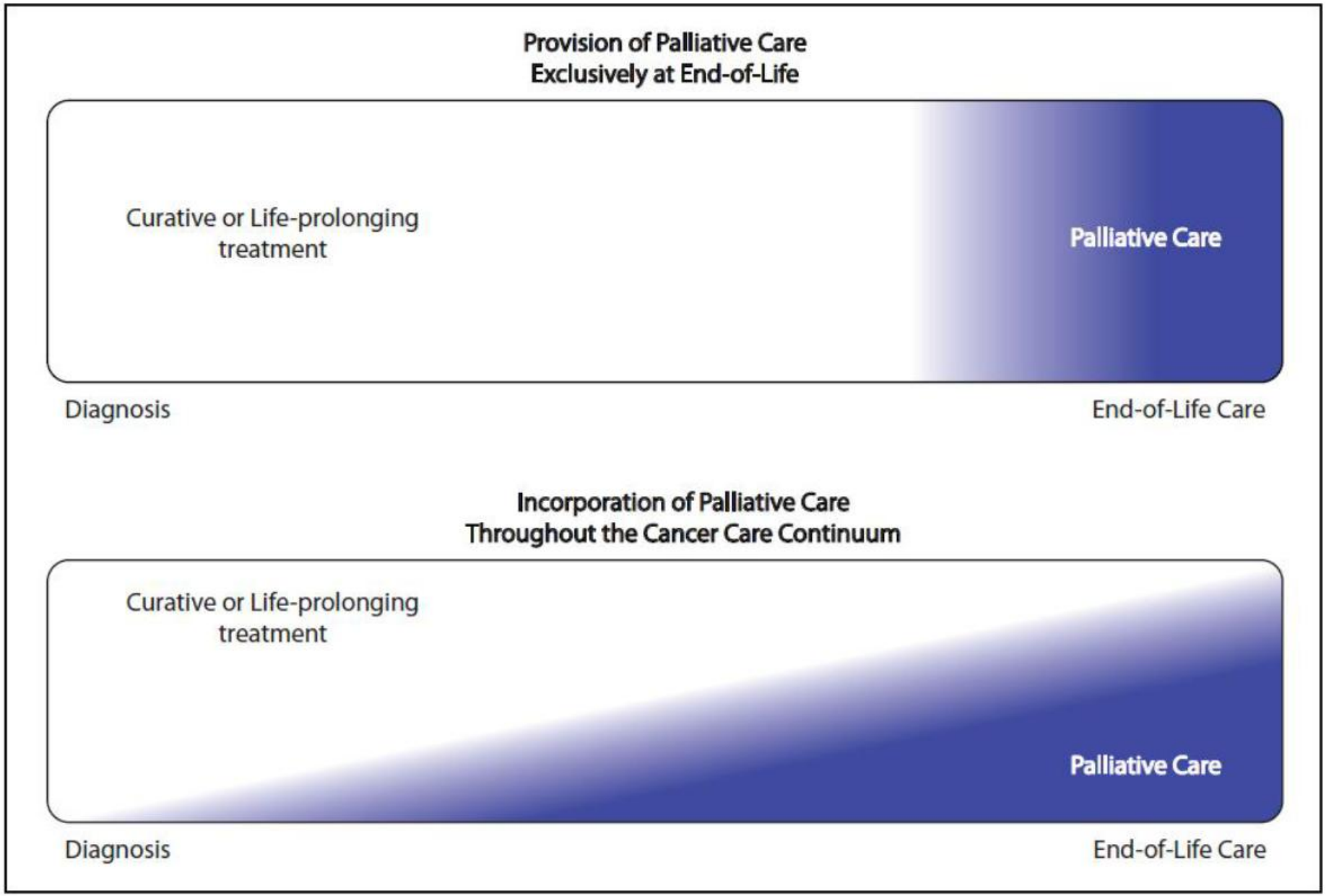
# Institute of Medicine Report

**Goals of the Recommendations**

1. Provide clinical and cost information to patients.
2. End-of-life care consistent with patients' values.
3. Coordinated, team-based cancer care.
4. Core competencies for the workforce.
5. Expand breadth of cancer research data.
6. Expand depth of cancer research data.
7. Develop a learning health care IT system for cancer.
8. A national quality reporting program for cancer care.
9. Reduce disparities in access to cancer care.
10. Improve the affordability of cancer care.

(IOM, 2013c, pg 14)

# Incorporation of palliative care across the care continuum






(IOM, 2013c, pg 18)

# Institute of Medicine Report & Resources

- www.iom.edu/qualitycancercare
  - Briefing Slides
  - Press Release
  - Questions for patients with cancer to ask their care team
  - Report Brief
  - Videos

(IOM, 2013d)

# Oncology Nursing Society (ONS)

- Professional association in the United States for oncology nurses
- More than 35,000 members
- "…committed to promoting excellence in oncology nursing and the transformation of cancer care."
- Many resources/benefits:
  - Continuing education
  - Certification
  - Policy & advocacy
  - Networking
  - Evidence-based practice
  - Quality improvement registry

https://www.ons.org/about

# Oncology Nursing Society (ONS)

- Priority: Improve the quality of cancer care.
  - Ensure that inpatient and outpatient quality measures used are meaningful, relevant, and promote quality cancer care.
  - Identify opportunities related to medical homes, accountable care organizations, and other emerging healthcare delivery models.
  - **Participate in the National Quality Forum (NQF) Measures Application Partnership (MAP) to promote the adoption of measures that are meaningful to cancer care and patients with cancer.**

(https://www.ons.org/advocacy-policy/priorities)

# National Quality Forum (NQF) Measures Application Partnership (MAP)

- NQF: Sets standards for measurement of various healthcare indicators
- MAP: Focuses on “measuring what matters”
- Identifying measurement gaps & availability of measures
  - Person-Centered Communication
  - Quality of Life and Functional Status
  - Shared Decisionmaking
- Applying measures across care delivery settings

(NQF, 2015)

# Palliative Care: Measuring What Matters

- American Association of Hospice & Palliative Medicine
- Hospice & Palliative Nurses Association
- Partnering to develop quality measures for palliative and end-of-life care

http://aahpm.org/quality/measuring-what-matters

# Conclusion

- Career Mission:
  - To be a leader in improving systems of care
  - Linking data and research to the bedside
  - Goal of improving patient safety and the quality of care provided in hospitals
- Lead quality improvement and research initiatives focused on studying the influence of various health care system factors on patient outcomes.
- Patient acuity, nurse staffing, processes of care
- Measurement
- Quality of care in oncology & palliative care

# Other Resources

- Institute of Medicine Future of Nursing Report (2010)
  - http://www.iom.edu/Reports/2010/The-Future-of-Nursing-Leading-Change-Advancing-Health.aspx
- End-of-Life Nursing Education Consortium (ELNEC)
  - http://www.aacn.nche.edu/elnec

- Thank you!

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