

NDNQI Research Findings for the Advanced Site Coordinator

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- * Director, NDNQI
- * Honorary FAAN
- * Sociologist
- * Great aunt of fabulous 11-month old

Vince Staggs



- * Statistician
- * Father of 3 bio kids and 1 feisty toddler from China

Catima Potter



- * Senior Statistical Analyst
- * Chronic Disease Epidemiologist
- * First time mom with love of photography and baking

Agenda

- * Falls
- * Assaults
- * Healthcare-associated Infections
- * BREAK
- * Pressure Ulcers
- * Pain
- * Nurse Turnover
- * Questions



Falls

Fall Indicator Development

- * Developed in 1998
- * Key Experts
 - * Nursing Executives and Quality Specialists
 - * American Hospital Association (AHA)
 - * Catholic Health Association (CHA)
 - * Agency for Health Care Policy and Research (AHCPR)
 - * Joint Commission on Accreditation of Healthcare Organizations (JACHO)



Fall Indicator Refinements

- * 2003
 - * Fall risk assessment scales
 - * Nursing process measures
 - * Adult Rehab
- * 2005
 - * Hendrich II fall risk assessment
- * 2010
 - * Modified injury fall level definitions



Fall Indicator Refinements

- * Indicator Review
 - * Implemented changes
 - * Unassisted fall rates
 - * Change rate calculation of process measures
 - * Guidelines clarifications
 - * Pediatric falls
 - * Proposed
 - * Data entry website validations
 - * Universal protocol
 - * Fall assisted by non-nurses

Falls

Research Findings

Prior Research

- * What are the effects of staffing and skill mix on falls?
 - * Mixed findings
 - * Methodological limitations
- * Unassisted falls are understudied

Lang et al (2004)

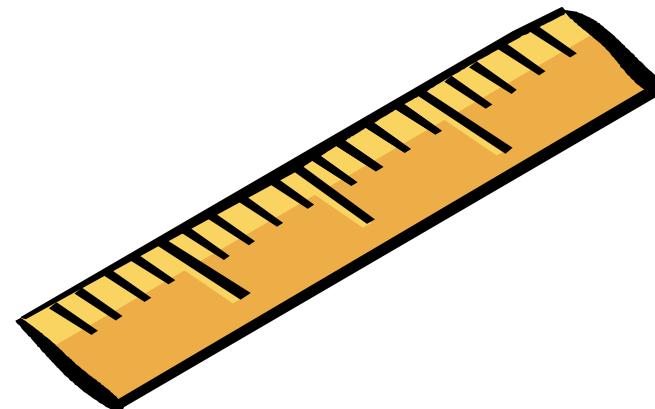
- * Reviewed research from 1980-2003
 - * Assessed clinical importance of findings
 - * Half of reviewed studies used hospital-level data
- * “Evidence suggests that richer nurse staffing is associated with lower failure-to-rescue rates, lower inpatient mortality rates, and shorter hospital stays.”
- * “evidence does not support relationships between nurse staffing and the incidence of pressure ulcers, patient falls, nosocomial infections . . .”

Other Reviews

- * Lake & Cheung (2006)
 - * Lit review through mid-2005
 - * “evidence of an effect of nursing hours or skill mix on patient falls and pressure ulcers is equivocal”
- * Lake et al (2010)
 - * Reviewed 6 subsequent studies
 - * With one exception, “recent findings reveal a lack of association between staffing and falls . . .”

Limitations of Prior Research

- * Assumption that staffing has a **linear** association with fall rate
- * Hospital-level analysis
- * RN, LPN, UAP hours combined



Dunton et al (2004)

- * NDNQI study
- * Modeled non-linear associations
- * Total falls
 - * On step-down, med, and med-surg units:
 - * Higher staffing associated with lower fall rate up to 15 TNHPPD
 - * No significant association above 15 TNHPPD
 - * On surgical units:
 - * No significant association below 15 TNHPPD
 - * Higher staffing associated with lower fall rate above 15 TNHPPD

Dunton et al (2004)

- * Injury falls
 - * On medical units, higher staffing associated with lower fall rate up to 9 TNHPPD
 - * No other significant associations with TNHPPD
- * Skill mix
 - * On step-down and med units, higher skill mix associated with lower total fall rate
 - * On step-down units, higher skill mix associated with lower injury fall rate

Dunton et al 2007

- * NDNQI data
- * Mixed Linear Modeling
- * Results
 - * For every 1 hour increase in TNHPPD, fall rates decreased by 1.9%
 - * For every 1 percentage point increase in skill mix, fall rates decreased by 0.7%
 - * For every 1-year increase in average years of RN experience, fall rates decreased by 1%

Lake et al (2010)

- * NDNQI data
- * Considered RN, LPN, and UAP hours separately
- * ICUs
 - * Higher RN staffing associated with lower fall rates
 - * Higher LPN staffing associated with **higher** fall rates
- * Non-ICUs
 - * Effect of RN staffing not significant
 - * Higher LPN and UAP staffing associated with **higher** fall rates

Unassisted Falls

- * More likely to result in injury (Krauss et al, 2007)
- * Better measure of nursing care quality
 - * Total falls include assisted falls
 - * Injury falls affected by patient age, condition
- * Very little research

Staggs et al (2012)

- * NDNQI study of unassisted falls
- * Longer average RN tenure on the unit, lower unassisted fall rate
- * Higher skill mix, lower unassisted fall rate
- * Effect of staffing (across unit types):
 - * Below 9 TNHPPD, higher staffing associated with **higher** unassisted fall rate
 - * Above 9 TNHPPD, higher staffing associated with lower unassisted fall rate

Staggs & Dunton (in progress)

- * NDNQI study of unassisted falls
- * Oct 2009 – Sept 2010
- * 369,727 falls
 - * 89% unassisted
 - * 7% assisted
 - * 4% not documented

Staggs & Dunton (in progress)

- * Likelihood of injury 45% greater for unassisted falls
- * When a fall is unassisted . . .
 - * Minor injury 1.4 times as likely
 - * Moderate injury 1.8 times as likely
 - * Severe injury 1.9 times as likely
 - * Death twice as likely

Staggs & Dunton (in progress)

- * Unit types modeled separately
- * Model 1
 - * Cubic spline for TNHPPD
 - * Skill mix as linear predictor
- * Model 2
 - * Cubic spline for RNHPPD
 - * LPN/UAP HPPD as linear predictor

Model 1 Results

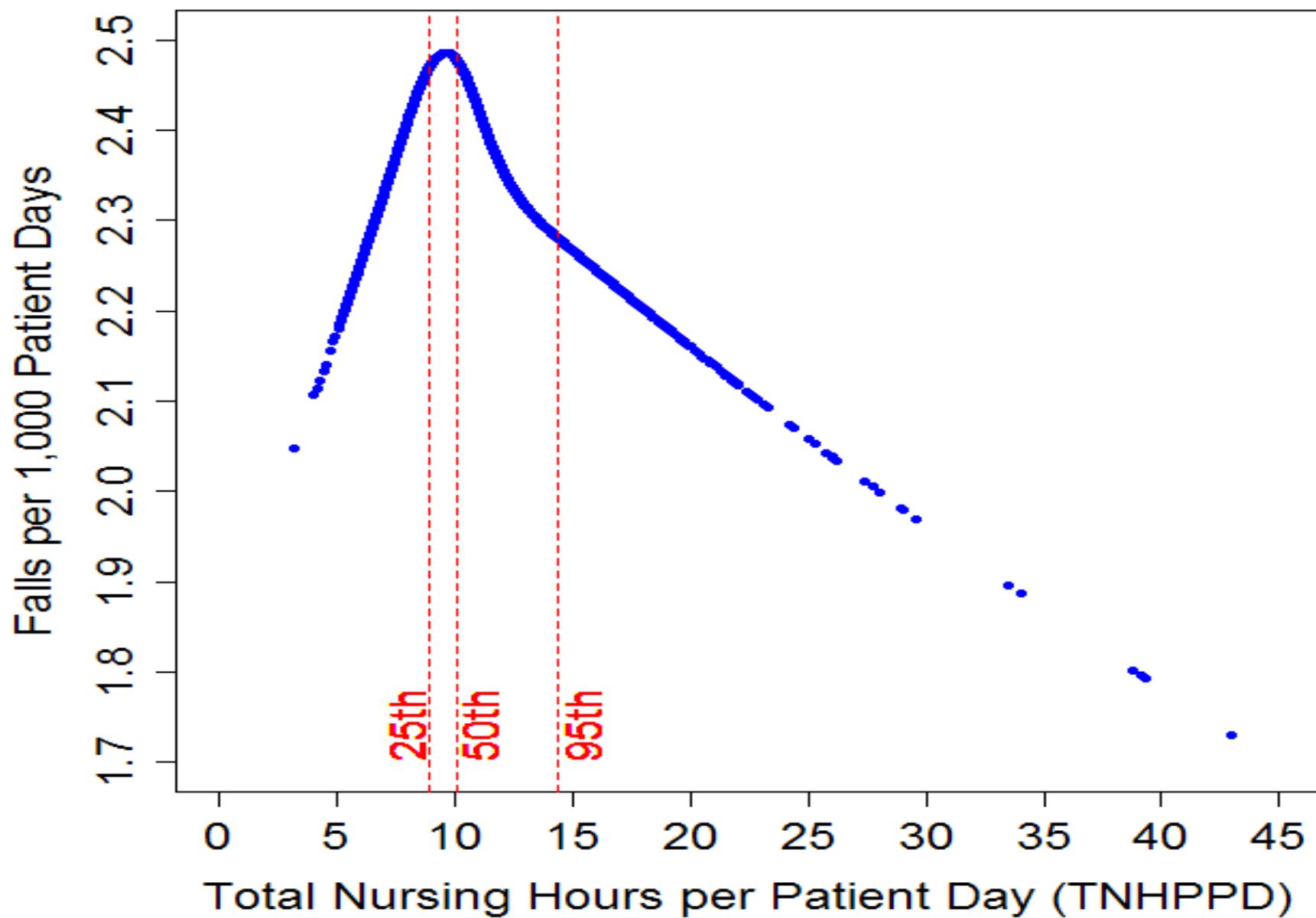
- * Step-down units

- * Higher TNHPPD associated with lower unassisted fall rate for $TNHPPD > 10$
 - * 5% lower fall rate per 10-percentage point increase in skill mix

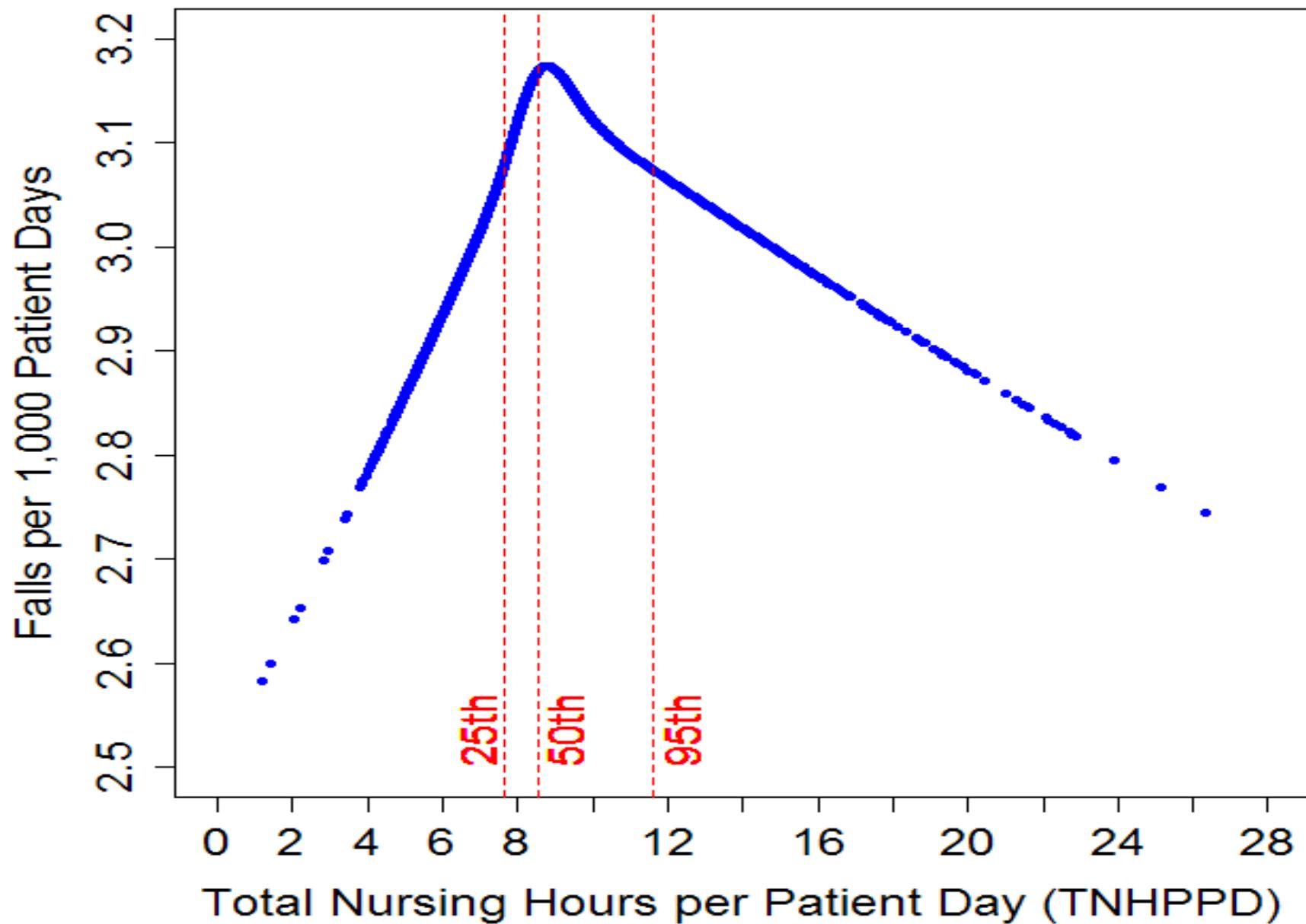
- * Medical units

- * Higher TNHPPD associated with lower fall rate for $TNHPPD > 9$
 - * 2% lower fall rate per 10-percentage point increase in skill mix

Step-Down



Medical



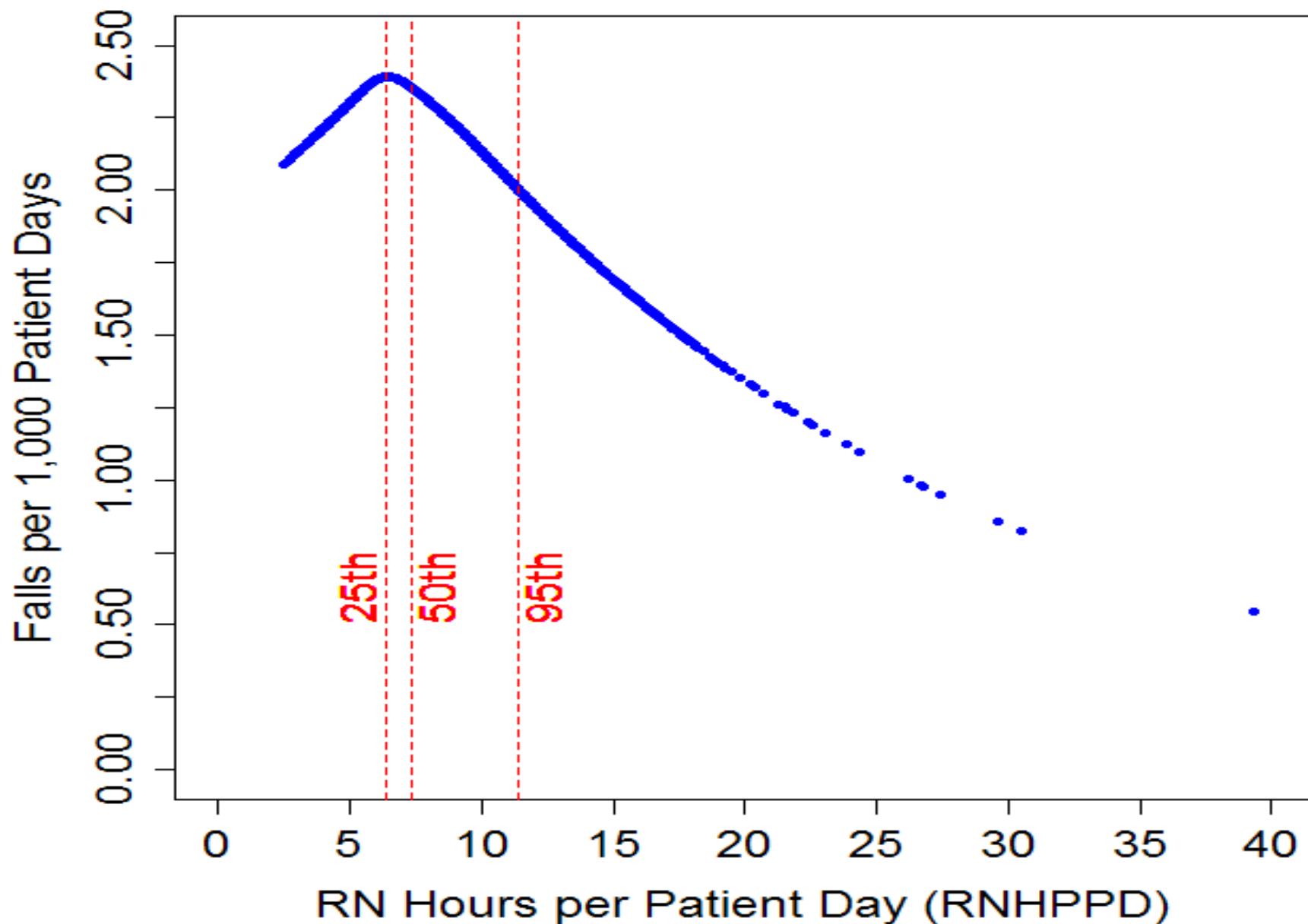
Model 1 Results

- * ICUs
 - * 3% drop in fall rate per additional TNHPPD
 - * No effect for skill mix
- * Surgical and Med-Surg units
 - * No effect for TNHPPD
 - * 3-4% drop in fall rate per 10-percentage point increase in skill mix
- * Rehab units: No effect for TNHPPD or skill mix

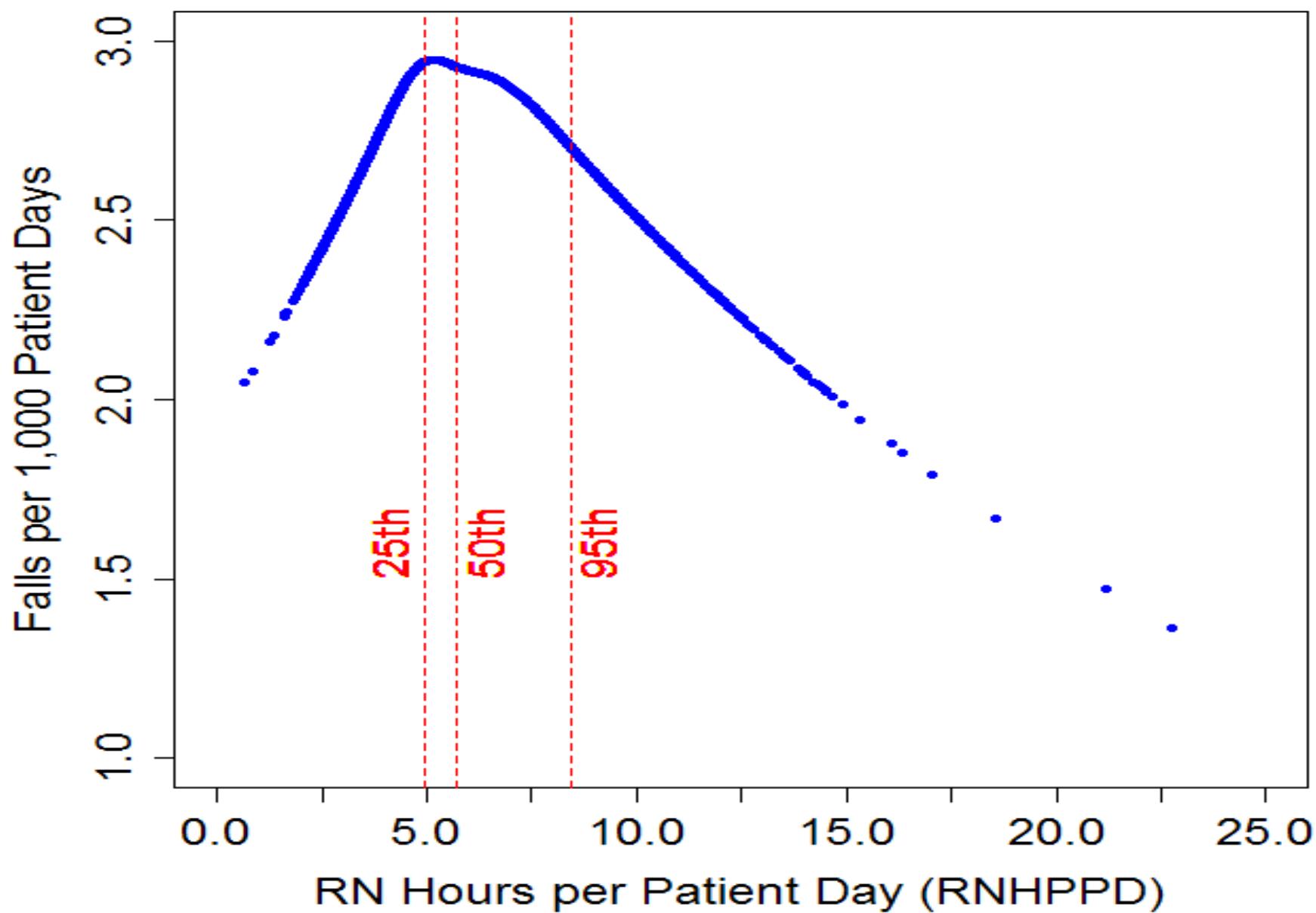
Model 2 Results

- * Surgical units
 - * 2% drop in fall rate per additional RNHPPD
 - * 4% **increase** in fall rate per additional LPN/UAP HPPD
- * Step-down, Medical, Med-Surg
 - * Higher RNHPPD associated with lower fall rate for RNHPPD > 25th percentile
 - * 3% **increase** in fall rate per additional LPN/UAP HPPD

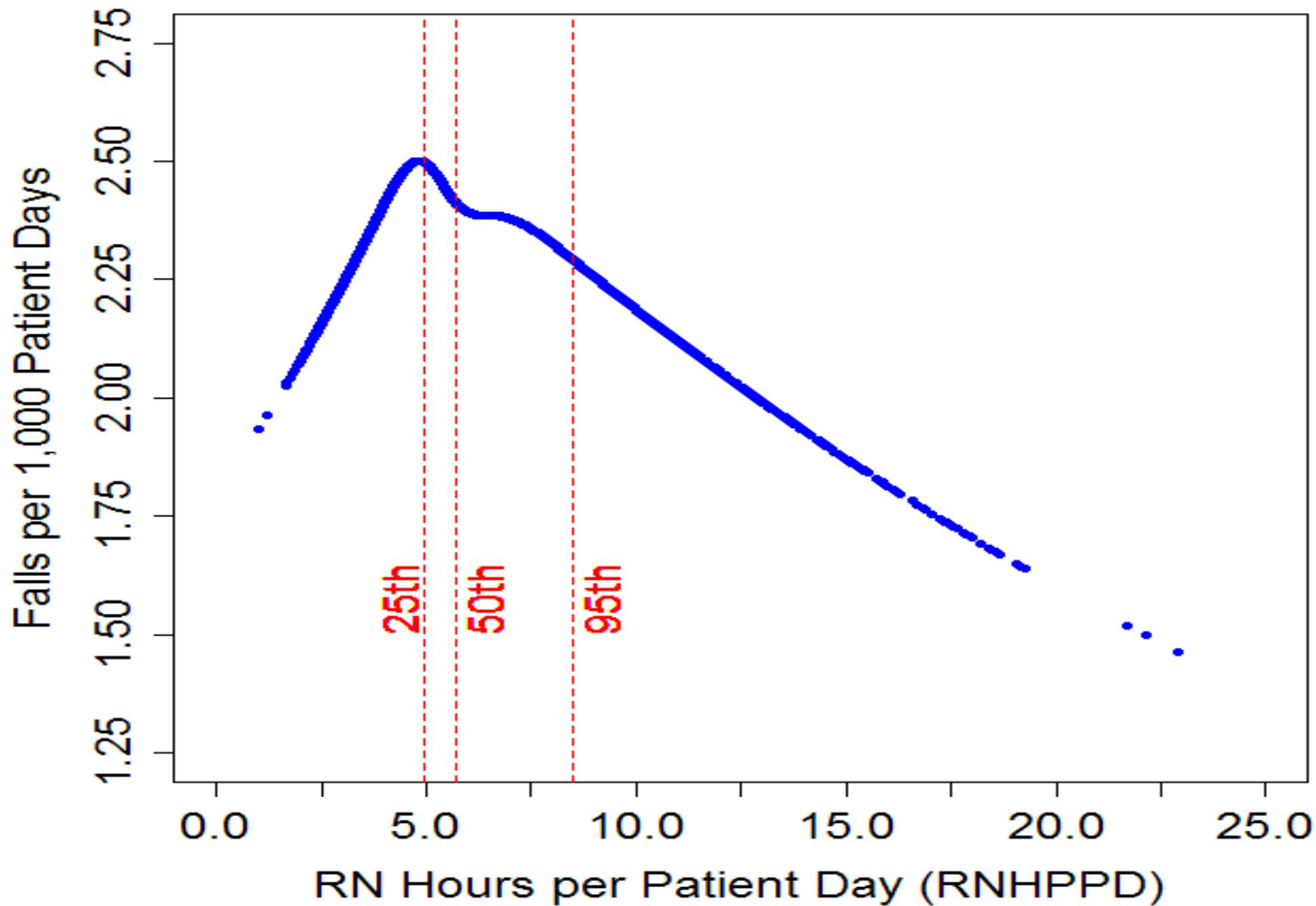
Step-Down



Medical



Medical-Surgical



Takeaways

- * Not all nursing hours are the same
 - * RN, LPN, UAP hours
 - * Nursing experience (Dunton et al, 2007) and/or tenure on unit
- * In general, reduce total fall rate by adding RNs
 - * Increases TNHPPD
 - * Increases skill mix

Takeaways

Reduce injury falls by reducing **unassisted** falls

- * Rehab units: ???
- * Step-down, Medical, Med-Surg units
 - * Increase skill mix and RNHPPD by adding RNs
 - * Step-down: Need RNHPPD >> 7
 - * Medical: Need RNHPPD >> 5 (preferably > 7)
 - * Med-Surg: Need RNHPPD >> 5
 - * Do not add LPN/UAP hours

Takeaways

Reduce injury falls by reducing **unassisted** falls

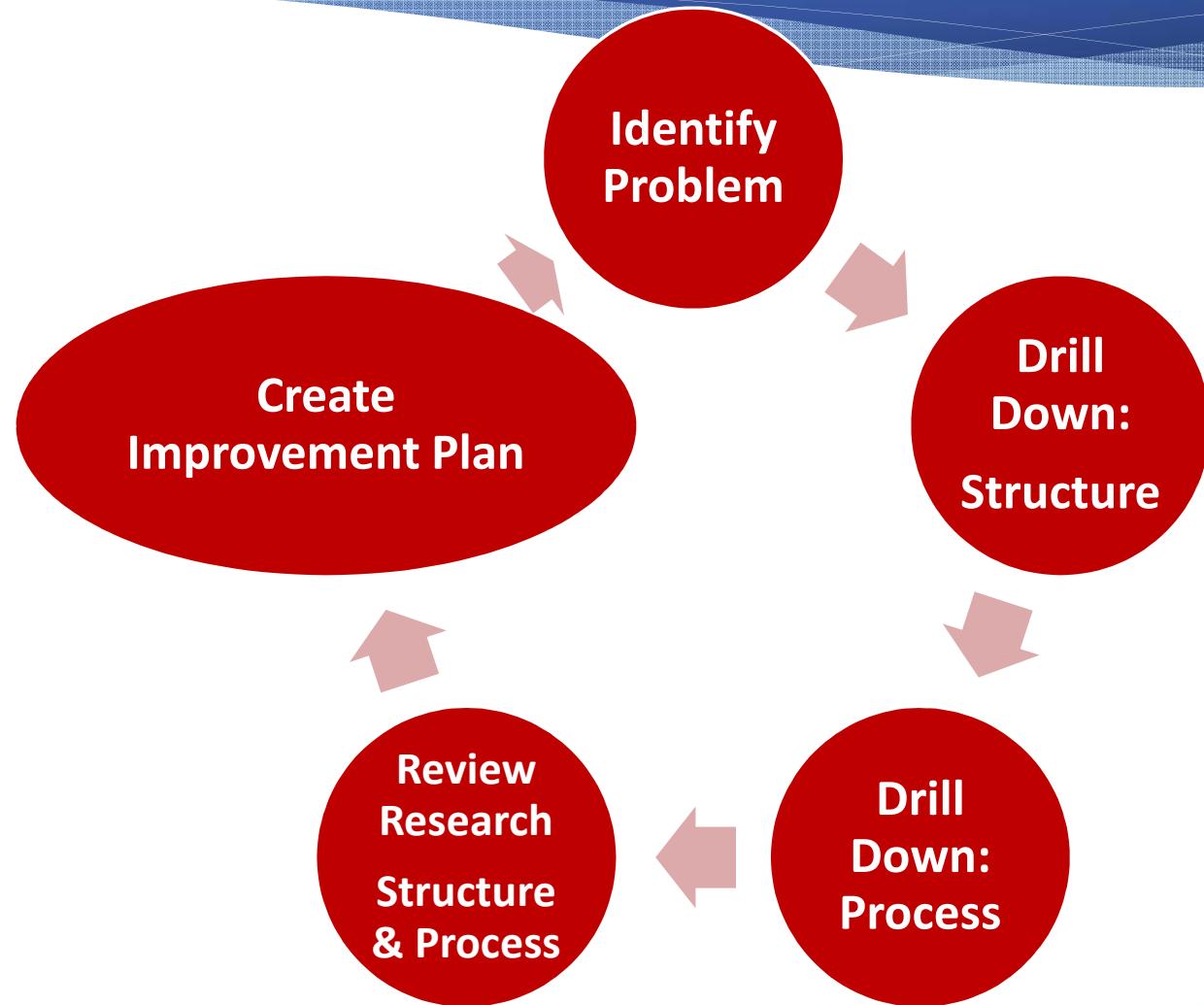
- * ICUs
 - * Increase TNHPPD
 - * RN hours better than LPN/UAP hours
- * Surgical units
 - * Increase skill mix and/or RNHPPD
 - * Do not add LPN/UAP hours

Falls

Quality Improvement Plans



Developing Quality Improvement Plans



Guidance on Structural Measures From NDNQI Research

- * **Hospital characteristics** not relevant to QI
 - * Magnet status the potential exception
- * **Unit type** is relevant
 - * Fall rates highest on Medical & Rehabilitation Units
- * **Staffing characteristics** present an opportunity for improvement
 - * More RNs beneficial
 - * Effect sizes vary by unit type and fall measure

Knowledge of Structural Effects

- * NDNQI has different kinds of fall measures: total, injury, unassisted
- * Others categorize falls as:
 - * Accidental—patient not at risk
 - * Unanticipated physiologic
 - * Anticipated physiologic
- * Choice of measure will guide your plan

What do you want to prevent?

- * Best QI plans are specific
- * Goal—Injury prevention
 - * Biggest target, reducing unassisted falls
 - * Increase TNHPPD & Skill Mix (%RN)
 - * --OR—
 - * Increase RNHPPD

Rehab Falls

- * Falls are a major safety issue—highest rates
- * Why no effects of staffing measures?
 - * Primary PT/OT assistance?
- * Higher proportion assisted (20%) than for other unit types (~10%)

Exercise

- * Medical Unit A's fall rate is 10/1,000 patient days
- * The skill mix is 50% RN hours
- * Research shows that a 10 percentage point increase in %RN will reduce fall rate by 4%
- * What is Unit A's expected fall rate if you increase to 60% RN hours

Guidance on Process Measures

- * Prevention based on risk assessment
- * Customized interventions targeted to specific risks
- * **TCAB Bundle**
 - * Frequent risk assessment, noting source of risk
 - * Identify patients at high risk at the beginning of shift
 - * Educate patient/family about risk
 - * Hourly or 2-hourly rounding

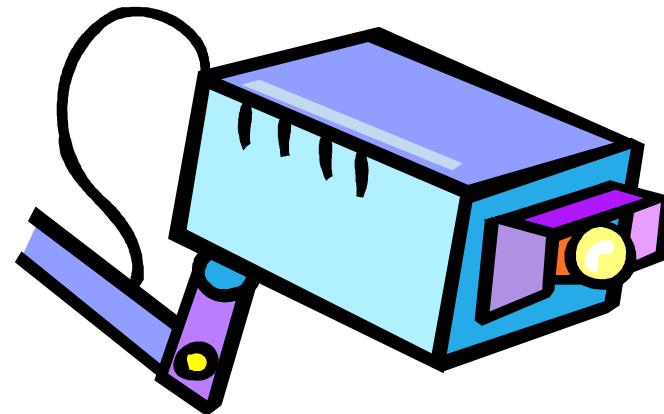
Institute for Healthcare Improvement

- * Considerable body of literature on fall prevention
- * Little evidence exists on the impact of specific interventions
- * “When healthcare professionals believe that they can prevent falls in hospitals, and undertake a well-thought-out program...., remarkable success can be achieved”



New Emphases

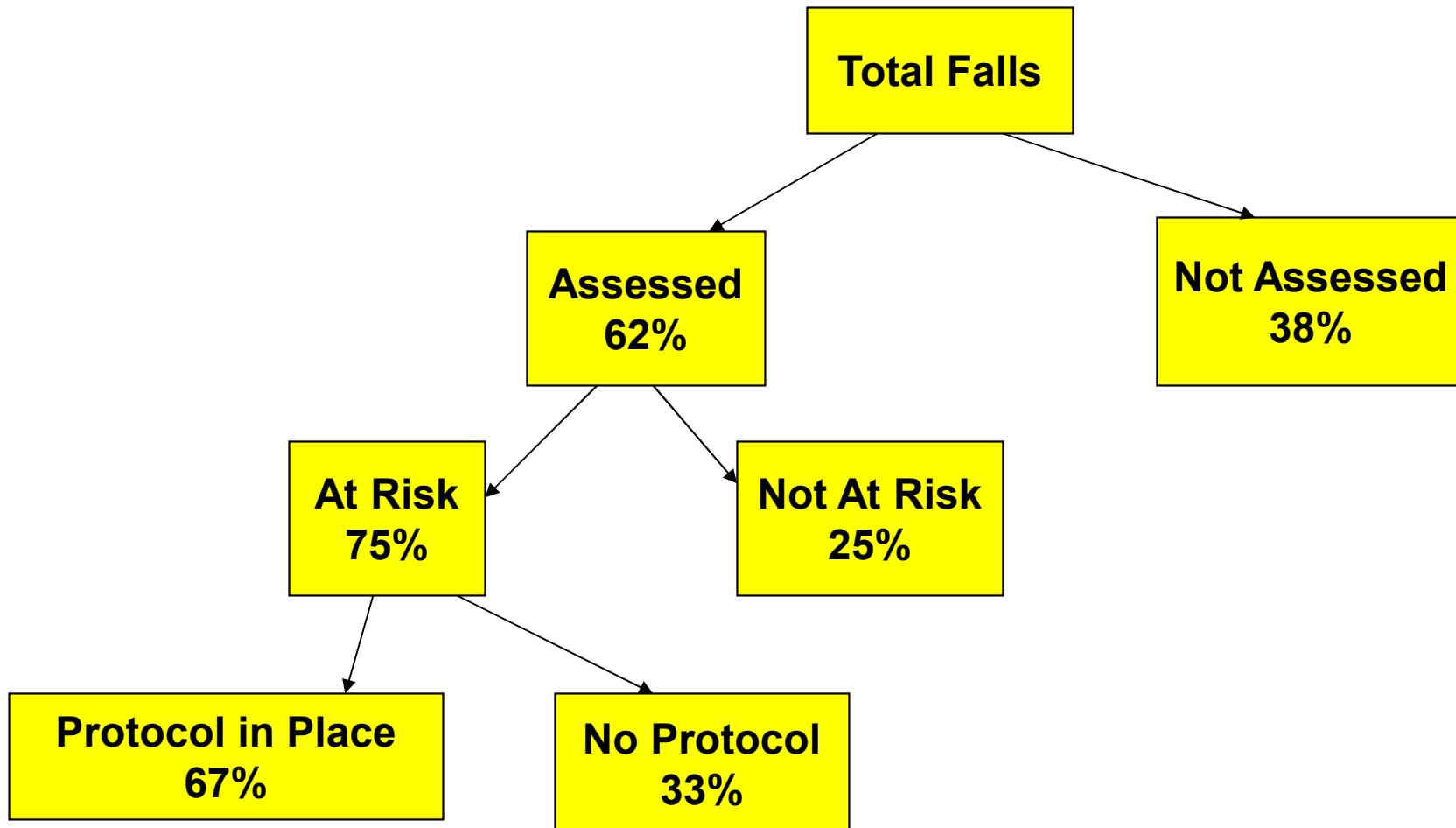
- * All high risk patients attended while in the bathroom
 - * In some locations, all at risk patients
- * Surveillance



NDNQI Analysis of Falls & Process Measures

- * Limited analysis
- * One study found a beneficial effect to recent risk assessment
- * Standard drill down shows opportunities for improvement on assessment & interventions

Could the Fall Process Prevention Process Be Improved?



Policy Influence

- * Trends in NDNQI Fall Rates generally show gradual decline since 2004
- * Rates for Rehab units declined sharply
 - * Change in Medicare coverage—those more likely to fall discharged to other facility types?
- * Rates for Surgical units increased
 - * Early Ambulation/Early Post-Op activity

Examples of Success

NDNQI Monographs



CHRISTUS St. Michael Health System

Texarkana, TX

- * Evidence-Based Advisory Committee established to find best practices
- * Developed Fall Protocol
- * Patients assessed @ ADT, change in status, & after a fall using Morse Fall Risk Screening
- * Goal of 8% reduction in number of falls



1st CHRISTUS Protocol

[Produced no change]

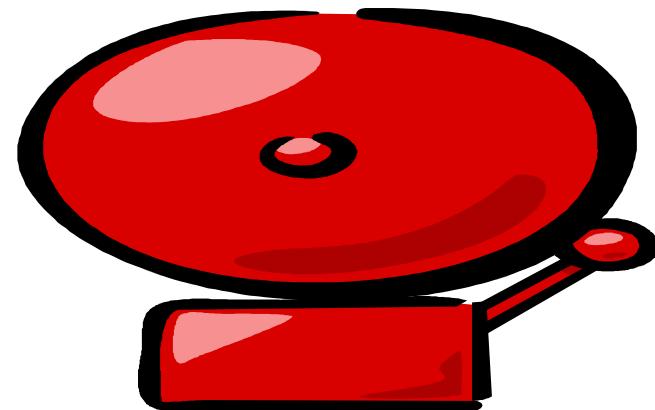
- * Moderate/High risk patients have
 - * Yellow arm band
 - * Yellow door signage
 - * Hourly rounds , Environmental Safety Check List
 - * Bed in low position
 - * Bed alarm turned on
 - * Reminding patient/family to call if patient needs to get out of bed
 - * Pain and Potty checks

2nd CHRISTUS Protocol

- * **Weekly Falls Committee** reviews all falls
 - * Goal—to identify possible causes
 - * Patient's nurse presents case
- * Identified factors
 - * Family member left patient room without notifying staff that patient would be unattended
 - * High risk patients left in bathroom unattended
 - * Faulty alarms
 - * Need to reorient staff on protocol periodically

CHRISTUS Purchased

- * Low beds
- * New bed & chair alarms
- * Commodes with drop sides
- * Surveillance cameras in patient rooms



CHRISTUS Identified Most Important Changes

- * **Changing culture** from belief that patients will fall to RN accountability for fall prevention
 - * This made the EBP fall prevention protocol and Weekly Fall Committee case reviews effective



Memorial Hospital

Chattanooga, TN

- * New bed & chair alarms
- * Algorithm for sitter usage
- * Lower nurse-to-patient ratio
- * Post fall huddles



Rush-Copley Medical Center

Aurora, IL

- * Changed **Organizational philosophy**
 - * “There will be no falls at our facility”
 - * Safety white boards in unit staff areas that document the number of days since the last patient fall
 - * 616 days without a fall with a major injury



Assaults

Assaults Indicator Development

- * Developed 2004
- * Key Experts:



- * Process
 - * Literature review
 - * Discussions
 - * Pilot testing
 - * Evaluation
 - * Modifications
 - * Implementation
- * Q1 2005

Assaults Refinement

- * Indicator Review
 - * Implemented
 - * Dashboard labels
 - * Proposed
 - * Types of seclusion
 - * Creating work environment indicator

Assaults

Research Findings

Research Questions

- * How does nurse staffing relate to assaults?
 - * Positive relation: More staffing associated with higher assault rates
 - * Negative relation: More staffing associated with lower assault rates
- * Does staffing influence assaults?
- * Do assaults influence staffing?

What We Know

- * Some conventional wisdom:
More staffing → lower assault rate
- * Very weak evidence
 - * Association between staffing and *rate* of violence not measured
 - * Sample limitations
 - * Other limitations
- * Best evidence: Units with higher staffing tend to have higher assault rates

Bowers et al (2009)

- * 136 psych units in 67 English hospitals
- * “Unwelcome finding”: More nurses, more physical aggression
- * Does higher staffing increase likelihood of patient-staff conflict?

Bowers & Crowder (2011)

- * 32 units from 2009 study
- * More qualified nurses, more conflict incidents (now and later)
- * Little evidence that conflict incidents influence staffing
- * Qualified staff role in limit-setting, etc.

Owen et al (1998)

- * 5 psych units in 2 Australian hospitals
- * More nurses, greater risk of violence



Depp (1983)

- * 1973 study of 4 psych units in a U.S. hospital
- * 31 violent incidents
- * “some tendency for higher staffing on the shift or day a violent incident occurred”

PATIENT VIOLENCE

by Marilee K. Jones MSN, RN, CS

report of 200 INCIDENTS

Studies of assaultive behavior in hospital settings are increasing. Results are often contradictory. These variances are dependent upon the type of hospital, the specific setting, and the disciplines involved in the reporting process. Open recognition that violent incidents occur, and the substitution of fact finding for finger pointing, are the first steps toward prevention and management.



Staggs & Dunton

Purposes:

- * Confirm a positive linear association between staffing and assault rates
- * Explore non-linear association
- * Show that psychiatric unit staffing is driven largely by hospital-level factors

Sample and Data

- * 2010 NDNQI data
- * 351 adult psych units in 255 U.S. hospitals
 - * 11 psychiatric
 - * 244 general
- * 3,397 unit-months of assaults and staffing data
- * Staffing data for non-psychiatric units in 219 general hospitals

Dependent Variables

- * Total assaults
 - * Any unwanted physical contact, regardless of intent to harm
 - * Includes repeat assaults
- * Injury assaults
 - * Includes repeat assaults
- * Non-repeat injury assaults
 - * Excludes repeat assaults in a month

Variables

- * Total Nursing Hours per Patient Day (TNHPPD)
- * RN Skill Mix
- * Hospital teaching status
 - * Academic medical center
 - * Teaching hospital
 - * Community hospital

Assault Rate Analysis

- * Linear model: TNHPPD as linear predictor of assault rate
- * Spline model: Non-linear association
- * Explanatory variables in both models
 - * Teaching status
 - * Hospital type (general, psychiatric)
 - * Locked/unlocked unit
 - * Time (month)

Assault Rate Analysis: Results

- * 3,193 assaults reported
- * 1,305 injury assaults
 - * 186 (14%) repeat assaults
 - * 1,100 (84%) non-repeats
- * 1,846,992 patient days

Linear Model Results

- * More staffing, more assaults
- * One-unit increase in TNHPPD associated with 14-15% higher assault rates
- * No differences by hospital type, teaching status, or locked unit status

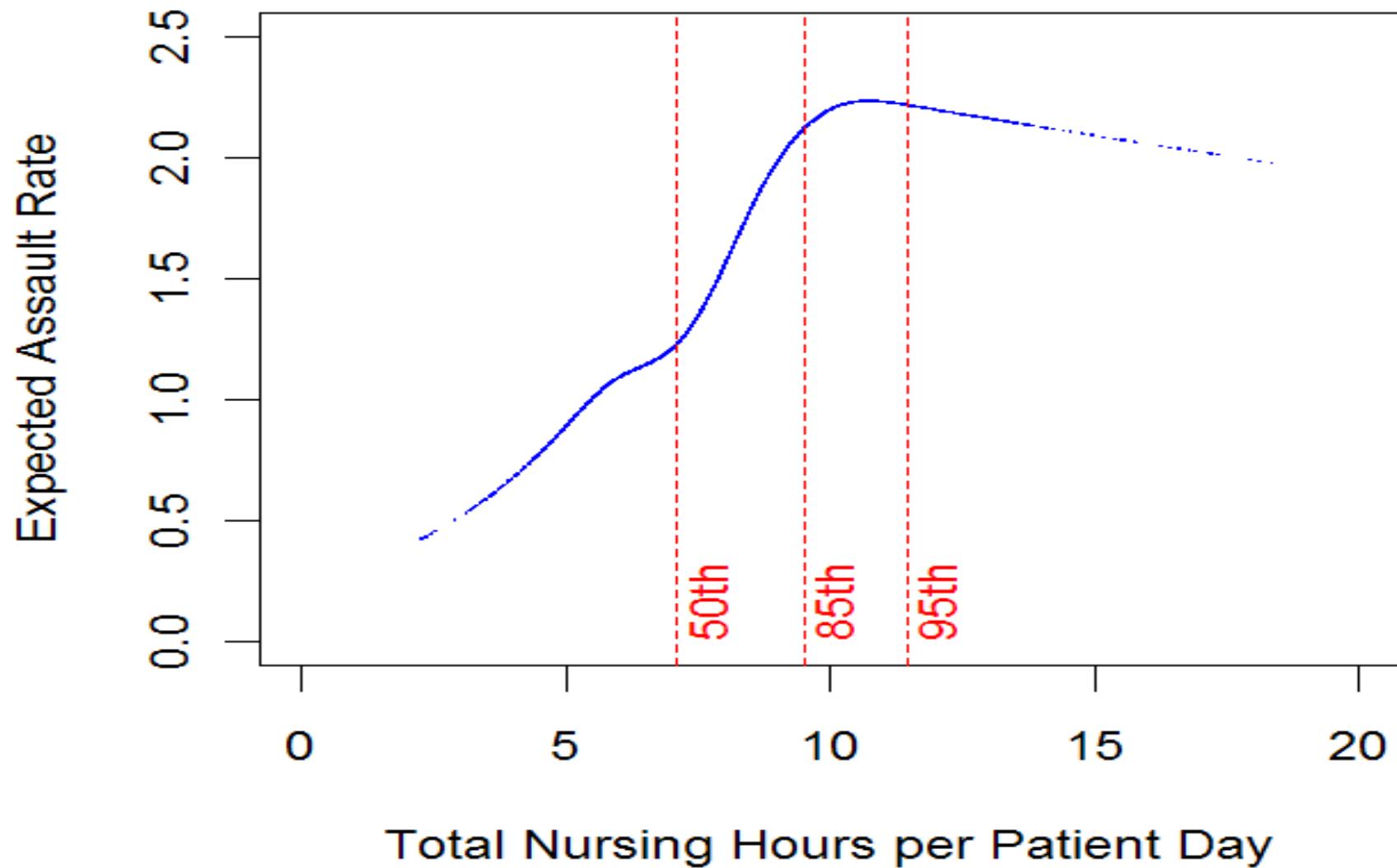
Simpler Explanations

- * Higher staffing means . . .
 - * Greater likelihood of patient-staff conflict over limit-setting
 - * More assaults observed and reported
- * Units with high assault rates have higher staffing . . .
 - * To prevent even more assaults
 - * To handle assaults

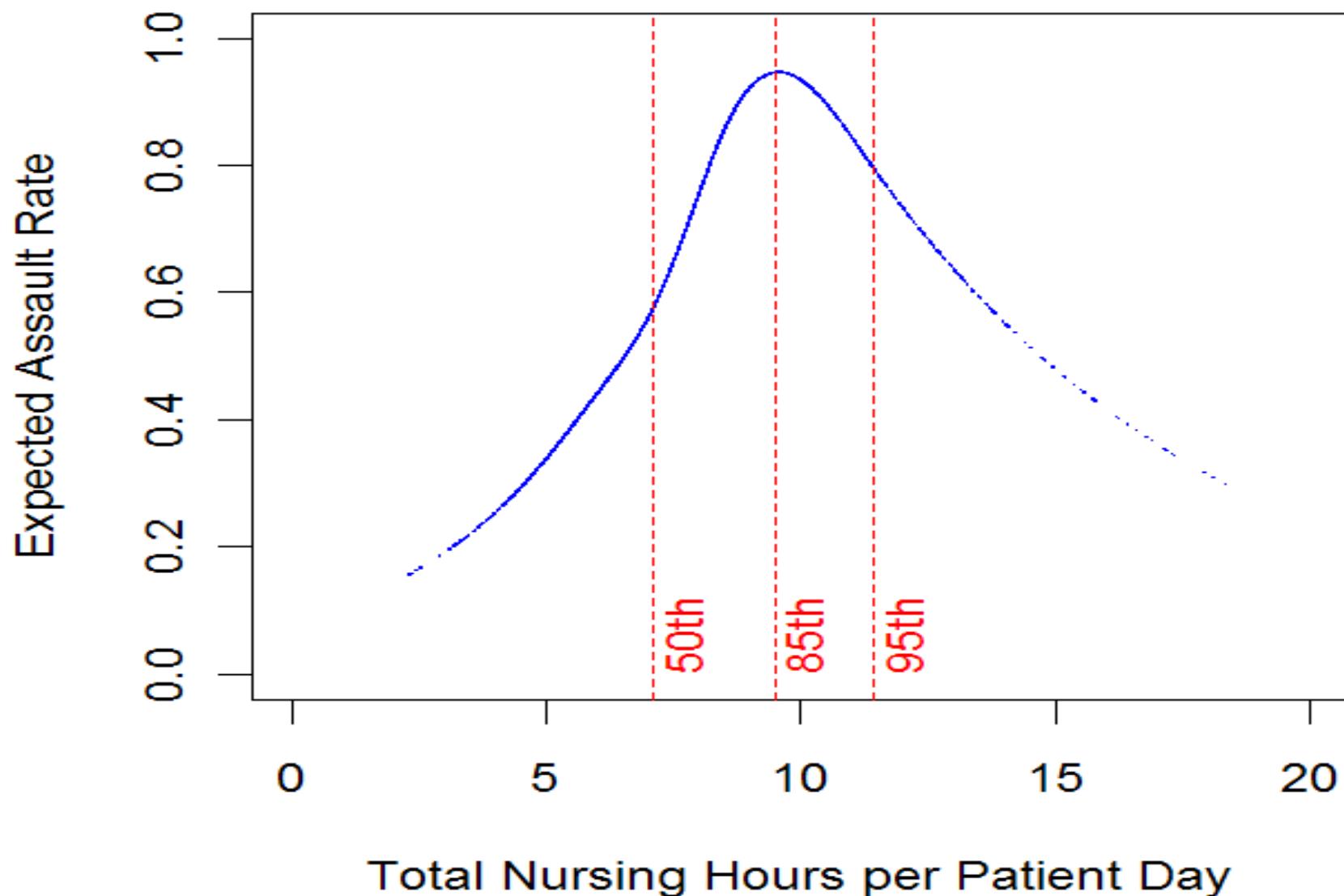
More Interesting Explanations

- * Depp's (1983) "demanded-activity hypothesis"
- * Morrison (1990)
 - * Staff members reinforce violent behavior with attention
 - * Seclusion seen as desirable
 - * Violence more likely in the presence of staff
- * Melbin (1969)
 - * Unusual behavior reinforced by consistent response from clinician
 - * Reduces uncertainty, gives sense of control

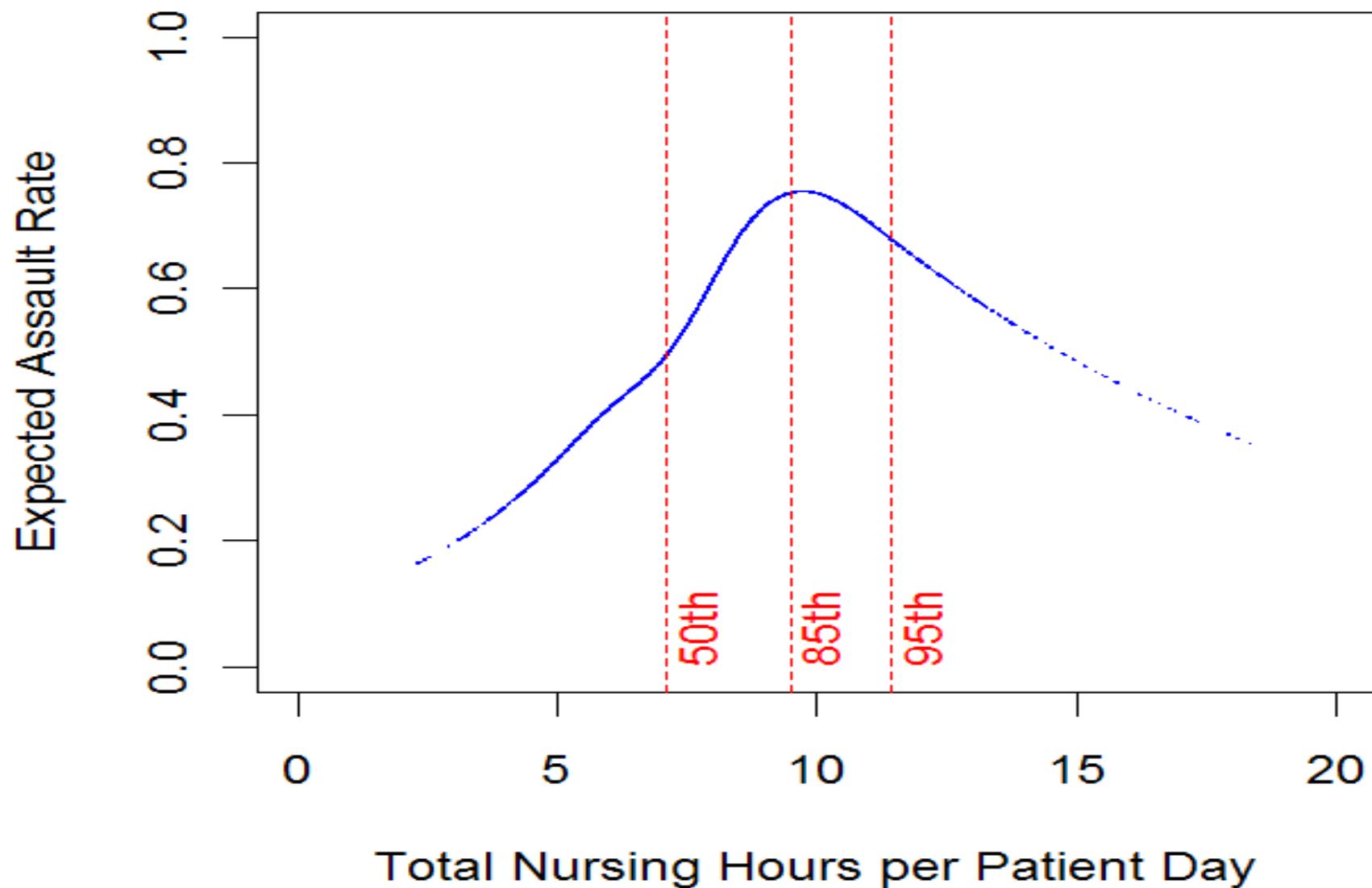
Total Assault Rate



Injury Assault Rate



Non-repeat Injury Assault Rate



Spline Model Results

- * Assault rates increase with staffing until TNHPPD exceeds 85th or 90th percentile
- * Rates then begin to drop
- * No differences by hospital type, teaching status, or locked unit status

Psychiatric Unit Staffing

- * Do assault rates determine staffing levels?
- * Psych units in the same hospital tend to have similar staffing levels (ICC = 0.60)
- * Staffing of non-psych units in a hospital is a strong predictor of psych unit staffing

Takeaways

- * Need to re-think psych unit staffing—more may not be better
- * Are RNs or MHTs involved in more assaults, and why?
- * Understand potential triggers
 - * Demanded activity after inactivity
 - * Limit-setting, rule enforcement
 - * Disruption in routine
- * Beware unintentional reinforcement

Assaults

Quality Improvement Plans



QI Plan for Assaults

- * Current staffing research of limited value for reducing patient assaults
- * Need additional research to explore other structural measures: skill mix, years of experience, certification
- * Need additional research on care processes that can be related to assaults, e.g., value of de-escalation

Examples of Success

NDNQI Monographs



Advocate Lutheran General Hospital

Park Ridge, IL

- * Goal: Assure a milieu for optimal treatment
- * Target the identification and management of aggressive or agitated behavior in patients
- * Studied data on assaultive episodes
- * Developed aggressive patient management protocol (from literature)
- * Unit dashboard on assaults with established goal
- * Integrate program into orientation and competency evaluation



Mary Greeley Medical Center

Ames, IA

- * Goal—reduce use of seclusion & restraints
- * Strategy—Create environment that promotes
 - * Patient empowerment
 - * Patient education in self-modulation of aggressive behaviors (self-soothing cart)
- * Activities re. seclusion & restraints
 - * Revised guidelines
 - * Developed a clinical pathway and flow sheet
 - * Developed patient & family education

Mary Greeley, con't

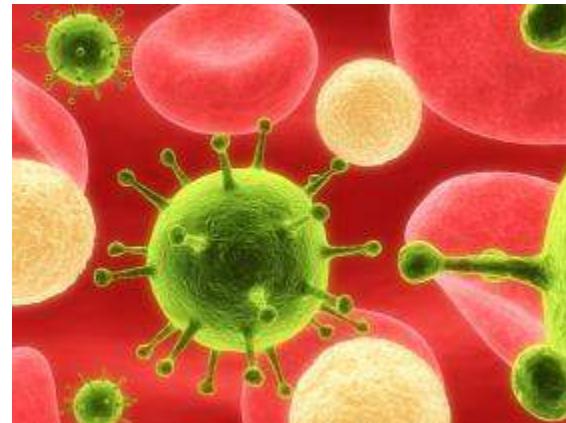
- * Modified admission process to identify risk factors
 - * 1:1 staffing for at-risk patients
- * Developed incident reporting form
- * Implemented mandatory education on symptoms, de-escalation & violent patient management, and self-defense
- * Increased use of therapeutic interventions
- * Increased use of camera monitoring

Healthcare-Associated Infections



HAI Indicator Development

- * Developed
 - * Centers for Disease Control and Prevention (CDC)
 - * National Health Safety Network (NHSN)
 - * Society for Healthcare Epidemiology of America (SHEA)



HAI Indicator Development

- * Process

- * Discussions with Teresa Horan, MPH
- * Pilot testing
- * Evaluation
- * Modifications
- * Implementation
 - * Q3 2007
 - * Adult Critical Care Units, Pediatric Critical Care Units, NICUs

HAI Indicator Refinements

- * 2008

- * Changed calculation method to quarterly rate to align with CDC

- * 2009

- * CAUTI

- * Removed Asymptomatic Bacteriuria (ASB)

- * Added Asymptomatic Bacteremic UTI (ABUTI)

- * 2010

- * CLABSI

- * Removed Clinical Sepsis from NICU

HAI Indicator Refinements

- * 2011

- * Opened to new unit types:
 - * Medical, surgical, med-surg, step-down, rehab
- * CLABSI
- * Neonates
 - * Umbilical catheter days
 - * Non-umbilical central line days



What we know

- HAIs are the fifth leading cause of death in acute care hospitals
 - * Two thirds of HAI deaths are the result of:
 - * Ventilator Associated Pneumonia (VAP)
 - * Catheter-associated bloodstream infection (CABSI)
 - * CAUTI is the most prevalent HAI

What we know

- * HAI contribute to increased hospital costs
 - * CAUTI: \$2,000 - \$5,000
 - * CABS: \$21,000-\$35,000
 - * VAP: \$23,000 - \$100,000
- * HAI contribute to increased hospital length of stay
 - * CABS: 7.5 days in hospital; 2 days in ICU
 - * VAP: up to 50 days

Recommendations

- * **Education** of personnel on proper procedure for insertion, maintenance of devices, risk factors and patient outcomes
- * Insertion and maintenance of devices done by **trained personnel**
- * Appropriate **nursing levels**

Initiatives

- * CMS
 - * Non-payment for CAUTI and CLABSI starting Oct 1, 2008
- * Checklists
- * Practice bundles
- * Monitoring
 - * Mandatory
 - * Voluntary
- * Publicly available reports
 - * Various levels of analysis

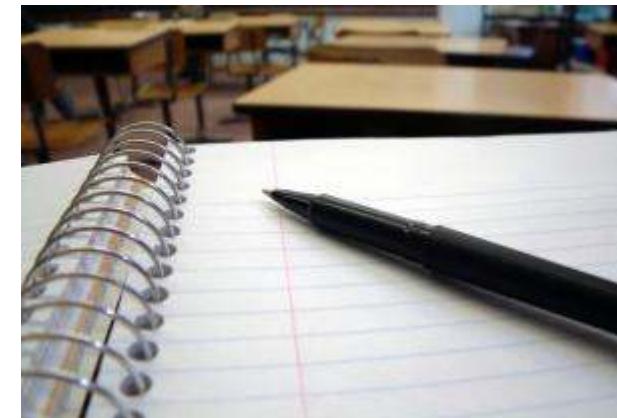


Overview

- * Association between staffing and HAI
 - * Higher patient to nurse ratio = higher infection rates
 - * Unable to provide recommended care
 - * Poor hand hygiene compliance
- * Association between agency nurses and HAI
 - * Higher use of temporary nurses = higher infection rates
 - * Unfamiliar with facility's procedures and best practices
 - * May not have the relationships that foster good communication

Umscheid et al (2011)

- Clinician education: Lectures, pre-post test, posters to educate staff on CDC recommendations
 - CAUTI: reduced by 17-69%
 - CLABSI: reduced 18-66 %
 - VAP: reduced by 38-46%



Fridkin et al (1996)

- * Staffing and CABSI
 - * Higher catheter line associated bloodstream infections in Surgical ICUs associated with:
 - * Low RN hours per patient day
 - * RN hours per patient day < 19

Hugonnet et al

- * Staffing and HAI (2007)
 - * Higher nurse to patient ratio associated with 30% reduction for all ICU HAI
 - * Lower nurse to patient ratio on a given day increased infection risk 2-4 days later
- * Staffing and VAP (2007)
 - * Lower nurse to patient ratios increase the risk for late-onset VAP but not early onset VAP

Stone et al (2007)

- * Staffing
 - * RN Hours per patient day
 - * Higher RN hours per patient day = lower VAP
 - * Association between RN hours per patient day and CLABSI
 - * Overtime
 - * High overtime = high CAUTI
- * Working Conditions
 - * RN perceived positive organization climate = 39% lower CAUTI

NDNQI Research: CLABSI

- * % RN Hours from Agency
 - * CLABSI rate on units with > 7% agency is 82% higher than on unit with <=7% agency
- * Total Nursing Care Hours per Patient Day
 - * CLABSI rate on units with > 17 THNPPD is 37% lower than on units with <=17 THNPPD

NDNQI Research: CAUTI

- * Total Nursing Hours Per Patient
 - * Critical Care units where TNHPPD <=18, CAUTI rate is 11% lower for every increase of 1 TNHPPD
- * Magnet
 - * Magnet facilities had 39% lower CAUTI rate than non-Magnet facilities

Dunton and Potter (in process)

- * NDNQI Study of CAUTI, CLABSI, and VAP
- * Adult Critical Care Units in 2010
- * Variables includes
 - * Hospital demographics
 - * Staffing
 - * Certification
 - * Quarterly
 - * RN Survey



Staffing Results

- * CAUTI
 - * RN hours per patient day increase by 1 = 4% decrease
- * CLABSI
 - * RN hours per patient day increase by 1 = 4% decrease
- * VAP
 - * Percent of RN hours from agency increase by 1% = 3% increase

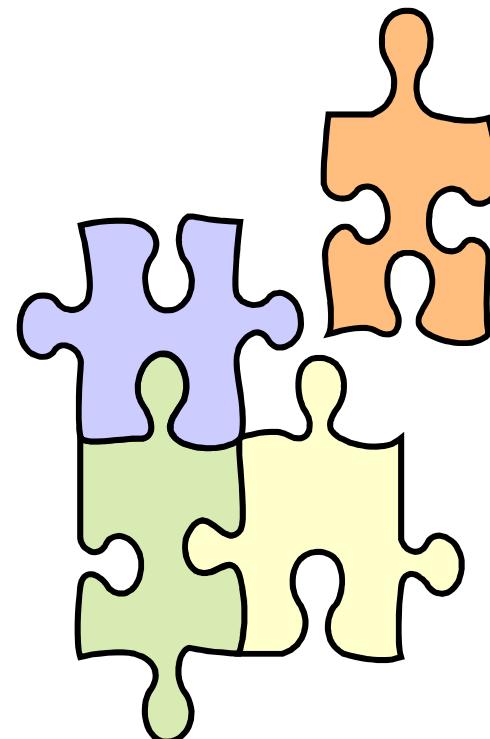
Certification Results

- * CAUTI
 - * CCRN certification: 1% decrease
- * CLABSI
 - * Cardiac Surgery Certification: 6% decrease
- * VAP
 - * No specific critical care certifications were associated with VAP



Why submit to NDNQI and NHSN

- * Both provide comparison data
 - * NDNQI has Magnet status
- * NDNQI has:
 - * Staffing
 - * Certification
 - * RN Survey
 - * Satisfaction
 - * Work Environment



NDNQI Staffing Measures

- * Staffing Data
 - * Total nursing care hours per patient day
 - * Nurse to patient ratio:
 - * Total nursing care hours per patient day / 24
 - * Patient to nurse ratio:
 - * 24/ total nursing care hours per patient day
 - * RN nursing care hours per patient day
 - * % of RN hours from agency hours
 - * % of RN hours
 - * RN Certification
 - * RN Education

RN Satisfaction Data

- * RN Satisfaction Data
 - * Job Satisfaction
 - * Practice Environment
 - * Job Enjoyment
 - * RN Work Context
 - * RN Characteristics
 - * RN Education
 - * RN Certification
 - * RN Years of Experience



Takeaways

- * Increase nursing care hours per patient day
- * Minimize agency hours
- * Educate staff
 - * Training on recommendations
 - * Increase number of RNs with specialty certification
- * Work Environment
 - * Open communication
 - * RN-RN
 - * RN-MD

Healthcare-associated Infections

Research and Quality Improvement Plans



Examples of Success

NDNQI Monographs



Medical Center of the Rockies

Loveland, CO

- * Reducing Catheter-Associated UTIs
- * Added review of the catheter necessity to the daily inter-professional rounds
 - * EBP specifies removal as early as possible (3 days), silver-coated catheters are effective, & soap & water perineal care
- * Roll-Out: educational posters in RN gathering places, training, emails, flyers, staff meetings



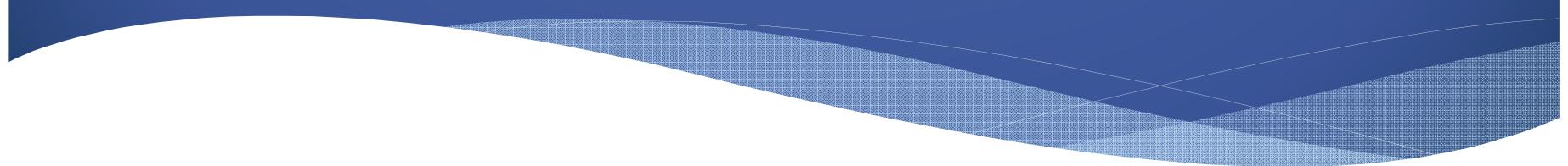
Cook Children's Medical Center

Fort Worth, TX

- * Reduced Central Line-Associated Blood Stream Infections
- * 2 full time RNs hired as a team for dedicated line insertion and dressing change
- * Team implemented EBPs
- * Team did daily rounds encouraging prompt removal of unused lines
- * Real-time feedback on infection-free days



Pressure Ulcers



Pressure Ulcer Indicator Development

- * Developed in 1998
- * Key Experts
 - * Nursing Executives and Quality Specialists
 - * American Hospital Association (AHA)
 - * Catholic Health Association (CHA)
 - * Agency for Health Care Policy and Research (AHCPR)
 - * Joint Commission on Accreditation of Healthcare Organizations (JACHO)



PU Indicator Refinements

- * 2003:

- * Stages of each hospital acquired pressure ulcers
- * Time since last risk assessment
- * Prevention protocol

- * 2006

- * Unit acquired pressure ulcers
- * Types of pressure ulcer interventions

- * 2007

- * Aligned definitions with 2007 NPUP guidelines
- * Added suspected Deep Tissue Injury (sDTI)

PU Indicator Refinements

- * 2009

- * Patient exclusion categories
- * Admission skin and risk assessment
- * Moisture management
- * Indeterminable

- * Unit types:
 - * Pediatric
 - * NICU III
 - * Geripsych
- * Risk assessment scales
 - * Braden Q
 - * NSRAS
 - * Multiple

PU Indicator Refinements

- * Indicator Review
 - * Implemented changes
 - * Guidelines clarifications
 - * Proposed
 - * Data entry website validations
 - * Universal protocol
 - * % of Surveyed Patients with PU Stage 3 and Above

Hospital Acquired Pressure Ulcers

Research Findings



Research on Staffing

- * Mixed results
- * Methodological limitations
 - * Hospital-level vs. unit-level
 - * Inadequate risk adjustment
 - * Not accounting for UAP hours
 - * Mixing direct care and admin/support RN hours
- * See Blegen et al (2011)

Lang et al (2004)

- * Reviewed research from 1980-2003
 - * Assessed clinical importance of findings
 - * Half of reviewed studies used hospital-level data
- * “evidence does not support a relationship between nurse staffing and the incidence of pressure ulcers”

Lake & Cheung (2006)

- * Lit review through mid-2005
- * Inconclusive evidence of effect for staffing
- * “Collectively, these studies have not identified the contributions of nurse staffing to . . . pressure ulcers.”

Dunton et al (2007)

- * NDNQI study
- * 0.7% fewer ulcers per percentage point increase in skill mix
- * Fewer ulcers on units with more experienced RNs
- * 4.4% **more** ulcers per additional TNHPPD
- * Inadequate risk adjustment?

Stone et al (2007)

- * 15,846 elderly ICU patients in 31 hospitals
- * Controlled for . . .
 - * Illness severity
 - * Comorbid conditions at admission
 - * Unit case mix (using nursing intensity weights)
- * Fewest ulcers in units with RNHPPD between 50th and 75th percentiles

Other Factors

- * Potter et al (2010)
 - * NDNQI study
 - * More unit-acquired ulcers on adult med-surg units with higher RN turnover
- * Stone et al (2007)
 - * Units with very high overtime (4th quartile) had more ulcers than units with very low overtime (1st quartile)

Reddy et al (JAMA, 2006)

- * Review of 59 randomized controlled trials
- * “Given current evidence, using support surfaces, repositioning . . . , and moisturizing sacral skin are appropriate strategies to prevent pressure ulcers.”
- * Effective support surfaces
 - * Mattress overlays on operating tables
 - * Specialized foam overlays
 - * Specialized sheepskin overlays

Bergquist-Beringer et al (in press)

- * National Pressure Ulcer Advisory Panel (NPUAP) monograph
- * NDNQI data
- * HAPUs more likely with
 - * Larger hospital size
 - * Higher Braden risk
 - * Older age
 - * Male gender
 - * Lower skill mix



Bergquist-Beringer et al (in press)

- * HAPUs in 2010
 - * 29% were Stage I
 - * 41% were Stage II
 - * 11% were sDTI (suspected Deep Tissue Injury)
 - * 13% were Unstageable or Indeterminable
- * Monitoring only Stage III & IV rate means ignoring 93% of HAPUs

Bergquist-Beringer et al (in press)

- * Patients with low/mild Braden risk accounted for 35% of HAPUs
- * Patients with moderate Braden risk accounted for 23% of HAPUs

Bergquist-Beringer et al (in press)

- * 96% of at-risk patients received prevention in last 24 hours
- * Prevention measures used
 - * Skin assessment for 98%
 - * Redistribution surface for 88%
 - * Routine repositioning for 83%
 - * Nutritional support for 64%
 - * Moisture management for 74%
- * One-third of at-risk patients received 3 or fewer prevention measures

Takeaways

- * Need prevention for patients with low and moderate Braden risk
- * Monitor overall pressure ulcer rate—don't ignore Stage I
- * Use all 5 prevention measures
- * Don't forget nutrition support and moisture management

Hospital Acquired Pressure Ulcers

Quality Improvement Plans



Guidance on Structural Measures From the Research Literature

- * Promote higher **skill mix** and more **experienced** RNs on units with problematic HAPU rates
- * Reduce RN **turnover**
- * Reduce **overtime**

Exercise

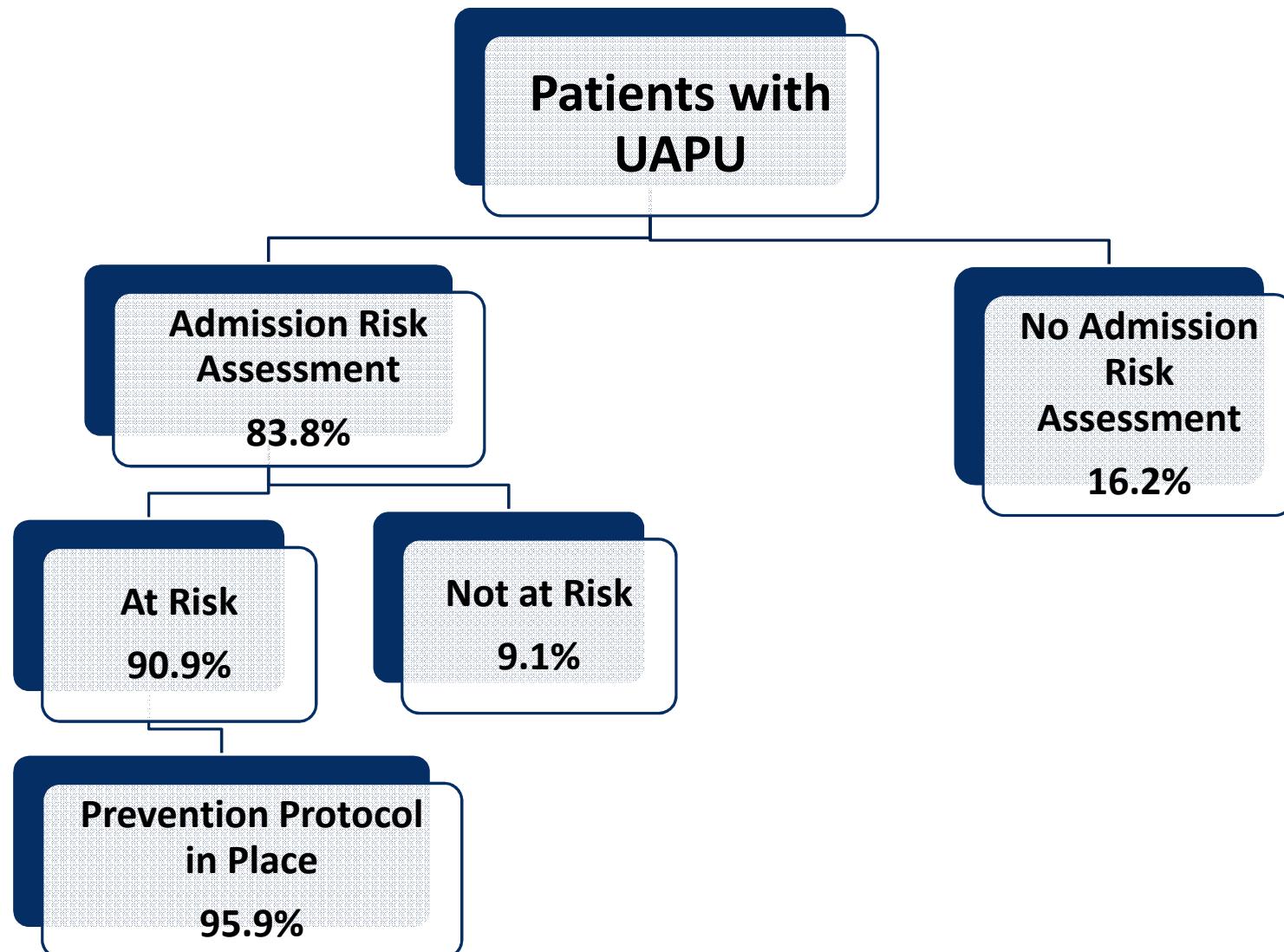
- * Intensive Care Unit A has a HAPU rate of 10%
- * Skill mix on ICU-A is 90% RN
- * Research found that for every percentage point increase in skill mix, HAPUs are reduced by 0.7%
- * ICU-A increases skill mix to 100%
- * What is ICU-A's expected HAPU Rate?

Guidance on Process Measures From the Research Literature

- * IHI Pressure Ulcer Prevention Bundle
- * Provide interventions linked to specific risk factors
 - * Daily skin assessment
 - * Pressure redistributing surface
 - * Routine repositioning
 - * Nutritional support
 - * Moisture management



Could Pressure Ulcer Prevention Be Improved?



Exercise

- * What is the single best improvement in the prevention process to reduce UAPU rates?

Examples of Success

NDNQI Monographs



Shands Hospital, U. FL

- * Team-Building and Staff Empowerment
 - * Unit-based OWLs (Ostomy Wound Liaison) are HAPU prevention resource to peers
 - * Product and process changes
 - * OWLs identified & ordered proper pH skin care products
 - * Sequential progression compression sleeves without ridges
 - * New Bi-PAP face masks
 - * Monthly prevalence studies



St. John Medical Center

Tulsa, OK

- * Paradigm shift from treatment of existing wounds to prevention
 - * Point-of-care education by CWOCN
- * Cost savings from lower pressure ulcer rates
 - * Enabled hire of CWOCN dedicated to the ICU
 - * Purchase of new prevention products
 - * Turning wedges
 - * Prevention boots for patients who cannot lift heels



Washington Hospital Center

Washington, DC

- * Developed comprehensive program
 - * Pressure Ulcer Performance Improvement Team
 - * Added CWOCN specialist
 - * Started Wound Resource Nurse program for point-of-care training
 - * Improved staffing profile
 - * EBP
 - * Culture change



Scripps Memorial Hospital

La Jolla, CA

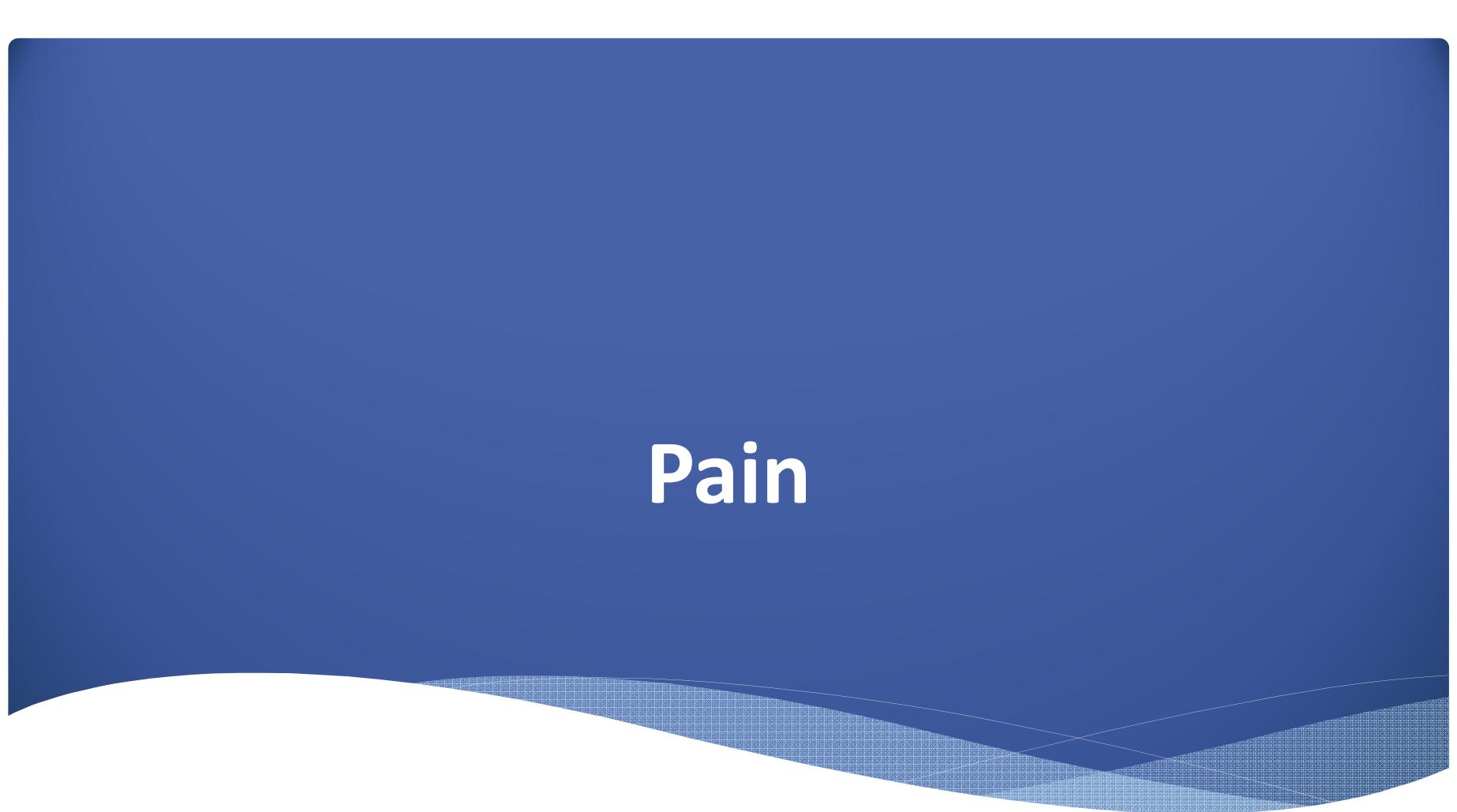
- * Unit redesign
- * Fewer agency nurses
- * Culture of prevention
- * Better products
 - * Pressure redistribution mattresses for all ICU beds
 - * Preventive dressings under Bi-PAP masks
 - * Indwelling fecal containment devices
- * Staff education



Exercise

- * Why did none of these hospitals increase skill mix or change assessment protocols?

Pain



Pain Indicator Development

- * Pediatric Pain
 - * Pain Assessment/Intervention/Reassessment Indicator
- * Developed in 2004
- * Key Experts
 - * Dr. Susan Lacey
 - * Dr. Susan Klaus
 - * Janis Smith
 - * Dr. Karen Cox

Pain Indicator Development

- * Process

- * Literature review
- * Discussions with pediatric nursing and quality measurement experts
- * Pilot testing
- * Evaluation
- * Modifications
- * Implementation
- * Q4 2004

Pain Indicator Refinements

- * Indicator Review

- * Implemented changes
 - * Guidelines clarifications
 - * Change in rate calculation
- * Proposed
 - * Changing from quarterly to monthly study
 - * Development of adult pain indicator

Pain Research Overview



Pain Prevalence

- * Amongst patients in medical/surgical units:
 - * 56-78% patients were in pain in the last 24 hours
 - * 25-48% of patients experienced **severe** pain in the past 24 hours.



Reference: Sawyer et al (2008)

Reasons for Pain

- * Underlying chronic illness
 - * Cancer
 - * Sickle cell anemia
 - * Arthritis
- * Post surgical
- * Diagnostic procedure
- * Routine care



Reference: Elcigil et al 2011

Unrelieved Pain

- * Unrelieved pain contributes to:
 - * Depression
 - * Insomnia and fatigue
 - * Increases recovery time
 - * Increase stress level
 - * Poor immune function
 - * Unwilling to cooperate with treatment

Reference: Elcigil et al 2011



Nurses Role in Pain Management

- * Nurses are the front-line caregivers in pain management:
 - * Assessment
 - * Initiate pain relief strategies
 - * Evaluation of pain treatment effectiveness
 - * Collaborate with an interdisciplinary team

Reference: Lewthwaite et al 2011



Lewthwaite et al (2011)

- * Knowledge and Attitudes Survey Regarding Pain
 - * 300 nurses
- * Strengths:
 - * Assessment
 - * Basic knowledge of pain medication administration
- * Weaknesses:
 - * Pharmacology; particularly opioids

Elcigil et al (2011)

- * Barriers to Assessment and Pain Management
 - * Nurse-related
 - * **Inadequate time for patient teaching**
 - * Physician related
 - * Inadequate assessment of pain and pain relief
 - * Doctor's indifference
 - * Patient related
 - * Patients difficulty with completing pain scales
 - * Consumers not demanding results
 - * System related
 - * Lack of psychology support services
 - * **Patient to nurse ratio**
 - * Lack of social workers

Limits

- * Limits on efforts to improve pain management
 - * Lack of pain-specific quality **indicators**
 - * Lack of **tools** to measure the quality of care related to pain management
 - * Lack of effective **strategies to translate** recommended clinical guidelines into practice

Adult Pain Indicator Development



Adult Pain Indicator Development

- * Interdisciplinary Nursing Quality Research Initiative with funding by Robert Wood Johnson Foundation (RWJF)
 - * Pain Care Quality Study
- * Co-Principal Investigators
 - * Susie Beck, PhD, APRN, FAAN
 - * Nancy Dunton, PhD, FAAN



Pain Care Quality Study (PCQS)

- * Aims

- * To evaluate the impact of disseminating and **implementing pain quality indicators** using an audit and feedback process
- * To evaluate the impact of implementing **multi-faceted implementation strategies** within a quality improvement framework
- * To evaluate the **barriers and facilitators** to measuring and improving pain management at the nursing unit level

PCQS Phases

- * Phase I: Data Collection
 - * April 2011 data collection
 - * November 2011 data collection
- * Phase II: Intervention
 - * Summer 2011



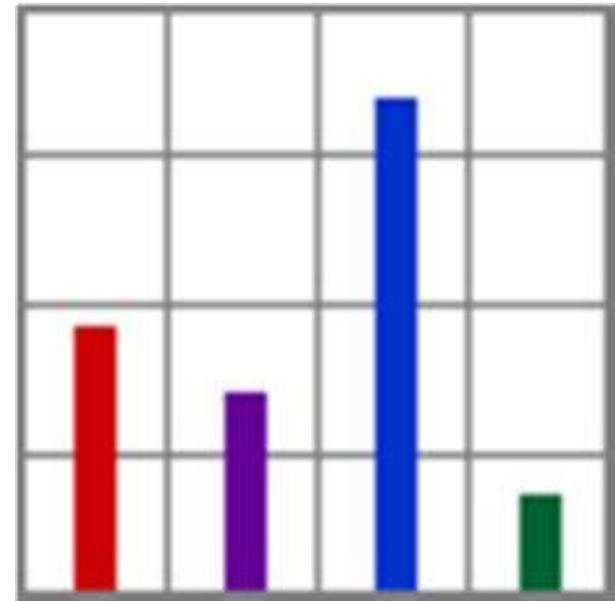
PCQS Intervention

- * Intervention Groups

- * Level 1
 - * Feedback on unit's rates compared to peer units
- * Level 2
 - * Feedback on unit's rates compared to peer units
 - * Tool kit
- * Level 3
 - * Feedback on unit's rates compared to peer units
 - * Tool kit
 - * Community of practice led by a pain expert

PCQS Reports

- * April and November Data Collection
- * Unit's Rate
- * National Comparison Data
 - * Teaching status
 - * All hospitals



PCQS Eligibility

- * Units

- * Adult Medical
- * Adult Surgical
- * Adult Med-Surg
- * Adult Step Down
- * Adult Rehab
- * Critical Access
- * Obstetric/Post Partum

- * Patients

- * Age 19 or older
- * Speak English
- * Be in pain or given pain medication within the last 24 hours

PCQS Survey Instrument Development

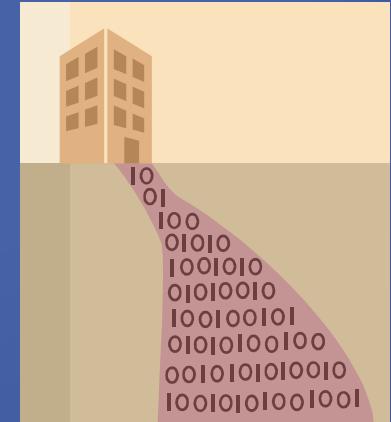
- * Qualitative Data: (102 items)
- * Construct Validity (89 items)
- * Cognitive Interviews (73 items)
- * Field Testing: (44 items)
 - * Also included the Brief Pain Inventory Short Form
- * Field Testing and Confirmatory Analysis (22 items)
- * NDNQI Stakeholders



PCQS Survey Instrument

- * Pain on Average: Scale 0-10
- * Medication Usage
- * Medication Effectiveness
- * Patient Perception of How Pain was Managed by Nurse
- * Patient Demographics
- * Cause of Pain
- * Reason for Hospital Admission



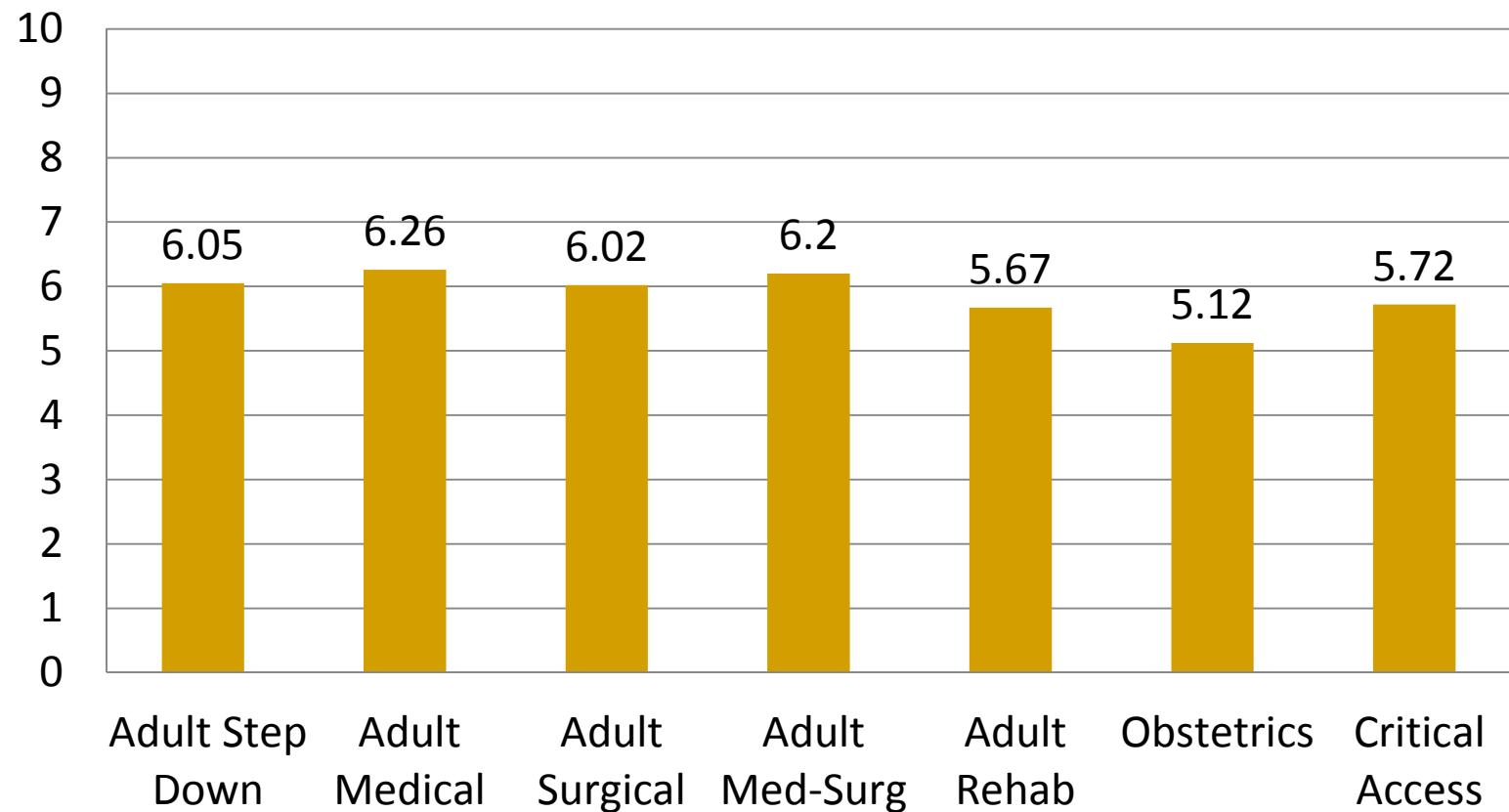


Preliminary Analysis: April Data Collection

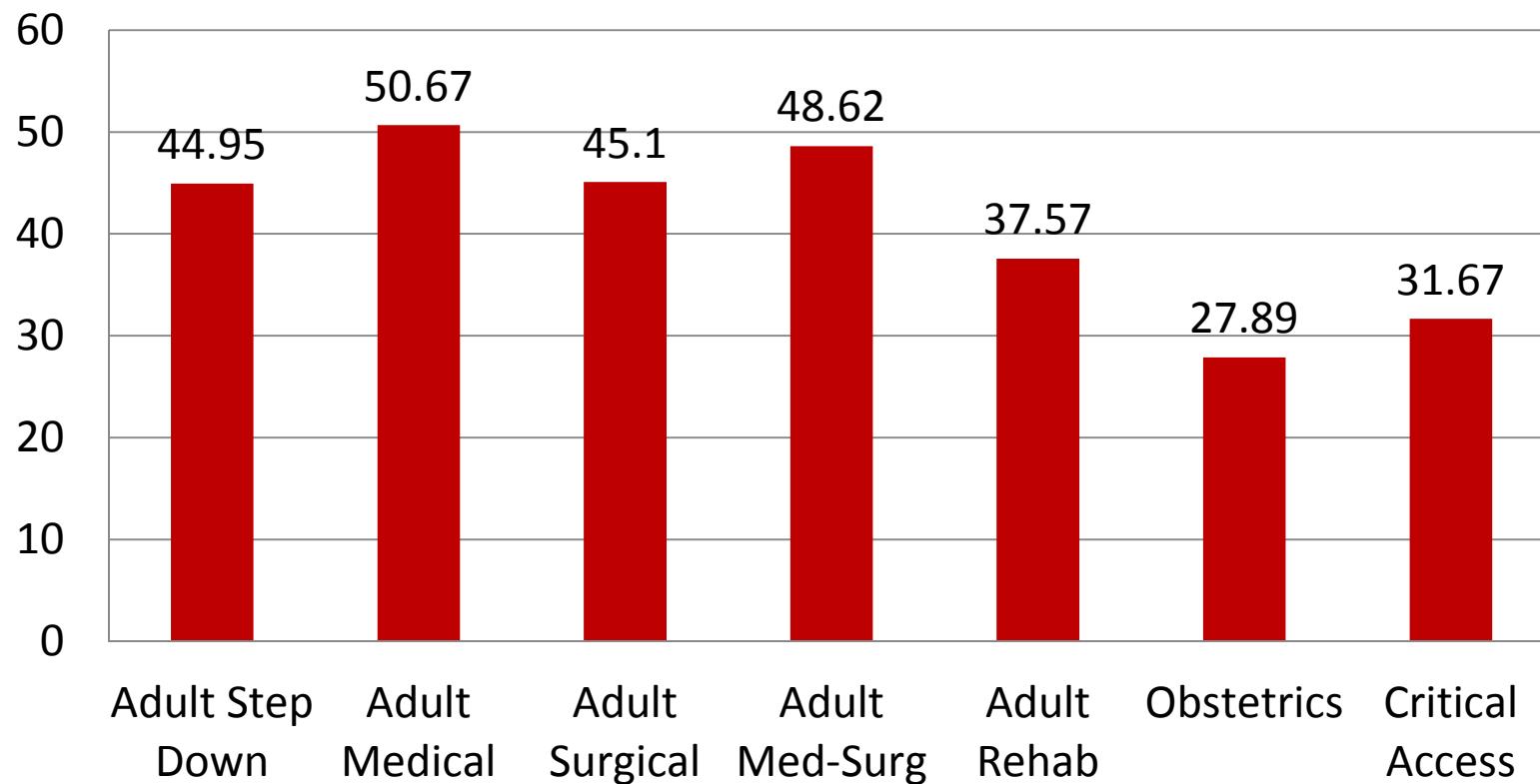
Participants

- * Number of Hospitals: 326
- * Number of Units: 1577 units
 - * Assessed at least 1 patient
- * Number of Patients
 - * Assessed: 12,314
 - * ~7 patients per unit
 - * Ineligible: 7,775
 - * Refused: 2,795

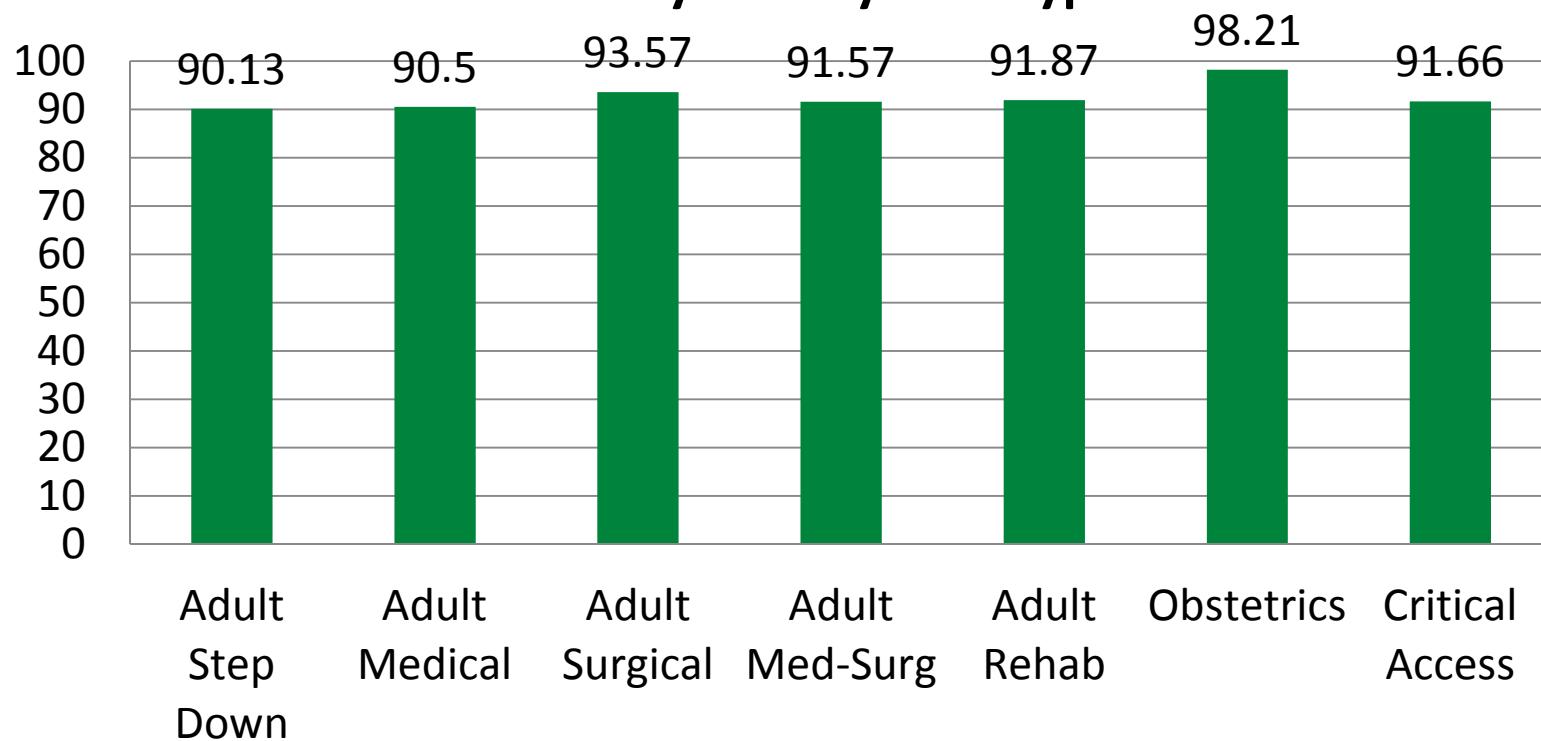
Average Pain Scale Score by Unit Type



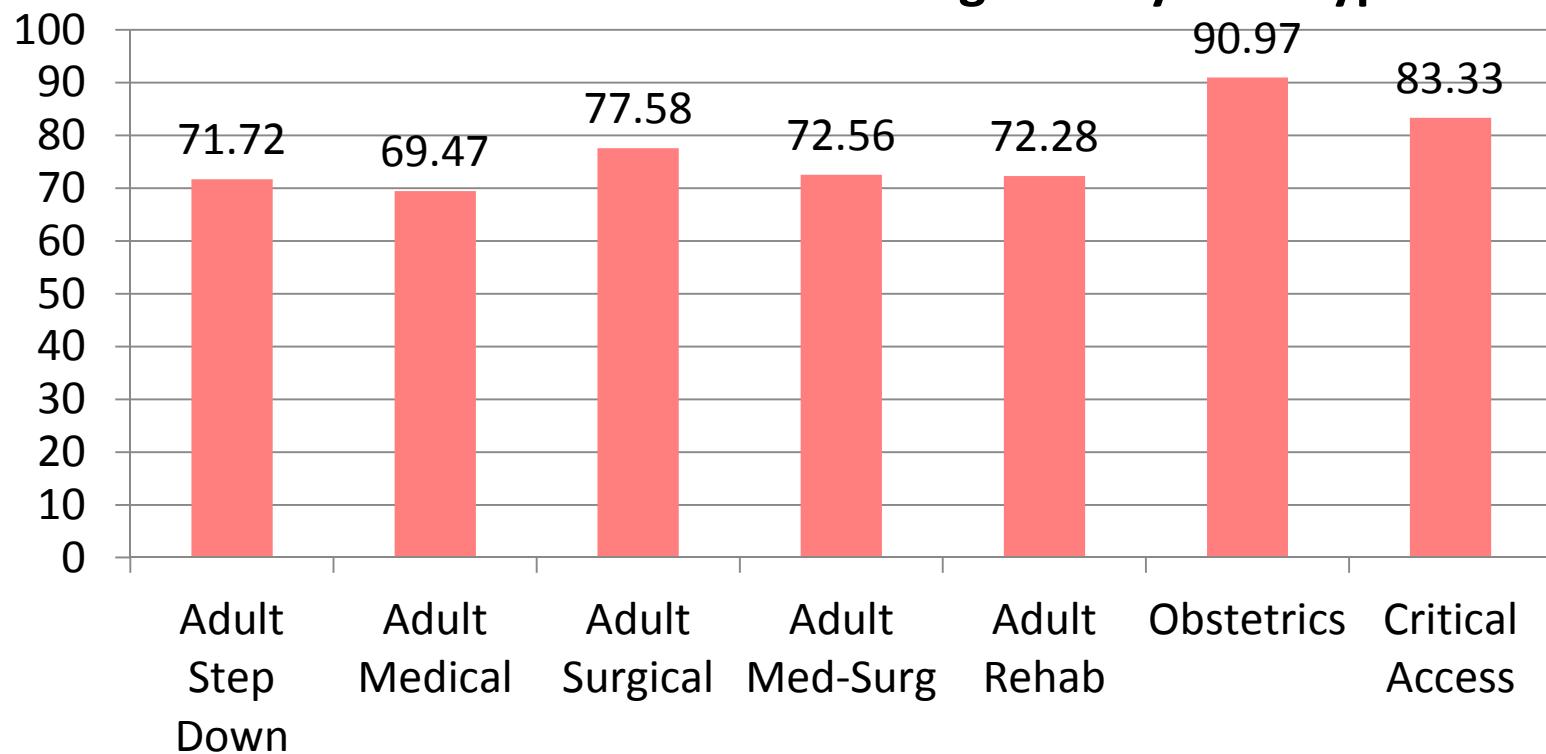
% of Patients in Severe Pain by Unit Type



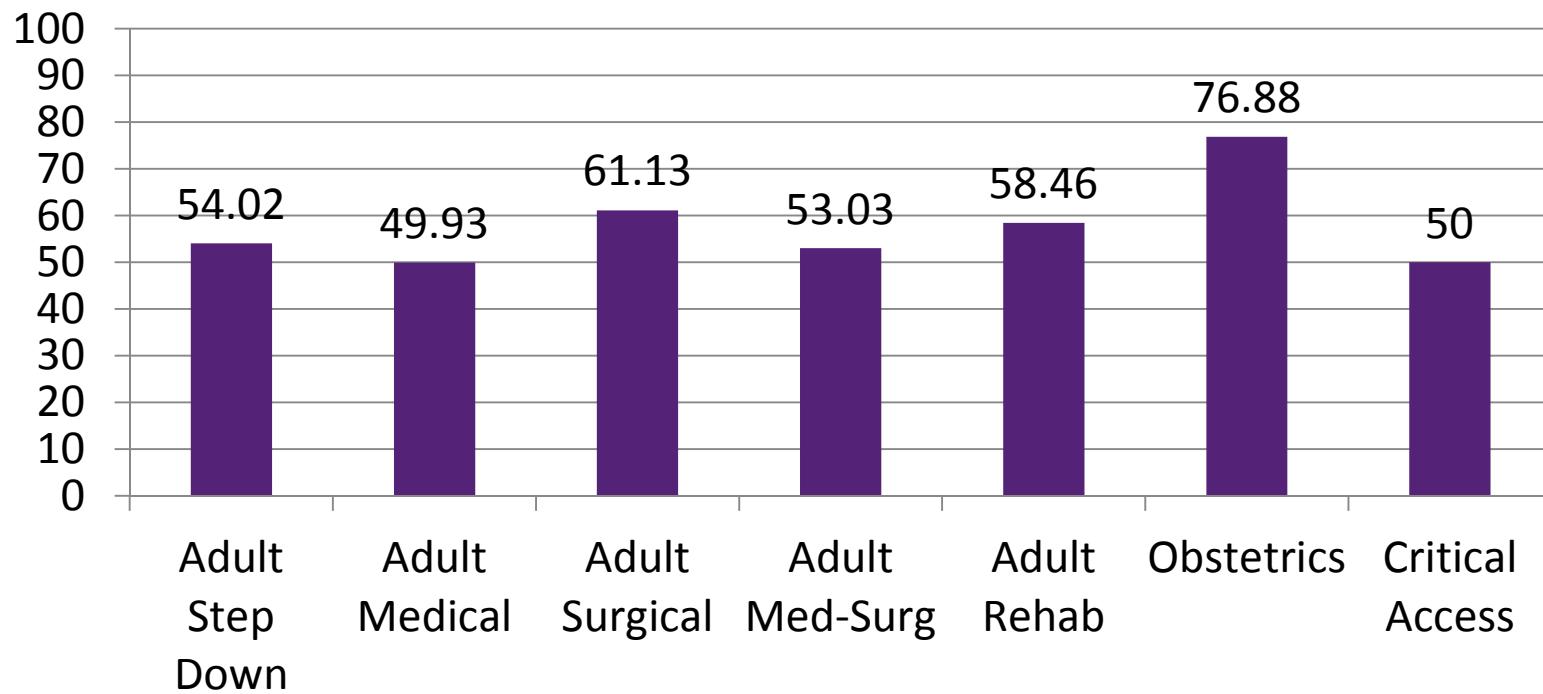
% Agreement with Nurse Believed My Reports About My Pain by Unit Type



% Agreement Health Care Team Involved Patient with Decisions About Controlling Pain by Unit Type

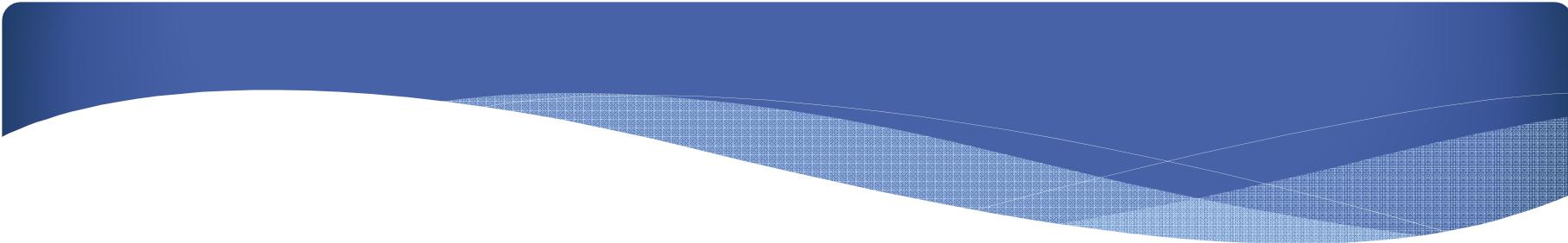


% Agreement with Nurse Suggestion of Other Approaches to Help with Pain Management by Unit Type



Analysis in Process

- * April Data Collection
 - * Correlations of staffing, education and pain
 - * Pain, work environment and RN satisfaction
- * November Data Collection
 - * Effectiveness of three interventions
 - * Was there an overall improvement between the April and November Data Collection



“There still is a huge learning curve when it comes to nurses’ and other health professionals’ understanding of pain and how to adequately control it,”

-Diane Thompkins, MS, RN, assistant director for Certification Services at the American Nurses Credentialing Center (ANCC), an ANA subsidiary.



Takeaways

- * An adult pain indicator is needed so units can monitor pain management in their units and develop quality improvement projects.
- * RNs and other health care professionals need more education on how to educate and manage pain amongst their patients
- * Examine staffing rates

Pain Care Quality

Research and Quality Improvement Plans



Association of Pain AIR with Nursing

- * Nursing Workforce Characteristics
 - * TNHPPD, RNHPPD
 - * %RN
 - * RN Education
 - * %RN Certification
- * No correlation with
 - * Completion of the AIR cycle with any nursing variable
- * Positive correlation of Mean # Assessments per patient with
 - * Staffing levels

Future Research on AIR

- * Look just at patients with pain on initial assessment
- * Look for non-linear relationships
- * Look for association for particular patient populations

Research on Beck/Dunton Pain Study

- * Mean pain rating ~6 (scale of 1-10)
- * $\frac{1}{4}$ in severe pain frequently or constantly
- * Yet, $\frac{3}{4}$ reported they received pain medicine when needed and it was effective
- * Early analysis shows some evidence of lower pain ratings with most staffing variables

Guidance on Structural Measures From NDNQI Research

- * Staffing, especially RN staffing, associated with
 - * Mean # of pain assessment cycles initiated
 - * Patients' ratings of pain
- * Other nursing workforce characteristics may be associated with better pain care quality, but this needs confirmation

Examples of Success

NDNQI Monographs



Children's Hospital of Philadelphia

- * Pain Resource Nurse Program with unit-based Champions
- * Modification of Patient Care Pain Management Flow Sheet
- * Chart audits with direct, individual coaching of staff nurses at the point of care



Advocate Hope Children's Hospital

Oak Lawn, IL

- * Pediatric Pain & Comfort Team
 - * Conducted baseline assessment of staff knowledge
 - * Reviewed patients' and parents' satisfaction with pain management
- * Addressed gaps
 - * Standardized age-appropriate assessment tools
 - * Revised pain treatment guidelines
- * Hired pediatric pain Advanced Practice Nurse to lead program
 - * More frequent audits of pain assessment
 - * Developed staff education



Children's Hospital

Omaha, NE

- * Identified knowledge deficit among nurses
- * Changed patient documentation system to have a central location for pain information—formerly scattered
- * Instituted nurse report cards on Pain AIR



Nurse Turnover

Nurse Turnover Indicator Development

- * Developed
 - * Voluntary Hospital Association (VHA)
- * Modified by NDNQI
 - * Key Experts
 - * Diane Boyle, PhD, RN
 - * Peggy Miller, PhD, RN
 - * Cheryl Jones, PhD, RN, FAAN
 - * Unit level
 - * Permanent unit based direct patient care
 - * All nursing categories
 - * Primary reasons for separation
 - * Further classify into controllable and voluntary



Nurse Turnover Development

- * Process
 - * Literature review
 - * Discussions with content experts
 - * Pilot testing
 - * January 2007
 - * Evaluation
 - * Modifications
 - * Implementation
 - * Q3 2007



Nurse Turnover Refinement

- * 2009
 - * Website validations
 - * Error messages and warning messages
 - * Education
 - * Teleconference
 - * Newsletter articles
 - * Guideline clarifications

Nurse Turnover

Research Findings

Turnover: What Is Known?

- * Cost per RN turnover (FY07):
\$82,000 - \$88,000 (Jones, 2008)
- * Possible effects on patient care (O'Brien-Pallas et al, 2010)



Turnover: What Is Known?

- * Inadequate staffing
 - * Cited by RNs as reason for leaving (Bowles & Candela, 2005)
 - * Linked to RN job satisfaction, burnout, likelihood of resignation (Aiken et al, 2002; Lake, 1998)
- * Magnet hospitals: Higher job satisfaction, greater intent to stay, better staffing (Lacey et al, 2007; Schmalenberg & Kramer, 2008; Ulrich et al, 2007)

Staggs & Dunton (under review)

- * 2010 NDNQI data
- * 1884 units in 306 hospitals
- * Critical care, step-down, med, surg, med/surg, psych, and rehab units
- * Neonatal, pediatric, and adult populations

Voluntary Turnover

- * Reasons for *voluntary* separations
 - * Compensation/pay
 - * Inability to advance
 - * Staffing or workload
 - * Dissatisfaction or conflict with team members or management
 - * Dissatisfaction with work environment
 - * Perceived lack of respect

Controllable Turnover

- * Reasons for *controllable* separations
 - * Voluntary
 - * Due to employee-initiated move from the area
 - * Due to job-related injury, disability, or illness

Observed Turnover Rates

- * RN turnover = 11.9%
- * Total turnover = 13.6%
- * Voluntary turnover = 0.5%
- * Controllable turnover = 1.6%
- * In 18-24 months
 - * 81% of units reported zero voluntary turnover
 - * 50% of units reported zero controllable turnover

Significant Predictors

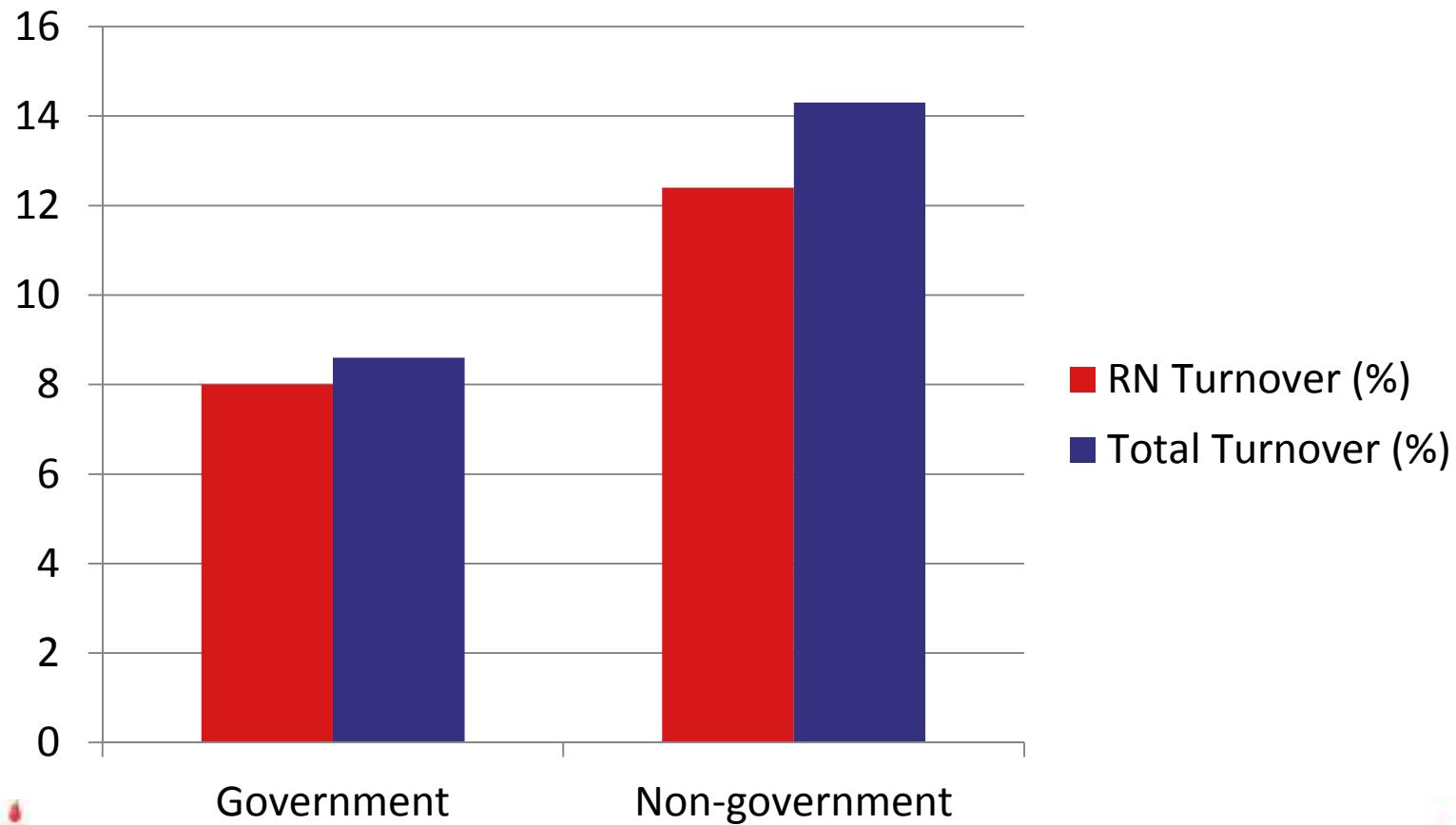
Predictors of RN turnover

- * Hospital ownership
- * Skill mix
- * Population age
- * Magnet status

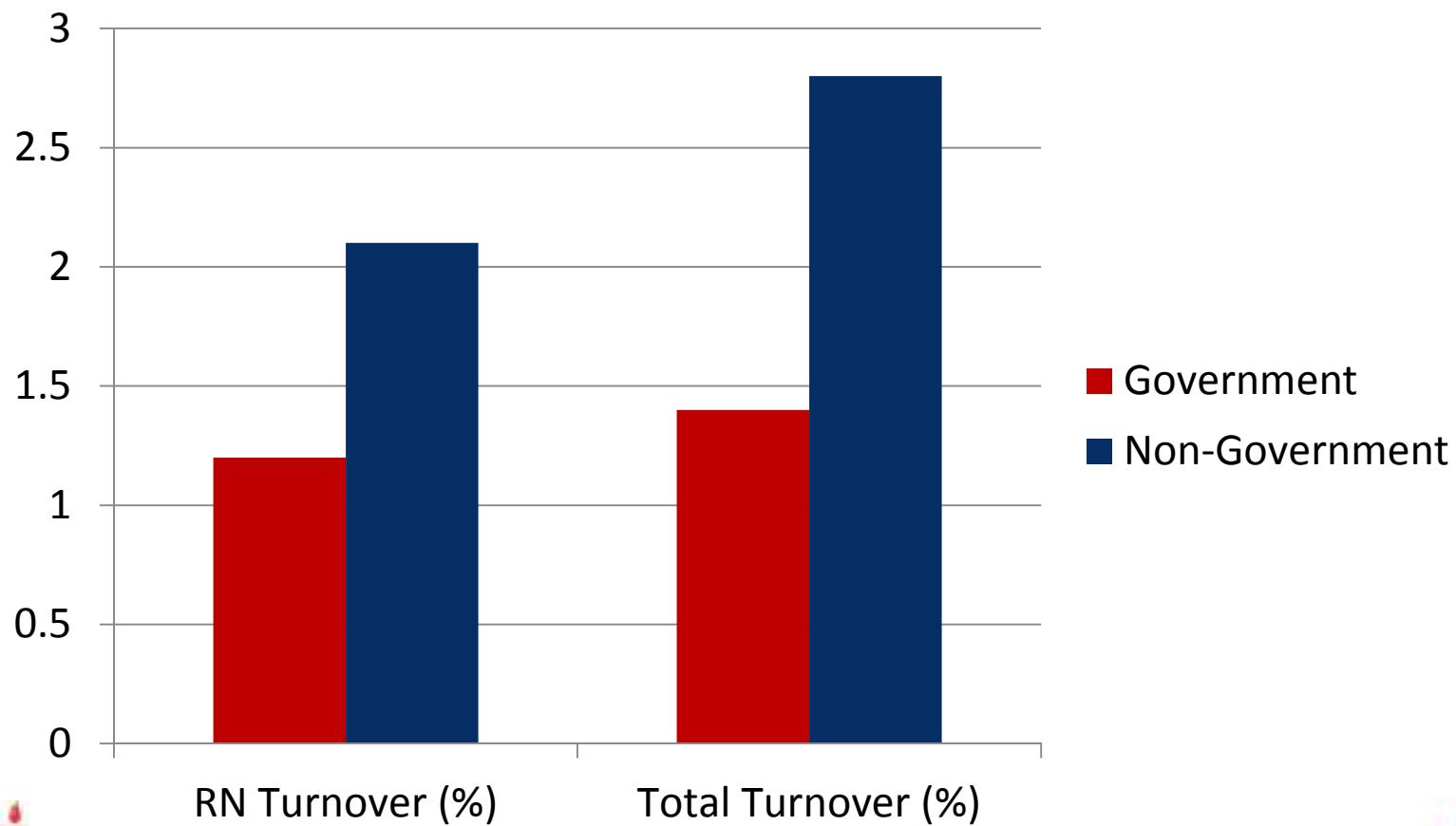
Predictors of total turnover

- * Hospital ownership
- * Skill mix
- * Population age
- * Magnet status
- * Unit service line

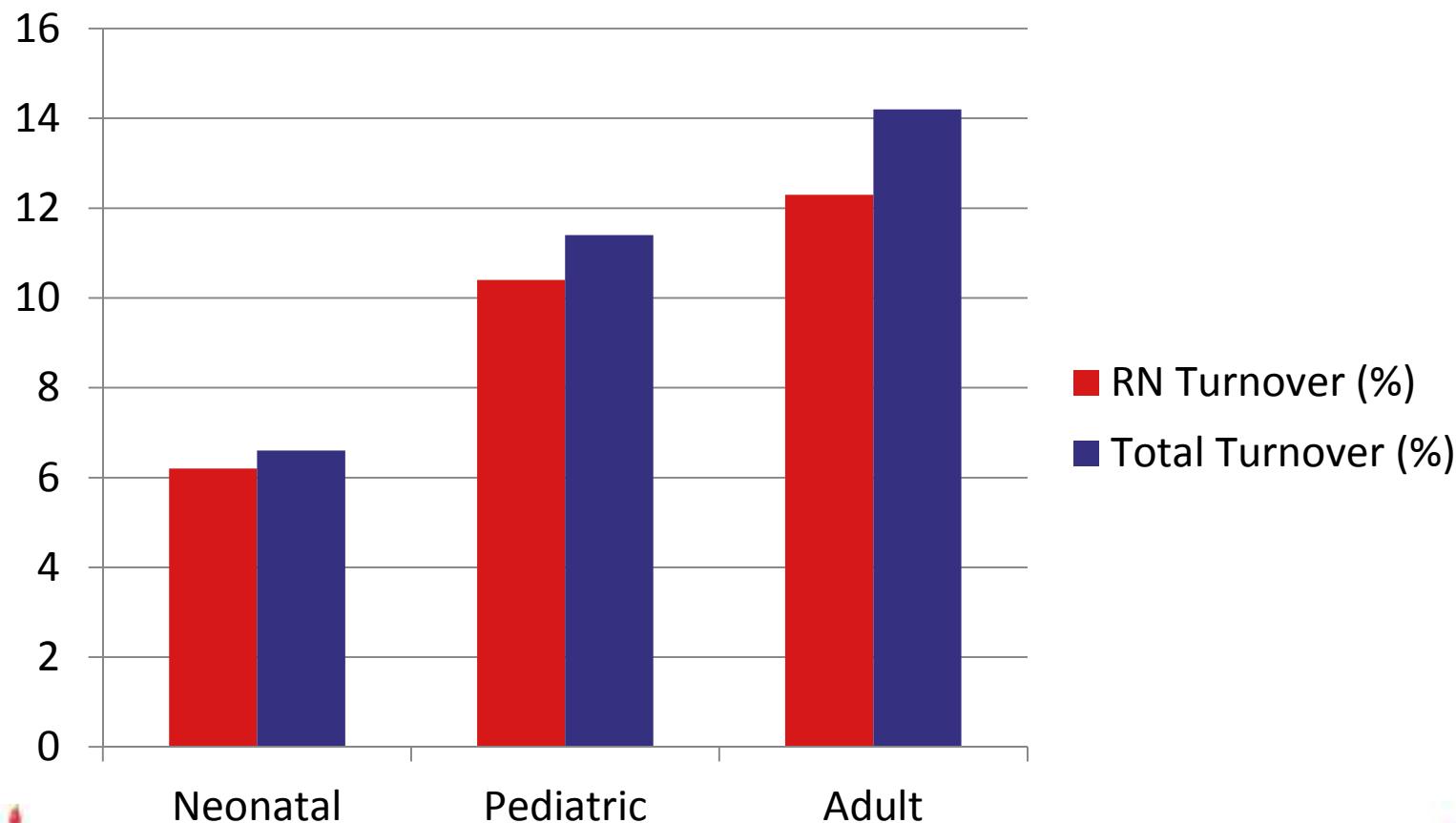
Observed Turnover by Ownership



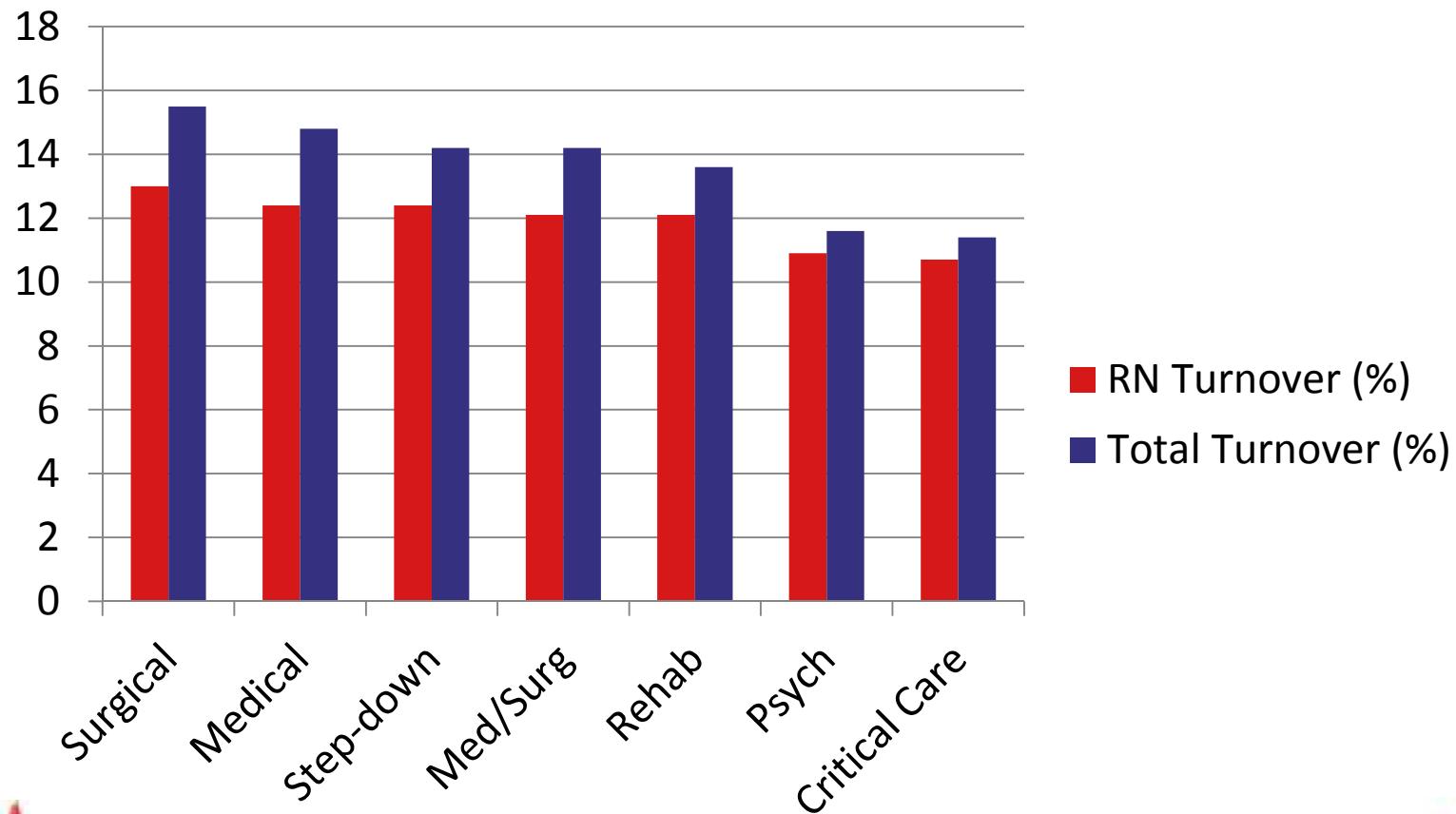
Turnover due to Performance or Discipline



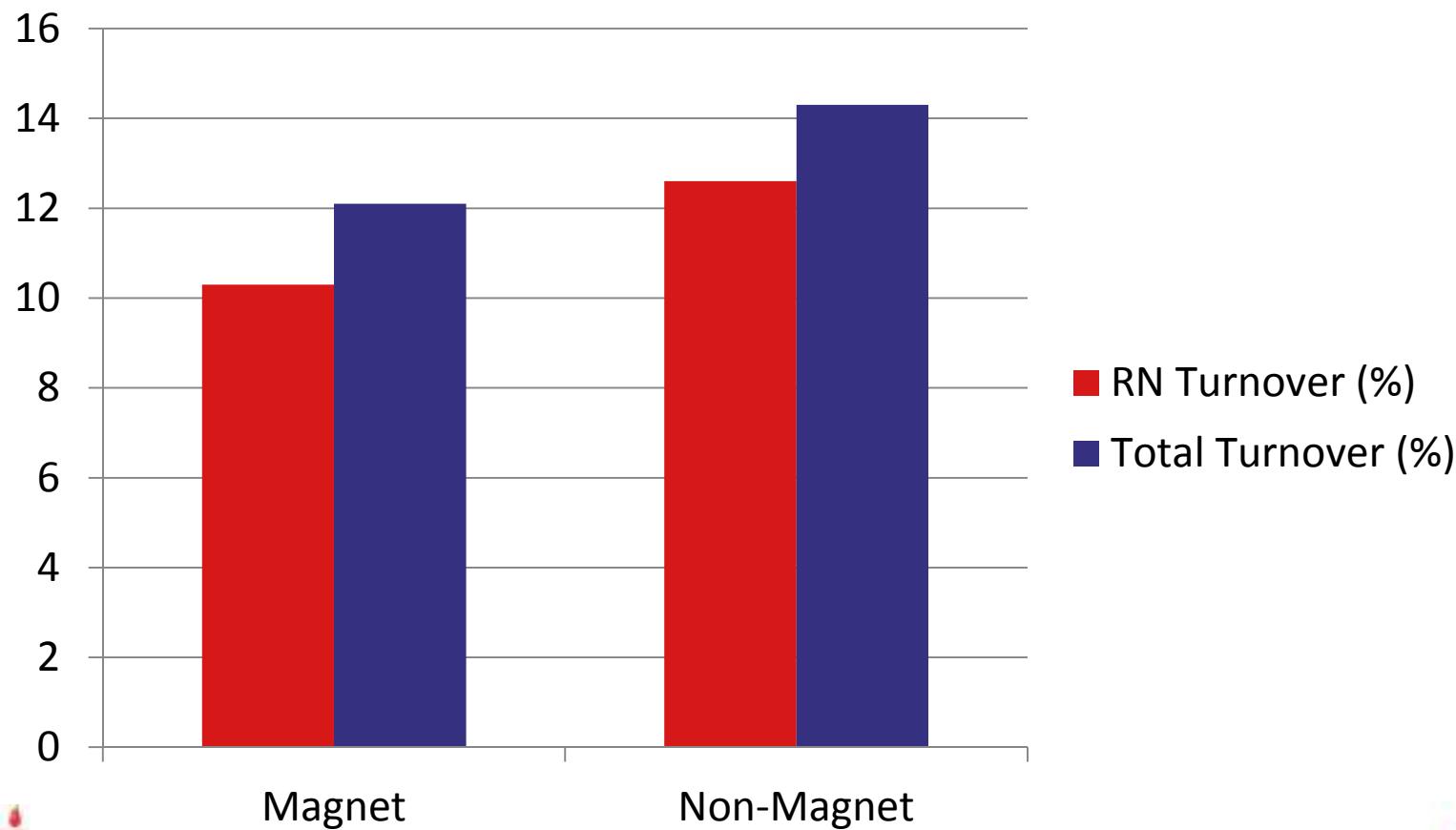
Observed Turnover by Population Age



Observed Turnover by Service Line



Observed Turnover by Magnet Status

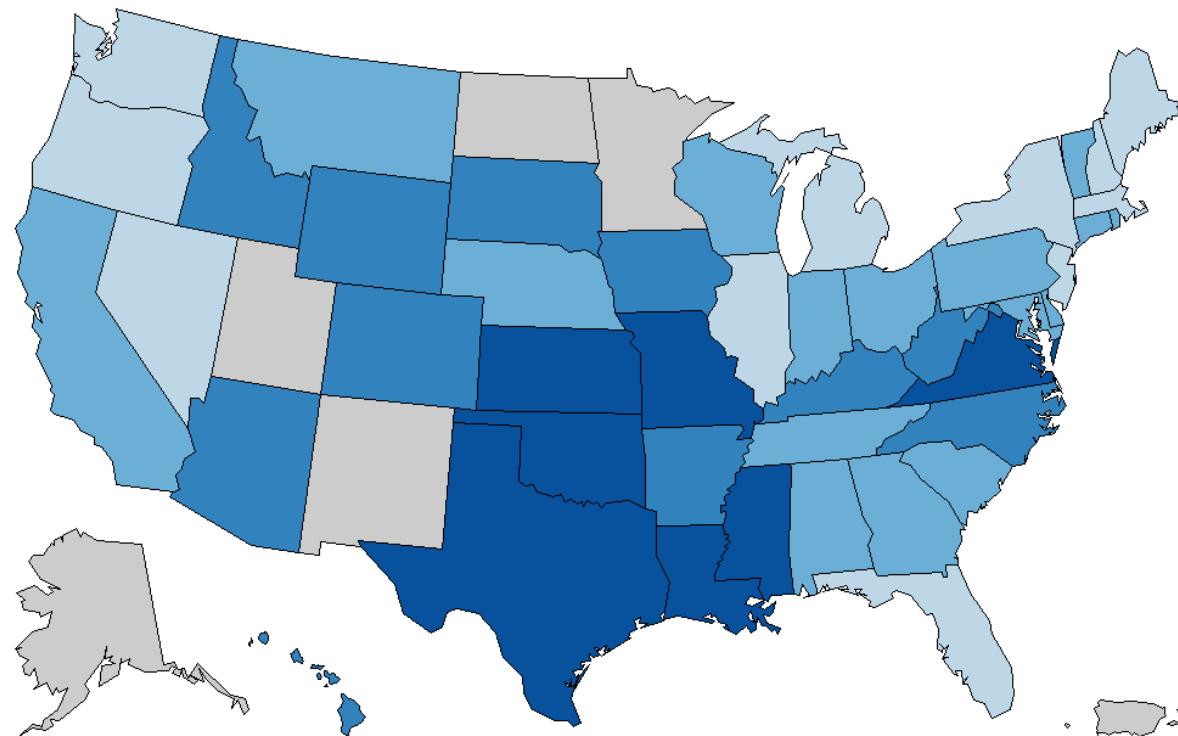


Skill Mix and Staffing

- * For each 10-point increase in skill mix
 - * RN turnover dropped by 4%
 - * Total turnover dropped by 5%
- * No effect for total staffing

Turnover by State

(Darker Blue = Higher Turnover)



Other Variables

No significant association with turnover

- * Hospital size
- * Profit status
- * Teaching status
- * Locale
- * Unit staff size
- * TNHPPD

Takeaways

- * Unit type matters
 - * Compare units of the same type
 - * Understand unit type differences
 - * Learn from pediatric and neonatal work environments
- * Consider increasing skill mix rather than total staffing

Takeaways

- * Replicate Magnet work environment
- * Government hospitals are unique
- * Compare hospitals in the same state
- * Take voluntary and controllable turnover rates with a grain of salt

Examples of Success

NDNQI Monographs

RN Job Satisfaction



Generalized Approach

- * Identify low scores on RN Survey
- * Talk to staff to identify issues
- * Implement change
- * Monitor for success
- * Frequent theme: Shared Governance Model

Examples of Unit Concerns

- * Poor RN-MD communication
 - * Surveyed each group on awareness of issues
- * Discomfort with caring for overflow patient populations outside practice area
- * Professional development: conference support, support for certification exams

University of Wisconsin Hospital and Clinics—Madison, WI

- * Implemented collaborative (shared) governance model
 - * Nursing council structure mandated 50% of participants be direct care RNs
 - * Individual unit councils
- * CNO does weekly rounds on each unit, recognizing achievements
- * RN HPPD higher = high satisfaction with task
- * Instituted Primary Nursing Practice Model



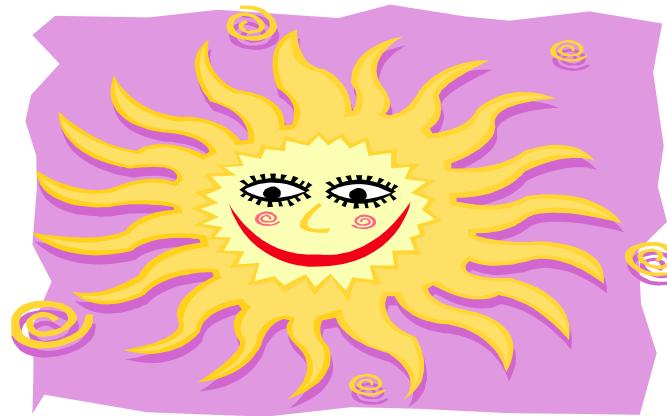
Michael E. DeBakey Veterans Affairs Medical Center

- * Identified task, teamwork, and decision-making issues
 - * RNs performing many of nurse assistants' tasks and struggling to complete their own work. Assistants appeared to have free time.
 - * Staff shared concerns at meeting
 - * Nurtured team focus
 - * RNs reapplied the art of delegation and held each person responsible for assignments
 - * Developed unit council



Hospital of the University of Pennsylvania

- * CNO annual update
 - * “You responded and here’s what we did”
- * Retreat “Backcasting” to identify an ideal state & structured interviews on how to get there



HUP Periop Example

Issue	Response
Staffing & Scheduling	Evening Resource Pool Weekend premium program Leadership presence on evening shift
Education & Orientation	Extending dayshift orientation Postponing new RN on-call requirement Added clinical educator
Stress Reduction	Respectful workplace practices Overlap day & evening shift Coverage for relief at lunch Raise evening support staff

HUP ED Example

- * Define expectations for staffing, scheduling & attendance
- * Increase flex shifts
- * Increase FTEs
- * Enhance resources (pharmacy, respiratory)
- * Boost supply and accessibility of equipment



New York University Hospitals Center

- * Nurse managers foster teamwork
- * Supported by Nurse Manager Wellness Program
 - * Emphasis on “mindfulness”





Takeaway Summary

Takeaway Summary

- * Falls: Reduce unassisted falls by adding RN hours (not LPN/UAP hours)
- * Assaults
 - * More staffing may not be the answer
 - * Understand potential triggers
- * Infections
 - * Higher staffing, fewer agency hours
 - * Education, training, and certification
 - * RN-RN and RN-MD communication

Takeaway Summary

- * Pressure ulcers
 - * Need prevention even for patients with low Braden risk
 - * Use all 5 prevention measures
- * Pain
 - * Educate RNs on pain management
 - * Examine staffing
- * Turnover
 - * Learn from pediatric, neonatal, and Magnet work environments
 - * Consider increasing skill mix

Thank You

