The intersection of occupational hazards for nurses, safe staffing, and infection control

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Program Goal Number 2

Attendees will recognize how infectious disease place both patients and staff at risk, constructing the intersection between occupational health and safety with patient safety initiatives.
Objectives
After attending, participants will be able to:

Describe the scope and Impact of occupational injury and illness among nurses and health care workers.

Define the relationship between short staffing, hospital acquired infection (HAI), gaps in knowledge about the impact of (HAI) on nurses and healthcare workers.
Purpose of study: to define, operationalize, measure, and evaluate the nurse surveillance capacity of hospitals

The quality of our nation’s healthcare system came under scrutiny as evidence grew about preventable medical errors (Institute of Medicine [IOM], 2000, 2001, 2004).

An uneven quality of care across hospitals (Jha, Zhonghe, Orav, & Epstein, 2005).

Research emerged documenting a link between greater investments in nursing and better outcomes for patients (Kane, Shamliyan, Mueller, Duval, & Wilt, 2007).

We hypothesize that better patient outcomes are achieved through more effective surveillance, a primary and vital function of registered nurses (RNs).

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Nurse Surveillance is a key Intervention

A process in which nurses:

• Monitor
• Evaluate
• Act upon emerging indicators of a patient’s change in status
• Components include continuous;
  • Observation
  • Assessment
  • Recognition
  • Interpretation of clinical data
  • Decision making

https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2906760/
Organizational Features Enhance or Weakens Nurse Surveillance.

Nurse Surveillance Capacity is effected by Organizational structures that impact safety:

- Staffing, hours of work, and overtime
- Education and training
- Expertise, teamwork, and collaboration
- Experience
- Nurse practice environment and safety culture

- Ann Kutney-Lee, PhD, RN,* Eileen T. Lake, PhD, RN, FAAN,† and Linda H.
- Aiken, PhD, RN, FAAN‡  https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2906760/
April 2017 - Survey Depicts a Health Care System in Crisis

A hospital management staffing firm called leaders for today (LFT) conducted a national survey:

- Response from 852 hospital workers.
- **Purpose**: to understand what concerns candidates had and were looking for in their careers
- Questions focused on a variety of departments and positions ranging from:
  - C-suite
  - clinical administration
  - non-clinical administration
  - physicians
  - nurses

Survey Results
Both Intriguing and Troublesome

• Unprecedented turnover and attrition rates among hospitals at key levels
• A shrinking talent pool as more hospital employees age toward retirement
• The crowded online job board market, and why it’s ineffective in health care
• How a painfully slow hiring process frustrates candidates and hurts hospitals

Four Main Take A Ways

#1. Continuity in hospital employment is lacking.

• Nearly 43 % had less than 2 years at current hospital.

• 65.7 % had less than five years.

• 37% plan to leave their current organization within two years.

• 68.6 % plan to leave within five years.

• The rapid pace at which hospital employees are switching jobs is widening the knowledge gap.
#2. The Current Hospital Environment Promotes High Turnover

- More than 27.4% left their job for a promotion or opportunity for advancement.

- Another 14.4% left for better compensation.

- The largest proportion, 58.2%, left for other reasons, such as:
  - long work hours
  - frustration
  - and burnout
3. The Growing Proportion of Retiring Employees Poses an Additional Challenge

• The workforce is aging

• Hospitals are looking at a significantly smaller pool of experienced talent to fill retirees' positions.

• 47.7% indicated they plan to retire within the next decade.
• 22.1% expect to retire within five years.
4. The Hospital Hiring Process Needs a Tune up.

According to LFT:

• Hospitals lose candidates who land job opportunities more quickly elsewhere.

• Respondents cited speed and transparency as the top two frustrations with the hiring process.

• Suggests hospitals will be the more competitive for attracting top talent if they can optimize the hiring process and move quickly.
Patient Surveillance is the Primary & Vital Function of RNs

- Nurses’ ability to deliver safe, effective, high-value care depends largely on the work environment in which that care is delivered.
- Influenced by multiple factors

- The next analysis looked at the impact of nurses’ perception of the safety of their work environment and the degree to which they believe their work environment is sufficiently resourced to complete essential patient surveillance tasks on every shift.

Work Environment Strongly Influences Nurse and Patient Outcomes


Data from analysis highlights strategic importance of:
Nurturing a work environment in which RNs feel their physical and emotional safety is an organizational priority.

“The role of workplace safety and surveillance capacity in driving nurse and patient outcomes”

Workplace safety and nurse surveillance capacity are significantly associated with a healthcare organizations' performance on nurse, patient experience.

Components of a safe work environment measured on survey included:

- Safe Patient Handling and Mobility Practices
- RN-to-RN interaction
- Appropriateness of Patient Care Assignments
- Meal-break practices
- Shift duration

“Workplace Safety was a More Significant Driver than the Surveillance Capacity”

• The analysis found work environment significantly influences nurse surveillance capacity—the degree to which nurses are able to:
  • Observe
  • Monitor
  • Collect
  • Interpret
  • Synthesize patient information
  • to make informed decisions regarding their course of care.

• Of the two work environment components, workplace safety had a stronger influence on outcomes than perceived surveillance capacity.

Notable Findings

In units where nurses rated their safety and surveillance capacity as high there were:

- Improved patient safety outcomes
- More positive patient experience ratings
- Higher RN engagement rates

Christy Dempsey, RN Chief Nursing officer at Press Ganey Assessed Findings in Relation To Maslow's hierarchy of needs

- **Safety is the Foundation of the Pyramid**

Impact on Patient Outcomes, Costs, & Satisfaction*

*Patient Deaths

*Medical Errors

Complications & Infections

Readmissions

Patient Satisfaction

*A Summary of Nurse Staffing Studies
Nurse – sensitive indicators*

Pressure ulcers
Falls
Medication errors
Nosocomial infections
Pain Management
Patient satisfaction

*A Summary of Nurse Staffing Studies
Impact on Staff Outcomes, Costs, & Satisfaction*

* A Summary of Nurse Staffing Studies

- Burnout & Turnover
- > Injury, Illness
- Workers’ Comp $$$
- Stress
- Job Satisfaction

*A Summary of Nurse Staffing Studies*
New Study on Nurse Staffing and ED Care

• A 2018 study in the *Western Journal of Emergency Medicine* found: excessive patient assignments and lower staffing levels in hospital emergency departments harm patient care;
• resulting in longer ED wait times,
• the likelihood patients will leave without being seen.

• A number of other studies show:
• *costs associated with implementing safe limits are off set by the benefits of better care and reduced RN turnover*
The State of Nursing in Massachusetts: A 2018 Survey of All Nurses in Massachusetts

- 86% do not have the time to provide adequate discharge planning
- 90% do not have time to properly comfort and care for patients
- 77% report they are assigned too many patients to care for at one time

Due to unsafe patient assignments:
- 36% of RNs report patient deaths that are directly attributable to having too many patients at one time
- 64% of RNs report injury and harm to patients
- 66% of RNs report longer hospital stays for patients
- 72% of RNs report readmission of patients
- 77% of RNs report medication errors

*The State of Nursing in Massachusetts” (May 2018), a survey of ALL nurses in Massachusetts
National, Peer Reviewed Studies Show

Studies show higher patient assignments are associated with more patient deaths, complications, medication errors, and readmissions.

• For every patient added to a nurse’s workload, the likelihood of a patient surviving cardiac arrest decreases by 5% per patient. (Medical Care, 2016)

• For children recovering from basic surgeries, each additional patient assigned to a nurse increased the risk of readmission by ;
• a shocking 48%. (BMJ Qaul Saf., 2013)

• For every patient added to a nurse’s workload there is a
• 7% increased risk of hospital acquired pneumonia,
• 53% increase in respiratory failure
• 17% increase in medical complications. (AHRQ, 2007)
National, Peer Reviewed Studies Show

Reducing nurse staffing is inefficient and can negatively affect financial performance. *(Health Care Management Review, 2013)*

• **“This study makes a strong business case:**
  • Just increasing the proportion of nurses without increasing the total nursing hours per day could reduce costs and improve patient care; by reducing unnecessary deaths and shortening hospital stays.” *(Health Affairs, 2006)*

• Implementing safe patient limits would produce significant cost savings: is less costly than many other basic safety interventions common in hospitals,

• including clot busting medications for MIs and PAP tests for cervical cancer. *(Medical Care, 2005)*
Ethical Issue

• Ethics: The first principle is – **do no harm**

• **According to Leah L Curtain RN:**

  • The American Nurses Association contends that ensuring adequate staffing levels has been shown to:
    • reduce medical and medication errors
    • decrease patient complications
    • decrease mortality
    • improve patient satisfaction
    • reduce nurse fatigue
    • decrease nurse burnout
    • improve nurse retention and job satisfaction.

• A conversation about the ethics of staffing: April 2016 Vol. 11 No. 4 Author: Leah L. Curtin, RN, MA, MS, ScD(h), FAAN
Federal Regulations (42CFR 482.23(b) require hospitals certified to participate in Medicare

• “have ‘adequate’ numbers of licensed registered nurses, licensed practical (vocational) nurses, and other personnel to provide nursing care to all patients as needed,” but the regulations do not say what is “adequate” nor who determines this.

• Does Medicare know when staffing is not adequate?

• The Joint Commission acknowledges the link between positive patient outcomes, quality, safe care, and effective staffing.
The Joint Commission

• The Joint Commission staffing standards state staffing effectiveness is composed of:

• the number, competency, and skill mix of staff in relation to the provision of needed care and treatment

• **HR.1.20** The hospital provides an adequate number and mix of staff consistent with the hospital’s staffing plan.

• **HR.1.30** The hospital uses data from clinical/service screening indicators and human resource screening indicators to assess and continuously improve staffing effectiveness.

• **HR.3.10** The nurse executive establishes nursing policies and procedures, nursing standards, and a nurse staffing plan(s).

• In spite of the data, these ambiguous statements allow health care facilities to continue to operate at or below minimum levels

• [https://www.americannursetoday.com/conversation-ethics-staffing/](https://www.americannursetoday.com/conversation-ethics-staffing/)
What is the connection between worker & patient safety?

Addressing worker safety & health issues can improve patient safety:

• Lifting and safe patient handling
• Workplace violence
• Slips, trips, and falls
• Workplace transmission of infectious diseases
• Workplace exposure to antineoplastic and other hazardous drugs
• Suboptimal work organization, resulting in stress, fatigue, and medical errors
Healthcare is the fastest growing industry

- Healthcare: fastest growing industry
- > 18 million workers
- Largest # work injuries and illnesses
  - 552,600 in, 2016
- > construction and coal mining combined
Working in healthcare is hazardous!

In 2016...

- 585,800 non-fatal occupational injury and illness cases
- Equivalent to one case being reported every 52 seconds
- Healthcare:
  - 17% of all recordable non-fatal occupational injury and illness cases in the private sector
  - 31% in State government sector
The American Nurses Association reported that the top four S&H concerns among nurses:

1. **Effects of stress and overwork**
2. **Musculoskeletal injuries**
3. **Infectious disease**
4. **On-the-job assault**

were no different between 2001 and 2011.

**Source:** ANA Health and Safety Survey of Nurses, 2001 and 2011
What Nurses Say...

When asked if they put patient care first before their own personal safety at work, most nurses (82 percent) say “yes.”

What impacts workplace safety:
- increasing workloads (89%)
- workplace stress levels (84%)

Key issues to nurses:
- patient care and organizational reputation
- patient safety
- infection control
- healthcare worker safety and staff productivity

American Nurses Association and Inviro Medical, 2008 Study of Nurses’ Views on Workplace Safety and Needlestick Injuries
Can you identify the hazards?
What is wrong in these pictures?
Patient Outcomes

• 722,000 patient hospital acquired infections 2011
• 75,000 patients deaths due to HAIs 2011
• 1/25 hospitalized patients had HAIs
What is an Aerosol Transmissible Disease (ATD)?

ATDs are transmitted when infectious agents are suspended or present in particles or droplets and contact the mucous membranes or are inhaled.

OSHA **Does Not** have an infectious disease or aerosol transmissible disease standard!!

Airborne droplets visible during sneezing (photo enhanced)

Photo: CDC
ATD Standard, definition

• **ATD**: A disease or pathogen for which droplet or airborne precautions are required.

• Aerosol Transmissible Disease Standard, §5199.

• [http://www.dir.ca.gov/title8/5199.HTML](http://www.dir.ca.gov/title8/5199.HTML)
ATDs

- Spore-containing powders Anthrax/Bacillus anthracis
- Aspergillosis*
- Varicella (chickenpox) and herpes zoster**
- Measles (rubeola)/Measles virus
- Monkeypox/Monkeypox virus
- Smallpox/Variola virus

- Tuberculosis Mycobacterium tb
- Severe acute respiratory syndrome coronavirus (SARS-CoV)
- Ebola Virus and hemorrhagic fever
- Novel or emerging pathogens for which public health guidelines and risk evaluations indicate airborne precautions
Clinical respiratory disease was significantly higher in HCWs wearing nothing or surgical masks compared to those wearing N95 respirators.
Viable influenza A virus in airborne particles expelled during coughs versus exhalations


• 61 adult influenza patients coughed and exhaled 3 times

• Aerosols were collected and sampled

Results:
• 53 tested positive for influenza A virus
• 28 (53%) during coughing
• 22 (42%) during exhalation

Conclusion: important to airborne transmission
There is no systematic tracking of HCW exposure or conversions
44% of SARS cases in Toronto were healthcare workers, 2003

Three healthcare workers died in the Toronto outbreak.
Surgical Smoke Hazards

- OSHA estimates 500,000 HCWs exposed to toxic smoke by burning tissue during laser surgery and electrosurgery.
- Transmission of Papilloma Virus documented.
- NIOSH Warning: “Surgical smoke has been shown to be mutagenic, cytotoxic and genotoxic.”
- Local exhaust ventilation and respirators frequently are NOT used.
REACH I and II
Respirator Evaluation in Acute Care Hospitals

REACH I studied influenza protection at 16 California hospitals, 2009 – 2010 during H1N1 outbreak

Workers used N95s but there were important gaps:

- Written respiratory protection programs
- Recordkeeping
- Designated RPP Administrator
- Program Evaluation
- Training
- Fit testing
- Improper donning & doffing
- No hand hygiene after removal
Use of exposure controls for surgical smoke, 2011

Respondents: nurse anesthetists, anesthesiologists, perioperative and OR nurses, surgical technologists

- 4% always used a respirator (1,102)
- 1% used a respirator, laser surgery (3,719)
- 55% sometimes/never used LEV, laser surgery
- 86% sometimes/never used LEV, electrosurgery
- Most used surgical and laser masks that don’t provide respiratory protection
Contamination of PPE

• 46% of HCWs contaminated their skin or clothing when removing contaminated PPE
• Gloves = 52.9%
• Gowns = 37.8%
• Practice with immediate visual feedback reduced the risk of contamination during removal of PPE to 18%
How safe are nurses in the work setting?

“Hospitals do not protect their workers, and it’s time they do”

- Nurses lift 1.8 tons every 8 hours
- Majority are attacked by the people helping
- Growing risk of antibiotic-resistant infections
- Exposure to blood & body fluids (BBFs) – infection & illness risk
- 47.7% of nurses exposed to BBF’s on the job in 2012
- Hepatitis C
- C Diff
- MRSA
- Influenza
- TB
- Ebola outbreak

http://minoritynurse.com/personal-safety-for-nurses/
Nurse-Staffing Levels and The Quality of Care in Hospitals
Needleman, et al., NEJM, May 2002

Administrative data from 799 hospitals, 11 states, 1997

Covering 5,075,969 medical and 1,104,669 surgical patient discharges

Averaged 11.4 hours of nursing care per day: 7.8 hours RN, 1.2 hours LPN, and 2.4 hours aides

More RN hours = 1) shorter length of stay, 2) lower rates of UI infection and GI bleeding, 3) lower rates of pneumonia, shock, or cardiac arrest, and 4) lower rates of failure to rescue
Nurse Staffing and Inpatient Hospital Mortality

• Data from 197,961 admissions, large academic medical center.
• 176,696 nursing shifts, 8 hours each, 43 units
• Assessed the relationship between mortality and nursing shifts below 8 hours of staffing target
• Reviewed patient mortality associated with high patient turnover due to admissions, transfers, and discharges.
Results, Needleman Study

“We estimate that the risk of death increased by 2% for each below-target shift and 4% for each high-turnover shift to which a patient was exposed.”
Patient Risk of Death

Mortality Rate Percent

Decreased staffing

Falls
HAIs
Failure to rescue
Readmission
California’s nurse-to-patient ratio law and occupational injury
P. Leigh, et al., Int Arch Occup Environ Health (2015)

- UC Davis study finds 1/3 drop in occupational injuries to nurses following mandated staffing ratios in California
- Used data from US BLS
Definition of “Patient Acuity”

A concept referenced by caregivers and medical literature without specificity or consistency of definition or measurement.

Acuity has become a reference for estimating nurse staffing allocations and budget determinations.

Acuity can be defined as the measurement of the intensity of nursing care required by a patient.

Acuity-based staffing system regulates the number of nurses per shift according to the patients’ needs, not raw patient numbers.
What are the problems with acuity based staffing?

- Does it work?
- What are the objective criteria?
- Who decides?
- Are there staff available?
H.R.5052 – S 2445: Registered Nurse Safe Staffing Act of 2018

- Requires each Medicare participating hospital to implement a hospital-wide staffing plan for nursing services
- Requires an appropriate number of RNs provide direct patient care
- Requires nurse staffing committee to implement the plan
- Specifies monetary and other penalties for violations
- Whistleblower protections against discrimination and retaliation
State Laws and Proposals
3 approaches:

- Require hospitals to have a staffing committee which create staffing plans.
- Mandate specific nurse to patient ratios.
- Require facilities to disclose staffing levels to the public and regulatory agency.
Enacted legislation/adopted regulations to date: (CA, CT, IL, MA, MN, NV, NJ, NY, OH, OR, RI, TX, VT, and WA) (*DC and ME rescinded AND NC requested study only 2009)
Approaches vary; for specific, refer to report.
How would you define safety culture?

A commitment to safety at all levels, frontline providers, managers and executives.

This commitment establishes a "culture of safety":

• acknowledgment of the high-risk nature of an organization's activities and determination to achieve consistently safe operations

• a blame-free environment where individuals are able to report errors or near misses without fear of reprimand or punishment

• encouragement of collaboration across ranks and disciplines to seek solutions to patient and staff safety problems

• organizational commitment of resources to address safety concerns

Source: Adapted from Agency for Healthcare Research & Quality
https://psnet.ahrq.gov/primers/primer/5/culture-of-safety
Define these key elements in Safety Culture

- Reporting
- Informed
- Flexible
- Just
- Learning
How would you rate your employment?

Types of Safety Cultures

- **GENERATIVE**
  Safety is how we do everything round here

- **PROACTIVE**
  Safety leadership and values drive our continuous improvement

- **CALCULATIVE**
  We have systems in place to manage all hazards

- **REACTIVE**
  Safety is important, we do a lot every time we have an accident!

- **PATHOLOGICAL**
  We don’t care as long as we’re not caught!

Credit: Prof Patrick Hudson
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3. Ann Kutney-Lee, PhD, RN, * Eileen T. Lake, PhD, RN, FAAN, † and Linda H. Aiken, PhD, RN, FAAN‡ “Development of the Hospital Nurse Surveillance Capacity Profile” https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2906760/


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  • Charles Hagood