ROLE OF NURSES IN PATIENT SAFETY
DIAGNOSES & MITIGATION OF
DIAGNOSTIC ERROR

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DISCLOSURES

• College of Emergency Nursing Australasia representative, Australian Resuscitation Council (unpaid)
• Member, International Liaison Committee on Resuscitation (ILCOR) Basic Life Support taskforce (unpaid)
• Deputy Editor, Australasian Emergency Nursing Journal (honorarium)

• No financial conflicts
**BACKGROUND**

**Diagnosis**
- shift way from term ‘diagnosis’ to ‘health problem’
- diagnosis → diagnostic process
- “the diagnostic process is a complex, patient-centered, collaborative activity that involves information gathering & clinical reasoning with the goal of determining a patient’s health problem”

**Diagnostic error**
- “failure to establish an accurate and timely explanation of the patient’s health problem(s) or communicate that explanation to the patient”

Institute of Medicine 2015 Improving Diagnosis in Health Care
Indicators of High-Quality HealthCare
• **safe**: avoiding injuries from the care that is intended to help patients
• **effective**: providing services based on scientific knowledge, refraining from services not likely to benefit
• **patient-centred**: care that is respectful of & responsive to individual preferences, needs, and values
• **timely**: reducing waits & sometimes harmful delays
• **efficient**: avoiding waste - equipment, supplies, ideas, & human resources
• **equitable**: providing care that does not vary in quality because of personal characteristics (gender, ethnicity, geography, and socioeconomic status)
Contributing factors to diagnostic error

- **Patient & family factors**: non-specific symptoms, communication challenges, preferences, dislikes, cultural considerations
- **Clinician factors**: experience, educational preparation, stress, fatigue, professional silos, decision biases (cognitive dispositions to respond)
- **Perceptions of diagnosis**: static vs dynamic, potential for evolution, misdiagnosis viewed as negative
- **System factors**: time pressure, interruptions, competing priorities, compliance vs safety & quality
- **Diagnostic tests**: sensitivity & specificity limitations, test results vs patient’s clinical status
BACKGROUND

Three central tenets
• diagnostic error is an underappreciated cause of harm in healthcare
• patients are central to the solution
• diagnosis is a collaborative effort

“.... nurses are often not recognized as collaborators in the diagnostic process, despite their critical roles in ensuring communication, care coordination, and patient education; monitoring a patient’s condition; and identifying and preventing potential diagnostic errors”
BACKGROUND

Conceptual model

• “diagnosticians, or those who make diagnoses, such as physicians, APNs, & PAs”

and

• “health care professionals who support the diagnostic process, such as nurses, pharmacists, laboratory scientists, radiology technologists, medical assistants, and patient navigators”
ROLE OF NURSES

Nurses
• are the largest component of the health workforce
• have greatest bedside presence of any professional group
• are responsible for structures, processes & outcomes of care 24/7
• have key patient safety responsibilities
  • surveillance
    • accurate measurement & interpretation of clinical data
    • data driven decision making
  • symptom management
  • prevention of complications & adverse events
Safe healthcare is a team sport ... patients are safer when nurses

- have appropriate nursing workloads $^{1,3}$
  - ≤6 patients per RN (compared to ≥ 10 patients per RN)
    - 20% ↓ risk of death in medical wards (RR 0.80, p<0.001)
    - 17% ↓ risk of death in surgical wards (RR 0.83, p=0.049)
  - for each additional patient = 7% ↑ risk of inpatient death <30 days (OR=1·068, 95% CI 1·031–1·106)

- are well educated $^{1,2,3,4}$
  - ↑ degree prepared nurses (RNs) = ↓ mortality
  - every 10% ↑ in BN RNs = 7% ↓ risk of inpatient death <30 days (0·929, 0·886–0·973)

- have effective inter-professional relationships $^{5,6}$

- have appropriate skill mix $^{7,8,9}$
  - ↑ proportion of RNs = ↓ LOS, ↑ pain management
    = ↓ infections (pneumonia, UTI, blood-stream infections), ↓ GI bleeding,
    = ↓ falls, ↓ medication errors

NURSES & DIAGNOSIS

Traditional notion of diagnosis
• diagnosis of specific conditions
• based on clinical, biochemical and radiological criteria
• traditionally the domain of medicine .... now seen as a collaborative endeavour
NURSES & DIAGNOSIS

Nurses diagnose patient safety states
- deterioration, recovery & wellness
- do not fit traditional notion of diagnosis = both processes & outcomes

<table>
<thead>
<tr>
<th>Indicators of clinical deterioration</th>
<th>Deviation from expectations</th>
<th>Assessment of risk</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Objective</strong></td>
<td><strong>Trajectory of care</strong></td>
<td><strong>Complications &amp; adverse events</strong></td>
</tr>
<tr>
<td>• vital sign abnormalities</td>
<td><strong>Expected response to therapies</strong></td>
<td>• falls</td>
</tr>
<tr>
<td><strong>Subjective</strong></td>
<td></td>
<td>• pressure injuries</td>
</tr>
<tr>
<td>• patient appearance</td>
<td></td>
<td>• infections</td>
</tr>
<tr>
<td>• new symptoms</td>
<td></td>
<td></td>
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<tr>
<td>• behaviour change</td>
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</tr>
</tbody>
</table>

Patient & family preferences
NURSES & DIAGNOSTIC ERROR

Nurses’ role in medical error recovery: an integrative review
Theresa A. Goffney, Barbara J. Hanover and Renee Milligan

Medical Errors Recovered by Critical Care Nurses

Strategies used by nurses to recover medical errors in an academic emergency department setting
Elizabeth A. Hemmerman, RN, PhD**, Fidela S.J. Blank, RN, MN, MBA**, Anna Gawelinski, RN, DNSrN**, Philip L. Hemmerman, MD**

Nurses’ Experience of Medical Errors
An Integrative Literature Review
Erica J. Lewis, PhD, RN; Marjanae Baernholdt, PhD, MPH, RN; Ann B. Hamric, PhD, RN, FAAN

Strategies Used by Critical Care Nurses to Identify, Interrupt, and Correct Medical Errors
By Elizabeth A. Hemmerman, RN, PhD, RNC, Jena C. Goffney, PhD, RN, Fidela S.J. Blank, RN, MN, MBA, Philip L. Hemmerman, MD, Robert Whitcomb, PhD, RN, and Barbara J. Hanover, PhD, RN
Figure  Modified Eindhoven model of error recovery.
Reprinted from Henneman and Gawlinski,©2004 with permission from Elsevier.
Recovery of medical errors - ICU
• aim to establish type, frequency, & severity of medical errors recovered in ICU over 1 year
• survey of 45 critical care RNs using Recovered Medical Error Inventory
• 18,578 medical errors were recovered
  • many related to diagnostic error

Table 2. Number of Recovered Medical Errors

<table>
<thead>
<tr>
<th>Recovered Medical Error Inventory Item</th>
<th>Number Recovereda</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aversive symptoms mismanaged</td>
<td>1,386</td>
</tr>
<tr>
<td>Coexisting health issues mismanaged</td>
<td>1,053</td>
</tr>
<tr>
<td>Improper precaution technique used</td>
<td>1,013</td>
</tr>
<tr>
<td>Invasive monitoring or therapy incorrectly timed</td>
<td>870</td>
</tr>
<tr>
<td>Necessary medication titration not ordered</td>
<td>820</td>
</tr>
<tr>
<td>Physical examination absent or incomplete</td>
<td>816</td>
</tr>
<tr>
<td>Risky action could lead to potential complication</td>
<td>812</td>
</tr>
<tr>
<td>Prophylactic measures not ordered</td>
<td>800</td>
</tr>
<tr>
<td>Incorrect IV volume ordered</td>
<td>781</td>
</tr>
<tr>
<td>Vital signs interpreted incorrectly</td>
<td>779</td>
</tr>
<tr>
<td>Electrolyte replacement ordered incorrectly</td>
<td>751</td>
</tr>
<tr>
<td>Incorrect dose of medication ordered</td>
<td>729</td>
</tr>
<tr>
<td>Medical record used or interpreted incorrectly</td>
<td>716</td>
</tr>
<tr>
<td>Laboratory data used or interpreted incorrectly</td>
<td>709</td>
</tr>
<tr>
<td>Unsafe transfer decision made</td>
<td>706</td>
</tr>
<tr>
<td>Inappropriate medication not discontinued</td>
<td>706</td>
</tr>
<tr>
<td>Needed medication not ordered</td>
<td>679</td>
</tr>
<tr>
<td>Standardized protocol not adjusted</td>
<td>672</td>
</tr>
<tr>
<td>Order for diagnostic test delayed</td>
<td>645</td>
</tr>
<tr>
<td>Medication ordered for wrong patient</td>
<td>603</td>
</tr>
<tr>
<td>Inadequate technique used for invasive procedure</td>
<td>600</td>
</tr>
<tr>
<td>Clinical signs misinterpreted</td>
<td>513</td>
</tr>
<tr>
<td>Contraindicated medication ordered</td>
<td>508</td>
</tr>
<tr>
<td>EKG strip used or interpreted incorrectly</td>
<td>465</td>
</tr>
<tr>
<td>Malfunctioning device not identified</td>
<td>446</td>
</tr>
</tbody>
</table>

Dykes et al. 2010. J Nurs Admin
NURSES & DIAGNOSTIC ERROR

Recovery of medical errors – medical-surgical wards

- survey of 184 medical-surgical nurses
- 3,392 errors recovered over 3 months (~13,568 pa)
- ↑ education & expertise = ↑ error recovery
  - BN nurses* = 1.5x higher error recovery (IRR = 1.5, 95% CI: 1.1-1.2, p = 0.016)
  - MN & Doctoral nurses* = 1.9x higher error recovery (IRR = 1.9, 95% CI: 1.2-2.9, p ≤ 0.005).
    * compared to associate or diploma trained nurses
- expert nurses = 4x error recovery rate of novice nurses (IRR = 4.1, 95% CI: 1.9-9.1, p ≤ 0.001)
- no significant relationships: age, hospital tenure, specialty tenure, certification, or personality
- ↑ workload = ↓ error recovery
  - nurses with higher patient ratios recovered fewer errors (rs = -0.280, p ≤ 0.001)
NURSES & DIAGNOSTIC ERROR

Recovery of medical errors – emergency department

- aim to explore how nurses recover medical errors in the ED
- focus groups with 20 ED nurses
- major themes

Identify
- surveillance
- anticipation
- double checking
- awareness of the big picture
- experiential knowing

Disrupt
- patient advocacy
- offer of assistance
- clarification
- verbal interruption
- creation of delay

Correct
- assembling the team
- involving leadership

Henneman et al. 2006. *App Nurs Res*
NURSES & DIAGNOSTIC ERROR

Identify
Disrupt
Correct

Figure  Modified Eindhoven model of error recovery.
Reprinted from Henneman and Gawlinski, ©2004 with permission from Elsevier.
NURSES: IDENTIFYING DIAGNOSTIC ERROR

Knowing
- patient & family
- clinicians & other team members
- environment
- organisation
- expected clinical course

Surveillance\(^1\)
- purposeful & ongoing
- acquisition, interpretation, synthesis of patient data
- for clinical decision making

NOT monitoring
- clinician observes, measures, & records patient data

Questioning
- self
- patient & family
- other nurses
- other clinicians

Error detection by nurses is increased by positive work environment & relationships
- engaged nurses, collaborative relationships, nurses supported by management, strong safety culture

Error detection by nurses is decreased by task stressors
- frequent interruptions, time pressure, performance constraints & task uncertainty

\(^1\) Henneman EA et al. 2012 Critical Care Nurse
NURSES: DISRUPTING DIAGNOSTIC ERROR

KEEP CALM AND DISRUPT
NURSES: DISRUPTING DIAGNOSTIC ERROR

Disruptive Innovations

• an innovation that creates a new market by applying a different set of values, which ultimately (and unexpectedly) overtakes an existing market

• often used to describe technological advances
NURSES: DISRUPTING DIAGNOSTIC ERROR

Disruptive Innovations
NURSES: DISRUPTING DIAGNOSTIC ERROR

Disruptive Innovations
NURSES: DISRUPTING DIAGNOSTIC ERROR

Are nurses a disruptive innovation in diagnostic error?

1987
1990
1994
2007
Collaboration & clear communication

**Probe**
Were you aware that this patient’s respiratory rate is 32?

**Alert**
I’m concerned, their respiratory rate has been increasing all day

**Challenge**
We urgently need to work out why this patient is getting sicker

**Emergency**
We need to call .....
NURSES: CORRECTING DIAGNOSTIC ERROR

Correcting errors

• tenacity & perseverance
  • multiple calls or pages = something is wrong = pay attention if you are the receiver
• physical presence
  • nurses favour face-to-face communication
• confirming or reviewing the plan of care
• collaboration
  • offering options & alternatives
  • involving other team members
IT TAKES A TEAM TO KEEP PATIENTS SAFE
QUESTIONS? COMMENTS?

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