Cognition, and Complexity in the Work of Nursing: Implications for Safety and Quality

Plexus Institute Conference
On the Edge: Nursing in the Age of Complexity

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Major barrier to making progress in safety and quality:

*failure to appreciate the complexity of work*

Management and Development Organizations
- Resources & Constraints
- Coordinating knowledge
- Mindset, goals
- Address, accommodate, cope
- Evolving and escalating situations
Overall Purpose of Ongoing Research
Data Collection/Analyses

- Identification of contributors to work complexity
- Identification of strategies used to manage complexity for desired outcomes
- Identification of cognitive work leading to clinical and workload management decisions

Methods

- Direct observation of individual RNs during actual work
- Cognitive task analysis (CTA) interviews:
  - Of individual RNs about their thinking during actual work
  - For near miss/adverse event data collection
  - From RN focus groups about process/procedures

Coordinating Knowledge, Mindset, and Goals
Factors Affecting Decision Making in the Context of Demanding Fields of Practice

- Knowledge
- Mindset
- Strategic factors/goals

Knowledge, Mindset, Strategic Factors/Goals

- **Knowledge**: factors related to the knowledge base that can be drawn on for solving problems in context
- Basic education, orientation, continuing education, experience

Knowledge, Mindset, Strategic Factors/Goals

- **Mindset**: Factors that govern the control of attention and the management of workload given the ebb and flow of activities (dynamics).
  
  OR
- Mindfulness and sensemaking about the demands of the practice field (context)
Knowledge, Mindset, Strategic Factors/Goals

- **Strategic factors/goals**: factors that influence how people cope with trade-offs among different goals that conflict (in the midst of uncertainty, risk, and pressure of limited resources).

- **Problem-solving ability around competing demands**

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Coordinating Knowledge, Mindset, and Goals

**Knowledge Patterns**
- Knowing individual patient information
- Knowing "typical" patient profiles
- Knowing self-norms and workflow

**Goal Conflict Patterns/Trade-offs**
- Maintain patient safety
- Prevent getting behind
- Avoid increasing complexity
- Avoid overpatient and overstaffing
- Maintain patient/family satisfaction
- Maintaining patient flow
- Managing patient flow

**Mindset**

**Care Management Strategy Patterns**
- Stacking (Mindfulness and Sensemaking)
- Anticipate or forward thinking
- Proactively monitoring patient status
- Strategic delegation and hand-off decisions
- Memory aid
- Work-arounds

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RN Stacking

- RN workload management strategy for dealing with task complexities.

- Represents list of multiple “to be done” tasks during actual workload situations and appropriate management of the stack.
RN Stacking

- “Failure-sensitive” strategies for preventing error and minimizing bad outcomes
- Has not been the focus of teaching in schools of nursing
- Significant discriminator of novice versus experienced nurse practice

Complex Adaptive Systems (CAS)

- Importance of diversity and adaptation
- Nonlinear – possibility for a small change to have a large impact
- Distributed control vs. centralized control – “self organization”
- Importance of patterns
- Focus on relationships


Complex Adaptive Systems

- Trouble starts small and is signaled by weak symptoms that are easy to miss
- Small discrepancies can cumulate, enlarge and have disproportionately large consequences
Mindfulness

> “Struggle for alertness”

> Ability to see the significance of early and weak signals and to take strong decisive action to prevent harm


Sensemaking

Process of transforming experiences into updated views of the system by “taking the time to make sense out of new and changing circumstances”

RN Stacking Study: Purpose

Funded by NPSF

Development of a knowledge base about the phenomenon of RN stacking through answers to the following questions:

1. What activities are stacked by RNs in the context of actual care delivery?
2. What factors, including goals and constraints, contribute to RN decisions surrounding what to stack and stacking strategies?
3. What strategies do RNs use to manage the stack, particularly those that reduce the potential for and consequences from erroneous actions, unexpected situations and complicating factors?
RN Stacking Study Demographics

<table>
<thead>
<tr>
<th>Individual observations/interviews</th>
<th>30</th>
</tr>
</thead>
<tbody>
<tr>
<td>Focus group (5) participants</td>
<td>24</td>
</tr>
<tr>
<td>Age range, mean</td>
<td>22-58, 33.5</td>
</tr>
<tr>
<td>Experience level (&lt;1, 1-5, &gt;5)</td>
<td>(4, 11, 15)</td>
</tr>
<tr>
<td>Clinical areas represented (MS, ICUs (3), OR, ED, OB, RR, OP/Proc)</td>
<td>9</td>
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</tbody>
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Study Preliminary Results

- Hierarchy of priorities in actual care situations
- Factors that complicate decision making
- Stacking management strategies
- Experienced RN/novice differences

RN Stacking: Priority Hierarchy

Activity Categories

Imminent Clinical Concerns
(clinical emergencies, pain management, relationship management, high uncertainty activities)

Clinical Core Care Activities
(Assessments, routine medications, orders, dressing changes, discharges, admissions)

Get To When You Can
(help team members, stock supplies, update documentation, patient education, medication error paperwork)

Personal Breaks
(bathroom, eat)
Factors Contributing to RN Stacking
Decision Priorities

- Unpredictability
- Clinical urgency
- Perceived time constraints
- Duration of activity
- Sequence, spacing and timing of events
- Lack of control
- Assigned load
- Quality of work-life
- Expertise
- Licensing constraints
- Availability and effectiveness of team

Work-Life Factors

- Psycho-social influences (peer, collegial and organizational) versus quality of patient care (pushing back)

- Managing stress and situation awareness (influence of stress on memory, sensemaking)

RN Stacking Management Decisions

- defer
- shed
- recruit
- cluster
- be proactive
- reorder
- reduce performance criteria
- complete
Stacking strategy management decisions and examples

- **Defer**: Schedule an activity that could be done now at a later time for a purpose (deferring teaching until family member arrives).
- **Shed**: Remove a task from the stack due to lack of time or resources (bumpable tasks; examples “cleaning up environment,” “face time” with patients, tearing down IVs).
- **Reorder**: Take current activity priorities and re-order based on needs of current situation (unexpected admission, test, procedure, emergency; physician needing assistance; upset patient/family).
- **Complete**: Finish an activity; check off, or remove from the list (finish 9A medications, complete admission assessment of new patient).
- **Recruit**: Gather, or prepare for additional resources (asking for help from team; offering help; teaming up to accomplish work safely, efficiently; enlisting family members).
- **Cluster**: Perform many tasks at a single advantageous point in time for efficiency (scheduling all care activities in one trip to room).
- **Be proactive**: Perform tasks ahead of time to save time and/or to prevent tasks from getting out of control (anticipating discharge; medicating for pain; anticipating patient/family requests to build trust).
- **Reduce performance criteria**: Change the nature of an activity due to constraints related to time, resources (modify aspects of assessment; provide less social time with patients/families; reduce patient teaching time, patient teach-back opportunity).
RN Expertise Factors

- Novice RNs - focusing on routine, linear list (Benner)
- Experienced RNs - redefining the stack - adding to, re-organizing, shedding
- Gaps filling - novice versus experienced RN differences in “tool kit or bag of tricks”
- Movement from reactive to proactive as experience increases - “seeing the day”, avoiding cascades
- Collaboration and building relationships - e.g., containing the role of patients/families to reduce requests/interruptions

RN Stacking

RN stacking is a dynamic cognitive decision-making process resulting in care delivery priorities, and dependent on the ability of the nurse to be mindful and engage in accurate sense-making about clinical and workflow data in the midst of unpredictable and constantly changing situations.

I think that they’ve learned how to allot their time and their efforts into the categories that every patient needs. You have so many hours that you can spend with each patient and those nurses who are more experienced and thrive on the unit are those who have kind of made sense of how much time I can spend on education, how much time I can spend giving meds, how much time I can spend on my assessment, how much time I have to devote to the tasky things that need to be done, taking out Foleys, performing procedures, putting an NG down, hiding that 30 minutes that they need for their lunch that no one else knows about because otherwise you won’t get it. Knowing when it’s okay to say, I’m at lunch, someone else is going to have to do it. Knowing when they can and can’t report off to somebody because everybody else is having a hectic day.
Nursing work is more than application of clinical knowledge and skills.

Patient safety and quality depend on critical decisions about the prioritization and organization of care for delivery in complex systems (RN stacking).

With increasing experience, RNs prioritize care delivery based on:

- **Knowledge** - from education and experience
- **Mindset** - dependent on their ability to attend to the demands of the practice field
- **Strategic factors/goals** - affecting problem-solving and trade-off decisions regarding competing demands.