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Nurse Managers' Decisions: Fast and Favoring Remediation

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Abstract

How do nurse managers make decisions about quality issues on their units? We asked 10 nurse managers in 3 Arizona hospitals to describe how they resolved a recent quality issue. The managers tended to use a linear, but cognitively expensive strategy, often jumping from problem to solution without a clear goal and selecting solutions biased toward remedial education. Decision support tools should help managers think more systemically, systematically and efficiently, while encouraging consideration of more alternatives to reach targeted goals.

Front-line nurse managers, who comprise the largest number of operational managers in hospitals (1) are being asked to take on many more responsibilities to meet a growing number of organizational priorities. Generally nurse managers are at the center of the action and are the “go-to” people when organizational leaders want something implemented. They are expected to identify problems and design and implement innovations that will help their units achieve targeted patient care outcomes while increasing efficiency and holding down costs. (2) Yet implementing unit-level innovations is expensive in terms of time, energy, staff good will, and dollars—and, given the nature of context, there is no guarantee that an innovation that worked in one setting will work in another.

Various generic tools have been proposed to help nurse managers make effective decisions (e.g., brainstorming, root cause analysis, fishbone diagrams, decision trees, mathematical models, and consequences tables. (3) Some decision support tools also have been developed, for example, a retrospective decision support tool that helped nurse managers understand staffing metrics over time. (1) Each of these tools has some utility. However, none of these tools let managers test prospectively the likelihood of success of various innovations in a virtual environment before implementing them on their actual units.

To address this need, we are developing a Dynamic Network Analysis Decision Support tool (DyNADS). that can evaluate complex, multilevel, multidimensional problems and test the likelihood of success for a single innovation or a combination of innovations. Still, if it is to be well used, DyNADS must fit nurse managers' work flow and decision making processes.

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(4,5) In this paper, we report the results of a study aimed at clarifying how nurse managers actually make decisions.

How do managers make decisions? What the literature tells us

With the help of a research librarian, we conducted a comprehensive literature search using several strategies: We searched PubMed using MESH headings of nursing, supervisory, nursing evaluation research, or nursing administration research, and decision making. CINAHL was searched using as search terms, supervisors, supervision, or nurse managers, and decision making (clinical, ethical, organizational or computer-assisted) or decision-making support. Finally we searched PsycInfo using, as search terms, nursing or nurses, manager, supervisor, head nurse, or management, and decision making, decision support systems or decision theory. The search generated over 100 articles, but few articles related to managerial decision making and, of those, few were recent.

Managerial decision making has been defined as “choosing options that are directed toward the resolution of organizational problems and the achievement of organizational goals” (6, p. 1) and as a systematic and dynamic process of selecting alternative solutions based on the desired goal. (7) In healthcare, managerial decisions are typically directed at providing optimal patient care and minimizing costs, that is, balancing quality and efficiency.

Traditional task analyses assume that people follow a structured process of decision making that is similar to the scientific or nursing process. However, several researchers have found that, because of the complexity of healthcare, nurse executives often must make decisions with incomplete data and settle for “satisficing” rather than optimizing solutions. (8,9) Etzioni observed that, when engaged in long-term, strategic planning, nurse executives tended toward rational, structured decision making, but adopted satisficing solutions in the short term. (10) Gillies seemed to support this for all management levels, noting that when situations have no precedent, there is no alternative for nurse managers but to creatively abstract and combine ideas into potential solutions. (11)

Numerous researchers have observed that novices follow a step-by-step, linear process while experts often take shortcuts. (12-19) Nurse executives often follow this pattern, quickly jumping to a solution without a thorough analysis, a strategy that may result in the right decision for the wrong problem. (3) If this behavior is also true of front-line managers, it creates strong implications for designing any decision support tool, because the tool must now support the structured decision making of novice nurse managers, as well as allow for the shortcuts that more experienced nurse managers may take.

Expert decision making is a constructive process in which the outcomes are not preplanned or the solutions simply pulled out of a memory bank. Instead, expert decision making activities are creative, innovative, and adapted to uncertainty and the context of the current problem, using learning from prior similar experiences. (12-19) In business, creativity and innovation have been touted as predictors of success. (20) Vicente describes expert decision making as the “concatenation of a string of skills that are tailored to task demands.” (21) (p. 186) If true, then an effective decision support tool must support this core set of skills while allowing for flexible adaptation.

How managers *really* make decisions

Does the decision making of front-line nurse managers resemble that of novices, experts, or both? To answer this question, we asked nurse managers to tell us about a recent quality or patient safety issue they had dealt with and then used a decision ladder (21) to plot their decision

process. Approval for the study was obtained from the University of Arizona Investigational Review Board and Hospital Research Committees.

The nurse managers we interviewed included 9 women and 1 man. Five managers had baccalaureate degrees, 2 had master's degrees in nursing, and one had a master's in business administration (the education level of 2 is unknown). Three managers had been in their current jobs for one year or less; one manager had held the same position for 20 years. Nine of the managers had the primary administrative responsibility for one patient care unit, while the tenth was managing 2 units at the time of the interview. All units were classified as medical/surgical. Units ranged in size from 28-42 beds. Number of unit staff ranged from 52-78 full time equivalents (FTEs).

Decision ladders as analysis tools

During 1-hour audiotaped interviews, we asked each of the nurse managers to describe a safety or quality issue they had identified recently, how they learned about it, their information sources, and how they had addressed the problem. The results were plotted using decision ladders (Figure 1). (18,19) The decision ladder represents a sequential process of problem identification and resolution. The ladder is “folded” to facilitate recording of shortcuts and shunts (jumps).

Novices are expected to begin at the lower left hand side of the ladder when they detect a problem and continue step-wise up the left hand side of the ladder and down the right side as they formulate and implement a solution to the problem. Experts can be expected to use shortcuts or jumps, for example using pattern matching to recognize the similarity of this situation to one experienced previously and adopting a solution that worked before.

Characterizing diagnostic search strategies

The ladder also allowed us to characterize the search strategies nurse managers used to “diagnose” each problem, using categories described by Rasmussen. (22) Rasmussen identified 2 categories of search strategies: topographic and symptomatic. Topographic search strategies require that decision makers have access to a model of how the system normally operates—either in their memories or in a diagram. Clinicians often use topographic strategies when thinking about physiological problems, comparing what they are observing to how they know a particular system, for example cardiac, to work. To what degree this approach is used by front-line nurse managers is unknown, but we speculated that they might use topographic strategies to diagnose problems with a particular piece of equipment or a process flow. Symptomatic searches include 3 distinct strategies: pattern recognition, decision tables, or hypothesis and test. Pattern recognition involves identifying a pattern of data as similar to one encountered before then quickly selecting the corrective action needed. Pattern recognition requires minimal cognitive processing, but depends on the observer having had a significant amount of relevant experience with the problem at hand. Decision tables use an “if, then” structure; for example, if I see symptoms a, b, and c, then I should do x. Decision tables are assumed to require more cognitive work because they place a high demand on short term memory. The hypothesis and test strategy begins with a hypothesis about the state of the system. The hypothesis could be the outcome of a previous hypothesis and test situation or of one of the other search strategies. Finding a solution requires a model of the “normal” situation, as well as a model of the current situation. The 2 models then are compared (hypothesis testing). If the results of the test are as expected, the hypothesis is supported. Hypothesis testing requires few observations, but is thought to make more demands on cognitive processes than the other strategies. (21)

Findings

Incidents described (with number of times cited in parentheses) focused on improper dosage of anticoagulants (3), unsafe unit environment (3), patient falls (2), high rate of urinary tract infections (UTIs) (1) and a glucometer-insulin protocol issue (1). The unsafe unit environment issues included nothing by mouth (NPO) signage in double rooms that was not patient-specific, improper use of Alaris pumps, and delays in unit safety issues being reported to the manager.

What did the decision making plots reveal?

Nurse managers' decision making procedures varied; no 2 plots looked exactly alike (See Figures 2 and 3 for examples). The decision ladder includes 8 distinct steps; the number of steps in nurse managers' protocols ranged from 4 to 8, with an average of 5.8 steps. Most decision procedures started with an alert generated by direct observation or a (verbal or written) report. Nearly all (9 of 10) decision procedures were sequential, following the steps of the decision ladder, although, not all started at the lower left hand side. None of the nurse managers reported evaluating performance criteria. All decision procedures ended with some type of resolution. Four of the 10 solutions involved staff inservice education.

In one protocol describing a Heparin error, a disciplinary solution (staff suspension) was implemented immediately, then a more detailed analysis was begun. That analysis revealed what the manager described as a "trail of errors." In response, the manager implemented remedial education for all staff nurses on the unit (Figure 2). The system issues were seemingly ignored. In another protocol, 3 possible reasons for the high UTI rate were hypothesized (not identifying UTIs on admission, not removing catheters promptly on intensive care unit transfers, and improper perineal care); but staff education was the sole solution implemented, again ignoring opportunities for changing the system of care. In 6 of the 10 cases, managers jumped from problem identification to solution selection without explicitly defining the problem, interpreting the consequences, evaluating performance criteria or defining the goal (e.g., Figure 3). Only 4 of the 10 managers explicitly identified a goal, which may have contributed to the propensity for quickly choosing remedial education as a solution.

There was no statistically significant correlation between the number of years in this nurse manager position and the number of steps taken or the number of jumps. The most experienced nurse managers exhibited jumps, but so did the 2 managers with the least experience in the current position.

Which decision strategies were used?

By examining the completed decision ladders, it was possible to characterize the managers' decision making strategies (Table 1). All diagnostic search strategies fell into the symptomatic category. Six nurse managers used decision tables; for example, if the problem was due to staff's lack of knowledge about a medication or how to use an Alaris pump correctly, then education was the solution. It is worth noting that nurse managers generally did not use decision tables to derive a diagnosis from a set of symptoms, but to jump directly from symptoms to a solution. Some managers used decision tables twice in the same incident, matching different symptoms to specific actions. Two managers used pattern matching strategies; for example, one recalled reading about a solution that seemed to fit this situation then proceeded to implement that solution. The other 2 managers adopted hypothesis and test solutions. In each of these cases, the hypothesis was generated by a staff nurse suggestion.

Implications

Cognitively expensive decisions biased toward training

Although nearly all the nurse managers we interviewed followed the decision ladder steps sequentially (as novices do); only 2 of the 10 nurses followed 7 or more of the 8 steps in the decision ladder. All but one exhibited some type of jump (as experts do), usually from an alert to a solution, rather than from alert to diagnosis. Education was the most frequently reported action chosen (appearing as at least part of the intervention in half of the cases), suggesting a bias toward remedial training. Discipline was used only once (staff suspension)—but it was applied immediately, as if this type of medication error triggered an automatic response.

The diagnostic search strategy used most often was the decision table. Decision tables require a high cognitive load because the user has to store all the “if-then’s” in memory. (6) The nurse managers in this study seemed to have a limited set of “if-then’s” (or at least “then’s” in their decision tables), thus leading to the observed emphasis on remedial staff education as a solution. To what extent this might be due to variations in leadership style cannot be determined from our interviews. In a study of military nurse managers, Corcoran concluded that managerial experience correlated with effective decisions, but effective decision making was also influenced by motivation to manage and managerial style, as well as by the setting. (23)

The 2 pattern matching examples exhibited quick jumps to a solution that drew on managers’ previous experience (remembering reading about a solution that might be applicable here, or opting for a “hot pink” color to indicate individual NPO status). We observed some consistency in the steps of the decision ladder that were not taken. Only one nurse manager discussed performance criteria for selecting a goal; few described the goal of their actions. Whether these activities simply were implicit, rather than explicit, cannot be determined from our data. Still, the frequency of this missing step for 9 of the 10 individuals is worth further investigation. Failing to identify performance criteria for selecting a goal might lead managers to be less thoughtful about the goals to be achieved and interventions that might meet those goals. Without performance criteria for goals, it is unclear that the impact of the intervention could be evaluated effectively. Interestingly, nurse managers are well aware of having measurable goals in quality improvement projects, but may not be transferring that knowledge to their own management practices.

Years of experience in the current position were unrelated to “jumps.” In fact, 2 of the nurse managers with the shortest tenure in the position exhibited jumps. This seems to contradict prior research suggesting that only experts exhibit jumps. However, expertise is not simply based on years of experience, but requires very focused attention to specific problems. (15, 16) One becomes an expert in a domain after experiencing many similar events. These medical-surgical nurse managers varied widely in their years of experience (from less than 1 to more than 20 years), but it is likely that they also varied in their experience of the particular situations they described in the interviews. In fact, it would be surprising if any of them were truly an expert in dealing with any of the individual problems.

Study limitations

The study had several limitations. First the sample was small and limited to 3 hospitals in one state so results cannot be generalized. Second, the interviews relied on self report. We would have preferred using direct observation, but it was more efficient for us and less intrusive for the nurse managers to conduct single interviews, rather than attempt to follow nurse managers over an extended period of time. It may be that the decision making procedures the interviewees described differed from those they actually used.

Facilitating nurse managers' decisions

Nurse managers do not make decisions in a vacuum. Organizational culture, top managerial support, and even adequate staffing can affect decision making. (21,24) Time constraints encourage nurse managers to make decisions very quickly, so it is not surprising that they take the kind of short cuts we observed. These short cuts may save time initially; but if the results are suboptimal, the time saved may be lost later on. Because the decision ladder is easy to use and understand, managers might use it to evaluate their own decision making processes or those of their subordinates. Managers are very familiar with tools such as the fishbone diagram for root cause analysis; and can use the decision ladder in much the same way to ensure efficient, yet comprehensive decision making, especially for those managers who are less experienced. Given the variety of decisions that nurse managers must make, it is unlikely that any is an expert on every problem.

Computerized decision support tools such as DyNADS are being developed that could facilitate nurse managers' decision making by encouraging systemic, systematic, efficient decisions based on, not only a careful assessment of the nature and causes of the problem, but also an evaluation of alternative solutions to achieve the desired outcome. An ideal decision support tool for nurse managers should allow managers to use their preferred decision making strategies when appropriate, but also support—or even suggest—alternative strategies when those might be more efficient (similar to Clancy's suggestion that managers should view problems through multiple “frames” or perspectives). (3) An ideal decision support tool must be able to help nurse managers deal with multi-factorial problems, the potential interaction of multiple problems and solutions, and the impact of different contexts. Given the prevalence of the decision table strategy, the high cognitive workload required by this strategy (especially in today's complex environment), and the limited set of interventions chosen by the nurse managers in this study, providing nurse managers with other solution options as an external memory aid and assistance in evaluating the options should be very useful.

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Figure 1.
The Decision Ladder (adapted from Vicente, 1999)

Figure 2.

A heparin overdose. The decision procedure used is depicted by dark, numbered circles linked by broken arrows.

Figure 3.

A patient fall. The decision procedure used is depicted by dark, numbered circles linked by broken arrows.

Table 1
Decision Making Events with Participant Procedures and Strategies

Event	Steps*	How detected	Jumps*	Solutions	Strategy
High unit urinary tract infection rate	4	Alerted by report	Yes	Quick jump from possible reasons to single solution (staff education)	Decision table
Heparin error	8	Alerted by Clinical Leader	Yes	Initial suspension of RN involved; followed by further investigation and ultimately staff education	Decision table (used twice)
Glucometer Insulin Protocol issue	6	Alerted by staff nurse	Yes	Jump from observed problem to adopting RN's suggested protocol revision	Hypothesize and test
Heparin overdose	6	RN reported	No	Staff education & 2- person check @ shift change	Decision table (used twice)
Patient fall	5	Computer report	Yes	Explored possible solutions with reporting nurse; then recalled & implemented another hospital's intervention	Pattern matching for action
Unsafe environment reported 2 weeks after discovered	7	Safety Rounds report	No	Joint rounding with Safety Committee initiated	Decision table
Patient falls during shift change	6	Patient satisfaction data	No	Staff schedule change to cover shift change	Hypothesize & test
Alaris Guardrail off	6	Observation	No	Education and monitoring. Added pump check to charge nurse rounds checklist	Decision table
Coumadin error	6	MD and RN notified	Yes	Charge nurse discussed with RN (individual education)	Decision table
NPO signage issue	4	Nutritionist reported difficulty in identifying which patient in semi-private room was NPO	Yes	Process improvement: New "hot pink" signs designed	Pattern matching

* Steps, number of steps in decision ladder; Jumps: jumping to a solution without a thorough analysis