Accuracy of Interpreting Human Responses

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ABSTRACT: Nurse managers who advocate continuous quality improvement should be examining system-level policies, procedures and attitudes to determine whether they support or detract from accuracy of nurses' interpretations of human responses. A study discusses the relationship of accuracy of nurses' diagnoses to continuous quality improvement and demonstrates why nurse managers should focus on accuracy in system-level decisions. Four guidelines, which emphasize quality of interventions and outcomes, are given.

Focusing on the accuracy of interpreting human responses may seem like a clinical rather than a management issue, yet it is a nurse manager's task to make the system-level decisions. A majority of nurses believe that accuracy of diagnosis is "not likely" under the present hospital conditions.

To accomplish continuous quality improvement (CQI) goals, nurse managers need to remove organizational barriers to quality, empower the staff, facilitate reshaping of the environment and support visionary nontraditional approaches. Continuous quality improvement in nursing may not be possible without a conscious and deliberate attention to the processes and outcomes related to accuracy of interpreting human responses, or nursing diagnoses. The theory that high accuracy of nurses' interpretations is positively related to increased quality and decreased costs applies to all nursing systems, not just those using "nursing diagnosis".

Accuracy of interpreting human responses is a judgment — an interpretation or diagnostic statement that matches the cues in a patient situation. This judgment occurs on a continuum, not as an either-or phenomenon. Some interpretations are close to the highest accuracy interpretation, others are in the ballpark, others are not supported by data. Seven degrees of accuracy were described and supported through research.

Two assumptions underlie this call for attention to accuracy:
- First, interpretations of human responses to health problems/life processes are complex enough to "need" interpretive reasoning.
- Second, every single interpretation of clinical cases has the potential to be less accurate than indicated by the data.

Illustration: focus on accuracy

Nurses who are interested in quality must focus on accuracy of interpreting human responses because of the direct connection between interpretations of cases, choices of interventions and achievement of positive outcomes. Low accuracy interpretations can lead to direct patient harm through neglect of actual and potential problems or the use of inappropriate interventions; absence of positive outcomes or a situation in which the patient is not actually helped by the nurse; wasted time, energy and money in treating phenomena; dissatisfaction of patients and families.

The following cases illustrate the significance of focusing on accuracy.

Case 1: George Jones is a 68-year-old male with a history of cardiac disorders. He was admitted three days ago for a heart attack complicated by congestive heart failure (CHF) and has been in normal sinus rhythm with no ectopy. The CHF has resolved; he is awake, alert and fatigued. His blood pressure (BP) is 120/80, respiratory rate is 32, S1 and S2 are within normal limits and there is no S3. He has positive jugular venous distention, negative hepatojugular reflux and a hematocrit of 36%. His skin is cool; he has pedal edema with decreased peripheral pulses and good venous filling. Fine crackles were noted at the bases of both lungs. His intravenous intake is 50cc per hour, while urine output is less than 30cc per hour. His pulmonary wedge pressure was 20mm of mercury.

Nurse A interpreted these data to mean Fluid Volume Excess, obtained an order for Lasix 40 milligrams (mg) and administered the medication. She kept Mr. Jones in a Fowler's position, slowed down the intravenous (IV) solution and sent him off to x-ray as planned. The urine output increased to 150cc in an hour, but then the BP decreased to 80/40. Nurse A increased the IV fluids, concluding that excessive diuresis had dropped the BP. The pulse rate then became 120, and Mr. Jones went into CHF.

The highest accuracy interpretation in this case should have been Decreased Cardiac Output (DCO) and the treatments should have been measures to reduce the cardiac workload. Instead, low accuracy interpretations in the realm of fluid balance provided di-
EXHIBIT I
DEFINING CHARACTERISTICS: DECREASED CARDIAC OUTPUT (DCO) AND FLUID VOLUME EXCESS (FVE)

DCO
- Variations in BP
- Oliguria
- Restlessness
- Possible change/decrease in mental status
- Rales (crackles)
- Dyspnea/SOB
- Orthopnea
- Jugular vein distention
- Other: arrhythmias, fatigue, color changes, & peripheral pulses, cold clammy skin, edema, cough

FVE
- Variations in BP
- Oliguria
- Restlessness
- Anxiety
- Rales (crackles)
- Shortness of breath
- Orthopnea
- Jugular vein distention
- Other: anasarca, pulmonary effusion, CVP or PA ↑, weight gain, S3 heart sounds, J start ↑ & ↓ electrolytes & hepatojugular reflex

resection for Nurse A's interventions at two different time periods and with two different sets of data. First it was confused with Fluid Volume Excess (FVE), then it was confused with Fluid Volume Deficit (FVD). There were cues for each of these low accuracy interpretations, yet when intervention focused on these interpretations, they caused harm to the patient. In the Lunney System of measuring accuracy, on a 7-point scale of -1 to 5, these diagnoses would fall at level 2; i.e., there are relevant cues for the interpretations but the diagnoses are inconsistent with some of the cues.

The defining characteristics (DCs) of DCO and FVE do indeed overlap. (See Exhibit I.) One can see the similarities and differences by placing the DCs across from one another. Cues that the nurse might have used to make the diagnosis of DCO instead of FVE were the negative hepatojugular reflex, decreased peripheral pulses, absence of S3 and presence of a normal hematocrit.

Case 2: Jim Hughes is a 76-year-old male paralyzed by a vertebral fracture (T5) sustained in a fall. Following morning care, the nurse noticed that the skin on his face was cold, clammy and flushed. The arterial line revealed a BP of 200/110. The reading was checked against a cuff pressure and found to be the same. He became bradycardic and, since he was intubated, mouthed the words “chest pain.” Nurse C noticed that there was no urine in the Foley bag and interpreted these data to mean Decreased Cardiac Output. A stat 12-lead ECG was done, IV fluids were decreased and a nitroglycerine tablet was given to Mr. Hughes.

A physician arrived on the scene and concurred with Nurse C's impression, made a diagnosis of “rule out myocardial infarction” (MI), and ordered morphine 5 mg. IV and a Dobutrex drip. The BP subsequently became 220/130 and Mr. H had a massive cerebral vascular accident.

The highest accuracy diagnosis in

EXHIBIT II
DEFINING CHARACTERISTICS: DYSREFLEXIA AND DECREASED CARDIAC OUTPUT (DCO)

DYSREFLEXIA
- Paroxysmal hypertension
- Diaphoresis
- Pallor (below injury)
- Bradycardia/tachycardia
- Paresthesias
- Chest pain
- Other: headache, chilling, conjunctival congestion, blurred vision, nasal congestion

DCO
- Variation in BP
- Cold, clammy skin
- Color changes
- Arrhythmias
- Decreased pulses
- Chest pain
- Other: fatigue, jugular vein distention, oliguria, rales, dyspnea, restlessness

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this case should have been Dysreflexia, and not Decreased Cardiac Output. Notice the overlap of cues for these two very different physiological phenomena. (See Exhibit II.) Dysreflexia occurs when autonomic pathways are severed in thoracic spine injuries. Although common in persons with this injury, the nurse apparently did not consider this interpretation because the cue of chest pain was misinterpreted as a cardiac problem. A noticeable cue was that Mr. Hughes' Foley catheter was kinked: full bladder and bowel are common causes of Dysreflexia.

Case 3: Mary Smith is a 55-year-old female with acutely exacerbated chronic respiratory disease who was on a mechanical ventilator. Although she had some recent ECG changes, she was sleeping peacefully when her physician, Dr. W, visited. Dr. W exited the room and asked Nurse B to prepare for a Swan Ganz catheter for hemodynamic monitoring of a possible MI and CHF.

Nurse B entered the room and found Ms. Smith looking upset, gesturing and trying to talk with the ventilator alarm ringing. Dr. W's entered the room after this and said, "She's very nervous, give her a Valium to calm down." With this, Ms. Smith started waving her arms wildly. Nurse B gave Ms. Smith the Valium as suggested.

In this case, the nurse's interpretation (anxiety) concurred with Dr. W's, when in fact, the highest accuracy interpretation should have been fear of the procedure. When Dr. W spoke to Ms. Smith, he said "I'm going to put a catheter into your heart to measure your cardiac status." Ms. Smith was afraid of the procedure and of having a catheter in her "heart." In addition, when Dr. W ordered Valium, it increased her fear because she had taken Valium the previous year and was afraid of the way it made her feel.

Even though the cues for anxiety and fear overlap, these are two different phenomenon with two different treatment goals. When the highest accuracy interpretation is fear, a feeling of dread related to an identifiable source, the goal is to help the person deal with the source. With Ms. Smith, the intervention should have been therapeutic communication, not Valium. When the diagnosis is anxiety, which is a vague, uncomfortable feeling with a nonspecific and unknown source, the goal is to help the person relax. The increasing stress Ms. Smith experienced when diagnosed with anxiety instead of fear led to a reduction in oxygen intake and increased myocardial oxygen consumption.

Meaning of case studies
These case studies typify nursing care situations and illustrate the connection between accuracy of interpretations, the interventions that are selected and the resulting patient outcomes. These are actual clinical cases. In nursing research, written and videotaped simulations consistently show that nurses vary in accuracy.¹

For Lunney's study, using three valid and reliable medical-surgical cases, only 7% of nurses with baccalaureate degrees and one to five years' experience stated the highest accuracy interpretation of one case study, and 43% stated the highest accuracy interpretations of the other two cases.³ The cues for the highest accuracy interpretations were stated in the cases and the cases were only 14 sentences long.

In a clinical study of the accuracy of nurses' diagnoses of the psychosocial problems of 160 medical-surgical cases, the mean of accuracy ratings was 3.36 (SD 1.74) of a possible 5 on the Lunney scale for rating accuracy.² Sixty-two nurses from three hospital systems in New York and New Jersey consented to participate in the study. The finding that 32.5% of diagnoses received the highest rating of +5 by two clinical experts trained in accuracy was encouraging. Although 71.2% of diagnoses were scored as +3 or above; 28.8% of diagnoses were scored below +3. Additional studies are needed before these findings can be generalized. The result that almost 30% of the cases in this study were seriously misinterpreted supports the premise that quality of nursing care may be compromised by low accuracy.

Guidelines for nurse managers
Accuracy is only one aspect of clinical decision making and critical thinking. Yet, this one aspect forms the basis for "doing the right thing" in other phases of clinical decision making.

Guideline 1: Accept that nurses may not be highly accurate. A full awareness of the hard truth should be integrated with all other thinking: Nurses, like diagnosticians in other disciplines, may not be highly accurate when interpreting clinical cases. This is expected with the complex health problems, the lack of attention thus far to accuracy in system-wide policies, procedures and attitudes, as well as the variance that exists in intellectual, perceptual, interpersonal and technical abilities. The complexity of human responses alone means that there is high potential for variance in accuracy.

Guideline 2: Modify the structure and function of the system. Examine the whole nursing department's structure and function. Does it support or detract from accuracy of interpreting human responses? To adopt this new philosophy, the old ways of ensuring quality may need to be modified.

For example, a care plan or critical pathway may require a nurse to initiate interventions for knowledge deficit. Yet, teaching, an expensive intervention, should not be conducted if the patient already "knows" the content. "Knowledge deficit" and other human responses are "diagnoses" because of their probabilistic nature. If nurses are expected to intervene, it decreases, rather than increases, quality. When a nurse focuses on that which is not appropriate, it prevents that nurse from recognizing important phenomena. The old way of standardizing care based on medical problems sends a message: The system is not interested in accuracy within the nursing domain. This makes it difficult, if not impossible, to focus on accuracy.

Numerical quotas that relate to accuracy of human responses—"The admitting nurse must state two nursing diagnoses," need to be adjusted. To diagnose means to recognize the existence of a phenomenon to be treated; policies should not dictate the number of diagnoses.

Guideline 3: Communicate the intention and accomplishment of accuracy. Collect statistical and qualitative data, illustrating both the intention and accomplishment of accuracy. Since an...
increased focus on accuracy will probably decrease costs, data also should show that the diagnostic skills of nurses are a cost benefit to the institution.

Guideline 4: Collaborate on expectations of nurses at all levels. Arbitrary decisions on nurses' expectations within the department will probably not help direct care practitioners to become expert diagnosticians. Nurses who are responsible to accurately interpret human responses need to have the self-confidence associated with personal power; i.e., shared governance or other types of collaboration.

Expectations—unit managers

Unit managers can adopt this new way of thinking by scheduling patient conferences, expecting staff nurses to be accountable and encouraging continuing education. In Lunney's study, only 18 of 86 nurses reported that they had in-service education on nursing diagnoses. These 18 nurses were significantly more accurate (p < .01) than the 68 nurses who reported having no in-service education. In the clinical study done by Lunney et al., continuing education on nursing diagnosis was the only demographic variable that correlated significantly with accuracy, r = .21, p = .05. If accuracy is a unit expectation, it will become a habit.

Educators

Educators can design sessions pertaining to human responses, diagnostic and critical thinking processes, nursing interventions for human responses and evaluation of outcomes. Inservice programs that include only topics like ECG interpretation or management of equipment do not help nurses to be accurate interpreters of human responses. Nurses need to know the definitions, defining characteristics, related factors, interventions and expected outcomes pertaining to human responses. Although knowledge alone does not produce accuracy, it is certainly necessary.

staff nurses

To adopt this new way of thinking, staff nurses must view themselves and other nurses as diagnosticians. The best judges of accuracy are the persons who are working directly with the clinical case—in most cases the staff nurse and the patient/family. Mutually interacting and validating interpretations, goals and interventions with patients and families support CQI, patient/family satisfaction and positive outcomes.

Developing a system that focuses on accuracy of nursing diagnoses requires the nurse manager to accomplish a broad base of actions that will support optimum clinical outcomes, patient and family satisfaction, and financial viability.

References

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