

Externalizing the Critical Thinking in Knowledge Development and Clinical Judgment ¹

NOREEN C. FACIONE, PhD, RN, FNP

UNIVERSITY OF CALIFORNIA SAN FRANCISCO
SAN FRANCISCO, CALIFORNIA, 94143

PETER A. FACIONE, PhD

SANTA CLARA UNIVERSITY
SANTA CLARA, CALIFORNIA 95053

ABSTRACT

CRITICAL THINKING, DEFINED AS PURPOSEFUL SELF-REGULATORY JUDGMENT, IS CENTRALLY EVIDENT IN NURSING KNOWLEDGE DEVELOPMENT AND EXPERT CLINICAL JUDGMENT. A HOLISTIC CT SCORING RUBRIC, A FRAMEWORK FOR CT INDIVIDUAL AND GROUP PRESENTATIONS, AND A CASE STUDY STRATEGY FOR TRAINING AND NURTURING CT IN STUDENTS ILLUSTRATE THAT THE CT IN NURSING KNOWLEDGE DEVELOPMENT AND CLINICAL JUDGMENT CAN BE EXTERNALIZED, TAUGHT, MODELED AND MEASURED.

¹This essay appeared as Facione, NC, Facione, PA, (1996). Externalizing the critical thinking in clinical judgment. Nursing Outlook, Volume 44, pages 129-36.

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Critical thinking (CT) is increasingly being recognized as the cognitive engine driving the processes of knowledge development and professional judgment in a wide variety of professional practice fields. In 1990 a consensus definition of CT, the results of a Delphi research project sponsored by the American Philosophical Association, was published. In describing CT, expert researchers and theoreticians said:

"We understand critical thinking to be purposeful, self-regulatory judgment which results in interpretation, analysis, evaluation, and inference, as well as the explanation of the evidential, conceptual, methodological, criteriological, or contextual considerations upon which that judgment was based."¹

Since 1990, this robust concept of CT has become the conceptual architecture used to achieve national consensus among hundreds of educators, employers, and policy makers with regard to those cognitive skills and personal dispositional attributes which form the core of CT.² Hypothesized relationships between knowledge development, clinical judgment, and an array of cognitive models of thinking have begun to appear in the literature,³⁻⁸ The relationship between these constructs is also the subject of a meta-analysis project currently underway in the United States.⁹ Co-investigators on campuses and in practice settings are sharing CT data gathered from both nursing students and practicing nurses in an attempt to discover how critical thinking affects nursing education and nursing practice.

This paper examines this national, cross-disciplinary consensus description of CT skills and the profile of the ideal critical thinker, which is the product of a Delphi study sponsored by the American Philosophical Association. By translating the definition into actual teaching and assessment strategies, the paper explores this consensus definition's value for describing the skill and disposition needed for competent clinical judgment in the nurse clinician. By way of translating this consensus definition into classroom teaching strategies, the paper demonstrates where the CT is embedded in nursing education. A case study example is used to identify opportunities to nurture CT skills and to demonstrate and reinforce CT dispositional attributes in students or practicing clinicians. Similarly, a sample class assignment is provided that both engages students in CT and produces a specimen of a student's critical thinking which could be graded or used in program assessment. Classroom or clinical practice level measure to assess the CT inherent in a nursing judgment is exemplified in the form of a rubric to holistically measure CT in varying practice or classroom settings. The paper is a guide to how the conceptual definition of CT can be translated to effective strategies for teaching CT and authentic measures of CT in a wide variety of assessment settings and at all levels of clinical practice.

Emergence of a cross-disciplinary, national consensus concept of CT

Nationally, CT has been identified as essential to knowledge development, professional

practice, and the development of an educated public, so that we may address the international and local social, economic, educational, environmental, and health challenges of the 21st Century.¹⁰⁻¹¹ As a result of this growing focus on the CT component of knowledge development and professional judgment across the disciplines, recent work has increasingly centered on defining criteria to measure CT¹²⁻¹³ and designing effective strategies to teach CT skills and nurture CT dispositional attributes.^{3,4,12,14}

Although many nurse researchers and educators currently struggle to draw connective lines between clinical judgment processes and CT processes, the national debate on the importance of CT would suggest that a more basic relationship should be examined: the cognitive and epistemological integration of CT and clinical judgment embedded in clinical practice and the development of nursing knowledge. The consensus construct of CT described here¹ greatly overlaps the construct of clinical judgment as articulated in the literature as does the description of the ideal critical thinker call to mind descriptions of a nurse with expert clinical judgment. The dispositional profile of the ideal critical thinker is described by the Delphi experts as follows:

"The ideal critical thinker is habitually inquisitive, well-informed, honest in facing personal biases, prudent in making judgments, willing to reconsider, clear about issues, orderly in complex matters, diligent in seeking relevant information, reasonable in the selection of criteria, focused in inquiry, and persistent in seeking results which are as precise as the subject and the circumstances of inquiry permit... "¹

In the clinical context, the nurse adept at CT would be expected to draw judiciously on developed nursing knowledge in forming, evaluating, or re-evaluating a clinical judgment. A nurse researcher engaged in the generation of new nursing knowledge or testing previously developed nursing theory, would be expected to use an organized and exhaustive approach to reflectively analyze, interpret, evaluate, infer, and explain evidence and hypotheses. Indeed, this intersection of constructs is at the heart of the challenge for theory and knowledge guided clinical practice.

The American Philosophical Association's commission of a Delphi study to explore a cross-disciplinary definition of CT was a response to the need for concept clarification on a topic gaining influence in United States educational and political institutions. Since that time, this definition has been utilized to address the US Department of Education's Education Goals: 2000¹⁰ mandate and has been the framework of a replication study of the definition and valuation of CT by educators, employers and policy makers.² In 1994, at national forums of the American Association of Higher Education (AAHE) and the American Educational Research Association (AERA), theoreticians and scientists reinforced the consensus regarding the CT construct.^{2,13,15,16} The APA consensus demanded that in using one's CT skills to reflectively form a purposeful judgment (in thinking critically) one must take into consideration evidence, conceptualizations, methodologies, criteria, and contexts.¹ Thus understood, CT is a particularly central phenomenon in practice disciplines. As a guide to knowledge development in nursing, this consensus definition might be measured against Meleis¹³ call for a process framework for nursing science and knowledge development that demands theoretical connections between believed facts and practical observation. Table 1 identifies the core CT skills as outlined in the APA consensus report.¹

Table 1:

**Critical Thinking Skills:
The 1990 APA Consensus Definition¹**

"We understand critical thinking to be purposeful, self-regulatory judgment which results in interpretation, analysis, evaluation, and inference, as well as explanation of the evidential, conceptual, methodological, criteriological, or contextual considerations upon which that judgment is based..."

Consensus Critical Thinking Cognitive Skills and Sub-Skills

<u>Interpretation:</u>	! Categorization ! Decoding Sentences ! Clarifying Meaning
<u>Analysis:</u>	! Examining Ideas ! Identifying Arguments ! Analyzing Arguments
<u>Evaluation:</u>	! Assessing Claims ! Assessing Arguments
<u>Inference:</u>	! Querying Evidence ! Conjecturing Alternatives ! Drawing Conclusions
<u>Explanation:</u>	! Stating Results ! Justifying Procedures ! Presenting Arguments
<u>Self-Regulation:</u>	! Self Examination ! Self Correction

At the same time, an increasing emphasis on the importance of the dispositional side of CT has been stressed by experts in CT teaching and assessment.¹⁵⁻¹⁹ The personal disposition toward CT would lead one to approach solutions to one's ill-structured problems through the use of one's CT skills, versus using some other less rational situational strategy (eg. appeal to other authority, implementing a rote protocol, guessing, ignoring). Table 2 displays one taxonomy of the dispositional attributes of CT. These attributes were derived from the APA Delphi description of the ideal critical thinker through subsequent empirical research projects.^{18,19}

Table 2:

**Constructs Empirically Derived from the
1990 APA Consensus Definition: The Ideal Critical Thinker^{1,18}**

"The ideal critical thinker is habitually inquisitive, well-informed, trustful of reason, open-minded, flexible, fairminded in evaluation, honest in facing personal biases, prudent in making judgements, willing to reconsider, clear about issues, orderly in complex matters, diligent in seeking relevant information, reasonable in the selection of criteria, focused in inquiry, and persistent in seeking results which are as precise as the subject and the circumstances of inquiry permit..."

The Disposition Toward Critical Thinking

- Truthseeking: ! A courageous desire for the best knowledge in a context, even if such knowledge fails to support or undermines one's preconceptions, beliefs or self interests.
- Open-Mindedness: ! Tolerance to divergent views, self- monitoring for possible bias.
- Analyticity: ! Demanding the application of reason and evidence, alert to problem situations, inclined to anticipate consequences.
- Systematicity: ! Valuing organization, focus and diligence in the approach to complex problems.
- CT Self-Confidence:! Trusting of one's own reasoning skills.
- Inquisitiveness: ! Eager to acquire knowledge and to learn explanations even when applications of the knowledge are not immediately apparent.
- Maturity: ! Prudence in making, suspending, or revising judgment. An awareness that multiple solutions may be acceptable and that reaching closure may be necessary even in the absence of complete knowledge.
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The centrality of CT in nursing

The conceptual definition of CT, containing clear reference to both skills and dispositional attributes, has particular application to descriptions of nursing knowledge development. Even the short summary of the APA Delphi consensus definition shown here is in symmetry with descriptions of developing a nursing knowledge base by carefully examining and delimiting key concepts/constructs and clarifying meanings, categorizing phenomena, identifying assumptions, testing relationships/hypotheses/theories, as well as conjecturing alternatives for testing, justifying procedures, and stating findings. All are manifestations of CT skills needed for clinical decision-making in situations which are often high stakes and time limited.

The concern that nursing knowledge development should expect a search for best knowledge in a given context is a central concern to nursing practice. Nursing practice demands fairmindedness to new evidence and a willingness to reconsider clinical judgments. It values a focused and diligent approach to ill-structured patient problems, and requires tolerance of multiple perspectives and interpretations when such perspectives and interpretations can be supported by reasons and evidence. All of these characteristics are identified as descriptors of ideal CT disposition.

Broadly conceived, CT can be characterized as purposeful, self-regulatory judgment, a human cognitive process. As such, CT is a pervasive human phenomenon which can be evident (at least on occasion) in problem solving, decision making, reasoned inquiry, professional practice, and everyday life. CT is a non-linear, recursive process in which a person forms a judgment about what to believe or what to do in a given context. In so doing a person engaged in CT uses a core set of cognitive skills – analysis, interpretation, inference, explanation, evaluation, and self-regulation – to form that judgment and to monitor and improve the quality of that judgment. CT is non-linear and recursive. This appreciation of the non-linear aspect of thinking critically is of central importance, and is manifest by observing that critical thinkers apply one CT skill to the products of another CT skill while addressing the problem at hand. For example, one must be engaged in analyzing one's interpretation of the problem, explaining one's analysis of the relevant context, or evaluating one's inferences of the potential consequences of a decision choice.¹ This iterative interaction of CT skills is essential to the self-regulation portion of the CT process, but a realistic conceptual model of this interaction defies a visual presentation. One model of clinical decision-making proposed by Gordon and colleagues⁸ employs language that is strongly congruent with the APA Delphi description of the CT process. Although their Integrated Model of Diagnostic-Therapeutic and Ethical Reasoning is depicted with directional arrows suggestive of linear processing, the authors' description is much richer and the process of reasoning occurring within their description of clinical judgment is CT.

The three examples in this paper are intended to illustrate that CT along with content knowledge and practice experience are the three essential components of the development of expertise in clinical judgment. One interprets to decode relevant information and to determine its position in the organizational structure of the knowledge base. One analyzes to identify clinical problems, gaps in the knowledge base, warranted and unwarranted assumptions and judgments. One uses evaluation to determine the warranted and preferable alternatives from unwarranted or less optimal. One infers theoretical and observable relationships. And one self-regulates, confirms, and corrects one's reasoning through meta-cognitive reflection, a process of thinking critically about one's thinking critically.

One way to evaluate the utility of the consensus definition of CT relative to nursing knowledge development and clinical judgment (a CT exercise in itself), is to ask the questions: "Can this consensus definition be readily translated to thought exercises for examining the quality of clinical judgment in the classroom and practice setting?" and "Does this definition of CT offer a sound guide for the development of measures to assess our performance of clinical judgment?" If so, one should be able to use the language of this consensus definition to create teaching aids to engage students and clinicians in CT. In a similar manner one should be able to create assessment devices to

measure the CT component of scientific presentations and/or demonstrations of clinical judgment. The following are examples of the assessment and teaching tools created using the guiding consensus definition.

Example 1:

The HCTSR: A Rubric for Assessing CT in a Clinical Judgment Exercise

What would a measure of CT in the context of knowledge development look like? Certainly, it would use the terminology of the consensus definition to describe CT skills. And, equally, it would make explicit references to which specific cognitive actions would represent CT in the knowledge-related performance that was to be assessed. In this first illustration, the language of the consensus definition is embedded in the Holistic Critical Thinking Scoring Rubric (HCTSR), a rubric that has been designed for the global assessment of CT. This rubric is in the public domain for educational and assessment purposes and may be used for the holistic measure of CT in a variety of forms.

Holistic Critical Thinking Scoring Rubric (HCTSR)

4 Consistently does all or almost all of the following:

Accurately interprets evidence, statements, graphics, questions, etc.
Identifies the salient arguments (reasons and claims) pro and con.
Thoughtfully analyzes and evaluates major alternative points of view.
Draws warranted, judicious, non-fallacious conclusions.
Justifies key results and procedures, explains assumptions and reasons.
Fair-mindedly follows where evidence and reasons lead.

3 Does most or many of the following:

Accurately interprets evidence, statements, graphics, questions, etc.
Identifies relevant arguments (reasons and claims) pro and con.
Offers analyses and evaluations of obvious alternative points of view.
Draws warranted, non-fallacious conclusions.
Justifies some results or procedures, explains reasons.
Fair-mindedly follows where evidence and reasons lead.

2 Does most or many of the following:

Misinterprets evidence, statements, graphics, questions, etc.
Fails to identify strong, relevant counter-arguments.
Ignores or superficially evaluates obvious alternative points of view.
Draws unwarranted or fallacious conclusions.
Justifies few results or procedures, seldom explains reasons.
Regardless of the evidence or reasons, maintains or defends views based on self-interest or preconceptions.

1 Consistently does all or almost all of the following:

Offers biased interpretations of evidence, statements, graphics, questions, information, or the points of view of others.
Fails to identify or hastily dismisses strong, relevant counter-arguments.
Ignores or superficially evaluates obvious alternative points of view.
Argues using fallacious or irrelevant reasons, and unwarranted claims.
Does not justify results or procedures, nor explain reasons.
Regardless of the evidence or reasons, maintains or defends views based on self-interest or preconceptions.
Exhibits close-mindedness or hostility to reason.

Figure 1:. 1994. The California Academic Press. Millbrae, CA. This Rubric was placed in the public domain. Cite the California Academic Press

Discussion of Example 1: This rubric is designed to be used to rate a classroom project presentation, a case presentation in the clinical setting, or to score a nursing theory paper written in response to a classroom assignment. The rubric might, more informally, be internalized as a check-list for a meta-cognitive evaluation of theory or research presentation of new knowledge.

More formally, this rubric can be used to achieve one data point in a multi-modal plan for curriculum assessment by providing a rating of a representative sample of student work which demonstrates the students' critical thinking. Please note that as an assessment device, all of the usual considerations for the attainment of inter-rater reliability in the ratings pertain. In using such a rubric for program assessment, a satisfactory Kappa statistic is needed to assure reliability of the measure.

Before a performance or presentation can be rated for the quality of its CT, that thinking must be, in some manner, observable in the performance or presentation. Towards that end, we must train ourselves, our colleagues and our students to externalize their thinking for others to evaluate. Although standards for knowledge presentation have traditionally implied that the presenter supply evidence of the quality of the process as well as the results of their scientific or clinical exploration, the realities of knowledge transmittal (the completed test or paper with its time limits and page limitations, as an example) lead to the emphasis being placed on the product or results. The challenge is to provide a means for evaluation of the CT process that was integral to the resulting clinical judgment or developed knowledge. Understanding that earning a positive evaluation is based in part on displaying the skills and dispositions described in the "4" and "3" range of the Holistic CT Scoring Rubric, and that evidence of falling in the "2" or "1" ranges shows poor thinking, not only facilitates the measure of CT but motivates the demonstrable use of CT in a variety of teaching, research, and practice settings.

The next illustration, a Framework for Externalizing CT, suggests criteria that might be demanded of scientific presentations, clinical conferences, or classroom group presentations, to assure a way to assess the quality of the thinking that has led to the new scientific information, clinical data, or theoretical position being advanced. This particular exercise is cast in the form of a classroom assignment for a course in nursing ethics. It assumes that students are as yet untrained in the demand of externalizing their CT in relation to their expression of applying relevant knowledge to an ethical problem and arriving at a judgment, and as a result gives explicit prompting regarding providing observable evidence of the CT inherent in their performance preparation. The explicit prompting provides a list of criteria that might be expected of all presentations of scientific and clinical information and its interpretation contributing to knowledge development.

Example 2:

A Framework for Externalizing CT in a Clinical or Theory Presentation

Directions:

The following guidelines for preparation of your presentation in health care ethics should not be approached in a step-wise or linear fashion. Rather, they are suggested as an interactive framework to drive your presentation and critique process. You should provide your audience with knowledge of your thinking process and criteria in choosing the position you plan to defend rather than merely listing possible opinions or conclusions. It is important that you demonstrate how you considered alternatives fairly by providing the reasons and evidence for the positions you take, descriptions of the other

alternative positions you considered but rejected, and the considerations you found to be decisive in forming your judgment.

Choose one of the following topics: 1) Prohibiting health care services delivery to undocumented aliens; 2) Nurse assisted suicide; 3) Limitations on the use of fetal tissue in research or treatment.

In order to thoroughly consider the issue, you will want to consider and then present: 1) The definitions and meanings of key concepts and relationships being advanced as central to the issue; 2) The main and secondary arguments or claims being advanced; 3) The evidence for the reasonableness of the claims being made; 4) The considerations, pro and con, for the various positions or strategies espoused; 5) The assumptions and probable consequences related to espousing various positions; 6) A justification for the position you recommend be taken in relation to your analysis; 7) The relevance of the position to guide professional practice and research.

To check your judgment process, you will want to assess if the following criteria apply: Did you remain open to new ideas even if these ideas failed to support existing preconceptions, beliefs or self interests? Did you demand the application of reason and evidence? Were you tolerant of divergent points of view that were supported by context based reasons and evidence? Did you anticipate the possible benefits and consequences of all the arguments, and particularly those you supported as most advised? Were you focused and diligent in your approach to the issue(s)? Were you prudent in making, suspending, or revising your judgments? Did you give fair consideration to all reasonably possible solutions or points of view?

Discussion of Example 2: This example is created to guide students or clinicians to practice CT skills and habits of mind. This activity is specifically designed to target the teaching of CT in the context of actual practice issues, so the topics should vary with the content area being taught and the current cultural issues being faced by professional nurses. The first list of criteria in the example produces a presentation (externalization) of the CT skills which structure the presentation. The second list of questions encourages a meta-cognitive self-appraisal of the dispositional approach of the presenter. Taken together, the lists comprise the criterion by which one would assess the presentation for its contribution to knowledge development, whether this knowledge was situation specific to the clinical setting or generalizable to a wider application. Such criteria as these which examine the thinking and judgments made by those advancing new theoretical positions or relationships, provide a template for the assessment of validity and reliability in new information presentations. Using such criteria, we might better judge where practice assumptions are as yet untested. We might make better estimates of the probability that any new information constitutes new knowledge.

The CT component of science and practice requires a constant reassessment of the nature of the problem to be addressed and *what constitutes relevant new information, criteria for action, evidence of status and change, and individual context*. But CT is believed to be more than a collection of thinking skills that one applies by rote to a given problem situation. "Rote application of CT skills" is an oxymoron. The key to CT is meta-cognitive reflection on what one is doing and why. Ideally CT becomes a habit of mind, a part of one's character. How do we develop this habit of mind that will support excellence in knowledge development? The APA Delphi research suggested that teaching CT was "most effective if the instructor models CT dispositions and the proper use of CT skills in the very process of instruction" (Recommendation 14, APA, 1990).¹ By one's own example one mentors

students in the use of CT, engaging them in CT to develop in them both the skills and the habits of mind of the critical thinker.

Clinicians and scientists should model CT in scientific collaborations. A CT approach should be the standard in written work communicating nursing science. And CT should be demanded in the classroom where the new scientists/clinicians are introduced to the need for knowledge development. The final example illustrates the language of the consensus construct guiding a classroom discussion (or clinical conference) designed to train the use of CT in the application of nursing knowledge and theory. Using such a guide to discuss clinical problems, a clinical instructor or mentor models the expectation of the use of reason, theory, evidence, and fairmindedness by modeling these CT skills and dispositions. This pedagogical guide identifies the CT embedded in a discussion of a clinical case while demonstrating a methodology for engaging students or fellow clinicians in CT to arrive at clinical judgments about the patient involved. The tone of this example is that of the classroom, and it is likely that some appropriate modifications would be necessary were the nurse educator addressing clinician colleagues.

Example 3:

A Pedagogical Guide for Modeling and Nurturing CT in the Classroom or the Clinic

The nurse educator selects for discussion a clinical patient with complex problems who is known to all the students (clinicians) or a hypothetical case targeting desired curriculum content areas. This example involves a hypothetical gentleman with squamous cell carcinoma of the head and neck who is scheduled for a total laryngectomy surgery.

The initial presentation of the situation: Mr. Reginald Jackson, a 50 year old automobile salesman, has been diagnosed with throat cancer related to his cigarette smoking.

The opening question: "What is the significance of Mr. Jackson's impending total laryngectomy and left radical neck dissection surgery to treat his cancer of the hypopharynx?"

The question is designed to be abstract and open-ended. Although it may elicit a trial balloon response from a more confident critical thinker in the class, (perhaps the ideal response is "Significance to whom?"), it may also be met by silence. Probably the group will demand that you interpret the question for them, but of course you will resist. If necessary, you might *paraphrase the question* [Interpretation]. "How might we approach the care of Mr. Jackson?" If it should become necessary to stimulate discussion or focus abstractions, you might ask, "What meaning will the surgery have for his physical, psychological, and social functioning?" To encourage thoughtful responses, wait several seconds before calling on anyone.

The initial time you employ this pedagogy students might express resistance to this non-didactic approach to knowledge delivery. While some may feign invisibility, praying the class will return to normal lecture room status, the more eager thinkers among them will commence to *decode the informational content and significance* [Interpretation] of the question you have so insistently posed. Later, students will become accustomed to being

required to access their own knowledge base to address a clinical problem (an authentic clinical demand) and will become more eager to engage in this type of an exercise. Eventually, the students will offer various hypothesized [Inference] physical, social or psychological "meanings" and "significance," interspersed with queries [Analysis] to gain more facts about Mr. Jackson, their shared patient. Here you might request someone to *categorize these hypotheses* [Interpretation]. Invite a student or colleague to work in a visible writing area (chalkboard or flip chart) and ask another to record the developing patient data base in another visible area. Demonstrations of *formulating categories and creating frameworks* [Interpretation] will thus be given by the two students (clinicians).

Defer correcting errors or short-comings you observe being made here. The recording work will be monitored by the others in the session [Evaluation]. After enough material accumulates on the board, ask those present whether they think the developing accounts are accurate [Interpretation, Evaluation] and adequate [Inference, Group CT-Self Regulation]. Invite editing as necessary, requiring reasons for changes [Explanation]. This will provide you a way to observe individuals that are *examining, checking and correcting the produced results*. Self-regulation, the most difficult CT skill to assess since it is an internal cognitive event, can be heard when individuals offer comments such as "At first I thought (X) but now I think (Y) because....," a comment that evidences reconsideration of formed evaluations in light of the evidence given as "because..."

The session should proceed to *identify the significant relationships* [Analysis] that are intended to occur and to *conjecture about what actual relationships will ensue* [Inference] as a result of Mr. Jackson's surgery [Analysis]. Participating students and clinicians will *examine ideas* [Analysis] by identifying the issues or problems and determining the component parts. In the course of the session, engaged participants will press for context about this gentleman as they struggle to interpret, analyze, evaluate, infer, and explain, in short to use CT to explore his problems. You will supply more and more context, but only as it is specifically demanded, perhaps putting it on the board or overhead to add to the patient data base. (He may be an automobile salesman, and smoke three packs of cigarettes a day, for instance.) At times you should not "know the answer" about Mr. Jackson. Just as in real life, sometimes data is missing and it is necessary to make judgments or come to reasonable closure without absolute certainty.

It is important that students and clinicians be required to *give reasons that justify* [Explanation] the interventions they propose. To arrive at the best knowledge in this context, ask the question: "Why do you think that would be the best intervention?" Guide participants to make explicit the alternative interventions they may have cognitively explored [Inference]. "What else did you consider?" Training communication in clinical decision-making improves patient safety both in clinical instruction and in clinical practice by minimizing misinterpretations, mistaken evaluations, and rash generalizations.

Nurture the disposition toward CT. It is vital to minimize ridicule by instructors or peers during this process lest students or clinicians stop sharing their thinking process. A student who risks offering a critique of received wisdom should be rewarded for her or his efforts, praised for new insights, and guided through the process of theory exploration and

testing until CT becomes a habit of mind. You should replicate the entire CT exercise by advancing the problem. Ask the questions: "What should we plan for his rehabilitation?" and "How will we assure a complete and appropriate intervention plan for Mr. Jackson?"

Learning Outcomes:

1. Students (clinicians) will *identify* what information is needed to *interpret* the anatomical implications of laryngectomy, the changes to the gastrointestinal and respiratory systems, the loss of taste related to diminished olfactory ability, problems of radiation induced stomatitis, the loss of accustomed communication during mealtime.
2. Students (clinicians) will *explain* all particular peri-operative nursing care necessitated by laryngectomy surgery, and *justifying their plan of care with reasons* supported by nursing knowledge.
3. Students (clinicians) will *identify and evaluate* the physical and psycho-social implications of altered communication ability and loss of natural voice, the value of electro-larynx devices and esophageal speech, the need for voice therapy and possibly counseling.
4. They will *explain* the implications of nicotine addiction and withdrawal on the peri-operative period and *draw inferences* about the health guidance needed for long term rehabilitation.
5. Students (clinicians) will *assess and examine* the severe disruption in Mr. Jackson's ability to earn a living selling automobiles, *conjecturing about possibilities and drawing warranted conclusions* about his needs for short vs. long term disability, interactions with his employer, and handling his health care expenses.
6. They will *conjecture* about Mr. Jackson's psycho-social needs and *conclude* that he will likely require support to cope with possible family problems, adjustment to a cancer diagnosis, his changed self image, and a moderately poor long term survival prognosis.

Discussion of Example 3: This example is designed to describe one approach to guiding a group in a critical thinking exercise to address the category of clinical problems associated with laryngectomy surgery within the context of an individual person. If participants are required to produce some evidence of their personal thinking process as a result of this exercise, this product could be used to assess the quality of their critical thinking about Mr. Jackson's health care needs.

The benefits from this type of exercise are particularly important if we are concerned with authenticity in our approach to teaching and assessing CT as it is used in nursing practice. If Mr. Jackson is a real person with a particularly difficult set of clinical problems, chosen for a clinical case conference because of his particular challenges to nursing care delivery, he is more likely to provide us with an authentic CT situation. If he is a creation for a student CT exercise, it is important that Mr. Jackson's problems become less paradigmatic and more defiant of simple solutions as our students advance in their educational level. Otherwise we will be preparing students for a clinical world that does not mirror actual nursing practice.

Use of the cross-disciplinary consensus definition of CT to frame exercises and measurement devices of the CT component of clinical judgment, such as the three given above, would appear to have resulted in a consistency of language with regard to the criteria expected in oral and written presentations of clinically related cases, ethical positions, and guiding theory. Although these are merely examples of the type of exercises and presentation guidelines that could be used to externalize the CT portion of knowledge development and clinical judgment, they would appear to offer exciting promise for a new focus on the measurement and evaluation of the thinking process behind knowledge development.

Some such measures of CT can be discipline neutral, as is the HCTSR rubric and the Framework for Externalizing CT shown in Examples 1 and 2. Discipline neutral devices must be focused on discipline specific problems or questions, however, to be useful for the training of judgment in the particular practice discipline. Or, the teaching and assessment devices can be set in a discipline specific context through and through, as is the Reginald Jackson case analysis example. These devices can be structured to gather both quantitative and qualitative data for theory testing. Carefully designed and properly implemented, they can authentically measure the CT component of clinical judgment in the clinical area.¹²⁻¹⁴

Accountability in Knowledge Development and Clinical Judgment

To assess CT in either nursing knowledge development or clinical decision-making, one's thinking process must be externalized for others to observe and evaluate. For example, to permit educators to assess clinical judgment in their students, the processes of making those judgments must be readily apparent by being spoken, written, or demonstrated. The challenge for our discipline is to externalize our own CT processes as scientists, clinicians, and educators. This externalization of the thinking process and the valuing of fairmindedness in thinking is what is meant by "modeling critical thinking in our teaching of clinical judgment." While dialoguing with scientist and clinician colleagues and when teaching the knowledge base of the discipline of nursing to students we must increasingly externalize our interpretations of new data, describing our analyses and inferences in relation to guiding theory, and providing our evaluations and meta-cognitive reconsiderations of existing nursing knowledge.

Meeting this challenge will aid in our ability to assess our students' CT, one parameter of their clinical judgment expertise. It will also organize our approaches to test theory in the context of explicit assumptions and the judicious acceptance of new information as representative of nursing knowledge. Our efforts to develop nursing knowledge to guide clinical practice are well served by the criteria suggested as representative of good CT. As illustrated here, defining, teaching, and measuring CT are neither mysterious nor enigmatic. Rather, good CT can be pervasively evident in sound nursing knowledge development and expert clinical judgment.

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