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## Introduction

# Why a Thinker's Guide to Clinical Reasoning?

Clinical reasoning can be defined as thinking through the various aspects of patient care to arrive at a reasonable decision regarding the prevention, diagnosis, or treatment of a clinical problem in a specific patient. Patient care includes history taking, conducting a physical exam, ordering laboratory tests and diagnostic procedures, designing safe and effective treatment regimens or preventive strategies, and providing patient education and counseling.

Obviously, the clinician should be well grounded in biomedical and clinical sciences and skillful at gathering clinical data from a patient before engaging in the process of clinical reasoning. This guide does not address the knowledge and skills required to competently gather and interpret clinical data. Rather, the guide is intended to help clinicians take the next step, which is determining the best course of action to take based on what is known or what can reasonably be hypothesized from clinical data. So, it isn't enough to have a strong background in the biomedical sciences or to possess excellent clinical knowledge, nor to know how to conduct a history and physical exam on a patient, or even to know how to formulate a differential diagnosis given the signs, symptoms, and test results of a patient. In addition to all of this, there is still a need to think critically about all the important information pertaining to a particular case and to formulate or synthesize a rational plan of action. In short, clinical reasoning requires critical thinking skills, abilities and traits which are often not taught in schools and colleges for the health professions.

Skilled clinicians systematically analyze their thinking by targeting the elements of clinical reasoning and evaluate their thinking through application of intellectual standards to those elements. These



clinicians also develop and routinely exhibit intellectual traits or dispositions of mind. When these foundations of critical thinking – the elements of reasoning, intellectual standards, and intellectual traits – are made explicit and deeply understood, the clinician has explicit intellectual tools useful for



examining, assessing and improving thought. This guide introduces the clinician to these foundations and offers examples of their application to the field.

It is important to note that there are numerous problems in clinical practice that go beyond the scope of this guide, including:

1. the mistakes in medical reasoning which lead to death or other adverse consequences.
2. the overspecialization within medical fields that often leads to fragmented care and lack of integration across specialities.
3. the overreliance of traditional medicine on prescription medications in dealing with medical problems rather than alternative potential therapies.
4. the general failure within traditional medicine to acknowledge and appropriately use effective alternative medical approaches (which is connected with the failure to integrate the best ideas within traditional medicine with the best ideas within alternative medicine).
5. the failure to emphasize prevention over “cure.”
6. the medical decisions being determined primarily by the vested interests of clinicians.
7. the influence pharmaceutical companies have on prescribing habits.

This guide focuses on a framework for critical thinking relevant to all domains of human thought and is specifically focused on clinical reasoning. The suggestions and conclusions herein are consistent with the suggestions and conclusions found in the works of prominent thinkers in the clinical fields, including Joy Higgs, Mark Jones, Jerome Kassirer, John Wong, Richard Kopelman, Daniel Pesut, Joann Herman, Kathryn Montgo, Eileen Gambrell, Jerome Groopman and Milos Jenicke.

Though this guide includes some significant examples within the field of medicine, given its limited nature, it does not include the many field-specific contributions to clinical reasoning from medicine, nursing, pharmacy, dentistry, veterinary medicine, and other health related fields. Moreover, we are not attempting to provide specific procedures for clinical reasoning, but only broad principles that must be contextualized by the user. For exemplification purposes, we have focused primarily on diagnosis and treatment. The guide is intended to detail and exemplify clinical reasoning as a mode of thought. Thus the principles illuminated in it should be integrated within the context of clinical reasoning – for the purpose of both teaching and practice at all levels. Finally, due to its nature, we have not attempted to link the principles in this guide to current or classical philosophical orientations within general argumentation, reasoning and decision making.

## Reasoning Through a Clinical Case

A 51 year old man complains of coughing up blood, shortness of breath, and difficulty in breathing. He first noticed these symptoms about 2 months ago. He smokes one pack of cigarettes per day and was told that his blood pressure was a "little high." He is otherwise well and takes no medications, but he is worried about his health. His father had a heart attack and died at the age of 52. A complete physical examination is normal except for a blood pressure of 150/96. His pre-clinic blood work was also normal including a serum cholesterol of 180mg/dL and a fasting blood glucose of 100mg/dL.

As you think about this patient, what questions come to your mind that, when effectively answered, enable you to better understand the patient's condition and how to approach the treatment of this patient?

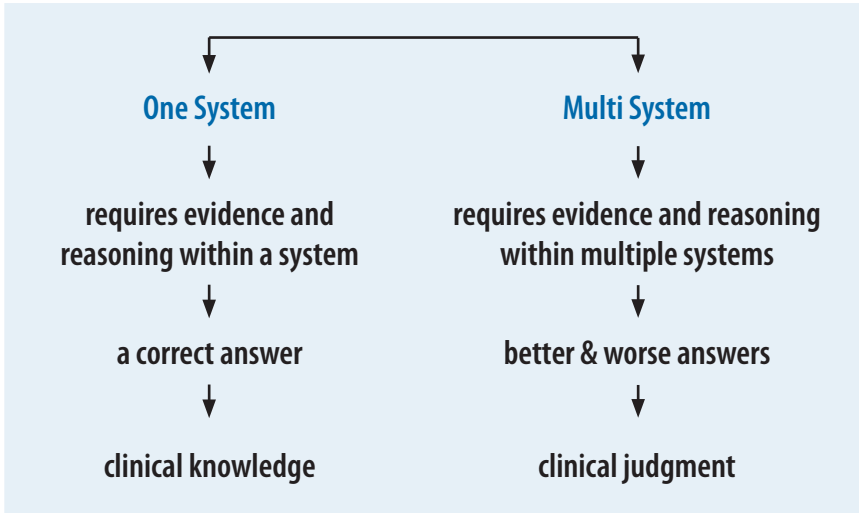
### Consider these possible questions:

1. What is the probability that this patient has lung cancer?
2. What diagnostic tests would provide the greatest utility in ruling in or ruling out cancer?
3. How likely is it that this patient's condition will worsen?
4. What are this patient's risk factors for lung cancer?
5. How long can this patient expect to live if he in fact has lung cancer?
6. What would be the best course of action to take in treating this patient?
7. Will risk factor reduction and treatment of his disease improve the quality and quantity of his life?
8. What caused this patient to develop his condition?

Important questions such as these enable the clinician to think through relevant issues like the diagnosis, risk factors, prognosis, treatment, prevention, and causation of disease and what can be done to treat or prevent disease or reduce the likelihood of disease complications.

## Two Kinds of Clinical Questions

In approaching a question, it is helpful to determine the kind of system to which it belongs. Is it a question with one definitive answer? Alternatively, does the question require us to consider competing answers or even competing approaches to either solution or conceptualization?



**Questions of Procedure** (established system)—These include questions with an established procedure or method for finding the answer. These questions are settled by facts, by definition, or both. These kinds of questions might be answered from a handbook or experimental results from a clinical trial.

Examples include:

- What evidence-based guidelines can be used to decide how to specifically treat this patient?
- What diagnostic test has been shown to provide the best sensitivity and specificity for making an accurate diagnosis?
- What is the most accurate instrument I can use to measure blood pressure?
- What steps can be taken to reduce the risk of heart disease in a 60 year old man who is obese and smokes cigarettes?





**Questions of Judgment** (conflicting systems)—These are questions requiring reasoning, but with more than one arguable answer, questions that make sense to debate, questions with better-or-worse answers (well-supported and reasoned or poorly-supported and/or poorly-reasoned answers). Here we are seeking the best answer within a range of possibilities. We evaluate answers to such questions using universal intellectual

standards such as breadth, depth, logicalness, and so forth. Some of the most important clinical questions are conflicting-system questions (for example, those questions with an ethical dimension). Answers to these questions depend heavily on clinical experience and expertise.

Examples include:

- Given the possible alternative treatments, which would be the best to use in this particular patient?
- What course of action should be taken for this patient who has no health insurance?
- What would be the most cost-effective way to determine if this patient has the disease I suspect?
- Should this patient undergo surgery for his condition or should we wait and see how the disease progresses?



## Analyzing & Assessing Clinical Research

### Use this template to assess the quality of any clinical research project or paper.

- 1) All clinical research has a fundamental PURPOSE and goal.
  - Research purposes and goals should be clearly stated.
  - Related purposes should be explicitly distinguished.
  - All segments of the research should be relevant to the purpose.
  - All research purposes should be realistic and significant.
- 2) All clinical research addresses a fundamental QUESTION, problem or issue.
  - The fundamental question at issue should be clearly and precisely stated.
  - Related questions should be articulated and distinguished.
  - All segments of the research should be relevant to the central question.
  - All research questions should be realistic and significant.
  - All research questions should define clearly stated intellectual tasks that, being fulfilled, settle the questions.
- 3) All clinical research identifies data, INFORMATION, and evidence relevant to its fundamental question and purpose.
  - All information used should be clear, accurate, and relevant to the fundamental question at issue.
  - Information gathered must be sufficient to settle the question at issue.
  - Information contrary to the main conclusions of the research should be explained.
- 4) All clinical research contains INFERENCES or interpretations by which conclusions are drawn.
  - All conclusions should be clear, accurate, and relevant to the key question at issue.
  - Conclusions drawn should not go beyond what the data imply.
  - Conclusions should be consistent and reconcile discrepancies in the data.
  - Conclusions should explain how the key questions at issue have been settled.
- 5) All clinical research is conducted from some POINT OF VIEW or frame of reference.
  - All points of view in the research should be identified.
  - Objections from competing points of view should be identified and fairly addressed.
- 6) All clinical research is based on ASSUMPTIONS.
  - Clearly identify and assess major assumptions in the research.
  - Explain how the assumptions shape the research point of view.
- 7) All clinical research is expressed through, and shaped by, CONCEPTS and ideas.
  - Assess for clarity the key concepts in the research.
  - Assess the significance of the key concepts in the research.
- 8) All clinical research leads somewhere (i.e., have IMPLICATIONS and consequences).
  - Trace the implications and consequences that follow from the research.
  - Search for negative as well as positive implications.
  - Consider all significant implications and consequences.

## Intellectual Traits Essential to Clinical Reasoning

No clinician can claim perfect objectivity. Our work is unavoidably influenced by strengths and weaknesses in our education, experiences, attitudes, beliefs, and self-interest.

Highly skilled clinicians recognize the importance of cultivating intellectual dispositions. These attributes are essential to excellence of thought. They determine with what insight and integrity one thinks. The clinical process poses distinct questions for the clinician in pursuit of each virtue.

**Intellectual humility** is knowledge of ignorance, being sensitive to what you know and what you do not know. It implies being aware of your biases, prejudices, self-deceptive tendencies, and the limitations of your viewpoint and experience. Clinicians should restrict their professional judgments to those domains in which they are truly qualified. Questions that foster intellectual humility in clinical reasoning thinking include:

- What do I really know about the issue I am facing?
- To what extent do my prejudices, attitudes, or experiences bias my judgment? Does my experience really qualify me to handle this issue?
- Am I quick to admit when I am dealing with an issue beyond my expertise and refer the patient to a specialist?
- Am I open to considering novel approaches to this problem, and willing to learn and study where warranted?

**Intellectual courage** is the disposition to question beliefs about which you feel strongly. It includes questioning the beliefs of your culture and any subculture to which you belong, and a willingness to express your views even when they are unpopular (with administrators, peers, subordinates, or patients). Questions that foster intellectual courage include:

- To what extent have I analyzed the beliefs I hold which may impede my ability to think critically?
- To what extent have I demonstrated a willingness to yield my positions when sufficient evidence is presented against them?
- To what extent am I willing to stand my ground against the majority (even though people might ridicule me)?





## Mistakes in Thinking and Vested Interest Often Lead to the Violation of Intellectual Standards

People who think and work within any discipline sometimes violate intellectual standards. One reason for this, we suggest, is a lack of explicit awareness of intellectual standards and their importance to thinking well. Another, we propose, is vested interest (when 'professionals' have a personal interest in violating one or more intellectual standards).

Within the field of medicine, for example, the importance of *gathering relevant information and accurately diagnosing patients* is presupposed. Yet, an individual doctor may misdiagnose a patient by failing to consider some important relevant information or by making some other mistake in thinking. In his book, *How Doctors Think* (2007), Jerome Groopman, M.D. links the problem of medical misdiagnosis to what he terms 'cognitive errors:'

Misdiagnosis...is a window into the medical mind. It reveals why doctors fail to question their assumptions, why their thinking is sometimes closed or skewed, why they overlook the gaps in their knowledge. Experts studying misguided care have recently concluded that the majority of errors are due to flaws in physician thinking, not technical mistakes. In one study of misdiagnoses, that caused serious harm to patients, some 80 percent could be accounted for by a cascade of cognitive errors...putting [clients] into a narrow frame and ignoring information that contradicted a fixed notion. Another study of one hundred incorrect diagnoses found that inadequate medical knowledge was the reason for error in only four instances. The doctors didn't stumble because of their ignorance of clinical facts; rather they misdiagnosed because they fell into cognitive traps. Such errors produce a distressingly high rate of misdiagnosis. As many as 15 percent of all diagnoses are inaccurate...(p. 24).

Consider, as well, the number of people injured each year due to receiving incorrect dosages or types of medicine, a significant issue linked to problems in reasoning:

"At least 1.5 million Americans a year are injured after receiving the wrong medication or the incorrect dose, according to the Institute of Medicine, part of the National Academies of Science. Such incidents have more than doubled in the past decade. The errors are made when pharmacists stock the drugs improperly, nurses don't double-check to make sure they are dispensing the proper medication or when doctors'