WHAT IS CLINICAL REASONING?

CLINICAL REASONING

Process by which clinicians collect, process, and interpret patient information to develop a plan of action which involves:

- Gathering and synthesizing information

- Generating hypotheses and formulating clinical improvisions

- Determining diagnoses and prognoses

- Developing treatment, care, or management plans

However, in clinical practice, clinical reasoning, is much more complex.

- "Reasoning as cognitive activity"

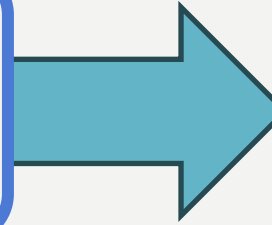- "Reasoning as contextually situated activity"

IMPORTANT TERMS

- **Problem representation:** abstraction of early key clinical information written or spoken as a problem in the context of generic patient factors (i.e. age, sex, pre-existing diagnoses) and serves the purpose of activating relevant knowledge

- **Summary statement:** articulation (verbal or written) of the patient's clinical problem, based on data acquisition and synthesis

- **Semantic qualifiers:** paired, opposing descriptions that can be used to compare and contrast diagnostic considerations

- **Dual process of thinking:**
  - System 1: FAST – intuitive, effortless, using information that is readily available (often visual), and usually occurring without our knowing (i.e. pattern recognition)
  - System 2: SLOW – analytical and deliberate and relies on the active assembly of collected information (logistic and probabilities) (i.e. diagnostic schema)

- **Diagnostic schema:** frameworks that depict organized clinical knowledge and serve as a bridge between problem representation and differential diagnosis

Bowen 2006

DIAGNOSTIC PROCESS

DIAGNOSIS AS INFORMATION PROCESSING "IN THE HEAD"

DIAGNOSIS AS A SOCIAL, SITUATED PROCESS "IN THE WORLD"

- Information-processing theory: clinical reasoning takes place "in the head" of the physician
- Focuses on just two parties, the doctor and the patient
- Methods to study diagnostic process: listening

- Situativity perspective: emphasizes the diagnosis takes place "in the world" and that our cognition is shaped by our interactions with others and with the resources in our environment
- Focuses on teamwork and resources
- Emphasis on context (adjacent vs. situational)
- Methods to study diagnostic process: observing, learning from stories

Graber 2020

IDENTIFY THE PATIENT'S SITUATION (CONTEXT OF THE SITUATION)

COLLECT INFORMATION (REVIEW WHAT IS KNOWN, GATHER NEW DATA, RECALL KNOWLEDGE)

PROCESS THE INFORMATION (INTERPRET DATA, RELATE, INFER, THINK OF OUTCOME)

IDENTIFY THE PROBLEM (SYNTHESIZE AND DIAGNOSIS PROBLEMS)

ESTABLISH A GOAL (WHAT IS THE DESIRED OUTCOME?)

TAKE ACTION (SELECT A PARTICULAR COURSE OF ACTION AND REASON WHY)

EVALUATE OUTCOMES (EFFECTIVENESS OF ACTIONS AND OUTCOMES)

REFLECT ON PROCESS (WHAT HAVE YOU LEARNED?, WHAT WOULD YOU DO DIFFERENTLY?)

WHY IS CLINICAL REASONING IMPORTANT?

DIAGNOSTIC ERROR

Diagnostic error: failure to (a) establish an accurate and timely explanation of the patient's health problem(s) or (b) communicate that explanation to the patient

WHAT CAUSES DIAGNOSTIC ERRORS?

- Inadequate collaboration and communication

- System that isn't well-designed to support diagnostic process

- Limited feedback regarding diagnostic performance

- Culture that discourages transparency and disclosure of errors

WHY DEFINE DIAGNOSTIC ERRORS THIS WAY?

Frames diagnostic error from patient's perspective because patient bears ultimate risk of harm from diagnostic errors

- Preventing or delaying treatment

- Providing unnecessary or harmful treatments

- Psychological repercussions

- Financial repercussions

National Academy of Medicine 2015

DIAGNOSTIC ERRORS EXPLORED

Diagnostic Errors in the Emergency Room: A Systematic Review

- Root cause of ED diagnostic errors were mostly cognitive errors linked to the process of bedside diagnosis

- The strongest, most consistent predictors of ED diagnostic error were individual case factors that increased the cognitive challenge of identifying the underlying disorder with nonspecific, mild, transient, or "atypical" symptoms

- The estimated ED error rate are low, but the number of patients potentially impacted is large

  – Over 1 year (130 million ED visits): estimated 7 million errors, 2.5 million serious harms, 350,00 patients suffering potentially preventable permanent disability or death

Newman et al. 2022

DIAGNOSTIC ERRORS EXPLORED

Diagnostic Errors in the Emergency Room: A Systematic Review

Over two thirds of serious harms are attributable to just 15 diagnoses and linked to cognitive errors, particularly in cases with "atypical" manifestations.

Newman et al. 2022

WHAT ARE SOME TOOLS AND STRATEGIES FOR CULTIVATING CLINICAL REASONING?

CLINICAL REASONING TOOLS

- **Tools:** direct observation, screen-based simulations, formative feedback
- Early consideration of a differential diagnosis may improve diagnostic accuracy → drives the cyclic nature of information gathering, hypothesis generation, more information gathering and hypothesis refinement
- **Chunking:** taking individual pieces of information and grouping them into larger buckets based on previously acquired knowledge enables more effective problem synthesis, illness script activation, and discussion of differential diagnosis → reduces cognitive load
- **Illness scripts:** three components including epidemiological risk factors, pathophysiology, and clinical findings → key to pattern recognition
- **Management scripts:** extensions of illness scripts; pre-compiled, conceptual knowledge structures of the courses of action a clinician can undertake to address s patient's health care issue
- Coupling illness script theory with probabilistic reasoning can augment learner's ability to estimate likelihood of a diagnosis

Bowen 2006

STRATEGIES FOR CULTIVATING CLINICAL REASONING

Knowledge remains essential, but not sufficient, for effective clinical reasoning. The role of context cannot be overstated.
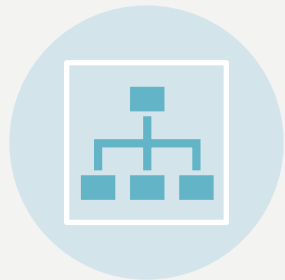
Emphasizing organization and prioritization

Accessing prior knowledge

Thinking aloud

Analyzing the literature

Bowen 2006

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