

## IMPROVEMENT OF CLINICAL REASONING

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Medical education exists to guide the formation of the next generation of medical professionals. A key ingredient in the professional development of these trainees, during both the under-graduate and graduate periods, is the development of clinical-reasoning expertise. The cognitive processes physicians use to diagnose and manage patients are essential for the delivery of high-quality care. When a physician's clinical reasoning fails, errors occur that can lead to poor delivery of care and even harm to patients<sup>1</sup>.

In the literature the terms clinical reasoning: *clinical judgment, problem solving, decision making* and *critical thinking* are often used interchangeably. The term clinical reasoning means the process by which clinicians collect cues, process the information, come to an understanding of a patient problem or situation, plan and implement interventions, evaluate outcomes, and reflect on and learn from the process. Clinical reasoning is not a linear process but can be conceptualised as a series or spiral of linked and ongoing clinical encounters. Thinking through the various aspects of patient care to arrive at a reasonable decision regarding the prevention, diagnosis, or treatment of a clinical problem is the clinical reasoning. 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.

The word reasoning comes from the Latin word *raciocinium* - calculation, evaluation, use of reason, whereas clinical derives from the Greek word *klinikos* - bed, clinic, place where preventive, curative and palliative procedures are carried out. Effective clinical reasoning skills have a positive impact on patient outcomes.

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Clinical reasoning errors often can occur as a result of one of four problems in trainees as well as practicing physicians: *inadequate knowledge, faulty data gathering, faulty data processing, or faulty metacognition*. Top three reasons for adverse patient outcomes are: failure to properly diagnose, failure to institute appropriate treatment, and inappropriate management of complications. Each of these is related to poor clinical reasoning skills. When considering a learner's development of clinical reasoning, there are two important and helpful models to examine. The dual process theory reasoning model illuminates the specific skills necessary for clinical reasoning, while the conscious competence model outlines a developmental roadmap for a trainee's acquisition of expertise<sup>2-4</sup>. There are eight main steps or phases in the clinical reasoning cycle: *look, collect, process, decide, plan, act, evaluate and reflect*.

Various theories have been proposed relating to how a clinician reasons. Elstein proposed the'dual theory of clinical reasoning<sup>5</sup> :-

i) Intuition: The general practitioner who sees several patients with upper respiratory tract infections every day would very quickly make this diagnosis in another patient.

ii) Analytical : If a more unfamiliar or unusual patient problem is encountered they may require more detailed questioning and analysis of the problem. Novice learners, such as medical students, have limited clinical experience and therefore need to approach most consultations in a more analytical ('Hypothetico-deductive') way.

Clinical reasoning is a *skill to be learnt rather than a concept to be understood*<sup>6</sup>. Clinical reasoning therefore requires not only an accumulation of knowledge but also a level of experience, which is generally what sets apart a practising clinician from a medical student or junior doctor.

The human body is very complex, and we cannot obtain all information we want, so that regardless of the reasoning process utilized, we can never absolutely prove or disprove most hypotheses in many cases. We derive the 'most likely' diagnosis, but we may need to eventually consider others if more information becomes available or the outcome

is different than expected. Clinical reasoning skills helps in improving time to diagnosis, avoiding assumptions, reducing unnecessary investigation and the costs these incur, improving patient satisfaction and helps to be branded with the 'good doctor' label.

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