Clinical Reasoning

Color Index	IMPORTANT	NOTES	GOLD	EXTRA

OBJECTIVES

- Define the diagnostic process
- Name the methods of problem solving (Inductive and hypothetico- deductive)
- Describe the diagnostic process (history/exam/lab)
- Discuss the important considerations in the diagnostic process
- Define the four principal factors of ranking of possibilities
- Discuss the difficulties faced by students
- Describe the three aspects of the diagnosis
- Discuss the tips for diagnosis

DONE BY

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Sources	Dr's Slides. Fraser's Clinical Method. Norman's research in clinical reasoning.

Introduction

- Clinical reasoning is a central component of physician competence.
- Objectives related to mastery of clinical reasoning skills appear in the documentation of most medical schools, licensing bodies and specialty societies.
- Saudi MEDs:
- Theme II: Patient care
- PLO4. Use clinical reasoning, decision making, and problem-solving skills in medical practice

Clinical Reasoning

"It is the ability to integrate and apply different types of knowledge, weigh evidence critically and reflect upon the process used to arrive at a diagnosis".

"ability to sort through a cluster of features presented by a patient and accurately assign a diagnostic label, with the development of an appropriate treatment strategy as the end goal"

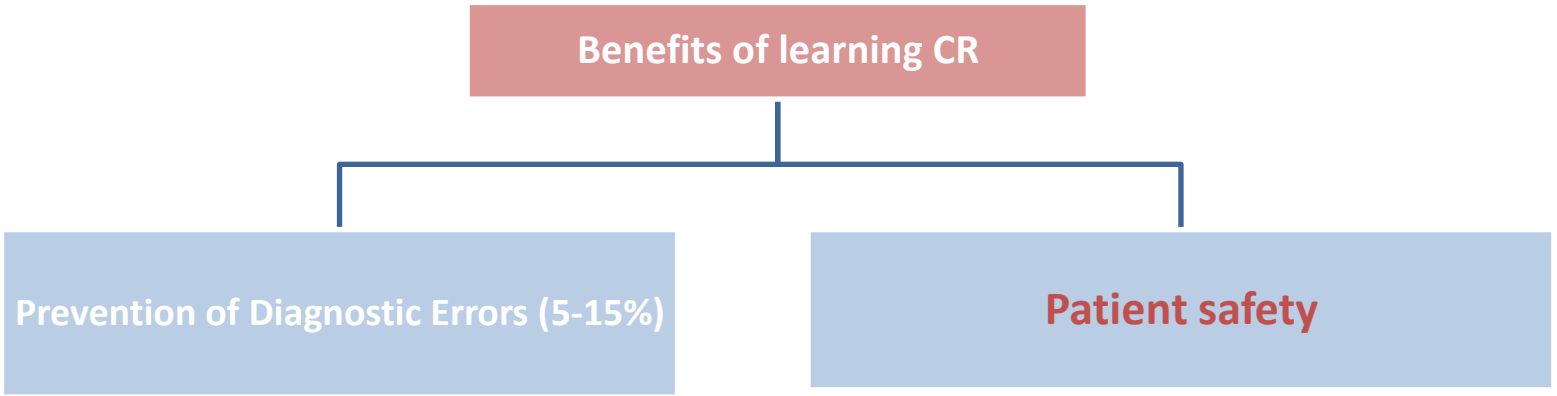
Anderson 2006

It includes almost all what doctors do (with some exceptions such as interpersonal and technical skills).

Synonyms: problem-solving, decision-making, Clinical judgement.

All these falls under **Clinical Reasoning**

- Ability to translate the unorganized information received from a patient into the organized clinical situation.
- In a short period of time expected to work with presenting symptoms to a diagnosis
- Decide which information to be taken and which to be discarded.
- What to select from clinical examination and lab tests based on patients' history and interpret to confirm diagnosis and treat



What is diagnosis?

A "pre-existing set of categories agreed upon by the medical profession to designate a specific condition" (Jutel, 2009)

Diagnosis in whole person terms include patient centered and disease centered elements.
Patient centered clinical method

Diagnosis is a statement of possibility rather than certainty.

Even by experienced doctors a firm diagnosis in practice is not possible in up to 30-50%

Methods of problem solving

Inductive or traditional method

A complete history/exam/investigation; irrespective of presenting complaint.

Hypothetico-deductive method

Educated guessing and testing.

Multiple hypothesis–guided, problem-oriented enquiry.

Comprehensive history

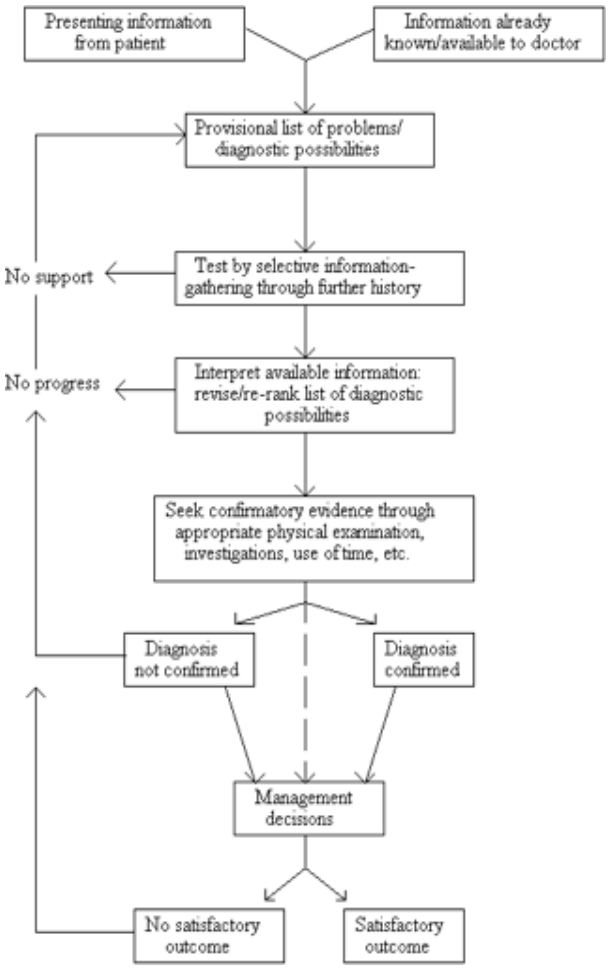
Presenting complaint	System review, Past medical Hx	Drugs, Social /family

PLUS

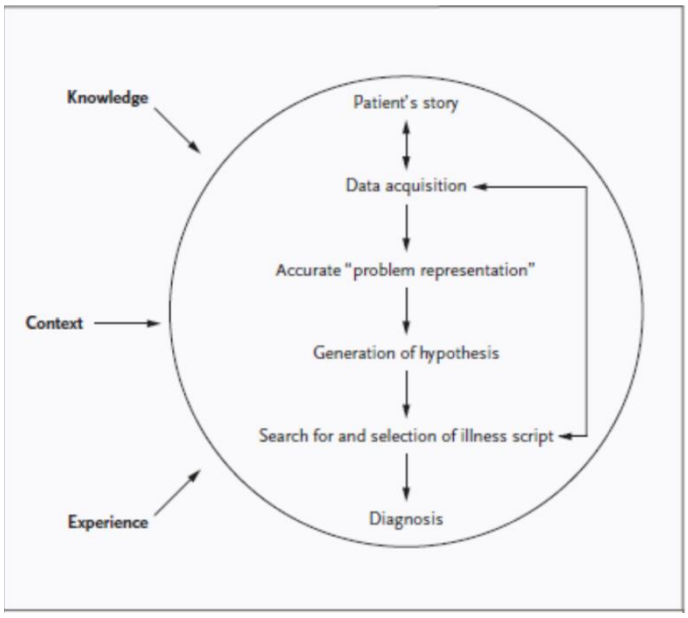
Complete physical exam

PLUS

Investigations	Then consider DIAGNOSIS



Key Elements of Clinical Reasoning



The contribution of history, examination and investigations:

- History is the key to diagnosis in the consultation
- Diagnosis can be made based on:
  - History in 83%
  - Examination 9%
  - Investigation 9%

(Hampton et. al 1975)

- A **study** in a medical outpatient department over 180 patients presenting with chest pain showed:
- History 90%
- Examination 0%
- Routine Investigation 3%
- Special investigation 6%

Sandler (1979)

The art of history taking

What is a good history?

- **Asking the right questions, not every question**

e.g. for Thyrotoxicosis: weight loss, increased appetite and heat intolerance rather than lethargy etc.

Principal factors for ranking differentials:

Probability

Probability is influenced by two factors:
The crude frequency of occurrence of the condition suspected.
The interaction of patient and symptoms variables.
Associated factors e.g. season or other epidemics at that time.

Seriousness

Life threatening or serious conditions.

They merit inclusion due to the consequences of delay in making diagnosis; even though disproportionate to their actual frequency of occurrence (e.g. melanoma)

Treatability

The more amenable to treatment an underlying cause for symptom, the more likelihood to be included.

Example: myxedema is an uncommon cause of tiredness but should not be overlooked as it is readily corrected by replacement therapy

Novelty

Rare conditions as a diagnostic probability should be resisted; such as pheochromocytoma.

For differential diagnosis aim to produce a list with two categories

- Most likely causes (up to 5)
- Less likely but important (1-2 only)

Difficulties experienced by students in making diagnosis

Differences in the types of problems presented in FM and hospital setting.

- Limited ability to perceive and interpret problems, as their knowledge is not geared to FM
- The knowledge is generally locked in inaccessible compartments without linkages.
- Example: tiredness in a 55 years old patient with rheumatoid arthritis.

Common errors:

Unwarranted fixation on a hypothesis:

- Most common: Focusing on a particular hypothesis

Practical tips

- Pre-diagnostic interpretation:
  - To narrow the focus of search for likely diagnosis
- Clarifying the presenting symptom (by patient) or ***pivotal symptom*** (selected by doctor).
- Use checklist or the surgical sieve (filter)
- If all fails, ask for help. Consult algorithm books/colleagues

The triple diagnosis

The three aspects of the diagnosis should always be considered at each consultation- ***as appropriate*****.**

- Physical
- Social
- Psychological

Use of time as an aid to diagnosis

- Wait and see approach
- Time as a diagnostic tool is important e.g. back pain
- A practitioner must answer three Qs

1. Has this patient gotten the disease?
   - Yes
   - No
   - Not sure
2. If the answer is ***no***, then why the patient has come….is it fear, or some other underlying problem?
3. If the answer is ***yes*** or ***unsure*** then:
   - If the patient is not ill….may use time as a diagnostic tool and follow.
   - If the patient is ill…. investigate, arrange referral, admit.
   - When using time as a diagnostic tool, doctors should use safety netting by outlining and advising patients when to contact.
   - **By using this strategy doctors can avoid**:
     - Devoting too much time to minor conditions
     - Avoiding unnecessary investigations
     - Referring to hospitals or ER

How to improve your CR

- During the course of a clinical encounter
- **Exposure to wide variety clinical conditions**
- Activation of previous knowledge
- Prioritize differential diagnoses
- Discussion, Reflection and Meta-cognition
- Deliberate practice and practice
- ***Always ask for feedback.***

Practical example

Mrs. S, A 67-year-old widow presents with history of wetting herself for the previous five days because she cannot get to the toilet on time. She had felt perfectly well prior to this. Past medical history is insignificant, and she is not a frequent attender.

What is Mrs. S problem list?

- **How do you frame the differential diagnosis?**
- Diagnostic possibilities:
  - Most likely UTI
- Less likely but important to consider:
  - Cystocele
  - Diabetes

- **What are the pivotal points in Mrs. S's presentation?**
  In order to limit the differential
  - Sudden onset
  - Short duration
  - Elderly
  - Previously well

Ask selective Qs:

- Frequency, at hourly intervals with dysuria
- No nocturia, hematuria, backache or fever.
- No loss of urine on coughing
- ✓ Family Hx: -ve
- ✓ Otherwise Okay

Further interpretation:

- Cystocele ruled out
- UTI most likely
- DM less likely
- How certain are you that Mrs. S has UTI?
- Should you treat her with antibiotics?

Actions before ending:

- Physical? as yield is negligible
- MSU to confirm diagnosis
- Check for glycosuria in clinic
- Antibiotic treatment: started -distressing nature of symptoms
- Explanation to the patient with early follow up

Follow up:

- MSU: E Coli
- Symptoms resolved and follow up showed MSU sterile

What if symptoms had not resolved and MSU negative?

- Reconsider the diagnosis
- Unusual presentation of cystocele: gynecological exam
- Psychological causes

If none of these possibilities confirmed and symptoms persisted:

refer to genitourinary surgeon; as the family physician has now reached the limits of his competence.

What distinguished experts from novices is?

- The accuracy **of or better early hypothesis and not their number**
- The outcome (e.g. diagnostic accuracy) was apparently related **strongly to content knowledge**, **not to the general process**.

- **Experts:**
  - Had more coherent explanations
  - Were more selective in the use of data
  - Made more inferences from the data.

Experts must have available to them:

- ⇧ knowledge
- Of ⇧ kinds,
- Better organized and
- ⇧ accessible

Than novices

Kinds of knowledge associated with expertise

Clinicians move through **three kinds** of mental representations with increasing experience, from

- ❑ ***Basic mechanisms of disease***
- ❑ ***Illness scripts***
- ❑ ***Exemplars*** (illustration, model, pattern): derived from experience.

Expertise is distinguished by:

The acquisition of illness scripts, decision trees, symptom disease probabilities, semantic qualifiers and more (or less) basic science.

What is the most critical aspect of learning?

- The acquisition of a particular strategy or skill. ⌫⌫
- The availability of a particular kind of knowledge. ⌫
- **The deliberate practice with multiple examples**

Experiential knowledge: exemplars

- Many categories we use in our representation of the world are defined, by a large collection of examples derived from experience (the cate ‘dog’ or ‘chair’ ...examples in memory).
- When we must classify an object, we do it by rapid retrieval of a similar prior examples, without conscious awareness.
- These studies suggest that, reasoning proceeds by early identification of possible diagnoses through recognition of a similar prior examples.

What is the reasoning process used by experts so that it could be taught to students?

- All the research reviewed suggests that expert clinical reasoning is a consequence of an extensive and multidimensional knowledge base.
- The context within which a problem is being addressed has a major impact on the accuracy of the decisions reached.
- Students learn better when engaged with many problems, which are carefully sequenced to optimize learning and transfer.
- Indeed, with increasing expertise, success requires less mental effort. As Anderson said: ‘One becomes an expert by making routine what to the novice requires creative problem-solving ability.’
- **Assess yourself with multiple short problems.**

QUESTIONS

QUESTIONS (1)

Which of the following is the key to diagnosis?

A) Examination

B) Routine investigation

C) History

QUESTIONS (2)

Which of the following is not one of the principal factors for ranking differential diagnosis?

A) Seriousness

B) Probability

C) Novelty

D) All of them

QUESTIONS (3)

acquisition of a particular strategy or skill is one of the most critical aspect of learning

A) True

B) False

ANSWERS C, D, A

Case scenario

Suad (سعاد) is a university student, aged 21 years.

She attends infrequently for minor illness and holiday immunizations.

Today she enters looking well but appears worried. She tells you she has had lower abdominal pain 'off and on' for some months, and then it '**has got a lot worse'** over the last month. It is now present almost all the time.

Questions

- What are your initial diagnostic hypotheses?
  Cystitis, Endometriosis, Appendicitis, Fibroids, **IBS**

- Explain how you arrived at these.
  Site, nature of the pain and gender.

- What questions would you want to ask to test your respective hypotheses?
  Diarrhea, Constipation (or alteration between the two), Fever?
  Social history: if pregnant, cyclic?
  Associated symptoms?
  Extra intestinal manifestation?

- Explain how the questions might help you.
  Rome criteria --> to exclude IBS
  If painless diarrhea and decreased by fasting --> celiac disease
  May be psychosomatic --> Anxiety