Clinical Decision Making: forgotten skill?

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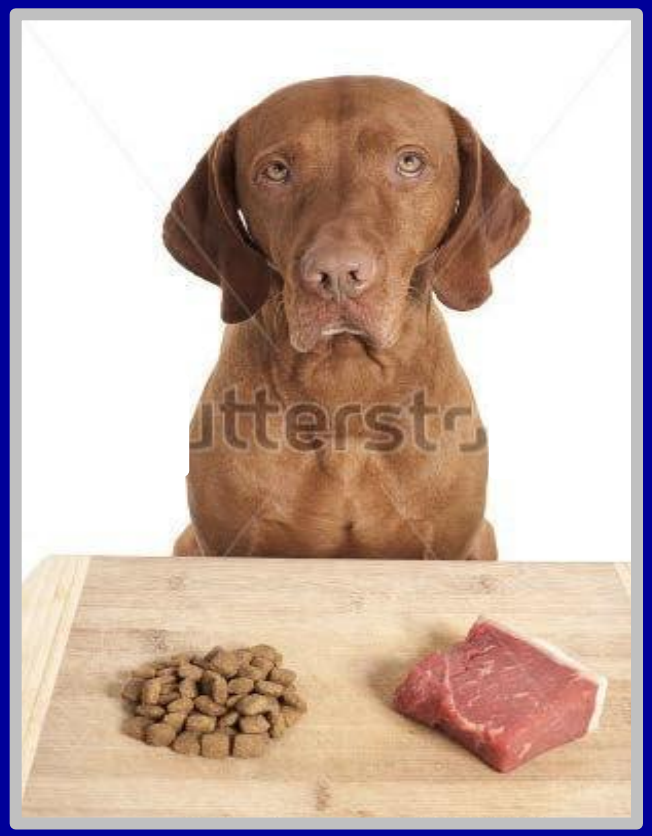
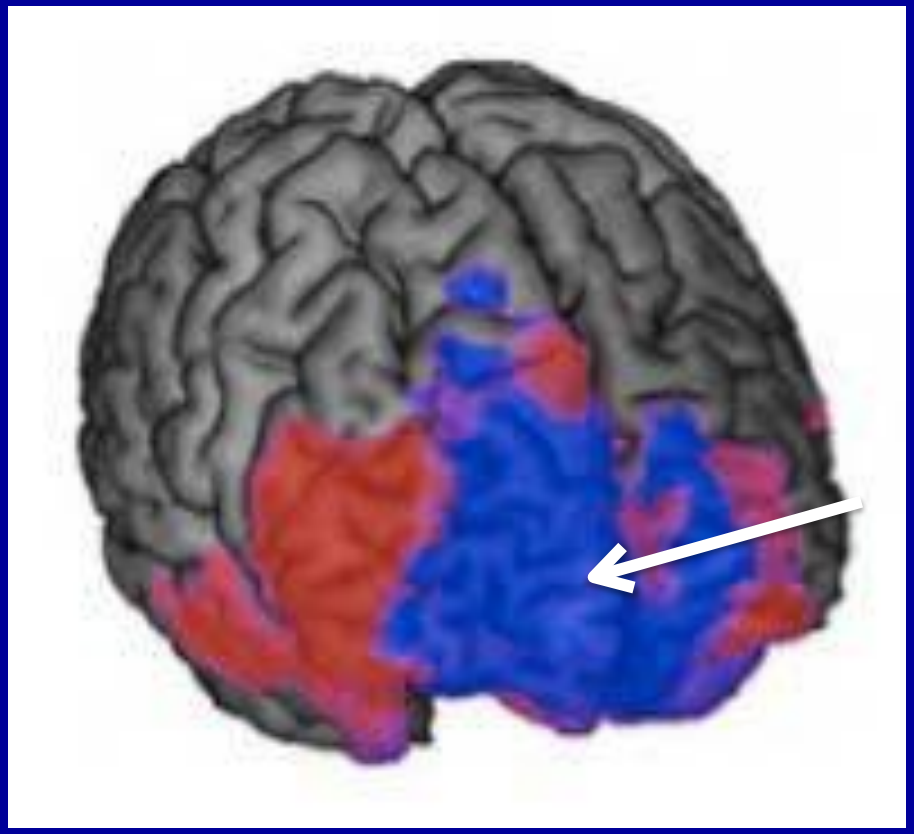
Making decisions is common to humans and animals



Barron AB, Klein C, **What insects can tell us about the origins of consciousness**. PNAS 2016. PMID: 27091981

The Society of Medical Decision Making has its own journal, society & meetings

Brain segments involved in decision making



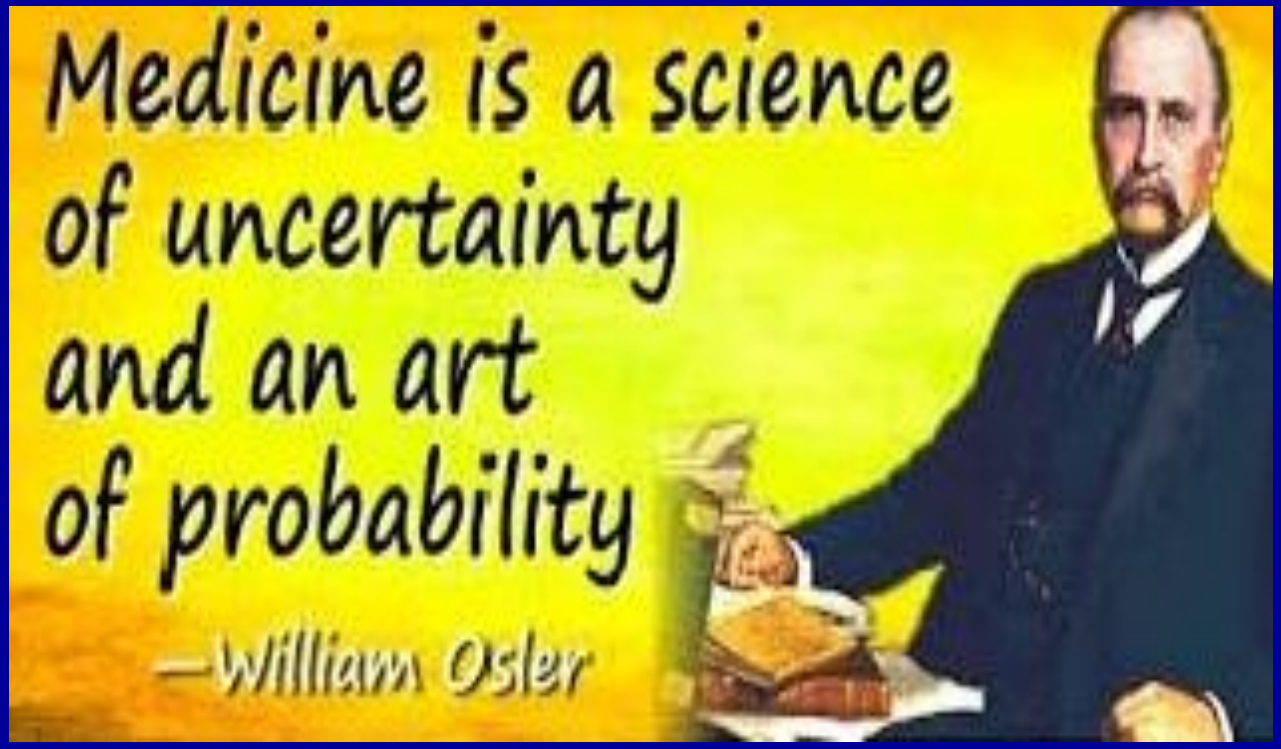
Regions of the brain associated with value-based decision-making include the orbitofrontal, ventromedial, and frontopolar cortex – the areas in which "… we give value to choices and how we make decisions"

Gläscher J, Adolphs R, Damasio H, *et al.*
Proc Natl Acad Sci U S A. 2012; 109:14681.

A short history of decision making

- Ancient Greek philosophers did not have a rational or rule-based framework for decision making, although they recognized it as an important activity
- Greek philosophers **did not recognize probability theory**, which is key to rigorous decision making
- But they did recognize **good *versus* bad decisions** and what the outcomes might be.

Legendary comments



Cont.

- Medicine is learnt by the bedside and not in the classroom.
  - Sir william Osler
- The best physician is the one who is able to differentiate the possible and the impossible.
  - Herophilus of Alexandria
- More mistakes are made from want of a proper examination than for any other reason.
  - Russel John Howard

Clinical reasoning: Definition

- Clinical reasoning describes the thinking and decision making processes associated with clinical practice
- It is a clinician's ability to make decisions (Often with others)based on all the available clinical information, starting with history and physical examinations
- Our understanding of clinical reasoning derives from the fields of education,cognitive psychology and studies of expertise

Elements of clinical reasoning

Clinical skills and decision making

- Even with major advances in medical technology ,the history remains the most important part of the clinical decision –making process
- Studies show that physicians make a diagnosis in 70-90% of cases from the history alone.
- It is important to remember that a good history is gathered not only from the patient but also , if necessary from all available sources : for example , paramedic and emergency department notes , eye – witnesses, relatives and/or carers

Shared Decision Making

- An integrative process between patient and clinician that:
  - Engages the patient in decision making
  - Provides the patient with information about alternative treatments
  - Facilitates the incorporation of patient preferences and values into the medical plan

(Charles C, Soc Sci Med 1997;44:681)

Original Model of "Shared Decision Making"

Clinician shares medical expertise:

- diagnosis
- treatment choices
- probabilities of outcomes

Patient shares values and lifestyle preferences:

- may be based on past experience with medical choices
- may depend on current social situation

Together they arrive at an informed, shared decision

Poor decision making in medicine is unfortunately common

- Mammographic diagnoses of breast cancer are wrong up to 20% of the time
- 30% of patients with strokes receive incomplete or inappropriate care
- Diagnoses of AMI missed in 3.45% of 371,638 patients
- 5-14% of admission diagnoses in acute hospitals are erroneous in one review.

Pow RE, *2016*; Wilson M, *2014*; Miller CS, *2013*; A Gawande, The checklist manifesto *2010*;

The problem of diagnostic error

Error category	Example
No Fault	Unusual presentation of a disease Missing information
System error	Inadequate diagnostic support Results not available Error prone process Poor supervision of inexperienced staff Poor team communication
Human cognitive error	Inadequate data-gathering Errors in reasoning

Reasons for errors in clinical reasoning

- Knowledge gaps
- Misinterpretation of diagnostic tests
- Cognitive biases

Evidence based clinical skills (History and physical examination)

- Evidence – based history and physical examinations is a term used to describe how clinicians incorporate knowledge about the prevalence and diagnostic weight of clinical findings into their history and physical examinations

Use and interpretation of diagnostic tests

- There is no such thing as a perfect diagnostic test.
- Test results give us test probabilities, not real probabilities.
- Test results have to be interpreted because they are affected by the following
  - How normal is defined
  - Operating characteristic
  - Sensitivity and specificity
  - Prevalence of disease in the population

Factors other than disease that influence test results

- A number of factors other than disease influence test results
  - **Age**
  - **Ethnicity**
  - **Pregnancy**
  - **Sex**
  - **Spurious (In vitro) results**

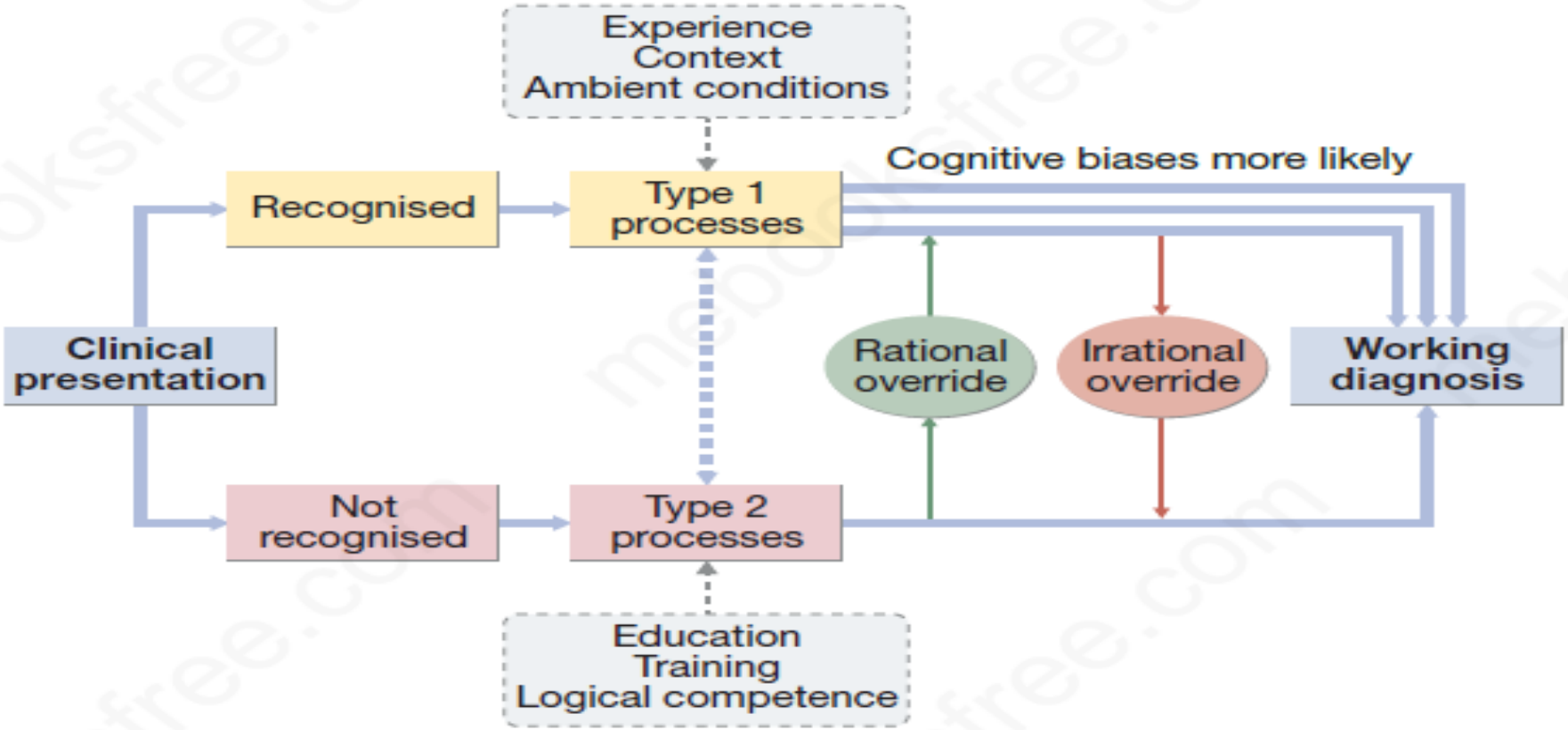
Cognitive biases and human factor

- Cognitive biases and personality traits (aversion to risk or ambiguity) may lead to diagnostic inaccuracies and medical errors resulting in mismanagement or inadequate utilization of resources.

1.6 Type 1 and type 2 thinking

Type 1	Type 2
Intuitive, heuristic (pattern recognition)	Analytical, systematic
Automatic, subconscious	Deliberate, conscious
Fast, effortless	Slow, effortful
Low/variable reliability	High/consistent reliability
Vulnerable to error	Less prone to error
Highly affected by context	Less affected by context
High emotional involvement	Low emotional involvement
Low scientific rigour	High scientific rigour

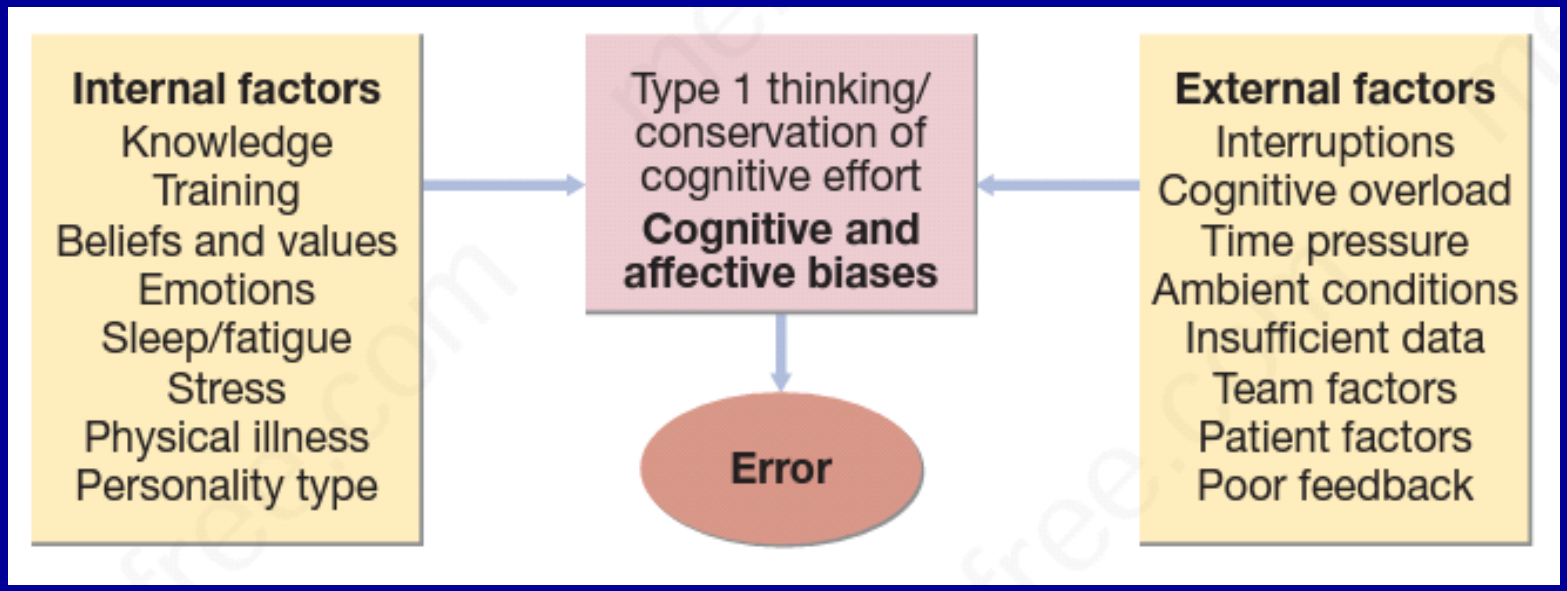
Cognitive biases contd…



- The Interplay between type 1 and type 2 thinking in diagnostic process

Adapted from Croskerry P. A universal model of diagnostic reasoning . Acad Med 2009:84:1022-1028

Reducing errors in clinical decision-making



Factors that affect our judgement and decision-making

Why are so many bad decisions made?

May reflect our cave-man background, where life or death decisions had to be made quickly, on the basis of minimal information.

- Made without sufficient information
- Made too quickly, without proper reflection
- Made without appropriate consultation
- Bring in our own beliefs rather than being evidence-based

How it can be resolved?

Patient –centred evidence-based medicine and shared decision -making

- Patient centred evidence-based medicine refers to the application of best- available research evidence while taking individual patient factors into account; these include both clinical and non-clinical factors (e.g the patient's social circumstances, values and wishes)

Clinical decision - making putting it all together

- Evidence based history and examination
- Deciding pre test probability
- Interpreting test results
- Treatment threshold
- Post test probability
- Cognitive biases
- Human factors
- Reducing cognitive error
- Person –centered EBM and information given to patient

Person-centred EBM and information given to patient

- The patient is treated according to evidence – based guidelines that apply to her particular situation.
- Test alone do not make a diagnosis

SUMMARY

Decision support is a process of:

- assessing decisional needs
- intervening to address individual needs
- evaluating the quality of decision making

A **high quality decision** is informed, values-based, and acted upon

Decision quality improves with:

- Patient decision aids
- Personal health coaching using a structured decision guide

TAKE HOME MESSAGE

Physicians of 21st century need

- Comprehensive knowledge and skill of basic and clinical sciences.
- Good communication skill
- Work effectively in a team
- Demonstrate professional and ethical behaviour
- Evaluating the quality of decision making
- Knowledge is necessary but not sufficient . Most critical skill is how doctor think, reason and make a clinical decision.

THANK YOU ALL