Clinical Reasoning – The Game!

Recognising the difficulty GP supervisors can face when trying to get their GP registrars to take a broad approach to clinical reasoning, a solution has been devised in the form of a card game by Dr Susan Tyler-Freer, BS, BSMT, MBBS (Sydney), Clin Dip Palliative Medicine, FRACGP and Dr Claudia Long, MBBS, FRACGP, B Nursing.

The aim of the game

The aim is to take a randomly generated presentation and practice clinical reasoning by considering the symptoms, signs or results using different reasoning methods to generate broad lists of differential diagnoses. As more cards are drawn, more information becomes available, and this list will be refined. The game ends when it's no longer possible to explain all the information with a single diagnosis.

The goals of the game are:

- to allow the registrar to revisit clinical reasoning processes;
- to experiment with some different styles of clinical reasoning; and
- to help GP registrars identify
  - their intuitive style of clinical reasoning and
  - the biases to which they are most prone.

OVERVIEW

MORE INFORMATION

HOW TO PLAY

Clinical reasoning creates a story from the cloud of patient information and clinician experience.
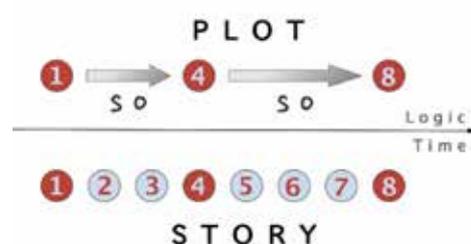
Induction vs Deduction vs Abduction

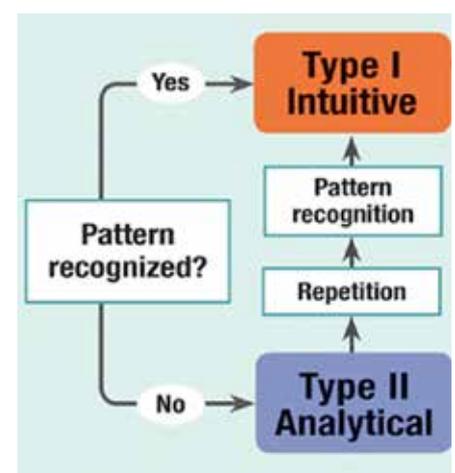| INDUCTION	DEDUCTION	ABDUCTION
• Not so much reasoning; more the discovery of a pattern of logical consequences • The conclusion may be false even if the original observations are accurate	• Is actually reasoning: applying those inductive generalisations to new specific situations • Conclusions may be valid logically, but the reasoning may be flawed because the first premise isn't as true as we thought it was • Example: 1st premise – Birds fly… Conclusion – Kiwis are birds, so they must fly…	• "The argument to the best explanation": abduction allows us to accept there are other possible – though less likely - explanations • Logical inference which starts with a set of observations, then seeks to find the simplest and most likely explanation for those observations • Abduction is about explanations that can be tested and can evolve, leading to plausible conclusions that don't seek to be positively verified or to result in absolutes

Dual Process Theory

- Non analytical (System I, Type 1)
    - Intuitive, automatic, fast, narrative, experiential, pattern recognition - illness scripts
    - Prone to error
- Analytical (System II, Type 2)
    - Analytical, slow, verbal, deliberative and logical
    - "Hypothetico-deductive" – includes testing to catch errors

System 1 thinking is prone to error…

…but it gets better and better as System 2 thinking builds richer scripts

Below are a range of illness scripts and models used for diagnostics with patients. When using any of these models, it is important to be aware that each model has it's limitations and one should always use sound analytical reasoning to achieve a successful diagnosis

Use the models to identify your own one or two natural reasoning styles. Then learn another one deliberately, and use it to cover the weak spots in your natural approach.

A broad initial differential means the true answer is highly likely to be in there somewhere. Remembering that makes sitting with uncertainty much more tolerable.
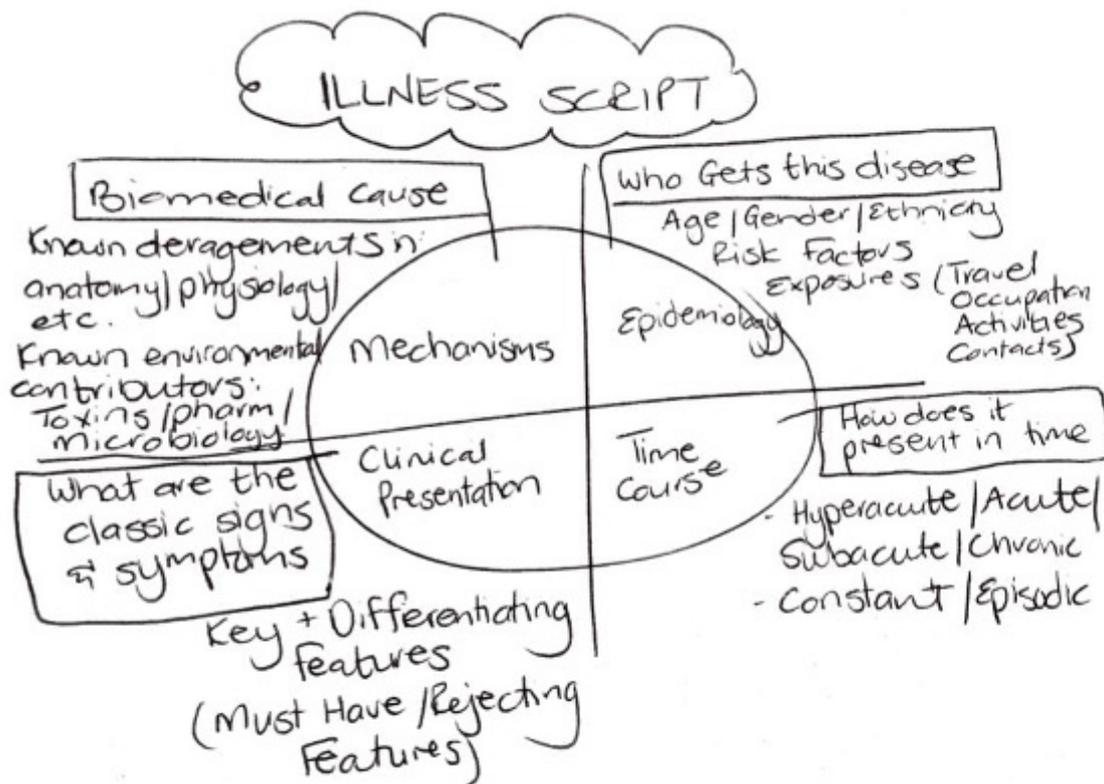
Illness Scripts and other Models

1. "Spot Diagnosis" / Illness Scripts
2. Surgical Sieve
3. Anatomic Model
4. Systems-Based Model
5. Murtagh's PROMPT
6. Cluster and Pivot

1. ILLNESS SCRIPTS

Diagnosis = Telling a story with the patient's information.

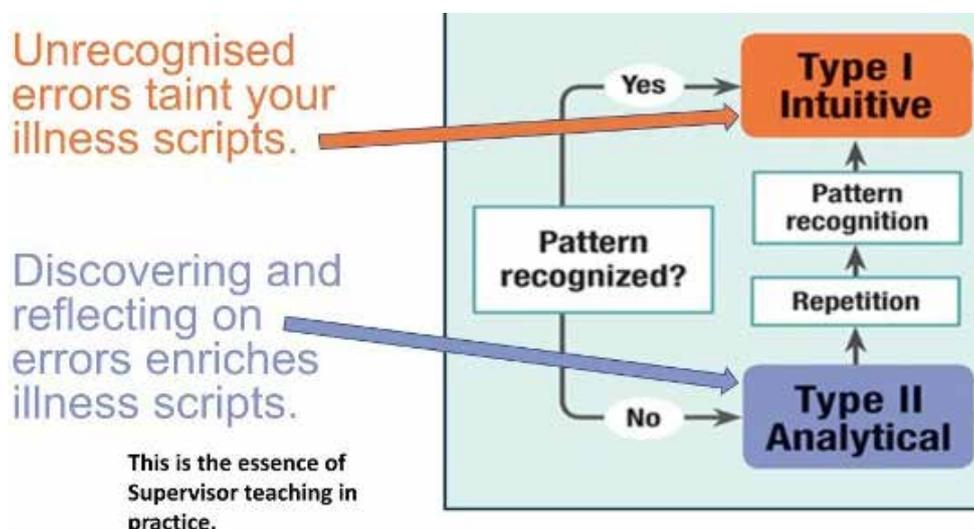*Illness Scripts = Recounting legendary stories that "everyone knows."*

Illness scripts are famously prone to the whole gamut of clinical biases:

- Availability bias
    - The differential is influenced by what is easily recalled.
    - People think that the likelihood of an event is proportional to the ease with which they can recall an example of it happening.
    - Eg.: presentations of headache are unduly influenced by the vivid recall of a ruptured berry anuerysm in your ED term.

- Representative bias
    - The tendency to look for prototypical manifestations of a particular disease and failure to accept atypical variants
    - A sign or symptom is taken to represent something specific and competing diagnoses are disregarded
    - Eg.: altered taste occurs in fulminant liver failure, but it also can result from B12 deficiency, which may be missed if you then restrict your reasoning to causes of fulminant liver failure.

- Confirmation bias
    - Selective thinking where information that confirms a preconception is: automatically noticed, actively sought, and overvalued.
    - This is where you shape the data that you observe to fit the conclusion you've already made, and you don't even notice data that contradict it.
    - Eg.: "That patient has cancer, so that new symptom must be the result of that cancer somehow."

- Anchoring bias / premature closure / diagnostic momentum
    - The first data gathered are overvalued compared to new data.
    - The story line is determined too early, and facts that don't fit are discarded.
    - Eg.: if ED discharges your patient with a diagnosis of pneumonia, you carry on from that point forward, increasingly awkwardly, rather than go back to basics and consider whether it was pneumonia or heart failure in the first instance

- Outcome bias
    - Accuracy is judged on the outcome rather than the logic and evidence.
    - The right thing happened for the wrong reason – eg the lichen sclerosus that you thought was dermatitis DID get better with steroid cream.
    - These errors stunt the development of clinical reasoning by teaching you inaccurate pattern recognition.

Unrecognised errors taint your illness scripts.

Discovering and reflecting on errors enriches illness scripts.

This is the essence of Supervisor teaching in practice.

2. SURGICAL SIEVE

SURGICAL SIEVE Mechanism-based		
	V:	Vascular
	I:	Infectious / Inflammatory
	N:	Neoplastic
	D:	Drugs / Degenerative / Deficiency
	I:	Intoxication / Idiopathic / Iatrogenic
	C:	Congenital
	A:	Autoimmune / Allergic
	T:	Traumatic
	E:	Endocrine
	M:	Metabolic / Mental Health

3. ANATOMIC MODEL

- HEENT
- CHEST
- ABDO
- PELVIS
- LIMBS
- SKIN

4. SYSTEMS-BASED MODEL

Cardiovascular   Respiratory   Neurologic   Gastrointestinal   Renal

Reproductive   Endocrine   Immune / Haematopoetic   MSK / Integument / Connective
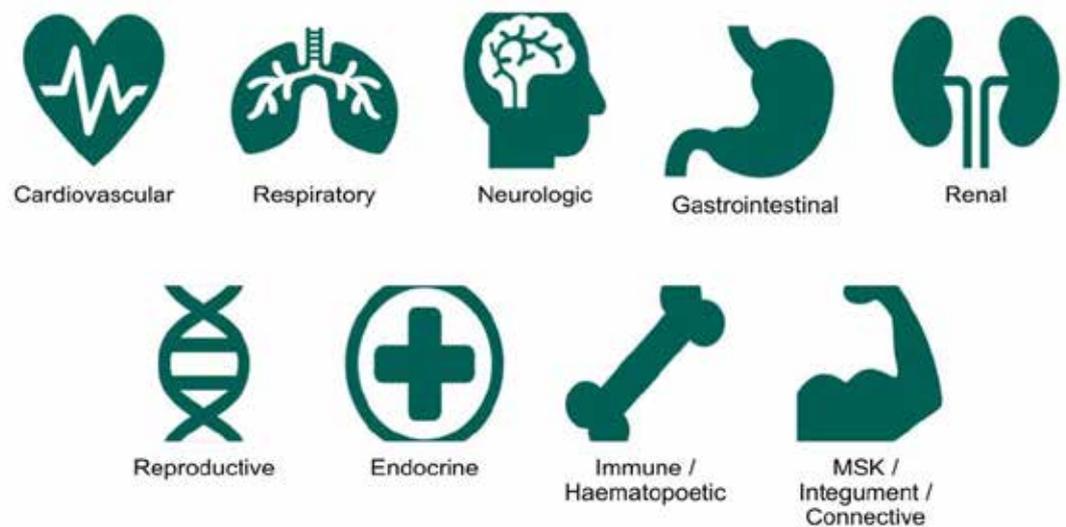
5. MURTAGH'S PROMPT

WHAT'S THE PROBABILITY DIAGNOSIS?

RED FLAGS?

OFTEN MISSED

CHECK FOR THE SEVEN MASQUERADES
Depression, diabetes, drugs, anaemia, thyroid, spinal dysfunction, UTI

IS THE PATIENT TRYING TO TELL ME SOMETHING?

6. CLUSTER AND PIVOT

Some data are more critical than others to the plotline of a coherent diagnosis story.

These key features should be given more "weight" when constructing a diagnosis to explain the whole of the data.

Figuring out the relative importance of all the data in front of you is a massive cognitive task. This can be simplified by quickly clumping it into clusters of illness scripts with similar symptoms, signs, and manifestations.
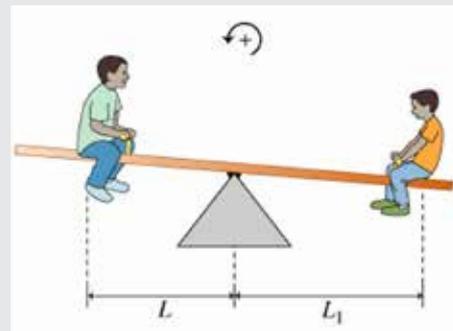
Consider…
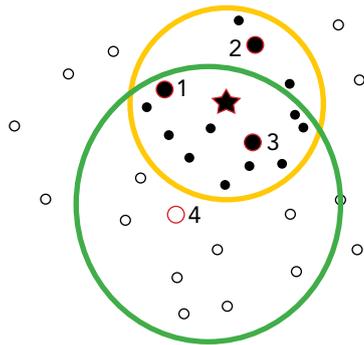17 yr old male with weekly headaches:
- Worse with long screen time
- Resolves fully with Panadol and sleep
- Unilateral
- Preceded by aura
- Associated with nausea
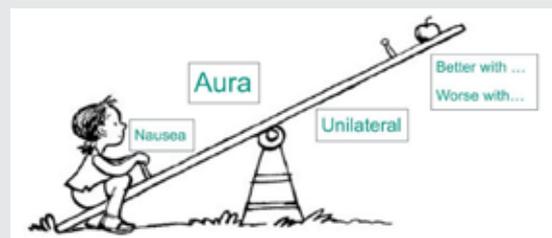
Any diagnosis can be a pivot. The cluster is a cloud of things that give a similar clinical picture / manifestation.

"Disease map"

★ Pivot Migrainew/aura
○ Cluster DDx headache
○ Cluster DDx aura
• Disease more likely to be included in the cluster
  ● Dot 1: Brain Tumour
  ● Dot 2: Ischaemic TIA
  ● Dot 3: Occipital epilepsy
○ Disease less likely to be included in the cluster
  ○ Dot 4: Cluster headache

Temporal pattern should be steadily increasing, not intermittent.

Headache not usually the strongest feature. If present, it doesn't usually respond to Panadol and rest.

Hm.. now that you mention it… why did I think it couldn't be this?

Lacks key feature of lacrimation

De-biasing then asks "Why is it not anything else in that cluster?"

The Breadth Check

INCREASINGLY LIFE–THREATENING ↑	Commonly Seen Life-Threatening	Regularly Seen Life-Threatening	Rarely Seen Life-Threatening
	Commonly Seen Serious	Regularly Seen Serious	Rarely Seen Serious
	Commonly Seen Not Serious	Regularly Seen Not Serious	Rarely Seen Not Serious

INCREASINGLY RARE →

Resources

- [The Master Clinician's Approach to Diagnostic Reasoning](#)

- [Teaching Clinical Reasoning - pivot and facet](#)

- [Strategies for generating differential diagnoses](#)

- [RACP Cognitive Bias and Diagnostic Error](#)

- [Pivot and Cluster Strategy: a Preventive Measure Against Diagnostic Errors](#)

- [Pivot and Cluster: An Exercise in Clinical Reasoning](#)

- [Identifying Reasoning Strategies in Medical Decision Making: A Methodological Guide](#)

- [How Expertise Develops in Medicine Knowledge pages 1133 to 1139](#)

- [Practical Way of Creating Differential Diagnoses Through an Expanded VITAMINSABCDEK mnemonic](#)

- [Doggie Diagnosis, Diagnostic Success and Diagnostic Reasoning Strategies: an Alternative View](#)

- [Diagnostic Reasoning Strategies and Diagnostic Success](#)

- [Diagnostic Aids: The Surgical Sieve Revisited](#)

- [Cognitive Biases Associated with Medical Decisions: a Systematic Review](#)

- [Clinical Reasoning Online Resources for Further Learning](#)

- [How to teach the skill of developing a differential diagnosis to registrars](#)

Does this resource need to be updated? Contact GPSA: P: 03 5440 9077, E: ceo@gpsa.org.au, W: gpsupervisorsaustralia.org.au
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