Paediatric Matters
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Diagnostic Error Part 2: Cognitive Factors & Clinical Reasoning

Patient Story*

Jake, a 2-year-old boy, presented to the Emergency Department (ED) with a referral from his General Practitioner. He had been vomiting for four days with no diarrhoea, alternating between very unwell and appearing to improve. He appeared restless, uncomfortable and inconsolable at times. His childcare centre had a gastroenteritis outbreak and the ED was at capacity with an influx of gastroenteritis cases. Following an initial assessment, he was placed on an oral fluid trial. During a shift handover, a brief case synopsis was provided focussing on a diagnosis of suspected gastroenteritis. Jack tolerated the oral fluid trial and was discharged home with ondansetron and a gastroenteritis factsheet. His parents were provided with safety netting advice and asked to return if symptoms did not settle. He represented two days later dehydrated, in discomfort and febrile. He had a large vomit which contained blood. A chest and abdominal X-ray revealed an ingested button battery lodged in his oesophagus. He was taken to theatre and the button battery removed. He required regular oesophageal dilatation due to a recurrent oesophageal stricture.

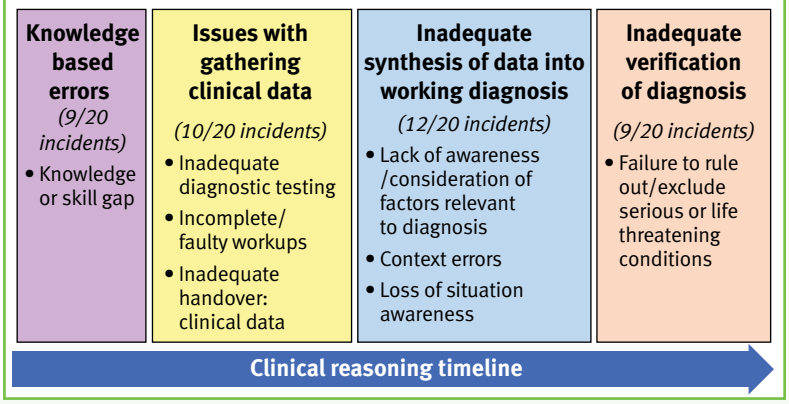
** Fictional story to illustrate key learnings*

Diagnostic errors include delayed, missed and wrong diagnosis. Cognitive factors are one of the most frequently cited factors that contribute to diagnostic errors.[1]

QPQC Review

The QPQC reviewed 26 Queensland Health SAC1 paediatric clinical incident reports (Jan 2018-Dec 2019) and found diagnostic error was a contributing factor in 20 incidents. Key findings from this review are described in Paediatric Matters Edition 8. Cognitive factors contributed to diagnostic error in 18/20 incidents (Figure 1).

Figure 1: Cognitive factors most commonly contributing to diagnostic error in Queensland Health paediatric clinical incidents



Lessons learnt

1. **A thorough directed clinical history, examination and tailored, timely patient workup are essential.** Follow up of results is key, particularly if time critical condition.
2. **Differential diagnoses and clinical reasoning should be identified, recorded and shared on each review of the patient.** This includes most likely diagnosis and areas of uncertainty.
3. **Consider the worst-case scenario in your differential diagnosis.** Memory aides can assist[2-3] (i.e.: SPIT) **S** - Serious; **P** - Probable; **I** - Interesting (rare or unusual); **T** - treatable conditions[4]
4. **Be aware that cognitive biases can impact clinical reasoning** (see Table 1). Clinical decision support tools and guidelines may help address this.
5. **Know when to reconsider the diagnosis and escalate if required (Diagnostic Pause).** This includes when concerns are raised by patients/families/clinicians; if patient is deteriorating/not responding to treatment; or at handovers.
6. **Identify and document risk-minimisation strategies.** Make sure the patient/family know when to return or to seek further advice (including through their GP or 13HEALTH), particularly when time critical conditions have not been excluded.

Table 1: Cognitive Bias Examples [1,5,6]

Anchoring	Clinician may "anchor" their diagnosis using clinical data identified early in the process.
Availability Bias	Clinician may be influenced by recent cases, prominent cases, or previous patients.
Confirmation Bias	Clinician may interpret new information in a way that confirms existing beliefs/decisions
Context Errors	Clinician unintentionally uses the wrong context to explain the patient's clinical symptoms.
Diagnostic Momentum	Clinician over-relies on previous clinician's diagnosis or patient's opinion without checking against current clinical signs.
Premature Closure	Clinician stops once a potential diagnosis is identified - without exploring other possibilities.
Representative Bias	Clinician may overestimate likelihood of diagnosis because patient has some features suggestive of diagnosis.

Useful Links/References

1. Phua, D.H., and Tan, N.C. *Cognitive Aspects of Diagnostic Errors.* Ann Acad Medicine, Singap. 2013 Jan; 42(1) 33-41
2. Clinician Checklists - Society to Improve Diagnosis in Medicine
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4. Society for Academic Emergency Medicine Meeting 2013: Guth T, Lovell, E, Shah, S, Epter, M. "Taking Advantage of the Teachable Moment: A Workshop for Efficient, Learner-Centred Clinical Teaching".
5. Common Cognitive Errors in Adverse events on Vimeo (STORK, Children's Health Qld, 2021)
6. Desjardins, J (2021) *Every Single Cognitive Bias in One Infographic*, Visual Capitalist

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