



Diagnostic uncertainty in clinical medicine

Dr Mary Davin-Power advises on how doctors should act when faced with diagnostic uncertainty

As we all know, a common reason for medico-legal litigation is a delayed or missed diagnosis. According to a CRICO strategies benchmarking report based on data from over 10 years of malpractice claims, 68 per cent of malpractice allegations involved aspects of the initial diagnostic assessment.

Clinical judgement can be a complex process, involving a variety of cognitive functions, particularly in areas of diagnostic uncertainty, a daily challenge in all medical disciplines. It is less amenable to 'quick fixes' as might be applied to administrative or other system failures. While to err is human, it can be useful to examine our approach to diagnostic uncertainty and how we structure our decision-making. Awareness of the following points might help reduce the risk of misdiagnosis, particularly when there is an element of uncertainty.

Dual decision-making model

A dual decision-making model commonly described in literature consists of two types of clinical reasoning:

Type 1: Where the reasoning process is automatic, intuitive, reflexive, and non-analytic. The doctor arranges patient data into a pattern and arrives at a working diagnosis based on previous experience and/or knowledge.

Type 2: Where the reasoning process is analytic, slow, reflective, and deliberate. This type of thinking is often associated with cases that are complex or with which the doctor is unfamiliar.

Managing uncertainty in medicine is very much a core part of the profession. In secondary care, where uncertainty exists, blood testing, x-rays, MRIs, and CT scans are reasonably accessible, and results are mostly received within a reasonable timeframe. Diagnostic uncertainty on a Friday evening of a bank holiday weekend in general practice, or an out-of-hours setting, can present an even greater challenge. With increased pressure on hospital beds and overcrowding in emergency departments, GPs are continuously being encouraged to treat patients in the community where possible, in order to reduce hospital admissions.

In both primary and secondary care, due to patient demand, the pressure to arrive at a timely diagnosis and keep the patient flow moving calls on razor-sharp cognitive reasoning.

Medical professionals use their clinical and diagnostic skills, combined with their knowledge and experience in order to diagnose, safely reassure the patient, and initiate appropriate treatment. However, diagnostic uncertainty can still prevail, and the cognitive process continues to be challenged.

Let's examine some of the mechanisms that can lead to misdiagnosis - assuming we have robust clinical knowledge and adhere to best practice guidelines, an awareness of what lies behind our own reasoning skills can lead to improvement in our diagnostic performance.

Cognitive bias

Different versions of cognitive bias in clinical reasoning can freeze our decision-making and drive us towards a narrow diagnostic field, discarding wider differential diagnoses prematurely. Consider the following possibilities. They are but a small selection of potential cognitive biases that we may be unaware can influence our thinking.

Unreliable heuristics

'I have a hunch that this could be...'

Heuristics, which are mostly efficient thinking strategies leading to shortcuts in reasoning, can sometimes cause us to be misled. We take shortcuts in our decision-making and judgements every day. For example, we walk along the pavement and encounter a worker up a ladder. Most of us will opt to walk around the ladder, rather than underneath; the decision is made in an instant, without really considering whether the worker up the ladder is likely to drop their

hammer or spill their pot of paint. This can be mirrored in diagnostic reasoning where one has a good level of experience and clinical knowledge, and a conclusion is arrived at without consciously going through the evidence detail piece by piece. Mostly this will work, particularly in a familiar environment where our brains will find the shortcut. But it can sometimes let us down as well.

Think of the patient with a persistent sore throat. The initial diagnosis might be *'a strep throat'* or *'a viral pharyngitis'* - it is common, and there is a lot of it about. However, have we considered the less common causes, say a sexually transmitted infection like chlamydia, or a retropharyngeal abscess? As we all know, time is very much part of the diagnostic process, so 'safety netting' is vital in daily practice - *'If it's no better in a week, make sure you come back to me...'*

Anchoring and confirmation bias

'I knew the moment the patient walked in that it was...'

When an early diagnosis seems to fit in with the initial assessment, as time goes by, we can be reluctant to stray from our early opinion, even when the patient returns with the same symptoms. If it seems to tick all the boxes, an early diagnosis can be an attractive, convenient, and time-sav-

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ing solution. We can be reluctant to review, and maybe to admit that our initial opinion might have been incorrect, often remaining unaware that we are *'anchoring'* to the initial pathway. Think of the patient who returns three times to the out-of-hours service or emergency department and consider a reappraisal of the initial diagnosis.

Presentism

'There's a lot of it about...'

Recently seen patients may have had had similar symptoms so it pops in higher up on our mental list of differentials, possibly erroneously. Just because a lot of them have it does not mean they all have it. When you hear hoofbeats, think horses certainly, but there are always one or two stray zebras around. Think the vomiting patient - probably norovirus, but could they have renal failure or a septicæmia?

Premature closure

'That's it, I have the solution, and we will proceed from here accordingly...'

'Premature closure' happens in the same way. The diagnostic pathway can be prematurely concluded, with no open view on whether symptoms and signs might be changing, or whether further investigations might be considered.

Think of the returning patient with recurrent 'indigestion' - could this be cardiac-related?

Confirmation bias

Similar to premature closure, confirmation bias can lead

the clinician to unconsciously manipulate subsequent information, signs and symptoms to fit an initial diagnosis, closing down awareness of something else going on. For instance, a high potassium level might be explained away by considering it was caused by a haemolysed blood sample.

Familiarity

'I have known this patient for years.'

'I know all their medical problems...'

It is easy to become comfortable with a patient's ongoing and familiar medical problems, and fail to notice or accept a new, unexpected diagnosis. Episodic reappraisal of the familiar patient with multiple co-morbidities can be surprisingly effective or to suggest that they attend a colleague occasionally, who will view them with greater objectivity.

The Dunning-Kruger effect

'I've got this...'

Dunning and Kruger in their seminal paper suggested that "people hold overly favourable views of their abilities...". This overestimation occurs, in part, because people who are unskilled in these domains suffer a dual burden: Not only do these people reach erroneous conclusions and make unfortunate choices, but their incompetence robs them of the metacognitive ability to realise it.

This describes how the underperformer can have an inflated sense of their own ability (*they don't know that they don't know*), whereas the higher performer can underestimate their skills. An important aspect of continuing professional development is to seek awareness of one's knowledge gaps and address them appropriately.

Where to from here?

These examples are but a taster of how our cognitive skills can be affected by our unconscious bias. A few tips follow which might help to overcome these risks in decision-making.

▶ Always safety net - *'If it's not gone in x weeks, make sure you come back to me.'* Remember to record that you have instructed the patient accordingly.

▶ Be prepared to revise the initial diagnosis where the patient is slow to respond to treatment.

▶ If you have an inkling that something is not right, listen to the 'angel on your shoulder' - heuristics work in a positive way too. Unlike Donald Rumsfeld you may not fully know that you know what you know.

▶ Don't be slow to ask for a colleague's opinion. It shows real strength, not weakness, as well as allowing true collegiality to develop in both directions.

▶ Checklists are not just for surgeons. Considering a differential diagnosis checklist, either mentally or with a written list, is a great habit. They alert us to other possibilities and can help prevent premature closure.

▶ Seek out and follow accredited guidelines and decision support tools - while not infallible, these provide robust support for the physician.

▶ Involve the patient or carer at every step of the diagnostic pathway. Their story can often solve a clinical mystery, if given time.

▶ Sleep deprivation and hunger affect cognitive ability. Self-care is paramount in managing to deliver safe patient care.

▶ If you think you will be worrying about a patient overnight, seek a second opinion.

▶ Reflective practice - as clinicians we might consider critically assessing our own thought process during the diagnostic journey.

These suggestions may sound self-evident, but can still be useful reminders to counter our own fallibility in the face of current time and staffing pressures.

References on request