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Editorial

Clinical Reasoning: The Analysis of Medical Decision Making.

Summer, 1982, The Ulster Hospital Dundonald. On a distant radio, Tears for Fears are seeking Pale Shelter. My group of 6 second year medical students are on a pick-up round with Dr Ken Nelson, Consultant Endocrinologist.

The next patient is a 68-year-old lady who has been admitted with increasing fatigue and weight gain. We ask a few questions – she is slow to reply and her voice is gravelly. Dr Nelson shows us the blood results -only basic results – this is 1982 and sophisticated tests will take some time to come back from the lab. He asks for a diagnosis. Various suggestions are made by the group: anaemia (she looks pale), diabetes (weight has increased), smoking (hoarseness) and Cushing's disease (impaired mental processes).

Dr Nelson is starting to look impatient – "it's fairly obvious" he says. Someone tentatively suggests hypothyroidism – "Yes, of course!" is the response.

Exposure to hundreds of similar cases in the past meant that Dr Nelson was able to use a fast, pattern recognising, intuitive way of thinking that can reach conclusions with just a few data points – *Type 1 thinking*, whereas we medical students plodded step-wise through a slow, logical but high effort approach – *Type 2 thinking.* [1]

Psychologists believe there is a very strong human trait to make consistent stories out of everything around us– a *narrative engine*. We like our world to make sense. If some of the information isn't there, we start to fill in the gaps. The only problem is, if our store of background knowledge and experience is lacking, then our story may not reflect reality. It also takes more mental effort to work things out from first principles and many of us are somewhat cognitively lazy. [1,2]

Pat Croskerry, an expert in Clinical Reasoning, talks about skilled clinicians having a bank of *illness scripts* where the clinical presentation is mentally compared with the script and if the pattern fits, a spot diagnosis (*Type 1 thinking*) can be made. If the pattern is not recognised or the patient doesn't respond to treatment, then it's back to plodding through differential diagnoses or finding a different script for comparison. [3]

Difficulties can arise if our spot diagnosis is wrong and we don't notice or respond to clues that something isn't right – we may develop an *anchor bias* – an unwillingness to consider other possibilities.

The narrative engine can suffer from other cognitive biases [4] including:

Confirmation Bias

Agreeing with evidence that supports our diagnosis (script) and ignoring data that refutes it.

Premature Closure

Facts are not checked and new data is not considered.

Search satisficing (a combination of satisfy and suffice)

Having found one diagnosis, we fail to look for a second – e.g., a small deep stab wound in the back as well as an obvious gunshot wound in the front.

Posterior Probability Bias

The diagnosis on the last 3 admissions may not be the right diagnosis this time.

Outcome Bias

A desire for a favourable outcome, e.g., blaming sepsis on pneumonia rather than an IV line infection.

We can also be strongly influenced by what Croskerry calls the *cognitive miser function.* [5] It sometimes takes a lot of cerebral effort to stop "*diagnostic momentum*" at an early stage:

2000 hrs: Patient states epigastric pain is similar to that during MI 20 years ago – admit cardiology as possible acute coronary syndrome.

2010 hrs: Commence loading doses of Aspirin 300mg plus Ticagrelor 180mg for ACS.

0130 hrs: Brisk haematemesis! Urgent call to hospital GI bleeding team.

0150 hrs: OGD shows duodenal ulcer.

Did the patient mean it was the same character of pain or the same intensity of pain? Would a more systematic consideration of causes of epigastric pain (*Type 2* thinking) led to a safer outcome?

At this stage, no-one knows if critical analysis of medical decision making will lead to a long term improvement in patient safety. Some units are starting to incorporate such analysis into morbidity and mortality meeting data. The concept is certainly interesting and I think we will hear more about "Clinical Reasoning" in the future.

John Purvis, Hon. Editor

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REFERENCES/BIBLIOGRAPHY

1. Kahneman D. *Thinking, Fast and Slow*. Penguin, 2012.
2. Hughes M, Nimmo G. Models of clinical reasoning. In: Cooper N, Frain J (eds), *ABC of Clinical Reasoning*. Wiley-Blackwell, Oxford, 2016.
3. Croskerry P. A universal model of diagnostic reasoning. *Acad Med* 2009; **84**: 1-7.
4. Croskerry P. Bias. A normal operating characteristic of the diagnosing brain. *Diagnosis* 2014: **1**: 23-7
5. Croskerry P. Clinical decision making. In: Barach P, JacobsL, Lipshultz SE, Laussen P (eds), *Paediatric and Congenital Cardiac Care: Vol 2: Quality Improvement and Patient Safety*. Springer-Verlag, London, 2015; pp. 397-409.

Ulster Medical Society Programme 2016 - 2017

President: Prof Patrick J Morrison CBE MD DSc. **Theme:** Medical Myths and legends

AUTUMN SEMESTER				
Date	**Meeting**	**Speaker**	**Title**	**Location**
Thursday 6th October 2016	**Presidential Address**	**Prof Patrick Morrison** CBE MD DSc FRCP FRCPI FFPHMI FRCPCH Consultant in Genetic Medicine	**Medical myths and legends***	8.00pm North Lecture Theatre MBC G07NT
Thursday 20th October 2016	**Joint meeting with NIMDTA & QUB. Research for Trainees - Opportunities, Presentations & Prizes**	**Prof Stephen Gordon** MD FRCP FRCP(Edin) Director Malawi-Liverpool-Wellcome Trust Clinical Research Programme	**Research is Global**	9.00am - 4.00pm Postgraduate Lecture Theatre BCH (Buffet from 12.00)
Thursday 10th November 2016	**Joint Meeting with the Ulster Society for the History of Medicine** **The Gary Love Lecture**	**Dr Brian Barton** MA PhD Historian and Author	**Medical aspects of the Belfast Blitz***	8.00pm Whitla Medical Building SR5 & SR6
Thursday 24th November 2016	**Joint Meeting with Belfast City Hospital Medical Staff. The 2016 BCH Lecture**	**Dr Fred MacSorley** MBE MB BCh FRCGP DipIMC(RCSEd) General Practitioner	**Medicine between, in and frequently over the hedges. 30 years of pre-hospital care in N. Ireland**	5.30pm Postgraduate Lecture Theatre BCH (Buffet from 5.00pm)
Thursday 1st December 2016	**Sir Thomas & Lady Edith Dixon Lecture**	**Prof Alexander McCall-Smith** CBE LLB PhD DLitt FRSE FRCP (Edin) FSL Author; Emeritus Professor of Medical Law, University of Edinburgh	**The Real Things that Happen to Fictional Characters***	8.00pm North Lecture Theatre MBC G07NT
Wednesday 7th December 2016+	**Desmond Whyte Lecture**	**Dr Fiona Stewart** MBE FRCP FRCPCH Consultant in Genetic Medicine	**Sweeping up the leaves – new approaches to old diseases**	6.00pm Centre for Medical and Dental Education and Training, Altnagelvin Hospital. (Buffet from 5.30pm)

SPRING SEMESTER				
Date	**Meeting**	**Speaker**	**Title**	**Location**
Thursday 12th January 2017	**Joint Meeting with the Ulster Obstetrical and Gynaecological Society**	**Dr Catherine Calderwood** MA FRCOG FRCP(Edin) Chief Medical Officer, Scotland	**Realistic Medicine**	8.00pm Whitla Medical Building SR5 & SR6
Tuesday 17th January 2017+	**Joint Meeting with the Ulster Medico-Legal Society**	**Dr Christopher Bass** MA MD FRCPsych Consultant Liaison Psychiatrist Oxford	**Somatoform and factitious disorders involving the limbs***	6.30pm Larmour Lecture Theatre QUB. Dinner Great Hall QUB 7.30pm
Thursday 16th February 2017	**Ulster Medical Society**	**Prof Dan Bradley** BA PhD FTCD MRIA Professor of Population Genetics, Trinity College Dublin	**Ancient Irish Genomics & Human origins on the Island***	8.00pm Whitla Medical Building SR5 & SR6
Thursday 23rd February 2017	**The Robert Campbell Oration**	**Dr Deirdre Donnelly** MD MRCPCH Consultant in Genetic Medicine	**From St Valentine to Easter Island – Neurocutaneous disorders through time**	8.00pm Whitla Medical Building SR5 & SR6
Thursday 9th March 2017	**Joint Meeting with Belfast City Hospital Medical Staff. The 2017 BCH Lecture**	**Prof Sir John Burn** MD FRCP FRCPE FRCPCH FRCOG FMedSci Professor of Clinical Genetics, Newcastle University, Chair QuantuMDx Ltd	**The rise and fall of Genomic Medicine**	5.30pm Postgraduate Lecture Theatre BCH (Buffet 5.00pm)
Friday 24th March 2017	**Annual Presidential Dinner**	**Dr Éamon Phoenix** BA MA PhD PGCE	**Voices 16: Northern Narratives of the 1916 Rising and the Somme**	7.15 for 8pm Canada Room, Great Hall QUB
Thursday 11th May 2017	**Annual General Meeting**			5.00pm Ulster Medical Society Council Room, Whitla Medical Building

*Suitable for a non-medical audience +Note different day of the week

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