

(seen in 83% of patients) involving all major organs and associated with aneurysm formation. Blood cultures are generally negative with positive cultures in only 31% of *Aspergillus* cases.<sup>2</sup> Often the diagnosis is made at surgery. The prognosis is poor with a high rate of recurrence and survival rate of only 18%.<sup>2</sup>

Ocular manifestations are seen in fungal endocarditis in approximately 13% of cases, but *Aspergillus* endophthalmitis secondary to endocarditis is extremely rare.<sup>4</sup> Treatment is with systemic and intra-vitreous antibiotics and, in severe cases, vitrectomy.

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# letters to the editor

Please submit letters for the editor's consideration within three weeks of receipt of *Clinical Medicine*. Letters should ideally be limited to 350 words, and sent by email to: clinicalmedicine@rcplondon.ac.uk

## Misdiagnosis: analysis based on case record review with proposals aimed to improve diagnostic processes

Editor – Neale and colleagues provide a valuable reminder that misdiagnosis is commonly related to cognitive errors (*Clin Med* August 2011 pp 317–21). They encourage a shift in emphasis from intuitive (system 1) to analytical (system 2) thinking because 'over-reliance on a simple perceptive approach to diagnosis may forestall analysis'. However, general strategies for correcting cognitive biases can be problematic. Croskerry<sup>1</sup> advises against viewing the two systems separately and has promoted a combined approach, emphasising the complexity of decision making in practice. Norman and Eva<sup>2</sup> have drawn attention to biases inherent in the analysis of errors. They note that similar errors are attributable to several mechanisms but cite some gains from combining the analytic and intuitive. They suggest that simple prompting strategies may be better than formal teaching about cognitive biases. Thus, to avoid the common bias of premature clo-

sure, 'think of the first thing that comes to mind but think of other possibilities'. Some studies provide evidence that teaching more analytical reasoning may sometimes, paradoxically, worsen results.<sup>3</sup> Norman and Eva reference a similar point.<sup>2</sup> None of this, of course, negates the need for analytic thought in context.

We have recently proposed that memorable aphorisms can still be valuable aids to judgement.<sup>4</sup> While such heuristics (short cuts) have come in for criticism they are not inherently bad (or good) but must be applied in context and reviewed critically. Neale and colleagues seem to be thinking along these lines where they say 'To remind clinicians not to ignore the pelvis perhaps the term 'PR (per rectum)' might be replaced by 'RPE' (rectal and pelvic examination)'. Could this be ripe for an aphorism? This important point about terminology influencing behaviour deserves more study. One of us has observed that the ubiquitous use of abbreviations such as ACS or TIA can cause diagnostic error by turning a verbal short cut into thought cut short.<sup>5</sup> Few would argue with their sugges-

tion for structural prompts in records. Too often 'clerking' is seen as an end in itself. Physicians will support their call for reflection, resisting speed of throughput at the expense of time for thought.

The authors treat the unfolding case as a series of links in a chain, noting error at various points. However, the linear chain is not always a good model for healthcare. Working with patients is a complex system involving uncertainty and unfolding over time. Within such a system, decisions require a wider process of sensemaking and situation awareness that must include networks of persons, as indeed the authors suggest in their recommendation for more consultation. Encouraging doctors (and others) to challenge diagnoses and voice uncertainty is essential, and inculcating these behaviours and collaborative work habits should start in medical school.

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### In response

In response to the thoughtful comments of Levine and Bleakley we are pleased to re-emphasise the principal purpose of our paper.

Cognitive shortcuts were first identified as key triggers of errors in judgement and decision taking.<sup>1</sup> Subsequently this view was challenged by researchers who have shown the value of 'cognitively hard-wired' systems in making sense of complex situations.<sup>2</sup> Clearly, 'intuition' plays a part in the diagnostic process. However, in our analyses of case records of emergency admissions, we were perturbed to find that the conclusions of clinical clerking by trainees usually appear under the term 'Imp' (ie impression). This term is non-specific and as a result follow-up actions may be ill-defined.

Recent evidence demonstrates that 'getting it right' using intuition is a marker of expertise. Experienced doctors may be able to arrive at the correct answer very quickly – their expertise has become cognitively implicit. Psychologists have developed a number of techniques to examine this aspect of expertise (including cognitive task analysis and verbal protocol analysis).<sup>3</sup> We conclude that intuition-based decision making may work well for an expert diagnostician but is likely to be less fruitful for a trainee physician.

In the light of this evidence we suggest that junior members of the care team should use a systems approach to back up initial thoughts. In caring for older patients, clinicians often face a complex web of possibilities. The proposed simple tabulated format (charting observations, conclusions and resultant actions) allows the team to create a plan for a patient, to share it adequately (including during handovers), and to provide follow-up.

We agree that diagnosis is a non-linear, dynamic cognitive process. It is exactly for this reason that a tabulated plan could help render the process more tractable. Care plans have been shown to improve outcomes in intensive care units.<sup>4</sup> However, it

is likely that such changes in process can only come from central directives. If it could be shown, in a prospective study, that tabulated observations, conclusions and resultant actions (of the type proposed) significantly enhance the process of assessing acute admissions to hospital, then it would seem reasonable to add such tabulations to the 'generic medical record-keeping standards' proposed by the Royal College of Physicians in 2007 and accepted by more than 80% of physicians.<sup>5</sup>

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### Including pharmacists on consultant-led ward rounds

Editor – Miller and colleagues highlight the useful interventions of pharmacists in prescribing on consultant-led ward rounds (*Clin Med* August 2011 pp 312–16). We have previously shown how giving feed-

back to junior doctors on consultant-led ward rounds can lead to a reduction in prescribing errors.<sup>1</sup> However, a major problem with this approach is that the doctor who wrote the drug chart is often not present on the round, as patients are quickly moved from the on-call or acute medical team to another ward. We therefore extended our work to a one-year study in which the pharmacist gave feedback to foundation year (FY) 1 doctors responsible for moderate or severe prescribing errors irrespective of the ward they worked on. Drug charts and take home prescriptions were systematically reviewed on three medical and one surgical ward by a single designated ward pharmacist who conducted the study. Feedback was given by the pharmacist face-to-face whenever possible (58% or errors), by telephone (26%) or by email if the trainee was otherwise difficult to contact (16%). The feedback was supplemented by six formal teaching sessions in which the prescribing errors were discussed in anonymised fashion.

In total, 275 errors were recorded by 25 FY1 doctors. The two most common errors were due to incorrect medication history itself, followed by wrong dose. There was a 62.8% reduction in total prescribing errors over the course of the year from 86 in the first eight weeks to 32 in the final eight weeks. Severe errors reduced by 92.3% from 13 in the first eight weeks to one in the final eight weeks. A questionnaire evaluation of the FY1 doctors' perceptions of the study revealed an overall feeling that providing feedback in this way was useful and effective. Six FY1s revealed that they had never received prescribing feedback from a senior member of their medical team.

An important goal of ward pharmacists should be to educate. Receiving feedback on performance is the most powerful way to learn.<sup>2</sup> Our study shows that pharmacists giving feedback to trainees on prescribing errors is feasible and effective even though they may not be working on the ward in which the errors were detected.

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