

Clinical decision rules for acute coronary syndromes: the specifics

Richard Body

In this issue of *Emergency Medicine Journal*, Steurer *et al* report a systematic review of clinical decision rules (CDRs) for suspected cardiac chest pain.¹ These patients may account for up to 6% of Emergency Department (ED) workload, and the majority are hospitalised for investigation even though only a minority actually prove to have an acute coronary syndrome (ACS).² It is therefore not surprising that there have been many attempts to develop a CDR to improve diagnosis in the ED for this important patient group. However, it is perhaps surprising to learn that only two CDRs have been validated in the troponin era and no CDRs have been validated using a contemporary gold standard.³ Notwithstanding this obvious drawback, Steurer *et al* have robustly demonstrated that no CDR has adequate diagnostic accuracy to confidently exclude ACS.

This raises the question of why, despite numerous attempts, it has not been possible to successfully derive, validate and implement a CDR for cardiac chest pain in the ED. Some argue that CDRs present an oversimplification, leading to the practice of 'tick box medicine', which can never replace the reasoned clinical judgement of a physician. However, many commonly accepted CDRs have been shown to have superior diagnostic accuracy to unstructured clinical judgement.⁴

Others may argue that CDRs work very well for answering 'simple' questions, such as 'Does this patient with an injured ankle need an x-ray?', but not as well for complex conditions in which the decisions

of clinicians may be influenced by multiple interactions between many variables. It has, however, been possible to introduce CDRs for conditions as complex as suspected pulmonary embolism. Perhaps we are simply in need of a different approach. Our approach in suspected pulmonary embolism, for example, combines clinical probability scoring with D-dimer testing. To date, CDRs for cardiac chest pain have focused either solely on clinical features and ECG findings, or solely on biomarkers.⁵ In future, a combination of the two may be more likely to yield successful results.

Furthermore, Steurer *et al* criticise the CDRs identified in their systematic review for a lack of specificity. This is with good reason, as the specificity of the top-performing CDR was found to be as low as 4% in one validation. However, although a lack of specificity will clearly reduce the potential impact of a CDR by reducing its potential to introduce cost-savings and yield benefits for patients, a CDR that could prevent only a proportion of hospital admissions for a condition as common as cardiac chest pain could still yield worthwhile benefits. The most widely used CDRs, for example, have specificities of below 50% in validation studies but still lead to reductions in the use of imaging.^{6–9}

Similarly, if suspected cardiac chest pain accounts for 27.4% of acute medical admissions² and the prevalence of ACS is assumed to be around 25%,¹⁰ a CDR with just 30% specificity could prevent up to one-quarter of all admissions for cardiac chest pain, reducing all acute hospital admissions by 7%.

Ultimately, Steurer's systematic review has implications both for future research and for practising clinicians. For researchers, the findings call for innovative

approaches to deriving CDRs and perhaps beckon us to accept imperfect diagnostic accuracy. A successful CDR may enable confident 'rule out' of ACS in some patients, even if the diagnosis cannot be 'ruled in' without further investigation.

For clinicians, the findings are a pertinent reminder of the elusive nature of ACS and the pitfalls in diagnosis. Atypical symptoms and the absence of ECG abnormalities are common, which almost certainly explains the historical failures to successfully validate a CDR. A high index of suspicion is mandatory.

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Cardiovascular Sciences Research Group, University of Manchester, UK

Correspondence to Richard Body, Emergency Department, Hope Hospital, University of Manchester, Stott Lane, Salford, Manchester, M16 8HD, UK; richard.body@manchester.ac.uk



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