

Injury

Ottawa ankle rules for the injured ankle

J Heyworth

Useful clinical rules save on radiographs and need to be used widely

What could possibly be more straightforward than the assessment of an injured ankle? Patients with ankle injuries, usually sustained recreationally or in a simple fall, attend emergency departments throughout the world in their hundreds of thousands every year. Most of these patients will have sustained simple injury to ligamentous soft tissue or a small avulsion fracture of no clinical significance. A minority will have sustained more serious fractures, requiring immobilisation or internal fixation. Patients with ankle injury constitute approximately 5% of all patients who visit emergency departments, although fewer than 15% of these patients will have clinically significant fractures.

Differentiating between these two groups of patients is not always easy, particularly for relatively inexperienced clinicians. The safety net for indeterminate examination has always been recourse to radiography. However, such an unselective policy has resulted in inestimable numbers of unnecessary exposures to radiation for little diagnostic yield. In addition to being poor medicine, such profligacy is a luxury that is no longer acceptable in any health system.

Faced with such inconsistent assessment and use of radiology, Stiell and colleagues developed the concept of a clinical decision rule to guide the assessment of ankle injuries—in particular, to determine the indications for radiography.¹ Their objective was to produce reliable and reproducible guidance based on objective criteria and thus reduce the subjective component of assessment. The validation of this rule involved thousands of patients in a structured programme to generate rigorous rules with exceptional performance as a diagnostic test. This became known as the Ottawa ankle rules, using bony tenderness and inability to bear weight as positive indicators for radiography.

During the subsequent decade, successive papers have reproduced Stiell's findings and established the Ottawa ankle rules as a safe, cost effective, and

reliable approach to assessing injured ankles with impressive consistency when applied by senior emergency doctors, junior doctors in training, and nurse practitioners.^{2,3}

The applicability of the Ottawa ankle rules in children aged 2–16 years has been confirmed with 100% sensitivity for significant fractures of the ankle and mid-foot. This would allow a reduction in radiographs of the ankle of 16% and of the foot by 29%, without missing any clinically significant fracture.^{4,5}

In a recent issue of the *BMJ*, Bachmann *et al* reported a systematic review of 27 studies evaluating the implementation of the Ottawa ankle rules.⁶ A sensitivity of almost 100% was confirmed, with a possible overall reduction in the number of radiographs performed of 30–40%.

Despite these impressive figures, the use of the Ottawa ankle rules remains variable, with far more common use reported by clinicians in Canada and the United Kingdom compared with the United States, France, and Spain.⁷ Critics of the decision rule concept cite loss of clinical autonomy and reluctance to practise within rigid guidance. However, such resistance is difficult to support given the large amount of evidence in favour of the Ottawa ankle rules.

Of course, the value of a normal *x* ray film in providing reassurance for patient and clinician should not be underestimated. However, the Ottawa ankle rules provide a high level of diagnostic confidence in the absence of radiographs when considering treatment options and recommendations for return to activity.

Applying the principle behind clinical decision rules to other conditions seen in emergency departments in high numbers, with variable clinical assessment and a tendency to order radiographs indiscriminately, has been a logical next step. The characteristic of all these rules is high sensitivity, allowing clinicians to be selective in the use of radiography. The Ottawa knee rule, for example, resulted in a reduction of 26.4% of patients referred for radiography of the

knee.⁸ The Canada cervical spine rule for radiography in alert and stable patients with trauma showed 100% sensitivity for identifying clinically important injuries to the cervical spine.⁹ Similarly, the Canada computed tomography head rule for patients with minor head injury defined high and medium risk factors for clinically important brain injury and thus identified the population for whom computed tomography was indicated.¹⁰ The cervical spine and head rules have been generated but not yet fully tested and validated.

These rules are transforming the approach to the assessment of these injuries and, after training, can be used by clinicians from a range of backgrounds (including medical, nursing, and paramedic staff), in both hospital and community settings.

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Author's affiliation

J Heyworth, Consultant in Emergency Medicine, Southampton General Hospital, Southampton SO16 6YD, UK

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