

Elbow extension test rules out fracture

Clinical Question:

Can the elbow extension test be used to rule out fracture in adults and children with an acute elbow injury?

Bottom Line:

In a group of patients with acute elbow injury -- 31% were eventually found to have a fracture -- the elbow extension test (described below) was effective in ruling out fracture without the need for radiography. But it was not as specific as it was sensitive; approximately half the patients who tested positive were fracture free. ([LOE = 1b](#))

Reference:

[Appelboam A, Reuben AD, Bengner JR, et al. Elbow extension test to rule out elbow fracture: multicentre, prospective validation and observational study of diagnostic accuracy in adults and children. BMJ 2008;337:a2428.](#)

Study Design:

Decision rule (validation)

Funding:

Foundation

Setting:

Emergency department

Synopsis:

The investigators enrolled adults and children aged at least 3 years who presented to participating emergency departments within 72 hours of an elbow injury. All patients were examined using the elbow extension test, described below. Investigators enrolled 1740 adults and children. Of the 958 adults, 33% were able to fully extend the elbow and thus avoided x-ray. Adults with a positive test result were x-rayed; children were x-rayed at the discretion of their clinician. Patients who were not x-rayed were followed-up by telephone in 7 days to 10 days and were examined if they had any symptoms. The reference (gold standard) consisted of either radiographic findings, results of the telephone follow-up, or follow-up at an orthopedic clinic. The overall prevalence of fracture was 31%. The elbow extension test was very effective in ruling out fracture, with an overall sensitivity of 96.8% (95% CI, 95.0 - 98.2) and a negative predictive value in this group of 97.2%. Approximately half the adults and children who failed the test actually had a fracture, giving the test a specificity of 48.5% (45.6 - 51.4) and a positive predictive value of 45.8%. The sensitivity of the test was better in

adults, but the specificity was similar in all age groups.

The elbow extension test: The patient is seated with arms supinated. The patient is asked to flex their shoulders to 90 degrees and then fully extend and lock both elbows. Injured and uninjured sides are compared visually.

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