Evaluation of acute knee pain in primary care
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CRD summary
This review set out to determine the role of radiological procedures in evaluating the causes of acute knee pain. Only a single radiological technique, magnetic resonance imaging, was evaluated. The conclusions drawn by the authors were recommendations for practice, based on a limited number of studies of unclear quality. The results of this review must therefore be treated with caution.

Authors’ objectives
To determine the role of radiological procedures in evaluating causes of acute knee pain.

Searching
MEDLINE was searched from 1966 to October 2002; the search strategy is available online (accessed 21/09/2005). See Web Address at end of abstract. The bibliographies of retrieved studies were also checked.

Study selection
Study designs of evaluations included in the review
Inclusion criteria relating to the study design were not reported. The review included both retrospective and prospective studies evaluating decision rules; no further details were given. No details of the design of studies evaluating physical examination and MRI were reported.

Specific interventions included in the review
Studies evaluating the accuracy of history, physical examination and imaging tests were eligible for inclusion. The included studies evaluated the diagnostic accuracy of physical examination or magnetic resonance imaging (MRI). The decision rules used to inform when to order a plain radiography film were Pittsburgh knee rules, Weber and colleagues’ rule, Ottawa knee rules, and Fagan and Davies’ rule. The clinical examination techniques evaluated were the Lachman Test, Anterior Drawer Test and Pivot Test.

Reference standard test against which the new test was compared
Inclusion criteria relating to the reference standard were not reported. The included studies used arthroscopy or arthrotomy as the reference standard.

Participants included in the review
Studies of people with acute knee pain, defined as beginning less than one week before the person seeks medical attention, were eligible for inclusion. No details of the participants in the included studies were given.

Outcomes assessed in the review
To be eligible for inclusion, the sensitivity and specificity, or sufficient data for their calculation, had to be reported.

How were decisions on the relevance of primary studies made?
The authors did not state how the papers were selected for the review, or how many reviewers performed the selection.

Assessment of study quality
Study quality was assessed using an adapted McMaster method. The criteria included: an explicit outcome definition; an explicit definition of findings to predict outcome; blinded assessment; reporting of intra-observer agreement, age and gender of population, details of the study site, and mathematical modelling technique used; a test of miscalculation rate; and the effects of clinical use prospectively tested. The authors did not state how the papers were assessed for quality, or how many reviewers performed the quality assessment.
Data extraction
Two reviewers extracted the data, with any disagreements resolved by consensus. Data were extracted to calculate the sensitivity and specificity; alternatively, the sensitivity and specificity reported in the study were used if there was insufficient information to calculate them. Receiver operating characteristic (ROC) curves were fitted for each study. The prevalence for each diagnosis was based on data from the National Ambulatory Medical Care Survey.

Methods of synthesis

How were the studies combined?
The fitted ROC curves were used to estimate the summary sensitivity and specificity. The summary test sensitivity was taken from the point on the fitted ROC curve corresponding to the median specificity. Confidence intervals for sensitivity and specificity were calculated from the fitted ROC curves, at the median specificity based on the standard deviation of the fitted line.

How were differences between studies investigated?
The authors did not investigate heterogeneity statistically, and did not provide sufficient details to determine whether clinical heterogeneity was present. The authors stated that subgroup analyses were conducted to investigate the effect of study quality.

Results of the review
The review included 129 studies. Of these, 5 evaluated the accuracy of decision rules (n=3,039), 35 revaluated physical examination and 89 evaluated MRI. There were insufficient study details to determine the sample sizes for studies evaluating physical examination and MRI.

MRI (89 studies).
The summary estimate for the sensitivity of MRI for detecting meniscal, posterior collateral ligament, anterior cruciate ligament tears, and cartilage damage ranged from 75 to 87%. The specificity for detecting these lesions ranged from 80 to 93%.

Decision rules (5 studies).
The sensitivity ranged from 95 to 100% and the specificity from 24 to 79%. The authors stated that the Ottawa knee rules were most thoroughly validated in 2 studies by the same authors, which reported a sensitivity of 100% and specificities of 49% and 54%.

Physical examination (35 studies).
The sensitivities for detecting meniscal, anterior cruciate ligament and posterior collateral ligament tears ranged from 74 to 81%. The sensitivity for detecting other cartilaginous damage was 51%. The specificity was between 92 and 96% for all lesions except medial meniscus lesions.

Authors' conclusions
The authors' conclusions were specific recommendations for practice.

CRD commentary
The review question seemed clear, stating that the authors were evaluating radiological techniques. However, only one radiological technique (MRI) was evaluated. Other non-radiological techniques (decision rules and physical examination) were also included, although not discussed fully in the narrative.

Overall, the inclusion criteria were very poorly defined. A very limited search was undertaken, resulting in the potential for publication bias which the authors did not investigate. In addition, the authors did not specify whether any
language restrictions were applied. There was very limited information on the methodology of the review; therefore, it was unclear whether methods to eliminate error and bias were employed. Study quality was assessed and was mentioned briefly in the narrative. However, details of the criteria used were absent, the effects of study quality were not fully explored, and the results of the subgroup analysis (which the authors reported had been undertaken) were not reported.

Insufficient details of the included studies were reported. The conclusions drawn by the authors were recommendations for practice, which were based on a limited number of inadequately described studies of unclear quality. Therefore, the results of this review may not be reliable and must be treated with caution.

**Implications of the review for practice and research**

**Practice:** The authors made several recommendations. In particular, the Ottawa decision rules should be used for deciding when to obtain a plain film to assess for knee fractures; a physical examination should be sufficient to decide whether patients with potential meniscal and ligament injuries should be referred; and the use of clinical criteria rather than plain films for evaluating osteoarthritis. The authors did not recommend the use of plain films for the diagnosis of pseudogout.

**Research:** The authors did not state any implications for further research.

**Bibliographic details**


**PubMedID**

14530229

**Original Paper URL**

http://www.annals.org/cgi/content/full/139/7/575

**Other publications of related interest**

This additional published commentary may also be of interest. Trinh K. Review: several diagnostic aids have moderate to high accuracy for detecting abnormalities in acute knee pain. Evid Based Med 2004;9:57.

**Indexing Status**

Subject indexing assigned by NLM

**MeSH**

Arthralgia /etiology; Arthrography /standards; Diagnosis, Differential; Fractures, Cartilage /radiography; Humans; Knee Injuries /diagnosis; Knee Joint /radiography; Ligaments, Articular /injuries; Magnetic Resonance Imaging; Menisci, Tibial /injuries; Osteoarthritis /diagnosis; Physical Examination /standards

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This is a critical abstract of a systematic review that meets the criteria for inclusion on DARE. Each critical abstract
contains a brief summary of the review methods, results and conclusions followed by a detailed critical assessment on the reliability of the review and the conclusions drawn.