Preparticipation evaluation: an evidence-based review
Wingfield K, Matheson G O, Meeuwisse W H

CRD summary
This review concluded that studies looking at specific cardiovascular screening techniques are divided on the effectiveness of history, physical examination, electrocardiogram and echocardiography for detecting cardiovascular risks for sudden death in athletes. The authors' conclusions follow from the evidence presented, although there are several methodological weaknesses in the conduct of the review which may limit its reliability.

Authors' objectives
To review the evidence on preparticipation evaluation (PPE) as a method for screening health risk prior to participation in exercise and sport. This abstract focuses on the review of effectiveness of cardiovascular screening tests.

Searching
MEDLINE, PubMed, SPORTDiscus, Current Contents, CISTI Source, the Cochrane Database of Systematic Reviews and EBM Reviews were searched from inception to January 2004 for studies reported in English; the search terms were reported. The reference lists of relevant studies and reviews were also checked.

Study selection
Study designs of evaluations included in the review
All research designs were eligible for inclusion.

Specific interventions included in the review
Studies of athletic PPE were eligible for inclusion. The included cardiovascular screening studies were of electrocardiogram (ECG), echocardiography and combinations of clinical history, physical examination and echocardiogram or ECG.

Reference standard test against which the new test was compared
Inclusion criteria for the reference standard test were not specified. The majority of the included studies used echocardiography as the reference standard test.

Participants included in the review
Studies of athletes and/or student athletes younger than 36 years of age were eligible for inclusion. The included studies were of high school and university student athletes, military conscripts and competitive athletes. The majority of the studies included mainly male participants.

Outcomes assessed in the review
Inclusion criteria for the outcomes were not specified. The following measures were reported where available: sensitivity, specificity, positive and negative predictive values, and false positives.

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
The authors did not state that they assessed validity.

Data extraction
The authors did not state how the data were extracted for the review, or how many reviewers performed the data extraction.

**Methods of synthesis**
How were the studies combined?
The individual studies were summarised in a table and some were also summarised in a narrative, though the studies were not synthesised.

How were differences between studies investigated?
Differences between the studies were described in the text and tables.

**Results of the review**
Ten studies of cardiovascular screening techniques were included: seven cross-sectional (two of which were specified as being prospective), one retrospective case review, one cohort study and one cost-effectiveness study.

The authors summarised individual studies and stated that there did not appear to be a consensus as to which screening tests are most effective for detecting cardiovascular risk factors in athletes. They stated that the evidence for efficacy of ECG is poor.

**Cost information**
One study of the cost-effectiveness of ECG was reported. This concluded that ECG screening to detect high-school athletes at risk of sudden cardiac death was the most effective strategy.

**Authors' conclusions**
Studies looking at specific cardiovascular screening techniques are divided on the effectiveness of history, physical examination, ECG and echocardiography for detecting cardiovascular risks for sudden death in athletes.

**CRD commentary**
The review addressed a broad question and the inclusion criteria for the intervention, participants and study design were loosely specified. A number of relevant databases were searched and the search terms were provided. However, since only English language studies were eligible for inclusion and there were no specific attempts to search for unpublished studies, relevant studies might have been missed. The review methodology was poorly described and appropriate measures do not appear to have been taken to minimise error and bias in the study selection and data extraction processes. The methodological quality of the studies was not assessed. The narrative synthesis had limitations. Only some individual studies were discussed and there was limited exploration of similarities and differences between the studies. The authors' conclusions follow from the evidence presented, although there were several methodological weaknesses in the conduct of the review which may limit its reliability.

**Implications of the review for practice and research**
Practice: The authors stated that it is not possible from the evidence to determine the ideal protocol for the cardiovascular assessment part of the PPE.

Research: The authors stated that more research is required to establish best practices for PPE.

**Bibliographic details**
Record Status
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.