CRD summary
This review assessed the efficacy of vasopressin compared with epinephrine for the treatment of sudden cardiac arrest. The author concluded that vasopressin conferred no survival benefit, but should be considered a safe and appropriate alternative treatment. However, the reporting of the review process was poor and no validity assessment was conducted, so the reliability of the conclusion is unclear.

Authors' objectives
To assess the effectiveness of vasopressin in improving survival in adults who experience sudden cardiac arrest.

Searching
The Cochrane Library (including the Cochrane Database of Systematic Reviews and the Cochrane Controlled Trials Register), MEDLINE, ACP Journal Club and DARE were searched from January 1st, 1996 to January 1st, 2005; the search terms were reported. References from clinical and reference textbooks published after 2000 were checked. Only peer-reviewed articles were eligible for inclusion.

Study selection
Studies were required to compare the administration of vasopressin with epinephrine in the treatment of medical cardiac arrest patients, aged at least 16 years. The included studies administered boluses of 40 units of vasopressin intravenously (IV) compared with 1-mg boluses of epinephrine. Studies of patients with terminal illness, a do-not-resuscitate order, or nonmedical cardiac arrest were excluded from the review, as were studies evaluating extended survival of organs for donation. It appears that randomised controlled trials (RCTs) were eligible for inclusion. Studies needed to assess either return of spontaneous circulation (ROSC) or survival to admission and survival to discharge including neurological outcome. Adverse events were also assessed.

The author did not state how the papers were selected for the review, or how many reviewers performed the selection.

Assessment of study quality
The author did not state that he assessed validity, but did comment on the blinding and loss to follow-up of included studies.

Data extraction
The author did not state how the data were extracted for the review, or how many reviewers performed the data extraction. Percentage values were extracted or calculated for survival and neurological outcomes.

Methods of synthesis
The studies were pooled in a meta-analysis, although the methodology was not reported. The relative benefit increase (RBI), absolute benefit increase (ABI) and number-needed-to-treat (NNT) were calculated with 95% confidence intervals (CIs). Subgroup analyses based on treatment course in the individual studies were also reported.

Results of the review
Three RCTs (n=1,426) were included in the review.

All of the RCTs were double- or triple-blinded. Two studies reported no loss to follow-up and the third study lost 43 (3%) of its patients to follow-up.

The RBI in survival to admission for vasopressin compared with epinephrine was 20.6% (95% CI: 4.6, 39.3), with an ABI of 5.5% (95% CI: 0.6, 10.4). The NNT to produce one additional survival to admission was 18 (95% CI: 10, 167).

The RBI in survival to discharge for vasopressin compared with epinephrine was 5.8% (95% CI: -21.3, 43.9), with an
ABI of 0.6% (95% CI: 0.0, 3.8). The NNT was 167 (95% CI: 26, ∞).

Neurological outcomes were also reported for individual RCTs. No evidence of adverse outcomes was reported. Subgroup data based on treatment course from two of the included studies were also reported.

Authors’ conclusions
Vasopressin does not improve survival outcomes in sudden cardiac arrest compared with epinephrine, but it is a safe alternative vasopressor.

CRD commentary
The review assessed a clear question and had clearly defined inclusion criteria. The author searched some relevant databases, but his decision to limit the review to peer-reviewed studies might have increased the possibility that some relevant studies were not included in the review, particularly as he did not report assessing publication bias. The author did not report using methods designed to reduce bias and error when selecting studies for the review or extracting the data, nor did he report a formal assessment of validity. In addition, only limited characteristics of the included studies were reported. The decision to use meta-analysis appears appropriate given the clinical homogeneity of the included studies, but the statistical methods used were poorly reported and there was no apparent assessment of statistical heterogeneity. The author's conclusion and recommendations appear appropriate given the evidence presented but, given the lack of a validity assessment and the poor reporting of review methodology, their reliability cannot be established.

Implications of the review for practice and research
Practice: The author stated that the American Heart Association should add vasopressin to the asystolic and pulseless electrical activity guidelines, with a classification of Class indeterminate (no harm, possible benefit, insufficient data).

Research: The author stated that further prospective studies should be conducted to assess whether vasopressin is more effective than epinephrine for asystolic cardiac arrest, and to assess it in combination with epinephrine for refractory cardiac arrest.

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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.