CRD summary
This review found that the use of intra-articular lidocaine for reduction of the dislocated shoulder resulted in fewer complications and less time spent in the emergency department when compared with opiate/benzodiazepine combinations for intravenous sedation. The increasing use of newer short-acting sedatives for sedation brings into question the applicability of this study to modern practice.

Authors' objectives
To determine if intra-articular lidocaine was as effective as intravenous sedation with opiates and benzodiazepines for reduction of anterior shoulder dislocations.

Searching
PubMed, Cochrane Central Register of Controlled Trials (CENTRAL), Cochrane Database of Systematic Reviews and EMBASE Drugs and Pharmacology were searched. Search terms were reported, but search dates were not reported. Bibliographies of retrieved papers were reviewed.

Study selection
Eligible studies were randomised controlled trials (RCTs) that compared intra-articular lidocaine to intravenous sedation for reduction of anterior shoulder dislocation. Mean ages of participants ranged from 34 to 48 (range 15 to 89). Males and females were included. Participants with primary and repeat dislocations were included. Reduction techniques were variable. Interventions were intra-articular lidocaine (20mL of 1%) compared to intravenous sedation using variable combinations of opiate drugs and benzodiazepines. Outcomes included: success of reduction; perceived pain; ease of reduction; time for reduction; length of stay in the emergency department; and complications.

Two reviewers independently selected studies. The selection was discussed at a meeting of sports medicine physicians.

Assessment of study quality
The authors used a previously published format that evaluated sources of bias and flaws in methodology and assigned a level of evidence on a scale of 1 (best) to 5.

Validity assessments were reviewed by each author and discussed at a meeting of sports medicine physicians.

Data extraction
For each study the number or percentage of patients with events of interest were presented; durations were presented for continuous outcomes.

The authors stated neither how data were extracted for the review nor how many reviewers performed the data extraction.

Methods of synthesis
A narrative synthesis was predominantly reported. When possible, outcomes were combined but the method of synthesis ($\chi^2$ analysis) was described only for the outcome of complications.

Results of the review
Seven RCTs were identified, but one study was unobtainable and so six studies were included (n=283).
Quality: Five studies were described as level 1. One study was allocated level 2.

None of the included studies reported any significant difference between intra-articular lidocaine and intravenous sedation in reduction success or perceived pain. Ease of reduction was reported in three studies with no significant difference between the groups.

Time of reduction was reported in four studies. Three studies found onset of medication effect was faster in the intravenous sedation group.

Length of stay in the emergency department was reported in two studies. Both studies found that the intra-articular lidocaine group spent significantly less time in the department (p<0.01).

Overall there were significantly fewer complications in the intra-articular lidocaine group (Χ² p<0.001). In the intra-articular lidocaine group included only one report (0.67%) of psychological agitation. The intravenous sedation group included 18 reports (13.3%) of nausea, vomiting or respiratory depression.

There was considerable heterogeneity between the studies. The number of prior dislocations, reduction technique and opiate/benzodiazepine combination used for intravenous sedation were highly variable.

Authors’ conclusions
The use of intra-articular lidocaine for reduction of anterior shoulder dislocations should be strongly considered as a first-line therapy. It was effective and safe and may potentially reduce time spent in the emergency department.

CRD commentary
The review addressed a clear question with well-defined inclusion criteria. Several relevant sources were searched to identify potential studies. No explicit attempt to address language bias or identify unpublished studies was described, which raised the possibility that language and publication biases might have been introduced in the review. Steps were taken to minimise the risk of reviewer bias and error, as more than one reviewer independently selected studies and assessed study validity; it was unclear whether this also applied to data extraction. There were relatively small numbers of patients in the included studies and there was considerable heterogeneity between the studies, so a predominantly narrative synthesis was appropriate. However, as the authors pointed out, increasing use is made of short-acting, non-benzodiazepine sedatives and short-acting opiates for intravenous sedation, which brings into question the applicability of this study to modern practice. Given the considerable heterogeneity between studies and considerations regarding external validity, the authors’ conclusions, although reasonable and based on the data presented, should be interpreted with care.

Implications of the review for practice and research
Practice: The authors stated that instead of intravenous procedural sedation for reducing the dislocated shoulder, emergency physicians might consider using intra-articular lidocaine.

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

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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.