CRD summary
The review found that dacryocystorhinostomy (DCR) was safe and effective for treating nasolacrimal obstruction. Outcomes after non-laser endoscopic endonasal DCR and external DCR were comparable. The failure rate for endonasal laser-assisted DCR was higher. Due to limitations in the review, which included a suboptimal search, a lack of controlled evidence and differences between studies, these conclusions require cautious interpretation.

Authors' objectives
To evaluate the use of dacryocystorhinostomy (DCR) for nasolacrimal obstruction in adults.

Searching
PubMed was searched from 1966 to December 2008. Only articles with an abstract in PubMed were considered for inclusion. A single search term was reported. The reviewers checked reference lists of articles retrieved and of evaluations of DCR published by American Academy of Ophthalmology and UK National Institute of Health and Clinical Excellence (NICE). The search was limited to articles in English.

Study selection
Studies of adults who underwent DCR for nasolacrimal obstruction were eligible for the review. Case series with fewer than five participants, case reports and studies that included children were excluded. Studies of conjunctivo-DCR, transcanalicular laser-assisted DCR and balloon dacryoplasty were excluded.

Most participants in the included studies were women (61%). Participant characteristics and indications for surgery varied. Mean participant age was 62 years. Interventions included external DCR (EX-DCR), endonasal laser-assisted DCR (LA-DCR) and non-laser endoscopic endonasal DCR (EN-DCR). Many of the studies used endocanaliculal stenting and some used intraoperative metabolites. Study definitions of treatment success varied, but usually included measures of symptomatic improvement and nasolacrimal patency; one third of studies did not explicitly define success.

Outcomes reported in the review included success of initial and/or revision DCR (using study-defined measures of success), intra-operative and postoperative complications and the effect of cointerventions (metabolites and stents). Mean duration of follow-up ranged from three to 74 months, where reported.

Two reviewers independently selected the studies.

Assessment of study quality
Studies were assigned grades using Oxford Centre for Evidence Based Medicine (CEBM) criteria to allocate levels of evidence based on study design.

The authors did not state how the assessment was performed.

Data extraction
Data were extracted on success rates in each study, expressed as a percentage.

The authors did not state how many reviewers performed data extraction.

Methods of synthesis
Studies were combined by narrative synthesis. Complication rates were added up across all studies and expressed as a total.
Results of the review
Seventy-three studies were included in the review (n=4,800 participants, 4,921 procedures). One study was graded level 2b, eight were level 3b and 64 (87%) were level 4 (which indicated that they were probably cohort, case-control and case-series studies).

Success rates ranged from 47% to 100% for LA-DCR (15 studies), from 65% to 100% for EX-DCR (13 studies) and from 71% to 94% for EN-DCR (22 studies). Success rates for revision DCR was 100% for EX-DCR (one study), 69% to 100% for EN-DCR (five studies) and 43% for LA-DCR (one study).

At longer term follow-up, success rates after EX-DCR and EN-DCR were over 90% at 70 and 49 months and the success rate for LA-DCR was 38% at five years (one study each).

In studies of intra-operative metabolites, only three out of 11 studies reported any benefit from use of mitomycin-C and there was no evidence of benefit from 5-fluorouracil (two studies). There were five controlled studies of endocanicular stenting, none of which found any evidence of benefit from stenting.

The overall intra-operative complication rate was 1% and the postoperative complication rate was 6.4%. The most commonly reported complications were wound haemorrhage and periorbital haematoma.

Authors' conclusions
DCR was safe and effective for treating nasolacrimal obstruction. Outcomes after EN-DCR and EX-DCR were comparable, but the failure rate for LA-DCR was higher.

CRD commentary
The objectives and inclusion criteria for the review were fairly clear but not stated explicitly. Only one database was searched, only one search term was used and the search was limited by language and exclusion of studies without abstracts. No specific effort was made to find unpublished studies. These factors mean that some studies may have been missed. Steps were taken to minimise risks of reviewer bias and error by having more than one reviewer independently select studies; it was unclear whether this safeguard also applied to validity assessment and data extraction. Few details were provided about study characteristics and quality (such as participant indication for surgery, nature of control intervention, follow-up rate). Reporting of study grades did not appear consistent. Most of the studies used designs subject to multiple biases, their outcome measures and findings varied widely and no measures of statistical variability were reported.

The authors’ conclusions with regard to which DCR techniques were superior were not well-supported by evidence, as no studies compared different DCR techniques. In view of limitations in the review, which included a suboptimal search, a lack of controlled evidence and differences between studies, the authors’ conclusions require cautious interpretation.

Implications of the review for practice and research
Practice: The authors stated that endonasal DCR may be a good alternative to the external approach.

Research: The authors stated that randomised controlled trials were needed on the role of stents and on the effectiveness and optimum regimen for antimetabolites in conjunction with DCR. Future studies of DCR should report adult and paediatric outcomes separately and should explicitly describe outcomes, heeding NICE recommendations on minimum data sets for outcomes.

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Bibliographic details
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.