Preferred Practice Pattern® (PPP) Clinical Questions are evidence-based statements that guide clinicians in providing optimal patient care. PPP Clinical Questions answer specific questions in the "Patient, Intervention, Comparison, Outcome" (PICO) format.

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Financial Disclosures

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Preferred Practice Pattern Clinical Questions should be clinically relevant and specific enough to provide useful information to practitioners. Where evidence exists to support a recommendation for care, the recommendation should be given an explicit rating that shows the strength of evidence. To accomplish these aims, methods from the Scottish Intercollegiate Guideline Network (SIGN)\(^1\) and the Grading of Recommendations Assessment, Development and Evaluation (GRADE)\(^2\) group are used. All studies used to form a recommendation for care are graded for strength of evidence individually. To rate individual studies, a scale based on SIGN\(^1\) is used. GRADE is a systematic approach to grading the strength of the total body of evidence that is available to support recommendations on a specific clinical management issue. Organizations that have adopted GRADE include SIGN, the World Health Organization, the Agency for Healthcare Research and Policy, and the American College of Physicians.\(^3\)

### SIGN\(^1\) Study Rating Scale

<table>
<thead>
<tr>
<th>Grade</th>
<th>Description</th>
</tr>
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<tbody>
<tr>
<td>I++</td>
<td>High-quality meta-analyses, systematic reviews of randomized controlled trials (RCTs), or RCTs with a very low risk of bias</td>
</tr>
<tr>
<td>I+</td>
<td>Well-conducted meta-analyses, systematic reviews of RCTs, or RCTs with a low risk of bias</td>
</tr>
<tr>
<td>I-</td>
<td>Meta-analyses, systematic reviews of RCTs, or RCTs with a high risk of bias</td>
</tr>
<tr>
<td>II++</td>
<td>High-quality systematic reviews of case-control or cohort studies</td>
</tr>
<tr>
<td></td>
<td>High-quality case-control or cohort studies with a very low risk of confounding or bias and a high probability that the relationship is causal</td>
</tr>
<tr>
<td>II+</td>
<td>Well-conducted case-control or cohort studies with a low risk of confounding or bias and a moderate probability that the relationship is causal</td>
</tr>
<tr>
<td>II-</td>
<td>Case-control or cohort studies with a high risk of confounding or bias and a significant risk that the relationship is not causal</td>
</tr>
<tr>
<td>III</td>
<td>Nonanalytic studies (e.g., case reports, case series)</td>
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### GRADE\(^2\) Quality Ratings

<table>
<thead>
<tr>
<th>Quality</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Good quality</td>
<td>Further research is very unlikely to change our confidence in the estimate of effect</td>
</tr>
<tr>
<td>Moderate quality</td>
<td>Further research is likely to have an important impact on our confidence in the estimate of effect and may change the estimate</td>
</tr>
<tr>
<td>Insufficient quality</td>
<td>Further research is very likely to have an important impact on our confidence in the estimate of effect and is likely to change the estimate</td>
</tr>
<tr>
<td></td>
<td>Any estimate of effect is very uncertain</td>
</tr>
</tbody>
</table>

### GRADE\(^2\) Key Recommendations for Care

<table>
<thead>
<tr>
<th>Recommendation Type</th>
<th>Description</th>
</tr>
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<tbody>
<tr>
<td>Strong recommendation</td>
<td>Used when the desirable effects of an intervention clearly outweigh the undesirable effects or clearly do not</td>
</tr>
<tr>
<td>Discretionary recommendation</td>
<td>Used when the trade-offs are less certain—either because of low-quality evidence or because evidence suggests that desirable and undesirable effects are closely balanced</td>
</tr>
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PPP Clinical Question

TOPIC
Nasolacrimal duct obstruction

CLINICAL QUESTION
What is the evidence that external dacryocystorhinostomy (DCR) is a more or less effective treatment for nasolacrimal duct obstruction than endonasal DCR? Secondly, how do the complication rates compare between the two procedures?

LITERATURE SEARCH
The literature search for the Cochrane Review was last updated in July 2012.

There was one study applicable to the topic discussed in the Cochrane Review. The articles systematically reviewed for this PPP Clinical Question can be viewed here:

SYSTEMATIC REVIEW

Recommendations for Care

SUMMARY
Nasolacrimal duct obstruction causes watering of the eye(s), discomfort to patients, and visual dysfunction.4 When the condition persists, it can be treated by dacryocystorhinostomy (DCR), a procedure that creates an alternative route for tears to drain by connecting the lacrimal sac to the nasal cavity. This procedure can be performed either through external DCR or endonasal DCR. An external DCR procedure involves making an incision on the side of the nasal bridge, while an endonasal DCR involves operating inside the nasal cavity with or without an endoscope or operating microscope. Various techniques to perform endonasal DCR exist, including the use of bone drills and lasers to vaporize the bone and create the alternative route for tear drainage.

Endonasal DCR is a popular DCR method as it offers the following potential advantages over external DCR: limited invasiveness, less intraoperative bleeding, shorter operation time, preservation of the orbicularis oculi muscle’s pump function, no external scar, minimal morbidity, and a low rate of complications. Potential disadvantages of the endonasal DCR procedure include a fairly small opening between the lacrimal sac and nasal cavity, a higher recurrence rate, expensive equipment, and the technical difficulty of the procedure. The small opening, prolonged learning curve, and technique used in endonasal DCR may affect its success rate.

The success rate of external DCR is estimated between 85% and 95%, while the success rate of endonasal DCR is estimated to be between 63% and 90%. While the success rates of these
procedures have been reported in medical literature separately, comparative success rates of the procedures are unknown.

The authors of the Cochrane Review found one randomized control trial (RCT) \(^5\) that met their criteria, which compared 32 external DCR procedures to 32 endonasal laser-assisted DCR procedures. Compared to external DCR, endonasal laser-assisted DCR was four times as likely to fail, a statistically significant risk. There was no significant intraoperative bleeding in either group; there was one case of postoperative bleeding in the external DCR group. The evidence presented in this review is limited due to the lack of RCTs and the low quality of evidence of the included study.

*(Study Rating Scale I-, Insufficient Quality, Discretionary Recommendation)*

**DISCUSSION**

The RCT randomized 64 participants to either external DCR or endonasal laser DCR using an otorhinologic operating microscope, with 32 participants in each group. Endoscopes were not used to perform the DCR in either group. The external DCR procedures were performed by an ophthalmologist, while the endonasal laser-assisted DCR procedures were performed by both an ophthalmologist and an otolaryngologist using a continuous wave CO2-Nd: YAG combined laser to fashion the bony ostium and nasal mucosal opening. (Note: It was unclear whether all procedures were performed by a single ophthalmologist, and whether a single ENT specialist was involved in all endonasal procedures.) All of the participants had a minimum follow-up of one year.

The external DCR group had a success rate of 91%, while the endonasal laser-assisted DCR group had a success rate of 63%. Neither group had any reports of significant intraoperative bleeding; the external DCR group had one case of postoperative nasal hemorrhage that required hospitalization and endonasal tamponade. The relative risk of failure was four times greater with the endonasal laser-assisted DCR group than the external DCR group, which was statistically significant.

**CONCLUSION**

While the reviewed study met review objectives and had complete outcome data, details of sequence generation, allocation concealment, and masking were unclear. Additionally, the small number of cases reviewed in the study led the authors to downgrade the evidence to low. Lastly, the included study took place in 1994, when endonasal laser-assisted DCR techniques were first being developed. Newer techniques have since been developed, possibly resulting in better surgical outcomes, though this was beyond the scope of this Cochrane Review. Thus, the low quality of evidence makes the study findings difficult to incorporate into practice. Also, because of the low quality of evidence, the complication rates between the two procedures cannot be accurately compared.

A more recent literature review has not revealed any additional studies (e.g., RCTs) that would meet the criteria of the Cochrane Review. In the absence of definitive evidence in the scientific literature, the clinical rationale for selecting one procedure over another is described below.

The American Academy of Ophthalmology’s Oculoplastics Ophthalmic Technology Assessment Panel members state that the choice of technique remains a decision reached by the surgeon and patient, where the pros and cons of each surgical approach are carefully weighed. The surgeon should note that the bulk of the literature does not support a difference in outcome between external DCR versus endoscopic DCR. The Cochrane Review does show that the literature describing early data demonstrates a higher success rate with external DCR, but that the techniques have evolved since then and current comparative data do not exist. A decision for external DCR may be made based on concern for lacrimal sac pathology or malignancy, prior
surgery, or outcome based on the experience of the operating surgeon. A decision for endonasal or endoscopic DCR may be preferred by a patient concerned about the skin incision, or by a physician’s relative experience with the available techniques. The external approach may be preferred by some surgeons for primary cases, as it gives more operative space and visualization, whereas the endonasal approach may be selected for revision DCR because the osteotomy has already been created.

Going forward, there is a clear need for quality RCTs of robust sample size that compares the two DCR techniques in order to provide ophthalmologists with better evidence to guide their practices. These trials need to compare new endonasal techniques to external DCR to determine whether endonasal DCR results in better patient outcomes. Also needed are RCTs that compare the success rates of different techniques of endonasal DCR. Given the relatively high success rate of these procedures, a collaboration of many surgeons or even registry data may be needed to best assess these technologies.

References