The most effective products available to facilitate ear syringing

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Authors' objectives
To determine the most effective preparation to facilitate ear syringing.

Searching
The Cochrane Library, MEDLINE (from 1966 to present), EMBASE (from 1980 to present), CINAHL (from 1982 to present) and OSHROM were searched. The keywords were 'ear', 'wax', 'cerumenolytic', 'drug therapy', 'therapeutic use' and 'random$'. The reference lists of the identified studies were also reviewed. Only articles published in the English language were eligible.

Study selection
Study designs of evaluations included in the review
RCTs were included, as were in vitro studies. The reasons for excluding seven of the identified studies were given.

Specific interventions included in the review
Studies that compared two currently available preparations, or one preparation compared with no intervention, were included. Studies using triethanolamine polypeptide oleate-condensate were included. The included studies used the following regimens: Dioctyl-medo and maize oil drops, 4 to 10 times for 2 to 7 days; Cerumol, olive oil, Waxol, Dioctyl-medo and sodium bicarbonate (control) drops daily for 3 days; Xerumenex and olive oil drops once before syringing; Exterol and glycerol, 5 to 10 drops daily for 7 days; Waxol and Cerumol drops instilled for 10 minutes nightly for 2 nights; Exterol and Cerumol, 5 to 10 drops twice daily for 7 days; Audax and Earex drops, twice daily for 4 days; dococuate sodium and triethanolamine polypeptide oleate-condensate drops instilled for 10 to 15 minutes; olive oil and sodium bicarbonate drops daily for 3 days; water instilled for 15 minutes; and oil instilled for 3 nights. Syringing was conducted after one instillation of the drops and up to after 7 days of treatment. In most studies, the drops were instilled by the patients.

Participants included in the review
The inclusion criteria were not defined in terms of the participants. The participants were aged from one to 81 years in the one randomised controlled trial (RCT) that reported such details.

Outcomes assessed in the review
Studies that did not assess syringing were excluded. The included studies assessed the following outcomes: the amount of water required for syringing; ease of syringing; pressure of water required; efficacy of syringing; appearance of syringed wax; amount of wax removed; patient and doctor impression; degree of impaction post drops; visualisation of tympanic membrane; and the number of attempts needed for successful syringing. Side-effects were also assessed.

How were decisions on the relevance of primary studies made?
The author does not state how the papers were selected for the review, or how many of the reviewers performed the selection.

Assessment of study quality
Validity was assessed using criteria described in the Critical Appraisal Skills Programme (CASP) guidelines (see Other Publications of Related Interest): was treatment assignment randomised; were all the patients entering the study accounted for at its conclusion; the percentage completing the trial; blinding of the patients, health workers and study personnel; baseline similarity of the treatment groups; equal treatment of the groups apart from the studied intervention; results generalisable to the local population; all important outcomes considered; and are the benefits worth the harms and costs. The author does not state how the papers were assessed for validity, or how many of the reviewers performed the validity assessment.

Data extraction
The author does not state how the data were extracted for the review, or how many of the reviewers performed the data extraction. The tabulated information included the author and year of publication, agents studied, intervention details, outcome and results.

**Methods of synthesis**

**How were the studies combined?**
The studies were grouped into three groups according to the agents studied: comparisons of commercial products with simple products (oils, glycerol and sodium bicarbonate); comparisons between commercial products; and comparisons between simple remedies. A narrative synthesis was then undertaken.

**How were differences between studies investigated?**
Differences between the studies were discussed in the text of the review.

**Results of the review**

Nine RCTs (approximately 908 patients) were included. Seven in vitro studies were also included.

Information on the methods and designs of the studies was often limited. Some of the outcomes reported in the individual studies were subjective. The statistical analysis tended to be limited to the reporting of significant difference and only more recent publications included confidence intervals. The RCTs compared different preparations; thus, it was not possible to determine the most effective preparation.

Comparison of commercial products with simple products (4 RCTs): the 4 RCTs found no difference between Dioctylmed and maize oil. Two RCTs found that Xerumenex and Exterol were more effective than oil and glycerine, respectively. One RCT, which compared a range of products with a sodium bicarbonate control, found that Cerumol was the most effective when compared with the control.

Comparison of commercial products (5 RCTs): 3 RCTs found that docusate sodium was more effective than Cerumol and triethanolamine polypeptide olate-condensate, 2 of which also found that docusate sodium was more effective than triethanolamine polypeptide olate-condensate in children aged 5 years or less. Other comparisons of preparations were studied in single RCTs. These results were presented in the review.

Comparison of simple products (2 RCTs): one RCT found no significant difference between olive oil and sodium bicarbonate, while the other found no significant difference between water and olive oil.

Side-effects: these were poorly reported. One RCT reported that 7% of the Waxol and 5% of the Cerumol group had side-effects, but no details were provided.

The results from 7 in vitro studies were also presented in the review.

**Authors' conclusions**
The evidence was not adequate to determine the most effective preparation.

**CRD commentary**
The aims of the review were stated and the inclusion criteria were defined in terms of the study design, intervention and outcome. Several relevant databases were searched and full details of the search strategy were presented. However, the methods used to select the studies were not described. The lack of an attempt to locate unpublished material raises the possibility of publication bias. The included studies were restricted to RCTs and a formal validity assessment was carried out using validated criteria. Relevant data were extracted and tabulated, but the methods used to extract the data were not described. A narrative review was appropriate given the small number of heterogeneous studies, and the evidence was adequately summarised. The evidence presented supports the author's conclusions.

**Implications of the review for practice and research**

**Practice:** The author states that the evidence was not adequate to determine the most effective preparation.

**Research:** The author states that there is an opportunity for nurses to research the effectiveness of currently available
cerumenolytics in facilitating ear syringing.

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**Other publications of related interest**

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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.