CRD summary
The authors' concluded that significant, short-term increases in mouth opening were found in head and neck oncology patients with exercises using therabite devices or tong blades, microcurrent electrotherapy, and pentoxifylline, whereas radiotherapy was found to reduce mouth opening. The authors' conclusions are based on four small studies of uncertain quality and are likely to be unreliable.

Authors' objectives
To determine risk factors for trismus (difficulty opening the mouth due to sustained contractions of the jaw muscles) in head and neck cancer, as well as the efficacy of interventions to treat trismus.

Searching
MEDLINE, EMBASE, and CINHAL were searched (from 1966 to June 2003) for relevant papers published in Dutch, German and English. Search terms were reported.

Study selection
Prospective clinical studies of head and neck oncology patients with a baseline assessment of trismus and measure of trismus were eligible for inclusion. Studies were required to have at least ten participants. Studies of dental hygiene during oncology treatment and exercise programmes were excluded.

The primary outcome reported was change in mouth opening (mm).

In included studies, the interventions were: microcurrent therapy (10 treatments in five days); pentoxifylline (400mg, three times daily for eight weeks); exercise programmes (10 sessions per day for 10 weeks) using therabite devices, tong blades or forced opening; and radiotherapy (involving the structures of the temporomandibular joint and or pterygoid muscles). Inclusion criteria varied across the included studies; some studies only included patients with limited mouth opening (less than or equal to 25mm or 30mm) or detectable fibrosis.

Papers were initially selected for further assessment by one reviewer; two reviewers independently selected studies for inclusion. Any disagreements were resolved by consensus, or by arbitration with a third reviewer.

Assessment of study quality
The authors did not state that they formally assessed internal validity.

Data extraction
Two reviewers independently extracted mean change (mm) and standard deviation (sd) in mouth opening, with 95% confidence intervals (CIs). Effect sizes (ES) were also calculated.

Methods of synthesis
Studies were combined in a narrative synthesis.

Results of the review
Four studies were selected for detailed review (n=125 patients); one randomised controlled trial (RCT) and three prospective cohort studies. Follow-up ranged from none to 12 months, where reported.

RCT: Three treatments were evaluated in the RCT (n=21 patients). Therabite devices (mean change 13.6 mm, 95% CI 8.6 to 18.7; ES 2.6) and tong blades (mean change 6.0mm, 95% CI 3.6 to 8.4; ES 1.5) significantly increased mouth opening compared with baseline. Forced opening was not associated with a significant change. There was no follow-up.

Cohort studies: Mouth opening was increased from baseline with pentoxifylline (mean change 4.0mm, 95% CI 0.6 to result. 
7.4; ES 0.3; one cohort study, n=20 patients, 16 evaluated; no follow-up) and microcurrent therapy (mean change 2.6mm, 95% CI 0.1 to 3.6; ES 0.3; one cohort study, n=26 patients, 23 evaluated; three months follow-up).

Radiotherapy was associated with a significant decrease in mouth opening at six to 12 months (mean change-18%, sd 17%; p not reported).

**Authors' conclusions**

Significant, short-term increases in mouth opening were found with exercises using therabite devices or tong blades, as well as microcurrent electrotherapy and pentoxifylline. Radiotherapy, involving the structures of the temporomandibular joint and or pterygoid muscles, reduced mouth opening.

**CRD commentary**

The review question was broadly defined in terms of intervention, population, and outcomes of interest. Three databases were searched, but specific attempts were not made to identify unpublished studies and the restriction to papers published in specific languages raised the possibility of publication bias. Appropriate steps were taken to minimise the likelihood of error or bias during data extraction, but similar steps were not taken for study selection.

Study quality was not formally assessed, so it was not possible to comment on the validity of the included data. Limited data regarding patient characteristics were presented. Studies of dental hygiene during exercise programs were excluded in the selection process, but one study of an exercise program to increase mouth opening was included in the review. Use of a narrative synthesis was appropriate given the differences between the studies.

The authors' conclusions are based on four small studies of uncertain quality and of different interventions, so are likely to be unreliable.

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

**Practice:** The authors did not indicate any implications for practice.

**Research:** The authors stated that further research into criteria for trismus, functional consequences of trismus, risk factors for trismus and interventions for trismus are needed.

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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.