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**Interventions for replacing missing teeth: hyperbaric oxygen therapy for irradiated patients who require dental implants (Review)**

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**WILEY**

[Intervention Review]

# Interventions for replacing missing teeth: hyperbaric oxygen therapy for irradiated patients who require dental implants

Marco Esposito<sup>1</sup>, Helen V Worthington<sup>1</sup><sup>1</sup>Cochrane Oral Health, Division of Dentistry, School of Medical Sciences, Faculty of Biology, Medicine and Health, The University of Manchester, Manchester, UK**Contact address:** Marco Esposito, Cochrane Oral Health, Division of Dentistry, School of Medical Sciences, Faculty of Biology, Medicine and Health, The University of Manchester, Coupland Building 3, Oxford Road, Manchester, M13 9PL, UK. [espositomarco@hotmail.com](mailto:espositomarco@hotmail.com).**Editorial group:** Cochrane Oral Health Group.**Publication status and date:** Stable (no update expected for reasons given in 'What's new'), published in Issue 10, 2019.**Citation:** Esposito M, Worthington HV. Interventions for replacing missing teeth: hyperbaric oxygen therapy for irradiated patients who require dental implants. *Cochrane Database of Systematic Reviews* 2013, Issue 9. Art. No.: CD003603. DOI: [10.1002/14651858.CD003603.pub3](https://doi.org/10.1002/14651858.CD003603.pub3).

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## ABSTRACT

### Background

Dental implants offer one way to replace missing teeth. Patients who have undergone radiotherapy and those who have also undergone surgery for cancer in the head and neck region may particularly benefit from reconstruction with implants. Hyperbaric oxygen therapy (HBO) has been advocated to improve the success of implant treatment in patients who have undergone radiotherapy but this remains a controversial issue.

### Objectives

To compare the success, morbidity, patient satisfaction and cost effectiveness of dental implant treatment carried out with and without HBO in irradiated patients.

### Search methods

The following electronic databases were searched: Cochrane Oral Health's Trials Register (to 17 June 2013), the Cochrane Central Register of Controlled Trials (CENTRAL) (*The Cochrane Library* 2013, Issue 5), MEDLINE via OVID (1946 to 17 June 2013) and EMBASE via OVID (1980 to 17 June 2013). No restrictions were placed on the language or date of publication when searching the electronic databases. We checked the bibliographies of relevant clinical trials and review articles for studies outside the searched journals. We wrote to authors of the identified randomised controlled trials (RCTs) and to more than 55 oral implant manufacturers; we used personal contacts and we made a request on an internet discussion group in an attempt to identify unpublished or ongoing RCTs.

### Selection criteria

Randomised controlled trials (RCTs) of HBO therapy for irradiated patients requiring dental implants.

### Data collection and analysis

Screening of eligible studies, assessment of the methodological quality of the trials and data extraction were conducted in duplicate and independently by two review authors. Results were analysed using random-effects models to determine mean differences for continuous outcomes and risk ratios for dichotomous outcomes, with 95% confidence intervals.

### Main results

Only one RCT, providing very low-quality evidence, was identified and included. Thirteen patients received HBO therapy while another 13 did not. Two to six implants were placed in people with fully edentulous mandibles to be rehabilitated with bar-retained overdentures.

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One year after implant loading, four patients had died from each group. One patient, treated with HBO, developed an osteoradionecrosis and lost all implants so the prosthesis could not be provided. Five patients in the HBO group had at least one implant failure versus two in the control group. There were no statistically significant differences for prosthesis and implant failures, postoperative complications and patient satisfaction between the two groups.

### Authors' conclusions

Despite the limited amount of clinical research available, it appears that HBO therapy in irradiated patients requiring dental implants may not offer any appreciable clinical benefits. There is a definite need for more RCTs to ascertain the effectiveness of HBO in irradiated patients requiring dental implants. These trials ought to be of a high quality and reported as recommended by the CONSORT statement ([www.consort-statement.org/](http://www.consort-statement.org/)). Each clinical centre may have limited numbers of patients and it is likely that trials will need to be multicentred.

## PLAIN LANGUAGE SUMMARY

### Interventions for replacing missing teeth: hyperbaric oxygen therapy for irradiated patients who require dental implants

#### Review question

This review, carried out by authors of Cochrane Oral Health, was produced to compare the success of dental implant treatment carried out with and without hyperbaric oxygen therapy (HBO) in patients who had previously had radiation treatment.

#### Background

Missing teeth can affect eating and speaking as well as appearance. Dental implants offer one way to replace missing teeth. Patients who have undergone radiotherapy and those who have also undergone surgery for cancer in the head and neck region may particularly benefit from reconstruction with implants. Dental implants into the bone of the jaw offer support for replacement teeth, and sometimes for replacements for parts of the mouth (prosthetics) that have been removed following surgery for cancer or as a result of damage to the bone (osteonecrosis) caused by radiation treatment.

Hyperbaric oxygen therapy (which requires patients to breath pure oxygen under pressure in a specially designed chamber on several occasions) has been advocated to improve the success of implant treatment. It has been suggested that HBO therapy will improve the healing of the bone and tissues around dental implants in patients who have undergone radiotherapy, but this remains a controversial issue.

#### Study characteristics

The evidence on which this review is based was up-to-date as of 1 July 2013. One small study carried out at a head and neck cancer clinic based at a university in the Netherlands was found. The study included 26 adults who had been treated for head and neck cancer either with radiotherapy or a combination of radiotherapy and surgery. All participants were missing all their teeth in the lower jaw and were experienced problems retaining a denture. The participants were split into two groups, 13 of them were treated with HBO and the other 13 were not.

#### Key results

Only one small trial that was at high risk of bias compared treatment with HBO with treatment without HBO. The results failed to determine a benefit for HBO therapy in preventing failure of dental implants or other serious complications such as the death of bone in the jaw caused by radiotherapy treatment. More reliable studies are needed to provide the final answer to this question.

#### Quality of the evidence

The quality of evidence was very low as it was based on one small trial at high risk of bias.