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Hyperbaric Oxygen Therapy for Brain Injury, Cerebral Palsy, and Stroke

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Preface

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We welcome written comments on this evidence report. They may be sent to: Director, Center for Practice and Technology Assessment, Agency for Healthcare Research and Quality, 540 Gaither Road, Rockville, MD 20850.

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Structured Abstract

Objectives. The purpose of this report is to describe the methods, results, and conclusions of a literature review of the benefits and harms of hyperbaric oxygen therapy (HBOT) for brain injury, cerebral palsy, and stroke.

Search Strategy. We searched MEDLINE, PreMEDLINE, EMBASE, CINAHL, the Cochrane Library, the Health Technology Assessment Database, HealthSTAR, AltHealthWatch and MANTIS from inception to March 2001, using terms for hyperbaric oxygen therapy, brain injury, cerebral palsy, and stroke. We also searched additional databases recommended by experts, meeting abstracts, conference proceedings, and reference lists. Peer reviewers and reference lists of included studies were queried for additional studies. The search was updated in February 2002, and July 2003.

Selection Criteria. Two reviewers independently assessed each title and abstract using predetermined inclusion criteria based on intervention, population, outcome measures, and study design criteria. Full papers, reports, and meeting abstracts that met inclusion criteria were retrieved and reviewed independently by two reviewers.

Data Collection and Analysis. Extraction of data from studies was performed by one reviewer and checked by a second reviewer. Each study was assessed for quality using predetermined criteria. An overall assessment of each body of literature was made based on the internal and external validity, and consistency and coherence of the results of studies.

Main Results. For traumatic brain injury, the evidence about effectiveness is conflicting. One trial found a significant decrease in mortality, associated with an increase in severe disability among those who survived. The other found no difference overall, but a significant reduction in mortality in one subgroup. Together, these studies provided insufficient evidence to determine whether the benefits of HBOT outweigh the potential harms. For other types of brain injury, no good- or fair-quality studies were found. For cerebral palsy, the results of the only truly randomized trial were difficult to interpret because of the use of pressurized room air in the control group. Patients who received HBOT and those who received pressurized air improved to a similar degree. No controlled trial of HBOT was designed to measure mortality in stroke patients, and the best studies found no improvement in neurological outcomes. Evidence about the type, frequency, and severity of adverse events in actual practice is inadequate. Reporting of adverse effects was limited, and no study was designed specifically to assess adverse effects.

Conclusions. Evidence from well-conducted clinical studies is limited. The balance of benefits and harms of HBOT for brain injury, cerebral palsy, or stroke has not been adequately studied. Future research of HBOT should include dose-ranging and safety studies to establish the optimum course of HBOT to evaluate in outcome studies. Future clinical trials should include several treatment options and should evaluate measure caregiver burden in addition to patients' functional outcomes.

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