**HYPERBARIC OXYGEN THERAPY FOR ANEMIA**

[Undersea Hyperb Med.](https://www.ncbi.nlm.nih.gov/pubmed/23045922) 2012 Sep-Oct;39(5):937-42.

**The effect of hyperbaric oxygen on severe anemia.**

[Van Meter KW](https://www.ncbi.nlm.nih.gov/pubmed/?term=Van%20Meter%20KW%5BAuthor%5D&cauthor=true&cauthor_uid=23045922)1.

[**Author information**](https://www.ncbi.nlm.nih.gov/pubmed/23045922)

* 1Louisiana State University-Health Sciences Center, Department of Medicine, Section of Emergency Medicine, New Orleans, Louisiana, USA. kwvanmeter@gmail.com

**Abstract**

As a respiratory pigment, hemoglobin allows blood to carry unnaturally high levels of nascent, molecular oxygen at one atmosphere of pressure in chemical solution to capillary beds and post-capillary venules supplying parenchymal cells of all organ systems in the body. When hemoglobin drops to critical levels to disallow proper oxygen delivery, hyperbaric oxygen therapy may be used as bridge therapy to emergently supply oxygen. Hyperbaric-administered oxygen allows oxygen to be dissolved in increased concentration in red blood cell-poor plasma or crystalloid/ colloid-diluted intravascular fluids in a volume-resuscitated patient. Additionally in both subacutely and chronically anemic patients, pulsed, intermittently provided normobaric or hyperbaric oxygen induces an increase in red blood cell/hemoglobic mass. Transfusions of separate donor red blood cells are transplantations of tissue not uncomplicated by immunomodulatory reactions. In the long term, autologous blood products may be less problematic than transfused, homologous packed red blood cells to reduce patient oxygen debt in illness or injury. Hyperbaric oxygen can reduce oxygen debt decisively in the polar clinical extremes of exsanguination with cardiopulmonary arrest all the way to resuscitation of the severely anemic patient who cannot be transfused with red blood cells for religious reasons, immunologic reasons, or blood availability problems. A hyperbaric oxygen treatment is equivalent in wholesale cost to a unit of packed red blood cells in the western world. By controversy, but true, hyperbaric oxygen provides a low-technology, cost-competitive means of pharmacologically reducing accumulated oxygen debt in the anemic, injured or critically ill patient with little side effect. To address severe anemia in trauma or illness, the future may well afford the use of hyperbaric oxygen therapy in the military far-forward, in pre-hospital EMS settings, in trauma center emergency departments, in operative and recovery units, and in intensive care units of hospitals.

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

[Undersea Hyperb Med.](https://www.ncbi.nlm.nih.gov/pubmed/15796315) 2005 Jan-Feb;32(1):61-83.

**A systematic review of the application of hyperbaric oxygen in the treatment of severe anemia: an evidence-based approach.**

[Van Meter KW](https://www.ncbi.nlm.nih.gov/pubmed/?term=Van%20Meter%20KW%5BAuthor%5D&cauthor=true&cauthor_uid=15796315)1.

[**Author information**](https://www.ncbi.nlm.nih.gov/pubmed/15796315)

* 1Department of Medicine, Section of Emergency Medicine, Division of Hyperbaric Medicine, Louisiana State University Health Sciences Center, New Orleans, Louisiana, USA.

**Abstract**

The treatment of severe anemia with hyperbaric oxygen (HBO2) is one of thirteen indications approved by the Hyperbaric Oxygen Therapy Committee of the Undersea and Hyperbaric Medical Society for appropriate use of the therapy (1). This paper systematically reviews the literature reporting the use of HBO2 therapy in the treatment and management of severe anemia. Increasingly, a trend to use standards of evidence-based medicine to evaluate the effectiveness of therapeutic interventions in injury and illness is productively with us in medicine today. At issue is discovery and evaluation of the best evidence available in world medical literature for evaluation of current treatment of the individual patient. The best evidence is a published randomized controlled prospective human trial; at the other end of the spectrum, the least valued evidence is a published expert opinion. In this review thirty-five publications have been reviewed as representing published results of applying HBO2 in treatment of severe anemia. Each article underwent the evidence-based evaluative grading of the American Heart Association system (AHA), the National Cancer Institute Patient Data Query system (NCI-PDQ), and the British Medical Journal's (BMJ) Clinical Evidence system. Comparative results using the three systems of evaluation are presented in tabular form for the reader. All publications report a positive result when HBO2 is delivered as treatment for severe anemia. Other alternatives other than transfusion with autologous or heterologous matched blood products are helpful but most too have not been the subject of prospective human randomized controlled trials. HBO2 may be used adjunctively with hematinics, fluorocarbons, and cell wall free polymerized hemoglobin (currently fluorocarbons and cell wall free polymerized hemoglobin are not available for routine use in the United States, but both are undergoing advanced stage clinical trials at the time of this review).