

# Use of hyperbaric oxygen in rheumatic diseases: case report and critical analysis

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Hyperbaric oxygen has been used in patients with rheumatic disease for many years without reports of untoward or unusual complications for a variety of non-rheumatic indications. Recent evidence that hyperbaric oxygen inhibits the actions of certain cytokines, acts as an immune modulator and may help cognitive dysfunction has resulted in a re-examination of its potential role in rheumatic diseases. A case report of a lupus/scleroderma crossover patient is presented whose cognitive dysfunction improved after hyperbaric oxygen therapy. The history of hyperbaric oxygen and its physiology are related, along with a focused review of its effects on the immune and central nervous systems. Areas which might warrant further consideration by rheumatologists are outlined, as well as areas of concern.

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## Introduction

Hyperbaric oxygen therapy is defined as the subjecting of patients to pure oxygen breathing at ambient temperatures which are greater than normal atmospheric pressure. Although concepts of hyperbaric oxygen therapy were first employed in 1662, its modern use other than for decompression dates from 1956 when hyperbaric oxygen was used to perform cardiac surgery in Holland.<sup>1</sup> Mechanically, the most common applications of hyperbaric oxygen are to dissolve air or gas emboli and treat divers with 'bends' or decompression sickness.

New insights into the biochemical and immune interactions of hyperbaric oxygen have increased interest in its potential applications over the past decade. The United States Medicare system has approved hyperbaric oxygen for 14 different indications ranging from acute carbon monoxide intoxication, gas gangrene and osteoradionecrosis to acute peripheral arteriolar insufficiency. Over the past 20 years, patients with a variety of conditions, especially multiple sclerosis, have reported cognitive improvements after undergoing hyperbaric oxygen. One lupus/scleroderma crossover patient whose case is reported here, underwent hyperbaric oxygen therapy specifically for cognitive impairment and experienced subjective and objective improvement. Her case is presented and our concepts of hyperbaric oxygen and the immune and central nervous systems are reviewed.

## Case report

A 53-year old Caucasian woman flight attendant who was in her usual state of health until 1979 when she underwent thyroidectomy and inadvertent parathyroidectomy for Graves' disease. In February 1980 her Heyer-Schulte saline breast implants (placed in 1977 for cosmetic purposes) were replaced with Cox-Uphoff silicone prostheses. She was