CONCLUSION: Demand for HBO therapy appears to decrease during the fall/winter months compared to the spring/summer months. This finding is contrary to what one would expect given the perceived increased usage of HBOT during the fall/winter time period secondary to the treatment of emergent carbon monoxide exposed patients. It might be appropriate to focus marketing strategies or increase scheduling of patients during fall/winter months to maximize use of the facility.

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SEDATION CONTROL WITH THE BISPECTRAL INDEX (BIS) IN VENTILATED CRITICAL CARE PATIENTS TREATED IN A MONOPLACE HYPERBARIC CHAMBER.

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INTRODUCTION: The bispectral index (BIS) was created to control sedation in the OR. It measures the frontal EEG and is expressed in a range of 0 to 100. A BIS level between 40 to 60 is required for adequate sedation of ventilated patients. Hyperbaric facilities managing critical care patients with monoplace chambers frequently require the use of sedation in such patients. Hyperbaric oxygenation is known to modify the pharmacodynamics of medication used for sedation, creating a problem for its adequate control.

METHOD: Sedation was monitored with bispectral index (Monitor BIS XP 5000) in 5 critical care ventilated patients during hyperbaric oxygenation treatment in a monoplace chamber (Sechrist 3200).

RESULTS: Adequate levels of sedation were obtained, as measured with BIS, with the use of continuous drug infusion during the course of hyperbaric oxygenation treatment. We encountered no problems with the sensor, connections and monitor of BIS.

CONCLUSIONS: The use of BIS allowed us to optimize sedation of ventilated critical care patients during treatment in a monoplace chamber. A controlled triple blinded study is being conducted to validate the use of this monitor in a monoplace hyperbaric chamber.

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LONGITUDINAL FOLLOW UP OF LUNG FUNCTION IN PERSONNEL ATTENDING PATIENTS UNDERGOING HYPERBARIC OXYGEN THERAPY.

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INTRODUCTION: The annual rate of change in maximal expiratory flows (MEF) and transfer factor for carbon monoxide (TlCO) is higher in professional divers compared with controls, and is related to diving exposure. This study was a longitudinal follow up of lung function of personnel attending patients undergoing hyperbaric oxygen therapy.

METHODS: Fourteen female hyperbaric chamber attendants aged 33-57 yrs had lung function testing annually for 4-6 years, including a Flow-Volume loop and TlCO. Three were current smokers. The hyperbaric exposures were at a pressure of 240 kPa for ~110 min breathing air, and oxygen during the last 10min of the bottom phase and decompression. The median number of exposures was 240, ranging from 37 to 456. The individual rate of change in lung function was calculated as the slope of the linear regression line fitting the measurements for each parameter.

RESULTS: The mean annual reduction in forced expired volume in 1sec (FEV1) was 38 (SD=31) mL·yr-1, in MEF at 25% of the vital capacity remaining to be expired (MEF25%) 61 (SD=59) mL·s-1·yr-1, and in TlCO it was 0.105 (SD=0.065) mmol·min-1·kPa-1·yr-1. The rates of change in FEV1, MEF25% and TlCO were significantly larger than predicted. There was a negative relationship between the number of dives performed and the rate of change in MEF25% only ($p=0.042$).

DISCUSSION: The long term changes in lung function is the same as in professional divers of other categories. There was no consistent relationship between cumulative exposure and the rate of change in the lung function variables in this small group of subjects. However, the dives they were exposed to are associated with hyperoxia and venous gas microembolism, which have been shown to contribute to the lung function changes associated with diving.

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ADVERSE EFFECTS IN HYPO-/HYPERBARIC CHAMBER EXPOSURES

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BACKGROUND: Pressure changes associated with hypo-/hyperbaric trials can produce adverse effects – undesirable and unintended, although not necessarily unexpected, results of exposure. These may affect patients, research subjects or staff. While acute adverse effects are generally easily managed, the effort can delay treatment or compromise exposure profiles dependent on rigid timelines. Our hyperbaric unit conducts clinical and research exposures, simulating both hyperbaric and hypobaric conditions. Operating since 1963, the unit has accumulated extensive documentation of adverse effects.

METHODS: Detailed records are maintained by chamber operators and nurses for every pressure cycle. The data available from 1963-2002 were reviewed. Fisher Exact tests were used to compare adverse effect rates. Significance was accepted at $p<0.05$.

RESULTS: A total of 34,653 hypo-/hyperbaric cycles were conducted in 40 years, with 121,488 person-exposures. These included 68,843 (57%) patient-exposures, 43,173 (36%) tender-exposures, and 8,674 (7%) research subject-exposures. The overall adverse effect rate was 0.019 (2326/121,488). Adverse effect rates were significantly different between the three groups: greatest for patients (0.0281; n=1935), dramatically lower for research subjects (0.0145; n=126) and lowest for tenders (0.0056; n=240). Ranked chief complaints were: patient barotrauma (0.0234; n=1611), subject barotrauma (0.0133; n=115), tender