If between 50 and 200 mmHg with HBO, 50 percent of post-op wounds fail to heal primarily, but 90 percent of these go onto to heal by secondary intention with HBO and optimal wound management.

Conclusions: To the best of our knowledge, this is the first algorithmic, evidenced-base approach for determining the indications for using HBO for wounds where adequate oxygenation concerns exist as well as reliably predict which of these wounds will heal.

C19
POST-CONCUSSION SYNDROME: RESPONSE TO HYPERBARIC OXYGEN THERAPY — A CASE REPORT

Joseph A[1], Dickey J[2], Baker M[3]
[1]Sports Medicine, Idaho State University, Pocatello, Idaho, USA; [2]Depts. of Psychology and Family Medicine Residency, Idaho State U; [3]Idaho Hyperbarics and Wound Care, Pocatello, Idaho, USA

Introduction: Repetitive minor traumatic brain injury (TBI) is a common contact sports-related injury and, most recently, frequently found in returning soldiers from the Middle East. Post-concussion syndrome may follow repetitive episodes and is manifested as chronic headache, cognitive impairment, hypopituitarism and behavioral disorders.

Materials and methods: A 19-year-old white male with a history of 20 concussive episodes over a four-year period underwent neuropsychological evaluation (RBANS) prior to, during and following HBOT at 2.4ATA, 90-minute duration, in a multiplace environment.

Results: The patient underwent two 30-treatment cycles. He was severely impaired cognitively prior to therapy and unemployable. Following the intervention, he married and now works and attends college. Data from the Repeatable Battery for the Assessment of Neuropsychological Status (RBANS) are presented. RBANS index score roughly equates with IQ. Index scores and percentile rank on successive administrations of the RBANS.

IMMEDIATE MEMORY
1st RBANS 07.23.2007:
Index score 76, percentile 5
2nd RBANS 09.18.2007:
Index score 85, percentile 16
3rd RBANS 12.17.2007:
Index score 106, percentile 66.

VISUOSPATIAL/CONSTRUCTIONAL
1st RBANS 07.23.2007:
Index score 62, percentile 1
2nd RBANS 09.18.2007:
Index score 100, percentile 50
3rd RBANS 12.17.2007:
Index score 121, percentile 92.

LANGUAGE
1st RBANS 07.23.2007:
Index score 74, percentile 4
2nd RBANS 09.18.2007:
Index score 89, percentile 23
3rd RBANS 12.17.2007:
Index score 101, percentile 53.

ATTENTION
1st RBANS 07.23.2007:
Index score 68, percentile 2
2nd RBANS 09.18.2007:
Index score 94, percentile 34
3rd RBANS 12.17.2007:
Index score 97, percentile 42.

DELAYED MEMORY
1st RBANS 07.23.2007:
Index score 80, percentile 9
2nd RBANS 09.18.2007:
Index score 97, percentile 42
3rd RBANS 12.17.2007:
Index score 121, percentile 92.

TOTAL SCALE
1st RBANS 07.23.2007:
Index score 65, percentile 1
2nd RBANS 09.18.2007:
Index score 90, percentile 25
3rd RBANS 12.17.2007:
Index score 113, percentile 81.

Conclusions: Remarkable neurocognitive benefit accrued from this intervention with HBOT for post-concussion syndrome. Mood and headache benefit were also clinically evident.

C20
EFFECTS OF PRIOR HYPERBARIC OXYGEN (HBO) THERAPY ON FREE FLAP OUTCOMES IN PREVIOUSLY IRRADIATED HEAD AND NECK SITES

Duran R, Lee W, Freiberger JJ
Center for Hyperbaric and Environmental Physiology Department of Anesthesiology, Department of Otolaryngology-Head and Neck Surgery, Duke University Medical Center, Durham North Carolina, USA

Background: Although HBO is used for flap salvage in tissue compromised by therapeutic radiation, (Zamboni 1989, Friedman 2006), there are no reports examining the impact of HBO on the prevention/salvage of threatened free flaps in an irradiated field. We checked the association of HBO with flap failure in patients who received radiotherapy for head and neck cancer at Duke Hospital over a four-year period.

Materials and methods: Medical records of patients undergoing free flaps in association with surgery with radio-therapy (XRT) between 1/1/05 and 12/31/2008 were compared for flap survival at six months by logistic regression while controlling for age, smoking, cancer recurrence, diabetes, peripheral-vascular disease (PVD), presurgical ENT and post-operative condition.

Results: Of 49 cases, seven received HBO [median treatments, 35 (2 ATA for 2h)]. Logistic regression did not predict a difference in outcome.

Flap failure was: HBO 28.6%, non-HBO 33.3%, (p=NS). Age, smoking, diabetes, PVD, total XRT and recurrent cancer rates were not different between groups. However, selection criteria for HBO varied. All (100%) of HBO patients had presurgical ENT complications (ORN, osteomyelitis, orocutaneous fistula, other) prior to their flaps versus 67% for non-HBO patients (p=.001 chi-sq).

Time from XRT to surgery was different for the two groups (1,216 days, HBO versus 10 days, non-HBO, p=.008 Mann-Whitney). The percentage of patients who received a flap into a radiated field was also higher for the HBO group: 80% versus 48%, p=.06.

Conclusions: HBO therapy did not change the outcome for free flaps in this limited sample. However, patients selected to receive HBO were significantly more likely to have received XRT prior to surgery, have more presurgical complications, and have a longer latency from XRT to surgery. These findings illustrate the potential for selection bias in retrospective studies as has been described previously (Nemiroff, 1988).

C21
CASE REPORT: PROBABLE ARTERIAL GAS EMBOLISM DURING EMERGENCE FROM ANESTHESIA

Holt D, LeDez K, Cowan G, Jamieson J
Discipline of Anesthesia and the Centre for Offshore and Remote Medicine (MEDICOR), Memorial University, St. John's, Newfoundland and Labrador, Canada

Background: We describe delayed hyperbaric oxygen treatment (HBOT) for cerebral arterial gas embolism (CAGE) after general anesthesia (GA) for minor surgery.

Case report: A healthy, 18-year-old male with Marfanoid features underwent GA with an endotracheal tube (ETT) and spontaneous ventilation, for excision of an earlobe keloid. In the recovery room he coughed on the ETT (possibly inappropriately connected to corrugated oxygen tube) and developed extensive subcutaneous emphysema and briefly, wide complex bradycardia and left arm blanching. Chest-xray demonstrated a small pneumothorax and pneumomediastinum. ENT examination under IV sedation found no airway trauma and he was extubated (no bullae present on chest CT). On the ward he deteriorated neurologically and 3 hours later vomiting, dense left hemiparesis and agitation were noted. He was transferred to ICU, and seen by neurology and hematolo-