



# HYPERBARIC OXYGEN THERAPY

## ADDICTION RECOVERY & HYPERBARICS

In this study, the utility of HBOT was evaluated as an adjunct in the detoxification of alcohol-dependent patients. The HBOT group had a better rate of improvement of withdrawal symptoms and the difference was statistically significant.

### PHYSIOLOGICAL BENEFITS

- ✓ Repairs Damaged Neurons
- ✓ Decreases Swelling & Inflammation
- ✓ Aids in Cellular Detoxification
- ✓ Improves Circulation in Damaged Tissues
- ✓ Regenerates Tissues
- ✓ Improves Sleep Patterns
- ✓ Stimulates the Appetite

There are many reasons to deploy the use of HBOT during drug and alcohol recovery programs. Most notably is the repair of damaged neurons from chronic substance abuse. This can have long term and immediate impact by quality of life, decision making, moods, etc.

Adding HBOT to conventional Drug and Alcohol programs may Reduce overall treatment times and complications.

The Effect of Hyperbaric Oxygenation in the Treatment of Alcohol Abuse and Narcomania European Psychiatry, Volume 12, Supplement 2, 1997 , pp. 208s-208s(1) HBOT led favorable effects that persisted following exposure, bringing about an approximately two-fold decrease of treatment duration and preventing the development of complications.

Method of Hyperbaric Oxygen in Narcotherapy Moscow Department of Health. The use of HBOT helps to increase the effectiveness of treatment of alcohol and drug dependent patient and to reduce their time spent in hospital.



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# HYPERBARIC OXYGEN THERAPY

## ALZHEIMER'S / DEMENTIA & HYPERBARICS

According to the National Institutes of Health, "Alzheimer's disease is an irreversible, progressive brain disorder that slowly destroys memory and thinking skills and, eventually, the ability to carry out the simplest tasks. It is the most common cause of dementia in older adults. Cognitive decline has become a significant concern in the Western World. Over 50% of individuals aged 60 and older express concerns about declining cognitive abilities. More than 5 Million Americans are living with Alzheimer's. 1 in 3 seniors die with Alzheimer's or another form of dementia. Between 2000 and 2018 Alzheimer's deaths increased by 146%."

\*2020 Alzheimer's Disease Facts & Figures. Alzheimer's Association.

Currently, no treatment for Alzheimer's exist. Until recently, medications and management strategies were the only options and they merely temporarily relieve symptoms. Recent research shows promising hope for other options. In 2019 the first PET scan documented improvement in brain metabolism in Alzheimer's Disease. A 2020 study demonstrated that hyperbaric oxygen therapy (HBOT) can significantly enhance the cognitive performance of healthy older adults.



### ENHANCED PERFORMANCE

- ✓ Improved Attention
- ✓ Increased Memory
- ✓ Enhanced Concentration

### THE BRAIN ON HBOT

- ✓ Enhanced Processing Speed
- ✓ Enhanced Executive Function
- ✓ Improved Brain Blood Flow

### IMPROVED QUALITY OF LIFE

- ✓ Resolved Anxiety
- ✓ Better Sleep
- ✓ Ease of Conversation
- ✓ Appetite Improvement
- ✓ Induces Angiogenesis to Mobilize Blood Flow to Affected Tissue and Bone
- ✓ Stem Cell Proliferation
- ✓ Angiogenesis
- ✓ Enhanced Tissue Repair
- ✓ Improved Gross Motor Function and Ability
- ✓ Lower Incidence of Disorientation and Frustration
- ✓ Increase in Ability to Perform Activities of Daily Living



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# HYPERBARIC OXYGEN THERAPY

## ANTI-AGING & HYPERBARICS & HYPERBARICS

Age-related diseases and degenerative maladies throughout the body are a growing concern world-wide. Hyperbaric oxygen therapy (HBOT) has been shown to help combat degenerative conditions by contributing to the regeneration of tissue and blood vessels. HBOT stimulates angiogenesis in areas of the body where circulation is compromised and is utilized by some physicians to help treat Coronary Heart Disease, Macular Degeneration, Parkinson's disease, Alzheimer's disease, Osteoarthritis and immune-related diseases. Additionally, HBOT promotes collagen activation to help battle the signs of aging including reducing skin damage and maintaining elasticity. Clinical studies have demonstrated the benefits of HBOT for age-related degenerative conditions by providing cellular aid to all organs in the body to promote health and beauty.



### CIRCULATION & GENERAL BLOOD FLOW

- ✓ Stimulates Angiogenesis
- ✓ Ameliorates Atherosclerosis
- ✓ Combats & Prevents Circulatory Diseases including Diabetes

### GENERAL HEALTH WITH HBOT

- ✓ Stimulates the Generation of Adenosine Triphosphate (ATP)
- ✓ Promotes Stem Cell Proliferation & Mobilization
- ✓ Decreases Risk of Infection
- ✓ Reduces Stress & Anxiety
- ✓ Supports the Immune System

Continued on Pg 2...



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# HYPERBARIC OXYGEN THERAPY

## ANTI-AGING & HYPERBARICS & HYPERBARICS

Continued...

### THE BRAIN WITH HBOT

- ✓ Stimulates Neurogenesis
- ✓ Promotes Neuroplasticity
- ✓ Improves Memory & Reaction Time

### THE HEART WITH HBOT

- ✓ Improves Oxygenation to Cardiac Tissue
- ✓ Reduces Risk of Heart Attack
- ✓ Improves Heart Muscle Functioning Following Heart Attack

### THE EYES WITH HBOT

- ✓ Helps Combat Age-Related Macular Degeneration
- ✓ Ameliorates Diabetic Retinopathy
- ✓ Reduces Central Retinal Artery Occlusion
- ✓ Attenuates Glaucoma Symptoms

### THE JOINTS, SOFT TISSUE & BONES WITH HBOT

- ✓ Ameliorates Osteoarthritis & Rheumatoid Arthritis
- ✓ Accelerates Healing
- ✓ Reduces Inflammation & Pain
- ✓ Improves Mobility & Stamina

### THE SKIN WITH HBOT

- ✓ Reduces Excessive Skin Damage (Ultraviolet-A Radiation Apoptosis)
- ✓ Maintains Skin Elasticity, Stimulates Epithelialization & Reduces Scar Formation



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# HYPERBARIC OXYGEN THERAPY

## AUTISM & HYPERBARICS & HYPERBARICS

The alarming number of children diagnosed with Autism Spectrum Disorders in recent years has tragically increased; from 1 in 150 in 2000 to 1 in 68 by 2012, according to the Center for Disease Control and Prevention. Due to that increase, more and more parents have turned to alternative forms of treatments to counteract the underlying symptoms of autism. Traditional medicines have often failed at producing desired results for many patients with autism and their families. However, studies have demonstrated hyperbaric oxygen therapy (HBOT) as an emerging treatment that parents and physicians are utilizing to help ameliorate the effects of ASD. This non-invasive treatment is as simple as a one-hour daily session, where the parent and child enter a hyperbaric chamber and receive increased levels of oxygen. HBOT has been shown to decrease inflammation and improve cognitive functions, which have substantially helped thousands of ASD patients. Studies have demonstrated the benefits of HBOT for autism with the following:



### ENHANCE BRAIN HEALING & REPAIR WITH HBOT

- ✓ Increases Oxygen Delivery to Hypoxic Tissues
- ✓ Reduces Neuroinflammation
- ✓ Moderates Mitochondria Dysfunction
- ✓ Promotes Neurogenesis
- ✓ Stimulates Stem Cell Proliferation & Mobilization
- ✓ Reduces Seizure Frequency
- ✓ Actuates Neuroplasticity

Continued on Pg 2...



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# HYPERBARIC OXYGEN THERAPY

## AUTISM & HYPERBARICS & HYPERBARICS

Continued...

### IMPROVE PHYSICAL FUNCTION WITH HBOT

- ✓ Promotes Receptive/Expressive Language
- ✓ Improves Movement & Walking
- ✓ Stimulates Better Eye Contact
- ✓ Improves Gross/Fine Motor Skills

### ADVANCE MENTAL FUNCTION WITH HBOT

- ✓ Improves Sensory/Cognitive Awareness
- ✓ Increases Attention Span & Alertness

### IMPROVE BEHAVIORAL FUNCTION WITH HBOT

- ✓ Improves Sleep Pattern
- ✓ Advances Social Skills & Interaction
- ✓ Reduces Aggression

### IMPROVE DIGESTIVE FUNCTION WITH HBOT

- ✓ Reduces Gastrointestinal Issues
- ✓ Decreases Inflammation
- ✓ Enhances Nutritional Absorption



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# HYPERBARIC OXYGEN THERAPY

## CANCER & HYPERBARICS & HYPERBARICS

In 2013, over 1.6 million people were diagnosed with cancer and over 500,000 cancer-related deaths occurred in the U.S. alone. Cancer is one of the leading causes of death, worldwide, and new integrated treatments are being utilized to help combat its devastating effects. Hyperbaric oxygen therapy (HBOT) is currently being utilized in conjunction with conventional treatments, including radiation and chemotherapy, to attain optimal dosages for patients, stimulate tumor regression and reduce the side effects of treatments. Cancer thrives in hypoxic environments and HBOT has been shown to increase these oxygen levels to weaken tumors and reduce their aggressiveness. Studies have demonstrated the benefits of HBOT for cancer with the following:

### ENHANCE “CONVENTIONAL” CANCER THERAPIES & TREATMENTS WITH HBOT

- ✓ Reduces Tumor Hypoxia
  - ✓ Better Radiation Therapy Results
  - ✓ Improves Chemotherapy Outcome
  - ✓ Enhances Brain Treatment
- ✓ Decreases Tumor Drug Resistance
- ✓ Allows for Optimal Therapy Dosage to be Attained
- ✓ Increases Post-Op Fibroblast Activation

### REDUCE SIDE EFFECTS OF “CONVENTIONAL” CANCER THERAPIES & TREATMENTS WITH HBOT

- ✓ Reduces Radiation Therapy Side Effects
- ✓ Decreases Chemotherapy Side Effects
- ✓ Accelerates Post-Operative Healing & Prevents Infection
- ✓ Reduces Chemo-Brain Syndrome Symptoms



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# HYPERBARIC OXYGEN THERAPY

## CANCER & HYPERBARICS & HYPERBARICS

Continued...

### ENHANCE IV CANCER TREATMENTS WITH HBOT

- ✓ Increases Intravenous Vitamin C Therapy Effect
- ✓ Enhances Chemotherapy Uptake

### REDUCE TUMOR AGGRESSIVENESS WITH HBOT

- ✓ Weakens Hypoxic Tumors
- ✓ Targets Metastatic Tumors

### INCREASE NATURAL KILLER CELL ACTIVITY AND FUNCTION WITH HBOT

- ✓ Increases Oxy-Radical Production
- ✓ Amplifies Apoptosis Effect
- ✓ Regresses Tumor Volume

### CANCER PREVENTION WITH HBOT

- ✓ Decreases Inflammatory Markers
- ✓ Normalizes Intracellular Oxygen Levels
- ✓ Stimulates Cellular Detoxification
- ✓ Reduces Risk of Pathogenic Inflammatory-Related Tumors
- ✓ Supports Cellular Energy Processes for Optimal DNA Repair



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# HYPERBARIC OXYGEN THERAPY

## CEREBRAL PALSY & HYPERBARICS & HYPERBARICS

Cerebral Palsy (CP) affects 1 in 303 children in the U.S. (8,000 new cases every year) making it the most devastating motor disability in childhood. This tragic disorder affects movement, posture and other motor skills and may result in the need for life-long care. Hyperbaric oxygen therapy (HBOT) has been shown to help ameliorate the effects of CP. Many forms of CP result from lack of oxygen to the brain at birth. The affected brain tissue, or penumbra, can be recovered or improved by introducing increased levels of oxygen. HBOT has been shown to be a promising treatment with multiple studies reporting improvements with its application. Studies have demonstrated the benefits of HBOT for CP with the following:



### ENHANCE NEUROLOGICAL REPAIR & REGENERATION

- ✓ Attenuates the Effects of Hypoxia on the Neonatal Brain
- ✓ Promotes Neurogenesis
- ✓ Moderates Mitochondrial Disorders
- ✓ Enhances Stem Cell Mobilization and Proliferation
- ✓ Increases Penumbra Tissue Recovery
- ✓ Escalates Neuroplasticity

### IMPROVE OVERALL FUNCTION WITH HBOT

- ✓ Advances Cognitive Function
- ✓ Improves Gross/Fine Motor Skills
- ✓ Enhances Speech & Language
- ✓ Alleviates Spasticity
- ✓ Lessens Frequency of Seizures
- ✓ Stimulates Better Eye Contact
- ✓ Improves Balance & Walking



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# HYPERBARIC OXYGEN THERAPY

## COVID-19 & HYPERBARICS & HYPERBARICS

This virus has created an unprecedented challenge for our healthcare system, has overrun our hospitals and has caused an alarmingly high mortality rate within critical care facilities. As Science is catching up to this novel virus, early clinical reports and anatomical findings show progressive hypoxemia as the main cause of deterioration in patients with covid-19. As hypoxemia progresses, "standard therapy cannot penetrate the diffusion barriers in the lungs because they are limited by ambient pressure." (2) Preliminary evidence is showing HBOT is not limited by these barriers and may improve these patients' conditions, especially if intervention occurs at early stages.

### BENEFITS OF HBOT

- ✓ Rapid Relief of Hypoxic Symptoms (1)
- ✓ Decreased Chest Pain (1)
- ✓ Decreased Dyspnea (difficulty breathing) (1)
- ✓ General Condition Reversal (1)
- ✓ Improves Liver Function and Myocardial Injury (1)
- ✓ Improved Lung Pathology (1)
- ✓ Gradual Improvement of Arterial Blood Gas (1)
- ✓ Increases blood oxygen saturation (3)
- ✓ Shown to be safe during mechanical ventilation (4)



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## COVID-19 & HYPERBARICS & HYPERBARICS

Continued...

If we extrapolate these observations to the COVID-19 situation, an early intervention before the need for mechanical ventilation could be of extraordinary utility for saving lives. In this regard, hyperbaric oxygen therapy (HBOT) that consists of exposure to 100% oxygen under increased atmospheric pressure up to 2.4 atm could be a great resource to improve the outcome from the infection when it is administered at early stages as soon as a reduction of arterial oxygen concentration is detected. (3)

Although these findings are promising, more clinical research is needed.

### STUDY: HBOT FOR COVID-19

1. Naval Specialty Medical Center Program Team. – Demonstration Report on inclusion of hyperbaric oxygen therapy treatment of Covid-19 Severe Cases. [https://www.ihausa.org/Hyperbaric\\_oxygen\\_therapy\\_in\\_the\\_treatment\\_ofCOVID-19\\_Sev ere\\_Cases.pdf](https://www.ihausa.org/Hyperbaric_oxygen_therapy_in_the_treatment_ofCOVID-19_Sev ere_Cases.pdf)
2. Paul G. Harch. Hyperbaric Oxygen treatment of novel coronavirus (COVID-19) respiratory failure. Medical Gas Research. 2020; 10: 61-62. <https://www.medgasres.com/article.asp?issn=2045-9912;year=2020;volume=10;issue=2;spage=61;epage=62;auiast=Harch>
3. Antonio De Maio and Lawrence E. Hightower. COVID-19, acute respiratory distress syndrome (ARDS), and hyperbaric oxygen therapy (HBOT): what is the link? Cell Stress Chaperones. 2020 May 18 : 1-4. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7232923/#CR31>
4. Jacques Bessereau, Jérôme Aboab, Thomas Hullin, Anne Huon-Bessereau, Jean-Luc Bourgeois, Pierre-Marie Brun, Sylvie Chevret, Djillali Annane. Safety of Hyperbaric Oxygen Therapy in Mechanically Ventilated Patients. 2017;68(1):46-51. <https://pubmed.ncbi.nlm.nih.gov/28357836/>



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# HYPERBARIC OXYGEN THERAPY

## DIABETES & HYPERBARICS & HYPERBARICS

Diabetes affects more than 12 million people and is the seventh leading cause of death in the U.S. With diabetes primarily affecting the small blood vessels, hyperbaric oxygen therapy (HBOT) has been demonstrated to stimulate angiogenesis to help ameliorate compromised blood flow and prevent organ failure. Research has shown that HBOT can lower blood sugar levels by increasing cellular sensitivity to insulin and skeletal muscle reception of glucose. Furthermore, recent reports have provided evidence towards linking HBOT to regenerating pancreatic islets of Langerhans, thus potentially producing more insulin. HBOT is often beneficial in treating osteomyelitis and cellulitis, in addition to preventing systemic toxicity and permanent disability. With chronic diabetes, impaired circulation reduces wound healing capability and promotes ulcerations. HBOT increases the amount of oxygen available to ulcerated areas, leading to increased fibroblast activation. Studies have demonstrated the benefits of HBOT for diabetes with the following:



### IMPROVE BLOOD CHEMISTRY PROFILE WITH HBOT

- ✓ Fasting Blood Sugar
- ✓ Hemoglobin HbA1C
- ✓ Lipid Profiles

### ADVANCE GLYCEMIC CONTROL WITH HBOT

- ✓ Increases Pancreatic Islets of Langerhans
- ✓ Improves Insulin Sensitivity
- ✓ Increases Skeletal Muscle Reception of Glucose

Continued on Pg 2...



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# HYPERBARIC OXYGEN THERAPY

## DIABETES & HYPERBARICS & HYPERBARICS

Continued...

### DECREASE CARDIOVASCULAR RISK WITH HBOT

- ✓ Promotes Long-Term Blood Pressure Control
- ✓ Attenuates Metabolic Syndrome
- ✓ Reduces Risk of Sudden Heart Attack Due to Ventricular Arrhythmias

### STIMULATE ANGIOGENESIS & REDUCE INFLAMMATION WITH HBOT

- ✓ Improves Brain Function & Reduces Risk of Stroke
- ✓ Enhances Heart Function & Reduces Risk of Heart Attack
- ✓ Reduces Risk of Diabetic Retinopathy
- ✓ Decreases Risk of Diabetic Neuropathy
- ✓ Minimizes Risk of Diabetic Nephropathy
- ✓ Combats Cellulitis

### ENHANCE INTERNAL/EXTERNAL HEALING WITH HBOT

- ✓ Proliferates Epithelialization
- ✓ Promotes Closure of Non-Healing Wounds
- ✓ Ameliorates Ulcerations
- ✓ Reduces Risk of Amputation



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# HYPERBARIC OXYGEN THERAPY

## INFLAMMATION & HYPERBARICS

Inflammation is an integral finding in numerous medical conditions and coincides with nearly all types of injuries and insults to the body. Numerous studies have reported chronic inflammation in Alzheimer's disease, Atherosclerosis, Autism, Cancer, Stroke, Diabetes, Traumatic Brain Injury and many other chronic health challenges. Hyperbaric Oxygen Therapy (HBOT) has been demonstrated to substantially attenuate inflammation throughout the body. HBOT drives increased levels of oxygen into the body, which travels through the plasma, subsequently reducing inflammation and pain. Studies have shown that HBOT increases anti-inflammatory levels and provides increased cellular aid to heal target regions. As oxygen serves as one of the primary mechanisms to ameliorating inflammation, HBOT creates the environment where this process is stimulated and enhanced. Studies have demonstrated the benefits of HBOT for inflammation with the following:



### SUPPORT ANTI-INFLAMMATORY PROCESS AT THE CELLULAR LEVEL WITH HBOT

- ✓ Decreases Acute/Chronic Inflammation
- ✓ Minimizes Pain & Discomfort
- ✓ Increases Anti-Inflammatory Cytokines
- ✓ Reduces Swelling
- ✓ Induces Fibroblast Activation

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# HYPERBARIC OXYGEN THERAPY

## INFLAMMATION & HYPERBARICS

Continued...

### REDUCE NEUROINFLAMMATION WITH HBOT

- ✓ Ameliorates Autism Symptoms
- ✓ Supports the Prevention & Treatment of Stroke
- ✓ Reduces Risk of Alzheimer's & Parkinson's Disease

### DECREASE GASTROINTESTINAL INFLAMMATION WITH HBOT

- ✓ Remediates Inflammatory Bowel Disease
- ✓ Ameliorates Ulcerative Colitis
- ✓ Improves Nutritional Absorption

### RELIEVE SOFT TISSUE/JOINT INFLAMMATION WITH HBOT

- ✓ Remediates Osteoarthritis & Rheumatoid Arthritis
- ✓ Ameliorates Tendinitis
- ✓ Accelerates Recovery from Sports-Related & High Impact Injuries

### PREVENT THE ONSET OF CHRONIC INFLAMMATORY-RELATED ISSUES WITH HBOT

- ✓ Attenuates Cancer Risk & Progression
- ✓ Reduces Risk of Atherosclerosis, Heart Attack & Stroke
- ✓ Ameliorates Diabetic Conditions Linked to Inflammation



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# HYPERBARIC OXYGEN THERAPY

## LYME DISEASE & HYPERBARICS

The United States Center for Disease Control is now reporting that there are over 300,000 new cases of Lyme Disease each year. Additionally, as the disease remains difficult to identify and diagnose, the definitive number of people affected is currently unknown, making this the fastest growing infectious disease in the U.S. The tick-borne bacterium or spirochete (*Borrelia burgdorferi*) is protected by the biofilm it creates to hide from the immune system, and can often lie dormant for years. Often antibiotic interventions alone fall short in providing much needed symptomatic relief. Hyperbaric oxygen therapy (HBOT) has been shown to elevate tissue oxygenation, which can be lethal to this bacteria, increase white blood cell activity and enhance antimicrobial responses. Oxygen is essential in the killing of bacteria and by exponentially raising oxygen levels throughout the body, the efficiency of bactericidal action of white blood cells can be enhanced dramatically. Clinical data and case reports have demonstrated lasting benefits of HBOT for Lyme Disease with the following:



### AMELIORATE NEUROLOGICAL CONDITIONS WITH HBOT

- ✓ Decreases Neuroinflammation
- ✓ Enhances Short-Term Memory
- ✓ Reduces Chronic Fatigue
- ✓ Improves Concentration
- ✓ Ameliorates Chronic Headaches
- ✓ Lessens Depression
- ✓ Moderates Insomnia

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## LYME DISEASE & HYPERBARICS

Continued...

### INCREASE MOBILITY WITH HBOT

- ✓ Diminishes Inflammatory-related Arthritic Pain
- ✓ Lessens Muscle Discomfort
- ✓ Improves Walking Distance
- ✓ Amplifies Energy Levels

### ENHANCE ANTIBACTERIAL EFFECTS WITH HBOT

- ✓ Induces Angiogenesis to Mobilize Blood Flow to Affected Tissue and Bone
- ✓ Augments Antibiotic Interventions by Driving Spirochete out of Biofilms
- ✓ Enhances White Blood Cell and Immune System Activity
- ✓ Improves Antibiotic Cell Wall Penetration
- ✓ Increases Oxygen Free Radicals to Combat the Bb Organism



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# HYPERBARIC OXYGEN THERAPY

## PLASTIC SURGERY & HYPERBARICS

Whether a patient's surgery is cosmetic or reconstructive, Hyperbaric Oxygen Therapy (HBOT) is a natural tool that may aid in the healing process and shorten recovery time. Patients undergoing surgery face many post-operative challenges similar to traditional surgery but may also be affected by specific postoperative challenges unique to plastic surgery. HBOT is an option that may speed healing while minimizing the effects of these other challenges. The high complication rate of these surgeries is attributable to blood supply disruption resulting in ischemia, necrosis, infection, wound dehiscence and excessive scarring. HBOT improves this by inducing new blood vessel growth. Many surgeons now recommend pre-and/or postoperative HBOT to their patients in order to enhance their healing, recovery and results.

### PHYSIOLOGICAL BENEFITS

- ✓ Quicker healing
- ✓ Less Scarring, Bruising, Infection

### ENHANCES HEALING & RECOVERY

- ✓ Reduces Inflammation
- ✓ Minimizes Pain & Discomfort
- ✓ Reduces Swelling

### REDUCES RISK OF INFECTION

- ✓ Elevates Phagocytosis To Above Normal Levels
- ✓ Enhances Microbial Activity
- ✓ Increases Intracellular Leukocytes



### SUPPORTS HEALING AT THE CELLULAR LEVEL

- ✓ Promotes Anti Inflammatory Proteins
- ✓ Improved Angiogenesis Enhancing Blood flow to Tissue
- ✓ Induces Fibroblast Activation
- ✓ Enhances Collagen Production
- ✓ Stimulates Neovascularization and Vasodilation
- ✓ Stimulates Bone Remodeling



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# HYPERBARIC OXYGEN THERAPY

## SPORTS & HYPERBARICS

Injuries caused by sports-related activities remain a substantial concern with players, coaches and parents alike. As inflammation and pain play primary roles with respect to recovery, hyperbaric oxygen therapy (HBOT) has been shown to significantly reduce inflammation and ameliorate pain. Additionally, HBOT can promote fibroblast/collagen activity to accelerate and enhance healing from surgeries and wounds. New evidence supports HBOT as an adjunct and practical treatment to help moderate the effects of traumatic brain injuries and enhance brain imaging results. HBOT is often utilized by physicians and patients to help reach a full recovery from high-impact insults to the body and is currently used by some of the U.S. Olympic Teams to treat sports-related injuries as a part of their official medical techniques and equipment. Studies have demonstrated the benefits of HBOT for sports-related injuries with the following:



### ACCELERATE RECOVERY FROM SPORTS-RELATED INJURIES WITH HBOT

- ✓ Increases Collagen Production
- ✓ Reduces Inflammation & Pain
- ✓ Faster & Better Recovery from Sprains, Tears & Bone Fractures
- ✓ Stimulates Angiogenesis
- ✓ Enhances Recovery from Medial Collateral Ligament (MCL) & Anterior Cruciate Ligament (ACL) injuries
- ✓ Decreases Susceptibility Towards Reinjuring Target Areas
- ✓ Rapid Recovery from Concussions & Head Injuries
- ✓ Improves SPECT Imaging Results

Continued on Pg 2...



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# HYPERBARIC OXYGEN THERAPY

## SPORTS & HYPERBARICS

Continued...

### FASTER RECOVERY FROM SURGERIES WITH HBOT

- ✓ Increases Fibroblast Activation
- ✓ Reduces Inflammation for Optimal Pre-Op Conditions
- ✓ Reduces Risk of Infection
- ✓ Stimulates Stem Cell Proliferation
- ✓ Decreases Hospital Time

### AMPLIFY RECOVERY FROM INTENSIVE TRAINING WITH HBOT

- ✓ Accelerates Healing from Acute Muscle Strain
- ✓ Improves Blood Flow
- ✓ Proliferates the Production of Adenosine Triphosphate (ATP)

### ENHANCE PERFORMANCE WITH HBOT

- ✓ Improves Concentration
- ✓ Increases Serotonin Levels
- ✓ Accelerates Jet Lag Recovery
- ✓ Decreases Lactic Acid



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# HYPERBARIC OXYGEN THERAPY

## STEM CELLS & HYPERBARICS

Stem cells have the remarkable potential to develop into numerous different cell types and serve as the body's primary internal repair system. The innate ability of stem cells to differentiate into other types of cells with specialized functions (blood, brain or tissue cells) replenishes and regenerates the body from the effects of aging and disease. Hyperbaric oxygen therapy (HBOT) has been shown to significantly increase the concentration of circulating stem/progenitor cells within the peripheral circulation system. By increasing blood plasma oxygen levels, bone marrow derived stem cells were shown to significantly proliferate and mobilize. The proposed mechanism of action was through a nitric oxide dependent mechanism. This evidence plays a key role in regenerative medicine as the increased number of stem cells in the body have the ability to provide enhanced and accelerated physiological repair. Studies have demonstrated HBOT's therapeutic influence on stem cells with the following:



### ENHANCES STEM CELL ACTIVITY WITH HBOT (DOCUMENTED PHYSIOLOGICAL EFFECTS):

- ✓ Activates nitric oxide synthase type 3 (NOS-3)
- ✓ Proliferates and mobilizes bone marrow derived stem cells
- ✓ Improves engraftment and differentiation of several progenitor cell types in organs such as the spleen, bone marrow, brain, peripheral nerve, pancreas, cartilage & heart
- ✓ Increases colony-forming cells
- ✓ Stimulates stromal-derived growth factor
- ✓ Reduces high ROS levels
- ✓ Promotes endothelial growth factor-2 for angiogenesis
- ✓ Increases CD34 expression & Pluripotent Stem Cells

Continued on Pg 2...



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# HYPERBARIC OXYGEN THERAPY

## STEM CELLS & HYPERBARICS

Continued...

### **ENHANCE HEALING FROM DISEASE/INJURY WITH HBOT (CLINICALLY DOCUMENTED + SUPPORTED THROUGH RESEARCH CITATIONS)**

- ✓ Accelerates growth & Repair of damaged tissue
- ✓ Improves tissue regeneration & organ functionality
- ✓ Promotes neurogenesis
- ✓ Stimulates osteogenesis
- ✓ Enhances recovery from heart attack



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# HYPERBARIC OXYGEN THERAPY

## STROKE & HYPERBARICS

Stroke is the fourth leading cause of death in the U.S. and has remained a leading cause of adult disability with 800,000 cases reported every year. Hyperbaric oxygen therapy (HBOT) has been shown to help prevent and treat stroke through a number of different mechanisms. HBOT can be used to precondition the brain by stimulating angiogenesis, thus producing more circulatory pathways throughout the brain and potentially decreasing the chance of stroke. Also, this has been shown to benefit post-stroke patients, as compromised blood flow to the affected brain tissue (penumbra) and its functionality are recoverable by introducing increased levels of oxygen. Studies have demonstrated the benefits of HBOT for stroke with the following:

### STROKE PREVENTION WITH HBOT

- ✓ Stimulates Angiogenesis
- ✓ Ameliorates Atherosclerosis
- ✓ Decreases Oxidative Stress in the Brain
- ✓ Preconditions the Brain to Enable Neuroprotective Properties

### STROKE RECOVERY WITH HBOT

- ✓ Faster Overall Recovery
- ✓ Improves Vision and Speech
- ✓ Reduces Paralysis
- ✓ Accelerates Gross/Fine Motor Skills
- ✓ Increases Penumbra Tissue Recovery
- ✓ Stimulates Angiogenesis for Faster Reclamation
- ✓ Promotes Neurogenesis
- ✓ Enhances Stem Cell Proliferation & Mobilization
- ✓ Escalates Neuroplasticity
- ✓ Alleviates Spasticity



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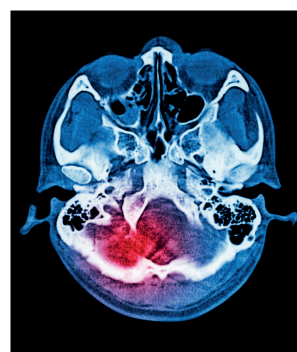
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# HYPERBARIC OXYGEN THERAPY

## TBI & HYPERBARICS

Traumatic brain injury (TBI) is a major cause of disability and death world-wide. According to the CDC, 138 people are affected by TBI every day and these injuries contribute to approximately 30% of all injury deaths in the U.S. In 2010, about 2.5 million TBI related hospitalizations were recorded in the U.S. alone. Hyperbaric oxygen therapy (HBOT) has been demonstrated to enhance the recovery from Traumatic Brain Injury and augment brain activity by reducing hypoxia and neuroinflammation, while increasing circulation in the brain. Also, Hyperbaric Oxygen Therapy has been reported to synergistically improve the effects of other TBI therapies, such as standard intensive rehabilitation, accelerating the recovery of the TBI patient. Clinical studies have demonstrated the benefits of HBOT for TBI with the following:



### ENHANCE NEUROLOGICAL REPAIR AND REGENERATION WITH HBOT

- ✓ Attenuates the Effects of Hypoxia and Inflammation in the Brain
- ✓ Promotes Neurogenesis
- ✓ Moderates Mitochondrial Disorders
- ✓ Enhances Stem Cell Mobilization and Proliferation
- ✓ Increases Penumbra Tissue Recovery
- ✓ Stimulates Neuroplasticity
- ✓ Induces Remyelination
- ✓ Augments Concussion Recovery

### IMPROVE OVERALL FUNCTION WITH HBOT

- ✓ Advances Cognitive Function
- ✓ Improves Gross/Fine Motor Skills
- ✓ Enhances Speech & Language
- ✓ Alleviates Spasticity
- ✓ Lessens Frequency of Seizures
- ✓ Stimulates Better Eye Contact
- ✓ Improves Balance & Walking



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