CEREBRAL PALSY & 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, in some studies, to alleviate the effects of CP. Many forms of CP result from a lack of oxygen to the brain. The affected brain tissue 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 with HBOT

- Reduces the Effects of Low Oxygen Levels on the Neonatal Brain
  - Promotes the Creation of New Brain Cells
  - Moderates Mitochondrial Disorders
  - Enhances Stem Cell Growth & Mobilization
  - Increases Brain Tissue Healing
- Escalates the Creation of New Brain Connections

Improve Overall Function with HBOT

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

Study: Motor Function Improved with HBOT

A study conducted with 25 participants assessed the effects of HBOT with children diagnosed with spastic diplegic CP. The children were evaluated after 20, one hour HBOT sessions. The results affirmed improvements in gross motor function (three of the five items) using the gross motor function measure (GMFM) and the fine motor function (three of six hand tests) utilizing the Jebsen Test for hand function. Additionally, reduced spasticity in three of the four muscle groups was confirmed by means of the modified Ashworth Scale. All tests were assessed by a physician specializing in CP.
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Inflammation is an integral part to numerous medical conditions and coincides with nearly all types of injuries and insults to the body. Some studies have reported inflammation in Autism, Stroke, Diabetes, Alzheimer’s, Traumatic Brain Injury and many other conditions. Hyperbaric oxygen therapy (HBOT) has been demonstrated to substantially decrease 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 reduce 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
  - Reduces Inflammatory Proteins
  - Promotes Anti-Inflammatory Proteins
    - Reduces Swelling
  - Accelerates Tissue Repair and Healing

**Reduce Brain Inflammation with HBOT**

- Reduces Severity of Autism Symptoms
  - Supports the Prevention and Treatment of Stroke
  - Reduces Risk of Alzheimer’s and Parkinson’s Disease

**Decrease Gastrointestinal Inflammation with HBOT**

- Remediates Inflammatory Bowel Disease
  - Helps Improve 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 Diseases with HBOT**

- Decreases Cancer Risk & Progression
  - Reduces Risk of Coronary Heart Disease, Heart Attack & Stroke
  - Improves Diabetic Conditions Linked to Inflammation

**Study: Inflammation & Hardening of the Arteries Decreased with HBOT**

A study published in July, 2008 examined the effects of HBOT on compromised blood flow due to hardening of the arteries with mice. Two groups of mice were treated with either 5 or 10 weeks of HBOT, whereas two other groups remained untreated and used as a control group. After the introduction of increased cholesterol levels, the treated group exhibited positive changes in the immune/inflammatory after HBOT. This represents a critical component of the beneficial effects of HBOT. This study demonstrated that HBOT significantly reduced circulating levels of cholesterol that can cause heart disease, kidney disease and stroke. Additionally, HBOT resulted in a substantial decrease in the production of pro-inflammatory proteins and showed a marked increase in the production of anti-inflammatory proteins. The observed improvements were already noted after only 5 weeks of treatment.
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CANCER & 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, world-wide, 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 Glioblastoma Treatment
- Decreases Tumor Drug Resistance
- Allows for Optimal Therapy Dosage to be Attained
- Increases Post-Op Fibroblast Activation

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

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

Enhance IV Cancer Treatments with HBOT
- Increases Intravenous Vitamin C Therapy Effect

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

Study: Tumor Regression Stimulated by HBOT

A non-randomized trial was conducted with 29 patients to evaluate the efficacy of radiotherapy combined with HBOT, in patients with a malignant glioma. Fifteen patients were irradiated daily after HBOT and fourteen other irradiated patients were treated without HBOT. In the HBOT group, 11 of 15 patients (73 percent) showed 50 percent tumor regression. In the non-HBOT group, only four of 14 patients (29 percent) underwent tumor regression. The median survival rate in patients with HBOT doubled that of the non-HBOT group (24 months vs. 12 months) respectively. No serious side-effects were observed in the HBOT patients. This provides additional support for HBOT to be a beneficial treatment for malignant gliomas.
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Injuries caused by sports related activities are a substantial concern among 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 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 (TBI) and enhance brain scan results. HBOT is often utilized by physicians and individuals 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 and clinical experiences 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 the Creation of New Blood Vessels
- 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 Brain Scan Results

**Faster Recovery From Surgeries with HBOT**

- Accelerates & Enhances Healing
- Reduces Inflammation for Optimal Pre-Surgical Conditions
  - Reduces Risk of Infection
- Stimulated the Creation of New Stem Cells
- Decreases Hospital Time

**Amplify Recovery From Intensive Training with HBOT**

- Accelerates Healing from Muscle Strain
  - Improves Blood Flow
  - Increases Energy Levels

**Enhance Performance with HBOT**

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

**Study: NFL Athlete Improves Cognitive Functioning with HBOT**

In 2011, a case report was published involving an NFL player who suffered multiple concussions. This subsequently led to the development of hydrocephalus (accumulated fluid within the brain), which required emergency shunt brain surgery. The star athlete continued playing and won the Super Bowl, only for his shunt to fail, which led to additional emergency back-to-back surgeries. Following his surgeries, he received 40, one hour treatments of HBOT. After the treatment protocol, he was independently assessed with neurocognitive evaluations and brain scans by the Amen Clinic in California. Marked improvement in 5 out of 6 indices on the MicroCog assessment for cognitive functioning (a computerized assessment sequence designed to detect early signs of cognitive impairment) was confirmed, in addition to drastic enhancements with respect to his brain scan.
ANTl-AGING
& HYPERBARICS

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ANTI-AGING & HYPERBARICS

Age-related diseases are a growing concern world-wide. Hyperbaric oxygen therapy (HBOT) has been shown, in some studies, to help combat degeneration by contributing to the regeneration of tissue and blood vessels. HBOT stimulates the development of new blood vessels 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, Arthritis and immune related diseases. Additionally, HBOT helps promote collagen activation to help battle the signs of aging including skin damage and 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 and General Blood Flow with HBOT**
- Stimulates the Formation of New Blood Vessels
- Combats & Prevents Circulatory Diseases, Including Coronary Heart Disease & Diabetes

**The Heart with HBOT**
- Improves Oxygenation to Cardiac Tissue
  - Reduces Risk of Heart Attack
- Improves Heart Muscle Functioning After Heart Attack

**The Brain with HBOT**
- Stimulates the Creation of New Brain Cells
- Promotes the Creation of New Brain Connections
  - Improves Memory and Reaction time

**The Joints, Soft Tissue & Bones with HBOT**
- Enhances Treatment for Arthritis
  - Accelerates Healing
- Reduces Inflammation & Pain
- Improves Mobility & Stamina

**The Eyes with HBOT**
- Helps Combat Age-Related Macular Degeneration
- Reduces Compromised Blood Flow to the Retina
  - Moderates Glaucoma Symptoms

**General Health with HBOT**
- Increases Energy levels
- Promotes the Creation of New Stem Cells
  - Decreases Risk of Infection
- Reduces Stress & Anxiety
- Supports the Immune System

**The Skin with HBOT**
- Reduces Excessive Skin Damage From Ultraviolet Radiation Exposure
  - Promotes Collagen Production & Maintains Skin Elasticity
- Improves Wound Healing & Reduces Scar Formation
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DIABETES & 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 the creation of new blood vessels to help combat 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, 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 internal and external wounds. HBOT increases the amount of oxygen available to these affected areas, leading to increase 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**
- Enhances Production of Insulin
- Improves Insulin Sensitivity
- Increases Skeletal Muscle Reception of Glucose

**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 the Creation of New Blood Vessels & Reduce Inflammation with HBOT**
- Improves Brain Function & Reduces Risk of Stroke
- Enhances Heart Function & Reduces Risk of Heart Attack
  - Reduces Risk of Diabetic Eye Disease
  - Decreases Risk of Diabetic Nerve Damage
  - Minimizes Risk of Diabetic Kidney Disease
  - Combats Cellulitis

**Enhance Internal/External Healing with HBOT**
- Facilitates Collagen Tissue Production
- Decreases Risk of Infection, Including Osteomyelitis
- Promotes Closure of Non-Healing Wounds
- Helps Control Diabetic Foot Ulcers
- Reduces Risk of Amputation

**Study: Amputation Rate Decreased with HBOT**
A study published in 2008 evaluated the effectiveness of HBOT with respect to decreasing amputation rates for patients with diabetic foot ulcer. A total of 184 consecutive patients received an average of 39 HBOT sessions (60 to 120 minutes) a day, six times a week with patients’ progress evaluated at 3, 6 & 12 months) in conjunction with standard treatments for diabetic foot ulcer. Following treatment, 115 (62 percent) were completely healed, 31 (17 percent) showed no improvement and 38 (21 percent) underwent amputation. HBOT’s success was illustrated by its ability to create new circulatory pathways, accelerate healing and increase antibacterial activity. This study confirmed that HBOT can help to reduce major amputation rates in diabetic foot ulcers by repairing tissue. This finding is especially noteworthy considering other conventional treatments had failed.

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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 producing more circulatory pathways to potentially decrease the chance of stroke. Also, this has been shown to benefit post-stroke patients, as compromised blood flow to the affected area of the brain 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 the Creation of New Blood Vessels
- Promotes Optimal Blood Flow
- 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 Recovery
- Increases Brain Tissue Recovery
  - Stimulates the Creation of Blood Vessels to Reclaim Damaged Brain Tissue
  - Promotes the Creation of New Brain Cells
  - Escalates the Creation of New Brain Connections
  - Alleviates Spasticity

**Study: Neurological Function Improved in Post-Stroke Patients with HBOT**

In January, 2013 a prospective, randomized, controlled trial focused on the introduction of HBOT to post-stroke patients. A total of 59 participants, who had suffered a stroke 6 to 36 months prior to inclusion and had at least one motor dysfunction, were randomly assigned to treated and cross-over groups. The treated group received two months of 40, one hour HBOT sessions, five days a week. Whereas the cross-over group was evaluated after one month with no HBOT and again after one month following HBOT, utilizing the same treatment protocol. The evaluating physicians found that neurological function, brain activity and quality of life of all treated patients improved after HBOT. Brain scan results directly correlated with clinical improvements and indicated that HBOT can lead to significant neurological improvements in post-stroke patients, even at chronic late stages. The observed clinical improvements indicated that new brain connections can be activated long after a stroke occurs.
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NEUROLOGY & HYPERBARICS

Approximately 1 billion people, of all ages, are currently affected by neurological disorders, with an estimated 6.8 million deaths that occur every year world-wide. This staggering statistical evidence illustrates the substantial impact of neurological disorders throughout the world. New evidence presents how hyperbaric oxygen therapy (HBOT) is helping individuals regain neurological activity and functionality. For neurodevelopmental and neurodegenerative disorders, in addition to neurological injuries, HBOT provides the brain with increased levels of oxygen to help recover/repair brain tissue, proliferate the creation of new brain cells and improve cognitive functioning. Clinical studies have demonstrated the benefits of HBOT for neurological conditions with the following:

Improve Brain Functioning & Performance with HBOT

• Increases Circulatory Pathways in the Brain
• Improves Oxygenation to the Brain
• Enhance Memory and Mental Performance

Improve Brain Repair & Recovery with HBOT

• Recovers & Repairs Damaged Brain Tissue
• Develops & Regains Cognitive/Motor Functions

Attenuate Nervous System Inflammation with HBOT

• Reduces Brain Swelling
• Reduces Risk of Compromised Blood Flow to the Brain
  • Decreases Pressure within the Skull
  • Minimizes Oxidative Stress

Increase Regeneration of the Nervous System with HBOT

• Stimulates the Creation of New Brain Cells
• Promotes the Construction of New Brain Tissue
• Facilitates the Formation of New Brain Connections

Improve Neurological Conditions with HBOT

• Neurodevelopmental Conditions (Autism, Cerebral Palsy, Fetal Alcohol Syndrome)
• Neurodegenerative Conditions (Alzheimer’s, Parkinson’s, Huntington’s disease)
• Neurological Injuries (Stroke, Traumatic Brain & Spinal Cord Injuries, Concussions)

Study: Brain Function Improves with HBOT

A prospective, randomized, crossover, controlled trial was published in 2013 testing the effectiveness of HBOT for improving brain function and quality of life for mild-traumatic brain injured patients suffering chronic neurocognitive impairments. A total of 56 patients, 1-5 years after injury, with prolonged post-concussion syndrome were evaluated. Patients in the treated group were assessed prior to HBOT and after 40 HBOT sessions. Whereas patients in the crossover group were evaluated three times: prior to HBOT after a 2-month control period of no HBOT and after 2-months of 40 HBOT sessions. Significant were evaluated three times: prior to HBOT, after a 2-month control period of no HBOT and after 2-months of 40 HBOT sessions. Significant improvements were confirmed in cognitive function and quality of life in both groups after HBOT, however, no significant improvement was observed following the control period. HBOT was Shown to induce significant brain function improvements, the creation of new brain connections and increased brain activity.
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AUTISM & HYPERBARICS

The alarming number of children diagnosed with Autism Spectrum Disorders (ASD) in recent years has tragically increased; from 1 in 150 in 2000 to 1 in 88 by 2008. Due to that increase, more and more parents have turned to alternative forms of treatment 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
  • Moderates Mitochondria Dysfunction
• Stimulates Stem Cell Proliferation & Mobilization
  • Actuates Neuroplasticity
  • Reduces Neuroinflammation
  • Promotes Neurogenesis
  • Reduces Seizure Frequency

Improve Physical Function with HBOT
• Promotes Receptive/Expressive Language
  • Improves Gross/Fine Motor Skills
  • Improves Movement & Walking
  • Stimulates Better Eye Contact

Advance Mental Function with HBOT
• Improves Sensory/Cognitive Awareness
• Increases Attention Span & Alertness

Improve Behavioral Function with HBOT
• Improves Sleep Pattern
  • Reduces Aggression
  • Advances Social Skills & Interaction

Improve Digestive Function with HBOT
• Attenuates Gastrointestinal Issues
• Enhances Nutritional Absorption
  • Decreases Inflammation

Study: Motor Function Ameliorate with HBOT

In 2009, a multi-center, randomized, controlled, double-blind trial was published, investigating the introduction of HBOT with 56 children diagnosed with ASD. ages 2-7. The study consisted of six separate HBOT centers that treated 30 children with 40 one hour sessions over the course of four weeks; whereas the remaining 26 children underwent sham treatment. Upon completion of this study, 80 percent of the treatment group's mean physician Clinical Global Impression (CGI) scores for overall functioning, receptive language, social interaction and eye contact significantly improved. Major improvements within the Aberrant Behavior Checklist (ABC) were observed in irritability, stereotypy, hyperactivity and speech. Finally, the treated children's ratings on the Autism Treatment Evaluation Checklist (ATEC) with respect to sensory/cognitive awareness, exemplified substantial improvement. Hyperbaric treatment was confirmed safe and well tolerated by the children and their parents in both groups.

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