STEM CELL &
HYPERBARICS

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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 has the ability to provide enhanced and accelerated physiological repair. Studies have demonstrated HBOT's therapeutic influence on stem cells with the following:

Enhance 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
- Increase in colony-forming cells
- Stimulation of stromal-derived growth factor
- Promotion in endothelial growth factor-2 for angiogenesis
- Increases CD34 expression & pluripotent stem cells

Enhance Healing from Disease/Injury with HBOT Clinically documented and supported through research citations to:

- Accelerates growth & repair of damaged tissue
- Improves tissue regeneration & organ functionality
- Promotes neurogenesis
- Stimulates osteogenesis
- Ameliorates diabetic symptoms
- Enhances recovery from heart attack

Study: Stem Cells Mobilized with HBOT

A landmark study published in 2005 involved 26 patients who were at risk for osteoradionecrosis after undergoing radiation therapy for head or neck tumours. All patients underwent 20 HBOT treatments and blood was collected and evaluated after the first, tenth, and twentieth treatment. The population of CD34 cells in the peripheral circulation system doubled after the first treatment and increased eightfold by the end of the trial. Colony-forming cells also significantly increased, while vascular endothelial growth factor-2 and stromal-derived growth factor increased as well. The study concluded that HBOT mobilizes bone marrow-derived stem/progenitor cells by stimulating nitric oxide synthesis.