

# THE NORTHWEST WELLBEING HUB



## HYPERBARIC OXYGEN THERAPY **TRAUMATIC BRAIN INJURY**

### KEY POINTS

- Increased oxygen supply to injured brain tissues
- Reduction of brain edema and swelling
- Promotion of neuroplasticity and neural repair
- Anti-inflammatory and antioxidant effects
- Improved cognitive and neurological outcomes

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## TRAUMATIC BRAIN INJURY

1. Increased oxygen supply to injured brain tissues: HBOT involves breathing pure oxygen in a pressurised chamber, which significantly increases the oxygen levels in the bloodstream. This increased oxygenation supports brain function and enhances cellular metabolism. By delivering high levels of oxygen to the injured brain tissues, HBOT may promote healing, reduce tissue damage, and improve overall brain recovery.

2. Reduction of brain edema and swelling: TBI often results in brain edema (swelling) due to inflammation and increased fluid accumulation. HBOT has been shown to help reduce brain edema by improving oxygenation, decreasing inflammation, and optimising tissue healing. By reducing brain swelling, HBOT may help alleviate intracranial pressure and enhance recovery following TBI.

3. Promotion of neuroplasticity and neural repair: TBI can lead to structural and functional changes in the brain. HBOT has been proposed to enhance neuroplasticity, the brain's ability to reorganise and form new neural connections. It may also promote neuronal repair and regeneration, potentially reversing some of the damage caused by TBI. This effect can contribute to improved cognitive function, memory, and overall brain recovery.

4. Anti-inflammatory and antioxidant effects: TBI triggers an inflammatory response in the brain, which can exacerbate tissue damage. HBOT has anti-inflammatory and antioxidant properties, helping to reduce inflammation and neutralise harmful free radicals. By modulating the immune response and reducing oxidative stress, HBOT may support the brain's healing process and limit secondary injury following TBI.

5. Improved cognitive and neurological outcomes: HBOT has been associated with improvements in cognitive function, attention, memory, and overall neurological outcomes in some individuals with TBI. While individual responses may vary, HBOT's potential to enhance brain oxygenation, reduce inflammation, and support neural repair may contribute to improved cognitive and neurological recovery in TBI patients.



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