



Hue Light USA

IMMUNITY CARE SYSTEM



HYPERBARIC OXYGEN

# THERAPY: A NON-INVASIVE TREATMENT

for Acute Sports-Related  
Traumatic Brain Injuries

Student-athletes commonly experience a wide range of deficits in neurocognitive function, motor control, and clinical symptoms after sustaining a concussion. These symptoms are caused by insulting neural tissue, which results in changes in cellular and physiological function. The mismatch between supply and demand can lead to a potentially damaging energy crisis. This is linked to symptoms such as migraine, dizziness, headaches, photophobia, phonophobia, nausea, and more. By addressing this initial symptom burden, clinicians could potentially improve recovery times. However, there is currently limited data demonstrating which concussion treatments will benefit young athletes the most.

## INTRODUCTION

Hyperbaric oxygen therapy is a medical treatment that involves breathing 100% pure oxygen in a pressurized chamber. HBO2 therapy increases the amount of oxygen in the blood and tissues, which can help promote healing and fight infection. HBOT can treat various conditions, but it is mainly used to treat decompression sickness, poisoning related to carbon monoxide, and injuries that are not healing properly. However, recent studies have shown that HBOT can also be an effective treatment for chronic traumatic brain injury (TBI). TBI is a debilitating condition that can cause numerous problems, including memory loss, impaired cognitive function, and chronic pain. HBOT works by increasing the oxygen levels in the body, which helps promote healing and improve symptoms. In one study, HBOT was shown to dramatically improve symptoms of TBI in a group of veterans who had been struggling for years. Although more profound research is needed to confirm these findings, HBOT holds promise as a safe and effective treatment for chronic TBI.

Hyperbaric oxygen (HBO<sub>2</sub>) therapy has been around for ages to help the body heal and teach the immune system how to fight diseases and injuries. This type of therapy is based on the principle that by increasing the oxygen levels in the blood, tissues can heal more quickly. This therapy has shown promising results in human and animal studies, and it may be useful for people who have suffered moderate to severe traumatic brain injury. However, the lack of research on this treatment has made it difficult to draw any conclusions about acute concussion treatment. Numerous explanations revolve around this lack of research, including the fact that concussions are often difficult to diagnose and can resolve spontaneously without any treatment. However, given the potential treatment of hyperbaric oxygen therapy, detailed research needs to be conducted to determine whether it is an effective treatment for concussions.

### **The following case study will provide:**

- Valuable information on how HBO<sub>2</sub> therapy can improve the care of concussed patients.
- HBO<sub>2</sub> therapy is a non-invasive, well-tolerated treatment.
- Comparison when participants are assigned to (a) hyperbaric oxygen therapy (HBOT), (b) 100% O<sub>2</sub> normobaric therapy, and (c) hyperbaric therapy with medical-grade air



## 1. Selection of Participants for Case Study

The case study involves 8 student-athlete participants randomly divided into three groups. Concussions are becoming more and more prevalent in sports. As a result, many schools refer their athletes who may suffer from these injuries to community-based family practices for treatment. The experts are experienced in evaluating the nuances of managing this type of brain trauma during gameplay. Upon confirming the concussion in the student-athletes, participants had to provide informed consent and have a legal guardian sign off on their inclusion in the research to continue the study further.

## 2. Carrying Out the Study

In this study, participants were selected randomly and placed in groups; they didn't know which group the other participants were in. Assignments were used during the study's phase but weren't shared with either the patient or the doctor so as not to bias anyone against receiving specific treatments based on knowledge about future outcomes.

The 8 participants were put into three groups: (a) HBO2 therapy; (b) hyperbaric with medical-grade air treatment; and (c) O2 therapy.

## 3. Outcome Chart

This study sought to understand the occurrence of concussions in young athletes. Eight patients, ages 12 to 18, were recruited to participate. The participants were all active in sports, with soccer being the most common. Throughout the study, it was found that none of the patients experienced any adverse effects. This critical study provides valuable insight into the care of young athletes who suffer from concussions.

## Demographic Information and Patient Histories

Patient	Group	Age	Sex	Sport	# Of Previous Concussions	Days Between Injury and First Treatment	Days Until Cleared for Activity	Symptom Score Reduction
1	O <sub>2</sub>	17	F	Soccer	4	3	11	20
2	HBA	15	F	Volleybal	0	3	17	14
3	HBO <sub>2</sub>	17	M	Lacrosse	1	3	15	37
4	O <sub>2</sub>	18	M	Soccer	0	3	8	41 <sup>c</sup>
5	HBA	15	M	Soccer	0	4	9	30
6	HBO <sub>2</sub>	16	M	Soccer	1	2	8	7
7	HBO <sub>2</sub>	15	M	Baseball	0	4	18	72
8	O <sub>2</sub>	15	F	Cheer	0	4	38	22

Image Ref: [Humankinetics](#)

### Note:

Symptom score reduction measures how much your symptoms improved after all five therapy sessions compared to when you first started receiving treatment.

## 4. Results

Let us discuss the results of the three groups:

### **a. HBO<sub>2</sub>**

The experimental group received five 1-hour sessions of HBO<sub>2</sub> therapy. After receiving HBO<sub>2</sub> treatment, they returned to their activities in an average of  $13.7 \pm 5.1$  days following treatment.

Patient No. 3's total symptom score was reduced by 37 points (initial score = 41; final score = 4. 90, giving a 2% reduction). Patient No. 6's total symptom score was reduced by 7 points (initial score = 9, final score = 2, giving a 77.8% reduction). Patient No. 7's total symptom score was reduced by 72 (initial score = 77, final score = 5, giving a 93.5% reduction). - Study done by [Humankinetics](#)

### **b. HBA**

In a study on the effectiveness of HBA therapy, the experimental group received five 1-hour sessions of HBA therapy. After receiving HBA therapy, they returned to their activities in an average of  $13.0 \pm 5.7$  days following treatment.

Patient No. 2's total symptom score was reduced by 14 points (initial score = 16, final score = 2, giving an 87.5% reduction), and patient No. 5's total symptom score was reduced by 30 points (initial score = 37, final score = 7, giving an 81.1% reduction). - Study done by [Humankinetics](#)

### **c. O<sub>2</sub> Therapy**

The study found that patients who received oxygen therapy after completing five 1-hour treatment sessions returned to their activities in an average of  $19.0 \pm 16.5$  days.

Patient 1's total symptom score was reduced by 20-point (initial score = 24, final score = 4, giving an 83.3% reduction), and patient 8's total symptom score was reduced by 22-point (initial score = 23, final score = 1, giving a 95.7% reduction). - Study done by [Humankinetics](#)

## CONCLUSION

The results of this case series are promising and support the need for further research into HBO2 therapy as an acute intervention for adolescent athletes with sports-related concussions. Given that HBO2 therapy is a non-invasive, well-tolerated treatment with minimal side effects, it has the potential to be widely adopted. It could play an integral role in the control of sports-related concussions. Furthermore, additional studies are required to confirm these findings and determine the long-term safety and efficacy of HBO2 therapy in this population.

### Reference Link

Case Study presented by <https://journals.humankinetics.com/view/journals/ijatt/26/3/article-p140.xml?content=fulltext>



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