

June 2024

HYPERBARIC MONTHLY MEETING

SerenaGroup
Building the Nation's Leading Wound Care Team



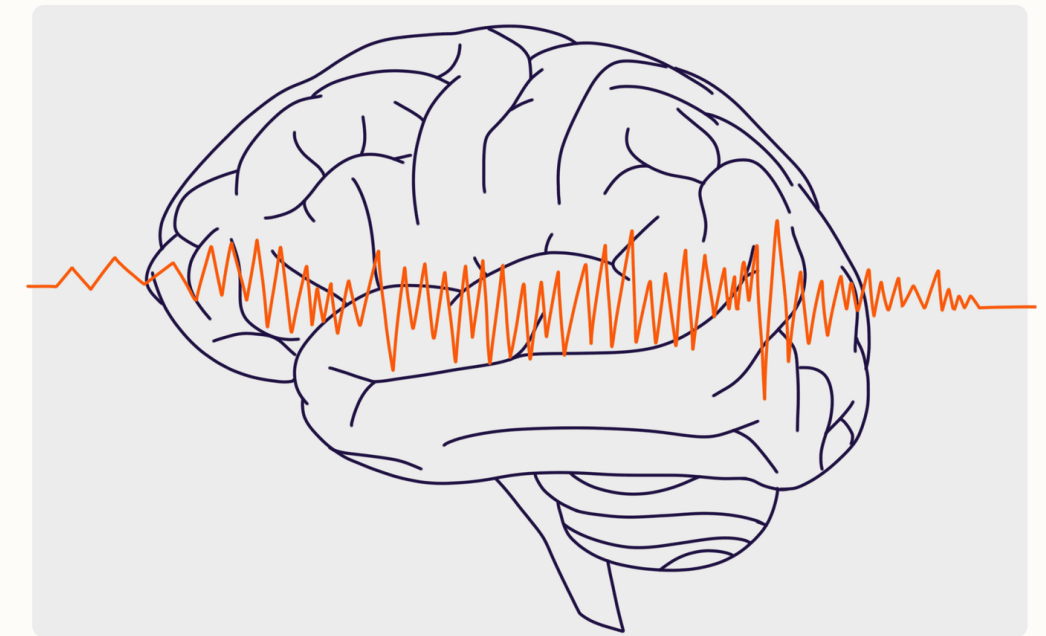
TOPIC:

June – Seizures

PRESENTED BY:

Lisa

SerenaGroup Monroeville

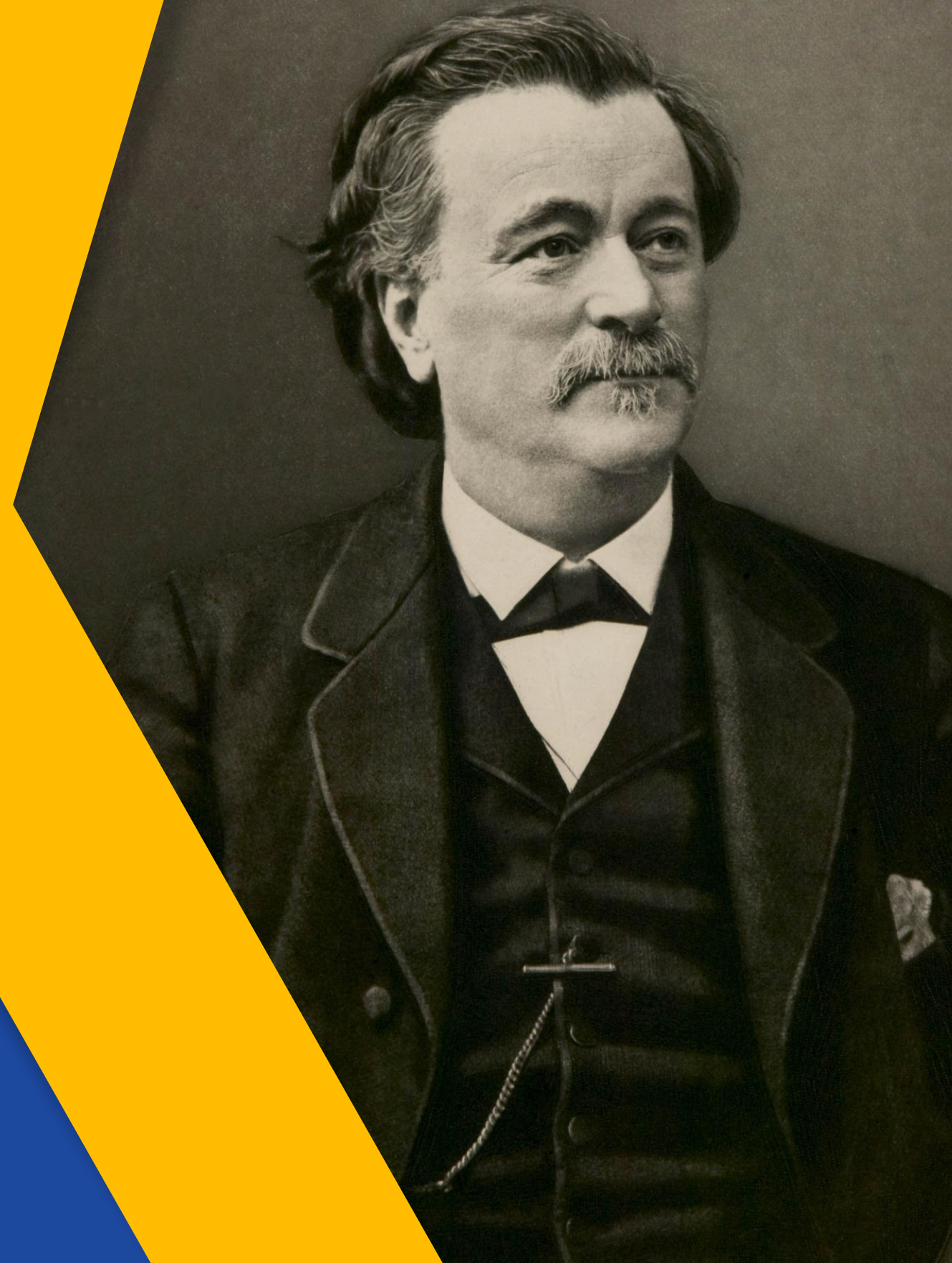




Seizures

Oxygen Toxicity Seizures

- Initially described by Paul Bert in the late 19th century, exposure to high levels of oxygen can lead to acute oxygen toxicity. The manifestations of which are neurologic in nature. The early signs are nonspecific such as twitching of the lip, changes in vision, tinnitus, or a sudden change in behavior. Left untreated the toxicity will progress to seizures.



Recognizing an oxygen toxicity seizure?

Recognizing the early signs and symptoms of oxygen toxicity can often look like other complications so recognizing them requires close attention. Conditions like hypoglycemia, anxiety, or illness can present similarly to oxygen toxicity.

Oxygen toxicity can lead to mild symptoms or progress rapidly to a seizure without prodromal symptoms. Careful attention to the patient throughout the treatment is key to identifying oxygen toxicity and intervening in a timely fashion. The acronym **VENTID** identifies the early signs of oxygen toxicity:

- V=changes in vision
- E= ears including symptoms such as tinnitus
- N=nausea
- T=twitching
- I=irritability
- D=dizziness

Signs and Symptoms

How likely is an oxygen toxicity seizure?

Instances of oxygen toxicity seizures in the hyperbaric chamber are varied from 0.01% to 0.06%. This means that it is very unlikely to experience an oxygen toxicity seizure. A review from 1989–2020, in which the cases of 25 presumed oxygen toxicity seizures were investigated, found that 4 seizures were ultimately due to other conditions. So we may be allocating more seizures to oxygen toxicity than we should be.

(<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC8426116/>)

In a different study, a total of 62,614 HBOT sessions, 7 seizure events were recorded while only one case could be considered to be a true oxygen toxicity seizure – a calculated incidence of 1.59:100,000. So while seizures are incredibly rare in HBOT, seizures that do occur are not more reliably oxygen toxicity versus another reason. ([PDF](#)) [Seizures during hyperbaric oxygen therapy: retrospective analysis of 62,614 treatment sessions \(researchgate.net\)](#)

[retrospective analysis of 62,614 treatment sessions \(researchgate.net\)](#)

Differential diagnosis

- Most seizures in a hyperbaric environment are not due to oxygen toxicity. The differential diagnoses include:
 - Hypoglycemia
 - Fever
 - New seizure disorder
 - Medications that lower the seizure threshold
 - Electrolyte abnormalities
 - Substance or alcohol abuse
 - Exposure to flashing or flickering lights (photosensitive epilepsy) including neon lights, strobe lights, video games or even patterns like narrow stripes



Medications that lower the seizure threshold

There are many medications/drugs that either lower the seizure threshold or have side effects that include seizures. To name a few...

- Bupropion (Wellbutrin)
- Opioids (Morphine, Tramadol, Codeine)
- Opioid agonists (Methadone, Suboxone)
- Tricyclic antidepressants (Clomipramine)
- Antibiotics (Penicillin, Metronidazole)
- Immunosuppressants (Cyclosporine)
- Anesthetic (Propofol)
- Chemotherapy (Methotrexate)
- Etc.



What to do if a patient has a seizure in HBO?

If the patient is observed or complains of any unusual neurologic symptoms, have the patient take an air break. Immediately, notify the physician supervising the treatment. Under the direction of the physician, consider decreasing the pressure in the chamber or discontinuing the treatment. In the case of a seizure, do not decompress the patient until seizure activity ceases (postictal phase). In diabetic patients, check a blood glucose level to rule out hypoglycemia as the source of the seizure. The patient is sent to the emergency room for a seizure work up. If the seizure is secondary to oxygen toxicity, the patient can resume HBOT. Prior to the next treatment incorporate an air break or more air breaks in the treatment protocol.

The Role of HBO Technician

- Maintain in eye contact range while patients are in the chamber, paying close attention for any signs of oxygen toxicity
- Make sure the provider is aware of any medical history or medications that could lower the patient's seizure threshold prior to the start of treatment
- Notify the physician if you notice any changes in the patient before, during, or after treatment.
- If you notice any signs of oxygen toxicity during treatment, put the patient on the air break and notify the physician.



How can we make HBOT safer for a patient that is at an increased risk of having a seizure?

Is the patient at risk due to a medication?
Can they be removed from that medication during HBOT?

Is the patient at risk because of a seizure disorder or neurological condition?
Are they or can they be medically managed?

Lower and Slower!

If all else fails, and we have done what we can to mitigate the risk of seizures in the chamber, but there is still a threat for a patient. Your provider should consider lowering the ordered set pressure to 2.0 ATA instead of 2.4 ATA AND including air breaks.





**Have you as a technician or your clinic
experienced a seizure?**

Please un-mute your microphone and share your experience.
What did you do? What was the outcome? Why did it happen?

SOURCES

- 2024 SerenaGroup Hyperbaric Safety and Education Manual.
- [Oxygen toxicity seizure mimics – PMC \(nih.gov\)](#)
- [\(PDF\) Seizures during hyperbaric oxygen therapy: retrospective analysis of 62,614 treatment sessions \(researchgate.net\)](#)





QUESTIONS?

A graphic for a quiz. The word "QUIZ" is written in large, bold, yellow letters with a blue outline. Above it are three blue speech bubble icons: one with an exclamation mark, one with a checkmark, and one with a question mark. The background is a white geometric pattern of interconnected lines. A large yellow and blue diagonal shape is on the right side. In the bottom right corner, there is a blurred image of a classroom with students raising their hands.

QUIZ

QUESTION 1 – True or False

Patients will always exhibit one or more signs/symptoms prior to having a seizure in the chamber.



Answer

False, patients may not show any clear signs prior to seizing.

QUESTION 2

Who initially described the signs and symptoms of acute exposure to high levels of oxygen?

OUTPATIENT

Answer

Paul Bert.

QUESTION 3 – True or False

Immediately decompress a patient that begins seizing.



OUTPATIENT

Answer

False, prior to decompressing, the patient should be postictal and no longer breath holding.

QUESTION 4 – True or False

Most seizures that occur in the hyperbaric chamber are due to oxygen toxicity.



answer

False. There is a very low instance of oxygen toxicity seizures. It is more likely that a patient has a seizure due to a seizure disorder, withdrawal, or a medication side effect.

ROUND TABLE?

- Avascular necrosis – UHMS
- New and old faces!



COMING UP NEXT MONTH

Topic: What can and cannot go into the chamber?

Presenter: Inspira Health Network

 **Date: Tuesday July 2nd at 12 pm east**

HYPERBARIC CONTACTS

THANK YOU!



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