



# HYPERBARIC OXYGEN THERAPY

# Introduction

- **Presenter: Kaylyn Lowery**
- **Role: HBO Tech II & Safety Director**
- **Location: Chambersburg, Pa**
- **Time in the field: 9 months**

This month's topic: *Seizures*



# Acute Oxygen Toxicity

Initially described by Paul Bert in the late 19th century, exposure to high levels of oxygen can lead to acute oxygen toxicity.

Oxygen Toxicity seizures are uncommon, occurring only 0.52 times per 10,000 hyperbaric treatments,


Air breaks reduce the potential for acute oxygen toxicity. If a patient undergoing HBOT exhibits the early signs of oxygen toxicity give him or her an air break and consider lowering the pressure in the chamber.


Alternatively, the physician can choose to end the treatment. In addition, eliminating fluorescent lighting in the chamber room decreases the risk of seizures.







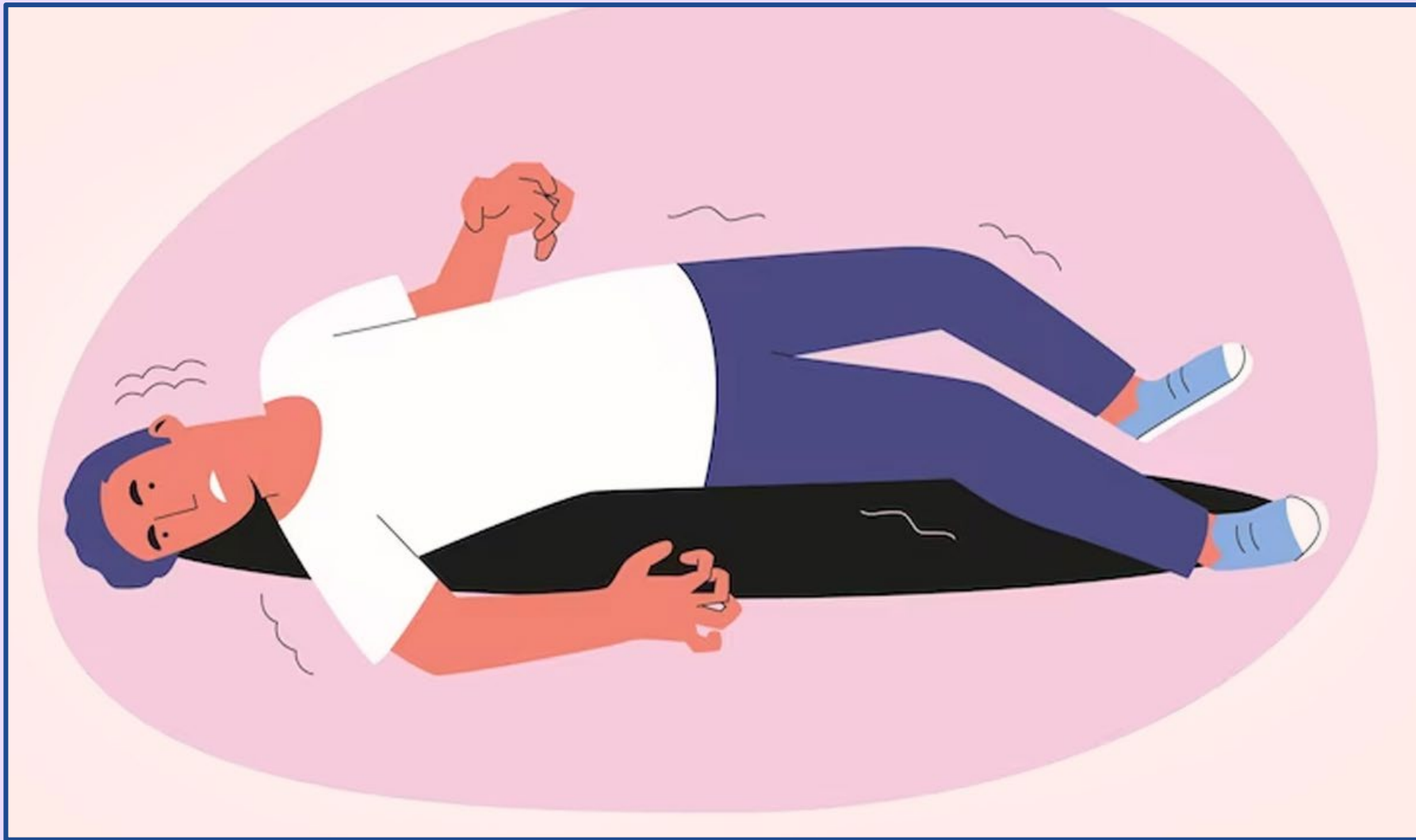
# Central Nervous System

 In hyperbaric conditions, the central nervous system is exposed to higher partial pressures of oxygen.

 This can increase excitatory neurotransmission, decrease inhibitory neurotransmission, and enhance the neurotoxic effects of drugs that already lower the seizure threshold.

 The manifestations of these hyperbaric-induced seizures 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 could progress to seizures.



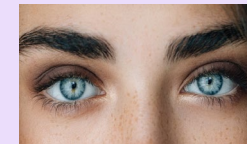
# Signs & Symptoms



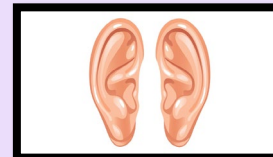
Oxygen Toxicity can lead to mild symptoms or progress rapidly to a seizure without prodromal symptoms.

\*Careful attention to the patient throughout the treatment is key to identifying oxygen toxicity and intervening in a timely fashion.\*

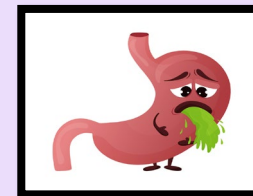
The acronym **VENTID** identifies the early signs of oxygen toxicity.



**V= changes in vision**



**E= ears including symptoms such as tinnitus**



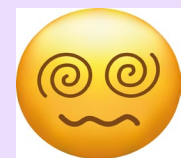
**N= nausea**



**T= twitching**



**I= irritability**



**D= dizziness**

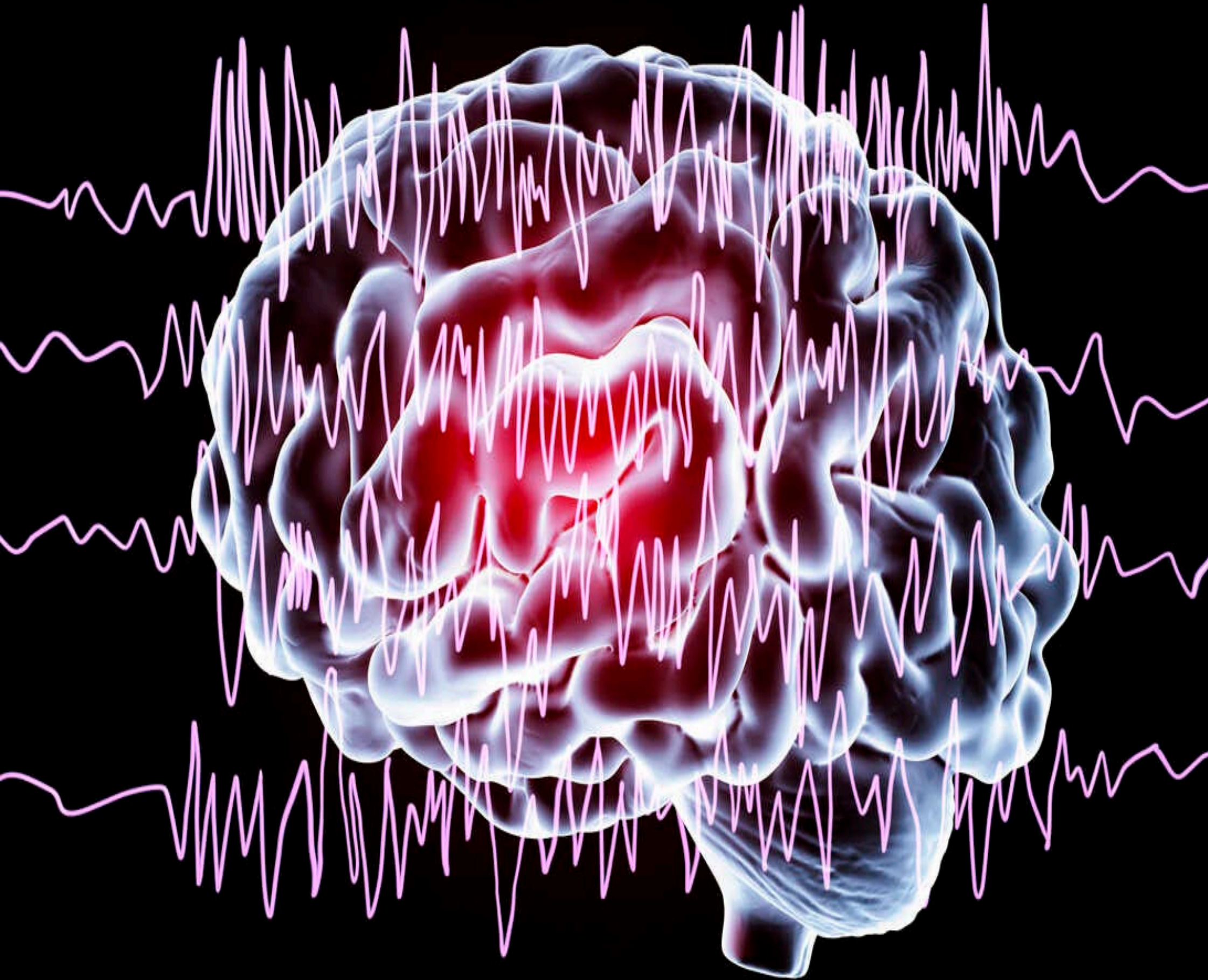
# Differential Diagnosis

**Most seizures in a hyperbaric environment are not due to oxygen toxicity.**

**The differential diagnoses include:**

- **hypoglycemia**
- **Fever**
- **seizure disorder**
- **medications that lower the seizure threshold**
- **electrolyte abnormalities**
- **substance or alcohol abuse.**

**Both withdrawal and overdose of many medication types could lead to seizures. The risk of HBOT-induced seizures in patients with a history or recent brain surgery is unknown.**



# Medications

## *That may cause concern for seizures during HBOT*

Disulfiram, by blocking superoxide dismutase, can increase the risk of oxygen toxicity, and should not be used concurrently with HBOT. Other medications that may cause concern for seizures include the following:

- **Antidepressants**
  - Tricyclic antidepressants (e.g., amitriptyline, nortriptyline)
  - Selective serotonin reuptake inhibitors (e.g., fluoxetine, sertraline)
  - Serotonin-norepinephrine reuptake inhibitors (e.g., venlafaxine, duloxetine)
  - Bupropion/Wellbutrin is especially notable for its seizure risk
- **Antipsychotics**
  - Clozapine
  - Chlorpromazine
  - Olanzapine
- **Stimulants**
  - Amphetamines (e.g., Adderall)
  - Methylphenidates (e.g., Ritalin)
- **Antibiotics**
  - Fluoroquinolones (e.g., ciprofloxacin, levofloxacin)
  - Imipenem
- **Anesthetics and Analgesics**
  - Lidocaine at high doses
  - Tramadol: especially in overdose or when combined with other serotonergic agents



- **Recreational Drugs**
  - Cocaine
  - Methamphetamine
- **Miscellaneous Medications**
  - Theophylline: a commonly used in respiratory conditions
  - Meperidine: a pain medication with neurotoxic metabolites
  - Isoniazid: used for tuberculosis

The above listed drugs do not rule a patient out of hyperbaric oxygen therapy.

**Disulfiram** is the only medication with a seizure risk that has made it on the relative contraindications list for HBOT.

# Procedures

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.)

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.

If a patient has a seizure that is not due to oxygen toxicity, the cause of the seizure should be determined and medically managed using anticonvulsant prophylaxis prior to returning to HBOT .



# Quiz





## Question 1

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

True or False

1



**False, sudden onset seizures without warning signs are possible.**

## Question 2

Initially described by \_\_\_\_\_ in the late 19<sup>th</sup> century, exposure to high levels of oxygen can lead to acute oxygen toxicity.

- A. Dan Kelly
- B. Antonine Lavoisier
- C. Paul Bert
- D. Ida Boerema

The background consists of a dense, overlapping collage of colorful sticky notes. The colors include shades of teal, light green, yellow, and light purple. Each sticky note features a large, black, hand-drawn question mark. The text 'Answer 2' is centered over this background in a white, sans-serif font.

# Answer 2

C. Paul Bert

# Question 3

Immediately decompress a patient that begins seizing.

True or False



**Answer**

**3**

**False**

# Question 4

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

***True or False***

# ***Answer 4***

**False**

# Round Table

- Updates on the Troy, MI chamber fire
- NEW Daily and Weekly Checklists follow-up
- NEW Chamber Emergency Cards follow-up
- Akron fire nearby their unit

# Attendance : March

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## In Attendance:

- Henry Ford
- Chambersburg
- Fairview
- Inspira
- Monroeville
- Akron
- ACMH

## Absent:

- Jackson
- MGMC



NEXT MONTH

# Topic: UHMS, CMS, and Insurance Medical Policies

*May 6<sup>th</sup>, 2025  
At 12:15pm eastern time*

## Has Presented In 2025...

- Ally
- ACMH
- Akron
- Chambersburg

## Has NOT Presented In 2025...

- Fairview
- Henry Ford
- Inspira
- Jackson
- MGMC
- Monroeville



Contact Us

# QUESTIONS/PROBLEMS

Ally George & Dr. Thomas Serena



## PHONE

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## MEMBER'S PORTAL

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**THANK YOU !!!**

