

2023 MONTHLY HBOT WEBINAR

TOPIC: TO DIVE OR NOT TO DIVE

HENRY FORD: APRIL 2023

ASHLEY ABRAMS



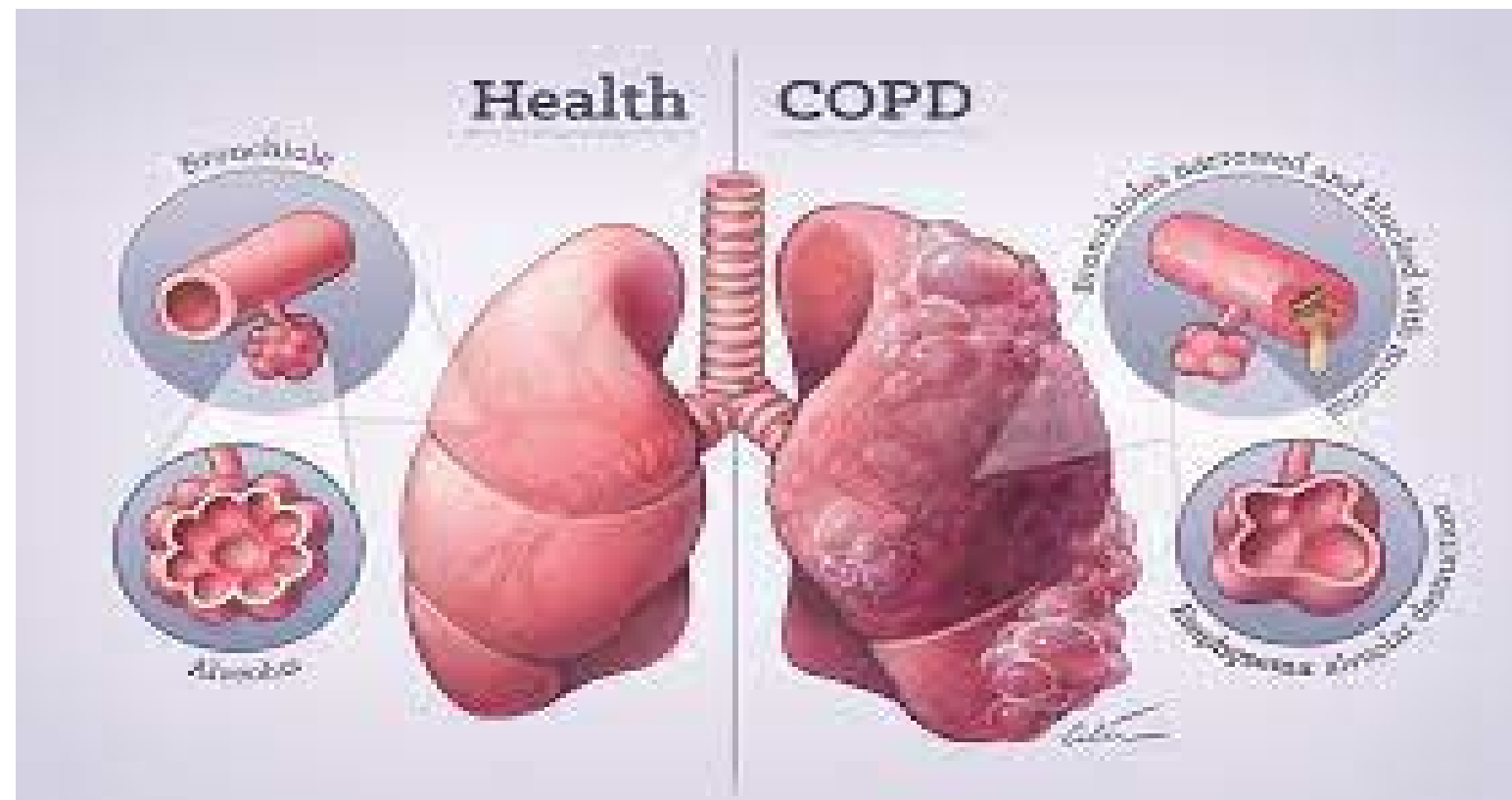
Over view

Comorbidities can add additional complications to a patient undergoing hyperbaric oxygen therapy. It is important to know when it is safe to treat a patient and how the risk can be reduced to protect them. Pre-treatment testing can rule out contraindications before the patient begins HBOT. Working with your overseeing hyperbaric physician to create the safest treatment protocol for a complex patient, can produce better outcomes.



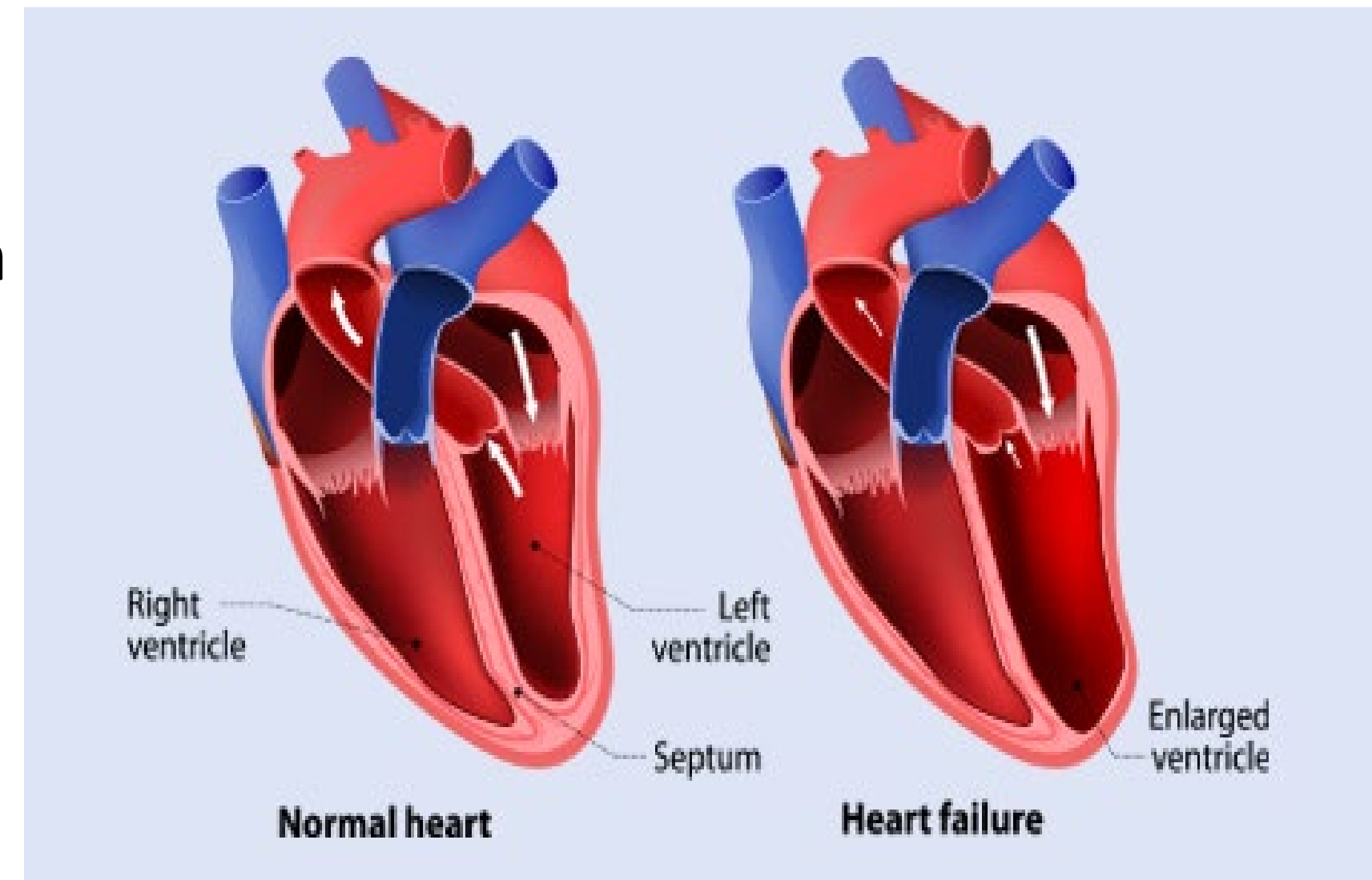
Comorbidities that pose a risk and how:

Chronic Obstructive Pulmonary Disorder (COPD) – COPD is a respiratory disorder. Pulmonary barotrauma from lung overinflation is a rare, but potential side effect of HBOT in patients that are at risk for air trapping during decompression with active bronchospasm, mucous plugging, and bullous lung disease.

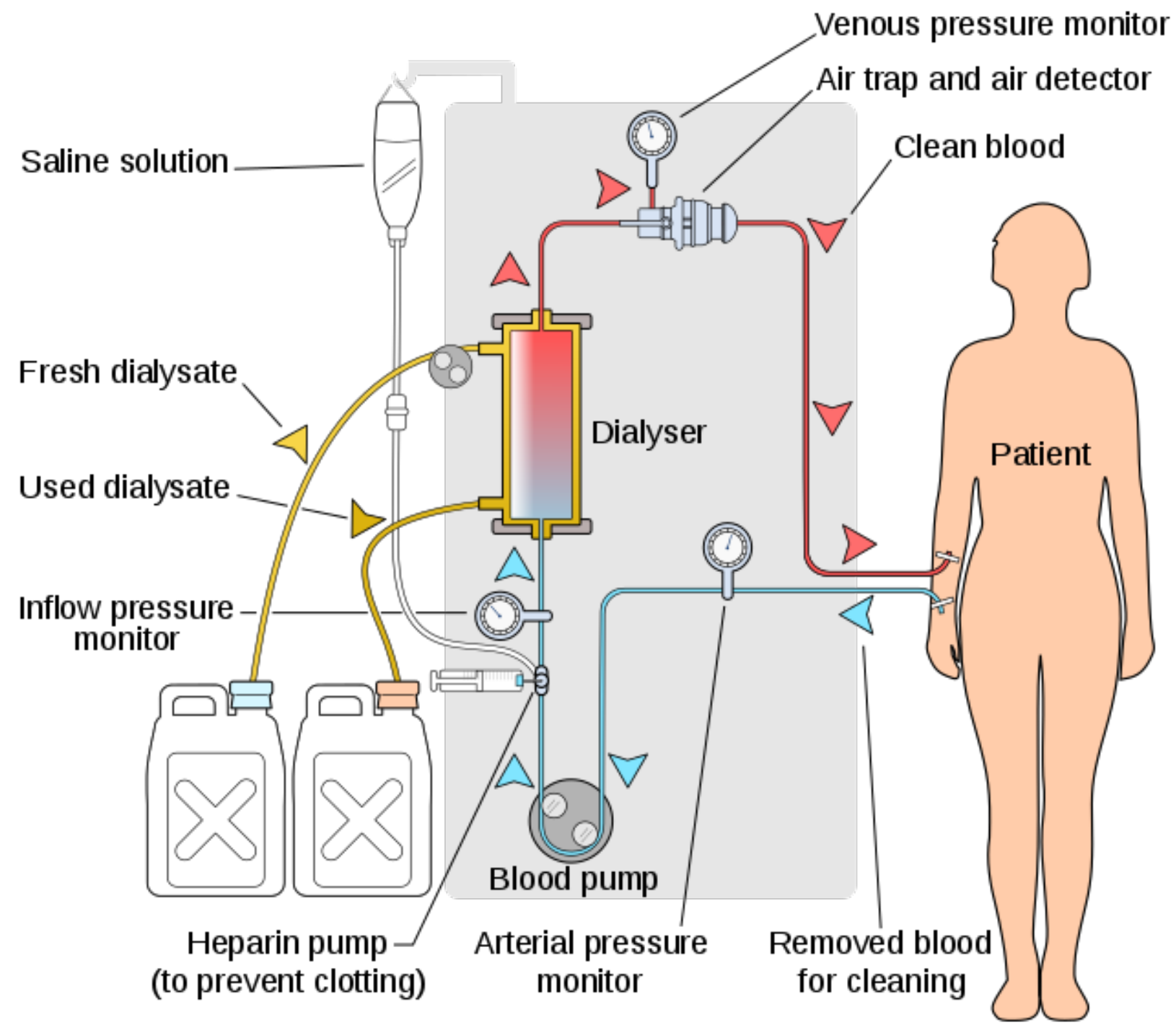


Comorbidities that pose a risk and how:

Congestive Heart Failure (CHF) – CHF is a condition in which the heart does not pump blood as well as it should. Patients with CHF, especially those with ejection fractions less than 30%, are at a higher risk for CHF exacerbation and acute pulmonary edema during HBOT due to fluid shift because of the pressure increase and decrease. Patients should not be fluid overloaded and a pretreatment, baseline echocardiogram may be considered.



Comorbidities that pose a risk and how:



Renal Dialysis Patients –

Patients receiving dialysis are at a higher risk of complications during hyperbaric treatment due to sudden fluid shifts from volume overload, causing acute pulmonary edema.

Comorbidities that pose a risk and how:

Long-Term Use of High-Flow Oxygen – Patients that utilize High-Flow Oxygen regularly, are at an increased risk of Pulmonary Oxygen Toxicity which could burn the lungs.



Pulmonary oxygen toxicity

- Lorrain Smith effect
- Threshold: 0.5-0.75ATM
- Airway collapse due to lack of other non-respiratory gases
- Irritation (cough, burning) on deep inspiration, SOB
- Progressive reduction in compliance, interstitial edema and fibrosis
- $FiO_2 < 0.5$ if possible
- Safe period of $FiO_2 > 0.5$ vary from 16-30hrs
- N.B. Safe upper limit of FiO_2 for chronic oxygen therapy in ambulatory setting is largely undefined

Sequence of Pulmonary Changes during Hyperoxic Exposure in Humans

O ₂ at 1 atm	Exposure Duration	Manifestations
100%	>12 h	Decreased tracheobronchial clearance; decreased forced vital capacity; cough; chest pain
	>24 h	Altered endothelial function
	>36 h	Increased alveolar-arterial oxygen gradient; decreased carbon monoxide diffusing capacity
	>48 h	Increasing alveolar permeability; pulmonary edema; surfactant inactivation
	>60 h	Acute respiratory distress syndrome
60%	7 days	Mild chest discomfort without changes in lung mechanics; possible changes in morphometry
24–28%	Months	Subclinical pathological changes; no clinical toxicity documented



Procedure:

- Complete hyperbaric consultation as normal but ensure the physician clearing the patient is aware of the patient's comorbidities.
- Discuss the treatment protocol with the physician, such as treating at 2.0 ATA.
- Make sure the pre-treatment testing that was ordered, has been carefully reviewed and signed off by the physician.
- Obtain additional clearances if the hyperbaric physician has requested this be obtained from the patient's specialist, i.e., cardiac clearance from the patient's cardiologist, pulmonology clearance from the patient's pulmonologist, etc.
- Watch the patient closely during treatment. Do not hesitate to abort the treatment if the patient exhibits any sign of respiratory distress. Address any concerns with the overseeing physician, whether it is in pre-treatment vital signs, after the treatment, or anything in between.



Safe Treatment Protocols

- The clearing HBO physician will determine the treatment protocol. Dr. Serena and Matt Schweyer, Serena Group's National Hyperbaric Safety Director, can work with the physician to answer any questions. The general recommendation from Serena Group for patients that are not deemed “at-risk” is 2.4 ATA for 90 minutes with two 5-minute air breaks, with a rate set of 1.5 psi/min.
- Why do we treat patients at 2.4 ATA? The deeper you go; the more Oxygen is driven into the body's compartments.
- If a patient is deemed “at-risk” their treatment protocol should be modified. 2.0 ATA is a therapeutic treatment pressure and does not require air breaks. Why should we treat “at-risk” patients at a lower pressure? We lower the treatment pressure to decrease the likelihood of HBOT side effects.
- When should you lower the rate set? Rate set should be lowered when patients are new to treatment and are still adjusting to pressure differentials, as well as when patients have potential air-trapping diseases.



quizz



Question 1



A patient with a history of CHF comes in and the physician cleared them for treatment. You take their blood pressure, and it is 220/108. Their BP at every other treatment has been between 112-140 systolic and 70-90 diastolic. What should you do, primarily?



Answer 1



- a. Dive the patient but keep a watchful eye.
- b. Chart the BP and make sure the physician signs off on it when he/she completes the note.
- c. **Notify the physician for further instruction before diving the patient. (FIRST)**
- d. Wait 15 minutes and retake the BP.
- e. Do not treat the patient that day.

Question 2



“At-Risk” patients should be treated at ____ ? ____ ATA unless otherwise determined by the clearing physician.



Answer 2



2.0 ATA

2.0 ATA is a therapeutic treatment pressure and does not require air breaks.



Question 3



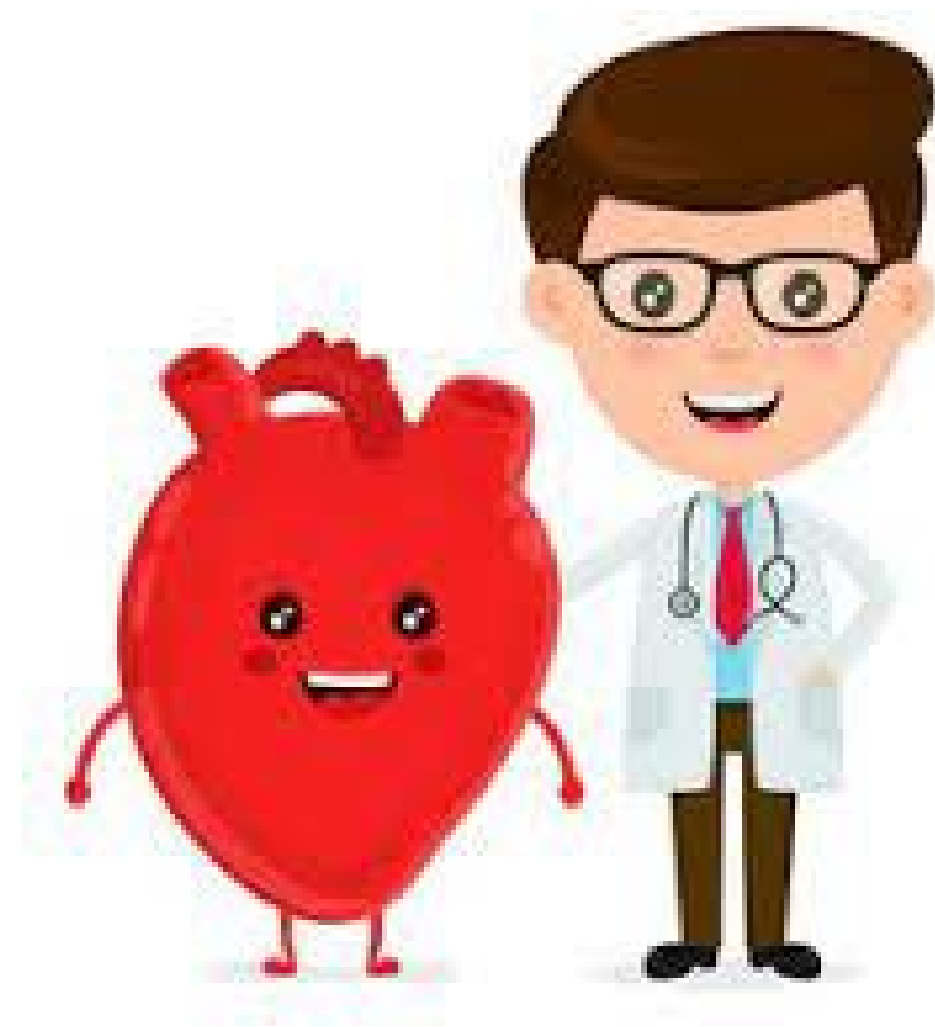
Which patients may we want to consider having cardiology clearance?



Answer 3



Congestive Heart Failure patients.



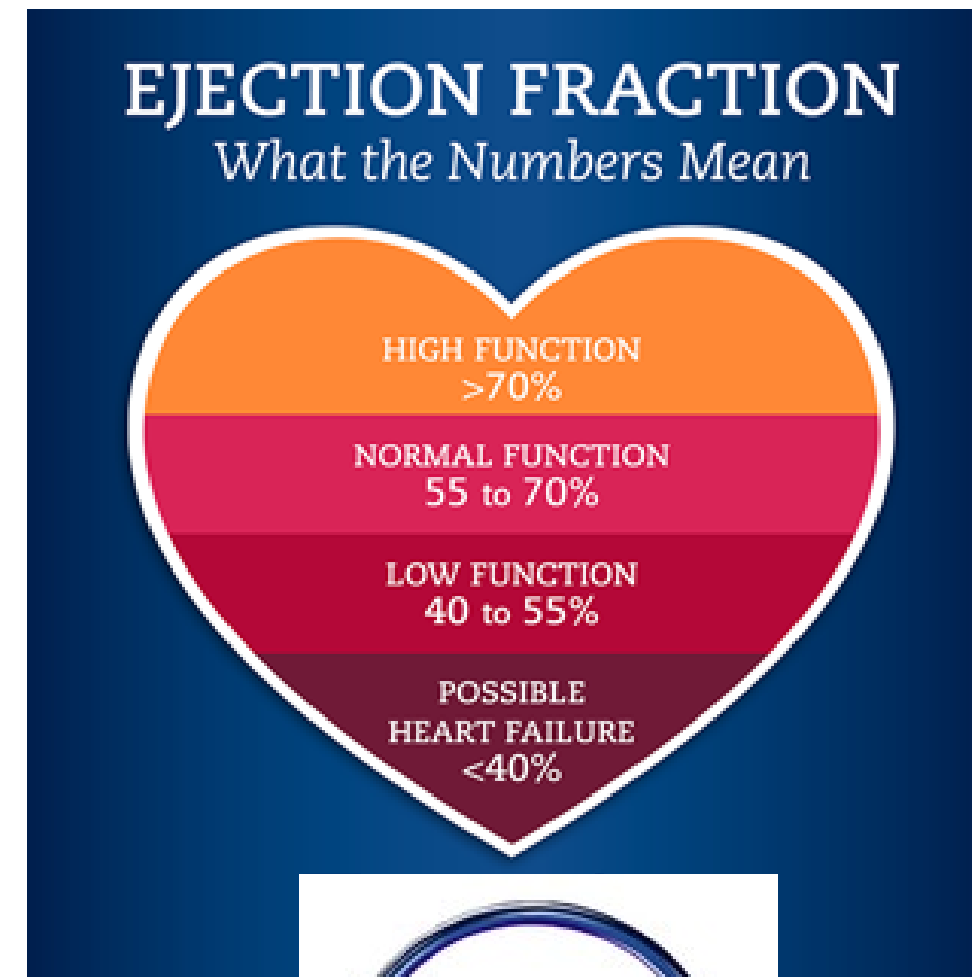
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Question 4



A patient with COPD and CHF, that has an Ejection Fraction of 40% can **NOT** receive HBOT. **TRUE or FALSE?**



Answer 4



FALSE

- ❖ CHF patients with ejection fractions less than **30%** should be treated at 2.0ATA and monitored closely throughout treatments. They're at higher risk for CHF exacerbation/acute pulmonary edema during HBOT.



THANK
YOU



Next Month



May Hyperbaric Safety Webinar



Topic: Clinical and Non-Clinical Emergencies and Preparedness



Presenter: Jackson Hospital



Date: 5/16/2023, 12 pm est.



Round Table

