



WHY DO WE REFUSE TO ALLOW TWO PERSONS IN A MONO-PLACE HYPERBARIC CHAMBER?

The National Fire Protection Association (NFPA) issue rules (every few years) which all local and State governments adopt in order to enforce the health and safety codes. The NFPA codes pertain to HEALTH CARE FACILITIES. Our relevant code in Zephyrhills is NFPA-99-2005 Chapter 20.

FDA adopt these rules and apply them to their requirements for clearance to market Medical Devices. FDA only "approve" drugs. They do however "clear to market" Medical Devices so we use the more accurate term "FDA 510(k) cleared".

Any manufacturer of HBOT Systems who uses the phrase "FDA approved" in a written or verbal description of their chamber systems demonstrate their ignorance of the law and should be considered suspect.

Our chambers are FDA 510(k) cleared Medical Devices, which means that they have been designed constructed, tested, and inspected by an FDA manufacturer to deliver HBOT in a safe and efficient manner.

NFPA classify chambers into three categories as follows:

CLASS A, B, & C

CLASS A Chambers designed and cleared for MULTIPLE PATIENTS (Multiplace).

Multiplace chambers are inherently much safer than monoplace chambers (Class B) that are pressurized with oxygen.

Chambers that are designed for more than one occupant require two types of Fire Suppression Systems (FSS). One must be a pressurized water DELUGE type and the other must be pressurized water HANDLINE type.

The DELUGE FSS system can be activated by the outside operator or by any chamber occupant. The HANDLINE FSS can only be operated by persons inside the chamber.

Additionally, multiplace chambers must be pressurized with medical grade air produced from a compressor or storage system that is "Oil-Less" and the atmosphere inside the chamber must be constantly monitored in order to assure that the percentage of oxygen (PO₂) in the chamber never exceeds 23.5%. Any chamber with 25% PO₂ or more presents safety issues.

Multiplace chamber systems utilize a BIBS (built-in breathing system) to deliver the pure oxygen to the patients pulmonary system. The patient may use an "oxygen hood" (some people refer to the hood as a "head tent") or a special mask. In general, masks are not as effective as hoods.

Humans do not absorb oxygen through the skin. The only transport of oxygen is through the pulmonary system so a chamber can be very safely pressurized with air while the BIBS delivers medical grade oxygen to the pulmonary system and



Hyperbaric Centers of Florida

21st Century technology in a safe and caring environment

then dumps the exhaled (oxygen rich) "air" from the patient's lungs outside the chamber, outside the room, and outside the building and into the atmosphere.

CLASS B Chambers (Monoplace) are designed and cleared for ONLY ONE PATIENT.

Most monoplace chambers are pressurized with pure medical grade OXYGEN which eliminates the need for a BIBS (hood or mask).

Monoplace chambers DO NOT HAVE ANY TYPE OF FIRE SUPPRESSION SYSTEMS! The simple reason that an FSS is not required is because a fire in a 100% oxygen environment (in truth any oxygen rich environment) cannot be extinguished.

The monoplace chambers at Hyperbaric Centers of Florida are able to be pressurized with medical grade oxygen or medical grade air. This unique capability gives us the flexibility of being able to deliver a variety of therapy options to our patients and increases the safety aspects of some treatment modalities.

All patients who are receiving treatment in our monoplace chambers are issued their own individual "Patient Ground Straps" which create an electrical bond between the patient and a dedicated chamber ground (for each chamber) so that any static electricity is conducted through the ground strap and outside the building.

All patient and technicians wear special Hyperbaric Scrubs (supplied by Hyperbaric Centers of Florida), which are 100% cotton with no pockets.

Hyperbaric Scrubs are used in all types of chambers.

Two important reasons for refusing to allow two persons in our monoplace chambers should be thoroughly understood.

At the moment you read this document there are probably dozens of parents inside monoplace chambers along with their small children. Centers who allow this practice show their disregard for the safety aspects of HBOT and demonstrate their lack of knowledge about the physics and physiology of HBOT.

One of the main reasons that we allow caregivers to go into the MULTIPLACE chamber with their children is to look for signs of Pulmonary Oxygen Toxicity. In the multiplace chamber only the patient is breathing oxygen while the caregiver is breathing chamber air. This means that the caregiver will not get pulmonary oxygen toxicity and can be diligent in looking for the signs of oxygen toxicity in the patient.

If BOTH caregiver and patient are in a monoplace chamber pressurized with oxygen both occupants become PATIENTS and there is no one to render the necessary help in the rare event that oxygen toxicity occurs.

One center in Oklahoma had a parent and child in a monoplace chamber when the parent became oxygen toxic and had a significant seizure.



As you can imagine, the resulting trauma to the child was very undesirable.

An even more important reason to utilize the chambers, as they were designed to be used, can be understood when you think about the following information.

An average adult has a "lung volume" of 6 liters. As you can imagine, children have much less lung volume.

If you pressurize the chamber to 2 ATA (as an example, on a Stem Cell Mobilization treatment protocol) the volume of the lungs are doubled (Boyle's Law). The increase in lung volume is in direct proportion to the pressure inside the chamber.

We all exhale CO₂ in the respiratory process (even when breathing 100% oxygen). CO₂ is a heavy gas and it seeks the lowest level of a hyperbaric chamber. When a parent and child are in a monoplace chamber the parent usually lays on their side and watches the child as they lay beside the adult.

The adult exhales much more CO₂ than the child (plus the doubling of the volume because of Boyle's Law) and because the child is directly below the parent they are inhaling a large proportion of CO₂.

CO₂ is a very undesirable gas to breathe (especially under pressure) because it is a "vasoconstrictor". The doubling of the parent's lung volume increases the CO₂ volume that is being presented to the child's pulmonary system and the child takes in a "double volume" (again because of Boyle's Law). The resulting vasoconstriction actually reduces the amount of oxygen being transported to the tissue (cellular level) and can result in NEGATIVE benefit for the child.

The majority of chamber operators do not grasp this basic complication.

This author has seen dozens of parents report that they saw better results when their child was treated (with the parent as a caregiver in the chamber) in a multiplace chamber as compared to their previous experience in a monoplace unit. When I explained the physics and physiology of the gases that we encounter in the process of delivering HBOT they became very upset with the centers that had clearly ignored some very important rules.

CLASS C Chambers designed for ANIMALS.

Hyperbaric Centers of Florida have all three classes of chamber (including one for companion animals).

If a patient requires a caregiver to be inside the chamber with them during their treatments we ONLY use the Class A chamber designed for more than one occupant. We will never allow more than one person to be pressurized in our Class B (monoplace) chambers.

Note:

Many people express their belief that being in a monoplace chamber in a 100% oxygen environment is better than being in a multiplace chamber pressurized with



air while breathing oxygen through the BIBS (using a hood).

In truth, a properly fitted hood can be a BETTER delivery method for oxygen.

Remembering the fact that we don't absorb oxygen through our skin, imagine a monoplace chamber when we close the door and begin to pressurize.

The chamber was filled with regular room air when we closed the door. Air is approximately 80% nitrogen and 20% oxygen. It can often take 10-12 minutes for the medical grade oxygen to displace the nitrogen (depending on the ventilation rate in the chamber).

When you are in a multiplace chamber and you are instructed to place your hood on the neck-seal and we switch the valve over to medical grade oxygen it takes only 10-15 seconds for the oxygen to displace the nitrogen in the small volume of the hood so your therapy begins much quicker.

For patients in the monoplace chamber we compensate for this inequity by taking up to 15 minutes to pressurize the chamber and then we "start the timer" for our treatment protocol.