



COMMENTS ON "SOFT OR MILD HYPERBARIC CHAMBER BAGS"

There exists a great deal of confusion over the validity and/or safety of "soft chamber systems".

Before listening to anyone's opinion on the subject you should first determine the level of expertise resident in the person offering the opinion.

I have 35 years of experience in the field of hyperbaric technology and medicine (22 years as a researcher at a major university involved in the physics and physiology of diving medicine).

I have owned two companies that have manufactured, sold, delivered, and installed chamber systems valued at over \$50 million dollars.

I am the founder of the oldest and most successful HBOT Center in Texas and I travel the world speaking on the subject of Hyperbaric Medicine.

A variety of companies are offering "soft hyperbaric chambers" for "mild HBOT".

The simple truth is that soft chambers do not exist.

These units are modifications of the famous GAMOW BAG designed to rescue high altitude climbers affected with "Altitude Sickness".

The bag was invented by Dr. Igor Gamow at the University of Colorado.

A group of individuals with little, or no knowledge, of the physics and physiology & safety aspects of hyperbaric technology have adopted Dr Gamow's bag and have marketed it to Chiropractors, Doctors, and family members desperate to get HBOT for their patients and loved ones.

We own a company that sells remanufactured HBOT systems to hospitals, clinics and (with a Physician's order) to individuals for home use.

We DO NOT sell "soft" chambers but we are offered dozens of them every month because the families and clinics that purchased the soft chamber realize that they have made a very serious and expensive mistake.

They make this error because they believe the salesman and have a desire to



help a family member. In fact they are actually placing their loved one at GREAT RISK (out of ignorance) by pressurizing them in a device that has only been cleared by FDA for the treatment of High Altitude Sickness.

In many instances we have been able to help these unfortunate buyers get all (or most) of their money back from the unscrupulous persons who have sold them the bag. Most however collect dust in a storage area and eventually end up in the dump.

WHY IS THE BAG INEFFECTIVE and A SAFETY CONCERN?

The bag was designed to be pressurized with a foot pump (just like a toy boat or raft at the beach or lake) but these “mild hyperbaric” sellers have added an “air brush air compressor” (just like air brush artists use at fairs and flea markets etc.).

Fortunately the little compressor is “non-lubricated” so you don’t run the risk of an explosion when oil and oxygen mix.

Unfortunately, when the PRV (pressure relief valve) on the chamber is modified (to allow the chamber to go deeper) or has a piece of cloth or paper blocking the port, the little compressor is capable of producing enough pressure to cause the bag to rupture.

If a bag ruptures under pressure (even a very low pressure) the occupants may suffer explosive decompression which can possibly result in a “tension pneumothorax”, either one is potentially fatal.

Real HBOT chamber systems are required to be manufactured according to the ASME (American Society of Mechanical Engineers) PVHO (Pressure Vessel for Human Occupancy) code requirements.

The reason that FDA allowed the bag to be used for High Altitude Sickness is because it was pumped up with a foot pump (see photo) and did not employ oxygen. Mountain climbers just need to be pressurized with air to allow their lungs to begin to work properly because pressurizing air increases the PO₂ enough to “rescue” the climber. High Altitude Sickness is the ONLY approved indication for

the bag!!!!!!!



The original Gamow Bag sold for less than \$2,500.00

The companies offering the “soft” chambers also suggest that you use an oxygen concentrator to expedite the therapy.

In fact, there is no measurable therapeutic benefit of breathing regular air under pressure so their suggestion has validity in order to get even a tiny benefit.

Unfortunately, the bag was not designed to be pressurized with anything other than air.

When you place a patient in a hyperbaric chamber and increase the PO₂ inside the chamber you are required to attach a “patient ground strap” to the patient’s wrist (or ankle) and use a #8 solid ground wire to connect the ground strap to a dedicated building ground. This means a copper ground rod 72” long driven into the soil outside a building. Bags don’t have any grounding capability.

Why is this important?

A static electrical spark has been proven to cause fires in hyperbaric chambers



that have an "elevated PO₂" (PO₂= percentage of oxygen).

It is a fact that in recorded history there has never been a survivor of a hyperbaric chamber fire in which the PO₂ inside the chamber was 25% or greater.

If you have doubts about this you should review the Ocean Hyperbaric Center double fatality two years ago in Fort Lauderdale, among many others.

We have measured the PO₂ inside a bag (pressurized with an oxygen concentrator) at 34 to 38% oxygen.

Most bag owners are not making any provisions for dumping exhausted oxygen outside their homes, clinics and seem to be oblivious of the dangers of increasing the PO₂ inside their respective buildings. If the PO₂ goes above 25% in the chamber room and a fire is started (fireplace, heater, etc) the results are going to make front-page news.

Suppose the oxygen is delivered to the patient with a mask or hood in a soft chamber?

That is a much safer approach IF the hood or mask has a BIBS system which dumps the oxygen rich exhaled breath outside the bag, outside the room, and outside the building. We have seen no such system for a bag because there is no way to install it properly.

If you use a mask or hood without a BIBS the PO₂ reaches dangerous levels inside the soft chamber in just a few moments.

What about putting more than one person inside the soft chamber?

My opinion is that putting two persons inside any chamber designed (and cleared) for one person is criminal negligence.

Here is why:

If both occupants are properly grounded and have on 100% cotton clothing and have NO ELECTRONIC DEVICES INSIDE THE CHAMBER (electrical devices of



any type can kill the occupants of any chamber in which the PO₂ is 25% or greater!) it is still a bad idea because of vasoconstriction.

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

When you pressurize any chamber to 2 ATA the volume of the lungs are increased (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 increasing 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 increase 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.

We should not be paying someone to place our loved one at risk and actually do



more harm that good.

In a recent phone conversation with a parent who wanted me to help them sell their \$12,000.00 dollar mistake I was asked why I was so negative about “soft” chambers. The person knew that I manufacture new chambers and have a company that sells reconditioned chambers and asked, “are the soft chambers affecting your business?”

I was honestly able to say..... no, in fact they have increased my business because the buyers of soft bags eventually want to buy the real thing.

My heart goes out to those who have been cheated out of their money and their hopes that “mild” HBOT would have any efficacy.

One would logically come to the conclusion that the people who sell them are either very ignorant, or that they know that the bags carry great risk and little hope of benefit, and that they simply want more people to part with their money.

It should be noted that there is one soft chamber manufacturer that makes a safe and proper transportable chamber for rescuing commercial and sport divers. It can be pressurized to beneficial pressures and can be transported by ambulance or helicopter.

It only costs about \$25,000.00.....but there is just one little problem..it has been designed to be destroyed after using it for only TEN TIMES!

Someday, in the future, NASA will license their soft chamber technology using proprietary Kevlar materials and I can comfortably recommend (and perhaps even sell) soft chambers.

In the interim, I have a need to lay my head on my pillow each night and take comfort in the fact that I have not offered false hope to anyone, or placed them or their family members (patients) at risk.

The first tenant of the Hippocratic Oath is ***“I will do no harm”***.



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