HYPERBARIC OXYGEN CHAMBERS





Baromedic Healthcare Pvt. Ltd

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About Us



- ☐ Baromedic Healthcare Pvt. Ltd; is a company established in 2012 with the sole objective of promoting Baromedic healthcare products and treatments in the world market.
- ☐ The company is promoted by professionals who have more than 20 years of experience in the field and has developed indigenously the technology for the manufacture of Hyperbaric chambers.
- ☐ In past 10 years time, we have done installations in the Defense Establishments and various Hospitals in Indian market
- □ Our HBOT chambers meet ASME-PVHO1-NFPA CODES & undergo a multi-stage inspection at the design, manufacturing, assembly, shipping and installation levels to ensure patient safety and maximum results.

Hyperbaric Oxygen Therapy: An Overview



What is HBOT?

 Hyperbaric oxygen therapy (HBOT) is breathing 100% oxygen while under increased atmospheric pressure.

HBOT Application

■ HBOT is an effective treatment for acute and chronic tissue damages of all types—any cause, any duration, any location.

The Therapy

- When a patient is given 100% oxygen under pressure, hemoglobin is saturated, but the blood can be hyper-oxygenated by dissolving oxygen within the plasma.
- The patient can be administered systemic oxygen in pressurized chambers
- The therapy can be used for routine wound care, treatment of most dive injuries, and treatment of patients who are ventilated or in critical care.

The role of Oxygen in our body...



- Oxygen floods areas that are oxygen starved to stimulate cell growth and regeneration.
- Hyperbaric oxygen acts as an anti-viral and anti-bacterial, as "bad" bacteria and viruses typically cannot tolerate oxygen.
- Hyperbaric oxygen is an immune modulator, supporting the immune system to bring T and B cells within normal function.
- Oxygen reduces tumor growth in cancer patients.
- Hyperbaric oxygen increases neural brain function due to oxygen saturation.
- Oxygen displaces toxins and other impurities to assist in detoxification of your system.
- Hyperbaric oxygen provides many other condition specific benefits.

Why HBOT?



HBOT Benefits

- ☐ Greatly increases oxygen concentration in all body tissues, even with reduced or blocked blood flow;
- □ Stimulates the growth of new blood vessels to locations with reduced circulation, improving blood flow to areas with arterial blockage;
- ☐ Causes a rebound arterial dilation after HBOT, resulting in an increased blood vessel diameter greater than when therapy began, improving blood flow to compromised organs;
- □ Stimulates an adaptive increase in superoxide dismutase (SOD), one of the body's principal, internally produced antioxidants and free radical scavengers; and,
- ☐ Aids the treatment of infection by enhancing white blood cell action and potentiating germ-killing antibiotics.

Vasoconstriction = Reduces Edema and Swelling

Aniogenesis and proliferation of fibroblasts Enhancement and regulation of the immune system

Antibacterial on it's own and Leukocytes (WBC) kill bacteria more efficiently Endothelial cell proliferation, resolves brusing and reduces scarring

Slight Ph shift to Alkaline, body temperature regulates

Enhancement of some antibiotics.
WBC oxidative killing synergism

Collagen synthesis and cross linking Healing of nerve Endings and reduction in pain and pain cycles



hyperbaric worx

HYPERBARIC OXYGEN TREATMENT

Oxygen diffusion from the Plasma is optimised Addresses tissue hypoxia (provides more oxygen to tissues and organs)

Destroys harmful bacteria

Reduces swelling

(oedema)

Hyperbarics: The Complete Treatment Assists in reducing Inflammation

Improves blood flow (Ischemia)

Aids in the reduction of stress related symptoms Improves the effectiveness of the immune system



<u>Maintaining high-energy phosphate</u> <u>bonds</u>

- *HBOT can reduce lactic acid released from ischemic parts
- *HBOT increases ATP which is the energy factor used for nutrition and regeneration of tissues

Conditions Treated With Hyperbaric Therapy:



FDA Approved Conditions

Actinomycosis

Air or Gas Embolism

Carbon Monoxide

Poisoning and Smoke

Inhalation

Gas Gangrene

Cyanide poisoning

Crush Injury and other

Acute Traumatic Ischemias

Decompression Sickness

Diabetic Wounds

Necrotizing Soft Tissue

Infections

Osteomyelitis (Refractory)

Radiation Tissue Damage

Severe Anemia

Skin Grafts and Flaps

(Compromised)

Thermal Burns

Conditions Treated With Hyperbaric Therapy:



Off Label Conditions

ADD/ADHD

ALS

Alzheimer's

Anoxic Brain Injury

Autism

Bell's Palsy

Cancer

Cerebral Palsy

Chronic Fatigue

Chronic Inflammatory

Disease

Crohn's disease

Decreased Immune

Function

Diabetes

Fibromyalgia

General Wellness/

Prevention

Heart Disease

Infections

Immune Dysfunction

Lyme Disease

Macula Degeneration

Meniere's Disease

Migraines

Mitochondrial Disorders

Multiple Sclerosis

Near Drowning

Peripheral Neuropathy

Post Electrocution

Raynaud's Phenomenon

Reflex Sympathetic

Dystrophy Retinitis

Pigmentosa

Rheumatoid Arthritis

Severed Limbs

Sickle Cell Crisis

Spinal Cord Injury

Sports Injuries

Stroke

Surgery Pre and Post

Traumatic Brain Injury

Trigeminal Neuralgia

Vascular Disease

Venomous Bites

and other conditions

HBOC Treatments...CASE STUDIES





Crush Injury motorcycle accident



Fungal Infection following C- Section



HBOT in Multiplace chamber





Post 06 HBO sits



Post Surgery &HBOT

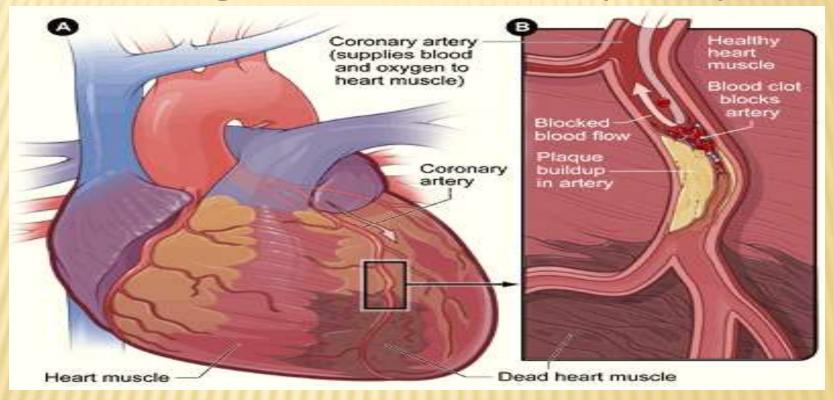


Post Graft

ISCHAEMIC HEART DISEASES



HBOT can do adequate oxygenation for heart muscle (myocardium) through plasma incase of blockage of involved coronary artery



Reference: Published data

HYPERBARIC OXYGEN THERAPY IN GLOBAL ISCHEMIA, ANOXIA, AND COMA TABLE 2 Human Studies

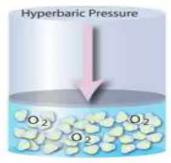
Author	Disto	Diagnosis	Number of Patients	Lough of Corne/Neuro Insult Pro-Hyperhoric Onygen Therapy (HBOT)	Timing of HBOT	HBOT PROTOCOL	Rosalto/ Conclusions
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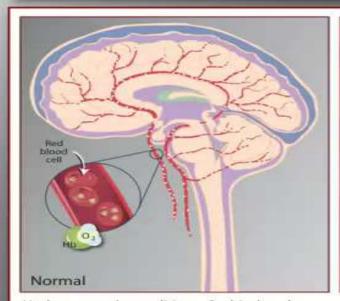
Transportation of Oxygen in the Human Brain Under Hyperbaric Conditions



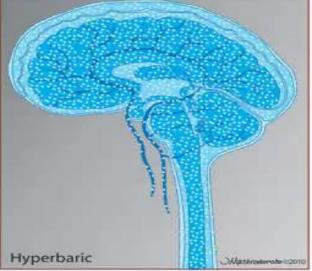




Oxygen (O₂) molecules become smaller under hyperbaric pressure and therefore more soluble. The smaller size allows oxygen to dissolve into all body fluids - plasma, cerebrospinal, interstitial, lymphatic, and synovial.



Under normal conditions, O₂ binds only to the hemoglobin (Hb) in red blood cells and is transported to the brain by blood supply.



Under hyperbaric conditions, the brain is saturated by oxygen, allowing O₂ to reach areas previously inaccessible by blood supply or blocked by damage.

- 1- HBO reduces chance of stroke recurrences
- 2- HBO relieves muscle spasticity and increases muscle strength
- 3- HBO improves mobility and fine motor function
- 4- HBO improves walking and balance
- 5- HBO increases exercise capacity
- 6- HBO improves sensitivity
- 7- HBO improves mental function including speech and memory
- 8 HBO improves visual acuity
- 9- HBO improves bowel and bladder control and reduces sexual deficit

STROKE



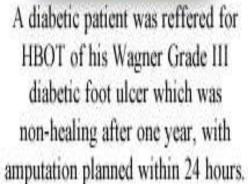


Diabetic foot injury











After three weeks (26 HBOT sessions) his wound showed considerable healing.



After 50 completed HBO sessions healing is evident.



Diabetic foot and foot ulcers



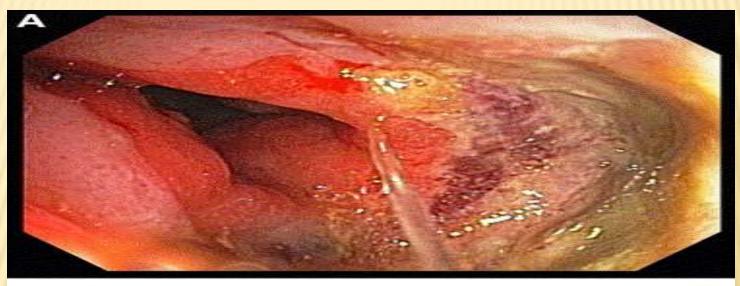
Success of a graft after HBOT multiple sessions





Radiation induced rectal ulcer treatment

Delayed Radiation Injury (Soft Tissue and Bony Necrosis)







Necrotizing Soft Tissue Infections





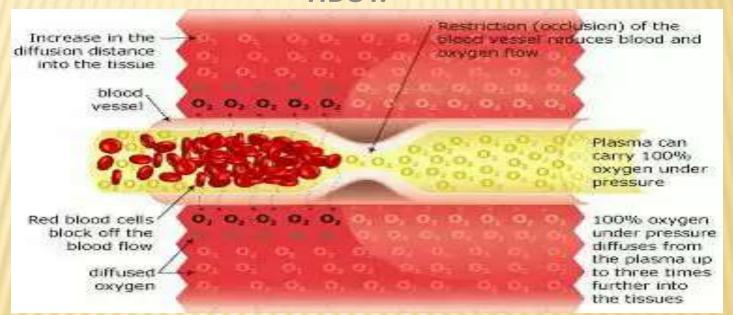


A non-healing Achilles tendon rupture following dehiscence of the suture line. After a second failed attempt at suturing the wound, HBO therapy was considered. The wound completely healed after 20 HBO treatments at 2.0 atmospheres absolute for 90 minutes, each with routine wound care and supplemental oral anibiotic therapy.



Arterial Insufficiencies: Central Retinal Artery Occlusion

Visual improvement has been reported even with delay of HBOT.



HBOC Treatments: CASE STUDIES -

Venous Stasis Ulcers



Mrs. J has been having problems with her legs for about 10 years. She had Varicose veins and developed chronic venous stasis ulcers . Her skin had formed open sites that didn't bleed and didn't hurt. But a foul-smelling odor and constant drainage had kept her from leaving her house.

Through a strict regimen of debriding and customized dressings and Hyperbaric Oxygen, her wound healed completely in a matter of weeks. Efforts were then made to improve her diet, start her on a walking program, and lace her in customized stockings. Today, she's not only wound-free for the first time in a decade, she also has better circulation in her legs.





HBOC Treatments: CASE STUDIES -

Diabetic Cellulites



This is the foot of a 48 years old, diabetic and smoker. He had been feeling extremely sick and started complaining of his feet bothering him. Thinking that it would just get better with time and rest he stayed at home and in bed. When the problem started becoming unbearable, he decided to have a doctor look at his feet who diagnosed he had cellulites of the feet. He was then admitted for IV antibiotics and further wound care. He continued this treatment including debridments for the next week. Ten days later, he was able to leave the hospital walking on both feet.



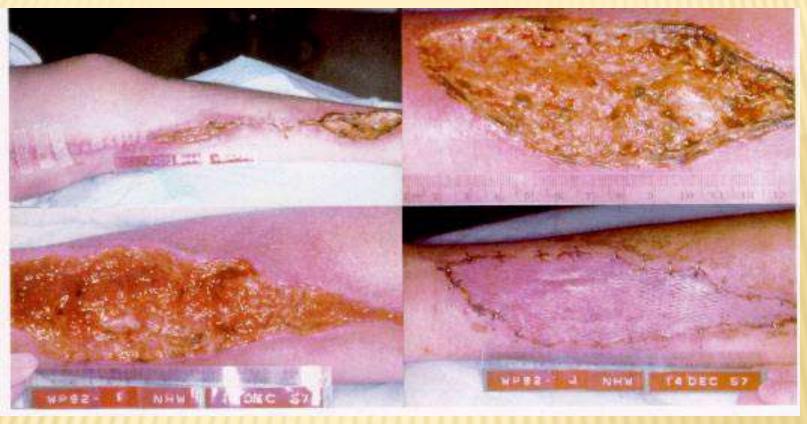




HBOC TREATMENTS: CASE STUDIES -

Diabetic Wound Infections





64 year old female insulin dependent diabetic, 18 days post femoral anterior tibial bypass. Post op wound infection grew out pseudomonas and failed to heal. Completely healed with 40 HBO treatments and skin grafting

HBOC TREATMENTS: CASE STUDIES -

Non Healing Wounds





55 year old female post transmetatarsal amputation secondary to gangrene of the hallux. Wound healing impaired by chronic steroid therapy for arthritis. Complete healing after 37 adjunctive hyperbaric treatments

HBOC TREATMENTS : CASE STUDIES - OsteoRadionecrosis





52 year old male post surgical excision of cancer of the floor of the mouth followed by radiation therapy. Presented with osteoradionecrosis of the mandible and oral cutaneous fistula which failed to heal with conventional therapy. Complete resolution with a total of 91 Hyperbaric treatments and two flap procedures.

Our Product: Hyperbaric Oxygen Chamber





Our products conform to ASME-PVHO I-NFPA codes and standards

Our Product: Hyperbaric Oxygen Chamber M 3





MODEL: M-3

Our products conform to ASME-PVHO I-NFPA codes and standards

Our Product: Capacity & Specifications (M - 8)



Main Chamber Capacity

- Two Beds and Four Seats OR
- One Bed and Six Seats OR
- Eight Seats OR
- Customized Combination to be specified while ordering

Air Lock Chamber Capacity

One Seat

Chamber Specifications

- Length (overall) : 7000 mm
- Inside diameter : 2400 mm
- Length (Main chamber) : 5500 mm
- Length (airlock chamber): 1500 mm
- Access door opening: 800 mm W x 1800 mm H (Rectangular)
- Penetrations Additional 4 nozzles,50mm dia will be provided at suitable location..
- Working pressure : 3 ATA
- Pressurization rate: 0.1 kg/cm2/minute to 0.25 kg/cm2/min adjustable

Our Product: Capacity & Specifications (M-3)



Main Chamber Capacity

- One Bed OR
- One Bed and Two Seats OR
- Four Seats

Chamber Specifications

Length (overall) : 3400 mmInside diameter : 1500 mm

Length (Main chamber) : 2800 mm

- Access door opening:800 mm W x 1100 mm H (Rectangular)
- Penetrations Additional 2 nozzles,50mm dia will be provided at suitable location..
- Working pressure : 3 ATA
- Pressurization rate: 0.1 kg/cm2/minute to 0.25 kg/cm2/min adjustable

PRODUCT UTILITIES FOR M-8 & M-3



UTILITIES

- Medical lock for main chamber
- Intercom /Sound powered communication system
- Oxygen & Carbon di oxide monitors with alarm
- CO2 Scrubber
- Fresh air ventilation
- Oxygen masks with dump facility for exiled CO2. with built in microphone.
- Entertainment facility
- Air conditioning of chamber for comfort
- Optional patient monitoring system for ECG, EEG, Pulse oxymetry etc.
- Optional PC-PLC based controls with HMI interface & data logging and Patient history spread sheet
- 100% Redundancy with auto and manual controls.
- Breathing quality air supply
- Detailed documentation with hard & soft copies and on line support through Team viewer software.

HYPERBARIC OXYGEN CHAMBERS: SYSTEMS



- Air Supply System with Ventilation
- Inter Communication System
- Oxygen Supply System with masks
- Temperature & Humidity System
- Closed Circuit TV
- O₂ and CO₂ Analyzers
- Fire Fighting System
- PLC based SCADA system

HYPERBARIC OXYGEN CHAMBERS: SYSTEMs



- Manufactured as per ASME- PVHO 1-NFPA
- 3rd Party design certification
- Material Selection
- Q.A.P. of process
- Certified Welders
- Radiography of Joints
- FEA for safe stress levels as per standards
- View Port manufacturing facility

ASME International











BREATHING QUALITY COMPRESSED AIR SYSTEM

- Breathing Quality Air
- Oil Free compressors
- 3 Stage Ultra Filters
- All valves with class 6 leakage standards
- Certified SS pipeline welding (Argon Arc welding)
- Zero Failure rate
- Redundancy in system









Oxygen System

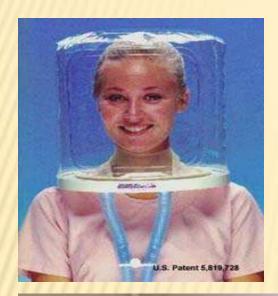






- Oxygen Manifold
- Oxygen Masks designed for patient comfort
- Ensures 100 % delivery of Oxygen
- Needs a positive pressure during inspiration, amount of pressure is patient dependent
- Exhaled gases are released outside the treatment area





Oxygen System

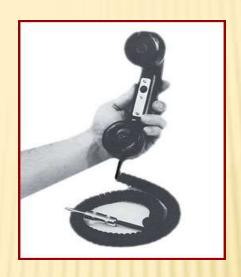
Oxygen Hoods

- Useful for patients who experience difficulty with mask
- Patient friendly, maintains eye contact
- Used in children



COMMUNICATION SYSTEM

- Sound Powered Two-way Handset
- Two-way microphone unit
- One to many Broadcasting
- Closed Circuit Cameras with remote pan and tilt functions.
 (Wireless option available)











CLIMATIC SYSTEM

- Maintains comfort conditions inside the chamber during treatment
- Uses Pneumatically operated Motors
- Parameters controlled by means of Controller with calibrated sensors





PATIENT MONITORING SYSTEM

- Gathers on-line information of Patients condition
- Datalogging facility of different parameters
- Patient history can be viewed
- Infrared system For Data Transmission









SAFETY SYSTEM

- Real time O₂ and CO₂ monitoring system
- Self Programmable Hi-Low limits & Audio/ Visual Alarms
- Fire fighting system as per NFPA standards for quick response
- Flameproof wiring
- Flameproof paints & fabric for upholstery.



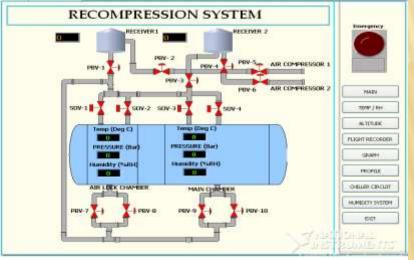




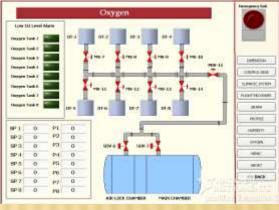


PLC & SCADA SYSTEM

- SCADA based command and control.
- Auto/Manual option
- Centralized control
- Data logging
- Report generation









MULTI UTILITY CONTROL PANEL



Centralized Control of all Parameters. Ergonomically Designed



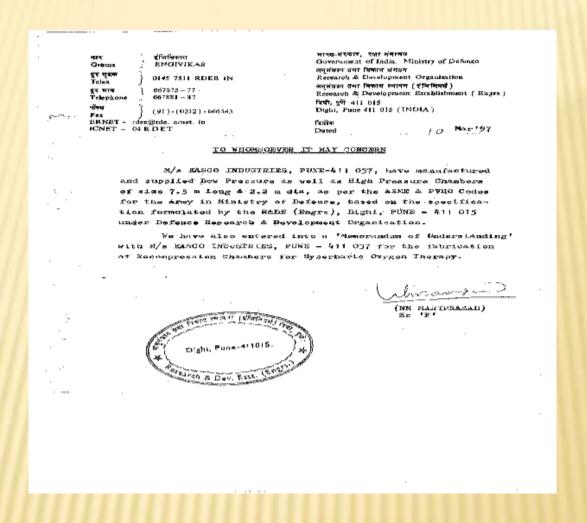
We have successfully Manufactured, Installed and commissioned Hyperbaric Chambers at following locations:

- 4 Bed +4 Seats Chamber at Leh
- 2 Bed + 4 Seats Chamber at Indraprasth Apollo Hospital, New Delhi
- 1 Bed Chamber installed at Sikkim
- 2 Bed Chamber at Apollo Hospital, Ahmedabad
- 2 Bed Chamber at Kargil
- 2 Bed + 4 Seating Chamber at IAM, Banglore
- 2 Bed+4 Seatung Chamber at Oxymed Hospital, Chennai
- 2 Bed+4 Seats Chamber at Godrej Memorial Hospital, Mumbai
- 2 Bed+4 Seats Chamber at Yashwantrao Chavan Hospital Pune
- 1 Bed+6 Seats Chamber at Amruta Hospital Kochi
- 1 Bed+2 Seats Chamber at S.P.Fort Hospital Trivendrum

MINISTRY OF DEFENCE GOVT.OF INDIA R&D ENGINEERS DEFENCE RESEARCH & DEVELOPMENT LAB. CERTIFICATION



BAROMEDIC HEALTHCRE PVT.LTD. Has technology transfer agreement with Kasco Industries who have MOU with DRDO Lab. For manufacturing Hyperbaric & Hypobaric chambers as per ASME-PVHO I-NFPA



HYPERBARIC OXYGEN CHAMBERS: CERTIFICATIONS



ABS Group Inc.

The American Standard for Over 135 Years

CERTIFICATE OF COMPLIANCE

Date: 21 June 1999

This is to certify that ABS Group, Inc. has carried out a full independent design review of the subject hyperbanic chamber in accordance with the design criteria indicated below.

Manufacturer: Kasco Industries

Component Description: Hyperbaric Chamber

Application: The equipment is installed and configured for use as an oxygen chamber in

hospital facility.

Basis of Review: The design review of the drawings and calculations performed in

accordance with the latest editions and addenda of the applicable

sections of the following codes or standards:

ASME PVHO-1,

Section VIII, Division 1

NFPA 99, Chapter 19

Exceptions: The equipment is designed in accordance with the above codes and standards with the following exception(s):

The equipment is not Code Stamp "U", as required by section 1.2.2 of the ASME PVHO-1, arid section 19-2.2.1 of the NFPA 99.

This certificate is valid for as long as no changes in design, materials, or repairs are made to the subject equipment, structure, item of materials, or components.

Issued in Houston, Texas, USA on 21 June 1999

For Indraprastha Medical Corneration Ltd.

Engineering Manager, ABS Group, Inc.

Certificate of Compliance From ABS Conforming to ASME-PVHO I & NFPA Standards

HYPERBARIC OXYGEN CHAMBERS



Core Competence

- Experienced Design team with expertise in Finite Element Analysis as per ASME - PVHO I
- Well established manufacturing facility
- Third party approved and certified designs
- Implementations of latest NFPA safety standards
- State of the art View Port manufacturing as per ASME-PVHO I

HYPERBARIC OXYGEN CHAMBERS



Core Competence contd..

- Certified compressed air and oxygen pipeline
- State of the art Control Panel and monitoring systems
- Experience in setting up total Hyperbaric facilities as per Standards
- Back up provided by Panel of experts in Implementing HBOT

HYPERBARIC OXYGEN THERAPY

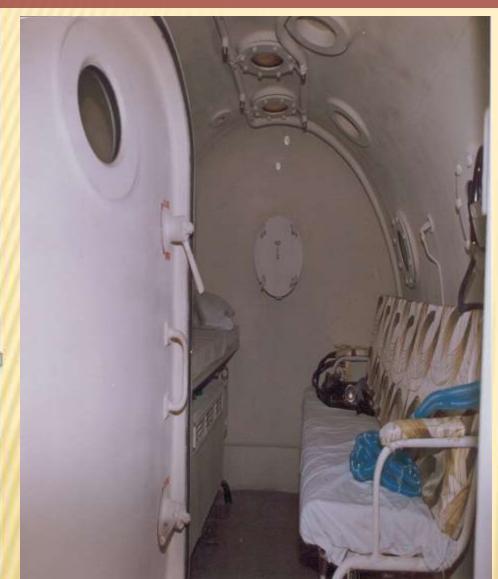


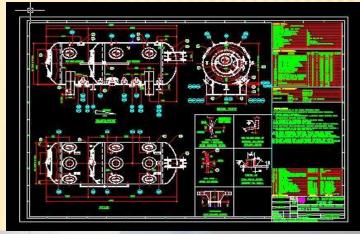
Our patients need the best that medical science can offer to alleviate suffering.
We as physicians must do all we can to ensure early recovery and minimal morbidity.

Conclusions

- We are poised at an exciting era of the revival of Hyperbaric Medicine.
- Must familiarize referring Physicians with recent research and remove skepticism of the sixties
- Strict scientific and ethical practices must be followed.









Two Bed Chamber at Apollo Hospital

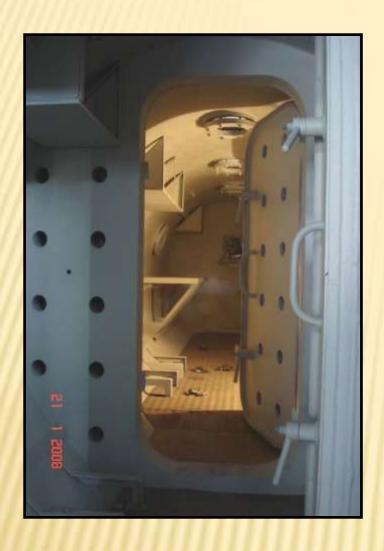






Monoplace Chamber with Air Lock Chamber at North Sikkim







2 Lying+4 Seating Chamber for IAM, Banglore





HBO CHAMBER AT GODREJ HOSPITAL, MUMBAI

MODEL M3 INTERIOR



ONE BED & TWO SITTING PATIENTS



MODEL M8: 2 BEDS & 4 SEATS OR 1 BED & 6 SEATS OR 8 SEATS COMBINATION AVAILABLE





Our Support - Installation and Training...



Installation

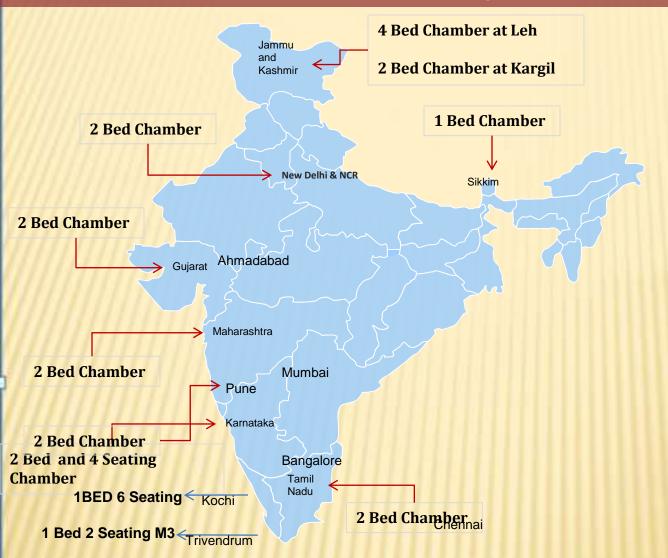
- Installation and Commissioning is done by an Expert team of BHPL
- Installation is offered for certification and Certificate obtained by BHPL
- Periodic visits undertaken by BHPL team to Supervise and verify the Performance
- On line support by our expert team is offered for operations of the system

Training

- Documented Operating Procedures are provided for the operations of the HBOT Centre
- On site Training for Doctors and Nurses are Provided by BHPL Team
- Periodic visits for up gradation of training and discussions on case Histories is arranged
- On line access to Expert Doctors is provided for support and help

Our Installations and Key Customers...













HBOT Centre:



Requirements, Investment and Returns...

MULTI-PLACE CHAMBER MODEL M8

AREA/SPACE REQUIREMENT

4.5 (M) Wide X 10 (M) Depth X 3.5 (M) Height is required

CAPITAL INVESTMENT

INR 2.1 Crores All Inclusive (Equipment, Taxes as Excise and VAT, Installation, Certification and Training)

REVENUE (70% Utilization)

INR 2.10 Crores per year

PAY BACK PERIOD

3.5 Years

BREAK EVEN

Less than 30 % Utilization

HBOT Centre:



An Overview of Requirements, Investment and Returns

METAL MONO/MULTI-PLACE CHAMBER MODEL M3

AREA/SPACE REQUIREMENT

3 (M) Wide X 6 (M) Depth X 3 (M) Height is required

CAPITAL INVESTMENT

INR 75 Lakhs All Inclusive (Equipment, Taxes as Excise and VAT, Installation, Certification and Training)

REVENUE (70% Utilization)

INR 94.5 Lakhs per year

PAY BACK PERIOD

4.02 Years

BREAK EVEN

Less than 29 % Utilization

Our Support - Installation and Training...



Installation

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BAROMEDIC HEALTHCARE PVT. LTD.



Thank You

For further information & details please contact D.S.KAMLAPURKAR (M)+91 9373450731 Email:info@baromedichealthcare.com Web site: www.baromedichealthcare.com