

Hyperbaric Chamber at PHD Reaches Milestone in Use of Atmospheric Medicine

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DALLAS - When the Hyperbaric Medicine Unit at Presbyterian Hospital of Dallas opened 15 years ago, it was one of the only units of its kind in the region. Originally used to treat decompression illness in SCUBA divers (the bends) and carbon monoxide poisoning, the science of hyperbaric medicine slowly expanded as researchers theorized it could treat other ailments.

As the role of hyperbaric medicine has expanded over the years, so has the unit at Presbyterian Hospital of Dallas. The team of specially trained doctors and nurses recently completed their 50,000th treatment, making it one of the busiest hyperbaric programs in the Southwest.

"We knew the science was strong for treating acute cases of the bends and carbon monoxide poisoning, but theories on how well it would impact wound-healing and other diseases were still being investigated 15 years ago," said Dr. Jeffrey Stone, medical director of the Hyperbaric Medicine program at Presbyterian Hospital of Dallas. "Through the years, studies have proven time and again that hyperbaric medicine can be an important part of a team-approach to treating complex medical cases.

"Completing 50,000 treatments is a great milestone, but the number in and of itself isn't important," Stone added. "What's important and meaningful to our staff is the knowledge that we've been able to improve the quality of life of the numerous patients who have come here for treatment."

The 1,100-cubic-foot compression chamber, which uses compressed air at simulated depths of up to six atmospheres, treats patients with chronic non-healing wounds, appropriate diabetic foot wounds, bone infections, radiation soft tissue injuries, failing skin grafts and muscle flaps, and other injuries that can benefit from the oxygen-rich environment. The chamber can treat up to seven patients at a time. Each treatment, or dive, lasts about two hours.

Most patients are treated at a pressure equivalent to two times normal atmospheric pressure, which when breathing 100 percent oxygen provides the patient with 10 times more oxygen than normal air at sea level. The gas levels in the patients' blood and organs undergo all the same physiological changes that people experience when deep-sea diving.

"Most of us take our body's ability to heal for granted," said Dr. Laurie Aten, a hyperbaric specialist on the medical staff at Presbyterian Hospital of Dallas. "In fact, the healing process is quite complex."

During normal healing, cells proliferate and divide, releasing growth factors. New blood vessels are created, a collagen matrix is formed, and remodeling occurs. These steps follow an orderly, predictable course. Each step depends upon the availability of appropriate substrates and nutritional elements. For some patients, certain conditions alter this course and derail the healing process.

"When this happens, destructive processes can outpace healing, and the wound can become chronic," Aten said.

Demand for hyperbaric medicine has increased in recent years as the rate of diabetes has skyrocketed locally and around the country. Non-healing wounds are a common side-effect of the disease. There are about 16 million diabetics in the U.S., including about 1 million in Texas, and the number of individuals affected grows each year. Diabetes causes physiological changes in the eye and kidney. These changes, which affect blood circulation and nerve response, also occur in the foot, a common site for non-healing wounds.

"This year, almost 90,000 diabetic patients will undergo surgical amputation as a result of a non-healing wound," Stone said. "These amputees face a long, costly rehabilitation, and permanently reduced mobility and independence. Hyperbaric treatments are an important tool in treating diabetic wounds before it's too late."

Other conditions can also lead to the development of non-healing wounds, including peripheral vascular disease, arterial or venous ulcers, traumatic injury, complications following surgery, rheumatoid arthritis, congestive heart failure, lymphedema and other conditions which compromise circulation.

The hyperbaric medicine program at Presbyterian Hospital of Dallas is a division of the hospital's Institute for Exercise and Environmental Medicine, which is a joint collaboration with UT Southwestern Medical Center at Dallas. The hyperbaric medicine unit serves as the referral center for the Divers Alert Network and Dallas County Poison Control. All nurses and technologists are specially certified in hyperbaric medicine, and each R.N. is also certified in critical care medicine. It's one of only four centers in the United States that offers a hyperbaric medicine fellowship certified by the American College of Hyperbaric Medicine.

"Hyperbaric therapy can be a treatment by itself, for example decompression illness in SCUBA divers or carbon monoxide poisoning," Stone said, "but for most conditions it is part of the multidisciplinary care delivered by a team of physicians and surgeons."

About Presbyterian Hospital of Dallas

Established in 1966, PHD is the flagship hospital of Presbyterian Healthcare System, a member of the faith-based, nonprofit Texas Health Resources system. *US News and World Report* ranks PHD, a recognized clinical program leader, providing technologically advanced care to patients, among the nation's best hospitals in digestive disorders, orthopedics, and neurology and neurosurgery. The 866-bed facility has approximately 4,000 employees and an active medical staff of more than 1,000 physicians. For more information about PHD, visit <http://www.phscare.org/>.

About Texas Health Resources

Texas Health Resources is one of the largest faith-based, nonprofit health care delivery systems in the United States and the largest in North Texas in terms of patients served. THR controls 13 affiliated hospitals and a medical research organization, and is a corporate member or partner in seven additional hospitals and surgery centers. THR's family of hospitals includes Harris Methodist Hospitals, Arlington Memorial Hospital and Presbyterian Healthcare System. For more information about Texas Health Resources, visit <http://www.texashealth.org/>.



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