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Port access surgery

By creating a few small incisions across the chest and neck, Dr. Bradley Taylor of UPMC Presbyterian Hospital can repair or replace damaged heart valves through a ground-breaking surgical method called Port Access Surgery. This type of surgery, that allows patients to recover in approximately one week with substantially less pain, helps to regulate blood flow through the body and cure maladies such as mitral valve stenosis. This new Port Access method has been successfully completed eight times at UPMC, and more than times 3,000 world-wide.

The surgery involves many of the same steps as open-chest heart surgery but eliminates one of the most painful steps – the need to open the chest via a 12-inch incision in the sternum. With the Port Access procedure, a physician gains access to the diseased heart via small tubes, or ports, which are placed in three different positions across the body.

First, a small port is placed in a large blood vessel in the groin. A second one is placed in the neck. These tubes are threaded through the vascular system until they reach the heart. The

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ports deliver heart-stopping drugs and balloons at their tips are inflated, occluding blood flow. This allows the surgeon uninterrupted access to the diseased valve or valves. The blood is quickly re-routed to a heart-lung bypass machine which continues to circulate the blood through the body while the heart is temporarily stopped.

Once the surgical team ensures the patient is stabilized on the machine, surgeons perform valve repair or replacement through one or more additional ports inserted on both sides of the chest, between the ribs. The incision needed to gain access is approximately one and a half to three inches long. No large incisions or breaking of the sternum is necessary.

Once inside the chest, these tubes permit specialized instruments and cameras to move through the chest cavity. The surgeon operates by viewing real-time images on a large view screen, sent by the cameras inside the body. The additional ports allow the doctor to repair or replace diseased heart valves with surgical tools. The entire process takes about four and a half hours.

The most significant advantages to this type of surgery are shorter recovery time and decreased risk for infection. The traditional type of valve repair involves making an incision down the middle of the chest, opening of the rib cage, and putting the patient on a complete bypass system. This antiquated, highly utilized method leaves the patient susceptible to various infections because a large part of the internal body is exposed to outside air. Infections of this type are typically difficult to manage and can even lead to death. With the Port Access method,

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the chances of infection are drastically reduced in part because a smaller percentage of internal systems are exposed. The areas of camera and tool insertion are much smaller and no opening of the chest is required.

Sherry Case, a registered nurse and case manager following some of these patients, said recovery time is also shorter. “Typically, a patient will spend an average of eight weeks recovering from open heart surgery. With the Port Access method, full recovery is reduced to about three weeks, about half the typical recovery time for open heart surgery.”

Providing there are no complications, patients spend approximately one to three days in intensive care, followed by an additional three to seven days on a regular floor. Most can leave the hospital in one week, completing the other two to three weeks of healing at home with the help of outpatient rehabilitation services. This throughput process saves thousands of dollars in hospital costs for the patient, health systems and insurance companies.

With the Port Access procedure, the placement of instrumentation proves helpful to both the patient and surgical team. During a typical open heart case, where the chest is opened, all necessary surgical instruments lie above or on the patient. This crowding makes it cumbersome for the surgeon’s team. With the Port Access procedure, all instruments are placed at the side of the patient, creating a more open, streamlined situation for the surgeon. It also decreases the risk of injury to other patient body parts, such as hands or arms that may be bruised or damaged during a normal open heart procedure.

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Other advantages to this new surgery include a decrease in the amount of blood a patient must receive, a decrease in the chance of heart arrhythmias (a common side-effect of open heart surgery which requires ongoing treatment) and a large decrease in the amount of post-operative pain due to the decreased trauma inflicted upon internal organs.

Dr. Taylor spent more than four months perfecting this procedure from its pioneer, Dr. Hugo K. Vanermen. Dr. Vanerman works with the Department of Cardiovascular and Thoracic Surgery, Onze Lieve Vrouw Hospital, located outside of Brussels, Belgium. Vanerman has performed over 1,600 Port Access surgeries. He has received world-wide praise for this innovative procedure and published several papers in various medical journals, including the "Journal of Cardiovascular Medicine," "Circulation," a journal from the American Heart Association, and "Innovations: Technology & Techniques in Cardiothoracic & Vascular Surgery." Vanerman speaks at countless conferences and trains several specialized cardiac surgeons each year. Dr. Taylor worked alongside Vanermen in 2006, performing two or three cases a day. In obtaining this invaluable first-hand education, Brad Taylor brings the innovative Port Access process to Western Pennsylvania.

Providing certain conditions are met, any patient needing a cardiac valve repair or replacement may be a candidate for this procedure. The patient may not have any type of peripheral vascular disease, such as hardening of vessels (called "stenosis") or a history of deep vein thrombosis, a blot clot in the leg which can travel to the lung. Any history of hardening of the aorta (aortic stenosis) or the collapsing of a lung (pneumothorax) also disqualifies the patient

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from this procedure. A history of these conditions places the patient at severe risk for life-threatening complications. Patients with a history of these conditions who needs heart valve repair, they would still undergo the traditional open heart method.

Various diagnostic tests, including a cardiac catheterization, CT scans, MRI and X-rays are conducted to determine a patient's eligibility and detect abnormalities that may exclude a patient from this less invasive procedure.

With the advancement of technology, almost every medical discipline has undergone radical changes over the past 10 to 15 years. Surgery that uses long scopes was originally used in the 1960s and 1970s by gynecologists and urologists. In 1985, the first computer chip to magnify images to a large screen was invented. It wasn't until the early 90s that surgeons revolutionized many procedures by using scopes to complete long operations. By the late 1990s, all surgical disciplines had embraced the new form of surgery, except cardiology. Dr. Taylor believes this Port Access procedure will enlighten many cardiac surgeons and open new opportunities for less invasive surgeries.

Dr. Taylor graduated with a bachelor's of Arts and his master's in public health from Emory University in Atlanta. He attended medical school at the University of Pittsburgh, where he also completed his residency. In addition to being a full-time heart surgeon, he also serves as an associate professor of thoracic surgery at the University of Pittsburgh Medical School. He is board certified by the American Board of Surgeons as well as the American Board of Cardio-thoracic Surgeons.

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