

Heart Valve Replacement

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The heart is a complex organ that keeps the entire human body functioning. The heart is made up of four chambers: the left and right atriums and the left and right ventricles. Separating each of the chambers is a heart valve, of which there are four. Oxygen-poor blood is first received in the right atrium from the superior and inferior vena cavae. The blood then passes through the tricuspid valve to the right ventricle. The right ventricle then releases the blood through the pulmonary valve and to the pulmonary trunk. The blood then goes to the lungs for gas exchange and returns to the heart. The now oxygenated blood is collected in the left atrium and passes through the mitral valve. This moves the blood to its final chamber, the left ventricle. Finally, once the blood exits through the aortic valve it is distributed to the rest of the body.

These heart valves open to allow blood to move through the heart and they also close to prevent the backflow of blood. If just one of these valves is not functioning properly (has problems opening or closing), the entire body is affected. This will force the heart to work harder to pump the same amount of blood and/or may lead to the back up of blood in the lungs and body (enabling the body from receiving sufficient oxygenated blood).

If a patient has heart valve problems the surgeon will decide if the patient's valve needs to be replaced or repaired. This decision is made once the surgery has begun. If the valve only needs to be repaired the surgeon will mend the valve to help it; however, if the valve needs to be replaced the surgeon will remove the diseased valve and replace it with a new valve insert.

The surgeon can also make the choice to do a traditional heart valve surgery or a minimally invasive heart valve surgery. Both of the surgeries accomplish the same thing; however, a minimally invasive surgery spares the patients from having a large scar. A minimally invasive surgery makes smaller incisions which require a surgeon with a higher level of surgical skill. This surgery is usually performed on narrowed valves or valves that do not close properly on the mitral and aortic valves. For traditional heart valve surgery an incision is made down the sternum, leaving the patient with a large scar; however, allowing the surgeon to have full access to the heart.

To perform a heart valve surgery, surgeons will choose between two types of valves: a mechanical or a biological valve. A mechanical valve is the most common replacement; it is made from plastics and metal, making it very sturdy. A mechanical replacement can last up to 20 or 30 years. A biological valve (tissue valve) is donated either from humans, pigs, or cows. Biological valves are less sturdy, making them only last 10 to 15 years and needing to be replaced. For a surgeon to decide on which replacement to use, he/she will take age, occupation, size of valve, heart's strength, heart's rhythm, and number of new valves into account. With a mechanical valve the patient will need to take life-long blood thinners, unlike the biological valve.

A non-surgical option to valve replacement is balloon valvotomy. This is usually used for patients who have mitral valve stenosis and for older patients with aortic stenosis (narrowing of valve). For balloon valvotomy a catheter is inserted into a blood vessel in the groin and then guided by x-ray to the heart. The tip of the balloon is directed to the narrowed valve and inflated. This puts the valve replacement in position and finally the balloon is deflated and removed. This new procedure allows the patients to not have any incisions on their chest and allows for a shorter hospital stay. Balloon valvotomy is a great advancement proving there is room for expansion.

Heart valve replacements have come a long way over the years and has so much further to go. Heart valve replacements have saved thousands of people each year, and keep these people living.

Works Cited

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