Preventing and Treating Heart Disease: The Vital Role of Cardiology and Surgery

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Description

Cardiology is the medical specialty that focuses on diagnosing, treating and preventing diseases of the heart and blood vessels. The cardiovascular system, which includes the heart, arteries, veins and capillaries, is essential for circulating blood throughout the body, delivering oxygen and nutrients and removing waste products. Cardiovascular diseases (CVDs), such as coronary artery disease, heart failure, arrhythmias and congenital heart defects, are the leading causes of death globally. Cardiology encompasses various diagnostic tools, medications and nonsurgical interventions, but many heart conditions require surgical solutions, making cardiac surgery a crucial aspect of cardiology. Cardiac surgeries are performed when less invasive treatments, such as medications or catheter-based interventions, are insufficient to address the underlying heart condition. These surgeries can range from life-saving emergency procedures to elective operations aimed at improving quality of life and preventing future complications. One of the most common types of heart surgery is Coronary Artery Bypass Grafting (CABG). It is primarily used to treat Coronary Artery Disease (CAD), where the coronary arteries, which supply blood to the heart muscle, become narrowed or blocked due to the buildup of plaque.

Chest pain

CAD can lead to angina (chest pain), heart attacks and heart failure if left untreated. In CABG, a surgeon takes a healthy blood vessel from another part of the body, such as the leg or chest and grafts it onto the blocked coronary artery, bypassing the blockage and restoring blood flow to the heart. CABG has proven to be highly effective in reducing symptoms, preventing heart attacks and prolonging life in patients with severe coronary artery disease. It is often performed in conjunction with other cardiology interventions like angioplasty or stenting, which open up blocked arteries using catheters and small balloons. Valvar heart disease is another major area of concern in cardiology and surgery is often necessary to treat conditions like valve stenosis (narrowing) or regurgitation (leakage). The heart has four valves (aortic, mitral, tricuspid and pulmonary), which ensure that blood flows in the correct direction through the heart. When these valves malfunction, the heart must work harder to pump blood, leading to heart failure if not corrected.

Valve repair, when possible, is preferable to valve replacement, as it preserves the patient's native tissue and function. Techniques such as valve ring annuloplasty (tightening or reshaping the valve) or leaflet repair (fixing tears or deformities in the valve flaps) can restore normal function. If repair is not feasible, valve replacement is required. Prosthetic valves are either mechanical (made of metal or plastic) or biological (derived from animal tissues) and the choice depends on the patient's age, lifestyle and medical history. Advances in cardiology have also introduced transcatheter valve replacement, a minimally invasive option where a new valve is delivered a catheter rather than through open-heart surgery. The aorta, the body's largest artery, carries blood from the heart to the rest of the body. Conditions affecting the aorta, such as aortic aneurysms (abnormal bulging of the aortic wall) or dissections (tears in the aortic wall), are life-threatening and often require surgery. Cardiothoracic surgeons perform procedures to repair or replace the weakened section of the aorta using synthetic grafts, preventing rupture or further damage. Aortic dissection is a particularly dangerous condition, often leading to sudden death if not treated immediately. In acute cases, emergency surgery is performed to remove the dissected portion of the aorta and restore blood flow. Cardiologists play a critical role in diagnosing and managing aortic diseases before surgical intervention, often using imaging techniques like echocardiography, CT scans, or MRIs to monitor the progression of the condition. Arrhythmias are abnormal heart rhythms that can result in an irregular heartbeat, leading to symptoms like dizziness, shortness of breath, or even sudden cardiac arrest. Atrial fibrillation (AFib), the most common arrhythmia, increases the risk of stroke and heart failure. While cardiologists often manage arrhythmias with medications or catheter-based procedures such as ablation (where abnormal electrical pathways are destroyed), surgery may be required for more severe cases.

Congenital heart defects

The Maze procedure is a surgical technique used to treat AFib. It involves creating a series of incisions or ablations in the atria (the heart's upper chambers) to form a "maze" of scar tissue that disrupts the abnormal electrical signals causing the arrhythmia. This restores the heart's normal rhythm. In some cases, the surgery is combined with other heart procedures,

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such as valve repair or CABG, to address multiple cardiac issues simultaneously. Congenital Heart Defects (CHDs) are structural abnormalities present at birth that affect the normal function of the heart. These can range from simple defects, like small holes between the heart chambers, to complex conditions, like hypoplastic left heart syndrome, where parts of the heart are underdeveloped. Pediatric cardiology plays a vital role in diagnosing these conditions, but many CHDs require surgery for long-term management. Surgeries for congenital heart defects are highly specialized and tailored to the specific needs of the patient. Common procedures include closing septal defects (holes in the heart), repairing abnormal blood vessels, and reconstructing underdeveloped heart chambers. Advances in both pediatric cardiology and surgery have significantly improved the outcomes for children born with heart defects, allowing many to lead normal, healthy lives. Although cardiologists do not perform surgeries themselves, they play a crucial role in the preoperative and postoperative care of patients undergoing heart surgery. Cardiologists use diagnostic tools like electrocardiogram, echocardiography, stress tests, and cardiac catheterization to evaluate heart function and determine whether surgery is necessary. After surgery, cardiologists monitor patients for complications, manage medications and oversee cardiac rehabilitation, which helps patients recover and regain strength. Close collaboration between cardiologists and cardiac surgeons is essential for ensuring the best possible outcomes. Cardiology and cardiac surgery are deeply interconnected fields, working together to treat a wide range of heart diseases. While cardiologists use medical therapies and non-surgical interventions to manage conditions like coronary artery disease, valve disorders, arrhythmias and congenital heart defects, surgery often provides the definitive solution. Advances in both fields, including minimally invasive techniques and trans catheter procedures, continue to improve patient outcomes, offering hope for those with complex cardiovascular conditions.

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