Surgery

Surgical Divisions

Surgery is performed by specially trained medical physicians known as surgeons. General surgery training and training in some surgical specialties, such as neurosurgery, which concerns the brain, spinal cord, and peripheral nerves, and orthopedic surgery, which repairs the bones and joints, is conducted in association with a hospital and usually lasts from five to seven years. At the end of this period, known as a residency, the general surgeon may receive further training to learn the skills of a particular specialty, or subdivision, of surgery. Surgical subdivisions include, for example, thoracic surgery, which is concerned with diseases of the chest; vascular surgery, which corrects diseases of blood vessels; plastic surgery, which reconstructs or cosmetically improves features of the body; and pediatric surgery, which is concerned with operations on children.

General surgery is the broadest surgical division, focusing on surgery of the abdomen, the breast, and the endocrine organs-the glands and tissues of the body that secrete hormones for controlling growth, development, and other bodily functions. General surgeons operate on the appendix, colon, small intestine, gallbladder, stomach, pancreas, spleen, and liver. Pediatric surgery is a subdivision of general surgery that focuses on the unique conditions of operating on infants and children-their organ systems are not fully developed, and anesthetics and medications must be adjusted for their smaller bodies. The most common pediatric procedures include correction of birth defects and removal of abnormal growths that are potentially cancerous.

Colon and rectal surgery procedures are performed on the anus, rectum, and intestines. These include operations to treat hemorrhoids (enlarged veins around the anus), polyps (usually benign growths), and cancer. In a colostomy, surgeons remove all or part of the large intestine. An opening called a stoma is then made in the abdomen, which allows the colon to empty waste into a specially designed plastic bag located outside of the body. An ileostomy is a similar operation in which the lower part of the small intestine is routed to the stoma.

Neurological surgery involves operations on the brain and spinal column. These procedures include excising, or cutting out, brain tumors and removing ruptured discs in the spine, an operation known as a laminectomy. The use of specialized imaging equipment, such as computed tomography (CT) and magnetic resonance imaging (MRI), permits surgeons to identify the exact location of some tumors, making surgery to remove these growths more precise and less harmful to surrounding healthy tissue.

Gynecology encompasses a variety of procedures, including surgery to remove diseased reproductive organs such as the uterus (Hysterectomy); surgery to remove tumors of the breast; and procedures to correct female infertility or facilitate permanent contraception (Tubal Sterilization). Obstetrics is a division that focuses on all aspects of a woman's pregnancy and may involve procedures such as a cesarean section, the surgical delivery of a newborn infant, or an episiotomy, a surgical enlargement of the vaginal opening.

Ophthalmic surgery involves operations on the eye and often requires the use of microsurgical techniques performed under a microscope. Such procedures include

the removal of a cataract (a clouding of the lens of the eye) and implantation of an artificial lens to restore vision; reconnection of a detached retina to the back of the eyeball; and radial keratotomy (RK), an operation on the cornea to correct nearsightedness.

Orthopedic surgery entails operations on bones, muscles, and joints. Orthopedic surgery allows for the replacement of hip and knee joints with artificial joints made of special metals and plastics. Fractures in bones are repaired with the implantation of pins, metal plates, and screws. These techniques greatly reduce the time needed for healing and recuperation. A subdivision of orthopedic surgery is sports medicine, which treats injuries and coordinates physical rehabilitation of amateur and professional athletes.

Otolaryngology involves the medical and surgical treatment of diseases of the ears, nose, tongue, larynx (vocal cords), and neck, which includes the esophagus, trachea, and blood vessels. Treated diseases include cancers of the head and neck. Radiation therapy and chemotherapy regimens have reduced the need for radical operative removal of these cancers. Significant advances have also been made in restoring the ability to swallow and speak following operations of the neck.

Plastic surgery encompasses cosmetic procedures to improve appearance and reconstruct damaged parts of the body such as skin and underlying muscle. Cosmetic procedures include enlarging or reducing the size of the breasts; rhinoplasty (cosmetic surgery on the nose); face lift (cosmetic surgery to tighten facial tissues); and blepharoplasty (cosmetic surgery on the eyelids). Reconstructive procedures include modifying tissues and scars to minimize deformities due to birth defects, prior operations, or traumatic events like car accidents. New developments in three-dimensional computer software imaging help plastic surgeons simulate the results of a particular procedure to show a patient the visual results possible before surgery is performed.

Thoracic surgery deals with surgery of the lungs, chest wall, heart, and large blood vessels of the chest. Typical procedures include the removal of malignant cancers and correction of structural birth defects in the lungs and chest. Cardiac surgery is a subdivision of thoracic surgery. Cardiac surgeons perform over 400,000 heart operations annually in the United States. These include coronary artery bypass graft (CABG) surgery, which restores blood flow through vessels blocked by atherosclerosis (a buildup of plaque on the inner walls of the arteries); heart valve replacement surgery, which replaces damaged or worn heart valves with artificial valves; and heart transplants, in which a patient's diseased heart is replaced by the healthy heart of a donor.

Vascular surgery involves replacing or repairing blood vessels, particularly arteries that deliver oxygenated blood to the body tissues. Operations on major abdominal arteries that carry blood to the legs or brain are performed to restore blood flow diminished by atherosclerosis. A procedure known as carotid artery endartarectomy-removal of blockages in the carotid artery in the neck-reduces the incidence of stroke in some patients. Weakness in a blood vessel wall can result in the development of an aneurysm, a dangerous widening of the blood vessel. Large aneurysms, which can rupture and cause death, are removed surgically and the blood vessel is reconstructed using a synthetic substitute.

Urology deals with kidney disorders, including malignancies, bladder and ureter problems, kidney stones, male infertility and reproductive disorders, and diseases and malignancies of the prostate gland in males. One of the most common operations is transurethral resection of the prostate (TURP), which removes portions of an enlarged prostate.