

# Glossary

## A

**abdominal cavity** Superior portion of the abdomin-opelvic cavity that contains the stomach, spleen, liver, gallbladder, most of the small intestine, and part of the large intestine.

**abdominopelvic cavity** A cavity inferior to the diaphragm that is subdivided into a superior abdominal cavity and an inferior pelvic cavity.

**abduction** Movement away from the midline of the body.

**abortion** The premature loss (spontaneous) or removal (induced) of the embryo or nonviable fetus; miscarriage due to a failure in the normal process of developing or maturing.

**abscess** A localized collection of pus and liquefied tissue in a cavity.

**absorption** Intake of fluids or other substances by cells of the skin or mucous membranes; the passage of digested foods from the gastrointestinal tract into blood or lymph.

**acetylcholine** A neurotransmitter liberated by many peripheral nervous system neurons and some central nervous system neurons. It is excitatory at neuromuscular junctions but inhibitory at some other synapses.

**acquired immunodeficiency syndrome (AIDS)** A disease caused by the human immunodeficiency virus (HIV). Characterized by a positive HIV-antibody test, low helper T cell count, and certain indicator diseases (for example Kaposi's sarcoma, pneumocystis carinii pneumonia, tuberculosis, fungal diseases). Other symptoms include fever or night sweats, coughing, sore throat, fatigue, body aches, weight loss, and enlarged lymph nodes.

**acrosome** A lysosome like organelle in the head of a sperm cell containing enzymes that facilitate the penetration of a sperm cell into a secondary oocyte.

**actin** A contractile protein that is part of thin filaments in muscle fibers.

**action potential** An electrical signal

that propagates along the membrane of a neuron or muscle fiber (cell); a rapid change in membrane potential that involves a depolarization followed by a repolarization. Also called a nerve action potential or nerve impulse as it relates to a neuron, and a muscle action potential as it relates to a muscle fiber.

**active transport** The movement of substances across cell membranes against a concentration gradient, requiring the expenditure of cellular energy (ATP).

**adaptation** The adjustment of the pupil of the eye to changes in light intensity. The property by which a sensory neuron relays a decreased frequency of action potentials from a receptor, even though the strength of the stimulus remains constant; the decrease in perception of a sensation over time while the stimulus is still present.

**adduction** Movement toward the midline of the body.

**adenosine triphosphate (ATP)** The main energy currency in living cells; used to transfer the chemical energy needed for metabolic reactions. ATP consists of the purine base adenine and the five-carbon sugar ribose, to which are added, in linear array, three phosphate groups.

**adhesion** Abnormal joining of parts to each other.

**adipocyte** Fat cell, derived from a fibroblast.

**adrenal cortex** The outer portion of an adrenal gland, divided into three zones; the zona glomerulosa secretes mineralocorticoids, the zona fasciculata secretes glucocorticoids, and the zona reticularis secretes androgens.

**adrenal glands** Two glands located superior to each kidney. Also called the suprarenal glands.

**adrenal medulla** The inner part of an adrenal gland, consisting of cells that secrete epinephrine, norepinephrine, and a small amount of dopamine in response to stimulation by sympathetic preganglionic neurons.

**adrenocorticotrophic hormone (ACTH)** A hormone produced by the anterior pituitary that influences the production and secretion of certain hormones of the adrenal cortex.

**aerobic** Requiring molecular oxygen.

**aerobic respiration** The production of ATP (36 molecules) from the complete oxidation of pyruvic acid in mitochondria. Carbon dioxide, water, and heat are also produced.

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**afferent arteriole** A blood vessel of a kidney that divides into the capillary network called a glomerulus; there is one afferent arteriole for each glomerulus.

**albinism** Abnormal, nonpathological, partial, or total absence of pigment in skin, hair, and eyes.

**aldosterone** A mineralocorticoid produced by the adrenal cortex that promotes sodium and water reabsorption by the kidneys and potassium excretion in urine.

**allantois** A small, vascularized outpouching of the yolk sac that serves as an early site for blood formation and development of the urinary bladder.

**alleles** Alternate forms of a single gene that control the same inherited trait (such as type A blood) and are located at the same position on homologous chromosomes.

**allergen** An antigen that evokes a hypersensitivity reaction.

**alpha cell** A type of cell in the pancreatic islets (islets of Langerhans) in the pancreas that secretes the hormone glucagon. Also termed an A cell.

**alveolar duct** Branch of a respiratory bronchiole around which alveoli and alveolar sacs are arranged.

**alveolar sac** A cluster of alveoli that share a common opening.

**alveolus** A small hollow or cavity; an air sac in the lungs; milk-secreting portion of a mammary gland. Plural is alveoli.

**Alzheimer's disease (AD)** Disabling neurological disorder characterized by dysfunction and death of specific cerebral neurons, resulting in widespread intellectual impairment, personality changes, and fluctuations in alertness.

**amenorrhea** Absence of menstruation.

**amnion** A thin, protective fetal membrane that develops from the epiblast; holds the fetus suspended in amniotic fluid. Also called the "bag of waters."

**amniotic fluid** Fluid within the amniotic cavity derived from maternal blood and wastes from the fetus.

**amphiarthrosis** A slightly movable joint, in which the articulating bony surfaces are separated by fibrous connective tissue or fibrocartilage to which both are attached; types are syndesmosis and symphysis.

**ampulla** A saclike dilation of a canal or duct. Dilated terminal portion of the ductus deferens. Widest, longest portion of the uterine tube.

**anabolism** Synthetic, energy-requiring reactions whereby small molecules are built up into larger ones.

**anaerobic** Not requiring oxygen.

**anal canal** The last 2 or 3 cm of the rectum; opens to the exterior through the anus.

**analgesia** Pain relief; absence of the sensation of pain.

**anaphase** The third stage of mitosis in which the chromatids that have separated at the centromeres move to opposite poles of the cell.

**anastomosis** An end-to-end union or joining of blood vessels, lymphatic vessels, or nerves. The plural is anastomoses.

**anatomical position** A position of the body universally used in anatomical descriptions in which the body is erect, the head is level, the eyes face forward, the upper limbs are at the sides, the palms

face forward, and the feet are flat on the floor.

**anatomy** The structure or study of the structure of the body and the relationship of its parts to each other.

**androgen** Masculinizing sex hormone produced by the testes in males and the adrenal cortex in both sexes; responsible for libido (sexual desire); the two main androgens are testosterone and dihydrotestosterone.

**anemia** Condition of the blood in which the number of functional red blood cells or their hemoglobin content is below normal.

**aneurysm** A thin, weakened section of the wall of an artery or a vein that bulges outward, forming a balloonlike sac.

**angina pectoris** A pain in the chest related to reduced coronary circulation due to coronary artery disease (CAD) or spasms of vascular smooth muscle in coronary arteries.

**angiogenesis** The formation of blood vessels in the extraembryonic mesoderm of the yolk sac, connecting stalk, and chorion at the beginning of the third week of development.

**antagonist** A muscle that has an action opposite that of the prime mover (agonist) and yields to the movement of the prime mover.

**anterior pituitary** Anterior lobe of the pituitary gland. Also called the adenohypophysis.

**anterior root** The structure composed of axons of motor (efferent) neurons that emerges from the anterior aspect of the spinal cord and extends laterally to join a posterior root, forming a spinal nerve. Also called a ventral root.

**anterolateral** At the front and away from the midline.

**antibody** A protein produced by plasma cells in response to a specific antigen; the antibody combines with that antigen to neutralize, inhibit, or destroy it. Also called an immunoglobulin or Ig.

**anticoagulant drug** A drug that promotes clotting.

**antidiuretic** Substance that inhibits urine formation.

**antidiuretic hormone (ADH)** Hormone produced by neurosecretory cells in the paraventricular and supraoptic nuclei of the hypothalamus that stimulates water reabsorption from kidney tubule cells into the blood and vasoconstriction of arterioles. Also called vasopressin.

**antigen** A substance that has immunogenicity (the ability to provoke an immune response) and reactivity (the ability to react with the antibodies or cells that result from the immune response); derived from the term antibody generator. Also termed a complete antigen.

**antigen-presenting cell APC** Special class of migratory cell that processes and presents antigens to T cells during an immune response; APCs include macrophages, B cells, and dendritic cells, which are present in the skin, mucous membranes, and lymph nodes.

**antioxidant** A substance that inactivates oxygen-derived free radicals. Examples are selenium, zinc, beta carotene, and vitamins C and E.

**antioxidant** A substance that inactivates oxygen-derived free radicals, such as selenium, zinc, beta-carotene, and vitamins C and E.

**anuria** A daily urine output of less than 50 mL.

**anus** The distal end and outlet of the rectum.

**aorta** The largest artery of the body.

**aortic body** Cluster of chemoreceptors on or near the arch of the aorta that respond to changes in blood levels of oxygen, carbon dioxide, and hydrogen ions (H<sup>+</sup>).

**apex** The pointed end of a conical structure, such as the apex of the heart.

**aphasia** Loss of ability to express oneself properly through speech or loss of verbal comprehension.

**apnea** Temporary cessation of breathing.

**apoptosis** Programmed cell death; a normal type of cell death that removes unneeded cells during embryological development, regulates the number of cells in tissues, and eliminates many potentially dangerous cells such as cancer cells.

**aqueous humor** The watery fluid, similar in composition to cerebrospinal fluid, that fills the anterior cavity of the eye.

**arachnoid mater** The middle of the three meninges (coverings) of the brain and spinal cord. Also termed the arachnoid.

**arachnoid villus** Berrylike tuft of the arachnoid mater that protrudes into the superior sagittal sinus and through which cerebrospinal fluid is reabsorbed into the bloodstream.

**arch of the aorta** The most superior portion of the aorta, lying between the ascending and descending segments of the aorta.

**areola** Any tiny space in a tissue. The pigmented ring around the nipple of the breast.

**arrector pili** Smooth muscles attached to hairs; contraction pulls the hairs into a vertical position, resulting in "goose bumps."

**arrhythmia** An irregular heart rhythm. Also called a dysrhythmia.

**arteriole** A small, almost microscopic, artery that delivers blood to a capillary.

**artery** A blood vessel that carries blood away from the heart.

**arthritis** Inflammation of a joint.

**arthrology** The study or description of joints.

**arthroplasty** Surgical replacement of joints, for example, the hip and knee joints.

**articular capsule** Sleeve-like structure around a synovial joint composed of a fibrous capsule and a synovial membrane. Also called a joint capsule.

**articular cartilage** Hyaline cartilage attached to articular bone surfaces.

**articular disc** Fibrocartilage pad between articular surfaces of bones of some synovial joints. Also called a meniscus.

**ascending colon** The part of the large intestine that passes superiorly from the cecum to the inferior border of the liver, where it bends at the right colic (hepatic) flexure to become the transverse colon.

**association area** Large cortical region on the lateral surfaces of the occipital, parietal, and temporal lobes and on the frontal lobes anterior to the motor areas connected by many motor and sensory axons to other parts of the cortex; concerned with motor patterns, memory, concepts of word-hearing and word-seeing, reasoning, will, judgment, and personality traits.

**asthma** Usually allergic reaction characterized by smooth muscle spasms in bronchi resulting in wheezing and difficult breathing. Also called bronchial asthma.

**astrocyte** A neuroglial cell having a star shape that participates in brain development and the metabolism of neurotransmitters, helps form the blood-brain barrier, helps maintain the proper balance of  $K^+$  for generation of nerve impulses, and provides a link between neurons and blood vessels.

**ataxia** A lack of muscular coordination, lack of precision.

**atherosclerosis** A progressive disease characterized by the formation in the walls of large and medium-sized arteries of lesions called atherosclerotic plaques.

**atherosclerotic plaque** A lesion that results from accumulated cholesterol and smooth muscle fibers (cells) of the tunica media of an artery; may become obstructive.

**atom** Unit of matter that makes up a chemical element; consists of a nucleus (containing positively charged protons and uncharged neutrons) and negatively charged electrons that orbit the nucleus.

**Atrial fibrillation (AF)** Asynchronous contraction of cardiac muscle fibers in the atria that results in the cessation of atrial pumping.

**atrial natriuretic peptide (ANP)** Peptide hormone, produced by the atria of the heart in response to stretching, that inhibits aldosterone production and thus lowers blood pressure; causes natriuresis, increased urinary excretion of sodium.

**atria** The upper chambers of the heart.

**atrioventricular (AV) bundle** The part of the conduction system of the heart that begins at the atrioventricular (AV) node, passes through the cardiac skeleton separating the atria and the ventricles,

then extends a short distance down the interventricular septum before splitting into right and left bundle branches. Also called the bundle of His (HIZ).

**atrioventricular (AV) node** The part of the conduction system of the heart made up of a compact mass of conducting cells located in the septum between the two atria.

**atrioventricular (AV) valves** A heart valve made up of membranous flaps or cusps that allows blood to flow in one direction only, from an atrium into a ventricle.

**atrophy** A decrease in the size of cells without subsequent decrease in the size of the affected tissue or organ; wasting away.

**auditory ossicle** One of the three small bones of the middle ear called the malleus, incus, and stapes.

**auditory tube** The tube that connects the middle ear with the nose and nasopharynx region of the throat. Also called the eustachian tube or pharyngotympanic tube.

**autolysis** Self-destruction of cells by their own lysosomal digestive enzymes after death or in a pathological process.

**autonomic ganglion** A cluster of cell bodies of sympathetic or parasympathetic neurons located outside the central nervous system.

**autonomic nervous system (ANS)** Visceral sensory (afferent) and visceral motor (efferent) neurons. Autonomic motor neurons, both sympathetic and parasympathetic, conduct nerve impulses from the central nervous system to smooth muscle, cardiac muscle, and glands. So named because this part of the nervous system was thought to be self-governing or spontaneous.

**autophagy** Process by which worn-out organelles are digested within lysosomes.

**autopsy** The examination of the body after death.

**autosome** Any chromosome other than the X and Y chromosomes (sex chromosomes).

**axon** The usually single, long process of a nerve cell that propagates a nerve impulse toward the axon terminals.

## B

**ball-and-socket joint** A synovial joint in which the rounded surface of one bone moves within a cupshaped depression or socket of another bone, as in the shoulder or hip joint. Also called a spheroid joint.

**baroreceptor** Neuron capable of responding to changes in blood, air, or fluid pressure. Also called a stretch receptor.

**basal nucleus** One of a pair of clusters of gray matter deep in each cerebral hemisphere including the globus pallidus, putamen, and caudate nucleus.

**basement membrane** Thin, extracellular layer between epithelium and connective tissue consisting of a basal lamina and a reticular lamina.

**basophil** A type of white blood cell characterized by a pale nucleus and large granules that stain blue-purple with basic dyes.

**belly** Skeletal muscle tissue between the origin and insertion.

**beta cell** A type of cell in the pancreatic islets (islets of Langerhans) in the pancreas that secretes the hormone insulin. Also called a B cell.

**bicuspid valve** Atrioventricular (AV) valve on the left side of the heart. Also called the mitral valve or left atrioventricular valve.

**bile** A secretion of the liver consisting of water, bile salts, bile pigments, cholesterol, lecithin, and several ions that emulsifies lipids prior to their digestion.

**bile canaliculus** Small duct between hepatocytes of the liver that collects bile produced by the hepatocytes.

**bilirubin** An orange pigment that is one of the end products of hemoglobin breakdown in the hepatocytes and is excreted as a waste material in bile.

**biopsy** The removal and microscopic examination of tissue from the living body for diagnosis.

**blastocyst** In the development of an embryo, a hollow ball of cells that consists of a blastocoel (the internal cavity), trophoblast (outer cells), and inner cell mass.

**blastocyst cavity** The fluid-filled cavity within the blastocyst.

**blastomere** One of the cells resulting from the cleavage of a fertilized ovum.

**blood-brain barrier (BBB)** A barrier consisting of specialized brain capillaries and astrocytes that prevents the passage of materials from the blood to the cerebrospinal fluid and brain.

**blood capillary** A microscopic blood vessel located between an arteriole and venule through which materials are exchanged between blood and interstitial fluid.

**blood clot** A gel that consists of the formed elements of blood trapped in a network of insoluble protein fibers.

**blood plasma** The extracellular fluid found in blood vessels; blood minus the formed elements.

**blood pressure (BP)** Force exerted by blood against the walls of blood vessels due to contraction of the heart and influenced by the elasticity of the vessel walls; clinically, a measure of the pressure in arteries during ventricular systole and ventricular diastole.

**blood reservoir** Systemic veins and venules that contain large amounts of blood that can be moved quickly to parts of the body requiring the blood.

**blood** The fluid that circulates through the heart, arteries, capillaries, and veins and that constitutes the chief means of transport within the body.

**body cavity** A space within the body that contains, protects, and supports internal organs.

**bolus** A soft, rounded mass, usually food, that is swallowed.

**bone remodeling** Replacement of old bone by new bone tissue.

**bony labyrinth** A series of cavities within the petrous portion of the temporal bone forming the vestibule, cochlea, and semicircular canals of the inner ear.

**brachial plexus** A network of nerve axons of the anterior rami of spinal nerves C5, C6, C7, C8, and T1. The

nerves that emerge from the brachial plexus supply the upper limb.

**bradycardia** A slow resting heart or pulse rate (under 50 beats per minute).

**brain stem** The portion of the brain immediately superior to the spinal cord, made up of the medulla oblongata, pons, and midbrain.

**brain** The part of the central nervous system contained within the cranial cavity.

**brain wave** Electrical signal that can be recorded from the skin of the head due to electrical activity of brain neurons.

**Broca's speech area** The part of the brain involved in translating thoughts into spoken words.

**bronchial tree** The trachea, bronchi, and their branching structures up to and including the terminal bronchioles.

**buffer system** A weak acid and the salt of that acid (which functions as a weak base). Buffers prevent drastic changes in pH by converting strong acids and bases to weak acids and bases.

**bulbourethral gland** One of a pair of glands located inferior to the prostate on either side of the urethra that secretes an alkaline fluid into the cavernous urethra. Also called a Cowper's gland.

**bulimia** A disorder characterized by overeating at least twice a week followed by purging by self-induced vomiting, strict dieting or fasting, vigorous exercise, or use of laxatives or diuretics. Also called binge-purge syndrome.

**bulk-phase endocytosis** A process by which most body cells can ingest membrane-surrounded droplets of interstitial fluid.

**bursa** A sac or pouch of synovial fluid located at friction points, especially about joints.

## C

**calcification** Deposition of mineral salts, primarily hydroxyapatite, in a framework formed by collagen fibers in which the tissue hardens. Also called mineralization.

**calcitonin (CT)** A hormone produced by the parafollicular cells of the thyroid gland that can lower the amount of blood calcium and phosphates by inhibiting bone resorption (breakdown of bone extracellular matrix) and by accelerating uptake of calcium and phosphates into bone matrix.

**calyx** A cup-like structure into which urine drains. Plural is calyces.

**canaliculi.** Small channels or canals, as in bones, where they connect lacunae. Singular is canaliculus.

**cancer** A group of diseases characterized by uncontrolled or abnormal cell division.

**carbohydrate** Organic compound consisting of carbon, hydrogen, and oxygen; the ratio of hydrogen to oxygen atoms is usually 2:1. Examples include sugars, glycogen, starches, and glucose.

**carcinogen** A chemical agent or radiation that produces cancer.

**cardiac cycle** A complete heartbeat consisting of systole (contraction) and diastole (relaxation) of both atria plus systole and diastole of both ventricles.

**cardiac muscle tissue** Striated muscle fibers (cells) that form the wall of the heart; stimulated by an intrinsic conduction system and autonomic motor neurons.

**cardiac notch** An angular notch in the anterior border of the left lung into which part of the heart fits.

**cardiac output (CO)** Volume of blood ejected from the left ventricle (or the right ventricle) into the aorta (or pulmonary trunk) each minute.

**cardiology** Cardiology The study of the heart and diseases associated with it.

**cardiovascular center** Groups of neurons scattered within the medulla oblongata that regulate heart rate, force of contraction, and blood vessel diameter.

**cardiovascular (CV) center** Groups of neurons scattered within the medulla oblongata that regulate heart rate, force of contraction, and blood vessel diameter.

**cardiovascular system** Body system that consists of blood, the heart, and blood vessels.

**carotene** Antioxidant precursor of vitamin A, which is needed for synthesis of photopigments; yellow-orange pigment present in the stratum corneum of the epidermis. Accounts for the yellowish coloration of skin. Also termed beta-carotene.

**carotid body** Cluster of chemoreceptors on or near the carotid sinus that respond to changes in blood levels of oxygen, carbon dioxide, and hydrogen ions.

**carpus** A collective term for the eight bones of the wrist.

**cartilage** A type of connective tissue consisting of chondrocytes in lacunae embedded in a dense network of collagen and elastic fibers and an extracellular matrix of chondroitin sulfate.

**cartilaginous joint** A joint without a synovial (joint) cavity where the articulating bones are held tightly together by cartilage, allowing little or no movement.

**catabolism** Chemical reactions that break down complex organic compounds into simple ones, with the net release of energy.

**cataract** Loss of transparency of the lens of the eye or its capsule or both.

**cauda equina** A tail-like array of roots of spinal nerves at the inferior end of the spinal cord.

**cecum** A blind pouch at the proximal end of the large intestine that attaches to the ileum.

**cell biology** The study of cellular structure and function. Also called cytology.

**cell cycle** Growth and division of a single cell into two identical cells; consists of interphase and cell division.

**cell division** Process by which a cell reproduces itself that consists of a nuclear division (mitosis) and a cytoplasmic division (cytokinesis); types include somatic and reproductive cell division.

**cell junction** Point of contact between plasma membranes of tissue cells.

**cell** The basic structural and functional unit of all organisms; the smallest

structure capable of performing all activities vital to life.

**cellular respiration** Oxidation of glucose to produce ATP; consists of glycolysis, formation of acetyl coenzyme A, the Krebs cycle, and the electron transport chain.

**cementum** Calcified tissue covering the root of a tooth.

**central nervous system (CNS)** That portion of the nervous system that consists of the brain and spinal cord.

**centromere** The constricted portion of a chromosome where the two chromatids are joined; serves as the point of attachment for the microtubules that pull chromatids during anaphase of cell division.

**centrosome** A dense network of small protein fibers near the nucleus of a cell, containing a pair of centrioles and pericentriolar material.

**cerebellar peduncle** A bundle of nerve axons connecting the cerebellum with the brain stem.

**cerebellum** The part of the brain lying posterior to the medulla oblongata and pons; governs balance and coordinates skilled movements.

**cerebral peduncle** One of a pair of nerve axon bundles located on the anterior surface of the midbrain, conducting nerve impulses between the pons and the cerebral hemispheres.

**cerebrospinal fluid (CSF)** A fluid produced by ependymal cells that cover choroid plexuses in the ventricles of the brain; the fluid circulates in the ventricles, the central canal, and the subarachnoid space around the brain and spinal cord.

**cerebrovascular accident (CVA)** Destruction of brain tissue (infarction) resulting from obstruction or rupture of blood vessels that supply the brain. Also called a stroke or brain attack.

**cerebrum** The two hemispheres of the forebrain (derived from the telencephalon), making up the largest part of the brain.

**cerumen** Waxlike secretion produced by ceruminous glands in the external auditory meatus (ear canal). Also termed ear wax.

**ceruminous gland** A modified sudoriferous (sweat) gland in the external auditory meatus that secretes cerumen (ear wax).

**cervical plexus** A network formed by nerve axons from the anterior rami of the first four cervical nerves and receiving gray rami communicantes from the superior cervical ganglion.

**cervix** Neck; any constricted portion of an organ, such as the inferior cylindrical part of the uterus.

**chemical reaction** The formation of new chemical bonds or the breaking of old chemical bonds between atoms.

**chemistry** The science of the structure and interactions of matter.

**chemoreceptor** Sensory receptor that detects the presence of a specific chemical.

**chief cell** The secreting cell of a gastric gland that produces pepsinogen, the precursor of the enzyme pepsin, and the enzyme gastric lipase. Also called a zymogenic cell. Cell in the parathyroid glands that secretes parathyroid hormone (PTH). Also called a principal cell.

**cholecystectomy** Surgical removal of the gallbladder.

**cholecystitis** Inflammation of the gallbladder.

**cholesterol** Classified as a lipid, the most abundant steroid in animal tissues; located in cell membranes and used for the synthesis of steroid hormones and bile salts.

**chondrocyte** Cell of mature cartilage.

**chondroitin sulfate** An amorphous extracellular matrix material found outside connective tissue cells.

**chordae tendineae** Tendon-like, fibrous cords that connect atrioventricular valves of the heart with papillary muscles.

**chorionic villus** Fingerlike projection of the chorion that grows into the decidua basalis of the endometrium and contains fetal blood vessels.

**chorion** The most superficial fetal membrane that becomes the principal embryonic portion of the placenta; serves a protective and nutritive function.

**choroid** One of the vascular coats of the eyeball.

**choroid plexus** A network of capillaries located in the roof of each of the four ventricles of the brain; ependymal cells around choroid plexuses produce cerebrospinal fluid.

**chromatid** One of a pair of identical connected nucleoprotein strands that are joined at the centromere and separate during cell division, each becoming a chromosome of one of the two daughter cells.

**chromatin** The threadlike mass of genetic material, consisting of DNA and histone proteins, that is present in the nucleus of a nondividing or interphase cell.

**chromosome** One of the small, threadlike structures in the nucleus of a cell, normally 46 in a human diploid cell, that bears the genetic material; composed of DNA and proteins (histones) that form a delicate chromatin thread during interphase; becomes packaged into compact rodlike structures that are visible under the light microscope during cell division.

**chronic bronchitis** A disorder characterized by excessive secretion of bronchial mucus accompanied by a cough.

**chronic obstructive pulmonary disease (COPD)** A disease, such as bronchitis or emphysema, in which there is some degree of obstruction of airways and consequent increase in airway resistance.

**chyme** The semifluid mixture of partly digested food and digestive secretions found in the stomach and small intestine during digestion of a meal.

**ciliary body** One of the three parts of the vascular tunic of the eyeball, the others being the choroid and the iris; includes the ciliary muscle and the ciliary processes.

**cilium** A hair or hairlike process projecting from a cell that may be used to move the entire cell or to move substances along the surface of the cell. Plural is cilia.

**circular fold** Permanent, deep, transverse fold in the mucosa and submucosa of the small intestine that increases the surface area for absorption. Also called plicae circulares.

**circulation** A collective term for the blood vessels of the body.

**circulation time** Time required for a drop of blood to pass through the pulmonary and systemic circulations; normally about 1 minute.

**circumduction** A movement at a synovial joint in which the distal end of a bone moves in a circle while the proximal end remains relatively stable.

**cirrhosis** A liver disorder in which the parenchymal cells are destroyed and replaced by connective tissue.

**cleavage** The rapid mitotic divisions following the fertilization of a secondary oocyte, resulting in an increased number of progressively smaller cells, called blastomeres.

**clitoris** An erectile organ of the female, located at the anterior junction of the labia minora, that is homologous to the male penis.

**clone** A population of identical cells.

**coccyx** The fused bones at the inferior end of the vertebral column.

**cochlea** A winding, cone-shaped tube forming a portion of the inner ear and containing the spiral organ (organ of Corti).

**collagen** A type of protein that comprises collagen fibers.

**colon** The portion of the large intestine consisting of ascending, transverse, descending, and sigmoid portions.

**colostrum** A thin, cloudy fluid secreted by the mammary glands a few days prior to or after delivery before true milk is produced.

**compact bone tissue** Bone tissue that contains few spaces between osteons (haversian systems); forms the external portion of all bones and the bulk of the diaphysis (shaft) of long bones; is found immediately deep to the periosteum and external to spongy bone.

**concha** Thin, scroll-shaped bone that increases the vascular and mucous membrane surface area of the nasal cavity; it also causes inhaled air to swirl, which, in turn, causes inhaled particles to become trapped in the mucus that lines the nasal cavity.

**conduction system** A group of autorhythmic cardiac muscle fibers that generates and distributes electrical impulses to stimulate coordinated contraction of the heart chambers; includes the sinoatrial (SA) node, the atrioventricular (AV) node, the atrioventricular (AV) bundle, the right and left bundle branches, and the Purkinje fibers.

**condyloid joint** A synovial joint structured so that an oval-shaped condyle of one bone fits into an elliptical cavity of another bone, permitting side-to-side and back-and-forth movements, such as the joint at the wrist between the radius and carpals. Also called an ellipsoidal joint.

**cone** The type of photoreceptor in the retina that is specialized for highly acute color vision in bright light.

**conjunctiva** The delicate membrane covering the eyeball and lining the eyes.

**connective tissue** One of the most abundant of the four basic tissue types in the body, performing the functions of binding and supporting; consists of relatively few cells in a generous matrix (the ground substance and fibers between the cells).

**continuous conduction** Propagation of an action potential (nerve impulse) in a step-by-step depolarization of each adjacent area of an axon membrane.

**convergence** A synaptic arrangement in which the synaptic end bulbs of several presynaptic neurons terminate on one postsynaptic neuron. The medial movement of the two eyeballs so that both are directed toward a near object being viewed in order to produce a single image.

**cornea** The nonvascular, transparent fibrous coat through which the iris of the eye can be seen.

**corona radiata** The innermost layer of granulosa cells that is firmly attached to the zona pellucida around a secondary oocyte.

**coronary artery disease (CAD)** A condition such as atherosclerosis that causes narrowing of coronary arteries so that blood flow to the heart is reduced. The result is coronary heart disease (CHD), in which the heart muscle receives inadequate blood flow due to an interruption of its blood supply.

**coronary** Refers to the coronary circulation (system of blood vessels) that supplies the heart wall.

**coronary sinus** A wide venous channel on the posterior surface of the heart that collects the blood from the myocardium.

**corpus albicans** A white fibrous patch in the ovary that forms after the corpus luteum regresses.

**corpus callosum** The great commissure of the brain between the cerebral hemispheres.

**corpuscule of touch** A sensory receptor for touch; found in dermal papillae, especially in the palms and soles. Also called a Meissner corpuscule.

**corpus luteum** A yellowish body in the ovary formed when a follicle has discharged its secondary oocyte; secretes estrogens, progesterone, relaxin, and inhibin.

**cramp** A spasmodic, usually painful contraction of a muscle.

**cranial cavity** A subdivision of the dorsal body cavity formed by the cranial bones and containing the brain.

**cranial nerve** One of 12 pairs of nerves that leave the brain; pass through foramina in the skull; and supply sensory and motor neurons to the head, neck, part of the trunk, and viscera of the thorax and abdomen. Each is designated by a Roman numeral and a name.

**crista** A crest or ridged structure. A small elevation in the ampulla of each semicircular duct that contains receptors for rotational acceleration or deceleration. Plural is cristae.

**crossing-over** The exchange of a portion of one chromatid with another during meiosis. It permits an exchange of genes among chromatids and is one factor that results in genetic variation of progeny.

**cryptorchidism** The condition of undescended testes.

**cupula** A mass of gelatinous material covering the hair cells of a crista; a sensory receptor in the ampulla of a semicircular canal stimulated when the head moves.

**Cushing's syndrome** Condition caused by a hyper-secretion of glucocorticoids characterized by spindly legs, "moon face," "buffalo hump," pendulous

abdomen, flushed facial skin, poor wound healing, hyperglycemia, osteoporosis, hypertension, and increased susceptibility to disease.

**cyanosis** Slightly bluish/dark-purple skin discoloration due to low oxygen levels in systemic blood.

**cyanotic** A bluish color due to the lack of oxygen.

**cyst** A vesicle or sac within the body.

**cytokinesis** Distribution of the cytoplasm into two separate cells during cell division; coordinated with nuclear division (mitosis).

**cytolysis** The rupture of living cells in which the contents leak out.

## D

**deciduous teeth** First set of teeth. Also called primary teeth, milk teeth, or baby teeth.

**deep** Away from the surface of the body or an organ.

**deep vein thrombosis (DVT)** The presence of a thrombus in a vein, usually a deep vein of the lower limbs.

**defecation** The discharge of feces from the rectum.

**dehydration** Excessive loss of water from the body or its parts.

**demineralization** Loss of calcium and phosphorus from bones.

**dendrite** A neuronal process that carries electrical signals, usually graded potentials, toward the cell body.

**dental caries** Gradual demineralization of the enamel and dentin of a tooth that may invade the pulp and alveolar bone. Also called tooth decay.

**dentin** The bony tissues of a tooth enclosing the pulp cavity.

**deoxyribonucleic acid (DNA)** A nucleic acid constructed of nucleotides consisting of one of four bases (adenine, cytosine, guanine, or thymine), deoxyribose, and a phosphate group; encoded in the nucleotides is genetic information.

**depression** Movement in which a part of the body moves inferiorly.

**dermal papilla** Fingerlike projection of the papillary region of the dermis that may contain blood capillaries, free nerve endings, or corpuscles of touch (Meissner corpuscles); singular is dermal papilla.

**dermatology** The medical specialty dealing with diseases of the skin.

**dermis** A layer of dense irregular connective tissue lying deep to the epidermis.

**descending colon** The part of the large intestine descending from the left colic (splenic) flexure to the level of the left iliac crest.

**detrusor muscle** Smooth muscle that forms the wall of the urinary bladder.

**developmental biology** The study of development from the fertilized egg to the adult form.

**deviated nasal septum** A nasal septum that does not run along the midline of the nasal cavity. It deviates (bends) to one side.

**diabetes mellitus** An endocrine disorder caused by an inability to produce or use insulin. It is characterized by: polyuria (excessive urine production), polydipsia (excessive thirst), and polyphagia (excess eating).

**diagnosis** Distinguishing one disease from another or determining the nature of a disease from signs and symptoms by inspection, palpation, laboratory tests, and other means.

**dialysis** The removal of waste products from blood by diffusion through a selectively permeable membrane.

**diaphragm** Any partition that separates one area from another, especially the dome-shaped skeletal muscle between the thoracic and abdominal cavities. A dome-shaped device that is placed over the cervix, usually with a spermicide, to prevent conception.

**diaphysis** The shaft of a long bone.

**diarrhea** Frequent defecation of liquid caused by increased motility of the intestines.

**diarthrosis** A freely movable joint; types are plane, hinge, pivot, condyloid, saddle, and ball-and-socket.

**diastole** In the cardiac cycle, the phase of relaxation or dilation of the heart muscle, especially of the ventricles.

**diastolic blood pressure (DBP)** The force exerted by blood on arterial walls during ventricular relaxation; the lowest blood pressure measured in the large arteries, normally less than 80 mmHg in a young adult.

**diencephalon** A part of the brain consisting of the thalamus, hypothalamus, and epithalamus.

**differentiation** The development of a cell from an unspecialized state to a specialized state.

**diffusion** A passive process in which there is a net or greater movement of molecules or ions from a region of high concentration to a region of low concentration until equilibrium is reached.

**digestion** The mechanical and chemical breakdown of food to simple molecules that can be absorbed and used by body cells.

**digestive system** Body system that ingests food, breaks it down, processes it, and eliminates wastes from the body.

**disease** An illness characterized by a recognizable set of signs and symptoms.

**diuretic** A substance that promotes excretion of water by the kidneys.

**dorsiflexion** Bending the foot in the direction of the dorsum (upper surface).

**dual innervation** The concept by which most organs of the body receive impulses from sympathetic and parasympathetic neurons.

**ductus arteriosus** A small vessel connecting the pulmonary trunk with the aorta; found only in the fetus.

**ductus deferens** The duct that carries sperm from the epididymis to the ejaculatory duct. Also called the vas deferens.

**ductus epididymis** A tightly coiled tube inside the epididymis, distinguished into a head, body, and tail, in which sperm undergo maturation.

**ductus venosus** A small vessel in the fetus that helps the circulation bypass the liver.

**duodenal gland** Gland in the submucosa of the duodenum that secretes an alkaline mucus to protect the lining of the small intestine from the action of enzymes and to help neutralize the acid in chyme. Also called Brunner's gland.

**duodenum** The first 25 cm of the small intestine, which connects the stomach and the ileum.

**dura mater** The outermost of the three meninges (coverings) of the brain and spinal cord.

**dysmenorrhea** Painful menstruation.

**dysplasia** Alteration in the size, shape, and organization of cells due to chronic irritation or inflammation; may progress to neoplasm or revert to normal if the irritation is removed.

**dyspnea** Shortness of breath; painful or labored breathing.

## E

**ectoderm** The primary germ layer that gives rise to the nervous system and the epidermis of skin and its derivatives.

**ectopic** Out of place; not in the normal position.

**edema** An abnormal accumulation of interstitial fluid.

**effector** An organ of the body, either a muscle or a gland, that is innervated by somatic or autonomic motor neurons.

**efferent arteriole** A vessel of the renal vascular system that carries blood from a glomerulus to a peritubular capillary.

**ejaculation** The reflex ejection or expulsion of semen from the penis.

**ejaculatory duct** A tube that transports sperm from the ductus (vas) deferens to the prostatic urethra.

**electrocardiogram** A recording of the electrical changes that accompany the cardiac cycle that can be detected at the surface of the body; may be resting, stress, or ambulatory.

**elevation** Movement in which a part of the body moves superiorly.



**embolus** A blood clot, bubble of air or fat from broken bones, mass of bacteria, or other debris or foreign material transported by the blood.

**embryoblast** A region of cells of a blastocyst that differentiates into the three primary germ layers—ectoderm, mesoderm, and endoderm—from which all tissues and organs develop; also called an inner cell mass.

**embryo** The young of any organism in an early stage of development; in humans, the developing organism from fertilization to the end of the eighth week of development.

**embryology** The study of development from the fertilized egg to the end of the eighth week of development.

**emission** Propulsion of sperm into the urethra due to peristaltic contractions of the ducts of the testes, epididymides, and ductus (vas) deferens as a result of sympathetic stimulation.

**emphysema** A lung disorder in which alveolar walls disintegrate, producing abnormally large air spaces and loss of elasticity in the lungs; typically caused by exposure to cigarette smoke.

**emulsification** The dispersion of large lipid globules into smaller, uniformly distributed particles in the presence of bile.

**enamel** The hard, white substance covering the crown of a tooth.

**endocardium** The layer of the heart wall, composed of endothelium and smooth muscle, that lines the inside of the heart and covers the valves and tendons that hold the valves open.

**endochondral ossification** The replacement of cartilage by bone. Also called intracartilaginous ossification.

**endocrine gland** A gland that secretes hormones into interstitial fluid and then the blood; a ductless gland.

**endocrine system** All endocrine glands and hormone-secreting cells.

**endocrinology** The science concerned with the structure and functions of endocrine glands and the diagnosis and treatment of disorders of the endocrine system.

**endocytosis** The uptake into a cell of

large molecules and particles by vesicles formed from the plasma membrane.

**endoderm** A primary germ layer of the developing embryo; gives rise to the gastrointestinal tract, urinary bladder, urethra, and respiratory tract.

**endometriosis** The growth of endometrial tissue outside the uterus.

**endometrium** The mucous membrane lining the uterus.

**endomysium** Invagination of the perimysium separating each individual muscle fiber (cell).

**endoneurium** Connective tissue wrapping around individual nerve axons.

**endoplasmic reticulum (ER)** A network of channels running through the cytoplasm of a cell that serves in intracellular transportation, support, storage, synthesis, and packaging of molecules. Portions of ER where ribosomes are attached to the outer surface are called rough ER; portions that have no ribosomes are called smooth ER.

**endosteum** The membrane that lines the medullary (marrow) cavity of bones, consisting of osteogenic cells and scattered osteoclasts.

**endothelium** The layer of simple squamous epithelium that lines the cavities of the heart, blood vessels, and lymphatic vessels.

**enteric nervous system (ENS)** The part of the nervous system that is embedded in the submucosa and muscularis of the gastrointestinal (GI) tract; governs motility and secretions of the GI tract.

**enzyme** A substance that accelerates chemical reactions; an organic catalyst, usually a protein.

**eosinophil** A type of white blood cell characterized by granules that stain red or pink with acid dyes.

**ependymal cell** Neuroglial cell that covers choroid plexuses and produces cerebrospinal fluid (CSF); it also lines the ventricles of the brain and probably assists in the circulation of CSF.

**epicardium** The thin outer layer of the heart wall, composed of serous tissue and mesothelium. Also called the visceral pericardium.

**epidemiology** Study of the occurrence and transmission of diseases and disorders in human populations.

**epidermis** The superficial, thinner layer of skin, composed of keratinized stratified squamous epithelium.

**epididymis** A comma-shaped organ that lies along the posterior border of the testis and contains the ductus epididymis, in which sperm undergo maturation. Plural is epididymides.

**epidural space** A space between the spinal dura mater and the vertebral canal, containing areolar connective tissue and a plexus of veins.

**epiglottis** A large, leaf-shaped piece of cartilage lying on top of the larynx, attached to the thyroid cartilage; its unattached portion is free to move up and down to cover the glottis (vocal folds and rima glottidis) during swallowing.

**epimysium** Fibrous connective tissue around muscles.

**epinephrine** Hormone secreted by the adrenal medulla that produces actions similar to those that result from sympathetic stimulation. Also called adrenaline.

**epineurium** The superficial connective tissue covering around an entire nerve.

**epiphyseal line** The remnant of the epiphyseal plate in the metaphysis of a long bone.

**epiphyseal plate** The hyaline cartilage plate in the metaphysis of a long bone; site of lengthwise growth of long bones. Also called the growth plate.

**epiphysis** The end of a long bone, usually larger in diameter than the shaft.

**episiotomy** A cut made with surgical scissors to avoid tearing of the perineum at the end of the second stage of labor.

**epithelial tissue** The tissue that forms the innermost and outermost surfaces of body structures and forms glands. Also called epithelium.

**erectile dysfunction (ED)** Failure to maintain an erection long enough for sexual intercourse. Previously known as impotence.

**erection** The enlarged and stiff state of the penis or clitoris resulting from the engorgement of the spongy erectile tissue with blood.

**erythema** Skin redness usually caused by dilation of the capillaries.

**erythrocyte** A red blood cell.

**erythropoietin (EPO)** A hormone released by the juxtaglomerular cells of the kidneys that stimulates red blood cell production.

**esophagus** The hollow muscular tube that connects the pharynx and the stomach.

**estrogens** Feminizing sex hormones produced by the ovaries; govern development of oocytes, maintenance of female reproductive structures, and appearance of secondary sex characteristics; also affect fluid and electrolyte balance, and protein anabolism.

**eupnea** Normal quiet breathing.

**eversion** The movement of the sole laterally at the ankle joint or of an atrioventricular valve into an atrium during ventricular contraction.

**exhalation** Breathing out; expelling air from the lungs into the atmosphere. Also called expiration.

**exocrine gland** A gland that secretes its products into ducts that carry the secretions into body cavities, into the lumen of an organ, or to the outer surface of the body.

**exocytosis** A process in which membrane-enclosed secretory vesicles form inside the cell, fuse with the plasma membrane, and release their contents into the interstitial fluid; achieves secretion of materials from a cell.

**extension** An increase in the angle between two bones; restoring a body part to its anatomical position after flexion.

**external auditory canal** A curved tube in the temporal bone that leads to the middle ear. Also called a meatus.

**external ear** The outer ear, consisting of the pinna, external auditory canal, and tympanic membrane (eardrum).

**external naris** The opening into the nasal cavity on the exterior of the body. Also called the nostril.

**external respiration** The exchange of respiratory gases between the lungs and blood. Also called pulmonary respiration.

**extracellular fluid (ECF)** Fluid outside body cells, such as interstitial fluid and plasma.

**extracellular matrix** The ground substance and fibers between cells in a connective tissue.

**eyebrow** The hairy ridge superior to the eye.

## F

**fascia** Large connective tissue sheets that wrap around groups of muscles.

**fascicle** A small bundle or cluster, especially of nerve or muscle fibers (cells).

**fasciculation** Abnormal, spontaneous twitch of all skeletal muscle fibers in one motor unit that is visible at the skin surface; not associated with movement of the affected muscle; present in progressive diseases of motor neurons, for example, poliomyelitis.

**fatty acid** A simple lipid that consists of a carboxyl group and a hydrocarbon chain; used to synthesize triglycerides and phospholipids.

**feces** Material discharged from the rectum and made up of bacteria, excretions, and food residue. Also called stool.

**feedback system** Cycle of events in which the status of a body condition is monitored, evaluated, changed, remonitored, and reevaluated.

**female reproductive cycle** General term for the ovarian and uterine cycles, the hormonal changes that accompany them, and cyclic changes in the breasts and cervix; includes changes in the endometrium of a nonpregnant female that prepares the lining of the uterus to receive a fertilized ovum. Less correctly termed the menstrual cycle.

**fertilization** Penetration of a secondary oocyte by a sperm cell, meiotic division of secondary oocyte to form an ovum, and subsequent union of the nuclei of the gametes.

**fetal circulation** The cardiovascular system of the fetus, including the placenta and special blood vessels involved in the exchange of materials between fetus and mother.

**fetus** In humans, the developing organism in utero from the beginning of the third month to birth.

**fever** An elevation in body temperature above the normal temperature of 37 degrees C due to a resetting of the hypothalamic thermostat.

**fibroblast** A large, flat cell that secretes most of the extracellular matrix of areolar and dense connective tissues.

**fibrous joint** A joint that allows little or no movement, such as a suture, syndesmosis, or interosseous membrane.

**fibrous tunic** The superficial coat of the eyeball, made up of the posterior sclera and the anterior cornea.

**fight-or-flight response** The effects produced upon stimulation of the sympathetic division of the autonomic nervous system. First of three stages of the stress response.

**filtration** The flow of a liquid through a filter (or membrane that acts like a filter) due to a hydrostatic pressure; occurs in capillaries due to blood pressure.

**fimbriae** Fingerlike structures, especially the lateral ends of the uterine (fallopian) tubes.

**fissure** A groove, fold, or slit that may be normal or abnormal.

**fixator** A muscle that stabilizes the origin of the prime mover so that the prime mover can act more efficiently.

**flaccid** Relaxed, flabby, or soft; lacking muscle tone.

**flagellum** Long, motile projection of the cell surface that is used for locomotion.

**flatus** Gas in the stomach or intestines; commonly used to denote expulsion of gas through the anus.

**flexion** Movement in which there is a decrease in the angle between two bones.

**follicle-stimulating hormone**

**(FSH)** Hormone secreted by the anterior pituitary; it initiates development of ova and stimulates the ovaries to secrete estrogens in females, and initiates sperm production in males.

**fontanel** A mesenchyme-filled space where bone formation is not yet complete, especially between the cranial bones of an infant skull.

**foramen ovale** An opening in the fetal heart in the septum between the right and left atria. A hole in the greater wing of the sphenoid bone that transmits the mandibular branch of the trigeminal (V) nerve.

**fornix** An arch or fold; a tract in the brain made up of association fibers, connecting the hippocampus with the mammillary bodies; a recess around the cervix of the uterus where it protrudes into the vagina.

**fovea centralis** A depression in the center of the macula lutea of the retina, containing cones only and lacking blood vessels; the area of highest visual acuity (sharpness of vision).

**fracture** Any break in a bone.

**free radical** An atom or group of atoms with an unpaired electron in the outermost shell. It is unstable, highly reactive, and destroys nearby molecules.

**frontal plane** A plane at a right angle to a midsagittal plane that divides the body or organs into anterior and posterior portions. Also called a coronal plane.

**fundus** The part of a hollow organ farthest from the opening; the rounded portion of the stomach superior and to the left of the cardia; the broad portion of the gallbladder that projects downward beyond the inferior border of the liver.

**G**

**gallbladder** A small pouch, located inferior to the liver, that stores bile and empties by means of the cystic duct.

**gallstone** A solid mass, usually containing cholesterol, in the gallbladder or a bile-containing duct; formed anywhere between bile canaliculi in the liver and the hepatopancreatic ampulla (ampulla of Vater), where bile enters the duodenum.

Also called a biliary calculus.

**gamete** A male or female reproductive cell; a sperm cell or secondary oocyte.

**ganglion** Group of neuronal cell bodies lying outside the central nervous system (CNS).

**gastric emptying** Passage of small food particles in chyme from the stomach through the pyloric sphincter into the small intestine.

**gastric gland** Gland in the mucosa of the stomach that produces gastric juice.

**gastric pit** Narrow channel within gastric glands.

**gastroenterology** The medical specialty that deals with the structure, function, diagnosis, and treatment of diseases of the stomach and intestines.

**gastrointestinal (GI) tract** A continuous tube running through the ventral body cavity extending from the mouth to the anus. Also called the alimentary canal.

**gastrulation** The migration of groups of cells from the epiblast that transform a bilaminar embryonic disc into a trilaminar embryonic disc with three primary germ layers; transformation of the blastula into the gastrula.

**gene** Biological unit of heredity; a segment of DNA located in a definite position on a particular chromosome; a sequence of DNA that codes for a particular mRNA, rRNA, or tRNA.

**genetics** The study of genes and heredity.

**genotype** The genetic makeup of an individual; the combination of alleles present at one or more chromosomal locations, as distinguished from the appearance, or phenotype, that results from those alleles.

**geriatrics** The branch of medicine devoted to the medical problems and care of elderly persons.

**gland** Specialized epithelial cell or cells that secrete substances; may be exocrine or endocrine.

**glans penis** The slightly enlarged region at the distal end of the penis.

**glaucoma** An eye disorder in which there is increased intraocular pressure due to an excess of aqueous humor.

**glomerular filtration** The process by which blood is filtered across the glomerulus and inner layer of the glomerular capsule.

**glomerular filtration rate (GFR)** The amount of filtrate that forms in both kidneys per minute (105 mL/min in females and 125 mL/min in males).

**glomerulus** A rounded mass of nerves or blood vessels, especially the microscopic tuft of capillaries that is surrounded by the glomerular (Bowman's) capsule of each kidney tubule. Plural is glomeruli.

**glucagon** A hormone produced by the alpha cells of the pancreatic islets (islets of Langerhans) that increases blood glucose level.

**glucocorticoids** Hormones secreted by the cortex of the adrenal gland, especially cortisol, that influence glucose metabolism.

**glucosuria** The presence of glucose in the urine; may be temporary or pathological. Also called glycosuria.

**glycogen** A highly branched polymer of glucose containing thousands of subunits; functions as a compact store of glucose molecules in liver and muscle fibers (cells).

**goblet cell** A goblet-shaped unicellular gland that secretes mucus; present in epithelium of the airways and intestines.

**goiter** An enlarged thyroid gland.

**Golgi complex** An organelle in the cytoplasm of cells consisting of four to six flattened sacs (cisternae), stacked on one another, with expanded areas at their ends; functions in processing, sorting, packaging, and delivering proteins and lipids to the plasma membrane, lysosomes, and secretory vesicles.

**gomphosis** A fibrous joint in which a cone-shaped peg fits into a socket.

**gonad** A gland that produces gametes and hormones; the ovary in the female and the testis in the male.

**gray matter** Areas in the central nervous system and ganglia containing neuronal cell bodies, dendrites, unmyelinated axons, axon terminals, and neuroglia; Nissl bodies impart a gray color and there is little or no myelin in gray matter.

**greater omentum** A large fold in the serosa of the stomach that hangs down like an apron anterior to the intestines.

**greater vestibular glands** A pair of glands on either side of the vaginal orifice that open by a duct into the space between the hymen and the labia minora. Also called Bartholin's glands.

**growth** An increase in size due to an increase in (1) the number of cells, (2) the size of existing cells as internal components increase in size, or (3) the size of intercellular substances.

**growth hormone (hGH)** Hormone secreted by the anterior pituitary that stimulates growth of body tissues, especially skeletal and muscular tissues. Also called human growth hormone (hGH) or somatotropin.

**gynecology** The branch of medicine dealing with the study and treatment of disorders of the female reproductive system.

**gynecomastia** Excessive development of the mammary glands in a male.

**gyrus** One of the folds of the cerebral cortex of the brain. Plural is gyri. Also called a convolution.

## H

**hair** A threadlike structure produced by hair follicles that develops in the dermis. Also called a pilus; plural is pili.

**hair follicle** Structure composed of epithelium and surrounding the root of a hair from which hair develops.

**hair root plexus** A network of dendrites arranged around the root of a hair as free or naked nerve endings that are stimulated when a hair shaft is moved.

**haustum** A pouch that characterizes the colon; caused by tonic contractions of the teniae coli. Plural is haustra.

**head** The superior part of a human, cephalic to the neck. The superior or proximal part of a structure.

**Heart block** An arrhythmia (dysrhythmia) of the heart in which the atria and ventricles contract independently because of a blocking of electrical impulses through the heart at some point in the conduction system.

**heart** Organ of the cardiovascular system responsible for pumping blood throughout the body; located in the thoracic cavity superior to the diaphragm.

**hematocrit** The percentage of blood made up of red blood cells. Usually measured by centrifuging a blood sample in a graduated tube and then reading the volume of red blood cells and dividing it by the total volume of blood in the sample.

**hematology** The study of blood.

**hemiplegia** Paralysis of the upper limb, trunk, and lower limb on one side of the body.

**hemodialysis** A type of dialysis that filters the patient's blood directly by removing wastes and excess electrolytes and fluid and then returning the cleansed blood to the patient.

**hemoglobin** A substance in red blood cells consisting of the protein globin and the iron-containing red pigment heme that transports most of the oxygen and some carbon dioxide in blood.

**hemophilia** A hereditary blood disorder where there is a deficient production of certain factors involved in blood clotting, resulting in excessive bleeding into joints, deep tissues, and elsewhere.

**hemopoiesis** Blood cell production, which occurs in red bone marrow after birth. Also called hematopoiesis.

**hemorrhage** Bleeding; the escape of blood from blood vessels, especially when the loss is profuse.

**hepatic portal circulation** The flow of blood from the gastrointestinal organs to the liver before returning to the heart.

**hepatocyte** A liver cell.

**herniated** Term used to describe an organ or tissue that is protruding; for example, a herniated disc.

**hinge joint** A synovial joint in which a convex surface of one bone fits into a concave surface of another bone, such as the elbow, knee, ankle, and interphalangeal joints. Also called a ginglymus joint.

**hirsutism** An excessive growth of hair in females and children, with a distribution similar to that in adult males, due to the conversion of vellus hairs into large terminal hairs in response to higher-than-normal levels of androgens.

**histology** Microscopic study of the structure of tissues.

**homeostasis** The condition in which the body's internal environment remains relatively constant within physiological limits.

**homologous chromosome** Two chromosomes that belong to a pair. Also called homologs.

**hormone** A secretion of endocrine cells that alters the physiological activity of target cells of the body.

**horn** An area of gray matter (anterior, lateral, or posterior) in the spinal cord.

**human chorionic gonadotropin (hCG)** A hormone produced by the developing placenta that maintains the corpus luteum.

**human chorionic** Pertaining to the human chorion.

**hyaluronic acid** A viscous, amorphous extracellular material that binds cells together, lubricates joints, and maintains the shape of the eyeballs.

**hymen** A thin fold of vascularized mucous membrane at the vaginal orifice.

**hypercapnia** An increase in the  $P_{CO_2}$  in arterial blood.

**hyperextension** Continuation of extension beyond the anatomical position, as in bending the head backward.

**hyperplasia** An abnormal increase in the number of normal cells in a tissue or organ, increasing its size.

**hypersecretion** Overactivity of glands resulting in excessive secretion.

**hypertension** High blood pressure.

**hypertonia** Increased muscle tone that is expressed as spasticity or rigidity.

**hypertonic solution** Solution that causes cells to shrink due to loss of water by osmosis.

**hypertrophy** An excessive enlargement or overgrowth of tissue without cell division.

**hyperventilation** A rate of inhalation and exhalation higher than that required to maintain a normal partial pressure of carbon dioxide in the blood.

**hypophyseal fossa** A depression within the sella turcica of the sphenoid bone where the pituitary gland is located

**hyposecretion** Underactivity of glands resulting in diminished secretion.

**hypothalamus** A portion of the diencephalon, lying beneath the thalamus and forming the floor and part of the wall of the third ventricle.

**hypothermia** Lowering of body temperature below 35°C; in surgical procedures, it refers to deliberate cooling of the body to slow down metabolism and reduce oxygen needs of tissues.

**hypoxia** Lack of adequate oxygen at the tissue level.

**hysterectomy** The surgical removal of the uterus.

**I**  
**ileocecal sphincter** A fold of mucous membrane that guards the opening from the ileum into the large intestine. Also called the ileocecal valve.

**ileum** The terminal part of the small intestine.

**immunity** The state of being resistant to injury, particularly by poisons, foreign proteins, and invading pathogens. Also called resistance.

**immunoglobulin** A protein synthesized by plasma cells derived from B lymphocytes in response to a specific antigen. Also called an antibody.

**immunology** The study of the responses of the body when challenged by antigens.

**implantation** The insertion of a tissue or a part into the body. The attachment of the blastocyst to the stratum basalis of the endometrium about 6 days after fertilization.

**inferior** Away from the head or toward the lower part of a structure. Also called caudal.

**inferior vena cava (IVC)** Large vein that collects blood from parts of the body inferior to the heart and returns it to the right atrium.

**infertility** Inability to conceive or to cause conception. Also called sterility.

**inflammation** Localized, protective response to tissue injury designed to destroy, dilute, or wall off the infecting agent or injured tissue; characterized by redness, pain, heat, swelling, and sometimes loss of function.

**infundibulum** The stalklike structure that attaches the pituitary gland to the hypothalamus of the brain. The funnel-shaped, open, distal end of the uterine (fallopian) tube.

**inhalation** The act of drawing air into the lungs. Also called inspiration.

**inheritance** The acquisition of body traits by transmission of genetic information from parents to offspring.

**inhibin** A hormone secreted by the gonads that inhibits release of follicle-stimulating hormone (FSH) by the anterior pituitary.

**inhibiting hormone** Hormone secreted by the hypothalamus that can suppress secretion of hormones by the anterior pituitary.

**insertion** The attachment of a muscle tendon to a movable bone or the end opposite the origin.

**insula** A triangular area of the cerebral cortex that lies deep within the lateral cerebral fissure, under the parietal, frontal, and temporal lobes.

**insulin** A hormone produced by the beta cells of a pancreatic islet (islet of Langerhans) that decreases the blood glucose level.

**integumentary system** Body system composed of the skin, hair, oil and sweat glands, nails, and sensory receptors

that helps maintain body temperature, protects the body, and provides sensory information.

**intercalated disc** An irregular transverse thickening of the sarcolemma that contains desmosomes, which hold cardiac muscle fibers (cells) together, and gap junctions, which aid in conduction of muscle action potentials from one fiber to the next.

**intercostal nerve** A nerve supplying a muscle located between the ribs. Also called thoracic nerve.

**intermediate filament** Protein filament, ranging from 8 to 12 nm in diameter, that may provide structural reinforcement, hold organelles in place, and give shape to a cell.

**internal ear** The inner ear or labyrinth, lying inside the temporal bone, containing the organs of hearing and balance.

**internal naris** One of two openings posterior to the nasal cavities opening into the nasopharynx. Also called choana.

**internal respiration** The exchange of respiratory gases between blood and body cells. Also called tissue respiration or systemic gas exchange.

**interneuron** Neuron whose axons extend only for a short distance and contact nearby neurons in the brain, spinal cord, or a ganglion; comprises the vast majority of neurons in the body. Also called association neuron.

**interosteonic canal** A minute passageway by means of which blood vessels and nerves from the periosteum penetrate into compact bone. Also called a perforating or Volkmann's canal.

**interphase** The period of the cell cycle between cell divisions, consisting of the G<sub>1</sub> (gap or growth) phase, when the cell is engaged in growth, metabolism, and production of substances required for division; S (synthesis) phase, during which chromosomes are replicated; and G<sub>2</sub> phase.

**interstitial fluid** The portion of extracellular fluid that fills the microscopic spaces between the cells of tissues; the internal environment of the body. Also called intercellular or tissue fluid.

**intervertebral disc** A pad of fibrocartilage located between the bodies of two vertebrae.

**intestinal gland** A gland that opens onto the surface of the intestinal mucosa and secretes digestive enzymes. Also called a crypt of Lieberkühn.

**intracellular fluid (ICF)** Fluid located within cells. Also called cytosol.

**intraepidermal macrophage** Epidermal dendritic cell that functions as an antigen-presenting cell (APC) during an immune response. Also called a Langerhans cell.

**intramembranous ossification** The method of bone formation in which the bone is formed directly in mesenchyme arranged in sheetlike layers that resemble membranes.

**inversion** The movement of the sole medially at the ankle joint.

**iris** The colored portion of the vascular tunic of the eyeball seen through the cornea that contains circular and radial smooth muscle; the hole in the center of the iris is the pupil.

**irritable bowel syndrome (IBS)** Disease of the entire gastrointestinal tract in which a person reacts to stress by developing symptoms (such as cramping and abdominal pain) associated with alternating patterns of diarrhea and constipation. Excessive amounts of mucus may appear in feces, and other symptoms include flatulence, nausea, and loss of appetite. Also known as irritable colon or spastic colitis.

**isotonic solution** A solution having the same concentration of impermeable solutes as cytosol.

## J

**jaundice** A condition characterized by yellowness of the skin, the white of the eyes, mucous membranes, and body fluids because of a buildup of bilirubin.

**jejunum** The middle part of the small intestine.

**joint** A point of contact between two bones, between bone and cartilage, or between bone and teeth. Also called an articulation or arthrosis.

## K

**keratin** An insoluble protein found in the hair, nails, and other keratinized tissues of the epidermis.

**keratinocyte** The most numerous of the epidermal cells; produces keratin.

**kidney** One of the paired reddish organs located in the lumbar region that regulates the composition, volume, and pressure of blood and produces urine.

**kidney stone** Insoluble stone occasionally formed from solidification of the crystals of urine salts.

**kinesiology** The study of the movement of body parts.

**kinesthesia** The perception of the extent and direction of movement of body parts; this sense is possible due to nerve impulses generated by proprioceptors.

## L

**labia majora** Two longitudinal folds of skin extending downward and backward from the mons pubis of the female.

**labia minora** Two small folds of mucous membrane lying medial to the labia majora of the female.

**labor** The process of giving birth in which a fetus is expelled from the uterus through the vagina. Also called parturition.

**lacrimal canaliculus** A duct, one on each eyelid, beginning at the punctum at the medial margin of an eyelid and conveying tears medially into the nasolacrimal sac.

**lacrimal gland** Secretory cells, located at the superior anterolateral portion of each orbit, that secrete tears into excretory ducts that open onto the surface of the conjunctiva.

**lactation** The secretion and ejection of milk by the mammary glands.

**lacteal** One of many lymphatic vessels in villi of the intestines that absorb triglycerides and other lipids from digested food.

**lacuna** A small space located in extracellular matrix. Plural is lacunae.

**lambdoid suture** The joint in the skull between the parietal bones and the occipital bone; sometimes contains sutural bones.

**lamella** Concentric ring of hard, calcified extracellular matrix found in compact bone.

**lamellated** Containing thin plates.

**lamellated corpuscle** Oval-shaped pressure receptor located in the dermis or subcutaneous tissue consisting of concentric layers of connective tissue wrapped around the dendrites of a sensory neuron. Also called a pacinian corpuscle.

**large intestine** The portion of the gastrointestinal tract extending from the ileum of the small intestine to the anus, divided structurally into the cecum, colon, rectum, and anal canal.

**laryngopharynx** The inferior portion of the pharynx, extending downward from the level of the hyoid bone that divides posteriorly into the esophagus and anteriorly into the larynx. Also called the hypopharynx.

**larynx** The voice box, a short passageway that connects the pharynx with the trachea.

**lateral ventricle** A cavity within a cerebral hemisphere that communicates with the lateral ventricle in the other cerebral hemisphere and with the third ventricle by way of the interventricular foramen.

**lens** A transparent organ constructed of proteins (crystallins) lying posterior to the pupil and iris of the eyeball and anterior to the vitreous body.

**leukemia** A malignant disease of the blood-forming tissues characterized by either uncontrolled production and accumulation of immature leukocytes in which many cells fail to reach maturity (acute) or an accumulation of mature leukocytes in the blood because they do not die at the end of their normal life span (chronic).

**leukocyte** A white blood cell.

**ligament** Dense regular connective tissue that attaches bone to bone.

**limbic system** A part of the forebrain, sometimes termed the visceral brain, concerned with various aspects of emotion and behavior; includes the limbic lobe, dentate gyrus, amygdala, septal nuclei, mammillary bodies, anterior thalamic nucleus, olfactory bulbs, and bundles of myelinated axons.

**lingual frenulum** A fold of mucous membrane that connects the tongue to the floor of the mouth.

**lipid bilayer** Arrangement of phospholipid, glycolipid, and cholesterol molecules in two parallel sheets in which the hydrophilic "heads" face outward and the hydrophobic "tails" face inward; found in cellular membranes.

**lipid** An organic compound composed of carbon, hydrogen, and oxygen that is usually insoluble in water, but soluble in alcohol, ether, and chloroform; examples include triglycerides (fats and oils), phospholipids, steroids, and eicosanoids.

**lipoprotein** One of several types of particles containing lipids (cholesterol and triglycerides) and proteins that make it water soluble for transport in the blood; high levels of low-density lipoproteins (LDLs) are associated with increased risk of atherosclerosis, whereas high levels of high-density lipoproteins (HDLs) are associated with decreased risk of atherosclerosis.

**liver** Large organ under the diaphragm that occupies most of the right hypochondriac region and part of the epigastric region. Functionally, it produces bile and synthesizes most plasma proteins; interconverts nutrients; detoxifies substances; stores glycogen, iron, and vitamins; carries on phagocytosis of worn-out blood cells and bacteria; and helps synthesize the active form of vitamin D.

**lower limb** The appendage attached at the pelvic (hip) girdle, consisting of the thigh, knee, leg, ankle, foot, and toes. Also called the lower extremity.

**lumbar plexus** A network formed by the anterior branches of spinal nerves L1 through L4.

**lumen** The space within an artery, vein, intestine, renal tubule, or other tubular structure.

**lung** Main organ of respiration that lies on either side of the heart in the thoracic cavity.

**lunula** The moon-shaped white area at the base of a nail.

**luteinizing hormone (LH)** A hormone secreted by the anterior pituitary that stimulates ovulation, stimulates progesterone secretion by the corpus luteum, and readies the mammary glands for milk secretion in females; stimulates testosterone secretion by the testes in males.

**lymphatic capillary** Closed-ended microscopic lymphatic vessel that begins in spaces between cells and converges with other lymphatic capillaries to form lymphatic vessels.

**lymphatic system** A system consisting of a fluid called lymph, vessels called lymphatics that transport lymph, a number of organs containing lymphatic tissue (lymphocytes within a filtering tissue), and red bone marrow.

**lymphatic tissue** A specialized form of reticular tissue that contains large numbers of lymphocytes.

**lymphatic vessel** A large vessel that collects lymph from lymphatic capillaries and converges with other lymphatic vessels to form the thoracic and right lymphatic ducts.

**lymph** Fluid confined in lymphatic vessels and flowing through the lymphatic system until it is returned to the blood.

**lymph node** An oval or bean-shaped structure located along lymphatic vessels.

**lymphocyte** A type of white blood cell that helps carry out cell-mediated and antibody-mediated immune responses; found in blood and in lymphatic tissues.

**lysosome** An organelle in the cytoplasm of a cell, enclosed by a single membrane and containing powerful digestive enzymes.

**lysozyme** A bactericidal enzyme found in tears, saliva, and perspiration.

## M

**macrophage** Phagocytic cell derived from a monocyte; may be fixed or wandering.

**macula lutea** The yellow spot in the center of the retina.

**macula** A discolored spot or a colored area. A small, thickened region on the wall of the utricle and saccule that contains receptors for linear acceleration or deceleration.

**major histocompatibility (MHC) antigen** Surface protein on white blood cells and other nucleated cells that is unique for each person (except for identical siblings); used to type tissues and help prevent rejection of transplanted tissues. Also known as human leukocyte antigens (HLA).

**malignant tumor** A cancerous tumor or malignancy.

**mammary gland** Modified sudoriferous (sweat) gland of the female that produces milk for the nourishment of the young.

**mast cell** A cell found in areolar connective tissue that releases histamine, a dilator of small blood vessels, during inflammation.

**mature follicle** A large, fluid-filled follicle containing a secondary oocyte and surrounding granulosa cells that secrete estrogens. Also called a Graafian follicle.

**mediastinum** The broad, median partition between the pleurae of the lungs that extends from the sternum to the vertebral column in the thoracic cavity.

**medulla oblongata** The most inferior part of the brain stem. Also termed the medulla.

**medullary cavity** The space within the diaphysis of a bone that contains yellow bone marrow. Also called the marrow cavity.

**medullary respiratory center** The neurons of the respiratory center in the medulla oblongata that consist of the dorsal respiratory group that is active during normal quiet breathing and the ventral respiratory group that is active during forceful breathing.

**meiosis** A type of cell division that occurs during production of gametes, involving two successive nuclear divisions that result in cells with the haploid ( $n$ ) number of chromosomes.

**Meissner corpuscle** See Corpuscle of touch.

**melanin** A dark black, brown, or yellow pigment found in some parts of the body such as the skin, hair, and pigmented layer of the retina.

**melanocyte** A pigmented cell, located between or beneath cells of the deepest layer of the epidermis, that synthesizes melanin.

**melatonin** A hormone secreted by the pineal gland that helps set the timing of the body's biological clock.

**membrane** A thin, flexible sheet of tissue composed of an epithelial layer and an underlying connective tissue layer, as in an epithelial membrane, or of areolar connective tissue only, as in a synovial membrane.

**membranous labyrinth** The part of the labyrinth of the internal ear that is located inside the bony labyrinth and separated from it by the perilymph; made up of the semicircular ducts, the saccule and utricle, and the cochlear duct.

**memory** The ability to recall thoughts; commonly classified as short-term (activated) and long-term.

**menarche** The first menses (menstrual flow) and beginning of ovarian and uterine cycles.

**meninges** Three membranes covering the brain and spinal cord, called the dura mater, arachnoid mater, and pia mater. Singular is meninx.

**menopause** The termination of the menstrual cycles.

**menstruation** Periodic discharge of blood, tissue fluid, mucus, and epithelial cells that usually lasts for 5 days; caused by a sudden reduction in estrogens and progesterone. Also called the menstrual phase or menses.

**mesenchyme** An embryonic connective tissue from which all other connective tissues arise.

**mesentery** A fold of peritoneum attaching the small intestine to the posterior abdominal wall.

**mesoderm** The middle primary germ layer that gives rise to connective tissues, blood and blood vessels, and muscles.

**mesothelium** The layer of simple squamous epithelium that lines serous membranes.

**metabolism** All the biochemical reactions that occur within an organism, including the synthetic (anabolic) reactions and decomposition (catabolic) reactions.

**metacarpus** A collective term for the five bones that make up the palm.

**metaphase** The second stage of mitosis, in which chromatid pairs line up on the metaphase plate of the cell.

**metaphysis** Region of a long bone between the diaphysis and epiphysis that contains the epiphyseal plate in a growing bone.

**metastasis** The spread of cancer to surrounding tissues (local) or to other body sites (distant).

**metatarsus** A collective term for the five bones located in the foot between the tarsals and the phalanges.

**microfilament** The thinnest element of the cytoskeleton that contributes to cell shape and strength.

**microglial cell** Neuroglial cell that carries on phagocytosis.

**microtubule** Cylindrical protein filament, from 18 to 30 nm in diameter, consisting of the protein tubulin; provides support, structure, and transportation.

**microvillus** Microscopic, finger-like projection of the plasma membranes of cells that increases surface area for absorption, especially in the small intestine and proximal convoluted tubules of the kidneys.

**micturition** The act of expelling urine from the urinary bladder. Also called urination.

**midbrain** The part of the brain between the pons and the diencephalon. Also called the mesencephalon.

**middle ear** A small, epithelial-lined cavity hollowed out of the temporal bone, separated from the external ear by the eardrum and from the internal ear by a thin bony partition containing the oval and round windows; extending across the middle ear are the three auditory ossicles. Also called the tympanic cavity.

**midsagittal plane** A vertical plane through the midline of the body that divides the body or organs into equal right and left sides. Also called a median plane.

**mineralocorticoids** A group of hormones of the adrenal cortex that help regulate sodium and potassium balance.

**mitochondrion** A double-membraned organelle that plays a central role in the production of ATP; known as the "powerhouse" of the cell. *Plural* is mitochondria.

**mitosis** The orderly division of the nucleus of a cell that ensures that each new nucleus has the same number and kind of chromosomes as the original nucleus. The process includes the replication of chromosomes and the distribution of the two sets of chromosomes into two separate and equal nuclei.

**mitotic spindle** Collective term for a football-shaped assembly of microtubules (nonkinetochore, kinetochore, and aster) that is responsible for the movement of chromosomes during cell division.

**molecule** A combination of two or more atoms that share electrons.

**monocyte** The largest type of white blood cell, characterized by agranular cytoplasm.

**monounsaturated fat** A fatty acid that contains one double covalent bond between its carbon atoms; it is not completely saturated with hydrogen atoms. Plentiful in triglycerides of olive and peanut oils.

**mons pubis** The rounded, fatty prominence over the pubic symphysis, covered by coarse pubic hair.

**morula** A solid sphere of cells produced by successive cleavages of a fertilized ovum about four days after fertilization.

**motor area** The region of the cerebral cortex that governs muscular movement, particularly the precentral gyrus of the frontal lobe.

**motor end plate** Region of the sarcolemma of a muscle fiber (cell) that includes acetylcholine (ACh) receptors, which bind ACh released by synaptic end bulbs of somatic motor neurons.



**motor neuron** Neuron that conducts impulses from the brain toward the spinal cord or out of the brain and spinal cord into cranial or spinal nerves to effectors that may be either muscles or glands. Also called an efferent neuron.

**motor unit** A motor neuron together with the muscle fibers (cells) it stimulates.

**mucosa** A membrane that lines a body cavity that opens to the exterior. Also called the mucous membrane.

**mucous membrane** A membrane that lines a body cavity that opens to the exterior. Also called the mucosa.

**mucus** The thick fluid secretion of goblet cells, mucous cells, mucous glands, and mucous membranes.

**muscle action potential** A stimulating impulse that propagates along the sarcolemma and transverse tubules; in skeletal muscle, it is generated by acetylcholine, which increases the permeability of the sarcolemma to cations, especially sodium ions ( $\text{Na}^+$ ).

**muscle fatigue** Inability of a muscle to maintain its strength of contraction or tension; may be related to insufficient oxygen, depletion of glycogen, and/or lactic acid buildup.

**muscle strain** Tearing of fibers in a skeletal muscle or its tendons.

**muscle tone** A sustained, partial contraction of portions of a skeletal or smooth muscle in response to activation of stretch receptors or a baseline level of action potentials in the innervating motor neurons.

**muscular dystrophy** Inherited muscle destroying disease, characterized by degeneration of muscle fibers (cells), which causes progressive atrophy of the skeletal muscle.

**muscularis** A muscular layer (coat or tunic) of an organ, such as the muscularis of the vagina.

**muscular tissue** A tissue specialized to produce motion in response to muscle action potentials by its qualities of contractility, extensibility, elasticity, and excitability; types include skeletal, cardiac, and smooth.

**musculoskeletal system** An integrated body system consisting of bones, joints, and muscles.

**mutation** Any change in the sequence of bases in a DNA molecule resulting in a permanent alteration in some inheritable trait.

**myasthenia gravis** Weakness and fatigue of skeletal muscles caused by antibodies directed against acetylcholine receptors.

**myelin sheath** Multilayered lipid and protein covering, formed by Schwann cells and oligodendrocytes, around axons of many peripheral and central nervous system neurons.

**myocardial infarction (MI)** Gross necrosis of myocardial tissue due to interrupted blood supply. Also called a heart attack.

**myocardium** The middle layer of the heart wall, made up of cardiac muscle tissue, lying between the epicardium and the endocardium and constituting the bulk of the heart.

**myofibril** Threadlike structure extending longitudinally through a muscle fiber (cell) consisting mainly of thick filaments (myosin) and thin filaments (actin, troponin, and tropomyosin).

**myoglobin** The oxygen-binding, iron-containing protein present in the sarcoplasm of muscle fibers (cells); contributes the red color to muscle.

**myogram** The record or tracing produced by a myograph, an apparatus that measures and records the force of muscular contractions.

**myology** The study of muscles.

**myometrium** The smooth muscle layer of the uterus.

**myopathy** Any abnormal condition or disease of muscle tissue.

**myopia** Defect in vision in which objects can be seen distinctly only when very close to the eyes; nearsightedness.

**myosin** The contractile protein that makes up the thick filaments of muscle fibers.

## N

**nail** A hard plate, composed largely of keratin, that develops from the epidermis of the skin to form a protective covering on the dorsal surface of the distal phalanges of the fingers and toes.

**nail matrix** The portion of the epithelium proximal to the nail root.

**nasal cavity** A mucosa-lined cavity on either side of the nasal septum that opens onto the face at the external nares and into the nasopharynx at the internal nares.

**nasal septum** A vertical partition composed of bone (perpendicular plate of ethmoid and vomer) and cartilage, covered with a mucous membrane, separating the nasal cavity into left and right sides.

**nasolacrimal duct** A canal that transports the lacrimal secretion (tears) from the nasolacrimal sac into the nose.

**nasopharynx** The superior portion of the pharynx, lying posterior to the nose and extending inferiorly to the soft palate.

**neck** The part of the body connecting the head and the trunk. A constricted portion of an organ, such as the neck of the femur or uterus.

**necrosis** A pathological type of cell death that results from disease, injury, or lack of blood supply in which many adjacent cells swell, burst, and spill their contents into the interstitial fluid, triggering an inflammatory response.

**negative feedback system** A feedback system that reverses a change in a controlled condition.

**neoplasm** A new growth that may be benign or malignant.

**nephron** The functional unit of the kidney.

**nervous system** A network of billions of neurons and even more neuroglia that is organized into two main divisions: central nervous system (brain and spinal cord) and peripheral nervous system (nerves, ganglia, enteric plexuses, and sensory receptors outside the central nervous system).

**nervous tissue** Tissue containing neurons that initiate and conduct nerve impulses to coordinate homeostasis, and neuroglia that provide support and nourishment to neurons.

**neuralgia** Attacks of pain along the entire length or a branch of a peripheral sensory nerve.

**neural plate** A thickening of ectoderm, induced by the notochord, that forms early in the third week of development and represents the beginning of the development of the nervous system.

**neural tube defect (NTD)** A developmental abnormality in which the neural tube does not close properly. Examples are spina bifida and anencephaly.

**neuritis** Inflammation of one or several nerves.

**neuroglia** Cells of the nervous system that perform various supportive functions. The neuroglia of the central nervous system are the astrocytes, oligodendrocytes, microglia, and ependymal cells; neuroglia of the peripheral nervous system include Schwann cells and satellite cells. Also called glia.

**neurology** The study of the normal functioning and disorders of the nervous system.

**neuromuscular junction** A synapse between the axon terminals of a motor neuron and the sarcolemma of a muscle fiber (cell).

**neuron** A nerve cell, consisting of a cell body, dendrites, and an axon.

**neurosecretory cell** A neuron that secretes a hypo-thalamic releasing hormone or inhibiting hormone into blood capillaries of the hypothalamus; a neuron that secretes oxytocin or antidiuretic hormone into blood capillaries of the posterior pituitary.

**neurotransmitter** One of a variety of molecules within axon terminals that are released into the synaptic cleft in response to a nerve impulse and that change the membrane potential of the postsynaptic neuron.

**neurulation** The process by which the neural plate, neural folds, and neural tube develop.

**neutrophil** A type of white blood cell characterized by granules that stain pale lilac with a combination of acidic and basic dyes.

**nipple** A pigmented, wrinkled projection on the surface of the breast that in the female is the location of the openings of the lactiferous ducts for milk release.

**nociceptor** A free (naked) nerve ending that detects painful stimuli.

**node of Ranvier** A space along a myelinated axon between the individual Schwann cells that form the myelin sheath and the neurolemma.

**norepinephrine (NE)** A hormone secreted by the adrenal medulla that produces actions similar to those that result from sympathetic stimulation. Also called noradrenaline.

**notochord** A flexible rod of mesodermal tissue that lies where the future vertebral column will develop and plays a role in induction.

**nucleolus** A spherical body inside the nucleus that consists of protein, DNA, and RNA and is the site of assembly of ribosomes.

**nucleus** A spherical or oval organelle of a cell that contains the hereditary factors of the cell, called genes. A cluster of unmyelinated nerve cell bodies in the central nervous system. The central part of an atom made up of protons and neutrons.

**nutrient** A chemical substance in food that provides energy, forms new body components, or assists in various body functions.

**obesity** Body weight more than 20% above a desirable standard due to excessive accumulation of fat.

**oblique plane** A plane that passes through the body or an organ at an angle between the transverse plane and the midsagittal, parasagittal, or frontal plane.

**obstetrics** The specialized branch of medicine that deals with pregnancy, labor, and the period of time immediately after delivery (about 6 weeks).

**olfactory bulb** A mass of gray matter containing cell bodies of neurons that

form synapses with neurons of the olfactory (I) nerve, lying inferior to the frontal lobe of the cerebrum on either side of the crista galli of the ethmoid bone.

**olfactory receptor cell** A bipolar neuron with its cell body lying between supporting cells located in the mucous membrane lining the superior portion of each nasal cavity; transduces odors into neural signals.

**olfactory tract** A bundle of axons that extends posteriorly from the olfactory bulb to olfactory regions of the cerebral cortex.

**oligodendrocyte** A neuroglial cell that supports neurons and produces a myelin sheath around axons of neurons of the central nervous system.

**oliguria** A daily urine output between 50 and 250 mL.

**oncogene** Cancer-causing gene; it derives from a normal gene, termed a protooncogene, that encodes proteins involved in cell growth or cell regulation but has the ability to transform a normal cell into a cancerous cell when it is mutated or inappropriately activated.

**oncology** The study of tumors.

**oogenesis** Formation and development of female gametes (oocytes).

**oophorectomy** Surgical removal of the ovaries.

**ophthalmology** The study of the structure, function, and diseases of the eye.

**optic chiasm** A crossing point of the two branches of the optic (II) nerve, anterior to the pituitary gland.

**optic disc** A small area of the retina containing openings through which the axons of the ganglion cells emerge as the optic (II) nerve. Also called the blind spot.

**optic tract** A bundle of axons that carry nerve impulses from the retina of the eye between the optic chiasm and the thalamus.

**organ** A structure composed of two or more different kinds of tissues with a specific function and usually a recognizable shape.

**organelle** A permanent structure within a cell with characteristic morphology that is specialized to serve a specific function in cellular activities.

**organism** A total living form; one individual.

**origin** The attachment of a muscle tendon to a stationary bone or the end opposite the insertion.

**oropharynx** The intermediate portion of the pharynx, lying posterior to the mouth and extending from the soft palate to the hyoid bone.

**orthopedics** The branch of medicine that deals with the preservation and restoration of the skeletal system, articulations, and associated structures.

**osmosis** The net movement of water molecules through a selectively permeable membrane from an area of higher water concentration to an area of lower water concentration until equilibrium is reached.

**ossification center** An area in the cartilage model of a future bone where the cartilage cells hypertrophy, secrete enzymes that calcify their extracellular matrix, and die, and the area they occupied is invaded by osteoblasts that then lay down bone.

**ossification** Formation of bone. Also called osteogenesis.

**osteoblast** Cell formed from an osteogenic cell that participates in bone formation by secreting some organic components and inorganic salts.

**osteoclast** A large, multinuclear cell that resorbs (destroys) bone matrix.

**osteocyte** A mature bone cell that maintains the daily activities of bone tissue.

**osteology** The study of bones.

**osteonic canal** A microscopic tube running the length of the spinal cord in the gray commissure. A circular channel running longitudinally in the center of an osteon (haversian system) of mature compact bone, containing blood and lymphatic vessels and nerves. Also called a central or haversian canal.

**osteon** The basic unit of structure in adult compact bone, consisting of

a central (haversian) canal with its concentrically arranged lamellae, lacunae, osteocytes, and canaliculi. Also called a haversian system.

**osteoprogenitor cell** Stem cell derived from mesenchyme that has mitotic potential and the ability to differentiate into an osteoblast.

**otolithic membrane** Thick, gelatinous, glycoprotein layer located directly over hair cells of the macula in the saccule and utricle of the internal ear.

**otolith** A particle of calcium carbonate embedded in the otolithic membrane that is involved in detecting linear acceleration or deceleration and head tilt.

**otorhinolaryngology** The branch of medicine that deals with the diagnosis and treatment of diseases of the ears, nose, and throat.

**oval window** A small, membrane-covered opening between the middle ear and inner ear into which the footplate of the stapes fits.

**ovarian cycle** A monthly series of events in the ovary associated with the maturation of a secondary oocyte.

**ovarian follicle** A general name for oocytes (immature ova) in any stage of development, along with their surrounding epithelial cells.

**ovary** Organ that produces oocytes (eggs) and female reproductive hormones.

**ovary** Female gonad that produces oocytes and the hormones estrogens, progesterone, inhibin, and relaxin.

**ovulation** The rupture of a mature ovarian (Graafian) follicle with discharge of a secondary oocyte into the pelvic cavity.

**ovum** The female reproductive or germ cell; an egg cell; arises through completion of meiosis in a secondary oocyte after penetration by a sperm.

**oxyhemoglobin** Hemoglobin combined with oxygen.

**oxytocin** A hormone secreted by neurosecretory cells in the paraventricular and supraoptic nuclei of the hypothalamus that stimulates contraction of smooth muscle in the

pregnant uterus and myoepithelial cells around the ducts of mammary glands.

## P

**pancreas** A soft, oblong organ lying along the greater curvature of the stomach and connected by a duct to the duodenum. It is both an exocrine gland (secreting pancreatic juice) and an endocrine gland (secreting insulin, glucagon, somatostatin, and pancreatic polypeptide).

**pancreatic duct** A single large tube that unites with the common bile duct from the liver and gall-bladder and drains pancreatic juice into the duodenum at the hepatopancreatic ampulla (ampulla of Vater). Also called the duct of Wirsung.

**pancreatic islet** A cluster of endocrine gland cells in the pancreas that secretes insulin, glucagon, somatostatin, and pancreatic polypeptide. Also called an islet of Langerhans.

**Papanicolaou test** A cytological staining test for the detection and diagnosis of premalignant and malignant conditions of the female genital tract. Cells scraped from the epithelium of the cervix of the uterus are examined microscopically. Also called a Pap test or Pap smear.

**papilla** Projection of the lamina propria covered with stratified squamous epithelium that covers the dorsal and lateral surfaces of the tongue.

**paranasal sinus** A mucus-lined air cavity in a skull bone that communicates with the nasal cavity. Paranasal sinuses are located in the frontal, maxillary, ethmoid, and sphenoid bones.

**paraplegia** Paralysis of both lower limbs.

**parasagittal plane** A vertical plane that does not pass through the midline and that divides the body or organs into unequal left and right portions.

**parasympathetic division** One of the two subdivisions of the autonomic nervous system, having cell bodies of preganglionic neurons in nuclei in the brain stem and in the lateral gray horn of the sacral portion of the spinal cord; primarily concerned with activities that conserve and restore body energy. Also known as the craniosacral division.

**parathyroid gland** One of usually four small endocrine glands embedded in the posterior surfaces of the lateral lobes of the thyroid gland.

**parathyroid hormone (PTH)** A hormone secreted by the chief (principal) cells of the parathyroid glands that increases blood calcium level and decreases blood phosphate level. Also called parathormone.

**parenchyma** The functional parts of any organ, as opposed to tissue that forms its stroma or framework.

**parietal cell** A type of secretory cell in gastric glands that produces hydrochloric acid and intrinsic factor.

**parietal pleura** The outer layer of the serous pleural membrane that encloses and protects the lungs; the layer that is attached to the wall of the pleural cavity.

**Parkinson's disease (PD)** Progressive degeneration of the basal nuclei and substantia nigra of the cerebrum resulting in decreased production of dopamine (DA) that leads to tremor, slowing of voluntary movements, and muscle weakness.

**parotid gland** One of the paired salivary glands located inferior and anterior to the ears and connected to the oral cavity via a duct (parotid) that opens into the inside of the cheek opposite the maxillary (upper) second molar tooth.

**parturition** The process of giving birth. Also known as labor.

**patent ductus arteriosus** A congenital heart defect in which the ductus arteriosus remains open. As a result, aortic blood flows into the lower-pressure pulmonary trunk, increasing pulmonary trunk pressure and overworking both ventricles.

**pathogen** A disease-producing microbe.

**pathologist** A physician who specializes in laboratory studies of cells and tissues to help other physicians make accurate diagnoses.

**pelvic cavity** Inferior portion of the abdominopelvic cavity that contains the urinary bladder, sigmoid colon, rectum, and internal female and male reproductive structures.

**pelvis** A basinlike structure formed by the two hip bones along with the sacrum and coccyx.

**penis** The organ of urination and copulation in males; used to deposit semen into the female vagina.

**pepsin** Protein-digesting enzyme secreted by chief cells of the stomach in the inactive form pepsinogen, which is converted to active pepsin by hydrochloric acid.

**peptic ulcer** An ulcer that develops in areas of the gastrointestinal tract exposed to hydrochloric acid; classified as a gastric ulcer if in the lesser curvature of the stomach and as a duodenal ulcer if in the first part of the duodenum.

**pericarditis** Inflammation of the pericardium that surrounds the heart.

**pericardium** A loose-fitting membrane that encloses the heart, consisting of a superficial fibrous layer and a deep serous layer.

**perichondrium** The membrane that covers cartilage.

**perimetrium** The serosa of the uterus.

**perimysium** Invagination of the epimysium that divides muscles into bundles.

**perineum** The pelvic floor; the space between the anus and the scrotum in the male and between the anus and the vulva in the female.

**perineurium** Connective tissue wrapping around fascicles in a nerve.

**periodontal disease** A collective term for conditions characterized by degeneration of gingivae, alveolar bone, periodontal ligament, and cementum.

**periosteum** The membrane that covers bone and consists of connective tissue, consists of osteoprogenitor cells, and osteoblasts; is essential for bone growth, repair, and nutrition.

**peripheral nervous system (PNS)** The part of the nervous system that lies outside the central nervous system, consisting of nerves and ganglia.

**peristalsis** Successive muscular contractions along the wall of a hollow muscular structure.

**peritoneum** The largest serous membrane of the body that lines the abdominal cavity and covers the viscera within it.

**peritonitis** Inflammation of the peritoneum.

**peroxisome** Organelle similar in structure to a lysosome that contains enzymes that use molecular oxygen to oxidize various organic compounds; such reactions produce hydrogen peroxide; abundant in liver cells.

**perspiration** Sweat; produced by sudoriferous (sweat) glands and containing water, salts, urea, uric acid, amino acids, ammonia, sugar, lactic acid, and ascorbic acid.

**phagocytosis** The process by which phagocytes ingest and destroy microbes, cell debris, and other foreign matter.

**phalanges** Bones of fingers or toes. Singular is phalanx.

**pH** A measure of the concentration of hydrogen ions ( $H^+$ ) in a solution. The **pH scale** extends from 0 to 14, with a value of 7 expressing neutrality, values lower than 7 expressing increasing acidity, and values higher than 7 expressing increasing alkalinity.

**pharmacology** The science of the effects and uses of drugs in the treatment of disease.

**pharynx** The throat; a tube that starts at the internal nares and runs partway down the neck, where it opens into the esophagus posteriorly and the larynx anteriorly.

**phenotype** The observable expression of genotype; physical characteristics of an organism determined by genetic makeup and influenced by interaction between genes and internal and external environmental factors.

**phlebitis** Inflammation of a vein, usually in a lower limb.

**photopigment** A substance that can absorb light and undergo structural changes that can lead to the development of a receptor potential. In the eye, also called visual pigment.

**photoreceptor** Receptor that detects light shining on the retina of the eye.

**physiology** Science that deals with the functions of an organism or its parts.

**pia mater** The innermost of the three meninges (coverings) of the brain and spinal cord.

**pineal gland** A cone-shaped gland located in the roof of the third ventricle that secretes melatonin.

**pituitary gland** A small endocrine gland occupying the hypophyseal fossa of the sphenoid bone and attached to the hypothalamus by the infundibulum. Also called the hypophysis.

**pivot joint** A synovial joint in which a rounded, pointed, or conical surface of one bone articulates with a ring formed partly by another bone and partly by a ligament, as in the joint between the atlas and axis and between the proximal ends of the radius and ulna. Also called a trochoid joint.

**placenta** The special structure through which the exchange of materials between fetal and maternal circulations occurs. Called the after-birth following birth.

**plane joint** Joint in which the articulating surfaces are flat or slightly curved that permits back-and-forth and side-to-side movements and rotation between the flat surfaces.

**plantar flexion** Bending the foot in the direction of the plantar surface (sole).

**plasma cell** Cell that develops from a B cell (lymphocyte) and produces antibodies.

**plasma membrane** Outer, limiting membrane that separates the cell's internal parts from extracellular fluid or the external environment.

**plasma** The extracellular fluid found in blood vessels; blood minus the formed elements.

**platelet** A fragment of cytoplasm enclosed in a cell membrane and lacking a nucleus; found in the circulating blood; plays a role in hemostasis.

**platelet plug** Aggregation of platelets (thrombocytes) at a site where a blood vessel is damaged that helps stop or slow blood loss.

**pleural cavity** Small potential space between the visceral and parietal pleurae.

**pleura** The serous membrane that covers the lungs and lines the walls of the chest and the diaphragm.

**plexus** A network of nerves, veins, or lymphatic vessels.

**pluripotent stem cell** Immature stem cell in red bone marrow that gives rise to precursors of all the different mature blood cells.

**polyunsaturated fat** A fatty acid that contains more than one double covalent bond between its carbon atoms; abundant in triglycerides of corn oil, safflower oil, and cottonseed oil.

**polyuria** Excessive excretion of urine.

**pons** The part of the brain stem that forms a "bridge" between the medulla oblongata and the midbrain, anterior to the cerebellum.

**pontine respiratory group (PRG)** A collection of neurons in the pons that transmits nerve impulses to the dorsal respiratory group, and may modify the basic rhythm of breathing. Formerly called the pneumotaxic area.

**positive feedback system** Feedback system that strengthens a change in one of the body's controlled conditions.

**postcentral gyrus** Gyrus of cerebral cortex located immediately posterior to the central sulcus; contains the primary somatosensory area.

**posterior pituitary** Posterior lobe of the pituitary gland. Also called the neurohypophysis.

**posterior root ganglion** A group of cell bodies of sensory neurons and their supporting cells located along the posterior root of a spinal nerve. Also called a dorsal root ganglion.

**posterior root** The structure composed of sensory axons lying between a spinal nerve and the dorsolateral aspect of the spinal cord. Also called the dorsal root.

**postganglionic neuron** The second autonomic motor neuron in an autonomic pathway, having its cell body and dendrites located in an autonomic ganglion and its unmyelinated axon ending at cardiac muscle, smooth muscle, or a gland.

**postsynaptic neuron** The nerve cell that is activated by the release of a neurotransmitter from another neuron and carries nerve impulses away from the synapse.

**precapillary sphincter** A ring of smooth muscle fibers (cells) at the site of origin of true capillaries that regulates blood flow into true capillaries.

**precentral gyrus** Gyrus of cerebral cortex located immediately anterior to the central sulcus; contains the primary motor area.

**preganglionic neuron** The first autonomic motor neuron in an autonomic pathway, with its cell body and dendrites in the brain or spinal cord and its myelinated axon ending at an autonomic ganglion, where it synapses with a postganglionic neuron.

**pregnancy** Sequence of events that normally includes fertilization, implantation, embryonic growth, and fetal growth and terminates in birth.

**prepuce** The loose-fitting skin covering the glans of the penis and clitoris. Also called the foreskin.

**presynaptic neuron** A neuron that propagates nerve impulses toward a synapse.

**prevertebral ganglia** Sympathetic ganglia that lie anterior to the vertebral column and close to the large abdominal arteries.

**primary germ layers** The major embryonic tissues from which the various tissues and organs of the body develop: ectoderm, mesoderm, and endoderm.

**primary motor area** A region of the cerebral cortex in the precentral gyrus of the frontal lobe of the cerebrum that controls specific muscles or groups of muscles.

**primary somatosensory area** A region of the cerebral cortex posterior to the central sulcus in the postcentral gyrus of the parietal lobe of the cerebrum that localizes exactly the points of the body where somatic sensations originate.

**prime mover** The muscle directly responsible for producing a desired motion. Also called an agonist.

**proctology** The branch of medicine concerned with the rectum and its disorders.

**progeny** Offspring or descendants.

**progesterone** A female sex hormone produced by the ovaries that helps prepare the endometrium of the uterus for implantation of a fertilized ovum and the mammary glands for milk secretion.

**prolactin (PRL)** A hormone secreted by the anterior pituitary that initiates and maintains milk secretion by the mammary glands.

**pronation** A movement of the forearm in which the palm is turned posteriorly.

**prophase** The first stage of mitosis during which chromatid pairs are formed and aggregate around the metaphase plate of the cell.

**proprioceptive sensation** Sensation that allows you to know where your head and limbs are located and how they are moving.

**proprioceptor** A receptor located in muscles, tendons, joints, or the internal ear (muscle spindles, tendon organs, joint kinesthetic receptors, and hair cells of the vestibular apparatus) that provides information about body position and movements. Also called a visceroreceptor.

**prostaglandin (PG)** Lipid released by damaged cells that intensifies the effects of histamine and kinins.

**prostate** A doughnut-shaped gland inferior to the urinary bladder that surrounds the superior portion of the male urethra and secretes a slightly acidic solution that contributes to sperm motility and viability.

**proteasome** Tiny cellular organelle in cytosol and nucleus containing proteases that destroy unneeded, damaged, or faulty proteins.

**protein** An organic compound consisting of carbon, hydrogen, oxygen, nitrogen, and sometimes sulfur and phosphorus; synthesized on ribosomes and made up of amino acids linked by peptide bonds.

**proto-oncogene** Gene responsible for some aspect of normal growth and development; it may transform into an oncogene, a gene capable of causing cancer.

**protraction** The movement of the mandible or shoulder girdle forward on a plane parallel with the ground.

**pseudopod** Temporary protrusion of the leading edge of a migrating cell; cellular projections that surrounds a particle undergoing phagocytosis.

**puberty** The time of life during which the secondary sex characteristics begin to appear and the capability for sexual reproduction is possible; usually occurs between the ages of 10 and 17.

**pubic symphysis** A slightly movable cartilaginous joint between the anterior surfaces of the hip bones.

**pulmonary circulation** The flow of deoxygenated blood from the right ventricle to the lungs and the return of oxygenated blood from the lungs to the left atrium.

**pulmonary edema** An abnormal accumulation of interstitial fluid in the tissue spaces and alveoli of the lungs due to increased pulmonary capillary permeability or increased pulmonary capillary pressure.

**pulmonary embolism** The presence of a blood clot or a foreign substance in a pulmonary arterial blood vessel that obstructs circulation to lung tissue.

**pulmonary ventilation** The inflow (inhalation) and outflow (exhalation) of air between the atmosphere and the lungs. Also called breathing.

**pulp cavity** A cavity within the crown and neck of a tooth, which is filled with pulp, a connective tissue containing blood vessels, nerves, and lymphatic vessels.

**pulse** The rhythmic expansion and elastic recoil of a systemic artery after each contraction of the left ventricle.

**pupil** The hole in the center of the iris, the area through which light enters the posterior cavity of the eyeball.

**Purkinje fiber** Muscle fiber (cell) in the ventricular tissue of the heart specialized for conducting an action potential to the myocardium; part of the conduction system of the heart.

**pus** The liquid product of inflammation containing leukocytes or their remains and debris of dead cells.

**P wave** The deflection wave of an electrocardiogram that signifies atrial depolarization.

## Q

**QRS complex** The deflection waves of an electro-cardiogram that represent onset of ventricular depolarization.

**quadriplegia** Paralysis of four limbs: two upper and two lower.

## R

**receptor** A specialized cell or a distal portion of a neuron that responds to a specific sensory modality, such as touch, pressure, cold, light, or sound, and converts it to an electrical signal (generator or receptor potential). A specific molecule or cluster of molecules that recognizes and binds a particular ligand.

**red blood cell (RBC)** Blood cell without a nucleus that contains the oxygen-carrying protein hemoglobin; responsible for oxygen transport throughout the body.

**red bone marrow** A highly vascularized connective tissue located in microscopic spaces between trabeculae of spongy bone tissue.

**red nucleus** A cluster of cell bodies in the midbrain, occupying a large part of the tectum from which axons extend into the rubroreticular and rubrospinal tracts.

**referred pain** Pain that is felt at a site remote from the place of origin.

**reflex** Fast response to a change (stimulus) in the internal or external environment that attempts to restore homeostasis.

**relaxin** A female hormone produced by the ovaries and placenta that increases flexibility of the pubic symphysis and helps dilate the uterine cervix to ease delivery of a baby.

**releasing hormone** Hormone secreted by the hypo-thalamus that can stimulate secretion of hormones of the anterior pituitary.

**renal corpuscle** A glomerular (Bowman's) capsule and its enclosed glomerulus.

**renal pelvis** A cavity in the center of the kidney formed by the expanded, proximal portion of the ureter, lying within the kidney, and into which the major calyces open.

**renal pyramid** A triangular structure in the renal medulla containing the straight segments of renal tubules and the vasa recta.

**reproduction** The formation of new cells for growth, repair, or replacement; the production of a new individual.

**reproductive cell division** Type of cell division in which gametes (sperm and oocytes) are produced; consists of meiosis and cytokinesis.

**respiration** Overall exchange of gases between the atmosphere, blood, and body cells consisting of pulmonary ventilation, external respiration, and internal respiration.

**respiratory center** Neurons in the pons and medulla oblongata of the brain stem that regulate breathing. It is divided into the medullary respiratory center and the pontine respiratory center.

**respiratory system** Body system consisting of the nose, nasal cavity, pharynx, larynx, trachea, bronchi, and lungs.

**rest-and-digest** Phrase used to describe the function of the parasympathetic nervous system.

**reticular activating system (RAS)** A portion of the reticular formation that has many ascending connections with the cerebral cortex; when this area of the brain stem is active, nerve impulses pass to the thalamus and widespread areas of the cerebral cortex, resulting in generalized alertness or arousal from sleep.

**reticular formation** A network of small groups of neuronal cell bodies scattered among bundles of axons (mixed gray and white matter) beginning in the medulla oblongata and extending superiorly through the central part of the brain stem.

**reticulocyte** A type of red blood cell precursor that has just ejected its nucleus.

**retina** The deep coat of the posterior portion of the eyeball consisting of nervous tissue (where the process of vision begins) and a pigmented layer of epithelial cells that contact the choroid.

**retraction** The movement of a protracted part of the body posteriorly on a plane parallel to the ground, as in pulling the lower jaw back in line with the upper jaw.

**Rh factor** The Rh antigen that may be present in the plasma membranes of red blood cells.

**ribonucleic acid (RNA)** A single-stranded nucleic acid made up of nucleotides, each consisting of a nitrogenous base (adenine, cytosine, guanine, or uracil), ribose, and a phosphate group; three types are messenger RNA (mRNA), transfer RNA (tRNA), and ribosomal RNA (rRNA), each of which has a specific role during protein synthesis.

**ribosome** A cellular structure in the cytoplasm of cells, composed of a small subunit and a large subunit that contain ribosomal RNA and ribosomal proteins; the site of protein synthesis.

**right lymphatic duct** A vessel of the lymphatic system that drains lymph from the upper right side of the body and empties it into the right subclavian vein.

**rod** One of two types of photoreceptor in the retina of the eye; specialized for vision in dim light.

**root canal** A narrow extension of the pulp cavity lying within the root of a tooth.

**root of the penis** Attached portion of penis that consists of the bulb and crura.

**rotation** Moving a bone around its own axis, with no other movement.

**rotator cuff** Refers to the tendons of four deep shoulder muscles that form a complete circle around the shoulder; they strengthen and stabilize the shoulder joint.

**round window** A small opening between the middle and internal ear, directly inferior to the oval window, covered by the secondary tympanic membrane.

**ruga** Large fold in the mucosa of an empty hollow organ, such as the stomach and vagina.

## S

**sacculle** The inferior and smaller of the two chambers in the membranous labyrinth inside the vestibule of the internal ear containing a receptor organ for linear acceleration or deceleration.

**sacral plexus** A network formed by the anterior rami branches of spinal nerves L4 through S3.

**saddle joint** A synovial joint in which the articular surface of one bone is saddle-shaped and the articular surface of the other bone is shaped like the legs of the rider sitting in the saddle, as in the joint between the trapezium and the metacarpal of the thumb.

**sagittal plane** A plane that divides the body or organs into left and right portions. Such a plane may be midsagittal (median), in which the divisions are equal, or parasagittal, in which the divisions are unequal.

**salivary amylase** An enzyme in saliva that initiates the chemical break-down of starch.

**salivary gland** One of three pairs of glands that lie external to the mouth and pour their secretory product (saliva) into ducts that empty into the oral cavity; the parotid, submandibular, and sublingual glands.

**saliva** A clear, alkaline, somewhat viscous secretion produced mostly by the three pairs of salivary glands; contains various salts, mucin, lysozyme, salivary amylase, and lingual lipase (produced by glands in the tongue).

**sarcolemma** The cell membrane of a muscle fiber (cell), especially of a skeletal muscle fiber.

**sarcomere** A contractile unit in a striated muscle fiber (cell) extending from one Z disc to the next Z disc.

**sarcoplasmic reticulum** A network of saccules and tubes surrounding myofibrils of a muscle fiber (cell), comparable to endoplasmic reticulum; functions to reabsorb calcium ions during relaxation and to release them to cause contraction.

**sarcoplasm** The cytoplasm of a muscle fiber (cell).

**satellite cell** Flat neuroglial cell that surrounds cell bodies of peripheral nervous system ganglia to provide structural support and regulate the exchange of material between a neuronal cell body and interstitial fluid.

**saturated fat** A fatty acid that contains only single bonds (no double bonds) between its carbon atoms; all carbon atoms are bonded to the maximum number of hydrogen atoms; prevalent in triglycerides of animal products such as meat, milk, milk products, and eggs.

**Schwann cell** A neuroglial cell of the peripheral nervous system that forms the myelin sheath and neurolemma around a nerve axon by wrapping around the axon in a jelly-roll fashion.

**sciatica** Inflammation and pain along the sciatic nerve; felt along the posterior aspect of the thigh extending down the inside of the leg.

**sclera** The white coat of fibrous tissue that forms the superficial protective covering over the eyeball except in the most anterior portion; the posterior portion of the fibrous tunic.

**scrotum** A skin-covered pouch that contains the testes and their accessory structures.

**sebaceous gland** An exocrine gland in the dermis of the skin, almost always associated with a hair follicle, that secretes sebum. Also called an oil gland.

**sebum** Secretion of sebaceous (oil) glands.

**secretion** Production and release from a cell or a gland of a physiologically active substance.

**selective permeability** The property of a membrane by which it permits the passage of certain substances but restricts the passage of others.

**semen** A fluid discharged at ejaculation by a male that consists of a mixture of sperm and the secretions of the seminiferous tubules, seminal vesicles, prostate, and bulbourethral (Cowper's) glands.

**semicircular canals** Three bony channels (anterior, posterior, lateral),

filled with perilymph, in which lie the membranous semicircular canals filled with endolymph. They contain receptors for equilibrium.

**semicircular duct** The membranous semicircular canal filled with endolymph and floating in the perilymph of the bony semicircular canal; it contains cristae that are concerned with rotational acceleration or deceleration.

**semilunar valve** A valve between the aorta or the pulmonary trunk and a ventricle of the heart.

**seminal vesicle** One of a pair of convoluted, pouchlike structures, lying posterior and inferior to the urinary bladder and anterior to the rectum, that secrete a component of semen into the ejaculatory ducts. Also termed seminal gland.

**seminiferous tubule** A tightly coiled duct, located in the testis, where sperm are produced.

**sensory area** A region of the cerebral cortex concerned with the interpretation of sensory impulses.

**sensory neuron** Neuron that carries sensory information from cranial and spinal nerves into the brain and spinal cord or from a lower to a higher level in the spinal cord and brain. Also called an afferent neuron.

**serosa** Superficial layer of the portions of the GI tract that are suspended in the abdominal cavity. Also called the serous membrane.

**serous membrane** A membrane that lines a body cavity that does not open to the exterior. The external layer of an organ formed by a serous membrane. The membrane that lines the pleural, pericardial, and peritoneal cavities. Also called a serosa.

**serum** Blood plasma minus its clotting proteins.

**sex chromosomes** The twenty-third pair of chromosomes, designated X and Y, which determine the genetic sex of an individual; in males, the pair is XY; in females, XX.

**shock** Failure of the cardiovascular system to deliver adequate amounts of oxygen and nutrients to meet the metabolic needs of the body due to inadequate cardiac output.

**sigmoid colon** The S-shaped part of the large intestine that begins at the level of the left iliac crest, projects medially, and terminates at the rectum at about the level of the third sacral vertebra.

**sign** Any objective evidence of disease that can be observed or measured, such as a lesion, swelling, or fever.

**sinoatrial (SA) node** A small mass of cardiac muscle fibers (cells) located in the right atrium inferior to the opening of the superior vena cava that spontaneously depolarize and generate a cardiac action potential about 100 times per minute. Also called the natural pacemaker.

**sinusoid** A large, thin-walled, and leaky type of capillary, having large intercellular clefts that may allow proteins and blood cells to pass from a tissue into the bloodstream; present in the liver, spleen, anterior pituitary, parathyroid glands, and red bone marrow.

**sinus** A hollow in a bone (paranasal sinus) or other tissue; a channel for blood (vascular sinus); any cavity having a narrow opening.

**skeletal muscle** Organ composed of hundreds to thousands of skeletal muscle cells.

**skeletal system** Framework of bones and their associated cartilages, ligaments, and tendons.

**skin graft** The transfer of a patch of healthy skin taken from a donor site to cover a wound.

**skin** The external covering of the body that consists of a superficial, thinner epidermis (epithelial tissue) and a deep, thicker dermis (connective tissue) that is anchored to the subcutaneous layer. Also called cutaneous membrane.

**skull** The skeleton of the head consisting of the cranial and facial bones.

**sleep** A state of partial unconsciousness from which a person can be aroused; associated with a low level of activity in the reticular activating system.

**sliding-filament mechanism** A model that describes how a skeletal muscle shortens as thick and thin filaments slide past one another.



**small intestine** A long tube of the gastrointestinal tract that begins at the pyloric sphincter of the stomach, coils through the central and inferior part of the abdominal cavity, and ends at the large intestine; divided into three segments: duodenum, jejunum, and ileum.

**smooth muscle tissue** A tissue specialized for contraction, composed of smooth muscle fibers (cells), located in the walls of hollow internal organs, and innervated by autonomic motor neurons.

**sodium-potassium ( $\text{Na}^+\text{-K}^+$ ) pump** An active transport mechanism that expels  $\text{Na}^+$  from cells and brings  $\text{K}^+$  into cells.

**somatic cell division** Type of cell division in which a single starting cell duplicates itself to produce two identical cells; consists of mitosis and cytokinesis.

**somatic motor pathway** Pathway that carries information from the cerebral cortex, basal nuclei, and cerebellum that stimulates contraction of skeletal muscles.

**somatic nervous system (SNS)** The portion of the peripheral nervous system consisting of somatic sensory (afferent) neurons and somatic motor (efferent) neurons.

**somatic sensory pathway** Pathway that carries information from somatic sensory receptors to the primary somatosensory area in the cerebral cortex and cerebellum.

**spasm** A sudden, involuntary contraction of large groups of muscles.

**spermatic cord** A supporting structure of the male reproductive system, extending from a testis to the deep inguinal ring, that includes the ductus (vas) deferens, arteries, veins, lymphatic vessels, nerves, cremaster muscle, and connective tissue.

**spermatogenesis** The formation and development of sperm in the seminiferous tubules of the testes.

**sperm cell** A mature male gamete. Also called a spermatozoon.

**spermiogenesis** The maturation of spermatids into sperm.

**spinal cord** A mass of nerve tissue located in the vertebral canal from which

31 pairs of spinal nerves originate.

**spinal nerve** One of the 31 pairs of nerves that originate on the spinal cord from posterior and anterior roots.

**spinothalamic tract** Sensory (ascending) tract that conveys information up the spinal cord to the thalamus for sensations of pain, temperature, crude touch, and deep pressure.

**spiral organ** The organ of hearing, consisting of supporting cells and hair cells that rest on the basilar membrane and extend into the endolymph of the cochlear duct. Also called the organ of Corti.

**spleen** Large mass of lymphatic tissue between the fundus of the stomach and the diaphragm that functions in formation of blood cells during early fetal development, phagocytosis of ruptured blood cells, and proliferation of B cells during immune responses.

**spongy bone tissue** Bone tissue that consists of an irregular latticework of thin plates of bone called trabeculae; spaces between trabeculae of some bones are filled with red bone marrow; found inside short, flat, and irregular bones and in the epiphyses (ends) of long bones.

**sprain** forcible wrenching or twisting of a joint with partial rupture or other injury to its attachments without dislocation.

**stem cell** An unspecialized cell that has the ability to divide for indefinite periods and give rise to a specialized cell.

**sterilization** Elimination of all living microorganisms. Any procedure that renders an individual incapable of reproduction (for example, castration, vasectomy, hysterectomy, or oophorectomy).

**stimulus** Any stress that changes a controlled condition; any change in the internal or external environment that excites a sensory receptor, a neuron, or a muscle fiber.

**stomach** The J-shaped enlargement of the gastroin-testinal tract directly inferior to the diaphragm in the epigastric, umbilical, and left hypochondriac regions of the abdomen, between the esophagus and small intestine.

**stretch receptor** Receptor in the walls of blood vessels, airways, or organs that monitors the amount of stretching. Also termed baroreceptor.

**stroma** The tissue that forms the ground substance, foundation, or framework of an organ, as opposed to its functional parts (parenchyma).

**subarachnoid space** A space between the arachnoid mater and the pia mater that surrounds the brain and spinal cord and through which cerebrospinal fluid circulates.

**subcutaneous layer** A continuous sheet of areolar connective tissue and adipose tissue between the dermis of the skin and the deep fascia of the muscles. Also called the hypodermis.

**sublingual gland** One of a pair of salivary glands situated in the floor of the mouth deep to the mucous membrane and to the side of the lingual frenulum, with a duct (Rivinus's) that opens into the floor of the mouth.

**submandibular gland** One of a pair of salivary glands found inferior to the base of the tongue deep to the mucous membrane in the posterior part of the floor of the mouth, posterior to the sublingual glands, with a duct (submandibular) situated to the side of the lingual frenulum.

**submucosa** A layer of connective tissue located deep to a mucous membrane, as in the gastrointestinal tract or the urinary bladder; the submucosa connects the mucosa to the muscularis layer.

**substrate** A reactant molecule upon which an enzyme acts.

**sudoriferous gland** An apocrine or eccrine exo-crine gland in the dermis or subcutaneous layer that produces perspiration. Also called a sweat gland.

**sulcus** A groove or depression between parts, especially between the convolutions of the brain.

**superficial** Located on or near the surface of the body or an organ. Also called external.

**superior** Toward the head or upper part of a structure. Also called cephalic or cranial.

**superior vena cava** Large vein that collects blood from parts of the body superior to the heart and returns it to the right atrium.

**supination** A movement of the forearm in which the palm is turned anteriorly.

**surface mucous cell** Nonciliated simple columnar epithelial cell that lines the surface of the gastric mucosa.

**surfactant** Complex mixture of phospholipids and lipoproteins, produced by type II alveolar (septal) cells in the lungs, that decreases surface tension.

**suture** An immovable fibrous joint that joins skull bones.

**sympathetic division** One of the two subdivisions of the autonomic nervous system, having cell bodies of preganglionic neurons in the lateral gray columns of the thoracic segment and the first two or three lumbar segments of the spinal cord; primarily concerned with processes involving the expenditure of energy. Also called the thoracolumbar division.

#### **sympathetic trunk ganglia**

Sympathetic ganglia that lie in two vertical rows, one on either side of the vertebral column.

**symphysis** A line of union. A slightly movable cartilaginous joint such as the pubic symphysis.

**symptom** Subjective change in body function that is not apparent to an observer.

**synapse** The functional junction between two neurons or between a neuron and an effector, such as a muscle or gland; may be electrical or chemical.

**synapsis** The pairing of homologous chromosomes during prophase I of meiosis.

**synaptic cleft** The narrow gap at a chemical synapse that separates the axon terminal of one neuron from another neuron or muscle fiber (cell) and across which a neurotransmitter diffuses to affect the postsynaptic cell.

**synaptic end bulb** Expanded distal end of an axon terminal that contains synaptic vesicles. Also called a synaptic knob.

**synarthrosis** An immovable joint such as a suture, gomphosis, or synchondrosis.

**synchondrosis** A cartilaginous joint in which the connecting material is hyaline cartilage.

**synsdesmosis** A slightly movable joint in which articulating bones are united by fibrous connective tissue.

**synergist** A muscle that assists the prime mover by reducing undesired action or unnecessary movement.

**synovial fluid** Secretion of synovial membranes that lubricates joints and nourishes articular cartilage.

**synovial joint** A fully movable or diarthrotic joint in which a synovial (joint) cavity is present between the two articulating bones.

**synovial membrane** The deeper of the two layers of the articular capsule of a synovial joint, composed of areolar connective tissue that secretes synovial fluid into the synovial (joint) cavity.

**system** An association of organs that have a common function.

**systemic circulation** The routes through which oxygenated blood flows from the left ventricle through the aorta to all the organs of the body and deoxygenated blood returns to the right atrium.

**systole** In the cardiac cycle, the phase of contraction of the heart muscle, especially of the ventricles.

**systolic blood pressure (SBP)** The force exerted by blood on arterial walls during ventricular contraction; the highest pressure measured in the large arteries, less than 120 mmHg under normal conditions for a young adult.

## **T**

**tachycardia** An abnormally rapid resting heartbeat or pulse rate (over 100 beats per minute).

**tactile disc** Saucer-shaped free nerve ending that makes contact with a tactile epithelial cell in the epidermis and functions as a touch receptor. Also called a Merkel disc.

**tactile epithelial cell** Type of cell in the epidermis of hairless skin that makes contact with a tactile disc, which functions in touch. Also called a Merkel cell.

**target cell** The cell that responds to a particular hormone.

**tarsus** A collective term for the seven bones of the ankle.

**teeth** Accessory structures of digestion, composed of calcified connective tissue and embedded in bony sockets of the mandible and maxilla, that cut, shred, crush, and grind food. Also called dentes.

**telophase** The final stage of mitosis.

**tendon** A white fibrous cord of dense regular connective tissue that attaches muscle to bone.

**terminal ganglia** Parasympathetic ganglia located close to or within the wall of the innervated organ.

**testis** Organ that produces sperm and male reproductive hormones.

**testis** Male gonad that produces sperm and the hormones testosterone and inhibin. Plural is testes. Also called a testicle.

**testosterone** A male sex hormone (androgen) secreted by interstitial endocrinocytes (Leydig cells) of a mature testis; needed for development of sperm; together with a second androgen termed dihydrotestosterone (DHT), controls the growth and development of male re-productive organs, secondary sex characteristics, and body growth.

**thalamus** A large, oval structure located bilaterally on either side of the third ventricle, consisting of two masses of gray matter organized into nuclei; main relay center for sensory impulses ascending to the cerebral cortex.

**thermoreceptor** Sensory receptor that detects changes in temperature.

**thoracic cavity** Cavity superior to the diaphragm that contains two pleural cavities, the mediastinum, and the pericardial cavity.

**thoracic duct** A lymphatic vessel that begins as a dilation called the cisterna chyli, receives lymph from the left side of the head, neck, and chest, left arm, and the entire body below the ribs, and empties into the junction between the internal jugular and left subclavian veins. Also called the left lymphatic duct.

**thorax** The chest region.

**thrombosis** The formation of a clot in an unbroken blood vessel, usually a vein.

**thrombus** A stationary clot formed in an unbroken blood vessel, usually a vein.

**thymus** A bilobed organ, located in the superior mediastinum posterior to the sternum and between the lungs, in which T cells develop immunocompetence.

**thyroid cartilage** The largest single cartilage of the larynx, consisting of two fused plates that form the anterior wall of the larynx. Also called the Adam's apple.

**thyroid follicle** Spherical sac that forms the parenchyma of the thyroid gland and consists of follicular cells that produce thyroxine ( $T_4$ ) and triiodothyronine ( $T_3$ ).

**thyroid gland** An endocrine gland with right and left lateral lobes on either side of the trachea connected by an isthmus; located anterior to the trachea just inferior to the cricoid cartilage; secretes thyroxine ( $T_4$ ), triiodothyronine ( $T_3$ ), and calcitonin.

**thyroid-stimulating hormone (TSH)** A hormone secreted by the anterior pituitary that stimulates the synthesis and secretion of thyroxine ( $T_4$ ) and triiodothyronine ( $T_3$ ). Also known as thyrotropin.

**thyroxine** A hormone secreted by the thyroid gland that regulates metabolism, growth and development, and the activity of the nervous system. Also called tetraiodothyronine.

**tic** Spasmodic twitching made involuntarily by a muscle that is normally under voluntary control.

**tissue** A group of similar cells and their intercellular substance joined together to perform a specific function.

**tissue rejection** An immune response of the body directed at foreign proteins in a transplanted tissue or organ.

**tongue** A large skeletal muscle covered by a mucous membrane located on the floor of the oral cavity.

**tonsil** An aggregation of large lymphatic nodules embedded in the mucous membrane of the throat.

**trabecula** Irregular latticework of thin plates of spongy bone tissue. Plural is trabeculae.

**trachea** Tubular air passageway extending from the larynx to the fifth thoracic vertebra. Also called the windpipe.

**tract** A bundle of nerve axons in the central nervous system.

**transverse colon** The portion of the large intestine extending across the abdomen from the right colic (hepatic) flexure to the left colic (splenic) flexure.

**transverse plane** A plane that divides the body or organs into superior and inferior portions. Also called a cross-sectional or horizontal plane.

**transverse tubule** Small, cylindrical invagination of the sarcolemma of striated muscle fibers (cells) that conducts muscle action potentials toward the center of the muscle fiber.

**tricuspid valve** Atrioventricular (AV) valve on the right side of the heart.

**triiodothyronine** A hormone produced by the thyroid gland that regulates metabolism, growth and development, and the activity of the nervous system.

**trophoblast** The superficial covering of cells of the blastocyst.

**tropic hormone** A hormone whose target is another endocrine gland.

**trunk** The part of the body to which the upper and lower limbs are attached.

**tubal ligation** A sterilization procedure in which the uterine (fallopian) tubes are tied and cut.

**tubular reabsorption** The process by which substances move from the renal tubule lumen into the bloodstream.

**tubular secretion** The process by which substances move from the bloodstream into the renal tubule lumen.

**T wave** The deflection wave of an electrocardiogram that represents ventricular repolarization.

**type I cutaneous mechanoreceptor** Slowly adapting touch receptor for fine touch; also called a tactile disc or Merkel disc.

**type II cutaneous mechanoreceptor** A sensory receptor embedded deeply in the dermis and deeper tissues that detects stretching of skin. Also called a Ruffini corpuscle.

## U

**umbilical cord** The long, ropelike structure containing the umbilical arteries and vein that connect the fetus to the placenta.

**umbilicus** A small scar on the abdomen that marks the former attachment of the umbilical cord to the fetus. Also called the navel.

**upper limb** The appendage attached at the shoulder girdle, consisting of the arm, forearm, wrist, hand, and fingers. Also called upper extremity.

**ureter** One of two tubes that connect the kidney with the urinary bladder.

**urethra** The duct from the urinary bladder to the exterior of the body that conveys urine in females and urine and semen in males.

**urinary bladder** A hollow, muscular organ situated in the pelvic cavity posterior to the pubic symphysis; receives urine via two ureters and stores urine until it is excreted through the urethra.

**urinary system** The body system consisting of the kidneys, ureters, urinary bladder, and urethra.

**urine** The fluid produced by the kidneys that contains wastes and excess materials; excreted from the body through the urethra.

**urology** The specialized branch of medicine that deals with the structure, function, and diseases of the male and female urinary systems and the male reproductive system.

**uterine cycle** A series of changes in the endometrium of the uterus to prepare it for the arrival and development of a fertilized ovum. Also called the menstrual cycle.

**uterine tube** Duct that transports ova from the ovary to the uterus. Also called the fallopian tube or oviduct.

**uterus** The hollow, muscular organ in females that is the site of menstruation, implantation, development of the fetus, and labor. Also called the womb.

**utricle** The larger of the two divisions of the membranous labyrinth located inside the vestibule of the inner ear, containing a receptor organ for linear acceleration.

## V

**vagina** A muscular, tubular organ that leads from the uterus to the vestibule, situated between the urinary bladder and the rectum of the female.

**varicose vein** Vein that is dilated and twisted in appearance.

**vascular spasm** Contraction of the smooth muscle in the wall of a damaged blood vessel to prevent blood loss.

**vascular tunic** The middle layer of the eyeball, composed of the choroid, ciliary body, and iris. Also called the uvea.

**vasoconstriction** A decrease in the size of the lumen of a blood vessel caused by contraction of the smooth muscle in the wall of the vessel.

**vasodilation** An increase in the size of the lumen of a blood vessel caused by relaxation of the smooth muscle in the wall of the vessel.

**vein** A blood vessel that conveys blood from tissues back to the heart.

**ventricles** A cavity in the brain filled with cerebrospinal fluid. An inferior chamber of the heart.

**ventricle** A cavity in the brain filled with cerebrospinal fluid. An inferior chamber of the heart.

**ventricular fibrillation** Asynchronous ventricular contractions; unless reversed by defibrillation, results in heart failure.

**venule** A small vein that collects blood from capillaries and delivers it to a vein.

**vertebral canal** A cavity within the vertebral column formed by the vertebral foramina of all vertebrae and containing the spinal cord. Also called the spinal canal.

**vertebral column** The 26 vertebrae of an adult and 33 vertebrae of a child; encloses and protects the spinal cord and serves as a point of attachment for the ribs and back muscles. Also called the backbone, spine, or spinal column.

**vertebra** Bone that makes up the vertebral column.

**vesicle** A small bladder or sac containing liquid.

**vestibular apparatus** Collective term for the organs of equilibrium, which includes the saccule, utricle, and semicircular ducts.

**vestibule** A small space or cavity at the beginning of a canal, especially the inner ear, larynx, mouth, nose, and vagina.

**villus** A projection of the intestinal mucosal cells containing connective tissue, blood vessels, and a lymphatic vessel; functions in the absorption of the end products of digestion. Plural is villi.

**viscera** The organs inside the ventral body cavity.

**vitamin** An organic molecule necessary in trace amounts that acts as a catalyst in normal metabolic processes in the body.

**vitreous body** A soft, jellylike substance that fills the vitreous chamber of the eyeball, lying between the lens and the retina.

**vocal folds** Pair of mucous membrane folds below the ventricular folds that function in voice production. Also called true vocal cords.

**vulva** Collective designation for the external genitalia of the female. Also called the pudendum.

## W

**white blood cell (WBC)** Nucleated blood cell that is responsible for protecting the body from foreign substances via phagocytosis or immune reactions.

**white matter** Aggregations or bundles of myelinated and unmyelinated axons located in the brain and spinal cord.

## Y

**yolk sac** An extraembryonic membrane composed of the exocoelomic membrane and hypoblast. It transfers nutrients to the embryo, is a source of blood cells, contains primordial germ cells that migrate into the gonads to form primitive germ cells, forms part of the gut, and helps prevent desiccation of the embryo.

## Z

**zona pellucida** Clear glycoprotein layer between a secondary oocyte and the surrounding granulosa cells of the corona radiata.

**zygote** The single cell resulting from the union of male and female gametes; the fertilized ovum.