

ANAPLASIA

ana- = backward

-plasia = formation or growth

A condition in which a cell or a group of cells dedifferentiate and enters into an immature stem cell-like phase - meaning the cell lost its distinct structural and functional differentiation. Anaplasia is a constant feature of malignancies (e.g., Leiomyosarcoma, Adenoma, and Adenocarcinoma).

APLASIA

a = without, not, or no;

-plasia = formation, growth

A developmental failure resulting in the absence of all or part of an organ or tissue. In most cases, aplasia is congenital however, certain types may sometimes not be apparent until a certain age.

DYSPLASIA

dys = bad, difficult, painful, or disordered

-plasia = formation, growth

In embryology and developmental biology, dysplasia is an abnormal growth and differentiation of tissues or organs. In oncology, it is used to describe atypical or disordered growth of cells; these cells may become cancer precursors.

HYPERPLASIA

hyper = excessive, beyond;

-plasia = formation, growth

An abnormal proliferation or increase in the number of cells that increases the size of a tissue or organ. For example, breast glandular epithelium hyperplasia, compensatory hyperplasia of the liver, and benign prostatic hyperplasia.

HYPOPLASIA

hypo = under, below, beneath, less than normal;

-plasia = formation, growth

Underdevelopment or incomplete development of a tissue or an organ, usually the result of a decrease in the number of cells. Hypoplasia can occur in many different areas of the body such as enamel, thumb, bone marrow, cerebellum, testes and ovaries, and optic nerve.

NEOPLASIA

neo = new

plasia = formation, growth

The new, uncontrolled growth of cells. Neoplasms can be (i) benign growths such as skin moles, cysts, and fibroids, (ii) cancer, or (iii) pre-cancerous tumors.

DIRECTIONAL TERMS IN ANATOMY

ANATOMICAL POSITION

The standard reference point for anatomical nomenclature (e.g., anterior and posterior, medial and lateral, cranial and caudal, or proximal and distal). The position with the body erect, the arms held out to each side and the palms forward; the feet at shoulder width, and toes pointing forward.

THE MIDLINE OF THE BODY

The imaginary line down the middle of the body that cuts the body into equal left and right halves.

ANTERIOR

Denotes the front side (chest) of the body, or towards the abdomen. For example, the kneecap is anterior to the leg. The term is also used in combination with other words to describe the location of a body part. For example, the belly button is described as anterior, mid-abdominal, i.e. it is located on the front in the middle of the abdomen.

POSTERIOR

Denotes the back of the body. Any body part that is not pictured in the Vitruvian man diagram, is likely a posterior part. For example, shoulder blades, sole, popliteus, etc.,

VENTRAL

Ventr/o = belly; equivalent to the anterior or front side of the body

-al = pertaining to

The ventral side of the body includes the chest, abdomen, shins, palms, and soles.

The ventral cavity in the human body is a fluid-filled space at the anterior side, housing visceral organs.

DORSAL

Dors/o = back; equivalent to the posterior or backside of the body

-al = pertaining to.

Examples are the back, buttocks, calves, and knuckles.

MEDIAL

medius = middle. **Medi/o** = middle;

-al = pertaining to

Refers to being toward the midline or the median plane, which splits the body, head-to-toe, into two halves, the left and right. For example, the torso is medial to the arms.

LATERAL

later/o = belonging to the side, **-al** = pertaining to

Side or part of the body that is away from the midline. For example, the arms are lateral to the torso.

- Ipsilateral: Body parts on the same side, the right or left as defined by the midline. Example: right arm and leg.
- Contralateral: Body parts on opposite sides of the midline. That makes one's arms contralateral as well as his/her legs, ears, and lungs.

MEDIOLATERAL

Medi/o = middle, **later/o** = side, **-al** = pertaining to

Refers to the axis from the medial side and extends out the lateral side; used to describe relative position of the side or part of the body along the left-right axis.

SUPERIOR

Refers to the body's vertical axis; any body part that is higher than another or above it is said to be superior to it. For example, the head is superior to the neck and the torso is superior to the legs. Also used to denote organs toward the head.

INFERIOR

Any body part that is lower than another or below it is said to be inferior to it. For example, the liver is inferior to the lungs. Also, used to denote organs at the caudal or lowermost regions of the body.

CRANIAL

Crani/o = skull

-al = pertaining to.

Denoting cranium, or the skull.

CAUDAL

Denoting tail, or hind/posterior part of the body.

DISTAL

Refers to parts of the body away from the trunk or center of the body. For example, the wrist joint is distal to the elbow. The distal bile duct is the farthest end of the cystic duct, away from the gallbladder.

PROXIMAL

Proxim/o = near; **-al** = pertaining to

Toward or nearer to the trunk or center of the body, or nearer to the point of attachment or origin. For example, the femur is proximal to the knee. Similarly, the shoulder is proximal to the elbow.

SUPERFICIAL & DEEP

In anatomy, 'Superficial' and 'Deep' are the directional terms used in reference to the position of tissues and organs. 'Superficial' denotes the structures closer to the surface of the body whereas 'Deep' denotes structures farther from the surface and toward the inside of the body. For example, the skin is superficial, while the bones and spine are deep in the body.

SUPINE

Lying on the back, face up; the most common position used during intracranial, cardiac, abdominal, gynecological, endovascular, laparoscopic, rectal, and urologic procedures.

SUPINATION

One of the movements occurring at the proximal radioulnar joint. When the palm faces up or forward, it's supinated. Supination occurs in functional activities such as feeding, washing the face, turning the hand to receive something, or holding a bowl of water.

PRONE

Lying on the stomach with the limbs unextended and head turned to one side; an ideal position for therapeutic massage, back surgeries, and various biopsies.

PRONATION

When the palm faces down or backward, it's pronated. Grabbing an object, turning a screwdriver, or rotating a screwdriver are some examples of pronation.

PLANE

Hypothetical geometric lines that cut through and section an upright body; used as reference points to describe direction and location of bodily parts.

Frontal plane

The frontal or coronal plane, the vertical plane that cuts the body into front (anterior) and back (posterior) sections.

Transverse plane

A horizontal plane that divides the body into superior (upper) and inferior (lower) portions. In anatomical studies, they are also referred to as a cross-section.

Midsagittal plane

A sagittal plane that bisects the body vertically through the midline, separating the right and left halves.

PLANTAR

Denotes the sole or bottom of the foot.

Plantar flexion

Downward movement of the foot; allows one to walk, run, dance, or pedal.

TERMS USED WHEN DISCUSSING THE HUMAN BODY

ABDOMINAL CAVITY

-abdomin/o = abdomen, -al = of the abdomen

The largest body cavity beneath the thoracic cavity and above the pelvic cavity; holds the major viscera including the greater part of the digestive tract, liver, pancreas, gallbladder, spleen, kidneys, colon, and rectum.

Abdominopelvic cavity

A collective term for abdominal and pelvic cavities; anatomically, it is divided into four quadrants (left upper quadrant (LUQ), left lower quadrant (LLQ), right upper quadrant (RUQ), and right lower quadrant (RLQ)).

abdomin/o = abdomen

pelv/i = pelvis

-ic = pertaining to

CARDIAC MUSCLE

Cardi/o- = heart, -ac = related to

The cardiac muscle or myocardium is the muscle of the heart. This involuntary, striated muscle is responsible for coordinated contractions, letting the heart pump blood.

CELL

From Latin cella = small room.

The smallest unit of life; some cells are organisms unto themselves (e.g., unicellular bacteria and protozoa); others are structural or functional units of multicellular organisms (e.g., plants and animals).

Cell membrane

Cell membrane, also called the plasma membrane, the thin semi-permeable outer covering of a cell. It acts as a gate to control the transportation of materials between the cytoplasm and the external environment.

CERVICAL VERTEBRAE

Cervic/o = the neck or the nape of the neck, -al = pertaining to
The first seven stacked bony rings of the spinal column; labeled as C1 through C7. Despite being the most delicate bones, cervical vertebrae do the jobs of supporting the skull, protecting the spinal cord, and providing mobility to the head.

CHROMOSOMES

Microscopic, organized bundles of tightly coiled DNA found in the nucleus of the cell; carries hereditary information as genes.

COCCYX

The tailbone; the terminal part of the vertebral column, representing a vestigial tail in humans. Comprising three to five coccygeal vertebrae, it serves as the attachment point for multiple muscles, ligaments, and tendons. The coccyx also provides weight-bearing support when in a seated position.

CONNECTIVE TISSUE

A group of tissues that support and bind other tissues in the body; also acts as a 'filler' for areas not occupied by other tissue. There are three main groups of connective tissues: Loose connective tissue (holds organs in place), Dense connective tissue (helps attach muscle to bones and links bones at their joints), and Specialized connective tissue (adipose, cartilage, bone, blood, and lymph)

CRANIAL

Crani/o = skull, -al = pertaining to.
Denoting the skull or cranium.

Cranial cavity

crani/o = skull, -al = pertaining to

The cranial cavity, or intracranial space, houses and protects the brain, its meninges, and vasculature.

CYTOLOGY

Greek *kytos* = hollow receptacle or container.

cyt/o = cell; -logy = study of.

Study of individual cells, their origin, structure, function, and pathology.

Cytoplasm

cyt/o = cell;

-plasm = living substance or substance of a cell

A jelly-like substance that fills each cell. It contains organelles, including the nucleus, endoplasmic reticulum, Golgi apparatus, lysosomes, peroxisomes, and mitochondria.

EPIGASTRIC REGION

Epi-= above;

-gastric = denoting stomach.

One of the abdominal regions, located between the left and right hypochondriac region; above the belly and below the ribcage. Parts of the right and left lobes of the liver and a major portion of the stomach come under the epigastric region.

EPITHELIAL TISSUE

Densely packed tissues lining the internal and external organs; it also lines the vessels, body cavities, glands, and hollow organs.

Based on the number of layers that make up the epithelium, it is classified as simple, stratified, and pseudostratified. Histologists classified epithelial tissue, according to the cell shape: squamous, columnar, and cuboidal.

GENE

A short segment of DNA that codes, or holds instructions for proteins.

HISTOLOGIST

hist/o = tissue; **-logist** = one who studies or specializes, an expert.

A histology specialist

HYPOCHONDRIAC REGION

Hypo = below, beneath, under; **chondr/i** = cartilage; **-ac** = pertaining to

A region on either side of the upper abdomen, under the cartilages of the false ribs, beside the epigastric region, and above the lumbar region. Includes the gallbladder and the right lobe of the liver.

HYPOGASTRIC REGION

Hypo = below, beneath, under; **gastr/o** = stomach, abdomen, **-ac** = pertaining to

The region below the umbilical region. Includes the urinary bladder, portions of the small intestine, and the appendix.

INGUINAL REGION

inguin/o = groin, **-al** = pertaining to

The groin, or lower lateral sections of the abdomen; also called the iliac region. In males, it is a site for herniations.

LUMBAR

Lumb/o = loin, lower back, **-ar** = pertaining to

Also referred to as the lower spine; a region between the hypochondriac and iliac regions, and outside of the umbilical region.

Lumbar vertebrae

Lumb/o = loin, lower back, -ar = pertaining to

The largest, out of all the vertebrae, located between the thoracic vertebrae and the sacral vertebrae in the spinal column; labeled as L1 through L5.

LYSOSOMES

Membrane-bound organelles that contain hydrolases, responsible for the digestion of macromolecules, old or damaged cells, and microbes.

MCBURNEY'S POINT

A point on the right lower abdomen, about two-thirds the distance between the umbilicus and anterior superior iliac spine (ASIS). It is the point of maximum tenderness in patients with acute appendicitis.

MEMBRANE

A thin layer that forms the outer boundary of a cell, body cavity, organs, or internal passageways.

MITOCHONDRIA

Membrane-bound organelles involved in energy (adenosine triphosphate aka ATP) production, cell signaling, and cell fate.

NUCLEUS

nucle/o = nucleus, core, inner part;
-us = noun suffix

A membrane-bound organelle that functions as the core of a eukaryotic cell.

ORGAN

A group of tissues that perform a specific function.

PELVIC CAVITY

pelv/I = pelvis; -ic = relating to

A bowl-shaped lower front cavity of the body sits beneath the abdominal cavity; houses the urinary bladder and reproductive organs.

PERITONEUM

peritone/o = peritoneum; -us = noun suffix

A thin serous membrane consisting of a single layer of the mesothelium. The parietal peritoneum lines the abdominal wall, whereas the visceral peritoneum lines the abdominal viscera.

RIBOSOMES

RNA-rich cell organelles that make proteins; often called protein factories of the cell.

SACRUM

sacr/o = sacrum, sacred bone, holy bone; *-um* = noun suffix
The sacrum is a single, inverted triangle-shaped bone, composed of five individual vertebrae that fuse during adulthood; forms the base of the spine and the pelvis.

SKELETAL MUSCLE

skelet/o = skeleton, dried up; *-al* = pertaining to
Striated muscle tissue that is attached to bones by tendons; functions to contract and permit the movement of skeleton.

Smooth muscle

Involuntary muscles found in the walls of hollow organs, such as the intestines, uterus, and stomach.

SPINAL CAVITY

spin/o = the spine, spinal cord, vertebral column; *-al* = relating to

The cavity within the vertebral column contains the spinal cord and the spinal nerve roots branching off the spinal cord. Also referred to as the spinal canal or vertebral canal.

THORACIC CAVITY

thorac/o = chest, thorax, the breast, breastplate; *-ic* = relating to
The chest cavity, houses the tissues and organs of the respiratory system (lungs, bronchi, trachea, pleura), cardiovascular system (heart, pericardium, great vessels, lymphatics), nervous system (vagus nerve, sympathetic chain, phrenic nerve, recurrent laryngeal nerve), immune system (thymus), and digestive (esophagus) system.

Thoracic vertebrae

thorac/o = chest, thorax, the breast, breastplate; *-ic* = relating to

A stack of 12 vertebrae located between the cervical and lumbar vertebrae; labeled from T1 through T12. The thoracic vertebrae hold the rib cage and protect the delicate organs of the thorax, including the heart and lungs.

TISSUE

A group of structurally similar cells, in close proximity, organized to perform specific functions. For example, adipose tissue is a group of adipose cells.

UMBILICAL REGION

umbilic/o = a middle point, center, navel; **-al** = pertaining to
One of the nine regions of the abdomen, located between the right and left lumbar regions and directly beneath the epigastric region. Contains the navel, also called the umbilicus.

Umbilicus

umbilic/o = a middle point, centre, navel; **-us** = noun suffix

The navel, or belly button; the remnant of what was once the umbilical cord in a newborn.

VISCERAL

viscer/o = organs within a body cavity, internal organs;
-al = pertaining to

Of or related to viscera, or the internal organs within the body, specifically those within the thoracic cavity (the heart or the lungs), or abdominal cavity (the liver, the pancreas, or intestines).

Visceral muscle

viscer/o = organs within a body cavity, internal organs; **-al** = pertaining to

Smooth muscles of the viscera, especially those in the abdominal cavity.

Prefixes and Combining Forms for Color Medical Terms

Black: melan/o

Blue: cyan/o

Gray, silver : glauc/o & poli/o

Green: chlor/o
Purple: purpur/o
Red: erythr/o, eosin/o, rube
White: albalbin/o leuk/o
Yellow: cirrh/o jaund/o xanth/o

ALB-

White

albino (person who has a marked deficiency of pigment in the eyes, hair, and skin; has abnormally white skin)

ALBIN/O

White

albinism (condition of abnormally white skin; characterized by absence of pigment in the skin, hair, and eyes)

CHLOR/O

Green

chlorophyll (green pigment in plants that accomplishes photosynthesis)

CIRRH/O

Yellow, tawny

cirrhosis (chronic degenerative disease of the liver with resultant yellowness of the liver and of the skin)

CYAN/O

Blue

cyanoderma (slightly bluish, grayish, slate-like, or dark discoloration of the skin)

EOSIN/O

Red, rosy

eosinophil (bilobed leukocyte that stains a red, rosy color with an acid dye)

ERYTHR/O

Red

erythrocyte (mature red blood cell)

GLAUC/O

Gray, silver

glaucoma (disorder of the eye due to an increase in intraocular pressure; creates a dull gray gleam of the affected eye)

JAUND/O

Yellow

jaundice (yellow discoloration of the skin)

LUTE/O

Yellow

corpus luteum (a yellow glandular mass on the surface of the ovary that forms after the ovarian follicle ruptures and releases a mature ovum)

LEUK/O

White

leukoplakia (white, hard, thickened patches firmly attached to the mucous membrane in areas such as the mouth, vulva, or penis)

MELAN/O

Black

melanoma (darkly pigmented cancerous tumor)

POLI/O

Gray

poliomyelitis (inflammation of the gray matter of the spinal cord)

PURPUR/O

Purple

purpura (collection of blood beneath the skin in the form of pinpoint hemorrhages appearing as red/purple skin discolorations)

RUBE-

Red

rubella (contagious viral disease characterized by fever, coldlike symptoms, and a diffuse, fine, red rash)



NEGATIVE PREFIXES

A-

Without, not, no

apnea (without breathing) Note: When a is used as a prefix it means “without, not, no”; a can also be used as a suffix.

AN-

Without, not, no

anesthesia (without feeling)

ANA-

Not,

without anaplasia (without formation or development)

ANTI-

Against

antidote (a drug or other substance that opposes [works against] the action of a poison)

CONTRA-

Against

contraceptive (any device or technique that prevents [works against] conception)

DIS-

Free of, to undo

discharge (to release a substance or object [to free it from its location])

IM-

Not

impotence (an adult male’s inability [not able] to achieve penile erection)

IN-

In, inside, within, not



incompetent (not capable)