

**Glossary: PBS**

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**A**

**Adenine:** A component of nucleic acids, energy-carrying molecules such as ATP, and certain coenzymes. Chemically, it is a purine base.

Adenosine tri-phosphate (ATP): A compound composed of adenosine and three phosphate groups that supplies energy for many biochemical cellular processes by undergoing enzymatic hydrolysis.

Allele: Any of the alternative forms of a gene that may occur at a given locus.

Amino Acid: An organic monomer which serves as a building block of proteins.

**Anemia**: A condition in which the blood is deficient in red blood cells, in hemoglobin, or in total volume.

**Angiogram**: The radiographic visualization of blood vessels after the injection of radiopaque substance.

**Angioplasty**: Surgical repair or recanalization of a blood vessel.

**Antibody**: An antigen-binding immunoglobulin, produced by B cells, that functions as the effector in an immune response.

**Anticodon**: A triplet of nucleotide bases in transfer RNA that identifies the amino acid carried and binds to a complementary codon in messenger RNA during protein synthesis at a ribosome.

**Aorta**: The large arterial trunk that carries blood from the heart to be distributed by branch arteries through the body.

**Aortic Valve**: The semilunar valve separating the aorta from the left ventricle that prevents blood from flowing back into the left ventricle.

**Artery**: Any of the tubular branching muscular and elastic-walled vessels that carry blood from the heart through the body.

**Aseptic Technique**: A procedure performed under sterile conditions.

**Atherosclerosis**: Changes in the walls of large arteries consisting of lipid deposits on the artery walls.

Atrioventricular Node: A specialized mass of conducting cells located at the atrioventricular junction in the heart.

**Atrium**: An anatomical cavity or passage; especially a chamber of the heart that receives blood from the veins and forces it into a ventricle or ventricles.

**Autopsy**: An examination of the body after death usually with such dissection as will expose the vital organs for determining the cause of death.

**Autosome**: A chromosome that is not directly involved in determining sex, as opposed to a sex chromosome.

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**B**

Bacillus: A cylindrical or rod-shaped bacterium.

**Bacteria**: Single-celled microorganisms that are often aggregated into colonies or motile by means of flagella, typically live in soil, water, organic matter, or the bodies of plants and animals, are usually autotrophic, saprophytic, or parasitic in nutrition, and are noted for their biochemical effects and pathogenicity.

Bibliography: A document showing all the sources used to research information.

Biomedical Science: The application of the principles of the natural sciences, especially biology and physiology, to clinical medicine.

**Blood Plasma**: The pale yellow fluid portion of whole blood that consists of water and its dissolved constituents including, sugars, lipids, metabolic waste products, amino acids, hormones, and vitamins.

**Blood Pressure**: Pressure exerted by the blood upon the walls of the blood vessels, especially arteries, usually measured by means of a sphygmomanometer and expressed in millimeters of mercury.

**B Lymphocyte (B cell)**: A type of lymphocyte that develops in the bone marrow and later produces antibodies.

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**C**

Calorie: The amount of heat energy required to raise the temperature of 1 g of water by 1°C; also the amount of heat energy that 1 g of water releases when it cools by 1°C. The Calorie (with a capital C), usually used to indicate the energy content of food, is a kilocalorie.

**Carbohydrate**: A sugar in the form of a monosaccharide, disaccharide or polysaccharide.

**Cardiology**: The study of the heart and its action and diseases.

**Cardiovascular System**: The transport system of the body responsible for carrying oxygen and nutrients to the body and carrying away carbon dioxide and other wastes; composed of the heart, blood vessels, and blood.

**Cell**: The smallest structural unit of living matter capable of functioning independently.

Chemical Bond: An attractive force that holds together the atoms, ions, or groups of atoms in a molecule or compound.

Chemical Indicator: A substance (as a dye) used to show visually usually by its capacity for color change, the condition of a solution with respect to the presence of free acid or alkali or some other substance.

**Chemical Reaction**: Chemical transformation or change; the interaction of chemical entities.

**Cholesterol**: A lipid that forms an essential component of animal cell membranes and acts as a precursor molecule for the synthesis of other biologically important steroids.

Chromosome: Any of the usually linear bodies in the cell nucleus that contain the genetic material.

**Citation**: A written reference to a specific work (book, article, dissertation, report, musical composition, etc.) by a particular author or creator which identifies the document in which the work may be found.

**Coccus**: A spherical bacterium.

**Codon**: A three-nucleotide sequence of DNA or mRNA that specifies a particular amino acid or termination signal; the basic unit of the genetic code.

**Compound**: A substance consisting of two or more elements in a fixed ratio.

**Contagious**: Communicable by contact.

Control Group: The group in an experiment where the independent variable being tested is not applied so that it may serve as a standard for comparison against the experimental group where the independent variable is applied.

**Coronary Bypass**: A surgical bypass operation performed to shunt blood around an obstruction in a coronary artery that involves grafting one end of a segment of vein removed from another part of the body into the aorta and the other end into the coronary artery beyond the obstructed area to allow for increased blood flow.

**Covalent Bond**: A type of strong chemical bond in which two atoms share one or more pairs of valence electrons.

**Cytosine**: A component of nucleic acids that carries hereditary information in DNA and RNA in cells. Chemically, it is a pyrimidine base.

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**D**

Dehydration Synthesis: A chemical reaction in which two molecules are bonded together with the removal of a water molecule.

Deoxyribonucleic Acid (DNA): A double-stranded, helical nucleic acid molecule capable of replicating and determining the inherited structure of a cell’s proteins.

Dependent Variable**:** The measurable effect, outcome, or response in which the research is interested.

**Diastole**: The stage of the heart cycle in which the heart muscle is relaxed, allowing the chambers to fill with blood.

**Diastolic Pressure**: Blood pressure that remains between heart contractions.

**Digestive System**: The group of organs that break down foods into chemical components that the body can absorb and use for energy and for building and repairing cells and tissues.

Disaccharide: A double sugar molecule made of two monosaccharides bonded together through dehydration synthesis.

**Documentation**: The act of creating citations to identify resources used in writing a work.

**Dominant Trait**: A genetic trait is considered dominant if it is expressed in a person who has only one copy of the gene associated with the trait.

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**E**

Electrocardiogram (EKG): A measurement of heart electrical activity.

**Element**: The smallest particle of a substance that retains all the properties of the substance and is composed of one or more atoms.

Erythrocytes (Red Blood Cells): Any of the hemoglobin-containing cells that carry oxygen to the tissues and are responsible for the red color of vertebrate blood.

**Experiment**: A research study conducted to determine the effect that one variable has upon another variable.

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**F**

Familial Hypercholesterolemia: A metabolic disorder that is caused by defective or absent receptors for LDLs on cell surfaces, that is marked by an increase in blood plasma LDLs and by an accumulation of LDLs in the body resulting in an increased risk of heart attack and coronary heart disease, and that is inherited as an autosomal dominant trait.

**Forensic Science**: The application of scientific knowledge to questions of civil and criminal law.

**Fungus**: Saprophytic and parasitic spore-producing eukaryotic organisms that lack chlorophyll and include molds, rusts, mildews, smuts, mushrooms, and yeasts.

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**G**

**Gel Electrophoresis**: The separation of nucleic acids or proteins, on the basis of their size and electrical charge, by measuring their rate of movement through an electrical field in a gel.

**Gene**: A discrete unit of hereditary information consisting of a specific nucleotide sequence in DNA (or RNA, in some viruses).

**Genetic Material**: Molecules responsible for heredity and variation of organisms.

**Genotype**: All or part of the genetic constitution of an individual or group.

**Glucagon**: A protein hormone secreted by pancreatic endocrine cells that raises blood glucose levels; an antagonistic hormone to insulin.

**Glucose**: A monomer of carbohydrate, simple sugar.

**Glucose Tolerance Test**: A test of the body’s ability to metabolize glucose that involves the administration of a measured dose of glucose to the fasting stomach and the determination of blood glucose levels in the blood or urine at intervals thereafter and that is used especially to detect diabetes.

**Gram Stain**: A method for the differential staining of bacteria that involves fixing the bacterial cells to a slide and staining with crystal violet and iodine, then washing with alcohol, and counterstaining with safranin. Results in gram-positive bacteria retaining the purple dye and gram-negative organisms having it decolorized so that the red counterstain shows up.

**Guanine**: A component of nucleic acids that carries hereditary information in DNA and RNA in cells. Chemically, it is a purine base.

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**H**

HDL (High Density Lipoprotein): A cholesterol-carrying particle in the blood, made up of cholesterol and other lipids surrounded by a single layer of phospholipids in which proteins are embedded. An HDL particle carries less cholesterol than a related lipoprotein, LDL, and may be correlated with a decreased risk of blood vessel blockage.

Health Insurance Portability and Accountability Act (HIPAA): A comprehensive set of standards and practices designed to give patients specific rights regarding their personal health information.

**Heart Attack**: An acute episode of heart disease marked by death or damage of heart muscle due to insufficient blood supply to the heart muscle usually as a result of coronary thrombosis or a coronary occlusion and that is characterized especially by chest pain.

**Heart Disease**: An abnormal organic condition of the heart or of circulation.

**Heart Rate**: A measure of cardiac activity usually expressed as the number of beats per minute.

**Helix**: Something spiral in form.

**Helminth**: A parasitic worm (as a tapeworm, liver fluke, ascarid, or leech).

**Hematocrit**: The percent of the volume of whole blood that is composed of red blood cells as determined by separation of red blood cells from the plasma usually by centrifugation.

Hemoglobin A1c: A test that measures the level of hemoglobin A1c in the blood as a means of determining the average blood sugar concentrations for the preceding two to three months.

**Heredity**: The transmission of traits from ancestor to descendant.

**Heterozygous**: Having two different alleles for a given gene.

**Homeostasis**: The maintenance of relatively stable internal physiological conditions (as body temperature or the pH of blood) in higher animals under fluctuating environmental conditions.

**Homologous Chromosomes**: Chromosomes having the same or allelic genes with genetic loci usually arranged in the same order.

**Homozygous**: Having two identical alleles for a given gene.

**Hormone**: A product of living cells that circulates in blood and produces a specific, often stimulatory, effect on the activity of cells that are often far from the source of the hormone.

**Hydrolysis**: A chemical process that splits a molecule by adding water.

**Hydrophilic**: Having an affinity for water.

**Hydrophobic**: Having an aversion to water; tending to coalesce and form droplets in water.

Hyperglycemia: An excess of sugar in the blood.

**Hypertension**: An abnormally high blood pressure.

**Hypertonic**: In comparing two solutions, referring to the one with a greater solute concentration.

Hypoglycemia: Abnormal decrease of sugar in the blood.

**Hypothesis**: Clear prediction of the anticipated results of an experiment.

**Hypotonic**: In comparing two solutions, referring to the one with a lower solute concentration.

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**I**

**Immunity**: A condition of being able to resist a particular disease, especially through preventing development of a pathogenic microorganism or by counteracting the effects of its products.

**Independent Variable**: The variable that is varied or manipulated by the researcher.

**Infection**: The state produced by the establishment of an infective agent in or on a suitable host.

**Inferior Vena Cava**: A vein that is the largest vein in the human body and returns blood to the right atrium of the heart from bodily parts below the diaphragm.

**Insulin**: A protein hormone secreted by the pancreas that is essential for the metabolism of carbohydrates and the regulation of glucose levels in the blood.

**Ionic Bond**: A chemical bond resulting from the attraction between oppositely charged ions.

**Isotonic**: Having the same solute concentration as another solution.

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**K**

**Karyotype**: A display of the chromosome pairs of a cell arranged by size and shape.

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**L**

LDL (Low Density Lipoprotein): A cholesterol-carrying particle in the blood, made up of cholesterol and other lipids surrounded by a single layer of phospholipids in which proteins are embedded. An LDL particle carries more cholesterol than a related lipoprotein, HDL, and high LDL levels in the blood correlate with a tendency to develop blocked blood vessels and heart disease.

Leukocytes (White Blood Cells): Any of the blood cells that are colorless, lack hemoglobin, contain a nucleus, and include the lymphocytes, monocytes, neutrophils, eosinophils, and basophils.

**Lipid**: One of a family of compounds including fats, phospholipids, and steroids that is insoluble in water.

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**M**

**Macromolecule**: A type of giant molecule formed by joining smaller molecules which includes proteins, polysaccharides, lipids, and nucleic acids.

**Medical Examiner:** A physician who performs an autopsy when death may be accidental or violent. He or she may also serve in some jurisdictions as the coroner.

**Meiosis**: The cellular process that results in the number of chromosomes in gamete-producing cells being reduced to one half and that involves a reduction division in which one of each pair of homologous chromosomes passes to each daughter cell.

Messenger RNA (mRNA): A type of RNA, synthesized from DNA and attached to ribosomes in the cytoplasm; it specifies the primary structure of a protein.

**Metabolic Syndrome**: A syndrome marked by the presence of usually three or more of a group of factors (as high blood pressure, abdominal obesity, high triglyceride levels, low HDL levels, and high fasting levels of blood sugar) that are linked to increased risk of cardiovascular disease and Type 2 diabetes.

**Microbiology**: A branch of biology dealing especially with microscopic forms of life (as bacteria, protozoans, viruses, and fungi).

**Mitosis**: A process that takes place in the nucleus of a dividing cell, involves a series of steps, and results in the formation of two new nuclei each having the same number of chromosomes as the parent nucleus.

**Mitral Valve**: A valve in the heart that guards the opening between the left atrium and the left ventricle; prevents the blood in the ventricle from returning to the atrium. Alternative name is bicuspid valve.

**Model**: A simplified version of something complex used, for example, to analyze and solve problems or make predictions.

**Molecule**: Two or more atoms held together by covalent bonds.

**Monomer**: The subunit that serves as the building block of a polymer.

Monosaccharide: A single sugar molecule such as glucose or fructose, the simplest type of sugar.

**Mutation**: A rare change in the DNA of a gene, ultimately creating genetic diversity.

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**N**

**Negative Control**: Control group where conditions produce a negative outcome. Negative control groups help identify outside influences which may be present that were not accounted for when the procedure was created.

**Negative Feedback**: A primary mechanism of homeostasis, whereby a change in a physiological variable that is being monitored triggers a response that counteracts the initial fluctuation.

**Nervous System**: The bodily system that in vertebrates is made up of the brain and spinal cord, nerves, ganglia, and parts of the receptor organs and that receives and interprets stimuli and transmits impulses to the effector organs.

**Nucleotide**: A building block of DNA, consisting of a five-carbon sugar covalently bonded to a nitrogenous base and a phosphate group.

**Nutrient**: A substance that is needed by the body to maintain life and health.

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**O**

**Organ**: Collection of tissues which performs a particular function or set of functions in an animal's body. The heart, brain, and skin are three organs found in most animals. Organs are composed of tissues and may be organized into larger organ systems.

**Osmosis**: The movement of water across a selectively permeable membrane from an area of higher concentration to an area of lower concentration.

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**P**

Pacemaker: An electrical device for stimulating or steadying the heartbeat or reestablishing the rhythm of an arrested heart.

PCR (Polymerase Chain Reaction): A laboratory technique for amplifying DNA *in vitro* by incubating with special primers, DNA polymerase molecules, and nucleotides.

Pedigree: A diagram of a family tree showing the occurrence of heritable characteristics in parents and offspring over multiple generations.

Personal Protective Equipment: Specialized clothing or equipment, worn by an employee for protection against infectious materials (as defined by OSHA).

**Phagocyte**: A cell (as a white blood cell) that engulfs and consumes foreign material (as microorganisms) and debris.

**Phenotype**: The observable properties of an organism that are produced by the interaction of the genotype and the environment.

**Polymer**: A large molecule consisting of many repeating chemical units or molecules linked together.

Polysaccharide: A polymer of thousands of simple sugars formed by dehydration synthesis.

**Positive Control**: Group expected to have a positive result, allowing the researcher to show that the experimental set up was capable of producing results.

**Positive Feedback**: Feedback that tends to magnify a process or increase its output.

**Prion**: Any of various infectious proteins that are abnormal forms of normal cellular proteins, that proliferate by inducing the normal protein to convert to the abnormal form, and that in mammals include pathogenic forms.

**Protein**: A three dimensional polymer made of monomers of amino acids.

**Protein Synthesis**: The creation of a protein from a DNA template.

**Protozoan** Any protist of the phylum or subkingdom Protozoa.

**Pulmonary Circulation**: The passage of venous blood from the right atrium of the heart through the right ventricle and pulmonary arteries to the lungs where it is oxygenated and its return via the pulmonary veins to enter the left atrium and participate in systemic circulation.

**Pulse**: The rhythmic expansion and recoil of arteries resulting from heart contraction; can be felt from the outside of the body.

**Punnett Square**: A simple graphical way of discovering all of the potential combinations of genotypes of an offspring*,* given the parents’ genotypes.

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**R**

**Recessive Trait:** A condition that appears only in individuals who have received two copies of a mutant gene, one copy from each parent.

**Respiratory System**: A system of organs, functioning in the process of gas exchange between the body and the environment, consisting especially of the nose, nasal passages, nasopharynx, larynx, trachea, bronchi, and lungs.

**Restriction Enzyme**: A degradative enzyme that recognizes specific nucleotide sequences and cuts up DNA.

**Restriction Fragment Length Polymorphisms (RFLPs)**: Differences in DNA sequence on homologous chromosomes that can result in different patterns of restriction fragment lengths (DNA segments resulting from treatment with restriction enzymes).

Ribonucleic Acid (RNA): A type of nucleic acid consisting of nucleotide monomers with a ribose sugar and the nitrogenous bases adenine (A), cytosine (C), guanine (G), and uracil (U); usually single-stranded; functions in protein synthesis and as the genome of some viruses.

**Ribosome**: A cell organelle that functions as the site of protein synthesis in the cytoplasm; consists of ribosomal RNA and protein molecules and is formed by combining two subunits.

**Risk Factor**: Something which increases risk or susceptibility.

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**S**

**Sex Chromosome**: One of the pair of chromosomes responsible for determining the sex of an individual.

**Sickle Cell Disease:** Individuals who are homozygous for the gene controlling hemoglobin S. The disease is characterized by the destruction of red blood cells and by episodic blocking of blood vessels by the adherence of sickle cells to the vascular endothelium.

**Sinoatrial Node**: A small mass of tissue that is made up of Purkinje fibers, ganglion cells, and nerve fibers, that is embedded in the musculature of the right atrium, and that originates the impulses stimulating the heartbeat -- called also S-A node, sinus node.

**Solute**: A substance that is dissolved in a solution.

**Solution**: A liquid that is a homogeneous mixture of two or more substances.

**Solvent**: The dissolving agent of a solution. Water is the most versatile solvent known.

Sphygmomanometer: An instrument for measuring blood pressure and especially arterial blood pressure.

**Spirillum**: A spiral-shaped bacterium.

**Stenting**: A surgical procedure or operation for inserting a stent, a mold to keep a passageway open, into an anatomical vessel.

**Stroke**: Sudden loss of consciousness, sensation, and voluntary motion caused by rupture or obstruction (as by a clot) of a blood vessel of the brain.

**Superior Vena Cava**: A vein that is the second largest vein in the human body and returns blood to the right atrium of the heart from the upper half of the body.

**System**: A collection of components organized to accomplish a specific function or set of functions.

**Systemic Circulation**: The branch of the circulatory system that supplies all body organs and then returns oxygen-poor blood to the right atrium via the veins.

**Systole**: The stage of the heart cycle in which the heart muscle contracts and the chambers pump blood.

**Systolic Pressure**: The pressure generated by the left ventricle during systole.

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**T**

Thrombocytes (Platelets): A minute colorless anucleate disklike body of mammalian blood that assists in blood clotting by adhering to other platelets and to damaged epithelium.

**Thymine**: A component of nucleic acid that carries hereditary information in DNA in cells. Chemically, it is a pyrimidine base.

**Tissue**: An integrated group of cells with a common function, structure, or both.

T Lymphocyte (T Cells): A type of lymphocyte responsible for cell-mediated immunity that differentiates under the influence of the thymus.

**Transcription**: The synthesis of RNA on a DNA template.

Transfer RNA (tRNA): An RNA molecule that functions as an interpreter between nucleic acid and protein language by picking up specific amino acids and recognizing the appropriate codons in the mRNA.

**Translation**: The synthesis of a polypeptide using the genetic information encoded in an mRNA molecule. There is a change of language from nucleotides to amino acids.

**Transmission**: The way a microbial organism moves from one host to another.

**Tricuspid Valve**: A valve that is situated at the opening of the right atrium of the heart into the right ventricle and that resembles the mitral valve in structure but consists of three triangular membranous flaps.

**Type 1 Diabetes**: Diabetes of a form that usually develops during childhood or adolescence and is characterized by a severe deficiency of insulin, leading to high blood glucose levels.

Type 2 Diabetes: Diabetes of a form that develops especially in adults and most often obese individuals and that is characterized by high blood glucose resulting from impaired insulin utilization coupled with the body’s inability to compensate with increased insulin production.

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**V**

**Valve**: A bodily structure (as the mitral valve) that closes temporarily a passage or orifice or permits movement of fluid in one direction only.

**Vein**: A vessel that returns blood to the heart.

**Virus**: Any of a large group of submicroscopic infective agents that typically contain a protein coat surrounding an RNA or DNA core of genetic material but no semipermeable membrane, that are capable of growth and multiplication only in living cells, and that cause various important diseases in humans, animals, or plants.

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