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Medical Terminology

A Comprehensive Guide to Anatomy, Physiology, Pathophysiology, and Pharmacology

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Mantra Publication

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Medical Terminology: A Comprehensive Guide to Anatomy, Physiology, Pathophysiology, and Pharmacology

This book is logically broken down into three sections, which are first the study of the *Human Anatomy and Physiology*, secondly the study of the *Pathophysiology*, the study of diseases and pathological terms, thirdly the study of *Pharmacology* which is a study of common diseases, their treatment, drug action, benefits and side effects. It is also useful to Pharmacy, MBBS, Nursing and Physiotherapy etc students of all levels, and the educators, researchers, aspirants and other healthcare practitioners who require a clear and in depth knowledge of medical terms.

Preface

Medical science is founded upon a language of precision a language of expressions which bring together anatomy, physiology, pathology and pharmacology, into one smooth system of knowledge. ***Medical Terminology: A Comprehensive Guide to Anatomy, Physiology, Pathophysiology, and Pharmacology*** is already produced with this specific purpose in mind to present to the learners and practitioners simple, structured, and integrated mastering of the language that specifies the medical world.

The book is well considered as there are three broad sections. The first one is the description of fundamental concepts of human anatomy and physiology, and this part of the work allows the reader to understand the complex structure and the coordination of actions of the human body. The second part is devoted to the pathophysiology, which discusses the way in which diseases disrupt the normal physiological balance and illustrates several important pathological concepts that are very important in clinical interpretation. The third and the last part is assigned to the pharmacology explaining mechanisms of action of drugs, mode of therapy, side effects and pharmacological mode of managing this or that disorder.

All the subjects in this book have been presented in straightforward, brief and easy to comprehend language in order to ensure learning was effective as well as interesting. Definitions, explanations, and examples are designed in a way that leads to the conceptual clarity, whereas combination of theoretical and clinical approaches enables readers to correlate terms with the real-life healthcare situation.

The book is aimed at being a complete learning guide among Pharmacy, MBBS, Nursing and Physiotherapy students and educators, health care practitioners and researchers who need to have accuracy in medical terminologies. It is also a strong guide particularly to the aspirants, who are about to take medical or paramedical tests, since they provide a comprehensive view of the way the scientific names echo the underlying biological and pharmacological processes.

Clarity, scholarly richness, and logical order have shaped the creation of this book. A lot of precision has been observed in order to maintain accuracy, relevancy, as well as compatibility with the contemporary instructive standards in a bid to assist in the instruction in the classroom as well as in autonomous discovery.

Realistically, we wish this work could promote knowledge, confidence and professional competence of the readers. Positive recommendations, observations, and feedbacks of students, teachers, and practitioners will be highly valued and will be used as helpful guides on how better editions of this book can be done in future.

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Acknowledgement

And with unbroken humble and grateful assistants to the Almighty, who alone through his unwearying grace, direction, and power has enlightened every step in the preparation of this work: ***Medical Terminology: A Comprehensive Guide to Anatomy, Physiology, Pathophysiology, and Pharmacology***. It is by His blessings we gained the strength of mind and perseverance as well as encouragement that we could work this piece through to completion.

Our teachers, mentors, and academic guides whose guidance and encouragement have been the pillars on our learning we are thankful. Their insightful ideas and their persistent encouragement made us improve our knowledge on the field of medical and pharmaceutical sciences and made us desire to create this text as a fullfledged knowledgeable and easy to read resource of the students and the professionals.

We would like to thank our fellow colleagues, our fellow peers, and our fellow students who showed their curiosity, feedback, and interests in the knowledge and which compelled us to be accordingly clear and accurate about every idea. They contributed largely to the improvement of the contents and presentation of this book through their interactions and positive ideas.

Another organization that we should like to thank is the **Mantra Publication** and **DeepScience Publishing**, which have been of great help in terms of their professionalism, attention to details, and dedication to academic standards. Their work attained the utmost provisions of quality, readability, and educative content.

We owe it a lot to the various researchers, scholars and healthcare professionals, whose efforts to promote the field of medical science have served as the greatest source of inspiration throughout the time. They have left a solid basis to most of the material contained here out through their published work and their contributions to the clinical field.

We are indebted with much thanks to our families and people that we love as they were the only ones who could support, be patient, and understanding in the long journey of writing and revision. Their support and belief in what we were doing made us not to give up in our activities but to work and realise this project.

Finally, the book has also been dedicated to all learners, instructors, medical professionals, and scientists whose work aims at gaining knowledge and improving human health. We hope with all sincerity that this work will become a reliable companion during their studies and practice as contributors to the knowledge and appreciation of the language of medicine..

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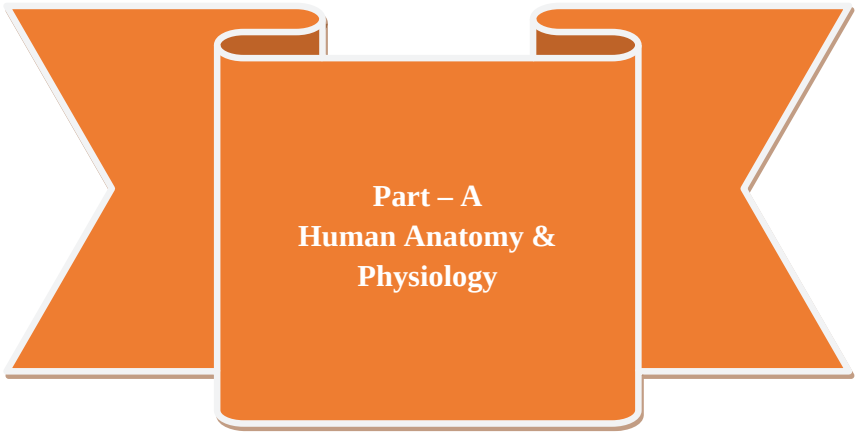

Part – A
Human Anatomy &
Physiology

1. Anatomy

Anatomy is a subdiscipline of biology that deals with the structural design of biological notions. It discusses the composition of different body parts and its relation with other parts. Anatomy study of humans is further subdivided into gross and microscopic anatomy in which the gross anatomy looks at visible structures, and microscopic anatomy looks at cells and tissues. Proper anatomical knowledge assists in the knowledge on how various organs and systems work. It is the basis of all medical and health studies since it provides a connection between the structure and the function.

2. Physiology

Physiology is the branch of study which is concerned with the functioning of living organisms. It describes the synchronized work of cells, tissues and organs that keep a person alive. The subjects of study include the breathing, blood circulation, digestion, and nervous control which are vital processes. It also looks at the adaptation process in the body to both internal and external alterations. The knowledge of physiology plays a significant role in the identification of diseases in their disruptive action on the normal processes of the body.

3. Homeostasis

Homeostasis is the process through which the body can achieve internal stability in order to react to changes of the environment. It controls vital parameters like temperature of the body, the PH of the blood and bodily fluids. These glands (endocrine system), and the nervous system combine to maintain this internal balance. The body also uses some negative feedback to indicate and put things back to their normalcy. Homeostasis is considered important in the life and proper functioning of all living creatures.

4. Cytology

Cytology refers to the investigation of structure, functioning, and chemistry of cells which are the basic components of life. It explores cell parts including nucleus, cytoplasm, as well as organelles. The cytological examination plays an essential role in the diagnosing of cancers and infectious diseases. The discipline falls between the biology of the microscope and molecular biology. Scientists gain knowledge on the development, division, and contact of cells in tissues through cytology.

5. Histology

Histology is the science of tissues which constitute body structures and organs, which is studied microscopically. It dwells on how various tissues are organized, put together and play particular roles. Pathologists determine diseases and cell abnormalities by the use of a microscope in analyzing tissue samples. Histology relates the structure of cells to that of the organ. It takes a fundamental connection between the medical sciences of anatomy and physiology.

6. Metabolism

Metabolism encompasses all the chemical reactions occurring within an organism to sustain life. These reactions are divided into catabolic and anabolic processes. Catabolism breaks down complex molecules to release energy, while anabolism builds essential compounds. Enzymes regulate metabolic pathways to ensure efficiency and control. Balanced metabolism is vital for energy production, growth, and repair.

7. Catabolism

Catabolism is the process through which complex large molecules are broken down into smallmolecules to act as a source of stored energy. It produces ATP which is the currency of energy in the cell. Glycolysis, cellular respiration and fat oxidation are all catabolic pathways. The produced energy is spent on muscular activity, biosynthesis and maintaining the cells. It is a key component in the balancing of the metabolism.

8. Anabolism

One of the positive processes of metabolism is called anabolism as the smaller molecules are joined together to create larger complex compounds. It involves the introduction of energy; typically through catabolic reactions. Cases are protein production, replication of DNA and mineralization of bones. Anabolic processes facilitate tissue growth, repair and differentiation. It plays a crucial role of growth and renewal of body organs.

9. Feedback Mechanism

Biological processes are controlled by a feedback mechanism where changes at the system are responded to. By reducing the deviations, negative feedback leads to stability and by amplification of the responses positive feedback leads to attainment of a goal. These processes are part of ensuring homeostasis. An example is the blood glucose regulation by insulin which is a typical negative feedback mechanism. They guarantee that internal conditions are optimal towards survival.

10. Organ

An organ can be defined as a structural unit that is made up of various tissues which are collaborating to accomplish a certain task. Such examples are the heart, liver, lungs and kidneys. The different organs play a role in ensuring that the body proves to be functional, as well as homeostatic. The way the organs are coordinated involves different types of systems i.e. digestive, respiratory, or circulatory systems. The knowledge of the structure and functions of organs is important in clinical medicine.

11. Organ System

Organ system is a complex of organs that work together to accomplish complicated tasks in the body. The cardiovascular system has an example of circulating blood and the nervous system being in charge of the body activities. Every system is dependent on another in order to achieve balance of the body. Disfunction in one of the systems may influence the other/s. The systems of organs ensure the wellbeing, development and control of energy.

12. Anatomical Position

Anatomical position is a conventional body position which is employed as an anatomical reference. In this pose, one is standing straight in with his arms at the side, palm in front and feet together. It gives a coherent reference point of describing directions and parts of the body. Such standardization is useful to prevent confusion between localizing the locations of structures. Every anatomical terminology is based on it.

13. Sagittal Plane

The body is divided based on the sagittal plane into the right and left parts. The exact run in the mid plane is referred to as the midsagittal or median plane. Any that is equal to this is calling parasagittal. It is applied to the movements like flexion and extension. This is a basic plane as far as medical imaging and anatomy is concerned.

14. Coronal Plane

The frontal (or coronal) plane divides the body in anterior (front) and posterior (back) parts. It is generally applied to radiological and anatomical analysis. Such movements as abduction and adduction would take place within this plane. This knowledge is useful in surgical practice and in the diagnostic imaging. It gives a spatial reference point to explain the position of the organs.

15. Transverse Plane

The body is split into superior (upper) and inferior (lower) by the transverse plane (horizontal). It is essential in cross sectional anatomy and CT or MRI. Most of the movements like rotation take place around this plane. It gives three dimensionality of internal organs. Such orientation helps the surgeons and radiologists to see body structures perfectly.

16. Superior

Superior is that which is nearer to head or the higher portion of a body. As an illustration, the chest is better than the abdomen. It assists in making relative location descriptions of the structures in the study of the anatomy. The name may be applied to both comparative and human anatomy. This is the antithesis of inferior.

17. Inferior

Inferior means a structure which is located below or towards the lower side of the body. As an example,the stomach is less than the heart. It is a direction term that is utilized to provide spatial relations. The use of such terms increases accuracy when describing medicine. It goes against the word superior.

18. Anterior

anterior is the frontal side or the ventral side of the body. It is applied to describe the parts when they are nearer to body frontal surface. Indicatively, the sternum is in front of the heart. It is employed interchangeably with ventral in human beings. It is necessary to make an accurate description of the location of organs and tissues.

19. Posterior

the back or the dorsal face of the body is called posterior. Indicatively, the spine is placed behind the chest. This is contrary to anterior and is applied to orient. It assists in revealing the structure relationships in the case of surgery or anatomy. In imaging, the posterior positioning is also applied in the interpretation.

20. Medial

Medial refers to the position that is nearer to the midline of the body. One of the examples is the nose which is medial of the eyes. It assists in explaining the alignment of the structures concerning the center of the body. This is an essential term in the medical description and anatomy. It is contrasted with the word lateral.

21. Lateral

Lateral refers to their direction in the body that is opposite the center or on the outer sides of the body. As an illustration the arms are at right angles to the chest. It is a term that is applied to describe spatial orientation in anatomy. The word assists clinicians in the correct whereabouts of the injuries or the abnormalities. It stands opposite to "medial."

22. Proximal

Proximal is a word that is used to describe something that is closer to where that body part attaches or even grows. It is extensively applied to refer to limbs, with the shoulder closer to the elbow. This direction word comes in handy in accurate descriptions of anatomy. The knowledge of the close relationships will be crucial when localizing surgical and anatomy. It has been used to offer spatial orientation when conducting clinical assessment and imaging.

23. Distal

Distal refers to a faraway location of the point of connection or origin. An example of this is the position of the wrist that is below the elbow. It is also commonly applied in characterization of limb anatomy to exhibit relative displacements. In clinical terms, the term is used to help to locate injury or disease. Distal orientation means being exact in medical written records and physical examination.

24. Superficial

Superficial refers to the structure that is beneath or on the surface of the body. The muscles under skin are regarded as being superficial to skin. This is a critical term used to explain the wounds or burns and surgical incisions. Anatomically, it aids in distinguishing the surface and deep structures. The injuries are severed and dealt with by the position in which they are laid.

25. Deep

Deep structures are those ones that are located at a distance to the surface of the body. An illustration of this is that bones are deep to muscles. It opposes superficiality, which gives completeness in space direction. Knowledge of profound anatomy is critical in images and surgery. It makes sure that there is accuracy in the interpretation of the placement of internal organs and trauma depth.

26. Cell Membrane

The cell membrane is a cell enclosed semimembrane and a thin or semipermeable part that surrounds the cell cytoplasm. It controls movement in and out of the substances, homeostasis of cells. It consists of a phospholipid layer which is a bilayer, containing in its interior proteins, and facilitates communication and transport. Cell recognition and signaling also occurs on the membrane. It is very vital in the preservation of integrity and environment of the cell.

27. Cytoplasm

The cytoplasm is another substance that is semifluid and fills the area between the cellmembrane and the nucleus. It hosts different organelles and it is the location of multiple metabolic processes. It is primarily made up of water, minerals, and proteins and thus it offers a conducive environment to the cellular activities. It allows the circulation of nutrients and elimination of waste products. It is also fluid which helps in the cell movement and division.

28. Nucleus

The nucleus serves as the headquarters of the cell wherein the genetic material (DNA) is placed and is protected as well. It regulates cell proliferation, metabolism and reproduction through regulating gene expression. It is also enclosed by a pair of layers of nuclear membrane which has nucleoli which produce ribosomes. All important cell functions are coordinated by the nucleus. It is part and parcel of genetic information and heredity.

29. Mitochondria

The mitochondria is a type of organelles that produces cellular energy in the form of ATP by respiration by way of the use of two membranes. They have been called the cell powerhouses. They are involved in addition to the generation of energy to control cell death (apoptosis) and calcium storage. The mitochondria have their own DNA and this helps them to be independent. Mitochondris maladies may cause various metabolic and neurological diseases.

30. Ribosomes

Ribosomes are small structures that are spherical in shape and they are the structures that synthesize proteins in the cell. They can be either freely present in the cytoplasm or they can be attached to rough endoplasmic reticulum. These organelles use the mRNA genetic instructions so as to create a particular protein. Their action is necessary in order to grow, repair, and form the enzymes in the cell. The ongoing protein synthesis by ribosomes is being supportive of the normal maintenance and the normal functioning of the cells.

31. Endoplasmic Reticulum (ER)

Endoplasmic reticulum is a sophisticated system of membranes, which helps to synthesize and to transport biomolecules. It exists in two various forms, rough ER with the proteinforming ribosomes, and smooth ER that formed lipids and relieved known toxic substances. The ER is a channel through which materials may move within the cell. It guarantees an adequate structure and biochemical regulation of cells. The impairment of proteins and lipid metabolism can be caused by any defect in the ER.

32. Golgi Apparatus

The Golgi apparatus is a conjunctive of flattened sacs which alters, packages and produces the protein and lipid synthesis that was manufactured in the ER. It receives products of cells and packages them in vesicles which transport it to the destinations of the cell products. The organelle participates in secretion, activation of enzymes and formation of lysosomes. It is very important in the cellular communication and hormone release. The failure of the Golgi complex may affect the secretion and intracellular signaling.

33. Lysosomes

The Lysosomes are vesicles that are enclosed in the membranes which have the digestive enzymes. They degrade waste products, impaired organelles as well as foreign materials. They are often referred to as the suicidal bags of the cell and they ensure that the cell remains clean. Phagocytic cells are highly dependent on Lysosomal activity as a defense mechanism. Storage diseases may be a result of malfunction like TaySachs.

34. Centrioles

Centrioles are micro tubules which are cylindrical arrangements surrounding the nucleus. They are important in arranging cell division of the mitotic spindle. The centrioles are also involved with the development of the cilia and the flagella. Adequate chromosome separation is ensured by their correct functioning. Centriole malfunction may cause malformation of the cell cycle and cancer.

35. Chromosomes

Chromosomes consist of DNA and proteins in the form of a thread that is located in the nucleus. They are carriers of genetic data that is requisite in regard to inheritance and cellular activities. Human beings have pairs of chromosomes that have chromosomes. When the cell divides, they make sure the genes are properly divided. Genetic disorders can be as a result of abnormalities of the number or structure of the chromosome.

36. DNA (Deoxyribonucleic Acid)

DNA is the genetic material and it is a hereditary material which contains genetic codes of how living organisms grow and become functional. It is made up of two strands that are in a dual helix. Genetic coding is a phenomenon which makes the protein synthesis to be regulated by DNA. During cell division, it is replicated to make sure there is inheritance. DNA mutations may either be disease causing or evolutionary.

37. RNA (Ribonucleic Acid)

RNA refers to a single strand molecule that passes genetic information in DNA to the ribosomes. It involves itself in the synthesis of proteins by transcription and translation. These are mRNA, rRNA and tRNA. RNA has regulatory functions in the expression and the activity of the enzyme in genes. It is essential to the metabolism and growth of the cells.

38. Diffusion

Passive movement of molecules in a high concentration area to a low concentration area is known as diffusion. It is carried out devoid of energy usage and contributes to exchange of nutrients and gas. These include diffusion of oxygen in blood and diffusion of carbon dioxide. The process provides homeostasis at the cell membranes. Cellular respiration and homeostasis are inseparable.

39. Osmosis

The flow of water molecules through a semipermeable membrane into low and high solute concentration is called osmosis. It regulates the fluidation of cells and tissues. Osmotic pressure determines the shape and the volume of cells. In a biological system it controls the hydration and the absorption of nutrients. Alteration in cell shrinkage or swelling can be caused by disruption in osmosis.

40. Active Transport

Active transport is transport of molecules across cell membranes, which occurs opposed to a concentration gradient, and needs energy (ATP). It allows the cells to take the necessary nutrients and ions. These are calcium transport and sodiumpotassium pump. The process keeps electrical and chemical gradients that are vital to the functioning of cells. Nerve transmission and contraction of muscles depend on it.

41. Endocytosis

It is a cellular process that involves the intake of external materials by the cell forming vesicles. It facilitates absorption of nutrients, fluids and macromolecules. They are phagocytosis (solid uptake) and pinacolytosis (liquid uptake). This is necessary in the protection of the immunity and absorption of nutrients. It ensures homeostasis and cellular communication.

42. Exocytosis

Exocytosis: This refers to the method of removal of materials in cells with the help of vesicles fusing with the plasma membrane. It is important in the release of neurotransmitters, as well as hormone release. The absorption also assists in getting rid of cellular waste. Exocytosis is referred to as a mechanism that preserves the integrity and the surface protein composition of the membrane. Communication between the cells and external environment is critical.

43. Mitosis

Mitosis refers to a cell division that leads to the production of two identical cells which are the daughters. It plays an important role in growth, repairing of tissues, and the replacement of the aging cells. It takes place through stages, which include prophase, metaphase, anaphase and telophase. In psychosis, equal distribution of chromosomes is ensured by mitosis. Mitosis may generate errors, which result in cancer.

44. Meiosis

Meiosis is a special cell division which produces gametes (sperm and egg cells) half the number of which are chromosomes. It guarantees the variation of genes via recombination and crossing over. There are two consecutive steps of meiosis i.e. Meiosis I and II. Sexual reproduction and heredity critically depend on it. Any faults in meiosis can lead to genetic disorders such as the Down syndrome.

45. Tight Junction

A tight junction is an individualized connection amidst the nearby cells that has blocked the spillovers of content amid the cells. It is selectively permeable in body regions like the intestinal peritoneum. These crossings aid in the maintenance of differences in tissue environments. We have the tight junctions that contain such proteins as claudins and occludins. They have the potential of causing barrier defects and disease due to their malfunction.

46. Desmosome

Mechanical cell connections constitute desmosomes, which are very powerful junctions. They occur in tissues that are exposed to stress such as the skin and heart muscle. The desmosomes are structural phenomena which hold and withstand shear forces. They have cadherin proteins which connect with the cytoskeleton. Desmosome defects may result into skin blistering and cardiomyopathy.

47. Gap Junction

Gap junctions are paths of direct communication between cells. They allow movement of eons and small molecules. They are located in the cardiac and smooth muscles and they facilitate coordinated contractions. The intersections include connexin protein connexons. Proper functioning of them makes them to have synchronized physiological activity in tissues.

48. Signal Transduction

Signal transduction refers to the process through which the cells get to know how an external signal can be translated into a functional response. It consists of receptors, secondary messengers and intracellular pathways. These are hormone signaling and neurotransmission. The mechanism controls the growth, metabolism, and gene expression. These breakages may cause such illnesses as cancer and diabetes.

49. Paracrine Signaling

The process of paracrine signaling is the release of signaling molecules that play action on the surrounding target cell. Local tissue regulation and coordination is imperative. They are, examples, the

growth factors and cytokines. This mode of communication enables quick localized reply. It has significant aspects in development, immunity and wound healing.

50. Endocrine Signaling

Endocrine signaling Endocrine signaling is a longrange communication system of hormones that is discharged into the blood. It controls metabolic, growth and reproduction. Even at the remote locations, the hormones would work on the relevant organs. Hormonal balance is important to achieve coordination of body functions by means of endocrine signaling. The dysfunction can be the cause of such disorders as diabetes or thyroid imbalance.

51. Synaptic Signaling

Nerve cells make synaptic signaling in which neurotransmitter impulses are transferred across a synapse. The postsynaptic cell receptors are bound with the chemical messengers released by the presynaptic neuron. Such communication is quick and effective in delivering quick information. It is important in the functioning of the brain, reflexes and muscular coordination. Any interference can lead to such neurological disorders as depression or epilepsy..

52. ContactDependent Signaling

The process of contactdependent signaling is used when cells are directly in contact with one another in order to transmit messages. It takes place via the signaling molecules and receptors that are membrane bound. This system controls immune response, tissue regeneration and embryogenesis. It helps in ensuring that the signal is only received on adjacent cells. It can cause uncontrolled cell development or growth, and its malfunctioning can result in such.

53. Epithelial Tissue

Epithelial is an outer surface of the body and internal linings. It shields the supporting structures, promotes absorption and secrection. Depending on the place it can be either a simple (one layer) or stratified (several layers). These can be the skin, gut lining and respiratory system. This tissue is also used as a selective fence allowing anthony to exchange substances.

54. Connective Tissue

The other body structures are supported, bound, and preserved with the help of connective tissue. It is a collection of cells that is built in an extracellular environment, comprising of fibers and ground substance. There are those of bone, cartilage, adipose, and blood. It offers the supply of nutrients and structural integrity of the organs. The connective tissue is essential in healing and stability of body frameworks.

55. Muscular Tissue

The body has muscle tissue that is specialized in contraction and movement. It is categorized in terms of structure and functions as skeletal, cardiac and smooth. Skeletal muscle facilitates voluntary movement of the body, cardiac muscle regulates the beating of the heart and smooth muscle regulates the performance

of the internal organs. Actin and myosin interaction are involved in production of force by muscle fibers. The health of the muscle is the key to the posture, locomotion, organ functionality.

56. Nervous Tissue

Nervous tissue is a type of tissue which passes through with electrical impulses. It consists of signal conducting and supporting neurons. The tissue controls the body functions by stimulating and organizing the responses. It is present in the brain, the spinal cord and nerves, and it regulates thought movement and reflexes. It may cause damage that may be sensory or motor.

57. Simple Epithelium

Single cells make up simple epithelium with the benefit of absorbing, filtering, and secreting well. It coats such structures as alveoli, capillaries and intestines. The cells can either be squamous, cuboidal or columnar in accordance with functionality. It is thin which enhances quick exchange of material. It is important in the process of diffusion and transportation.

58. Stratified Epithelium

Different layers of stratified epithelium are various layers that shield against mechanic and chemical objects. It is a permanent protection in the skin, mouth, and esophagus. Based on the location the outer cells can either be keratinized or nonkeratinized. This is an abrasive covering of underlying structures. This is necessary in terms of ensuring integrity of tissues in highfriction regions.

59. Adipose Tissue

Adipose or fatty tissue is a specialized connective tissue which knows fat as energy reserves. It protects body organs and shields the body against heat. Adipocytes are found in the tissue and enlarge or get smaller with the storing of fat. It also secretes such hormones as leptin that controls metabolism. The surplus fat may cause obesity and metabolic illnesses.

60. Cartilage

Cartilage is an elastic connective tissue that cushions and supports the body structures more so the joints. It is avascular, that is, does not contain blood and therefore its healing process is slow. These are three major ones; hyaline, elastic and fibrocartilage which are all important in offering structural functions. The cartilage exists on the nose, ears, and the trachea areas. It reduces friction between the bones and absorbs when moving.

61. Epidermis

The epidermis is the deepest layer protection of the skin and best characterized using stratified squamous epithelial cells. It serves as a resistance to the microbes and chemicals as well as loss of water. Keratinocytes are the principle ones, which are aided by melanocytes and immune Langerhans cells. This is the continuous division of cells contained in the bottom of this layer. Epidermis is very important in the color determination and defense of the body as it comprises the first line of defense in the body.

62. Dermis

Below the epidermis is the dermis which serves as a structure to give strength, flexibility, and nourishment to the skin. It is also full of collagen and elastic fibers together with nerves, lymph vessels and capillary. This coating facilitates sense perception, thermal regulation as well as repairing wounds. It has also the sweat, sebaceous as well as hair follicles. Dermis ensures that the skin is strong and firm.

63. Hypodermis

The underdermal layer or the hypodermis is the layer that attaches skin onto the internal muscle and bones. It consists primarily of adipose tissues and connective tissues which give it its insulation and cause it to absorb shock. This layer also aids in controlling the temperature in the body and acts as a storing point of energy. It enables the skin to move loosely along internal organs. The hypodermis plays a significant role to cushion and protect against temperature.

64. Melanin

Melanin is a natural pigment that is synthesized by a group of cells in the epidermis called the melanocytes. It defines the skin color, the hair and the eye color and secures the tissues against ultraviolet (UV) radiation. The variations in the skin tone are because melanin is differentially produced. Melanins are needed in adequate amounts to protect the DNA against mutations resulting in UV radiation. The defects in its synthesis may lead to pigmentation disorders of such types as albinism or melasma.

65. Keratin

Keratin is a tough fibrous protein, which is a skeleton component of skin, hair and nails. It gives strength and resistant to pain when exposed to friction and microbial invasions. Keratinization in the epidermis makes the skin waterproof reducing the amount of water that is lost. It is a protein synthesized by the outer skin layers by keratinocytes. Keratin is sufficient to maintain the skin tissue and health in general.

66. Sebaceous Gland

Sebaceous glands are types of microscopic glands found in the dermis and produce sebum which is an oily fluid that is very vital in the lubrication of the skin and hair. Sebum prevents bacterial infections, dry areas, and cracks through keeping a protective layer. These glands are found to be most active on the scalp, face as well as the upper body. Hormones affect their functionality. The surplus of sebum can cause acne or some other dermatitis.

67. Sweat Gland

Sweat glands consist of tubes which produce perspiration. They assist in the regulation of the body temp. and also in the excretion of waste products. There are two (thermoregulation: eccrine and armpits and groin: apocrine). When one is sweating, it cools the body when it becomes hot or during exercise. The balanced gland functions bring about fluid and electrolyte balance.

68. Hair Follicle

A hair follicle is a tube on the dermis where hair is growing out. It encircles the hair root and is leading to sebaceous glands. The growth of hair takes place due to active division of cells on the follicle base. Sensory nerves are also found in follicles which detect movement. The activity of the hormones affects their growth cycles.

69. Nail Bed

The nail bed is the skin tissue underneath the nail plate which has abundant blood vessels and nerves. It supplies the nail with nutrients and nourishment. A healthy nail bed will give one good and smooth nail development. Alteration in its color, or texture can be as evidence of systemic health problems. It is crucial in regeneration of nails.

70. Osteology

The science of bones, their structure, function and their formation is called osteology. It assists in the knowledge of skeletal structure, bone pathology and the identification of a corpse. The hand off topic is bone formation (ossification), as well as mineral composition. Osteology plays a very important role in anatomy, orthopedics as well as archaeology. It gives the information about movement, protection, and body support mechanisms.

71. Axial Skeleton

The spinal column structure is the skeleton of the central part of the human form as it consists of the skull, vertebral column, ribs and sternum. It creates a good structural support and cushions such important organs of the body as brain, spinal cord, heart, and lungs. This section of the skeleton helps to make the body straight. It is also a fastening point of muscles that help to move. The axial bone forms the center of the body, which produces movement and stability.

72. Appendicular Skeleton

The bones of the limbs sent up by the limbsgirdles attaching the bones of limbs to those of the axial skeleton make up the appendicular skeleton. It consists of upper limbs, lower limbs, pectoral girdle and the pelvic girdle. This component of the structure is in charge of movement, locomotion, and coordination. It facilitates walking, grasping and lifting. The appendicular skeleton helps in mobility, strength, as well as overall body balance.

73. Cranium

The skull or its frontal part is called the cranium which is used to protect the brain and gives support to the face structures. It is made up of eight Osteoletic bones which form a hard casing of the brain. Crania offers points of attaching muscles which play the role of chewing and facial expression. It contains also entries of nerves and blood vessels serving the head. The cranium is an essential factor that ensures the safety of the brain and stability of the head.

74. Mandible

It is the largest, strongest face bone and it is the mandible or the lower jawbone. It makes the teeth on the lower part firm and allows one to chew, talk and move his face. The jaw is given the ability to move due to the existence of tons of temporal bones that are joined to the mandible by the temporomandibular joints. It offers support to a number of muscles that do the piece of food. Any damage or asymmetry in the mandible may have an influence on the functions of speech and eating.

75. Vertebrae

The vertebral column is socalled spine or the backbone that consists of the individual bones called vertebrae. They cover the spinal cord and it is the primary source of structural support to the body. The spinal cord is centrally located in each vertebra, and there are projections of bones to attach the muscles. The spine is classified into cervical, thoracic, lumbar, sacral and coccygeal. Flexibility, posture and balance are achieved by proper vertebral alignment.

76. Sternum

Sternum, or the breastbone is a flattened, long shaped bone present in the middle of the chest. It links the ribs with each other through costal cartilages and creates the anterior part of the rib cage. Sternum serves the vital organs like lungs and heart. It consists of three components, namely: the manubrium, body and xiphoid process. The sternum is another landmark that is very important in the medical procedures such as CPR and thoracic surgery.

77. Ribs

Ribs are formed bones that are long and curved forming the protective cage of the chest cavity. They safeguard the mental grounds, heart, and huge veins. A normal human being possesses an average of twelve ribcages true, false and floating ribs. During respiration the ribs move with the diaphragm which assists in breathing. They are flexible and are able to enlarge and shrink the chest as part of the breathing in and out.

78. Clavicle

The collarbone, also known as the clavicle is a thinshaped S bone that attaches the sternum with the scapula. It does assist in keeping the shoulders in place and is a strut between the upper limb and the trunk. The clavicle is the conductor of mechanical forces of the arm to the central skeleton. It has an architecture that is passive to strength and flexibility. It has the highest rates of fracture in the body due to its location.

79. Scapula

The scapula or shoulder slope is a flat triangular bone on the thoracic area which is located in the back. The shoulder joint is formed by linking it to the clavicle and the humerus. Several muscles on the arm and the shoulder are attached to the scapula. It has a large scope of motion in its lifting and rotational capacity which is made possible by its mobility. To have a wellcoordinated upper limb activity, proper scapula position is required.

80. Humerus

The long arm bone starting with the shoulder to the elbow is known as the humerus. It gives articulation to the scapula at the shoulder joint, the radius and ulna at the elbow. Defying muscles are attached in order to allow movement of the arm such as lifting and rotation by the use of the bone. It is essential to strength and coordination of upper limbs functions. Humerus fractures may also affect the movement and create severe pain..

81. Radius

The radius is one of the two long bones of the forearm, which is at the side of the thumb. It is connected to the elbow and terminates in the wrist and moves along with the ulna to enable the rotation of the arm. The higher end is connected to the humerus and the lower end is used to shape up the wrist. It allows such movements as the pronation and supination of the hand. The radius is critical in terms of the flexibility, grip, and lifting.

82. Ulna

The long forearm bone is the ulna which has been placed on the side of the little finger. It provides a hinge joint of the elbow when it articulates with the humerus. Olecranon process is the bump that is located on the upper end of the ulna; this forms the top part of the elbow. It brings stability to the forearm and assists in the ability to move such as flexion and extension. The ulna cooperates with the radius in order to ensure the normal wrist and hand operations.

83. Femur

The long bone in the human body is the femur or the thigh bone which is the most powerful. It attaches to the hip and extends to the knee providing the body with support. The lower end of the Femur clips into the pelvis acetabulum creating the hip joint. The lower end is knitted with the knee to the tibia. It has a strong framework that offers torque and strength to walk, run and leap.

84. Tibia

The bigger of the two lower leg bones is the tibia or commonly referred to as the shin bone. It supports the majority of the body weight and attaches the knee with the ankle. At the upper level, the tibia and the femur interconnect and at the lower level, the tibia and the talus bone have an interconnection. It offers support, strength and balance to movement. This is an essential bone in terms of posture, walking, and stability of the standing.

85. Fibula

Fibula is a thin bone that is found in the outer side of the lower leg and is parallel with the tibia. It gives the ankle and leg structural support as well as stability. It has fewer weights however, it is a place of attachment of some of the muscles. Fibula gets attached to the tibia and helps the leg to be straight and balanced. It has a significant contribution to mobility and coordination.

86. Pelvis

The pelvis is a bony structure in the shape of a ring which wears off due to a joining of the ilium, ischium and pubis bones. It is the one which unites the spine column with the lower extremities and the weight of the upper part of the body. The pelvis safeguards the organs including the bladder, the intestines and the reproductive organs. It gives the attachment points to muscles with regard to movement and posture. The pelvis plays an important role in child birth as well because it constitutes a birth canal.

87. Patella

The patella or kneecap is a tiny triangular bone that appears at the front part of a knee joint. It cushions the joint and strengthens the quadriceps muscles leverage in the process of extending the legs. The knee is able to move easily as it is forked by the patella and the femur. It holds the tendon in correct position and provides the joint with stability. Patella is necessary in walking, running and jumping.

88. Tarsals

Tarsals refer to the ankle and upper foot that consist of seven bones of incomplete shape. These are the talus, the calcaneus, the navicular, the cuboid, and cuneiform bones. These bones help in giving the foot strength, flexibility and stability. The tarsals facilitate the body weight distribution and shock absorption when moving. They are very critical in balance, standing and locomotion.

89. Carpals

Carpals are eight bones that are placed in two rows to create the wrist joint. Their hand is attached to the forearm and gives them the freedom to move their hand in various ways. Carpal bones consist of scaphoid, lunate, triquetrum, pisiform, trapezium, trapezoid, capitate and hamate bones. Their exclusive design is flexible and shock absorbing. Carpals facilitate such specific and smooth movements essential in the day to day activities.

90. Phalanges

Phalanges are small bones that are tubular and these constitute the fingers and toes. A phalange comprises three bones (or three toes), proximal, middle and distal except the two in the thumb and big toe. They facilitate fine motor skills such as grasping, holding and writing. They maintain support in the feet in walking. Phalanges serve to enhance dexterity, coordination and movements.

91. Compact Bone

Cortical bone or compact bone is the outermost or hard bony layer of the bones. It is thick, robust and meant to have pressure and bear stress. The architecture will be made up of osteons (Haversian systems) that are closely compressed and filled with blood vessels, and nerves. The compact bone offers the body support, protection, and form. It also allows the attachment of the movement of muscles and tendons.

92. Spongy Bone

Cancellous bone or spongy bone is a porous tissue that is lightweight and is located within the bones. It is made up of a system of trabeculae that are supportive of bone marrow and decrease bone weight in general. It has high strength and flexibility despite the fact that it is less dense. The spongy bone occurs mostly in the extremities of long bones and in flat bones. It aids in the absorption of shock and production of blood.

93. Periosteum

Periosteum gradually is a thin fibrous tissue that covers the outer portion of bones with the exception of the joints. It consists of blood vessels, nerves and osteoblasts which help in the enhancement of bone growth and repair. Another factor which connects to the periosteum is just the tendons and ligands. It is crucial in provision of nutrients to the bone tissues. This layer guarantees remodelling and postinjury healing of the bones.

94. Bone Marrow

Bone marrow is a soft and spongy bone tissue located within the bones particularly the sternum, pelvis, and the femur. It is availed in two types; red marrow that forms blood cells and yellow which hoards fat. The red marrow is the one that forms red blood cells, white blood cells and platelets. It is essential in transportation of oxygen and immune abilities. Bone marrow is the condition that is required to keep healthy blood circulation.

95. Osteoblast Cells

Osteoblasts are special cells that help in the production of new bone tissue. They release collagen and minerals such as calcium phosphate in order to develop the bone matrix. After being trapped in this matrix, they grow to be osteocytes. Osteoblasts are important in the formation, remodeling and repair of the bones. Estrogen, growth hormone and vitamin D are some of the hormones that influence their activity.

96. Osteoclast

Osteoclasts are huge multinucleated bone remodelling engaging cells that destroy bone tissue. Bone minerals, collagen are broken down in an enzymatic activity that emits calcium into the bloodstream. This is a way of mineral balance and enables bones to renew themselves. An osteoclast is in liaision with osteoblasts to maintain the health of the skeleton. Osteoactivity of osteoclasts may result in such bone loss diseases as osteoporosis.

97. Osteocyte

Osteoblasts that have penetrated the bone mass are the osteocytes which are the mature bonecells. They live in tiny canals known as lacunae and keep communication with the help of canaliculi. The cells facilitate the regulation of mineral exchange, as well as signal any mechanical stress on bones. Osteocytes are critical in ensuring that there is strength and density of bone. They guarantee bone homeostasis and bone repair on a longterm basis.

98. Myology

Myology is a scientific study of muscles, their structure, their function, or their disease. It investigates the contraction and generates motion in muscles along with the posture. The biochemical and physiological properties of the muscle tissue are also studied by myology. It gives the understanding of such disorders as muscular dystrophy and myasthenia gravis. The study is essential to the study of the human movement and rehabilitation.

99. Skeletal Muscle

A form of skeletal muscle that is attached to the bones with the help of tendons is known as skeletal muscle. It comes under the conscious movement of the body because it is under voluntary control. Such muscles are long multinucleated muscles that are able to contract swiftly. Locomotion, posture, and maintenance of body temperature is their requirement. The skeletal muscles act in pairs making them to take actions accurately and coordinated.

100. Smooth Muscle

Smooth muscle is nonstriated and is present in the wall of internal organs like those of stomach, intestine and blood vessels. It automatically shrinks when there is control of the autonomic nervous system. These muscles are useful in peristalsis, the regulation of blood flow, and movement of organs. Smooth muscle fibers are the spindleshaped and slow contracting yet slowfatiging muscles. They maintain the stability of the crucial processes inside the organism.

101. Cardiac Muscle Heart muscle

A special type of muscle is cardiac muscle that is an involuntary striated muscle specific to the heart. It is made up of the branched fibers attached with intercalated discs that can enable isolated contraction. These contraction rhythms circulate blood all over the body with no exhaustion. The heart muscles are autonomously controlled and have a high level of mitochondrial density to provide a constant supply of energy. It has a sustained heartbeat which is also selfexcitatory and which is critical to survival.

102. Sarcomere

Sarcomere is the structure and the functional unit of a muscle fiber concerned with contraction. It is characterized as a space between two Zlines and it is made up of actin and filaments of myosin. When contracting, filaments pass over each other thereby making the sarcomere shorter. This is a sliding mechanism, which causes muscle motion force. Skeletal muscles and heart muscles have the striated appearance they have due to the structure of the sarcomeres.

103. Myofibril

The myofibrils are cylindrical organelles that are present in muscle cells that have repeating sarcomeres. They consist of the thick (myosin) and thin (actin) filaments arranged in an accurate scheme. The muscles are then able to contract effectively with the assistance of myofibrils, which are able to pass signals along

the fiber. It is vital to their coordinated action to be strong and enduring. Myofibrils destruction may worsen the functionality and performance of the muscles.

104. Actin

Actin is a protein which makes the slim filament in the sarcomere. That is it interacts with myosin to generate muscle contraction via the sliding filament process. The origin of the actin filaments lies in their binding with the Zline and their movement towards the middle during contraction. An interaction between tropomyesin and troponin regulates their binding which depends on calcium. The structural role of actin is also to ensure the integrity of the muscle fibers.

105. Myosin

Myosin is a motor protein which makes up thick filament in muscle tissue. Its heads bind to actin filaments and drag them towards the inner part of it to bring about contraction. This movement is powered by the broken down ATP energy. The strength of muscles and rate of contraction depend on the activity of myosin. It is in partnership with actin that all movements of the body muscles are based.

106. Neuromuscular Junction

The neuromuscular junction refers to the location where a motor cell and a muscle tissue interact. It passes through nerve impulses and activates muscle contraction. When an activity potential reaches this point in time the release of neurotransmitters will occur to initiate the activity in the muscles. This is where the electric impulses are transformed into mechanical action. Any interference in this may result into muscle paralysis or weakness..

107. Acetylcholine – Neurotransmitter for muscle contraction

Acetylcholine (ACh) is a neurotransmitter which is discharged by the motor neurons at neuromuscular junction. It is anchored to the muscle membrane; consequently, depolarizing and contracting it occurs. On stimulation, it is dismantled by acetylcholinesterase to cease the signal. ACh balance is required to have controlled movement. The inadequacy or the surplus may lead to spasms or disorders in the muscles.

108. Sliding Filament Theory

The sliding filament theory gives an explanation of the muscles contraction by interaction of actin and myosin. In response to the addition of calcium ions to the regulatory proteins, the myosin heads are bound and themselves to actin filaments and draw them toward the inside. This shortens the sarcomere leading to shortening of contraction. This process and detachment of crossbridges occurs using ATP. The theory is a basis on the interpretation of the force generation by the muscle.

109. Isotonic Contraction

Muscle length also varies in isotonic contraction although tension remains constant. It happens when an individual is walking, lifting or running. The shortening (concentric) or lengthening (ecentric) can occur.

It is a kind of contraction that enables the body parts to be seen to move. Isotonic exercises enhance elasticity, coordination and muscle endurance.

110. Isometric Contraction

Isometric contraction is a phenomenon that lies within the range of tension that is generated by the muscle without its length changing. It occurs during equal forces of antagonism like when maintaining a position or struggling against an unrelievable thing. Such contraction pulls muscles up and makes joints stable. Isometric training can refer to rehabilitation and resistance training. They increase endurance and strength at rest.

111. Origin

The point at which a muscle is attached to a bone is known as its origin and is normally closer to the centre of the body. This point will not move along with movement and the insertion moves. Knowledge about its origin aids in determining its muscle functioning and leverage. It offers stability on the structure during contraction. The vast majority of muscles are the ones that have one origin, and some ones possess more than one origin.

112. Insertion

Insertion can be defined as a moveable part of a muscle that is attached to the bone which moves during the contraction. It is usually placed more distant to the midplane of the body. As the muscle contracts, the insertion pulls towards the origin causing a motion. It is the direction and effectiveness of movement which depends on this attachment. The investigation of insertion points is one of the significant areas of investigation in anatomy and kinesiology.

113. Flexion

Flexion is the reducing in height of the Angle between two parts of the body e.g. bending the knee or elbow. It takes place when a contraction of muscles makes bones come nearer to each other. This is the movement of the joints which is caused by flexor muscles. Flexion is very important in locomotion, lifting as well as daytoday activities. Hypomobility preserves a position and flexibility of joints.

114. Extension

The extension is antiflexional and the opposite to flexion, where the angle between two bones is enlarged. It bends a part of a body or limb, e.g. straightening the knee or the elbow. This is done by the extensor muscles in order to take the body back to its anatomical posture. It is necessary in keeping the upright body posture and movement. Strength and mobility is brought by extension.

115. Abduction

The term abduction is used to define the displacement of a limb causing it to be out of place with the center of the body. it is at such joints as the shoulders or hips, or fingers. This motion is done by such

muscles as deltoid and gluteus medius. Through abduction, balance and coordination of limbs are made maximum. It plays a crucial role in walking, lifting of arms and body stability.

116. Adduction

The term adduction refers to the process in which a body part is transported in a direction towards the midline or the subsistence of another object. It is normally used after abduction and it brings the limb to the normal position. Such muscles as adductors of thigh help in this action. Adduction preserves the body equilibrium and coordinated movements. It is important to controlled movement of limbs and alignment of postures.

117. Rotation

Rotation entails the rotating of a bone around its longitudinal axis. It may be internal (with the midline) or external (non central). This movement happens in such joints like shoulder, hip and neck. Rotations play a major role in sporting activities and daytoday activities such as head turning. Flexibility and balance is attained through proper rotation.

118. Circumduction

Circumduction is a complicated movement which consists of flexion, extension, abduction and adduction. It causes a circular movement in such joints as the shoulder and the hip. The movement enables limbs to follow a coneshaped movement. Circumduction allows such diverse movements as swimming or throwing. It improves the movement of the joint and coordination.

119. Synarthrosis

Synarthrosis can be defined as a form of joint, where bones are closely bound together and cannot be moved. Such examples are sutures in the skull. These are joints that offer strength and security as opposed to locomotion. The fibrous tissue or cartilage bonds them. The stability of certain regions that require rigidity is achieved by the synarthrotic joints like cranial cavity.

120. Amphiarthrosis

Amphiarthrosis joints are restricted in movement and can be related with cartilages or ligaments. Examples will be intervertebral discs and pubic symphysis. They support the skeleton as well as offering flexibility. These joints ensure that the motion absorbs shocks, they balance the forces during movement. Amphiarthrosis is mandatory in skeletal mechanism balance.

121. Diarthrosis

The commonest form of joint with a free movement is diarthrosis which is the synovial joint. It comprises structures such as the shoulder, hip as well as knee. These are the joints which harbor lubrication and smooth movement through the synovial fluid. Diarthrotic joints permit different movements including rotation and flexion. They support day to day activities and sporting functions.

122. Synovial Fluid

Synovial fluid is a visa mongous and slippery liquid that is present in the synovial joints. It decreases friction between the articular surfaces in the process of movement. The fluid also nourishes the cartilages as well as preventing their wear. One of them is made by the synovial membrane and it is also composed of hyaluronic acid and proteins. Sufficient synovial fluid is crucial towards the health and flexibility of the joints.

123. Ligament

Ligaments are thick fibrous tissues that attach bones at the joints and they are known to be stabilizing and supporting. They ensure that a person does not move excessively leading to dislocation/injury. They are made up of collagen fibers and are therefore elastic and strong. Joint motion and alignment is also controlled by ligaments. Joint instability or sprains also come about with the tears in ligaments.

124. Tendon

Tendons are cord like structures connecting muscles to bones that are strong. They transmit the force created by muscles so as to cause movement. They are made up of thick collagen fibers and therefore they are very resistant to tension. Tendons are very crucial to the locomotion, the posture and the balance. Good tendon health provides well coordinated muscular activity.

125. Plasma

Plasma refers to that part of blood that is liquid in nature i.e.about percent of the total blood. It mainly comprises of water and proteins, salts, nutrients, hormones and metabolite waste. Plasma is the medium of transportation that transports the blood cells and dissolved transportations in the body. It is also assistive in the stabilization of the body temperature and acidbase balance. Protein plasma—specially albumin, fibrinogen and globulins are vital in osmotic equilibrium, coagulation as well as immune protection.

126. Erythrocyte

Erythrocytes refer to the redcoloured cells that help in transportation of oxygen to different tissues in the body. They carry hemoglobin which is an ironcontaining pigment that is able to bind and release oxygen. These cells are biconcave and they do not contain any nuclei thus they gain larger flexibility and gas exchange. They are generated in the bone marrow and the process is referred to as erythropoiesis. The average erythrocytes last approximately days, then it is destroyed in the liver or the spleen.

127. Leukocyte

Leukocytes are cells which are protective and they protect the body against infections, toxins and foreign invaders. They are split into granulocytes (neutrophils, eosinophils and basophils) and agranulocytes (monocytes and lymphocytes). The subtypes each have distinct immune functions, e.g. phagocytosis, making of antibodies or control of inflammation. The white blood cells are found in the circulation of the

blood and move to the tissues where they are required. Their response is usually due to the infection or activation of the immune.

128. Thrombocyte

Thrombocytes also known as platelets are small fragmentary shapes of cytoplasm that are formed by megakaryocytes inside the bone marrow. They are important in avoiding the loss of blood because they cause the formation of clots. When platelets become attached to the damaged surface and a temporary plug is created when injured, they also release clot promoting chemicals. These measures induce the coagulation cascade in order to stabilize the clot. Besides hemostasis, platelets promote healing of the tissue and wounds.

129. Hemoglobin

The red protein in blood, which is ironcontaining, is called hemoglobin and is found in the erythrocyte that transfers oxygen in the lungs and carbon monoxide in the tissues respectively. The quaternary structure of each molecule is able to carry four oxygen molecules. Hemoglobin is also useful in the transportation of part of the carbon dioxide in tissues to the lungs. The amount of it in the blood predetermines the oxygencarrying property of the blood. Abusive level is a sign of a number of disorders: anemia, hypoxia or pulmonary disease..

130. Hemopoiesis

The process of producing new blood cells of the bones marrow through the use of pluripotent stem cells is known as hematopoiesis or hemopoiesis. It manufactures red blood cells, white blood cells and platelets in a controlled order which is affected by such hormones as erythropoietin or cytokines. The continuous process makes the functional blood parts stable. Any impairment of hemopoiesis can lead to hematological diseases like anemia, leukemia or bone marrow prostration.

131. Anemia

Anemia is a complication that is associated with a low number of red blood cells in the body or a diminished level of hemoglobin in the body, which results in an inability to carry the oxygen. It can be a result of nutritional deficiencies (i.e. iron or vitamin B lack), chronic illness, or excessive blood loss. The common symptoms are fatigue, pallor, dizziness, and dyspnea. The treatment aims at curing the cause diet, supplements or transfusion. Unmanaged severe anemia may compromise the effect of organs given the fact that it causes hypoxia.

132. Polycythemia

Polycythemia is a condition that is related to overproduction of red blood cells that results in thickened blood. Depending on whether it is as a result of excess production of bone marrow (primary) or longterm hypoxia (secondary), it can be either primary or secondary. The disorder predisposes people to the risks of clotting and stroke. Its symptoms are ruddy complexion, headache and dizziness. Phlebotomy or medication is commonly used as a treatment to decrease the viscosity of the blood.

133. Leukemia

Leukemia is a cancers disease of the bone marrow due to the uncontrolled cell multiplication of the white blood cells. These cancerous cells disrupt the normal production of blood cells causing anemia, blood loss, and infections. The progression of leukemia is categorized either into acute or chronic leukemia. Blood counts and bone marrow investigation is used in diagnosis. The treatments provided are chemotherapy, radiation, or transplantation of the bone marrow.

134. Hemophilia

Hemophilia is hereditary when blood cannot clot its contents as a result of the absence of clotting factors. The small injuries may lead to extended bleeding or internal bleeding. It is an inherited malady that mostly occurs among the males, through the X chromosome. It can be treated by the replacement of the missing clotting factor. Through modern therapy, most patients are able to live almost normal lives.

135. Coagulation

Coagulation is a complicated process, which checks the loss of blood following vascular injuries. It comprises a series of events that cause fibrinogen into fibrin so as to create a stable clot. The important roles in this mechanism are played by platelets and clotting factors. Close control is exercised in order to avoid exorbitant clotting or bleeding. Coagulation disorders may cause such organs as thrombosis or hemophilia.

136. Prothrombin initia

Prothrombin is a hepatic protein, which forms a precursor of thrombin. It is changed to active thrombin during the process of coagulation through prothrombinase. Fibrinogen is then converted to fibrin through the action of thrombin. Vitamin K is important to the production of prothrombin. Lpotathy or liver disease may decrease the level of prothrombin, just to the point of being unable to create a clot.

137. Fibrinogen

Fibrinogen is a soluble plasma protein which is insoluble and changed into fibrin in coagulation. Fibrins strands create a net whereby the blood cells are confined to produce stable clot. The liver synthesizes it and causes its release into circulation. The lack of fibrinogen may cause undue bleeding whereas its abundance may result in clotting. It is involved in the central part of wound healing and tissue repair.

138. Serum.

Serum is the clear part of blood that is left behind after the blood had clotted. It contains no fibrinogen, clotting factors and an electrolyte, hormones, and antibody content. Serum has been extensively applied to the diagnosis and the biochemical studies. It allows one to obtain important information regarding the metabolic and immune condition of the person. Serum cannot be used to study coagulation as opposed to plasma.

139. Blood Group

The blood groups are the categories of red blood cells depending on whether they have particular antigens or not. The ABO and the Rh systems are the major ones. During transfusion, there has to be compatibility between the donor and the recipient blood types. The outcome of mismatch is immune reactions and hemolysis. Blood grouping is an important and standard medical practice.

140. Rh Factor

Rh factor is a protein present on the surface of red blood cells previously mentioned that is mostly the D antigen. Whether it is present or not, individuals are separated into Rh positive or Rh negative. The incompatibility of mother and fetus may result in hemoglobin sickness in the newborn baby. Before blood transfusion or pregnancy control, Rh typing is of prime importance. Rh immunoglobulin prevention is able to prevent complications.

141. Agglutination

Agglutination refers to the clumping of the red blood cells as a result of the reaction between the red blood cell antigens and the antibodies. This is caused when incompatible blood groups are combined in the act of transfusion. This is used in the laboratory tests to determine blood groups. Within the body, however it may result in blocked blood vessels and damage of the organs. Agglutination is a crucial technique in diagnostic and immunological processes that require the use of controlled agglutination.

142. Transfusion

A transfusion refers to the medical procedure of physiological blood transfusion or component transfusion of blood of a donor to a receiver. It replenishes the amount of blood, its oxygen carrying capacity or the ability to clot. Evidence compatibility testing is done to avoid the reaction. Transfusion is used to save lives in those situations where one has suffered an injury or had surgery or anemia. The correct screening will keep safe against infections and immune complications.

143. Antigen

Any molecule or any pathogen that is immunogenic to the body is known as an antigen. It is a polysaccharide or protein that is usually located on the surface of toxins, cells or microbes. The immune system generates the antibodies of a given type to counter it when it is identified. The key to the development of a vaccine and detection of a disease is the antigens. They aid the body to differentiate between the self and nonself cells.

144. Antibody

The antibodies are Yshapedantigenreactive protein synthesized by B lymphocytes. They shape on to the foreign molecule giving a signal to the immune cells to destroy the molecule. The antibodies are in the circulation of blood and in the lymph, which gives protection during a long period following the infection or vaccination. There are five clustering classes and they are IgG, IgA, IgM, IgE and IgD. They are used in the middle of immune protection and diagnostic tests.

145. Reticuloendothelial System

The reticuloendothelial system (RES) refers to the system of phagocytic cells that are scattered all around the body. It has macrophages, monocytes and Kupffer cells which digest and demolish pathogens or debris. The RES helps to defend against immune and clean the blood. It also helps in recycling the old blood cells and purification processes. The good functioning of the immune system and tissue upkeep is guaranteed by a healthy RES.

146. Lymph Node

Lymph nodes are small bodies, oval in shape and which are spread along lymphatic vessels, which are biological filters. They intercept microorganisms, foreign bodies and cancerous cells of the lymph and send it back to blood. The immunGlobulones of the immune system, lymphocytes, and macrophages are immune cells that are found in each node and which help to trigger some defensive defense. Lymph node enlargement is an indication of infection or inflammation. They serve as essential checkpoints of surveillance and control of the immune activity.

147. Lymph vessels

Lymphatic vessels are small vessels, which collect tissues lymph and drain it into the veins. They are structurally the same as veins, having valves that ensure the backward flow of fluid does not take place. These vessels specify to maintain the fluid balance, digestive tract fats absorption, and carry the immune cells. They also attach the peripheral tissues to the lymph nodes in order to screen the immune. An obstruction in these vessels may result in the formation of lymphedema or swelling in a localized form.

148. Spleen

Spleen is a vascular organ, smooth and situated at the upper left of abdomen, slightly below diaphragm. It sieves the blood to eliminate the inert red blood cells as well as damaged red blood cells and pathogens. Spleen is also the storage place of platelets and lymphocyte proliferation place. It plays a role in immune owing to the detection of antigens in the circulating blood. The removal of the spleen through surgery can make a person susceptible to infections.

149. Thymus

Thymus is a bilobed lymphoid gland situated behind the sterna which is very important in the formation of immune system at an early stage of a person. It gives a habitat to the immature T lymphocytes to grow and develop. Hormones such as thymosin that regulate the immune process are secreted by the thymus. This slowly becomes smaller and inactive as one gets older, a phenomenon referred to as involution. There is specific thymic naivety that must be in place in order to achieve immune tolerance and adaptive immunity.

150. Tonsils

The tonsils are lymph nodes located in the pharyngeal area, which constitute the initial stage of immunity against the ingested or inhaled pathogens. They catch microorganisms which are introduced into the organism via the mouth or nose and contribute to the reaction of the immune system. There are major ones such as palatine, pharyngeal (adenoid) and lingual tonsils. They have a high immune response

especially in children and the level decreases as they get older. The functioning of tonsils is modern in the form of antibody stimulation.

151. Lymphocye

The lymphocytes are white blood cells that are specialized and the foundation of the adaptive immune system. They are of three major categories, that is, B lymphocytes which produce antibodies, T lymphocytes which effect cellular immunity, and natural killer (NK) cells which kill infected or cancerous cells. These cells are the ones that identify and keep in memory the special antigens and they offer long time protection against the antigens. Lymphocytes are formed of the bone marrow and mature in such organs as thymus and spleen after which they enter into the circulation.

152. Immunity

Immunity is described as the biological aptitude of the body to withstand infections and get rid of harmful substances. It works according to two primary systems, namely, innate immunity that offers immediate and nonspecific protection, and adaptive immunity that generates specific and prolonged defense. The immune system entails a combination of cells, tissues, and signaling molecules that are coordinated with each other. Immunological memory makes recall quicker when it occurs again in the case of being reexposed to pathogens. This process is the one which keeps health and disease resistant.

153. Edema

The abnormal acquisition of fluid in the tissues in excess of the normal amount is called edema which results in the swelling and discomfort of the affected areas. It may develop due to venous circulation deficiency or kidney or liver malfunction, heart failure or even inflammation. The swelling is brought about by the leakage of fluids in the capillaries into the surrounding tissues which is normally expected in the ankles, feet or hands. Treatment involves the treatment of underline and reduction of fluid accumulation. Prolonged edema can also indicate the presence of systemic disease that has to be treated by a practitioner.

154. Neuron

A neuron is the fundamental structurally functional geometrical unit of the nervous system which conducts electric impulses in the body. Every cell is made up of cell body, dendrites, which receive the signals and an axon that transmits the impulses to other cells. Sensation, movement, thought, and coordination are some of the key functions that are facilitated by neurons. They interact via the synapses in an electrical and chemical manner. Brain cells that have reached maturity do not multiply; thus neural damage is normally irreversible.

155. Neuroglia

Neuroglia or glial cells are nonneuronal cells which support neurons in terms of structure, metabolism and protection. They aid in sustenance of extracellular environment, myelin sheathing and aid in the transmission of signals. Significant ones are astrocytes, oligodendrocytes, microglia and Schwann cells. This is in contrast to the neurons, which do not undergo such a capability of division and regeneration

(glial cells do). They are extremely involved in the repair of the neural tissue, defence against immune diseases and keeping the nervous system intact in general.

156. Dendrite

Branched extensions of a neuron are known as dendrites to which electrical signals are received. They pass impulses to the cell body, the combination of several inputs. Dendrites, with receptors on them, are the brain's sensors on other brain cells that release the neurotransmitters. They are well organized in order to achieve efficient reception and processing of signals. They are important to the communication between the neurons and the synaptic plasticity.

157. Axis

Axon is a long fine extension of a neuron which transports impulses out of the cell body. It can be myelinated in order to increase the speed of the signal transmission. The axon also terminates into neurotransmitter terminal (synapse releasing terminals). It provides communication between the neurons and muscle along with the glands. The destruction of axons may lead to negative nerve functions and neurological conditions.

158. Synapse

A synapse refers to a miniaturized gap between two neurons or one neuron and another cell. It allows the passing of signals by releasing the neurotransmitters. The synapse changes electrical impulses into chemical signals and electrical impulses into electrical impulses in the succeeding cell. This is done to guarantee that there is directional and controlled communication. Synapses are important in learning and the memory.

159. Neurotransmitter

Neurotransmitters are signaling molecules which are used to transfer impulses through synapses. They are acetylcholine, dopamine, serotonin and norepinephrine. On their release they attach to receptors on the target cell to cause a response. Their balance plays a role in mood regulation, cognition and are used to control the motor control. Disproportion of the neurotransmitter normally causes disorders of the nervous or psychiatric system.

160. Acetylcholine

Acetylcholine is the neurotransmitter which helps in the contraction of the muscles and communicating the nerve. It is located in neuromuscular junctions, which carries the nerves to the muscles. It is also used in the brain to control attention and learning. Its action is stopped by breakdown by acetylcholinesterase. The lack or the surplus may result in such diseases as myasthenia gravis or Alzheimer diseases.

161. Dopamine

Pleasure and reward circuits of the brain. It is produced primarily in the substantia nigra and the ventral tegmental area, and it contains the signals that affect the motivation and coordination. The insufficient

level of dopamine is associated with Parkinson disease, whereas the overactivity can be associated with schizophrenia. It is very important in emotional balance and motor functioning..

162. Serotonin

Serotonin is a neurotransmitting chemical, which controls the mood, sleep, appetite, and digestion. It is produced in the brainstem and gastrointestinal tract, and has an effect on emotional stability. The lack is associated with depressions and fear while the moderation level is associated with wellbeing. Most antidepressants have effects of increasing serotonin levels. It is important in the preservation of both psychological and physical wellbeing.

163. Reflex Arc

Reflex actions take place by a shortest route and this route is referred to as reflex arc. It contains receptors, sense neurons, inter neurons, motor neurons and effectors. Reflexes are automatic and defensive in nature so that one has a rapid response to stimuli. Such examples are kneejerk and withdrawal reflexes. The system guarantees the instant response without the use of conscious regulation of the brain.

164. Afferent Neuron

Sensory neurons or also referred to as afferent neurons, play the role of transmitting nerve impulses to the central nervous system (CNS) of the body through sensory receptors. They sense external stimuli like pain, temperature, and touch then converting them into electric impulses. Structurally, they have long dendrites and short axons and this enables them to transmit sensory information efficiently. They are mainly aimed at facilitating awareness and protection responses. The absence of these neurons would make the body not perceive and respond to the changes in the environment.

165. Efferent Neuron

Motor neurons, also called efferent neurons, transmit the signal of the CNS to the muscles and the glands in order to induce movement or seclusion. They dictate voluntary and involuntary behaviors of the body. Such neurons locate their cell bodies in the spinal cord with their long axons radiating to the target tissues. Their operation converts the neural messages to physical behaviors. When efferent neurons are injured or degenerated, it may lead to exitus or lack of coordination in muscle.

166. Peripheral Nervous System

The peripheral nervous system (PNS) is a system that includes the totality of the nerves that are located beyond the spinal cord and the brain. It is a kind of a bridge in communication between the central nervous system and the rest of the organs, limbs and tissues. The PNS is organized into two divisions including the autonomic nervous system, a division that involves involuntary activities and the somatic nervous system, a division that involves voluntary activities. Its effective operation is related to sensory and motor balance within the body causing a good balance and coordination.

167. Somatic Nervous System

Somatic nervous system controls muscular movements and the reflexes, which are voluntary and involuntary respectively. It is composed of sensory neurons whose transmission of information to the CNS and motor neurons transferring commands in reverse is communicated to the skeletal muscles. This system is capable of conscious activity, speaking, walking or writing. The automatic reflexes also take place under the control of this system. It is essential in coordinating the sense of perception and the movement that is intentional.

168. Autonomic Nervous System

The autonomic nervous system (ANS) is an automatic system that controls the body processes that are vital like the heart beating, digestion and breathing. It works continuously in order to maintain internal balance, or homeostasis. Possessing two branches which are sympathetic branch and parasympathetic, the ANS consists of two branches that complement each other to ensure an equilibrium. It is these coordinated processes that allow the ANS to stabilize the internal organisms to adapt well during the stress as well as rest state.

169. Sympathetic Nervous System

The sympathetic nervous system which is involved in making the body ready in the case of emergency or stressful situations is commonly referred to as the fight or flight response. It raises heart rate, dilation of the pupil and redirection of blood to the muscles giving them false swift movements. These responses are principal neurotransmitters mediated by norepinephrine. As much as this system is essential in survival under threat, its constant activation has been known to aid stress related disorders hence the need to maintain a balance with the parasympathetic system.

170. Parasympathetic Nervous System

The aftermath of after being anxious is the release of calmness through the parasympathetic nervous system, which facilitates relaxation and conservation of energy. It decreases the heart rate, increases the digestive activity, and promotes pedestrian functions. This is one division that is opposite to the sympathetic system so as to stabilize the interiors. It has acetylcholine as its main neurotransmitter. An equal distribution of both systems is essential in physiological harmony and health in the longrun.

171. Cranial Nerve

This is a group of twelve pairs of nerves which have their origin in the brain, and not in the spinal cord. They control sensory functions as well as the motor functions of the head, neck, and part of the thoracic organs. Specific tasks are carried out by each nerve including the optic nerve that regulates vision and the facial nerve that enables expression and the vagus nerve that regulates some of the autonomic functions. These nerves play a vital role in ensuring sensory perception and muscular coordination because their proper functioning is important.

172. Spinal Nerves

Spinal nerves are emerged out of the spinal cord and spread throughout the body forming pairs in total. It has been broken down into cervical, thoracic, lumbar, sacral and coccygeal segments. All nerves have

sensory and motor, which makes them able to take a reflex response and voluntary control. They form an extremely important source of communication between the CNS and peripheral organs. The injuries to these nerves may cause sensory and/or paralysis.

173. Optic Nerve

The cranial nerve II is referred to as the optic nerve and conveys visual signals on the retina to the brain. It is essential in vision, which enables seeing of images and deciphering them. The optic nerve is encircled by protective meninges just as is the case of the brain. Any pressure on it, or damage to it, can result in the loss or impaired vision. It is absolutely essential in the detection of light and in the retention of sight.

174. Olfactory Nerve

Crainial nerve I or olfactory nerve is connected with the detection of odors. It transmits sensory signals of the nose in the olfactory bulb where the brain contains the diverse scent interpretations. This also improves the sense of taste and generates emotional or memory related reaction. Functional loss causes anosmia which is the inability to smell. The sense of smell has an important role to play in environmental protection and pleasure.

175. Auditory Nerve

The hearing and the balance occur in the auditory or vestibulocochlear nerve (cranial nerve VIII). It transmits the impulses of the cochlea and the semicircular canals of inner ear to the brain. This enables hearing abilities and balance. Damage to this nerve or infection may cause deafness or vertigo. It makes sure that the brain is able to process auditory and positional information correctly.

176. Oculomotor Nerve

Most of the eye movements, constriction of the pupil and elevation of the eyelid are motor activities controlled by the oculomotor nerve (cranial nerve III). It serves some of the muscles of the eye, which enables us to see and be able to focus simultaneously. Damage may result in eyelid drooping, loss of eyesight or eye deviation. It collaborates with other nerve functions of the head in control of the eye functions. This is a crucial nerve on the visual tracking and reflex.

177. Trigeminal Nerve

The trigeminal nerve (cranial nerve V) serves the face and the muscles used in the process of chewing. It has three branches that include ophthalmic, maxillary and mandibular. It conveys the sense of touch, pain and temperature of the facial parts. This nerve may cause neuralgia producing extreme pain on the face. It is the great cranial nerve and it is crucial in sensory and motor aspects of the face.

178. Facial nerve

The expressions, taste sensation in the tongue, and the secretion of glands are controlled by the facial nerve (cranial nerve VII). It controls muscles of smiling, frowning and blinking. Damage may cause Bell

palsy which will temporarily leave faces of Bell paralyzed. It helps in production of tears and saliva production. The nerve is vital in expression and communication of emotions.

179. Vagus Nerve

One of the major parasympathetic nerves that control the heart rate, digestion, and breathing rate is referred to as the vagus nerve (cranial nerve X). It is a continuation of the brainstem to the abdomen affecting several organs. It conveys sensory data and regulates the movement of smooth muscles. The vagus nerve stimulation ensures relaxation and homeostasis. This is important to the autonomic control and the coordination of internal organs.

180. Retina

The retina is the deepest component of the eye which receives light and in turns converts them into neural impulses. It possesses photoreceptor cells rods and cones which process the visual information. These signals pass through the optic nerve to the brain in order to interpret an image. Color and visual acuity The retina is very critical in seeing color and visual clarity. It may be damaged and therefore blindness or impaired vision may follow.

181. Cornea

The cornea is the transparent and dome shaped part that has the front of the eye. It bends the light to come in which focuses the light on the retina. It is composed of five layers and it is also protective and optical. It is very sensitive thus it can be used in detecting foreign objects or injury. The transparency of the cornea is important in having a sharp vision.

182. Lens

This is a transparent, pliable lens that is located just behind the iris and focusses the light over the retina. It adapts to the near or distant vision by changing shape using the process of accommodation. The lens consists of crystalline proteins which are the main composers that make it clear. As one ages, the elasticity of the lenses reduces, and this results in presbyopia. The cataracts are due to the opacification of the lens.

183. Iris

The iris is that portion of the eye that is of a color other than white. It controls the entry of light into the eye by changing the level of the pupil diameter. The iris has both circular and radial muscles which either contract or relax to the intensity of light. This reflex movement makes the vision look as good as possible under different light conditions. It is also involved in the variation of eye colours in the individual.

184. Pupil

The iris has a central opening called the pupil through which the light gets to the retina. It is variable in size with the light conditions, narrowing during the bright day and enlarging in the nights. It is operated

by the autonomic nervous system. An important clinical indicator of nerve and brain functionality entails the reaction of the pupil. The correct control of light guarantees a good and balanced vision.

185. Optic Disc

The very area where the optic nerve comes out of the retina is known as the optic disc or the blind spot. It does not have photoreceptors and it is therefore not sensitive to light. This is notwithstanding, the brain fills the gaps created by the absence of the visual data but the blind spot is thus invisible in most cases. It is with a critical zone of ophthalmic checkup. The optic disc swelling might be a sign of intracranial pressure or codes of the nerves.

186. Cones

The cones are special cells in the retina which are called photoreceptor cells which produce color vision and visual acuity. They are sensitive to Pale, red and green and blue light colors. The fovea centralis has cones concentrated such that it allows finer and colorrich vision. Color blindness is brought about by damage or lack of cones functionality. Their activity is a complement to the rods to perform a complete visual activity.

187. Rods

Phyoreceptors in the retina which make one see even in dark conditions are called rods. They perceive light, however, they are not sensitive to color. Rods are found in the peripheral retina and they assist in motion recognition and night vision. They cannot work without vitamin A which forms rhodopsin, a light sensitive pigment. This may degenerate the rods resulting in night blindness.

188. Cataract

A cloudy outlook of the eye lens is the cataract which makes vision blurry or dark. It evolves as a consequence of old age and UV rays, trauma, or metabolic abnormalities. The disease obstructs the light penetration which makes vision blurred. The initial signs of it are glare sensitivity and diminished color perception. The surgical lens replacement is the most effective therapy to cataracts.

189. Glaucoma

Glaucoma is an ocular condition that is brought about by a high level of intraocular pressure leading to a destruction of the optic nerve. It may cause slow degradation of vision or loss of sight in case it is not treated. The chronic and the angle closure (acute) forms are possible. Progression can be avoided with frequent monitoring of eye pressure and medication. The sight is safeguarded by early detection.

190. Tympanic Membrane

The tympanic membrane is a thin structure with the shape of a cone prerequisite between the outer ear and the inside ear. It moves with sound vibration propagating the sound vibration to the ossicles. The

middle ear is also covered by the membrane as it protects against foreign objects. Hearing clarity depends on its integrity. The loss or discomfort of hearing or damage can be as a result of damage or infection.

191. Cochlea

Cochlea is a fluid filled in the inner ear that is shaped in a spiral form with the ability to translate sound vibrations into nerve impulses. It holds the organ of Corti, in which are the hair cells, which sense the sound frequencies. through the auditory nerve they are passed on to the brain. The ear is able to detect pitch and loudness, in the cochlea. The damage to it may cause sensorineural hearing loss.

192. Semicircular Canals

The inner ear contains three looped structures called the semicircular canals whose purpose is to keep the balance and space orientation. The fluid motion and hair sensory cells detect the movement of the head. The input of such canals is transmitted to the brain to control posture and balance. Vertigo or dizziness can be brought about due to dysfunction. They liaise closely with the cochlea to the combined control of sensuality.

193. Olfactory Epithelium

The olfactory tracts organized in the interior of nasal cavity is the special tissue on which the smell detection sensory neurons are located. The odor molecules are bound through these receptors and their signals are sent to the olfactory bulb of the brain. It assists in the differentiation of different scents and aids in taste. A destruction of this tissue may cause anosmia. It is also involved in emotional and memory relations to smells.

194. Taste Buds

Taste buds are structures of the sense which are mostly found on the tongue and which are used to perceive the various taste sensations; sweet, sour, salty, bitter and umami. Buds have gustatory cells which react to food chemical stimuli. They transmit the signals to the brain by the cranial nerves of taste perception. Taste buds may be sensitive and be many or few depending on the person. Appetite and enjoyment of food are promoted by proper functioning.

195. Papillae

There are tiny erections on the tongue which are known as papillae which also have taste buds and help in the manipulation of food. This is of four broad forms which are filiform, fungiform, circumvallate and foliate. They also improve the sense of grip and texture during chewing in addition to taste. It influences taste sensitivity because of their distribution. Taste perception can be changed through inflammation or loss of papillae.

196. Conjunctiva

Conjunctiva This is a thin transparent layer which covers the inner eyelids and sclera. It prevents dust and microorganisms and also keeps the eye moist. The conjunctivitis or pink eye is inflammation of

conjunctiva. It is a major component in eye lubrication and defense of immunity. Good hygiene is utilized to eliminate conjunctive infections.

197. Auditory Ossicles

There are three little bones located in the middle ear malleus, incus and stapes which are known as auditory ossicles. They enhance and are able to pass the sound vibrations of the eardrum to the inner ear. The smooth movement of the sound is necessary in coordination by them. These bones may damage or be fixed leading to conductive hearing loss. They are the tiniest bones of a human body.

198. Eustachian Tube

The Eardrum is divided into two chambers where each has an eardrum attached to it; the middle ear is linked to the nasopharynx of the human body and this is known as the Eustachian tube which balances the air pressure on each side of the ear drum. It is only opened in case of swallowing or yawning so that the ears do not hurt. The malfunction may cause ear infection or the sensation of fullness. The middle ear has secretion as well which is emptied via the tube. Normal hearing and equilibrium are brought about by proper functionality.

199. Cardiology

Cardiology is the section of medicine that is concerned with study of, diagnosing and treatment of heart diseases. It contains the cardiac anatomy, physiology and pathophysiology. Cardiologists deal with hypertension, arrhythmia, and the coronary artery disease. The field is very vital in preventive health care and saving lives. The current cardiological researches contribute to the development of cardiac care and treatment outcomes.

200. Pericardium

Pericardium refers to a protective but a membrane comprising of two layers which encircle the heart. It is composed of an outer fibrous layer and inner layer with the serous fluid caught in it and serves to minimize the friction found with cardiac movements. It is a structure that keeps the heart in its place in the thoracic cavity and that the heart does not over dilate due to overfilling. It also gives the defensive level against transmissions of infections by other organs. In total, it is the pericardium that ensures the stability and maximum functioning of the heart.

201. Myocardium

The myocardium is the muscular middle force of the heart wall and it has the major role of pumping blood at every part of the body. It is made of specialized cells of heart muscles which contract in a rhythmic manner. The coronary arteries supply oxygenated blood to it. Contractile strength of the myocardium is what dictates the efficiency of the cardiac output. Any destruction of this tissue as in the case of myocardial infarction highly impairs the heart activity.

202. Endocardium

The inner layer of the valves and chambers of the heart is a thin smooth surface known as the endocardium. It is made of endothelial cells and connective tissue; thus, it offers nonthrombogenic surface which facilitates the flow of blood without being subjected to friction. It is known to be helpful in coordination of contraction and electrical conduction. Any inflammation or infection to this layer causes endocarditis, which is a severe cardiac disease. The inner cardiac muscle is important in inner heart cohesion.

203. Atria

The two upper chambers of the heart and which receive the incoming blood are referred to as the atria. The deoxygenated blood of the body is pumped into the right atrium and the oxygenated one is pumped to the left atrium. Their muscular walls are thin, hence, give them the capacity to serve as temporary reservoirs which later pass the blood onto the ventricles. Atrial shortening brings about the achievement of filling to ensure that the ventricles fill. Incorrect atrial activity helps to sustain the regular heart rate and blood circulation.

204. Ventricles

The lower chambers (ventricles) of the heart are the ones involved in pushing out blood of the heart. The deoxygenated blood is pumped by the right ventricle to the lungs and the oxygenated blood is pumped by the left ventricle into the aorta which supplies the body with blood. These chambers have thick muscular walls that help in the creation of adequate pressure to force blood out. The left ventricle is especially strong in order to support the systemic circulation. The systolic heartbeat comprises contraction of the ventricles.

205. Septum

Septum is a muscular wall which separates the right and the left sides of the heart. It avoids the mixing of the deoxygenated and blood. It has both the interatrial and interventricular septa, structurally. Other important areas of the cardiac conduction system include Bundle of his that are found in the septum. Any imperfection in this wall be it by birth or by accident may weaken the performance of the heart and circulation.

206. Valves

Heart valves are flaplike structures made of elastic material that is used to regulate one way blood flow within the heart chambers. They open and close by changing pressure variation on the cardiac cycle. There are four main valves, that is, tricuspid, pulmonary, mitral, and aortic which are used to make sure that the blood moves forward without retrograde. Their synchronized or coordinated activity fosters successful circulation and oxygen supply. The failure of any of the valves may result in the development of cardiac failure.

207. Aortic Valve

The aortic valve lies between the aorta and left ventricle and this valve opens in case of systole to allow oxygenated blood to flow into systemic circulation. It seals in case of diastole so as to avoid refluxing

back to the ventricle. The valve has three cusps that are semilunar and are meant to be able to withstand high pressure. Such disorders as aortic stenosis or regurgitation may worsen cardiac effectiveness and increase workload on a left ventricle.

208. Mitral Valve

Mitral valve or Bicuspid valve is the separation between the left ventricle and the left atria. It enables one directional movement of oxygenated blood during relaxation and backflow during ventricular contracting. This remains tightly closed under pressure with the assistance of chordae tendineae that are attached to the papillary muscles. Such conditions like mitral stenosis or prolapse disrupt normal blood flow and decrease cardiac output.

209. Tricuspid Valve

The tricuspid valve is placed between the right atria and the right ventricle, it provides the blood with a unidirectional flow in every cardiac cycle. It has three leaflets attached with chordae tendineae so as not to be inverted during contraction. The valve works within relatively low pressure than the valves on the left side. Malfunctions such as tricuspid regurgitation may lead to the congestion of the venous and edema on the system.

210. Pulmonary Valve

The pulmonary valve is used to protect the ventricular to pulmonary artery aperture. It dilates to allow blood to flow forward into to the lungs and in order to eliminate any turning back of the blood it closes during relaxation. The three semilunar cusps help its circulation to be forward. The defects of the valves of the lungs can be the reasons of dyspnea and excessive load on the right ventricle.

211. Aorta

The aorta is the largest artery of the body which originates at the left side of the ventricle and delivers tanks of oxygenated blood to the body organs. It divides into a number of large arteries that serve the head, limbs and the abdominal organs. It can withstand high pressure due to its elastic muscular wall to assist in the maintenance of stable blood flow. Central to the systemic circulation is the aorta either which can be a life threat due to aneurysm or damage.

212. Vena Cava

The vena cava is a combination of two large veins known as superior and inferior vena cava that cause deoxygenated blood to be returned to the right atrium. The upper body is drained via the superior vena cava whereas the lower body is drained via the inferior vena cava. The combination of the two is necessary to sustain the venous flow to ensure that the heart fills continuously. Any complication can cause swelling and poor circulation.

213. Pulmonary Artery

The lungs are fed with deoxygenated blood in the pulmonary artery which is oxygenated. It is the only artery that has deoxygenated blood out of all the arteries. It branches into the right and left where each lung is supplied. It plays an essential role in the process of gas exchange and effectiveness in breathing. It could be a pulmonary embolism which is dangerous to life unless treated.

214. Pulmonary Vein

Pulmonary veins carry oxy-blood in the lungs to the left atrium. Typically, the number of the veins is four- two veins being of each lung. These are the sole veins in the body which contain blood of oxygenated quality. They have sustained inflow through which the cardiac filling and systemic oxygenation occur. The pulmonary congestion and shortness of breath can be experienced as obstruction or narrowing of these veins.

215. Artery

Arteries are blood vessels which transfer the blood, which is under high pressure, away in a heart. They are also elastic and muscular which helps support the circulation of blood between heartbeats. They provide tissues with nutrients and oxygen required in the metabolism. The integrity of the arteries plays a significant role in maintaining the pressure of the blood and the supply of organs. Alteration or obstruction, such as atherosclerosis, may limit circulation and cause ischemia.

216. Vein

Veins are one layered arteries, which transport blood back to the heart, and are typically carrying deoxygenated blood. They have valves that allow down spillage to be eliminated and upward movement against gravity guaranteed. Veins are also reservoirs of blood, which contain a significant amount of total volume of blood. These are superficial or deep basing on their location. Pathologies like the varicose veins or thrombosis affect the normal venous circulation.

217. Capillary

The smallest blood vessels are the capillaries and they contain extensive networks in or around the body. They connect arterioles with venules through which exchange of oxygen, nutrients and metabolic wastes takes place. Their walls are one cell thick enabling effective diffusion of the blood with the adjacent tissues. Capillary density is activity dependent in the tissues, that has sufficient oxygen supply, and desirable evacuation of waste. Due process of metabolism in cells requires proper functioning of the capillaries.

218. Coronary Artery

The coronary arteries are the continuation of the aorta at its base to the heart muscle (myocardium) to supply it with oxygen and nutrients. They contain the right and the left coronary arteries that have smaller branches. These vessels play an important role in maintaining uninterrupted energy requirements of the heart. Obstructed or constrained blood flow causes myocardial ischemia or infarction, which are causes of significant cardiovascular diseases worldwide.

219. SA Node

The natural pacemaker of the heart is the sinoatrial (SA) node that is located in the right atrium. It produces electrical signals that cause every heartbeat sending across the atria to cause contraction. It is through this activity that the normal beat of beats every minute will be created. Under the SA node, there is synchronous cardiac functioning. The arrhythmias or irregular heart rhythm may occur due to malfunction.

220. AV Node

The atrioventricular (AV) is the node that is located between the atria and ventricles. It picks up the impulses on the SA node and slows them down a bit in order to allow the full filling of the ventricles. This is what brings about coordinated contraction of the chambers of the heart. It then sends impulses to the Bundle of His. Conduction defects and bradycardia may be the result of AV nodal blockage.

221. Bundle of His

The Bundle of His is a special group of fibers through which electrical impulses are passed by the AV node to the ventricles. It separates into right and left bundle branches in order to coordinate contraction of the ventricles. It brings about homogenous depolarization of both ventricles. These fibers have any block that can cause arrhythmia. It is very important in conducting of the heart.

222. Purkinje Fibers

Purkinje fibers are those fine conducting fibers that are found on the inner walls of the ventricles. They distribute electrical impulses exceedingly fast over ventricles. This has the effect of making contraction synchronized to eject blood effectively. They guarantee the latter in the cardiac electric path. These fibres can be damaged resulting in abnormal heartbeats and decreased heart output.

223. Heart Contraction

It means the tightening or squeezing of the heart muscle to pump blood to the lungs and the rest of the body.

224. Cardiac Cycle

The sequence of mechanical and electrical events of the heartbeat is known as the cardiac cycle. It involves contraction of the atria, contraction in ventricles (systole) and relaxation (diastole). At rest every cycle takes approximately. seconds. The cycle ensures that there is constant circulation of the body. Disruption has an impact on the general blood pressure and perfusion.

225. Systole

The contraction of the heart muscles that expels the blood in the chambers is called systole. Systole of the ventricles forces the blood in high pressure arteries. It is the highest value of the blood pressure. Sufficient systolic performance is important to adequate perfusion. Poor systole will cause cardiac failure.

226. Diastole

The relaxation of the heart cycle is called the diastole and is followed by the filling of chambers which is also referred to as the filling up of blood into the chambers. It is preceded by systole and gives cardiac rest. This is the period when blood is pumped out of the atria into ventricles. The lowest pressure of the arteries is known as the diastolic pressure. Low diastolic filling may lead to decreased output of the cardiac and fatigue.

227. Heart Rate

The rate of the heart is the rate of the hear tbeats per minute with the normal rate between and bpm in adults. The autonomic nervous system controls it and physical activity. When it gets faster, it is termed as tachycardia and when it is slower, then it is bradycardia. It represents general fitness of the cardiovascular. Irregular heart rate is a sign of pathology or stress.

228. Stroke Volume

The volume of blood expelled through the ventricles per beat is the measures of stroke volume, and this is approximately 70 ml in adults. It is reliant on the venous return, contractility and afterload. It has direct effect on cardiac output and perfusion of tissues. Stroke volume is increased by regular exercising. In case of a heart failure or shock, the volume of stroke decreases.

229. Cardiac Output

The sum number of blood pumped every minute by the heart is known as the cardiac output. It is computed as a product of volume of stroke and the heart rate. The normal output ranges at approximately 5 liters per minute. It identifies the efficiency with which the heart is fulfilling the oxygen requirement of the body. Reduced myocardial output results in hypoxia of tissues and dysfunction of the organs.

230. Blood Pressure

Blood pressure is the pressure of blood flowing in a body that acts on the one wall of arteries. This is presented in the form of systolic vs. diastolic pressure (e.g., 120/80 mmHg). It is a reflection of output of the heart and resistance of the vessels. There is regulation such as neural, hormonal and renal. Physical harm of essential organs may occur due to chronic high or low BP.

231. Sphygmomanometer

A sphygmomanometer is a tool, which measures blood pressure. It has an inflatable cuff, pressure gauge, and a stethoscope to participate in auscultation. Cardiovascular health is evaluated with the assistance of readings. It is a diagnostic instrument that is common in clinics and hospitals. The frequent checkups help to identify the presence of hypertension.

232. Pulse

Pulse refers to expansion and contraction of an artery through contraction of the heart. It is experienced in those areas that have close arteries with the skin such as the wrist or the neck. The pulse rate, rhythm and hemiolence demonstrate the functioning of the heart. It assists in measuring the blood circulation and health. Problems with the heart may be indicated by weak or atypical heartbeats.

233. ECG (Electrocardiogram)

The ECG is the recording of the electrical activity performed by the heart by means of surface electrodes. It shows typical waves which are the depolarization and repolarization waves. It assists in the diagnosis of arrhythmias, heart block and myocardial infarction. ECG is yet another noninvasive and routine cardiac test. A regular ECG will make it possible to identify heart abnormalities early enough.

234. Hypertension

Hypertension is the condition of the continuously high level of blood pressure above normal. It exposes one to heart attack, stroke and kidney damage. The most prevalent ones are stress, obesity, and the consumption of salt. Modifications of lifestyle and drugs assist in its management. High blood pressure over a long period has no symptoms, but it destroys the arteries and organs.

235. Hypotension

Low blood pressure is hypotension which causes insufficient tissue perfusion. The symptoms include dizziness, blackout, and exhaustion. It may be caused by the dehydration, loss of blood or dysfunction of the heart. Where the mild cases can be harmless, serious cases of hypotension lead to shock. Normal hydration and medical attention lead to a restoration in the normal pressure.

236. Atherosclerosis

The stiffening and constriction of the arteries as a result of a plaque are known as atherosclerosis. It decreases blood circulation and blood supply to the tissues. Plaques are composed of cholesterol, fat and calcium deposits. It causes coronary artery disease and stroke in a significant proportion. It is slowed down by lifestyle management and drugs.

237. Myocardial Infarction

Heart attack or myocardial infarction is a complication that results in the blockage of blood in a section of the heart. This results in death of tissues as a result of the unavailability of oxygen. The normal symptoms comprise chest pains, sweating, and the feeling of breathlessness. It demands an immediate medical intervention. Preventing the recurrence is done through rehabilitation and changes in lifestyles.

238. Arrhythmia

A fibrillar rhythm that is either slow, rapid or irregular, is known as arrhythmia. It is caused by the disruption of the electrical conductive system of the heart. A few arrhythmias are not dangerous whereas some are life threatening. ECG helps in diagnosis. Treatment involves medication, pacemakers or electrotherapy.

239. Angina Pectoris

Angina pectoris refers to the chest pains that transpire due to a low circulation of blood to the heart muscle. It is frequently caused by the exertion or stress and is alleviated by the rest or nitroglycerin. It means that there is the underlying coronary artery disease. Myocardial infarction may be preceded by persistent angina. Managing early helps to enhance the prognosis and heart.

240. Tachycardia

Tachycardia is a rapid and excessive heart rate of over bpm. It may be caused by fever, apprehension, anemia or heart disease. Continued tachycardia augments cardiac labour and oxygen requirement. It can result in fainting or heart failure in case of unaddressed cases. Drugs and relaxation aids the control of rate.

241. Bradycardia

Bradycardia is a slow heart rate, which is below bpm. It can be experienced either in sportsmen or as an effect of heart block. In extreme cases, it may create fatigue, dizziness or syncope. In the chronic cases, pacemakers are utilised. It means that there is electrical activity that is low in the heart.

242. Congestive Heart Failure

Congestive heart failure (CHF) is a disorder that is caused by the inability of the heart to pump blood properly. It causes the accumulation of fluid in body organs, legs, and lungs. This is caused by hypertension, coronary disease, and valve disorders. One of the symptoms is swelling and shortness of breath. Treatment involves drug and diet management.

243. Stroke

Stroke it happens when the supply of blood to a section of the brain is cut off causing the death of cells. It may be ischemic (blockage) and hemorrhagic (bleeding). The symptoms are weak, speech difficulty and facial drooping. Treatment should be administered as early as possible to reduce brain damage. Rehabilitation is useful in recovery and restoration of functions.

244. Aneurysm

An aneurysm is a distended or swell up in the wall of a vessel. It tends to impinge upon such arteries as the aorta or the brain vessels. It is fatal and internal bleeding occurs in case it ruptures. Such risk factors are atherosclerosis and hypertension. Repair Surgical repair avert rupture and complications.

245. Hemodynamics

The study of the circulation of blood and the forces that the blood moves is called hemodynamics. It investigates such parameters as pressure, resistance and volume. Adequate hemodynamics leads to an effective provision of oxygen and nutrients. the disturbances may give rise to shock or heart failure. Specifically to clinical treatment in the critical care, monitoring assists in its direction.

246. Hemorrhage

Excessive bleeding of blood vessels is known as hemorrhage. It is either internal or external thus causing a rapid loss of blood and shock. The level of the severity is based on location and blood loss. It should be controlled quickly by means of pressure or surgery. Anemia may be as a result of chronic or minor bleeding.

247. Vasoconstriction

When the blood vessels are narrowed by the contraction of blood vessel muscles, the effect is referred to as vasoconstriction. It raises the blood pressure and decrease blood circulation to specific regions. It aids in the stabilization of core temperatures and loss of blood. This is brought about by hormones such as adrenaline. Cyclic vasoconstriction could cause high blood pressure.

248. Vasodilation

The process of relaxation of smooth muscles, which causes the blood vessel to widen is called vasodilation. It reduces the blood pressure and improves the flow of blood to tissues. It is natural when it is exposed to heat, or in the state of exercise. The mediators of this process include nitric oxide. Hypotension or flushing may be as a result of abnormal vasodilation.

249. Baroreceptor

Baroreceptors are sensory nerve endings which are pressure sensitive and are found mostly in both the aorta and carotid sinuses. They sense the changes in blood pressure and send them to the brainstem. The central nervous system reacts by compensating the changes in the heart rate and vascular resistance, to maintain the blood pressure steady. This is a reflex mechanism that ensures short term cardiovascular balancing. Baroreceptor dysfunction may be a lead to hypertension or orthostatic hypotension.

250. Autonomic Regulation

Autonomic regulation can be defined as voluntary regulation of the heart rate, vascular tone and organ activity which is generally controlled by the autonomic nervous system. The sympathetic division accelerates the heart, and constricts blood vessels, which slows down the heart and relaxes through the parasympathetic division. This is a dynamic balance that maintains stable blood flow when one is in a rest or stressful situation. The violation of this regulation may cause rhythm disorders and cardiac diseases.

251. Nervous System

Nervous system is a complicated system of communication between the body which provides the coordination of the work in the body and homeostasis. It carries electrical signals within the brain, spinal cord and the peripheral organs. Perception, movement and reflexes are managed in an efficient manner through this system. Anatomically it is separated into central nervous system and peripheral nervous system. It operationally allows quick reaction to the internal and external environmental changes.

252. Central Nervous System (CNS)

CNS is a mix of the brain and the spinal cord which is the predominant control and processing center of the body. It processes what is received by the senses and it coordinates information and produces the right motor reaction. The brain regulates the higher cognitive and vital functions and the spinal cord allows the transmission of the impulses to the body and back. They are both covered by meninges and fluid of cerebs.

253. Peripheral Nervous System (PNS)

The PNS links the central nervous system to the rest of the body through an extensive network of nerves. It includes cranial and spinal nerves that carry sensory and motor information. This system allows continuous communication between the brain, spinal cord, and peripheral organs. It is subdivided into somatic (voluntary) and autonomic (involuntary) components for precise functional control.

254. Autonomic Nervous System (ANS)

ANS controls the involuntary physiological processes, like heart rate, digestion process, and glandular secretion. It functions comparing to the subconscious in order to be internally stable. The system comprises two parts; the sympathetic one that readies the body to act (fight or flight) and the parasympathetic that favors relaxation and gutting (rest and digest). The two collaborate in promoting homeostasis.

255. Somatic Nervous System

The skeletal muscles have voluntary motions that are controlled by the somatic nervous system. It comprises motor neurons which carry commands provided by the CNS to muscles and sensory neurons which get the feedback of the receptors. This system is able to enable conscious actions such as walking, writing or speaking. Quick protective responses to reflexive arcs can also be found in it without thought.

256. Neuron

A neuron is the basic constituent of the nervous system that carries an electrical impulse both structurally and functionally. A neuron is made up of cell body, dendrites and axon. The neurons interact with each other through the synapses where the electrical signal is converted into the chemical signal through the neurotransmitters. They create complex systems that are critical in sensation, thinking as well as motor control.

257. Neuroglia

Neurons are supported structurally, metabolically and protected by the help of neuroglial cells or glial cells. They preserve the ionic environment, establish myelin as well as contributing to the repair following neural injury. These are the major ones, which are astrocytes, oligodendrocytes, microglia, as well as Schwann cells. The glial cells are also able to divide and regenerate unlike the neurons hence good health of the neurons, and efficiency.

258. Nerve Fiber

A nerve fiber is a long axon of a neuron, which is specialised to transmit electrical and impulses. The fibers can either be myelinated or unmyelinated, the myelinated fibers relay impulses faster because of being insulated. The nerves consist of groups of nerve fibers linking the CNS and peripheral tissues. They play an important part in fast and synchronized signal conduction.

259. Axon

An axon is a long slender extension of a neuron that transmits nerve signals in the absence of the cell covering to further connect with the target cell(s). It ends in the axon terminals where neurotransmitters are discharged. Axons have the ability of stretching over long distances, thereby guaranteeing communication between the far areas of the nervous system. Their honesty plays an important role in proper plea of the neural functioning.

260. Dendrite

Dendrites are branch outlets of the neurons which take the incoming signals of other neurons or sensory receptors. These signals are transmitted by them to the cell body of the neuron to be processed. They have receptor sites of neurotransmitters on their surface. The dendritic branching provided by the neuron enables it to combine a number of inputs leading to improved neural communication.

261. Myelin Sheath

Myelin sheath It is a multilayered lipid wrap that encloses some axons, which serves as an electrical conductor. It enhances fast and effective transmission of impulses. In CNS, myelin is synthesized by oligodendrocytes, and in the PNS it is the Schwann cell which does the same. In multiple sclerosis, physical injury to the myelin sheath interferes with the conduction between neurons and leads to clinical effects.

262. Node of Ranvier

Ranvier Nodes Small unmyelinated intervals between a myelinated axon. These are openings through which ions are readily exchanged so that electrical conduction (senescence), in which conduction is by leaps, is possible between two nodes. This is a much energy saving conduction speed mechanism. Nodes play a critical role of ensuring an efficient and accurate nerve signaling.

263. Synapse

A synapse is the specialized linkage with the help of which a neuron interacts with one of the neurons or an effector cell. The discharge of the neurotransmitters across the synaptic cleft is activated by electrical impulses within the presynaptic neuron. Both of these chemical messengers attach to the receptors over the postsynaptic cell to pass or suppress signals. Directional and modulated information transfer is ensured by the presence of synapses.

264. Synaptic Cleft

The microscopic space between the presynaptic and postsynaptic membrane of a synapse is referred to as the synaptic cleft. It is in this space that neural signals are passed to a different brain region through the neurotransmitters. The chemical properties of the cleft and risk of speed and accuracy depend on the cleft width. A proper working of this gap is important in effective neural communication.

265. Neurotransmitter

Neurotransmitters refer to biochemicals messengers, which relay signals in their interactions amid neurons or to effector cells. They attach to certain receptors to trigger an excitatory or an inhibitory effect. The well known ones are acetylcholine, dopamine, serotonin and norepinephrine. These chemicals control the mood, cognition, movement of the muscles, and other physiological functions.

266. Acetylcholine

The acetylcholine (ACh) is an important neurotransmitter that takes part in muscle contraction and memory. It functions at the neuromuscular junctions, at the autonomic system. It is involved in both sympathetic and parasympathetic signaling. Low levels have been associated with the Alzheimer disease.

267. Dopamine

Dopamine is used to control movement, motivation and reward behavior. It is produced on the regions of the brain such as the substantia nigra. The imbalances result in such conditions as Schizophrenia and Parkinson disease. It influences emotional reactions and the motor control as well.

268. Serotonin

Serotonin plays a role in mood, appetite and sleeping efficiency. It is mostly present in brainstem and gastrointestinal tract. Poor levels of serotonin bring out depression and anxiety. It assists one in staying emotionally stable as well as circadian rhythm.

269. Norepinephrine

This is a neurotransmitter that acts in alertness and arousal. It is a hormone and a neurotransmitter when dealing with stress. It accelerates the heart rate and blood pressure by releasing it through the sympathetic nerve endings. It is important that it is attentive and focused.

270. GABA (Gamma-Aminobutyric Acid)

The key neurotransmitter of the brain is GABA. It decreases the excitability of neurons and inhibits over stimulation. It assists in control of muscle and calmness. Anxiety and seizures are treated with drugs that amplify the GABA activities.

271. Glutamate

In the CNS, the major excitatory neurotransmitter is Glutamate. Learning and memory are essential to it. Excess stimulation with glutamate may cause damage of neurons. It has an action on NMDA receptors and AMPA receptors.

272. Action Potential

An electrical impulse produced when a neuron is stimulated is referred to as an action potential. It entails depolarization and repolarization of the membrane. This signal is sent in the axon transmitting information.

273. Resting Membrane Potential

The membrane potential of rest is voltage difference across the membrane of a neurons at rest. It is held constant by ion pumps and channels, which is ordinarily at -70 mV. This possibility is important to the excitability of neurons.

274. Depolarization

The decreasing of the negative membrane potential of the neuron results in depolarization. It is due to influx of sodium ions. This stage provokes the transmission of the action potential.

275. Repolarization

The depolarization of neurons is followed by the restoration of the resting level by repolarization. Potassium ions leave the neuron and restore the negative membrane potential value. This stage makes sure that there is the correct sequence of impulses.

276. Hyperpolarization

Hyperpolarization Stabilization into a negative value of the membrane potential is hyperpolarization. It suppresses in advance another impulse, so that no transmission in both directions occurs.

277. Saltatory Conduction

In myelinated axons, saltatory conduction happens whereby the impulses leap between Nodes of Ranvier. This highly enhances speed of conduction. It will help to conserve energy and enhance efficiency.

278. Nerve Impulse

A nerve impulse is an electric signal that is transmitted by neurons. It forms a type of communication between the brain, spinal and the organs. The transmission is dependent on ion exchange and neurotransmitters..

279. Receptor

The receptors are specialized receptors that identify stimuli like light, touch, sound etc. They translate physical or chemical signals in order to nerve impulses. The process of sensing is triggered by receptors.

280. Effector

A nerve stimulation responds with an effector which is a muscle or a gland. It performs the action of the body on the responses of the neural commands. Some of them include sweat glands and skeletal muscles.

281. Reflex Arc

Reflex neural pathway is the final pathway that is involved in reflex actions. It consists of receptors, sensory neurons, inter neurons, motor neurons and effectors. It enables rapid involuntary reactions towards stimuli.

282. Afferent Neuron

The receptors transmit information, which is sensory, to the CNS via an afferent neuron. It is essential in the perception and reflexes. They are neurons that respond to the changes in the internal or external environment.

283. Efferent Neuron

Motor CNS to effector commands are transported via the efferent neurons. They foment muscle contraction and glandular discharge. They have axons that make motor nerves that control both voluntary and involuntary actions.

284. Motor Neuron

The impulses are transmitted to the muscles or glands through the motor neurons. They are also necessary to movement and reflex. Trauma causes weakness or paralysis of muscles.

285. Sensory Neuron

The receptors receive the surrounding stimuli and transmit the information to the CNS. They transform the sensory input into electricity. They are important to sense of touch, vision and pain.

286. Interneuron

Sensory and motor neurons in the CNS are linked by the interneurons. These are information processors and decision makers. They make complicated neural networks needed in learning and memory.

287. Meninges

Three outer layers that are covering the brain and spinal cord are the meninges. These are the dura mater, arachnoid mater and the pia mater. They cushion the CNS and are filled with cerebral milk.

288. Dura Mater

Dura mater is the outer layer of meninges which is tough. It offers good mechanical fortification to the brain and the spinal cord. It also develops blood drainage venous sinuses.

289. Arachnoid Mater

This is the intermediate or web meninges. It surrounds the CNS in cushioning and also between dura and pia mater. The area under it is subarachnoid space which holds cerebral space fluid.

290. Pia Mater

The pia mater is the innermost layer which is the thin layer that closely covers the surfaces of the brain and the spinal area. It feeds the nervous tissue with its abundant blood capillaries.

291. Cerebrospinal Fluid (CSF)

CSF is a clear liquid that is flowing in the ventricles and within the sub arachnoid space. It protects the brain, eliminates waste and ensures that the brain is stable in terms of chemicals. The choroid plexus is what produces it.

292. Ventricles of Brain

The ventricles refer to cavities in the brain which are full of CSF. These are lateral, third and fourth ventricles. They assist in the circulation of the fluid and removal of wastes.

293. Cerebrum

The cerebrum is the brain part that reflects the higher functions such as thought, recollection and sensation among others. It has two lobes making it bifurcated into two halves.

294. Cerebellum

Defining the cerebellum, the brain part controls the balance, posture, and coordination. It lenses motor movements and makes them run through smoothly. The damage brings about loss of motor qualities and balance.

295. Brain Stem

The brain stem is what links the brain and the spinal cord. It regulates such essential processes as the breathing, heartbeat, and awareness. It consists of midbrain, pons and medulla.

296. Midbrain

The midbrain is used in carrying visual and auditory information. It regulates the eye movement and reflexes. It connects the motor output and the senses.

297. Pons

The pons is a transition zone between the portions of the brain. It controls breathing pattern and sleep wave. It provides messages to the cerebellum through the cerebrum.

298. Medulla Oblongata

The medulla regulates vital body processes such as the circulation of heart and the breathing of lungs. It is a pathway of communication between spinal cord and brain.

299. Spinal Cord

The spinal cord is a long cylindric piece that joins the brain and the peripheral nerves. It transmits both sensory and motor impulses and organizes the reflexes.

300. Grey Matter

The neuron cell bodies and dendrites can be found in the grey matter. It is the information processing part and the external part of the brain (cortex). It is important to integration and decision.

301. White Matter

The major component of white matter consists of the myelinated axons linking various portions of the brain and the spinal cord. It aids in quick electric communication among neurons. It is found at the bottom of the cerebral cortex and coordinates the motor and sensory information. The myelin imparts a whitish tone to it. White matter damage ascertains signal conduction and leads to neurological impairments.

302. Ascending Tracts

Sensory pathways are tracts in the spinal cord that lead the information to the brain, which ascend. They relay such sensations as touch, heat and pain. Large pathways are the spinothalamic and dorsal column pathways. These tracts guarantee the brain the constant updates of the body.

303. Descending Tracts

Going down tracts are motor pathways, which transfers the brain commands to the muscles. Such examples are corticospinal and extrapyramidal tracts. These are voluntary motor and reflex motor actions. The destruction of these tracts results in paralysis or lack of motor coordination.

304. Reflex Action

Reflex action refers to the automatic action to stimulus. It takes place via the reflex arc devoid of involvement of the brain. Cases in point are the kneejerk or withdrawal reflex. Reflexes are used as defense mechanisms against body damage and posture.

305. Somatic Reflex

The effectors in somatic reflexes are the skeletal muscles. They are capable of responding quickly such as withdrawing a hand in case of heat. They are coordinated through the spinal cord to be fast. These reflexes are imperative in control of the motor and protecting the body.

306. Autonomic Reflex

Involuntary movements in body parts such as heart and glands are administered through autonomic reflexes. They include regulation of blood pressure and the size of the pupil. They have the maintenance of homeostasis by cardiac muscle and smooth muscles.

307. Cranial Nerves

Cranial nerves are twelve pairs which are directly an outgrowth of the brain. They carry out sensory, motor or mixed functions such as vision, taste and movement of face. All nerves have a particular sensory and motor control of the head and neck.

308. Spinal Nerves

There are pairs of spinal nerves which are a result of the spinal cord. They both have sensory and motor aspects. They interface between the body and the skin, muscles and organs to the CNS. These are essential nerves of sensation and motor nerves.

309. Ganglia

Ganglia consist of a collection of neuron cell bodies that are found outside of CNS. They serve as posts of the transmission of nerve impulses. There are incoming information and outgoing information sensory and autonomic ganglia. Their significance in the peripheral communication is important.

310. Thalamus

The thalamus is the relay center of the brain as it sends the information that is received by the senses to the right areas of the cortex. It sifts and sorts signals that it sends to the conscious. It is also involved in alertness and sleeping. Harm may affect sense and consciousness.

311. Hypothalamus

The hypothalamus regulates important autonomic and endocrine activities. It controls hunger, thirst, temperature and circadian cycles. It is linked to the gland releasing hormones the pituitary gland. It guarantees emotional balance and homeostasis.

312. Limbic System

Memorizing, emotion and the drive is controlled by the limbic system. It encompasses such structures as the hippocampus, amygdala, as well as cingulate gyrus. It is a unification of emotional experiences and behavior and decision making. Mood disorders and loss of memory are associated with dysfunction.

313. Corpus Callosum

The corpus callosum refers to a heavy strip of nerve fibers that bind two cerebral sides. It facilitates interaction and coordination between the right and the left sides of the brain. Damage may lead to disconnection syndromes which influences both motor and cognitive functions.

314. Basal Ganglia

The deep brain structures that control the movement and posture are basal ganglia. They plan voluntary movements and repel redundant movements. Disease causes such diseases as Parkinson, and Huntington disease.

315. Reticular Formation

The reticular formation is a system of brains in the brainstem that governs the level of alertness and concentration. It sifts the sensory reception and carries on consciousness. It also controls the reflex and tone of the muscles.

316. Electroencephalogram (EEG)

EEG is one of the diagnostic tests which measures the electrical activities of the brain. It records the brain waves by using scalp electrodes. It aids in the detection of epilepsy, sleep disorders and malfunction of the brain. EEG patterns indicate diverse mental conditions.

317. Parasympathetic Nervous System

It is an energy saving system that enhances relaxation. It decreases the rate of heartbeat, improves digestion and helps in recuperating stress after stress. Its activities are contrary of the sympathetic division. Vagus nerve plays a significant part as a parasympathetic process.

318. Sympathetic Nervous System

Preparation of the body to fight or flight is done by the sympathetic system. It raises heart rate, enlargement of pupils, and diversion of blood to the muscles. It is triggered in the case of stress or emergency. It is held balanced together with the parasympathetic system.

319. Sensory Receptors

Sensory receptors are special cells used in sensemaking changes in the environment. They transform both physical or chemical stimuli into electrical signals. These are mechanoreceptors, thermoreceptors and chemoreceptors. They cause the nervous system to begin with sensory perception.

320. Proprioceptors

Proprioceptors are sensory receptors which give information on the body position and movement. They are found in the muscles, tendons, and the joints and they assist in maintaining balance as well as posture. They also allow unmonitored motion.

321. Digestive System

The digestive system comprises of organs that process food to specific nutrients that can be absorbed. It consists of the mouth, the esophagus, stomach, intestines and the accessorial glands. Its significant processes include ingestion, digestion, absorption and elimination. It secures the levels of energy and distribution of nutrients in the body.

322. Gastrointestinal Tract (GIT)

The GIT is a lengthy passageway of unbroken tubes in the mouth to the anus. It is used to mechanically and chemically digest food. All its parts such as mouth cavity, stomach and intestines are specialized. It is also useful in absorption of nutrients and also in the elimination of waste.

323. Oral Cavity

The first section of the digestive system is the mouth cavity whereby food is consumed. It inherits tongue, teeth, as well as the salivary glands. Here mechanical breakdown and mixing with saliva starts. It digests the food to be swallowed and chewed.

324. Salivary Glands

The secretion of these glands is saliva which lubricates the food and starts the process of digesting starch. There are three primary pairs; these include the parotid, submandibular and sublingual glands. Enzymes, electrolytes and mucus that are found in saliva facilitate swallowing. It works in preserving oral hygiene as well.

325. Parotid Gland

The largest gland in the salivary is the parotid gland found around the ears. It produces amylase loaded saliva which is a liquid. Its duct end into the oral hole of the teeth above upper molars. This gland inflammation is referred to as parotitis.

326. Submandibular Gland

This gland is found under the lower jaw and it secretes a combination of the serous and mucous saliva. It plays a major role in the formation of saliva in a day. Its exudates grease and partly digest food. Either diaphragm of its ducts may become swollen or infected.

327. Sublingual Gland

It is found under the tongue and it secretes the mucous saliva to ensure that the mouth is moisturefilled. It helps in speech, swallowing as well as in digestions. It has ducts that open straight into the mouth floor. It is the least in size of the salivary glands.

328. Tongue

Tongue is a muscular organ required to taste, chew and swallow. It has taste buds which sense sweet, sour, salty and bitter taste. It aids in combining food with saliva and creation of bolus. It also helps in articulation of the speech.

329. Teeth

The teeth are the hard formations that are contained in the jaws. They chop, rip and cut food into small blows to be digested. Humans possess two sets, that is, decedious and permanent. The correct way of taking care of the teeth helps to avert caries and periodontal diseases.

330. Pharynx

The throat or pharynx is through which one is able to pass food and air. It divides the mouth cavity and the nasal cavity as the esophagus and the larynx, respectively. In the process of swallowing, it directs food to the esophagus and it does not allow it to enter the airway.

331. Esophagus

The esophagus is a tube that involves a muscular channel which moves food through the pharynx to the stomach. It passes on coordinated muscle contractions referred to as peristalsis. The sphincter of the heart does not allow the stomach acid to be thrown into it. Such disorders are acid reflux and achalasia.

332. Stomach

The stomach is an appendage that is muscular and in which food combines with gastrointestinal juices. It secretes enzymes such as pepsin and secretory hydrochloric acid which help in digesting proteins. It also supplies short term storage of food and controls its transfer to small intestine.

333. Cardiac Sphincter

This sphincter is found at the esophagus & stomach. It helps in avoiding the reflux of acidic substances to the esophagus. This sphincter has weakness which leads to heartburn and gastroesophageal reflux disease (GERD).

334. Pyloric Sphincter

It is located between the stomach and duodenum and it regulates the chyme flow. It closes occasionally opening into the intestine in order to permit traces of food to enter it. Its control makes sure that it is well digested and the absorption of nutrients is efficient.

335. Gastric Juice

The gastric juice is a combination of atomic acid, pepsinogen, mucus and intrinsic factor. It will help to digest proteins and destroy pathogens. Digestive enzymes are activated by the acidic environment hence accelerating food digestion.

336. Hydrochloric Acid (HCl)

HCl is produced by parietal cells in the stomach to generate an acidic PH. It triggers the conversion of pepsinogen to pepsin and involves the denaturing agents of proteins. It also destroys microbes that get ingested together with food. The over secretion may result in ulcers.

337. Pepsin

Pepsin is a protein digestive enzyme which decomposes proteins to form little peptides. It exists in acidic stomach condition. It is derived out of its inactive precursor, pepsinogen. It is very important in the initial stage of protein digestion.

338. Pepsinogen

Pepsinogen is the inactive zymogen of chief cell; this is a secretion of the chief cells. It is changed into pepsin as a result of the HCl. This action type makes the enzyme unable to digest the tissues of the stomach.

339. Mucus

The stomach is covered with a protective layer comprising of mucus. It inhibits the action of self digestion: it neutralizes acid and makes the passage of food possible. The damage of mucosa may result in gastritis or ulcers.

340. Intrinsic Factor

Intrinsic factor is a glycoprotein secreted by the parietal cells and is necessary in the entrapment of vitamin B into the small intestine. Its inadequacy will result in pernicious anemia. It plays a major role in keeping the red blood cells healthy.

341. Small Intestine

Digestion and absorption mostly occur at the small intestine. It is divided into three sections, which include duodenum, jejunum and ileum. It is fed on the bile and pancreatic juice to digest. Its inner layer consists of villi and microvilli in order to increase surface.

342. Duodenum

The proximate part of the small intestine; it receives the chyme, bile and pancreatic enzymes. It balances the stomach acid and initiates the process of absorption of nutrients. It is crucial in the level of secretions of the digestive system.

343. Jejunum

The optimal piece of the small intestine that results in most nutrients absorption is the jejunum. It is lined with rich cruelty and profuse blood supply. It goes on with breakdown of carbohydrates, proteins and fats.

344. Ileum

Ileum is the terminal tract of the small intestine. It absorbs large quantities of vitamin B12 and bile salts. It orifices at the ileocecal valve to maize big intestine. It finishes nutrition intake prior to waste finding its way to the colon.

345. Large Intestine

The large intestine absorbs electrolytes and water in the undigested food. It comprises of cecum, colon, rectum, and anus. It also contains good bacteria which assists in the fermentation. It mainly plays the role of feces creation and excretion.

346. Cecum

Cecum is a pouch cavity located on the onset of the large intestine. It is attached to the ileum and gets digested contents. Its bottom end is extended into the appendix. It is involved in absorption of fluids and salts.

347. Colon

The colon is divided into ascending, transverse, descending and sigmoid. It recycles water and solid feces is produced. It also promotes intestinal microorganisms which synthesize vitamins such as K and B complex.

348. Rectum

Feces are stored in the rectum which is then emptied. Stretch receptors in the walls give the defecation desire. It is critical in the bowel continence maintenance.

349. Anus

The anus has been described as the end of the digestive tract. It contains both inner and outer sphincter in order to defecate. It enables the removal of the waste matter in the body.

350. Liver

Liver is the biggest internal organ that is connected with the metabolism and detoxification. It secretes bile, keeps glycogen and makes plasma proteins. It also controls the level of nutrients in the blood.

351. Hepatocytes

The liver has functional cells known as hepatocytes. Their metabolism of carbohydrates, fats and proteins takes place. They also introduce cleansing of drugs and bile. It aids liver recovery in that they have a strong regeneration ability.

352. Bile

Bile is the liquid that is secreted by the liver and is stored in the gallbladder and it is yellow green in color. It disperses fats, which are useful in digesting and absorption. It also aids in the removal of the bilirubin and cholesterol.

353. Gallbladder

The gallbladder is a small bag which accumulates and concentrates bile. When fat is being digested it releases bile into the duodenum. A disproportion in bile salts and cholesterol may result in the formation of the gallstones.

354. Pancreas

Pancreas possesses exocrine and endocrine functions. It releases digestion enzymes and bicarbonate into the duodenum. Its endocrine component produces insulin and glucagon so as to control blood sugar.

355. Pancreatic Juice

This juice has enzymes such as lipase, amylase and protease. It counters the stomach acid using bicarbonate and helps in digestion. It is secreted by the action of such hormones as secretin and CCK.

356. Amylase

Amylase is an enzyme which digests the complex carbohydrates into simple sugars. It is secreted in the salivary glands and the pancreas. It makes the extraction of starch containing foods an efficient one.

357. Lipase

Lipase is an enzyme in fat digestion that changes the triglycerides into fatty acids and glycerol. It is secreted by pancreas and triggered in the small intestine. Absorption of lipids: the lipids are necessary.

358. Trypsin

Trypsin is a pancreatic digestive enzyme which breaks proteins to small peptides. It is spawned off trypsinogen in the small intestine. It brings about the disintegration that pepsin started in the stomach.

359. Protease

Protease is defined as a category of enzymes, which breaks peptide bonds. These are pepsin, trypsin and chymotrypsin. They are known to make full protein digestion in amino acids.

360. Digestion

Digestion referred to the process of breaking food down to smaller units which could be absorbed. It is both mechanical and enzymatic activities of the digestive tract. Digestion is essential in availability of nutrients and production of energy.

361. Absorption

Absorption refers to the absorption of the digested nutrients through bloodstream or lymph. It takes place on a mainly small intestine through villi and microvilli. It supplies needed components in cell development and repair.

362. Peristalsis

The process of muscular contraction is known as peristalsis in the GIT which is rhythmic. It drives food and garbage along the row. It is controlled on the basis of the autonomic nervous system.

363. Defecation

Defecation refers to the process of passing of fecal content through anus. It entails voluntary and involuntary use of the muscles. It is the final point of the digestive process.

364. Enzyme

Biological catalysts are called enzymes and they accelerate their chemical reaction. Carbohydrates, fats, and proteins are subject to the action of digestive enzymes. They require some temperature condition and PH.

365. Villi

On the small intestine, there are tiny extensions of the projections and are known as villi. They enlarge the surface area of absorption of nutrients. There are transport capillaries and lymph vessels in each of the villi.

366. Microvilli

Microvilli refer to the microscopic extensions of epithelial cells and this creates a brush border. They increase absorption effectiveness by increasing the surface area. They are severe in the jejunum and the ileum.

367. Metabolism

Metabolism comprises of all chemical reaction in living cells. It gives energy out and produces necessary compounds. It is broken down into anabolic and catabolic.

368. Catabolism

Dissimilar molecules are complicated and are broken down by catabolism to simpler molecules giving out energy. It provides the ATP to the cellular processes. Such examples are glycolysis and fatty acid oxidation.

369. Anabolism

The process of anabolism consists of complex molecules assembled out of simpler ones, which requires energy. It aids in the growth, repair and protein and nucleic acid synthesis in tissues. It plays an important role in sustaining the body structure and functioning.

370. Basal Metabolic Rate (BMR)

The lowest energy consumption sustained during rest is referred to as BMR. It responds to the amount of energy that the body needs to support essential processes of the body such as respiration and heartbeat. It depends on age, sex and constitution of the body.

371. Respiratory System

Oxygen gets to the body and carbon dioxide is eliminated via the respiratory system. It involves the nasal passages, pharynx, larynx, trachea, bronchi and lungs. It facilitates the gaseous exchange of respiration of cells. It needs to work correctly in order to balance pH and metabolic levels..

372. Nose

Air enters the respiratory system through the nose which is the main entry point. It blocks, heats and moisturizes the incoming air through nasal hairs and mucosa. It also facilitates in smelling and vibrating the voice.

373. Nasal Cavity

The nasal cavity, which contains a hole behind the nose is separated by a septum. It is covered with ciliated mucous membrane which covers dust and pathogens. It cleans up the air and then it is sent to the lower respiratory tract.

374. Pharynx

The air and food have a common passage through the pharynx. It links the esophagus with the nasal cavity and the larynx. It assists in channeling air to the lungs during breathing as well as speech resonance.

375. Larynx

The voice box is located between the trachea and The pharynx. It has vocal cords which give out sound when air is passed through them. Epiglottis is used to hide the opening when swallowing to avoid being aspirated.

376. Trachea

The windpipe or trachea is a tube that is supported by rings of cartilage in the shape of C. It takes air into the bronchi filtering it with the help of cilia. It heals foreign particles by its inner lining which secretes mucus.

377. Bronchi

The trachea separates into the right and the left bronchi which lead to the lungs. They further stream to small airways. The bronchi distribute air and has cartilaginous support in form of cartilage.

378. Bronchioles

Smaller branches of the bronchi (without cartilage) are referred to as bronchioles. The smooth muscle contraction is known to regulate the resistance to airflow. They end up in groups of alveoli where exchange of gases takes place.

379. Alveoli

Alveoli are small air sacs occurring on the end of bronchioles. Capillaries enclose them to be able to exchange oxygen and carbon dioxide. They are very efficient due to their thinness and big surface area.

380. Lungs

The lungs are paired coarse organs to the thoracic cavity with majority of the body. They contain bronchi, bronchioles as well as alveoli. In the right lung, there are three lungs whereas the left one has two to allow the heart to be located.

381. Pleura

Pleura is a membrane that surrounds the lungs which is two layered. The visceral is sticking along the lungs and the parietal along the chest. It secretes fluid to provide a smooth breathing effect.

382. Pleural Cavity

The potential space between the two layers of pleura is called the pleural cavity. It includes lubricating fluid which makes the lungs move easily. Taking in of air here leads to pneumothorax or collapsing of lung.

383. Diaphragm

A diaphragm is a dome shaped muscle that divides the abdominal and thoracic cavity. It becomes short and flatter during breathing in expanding the thoracic volume. It is the major breathing muscle.

384. Intercostal Muscles

The intercostal muscles are found between ribs and this helps in breathing. During the process of breathing, the ribs are raised by external intercostals during the inhalation cycle and the ribs are lowered and the breaths are expelled with the help of internal intercostals. They aid in the enlargement and squeeze of thoracic cavity.

385. Inspiration

The active process of mater taking in of air into the lungs is called inspiration (inhalation). The diaphragm contracts and the chest is expanded. This reduces pressure on the inside enabling the air to enter.

386. Expiration

The passive process of getting rid of air in lungs is called expiration (exhalation). The diaphragm becomes weaker and the thoracic volume becomes less. The pressure rises and the air is expelled out of the lungs.

387. Ventilation

Ventilation It can be defined as the movement of air in and out of the lungs by a mechanical process. It comprises of inspiration and expiration. It keeps the levels of oxygen and carbon dioxide constant in the organism.

388. External Respiration

Gas exchange between alveoli and pulmonary capillaries is referred to as external respiration. There is diffusion and uptake of oxygen in blood and also diffusion of carbon dioxide out of the blood. It relies on level of pressure and permeability of membrane.

389. Internal Respiration

The process of internal respiration takes place between the body cells and systemic capillaries. Oxygen is transported to tissues, whereas carbon dioxide is taken to blood. It makes sure that there is cellular oxygen to sustain metabolism.

390. Cellular Respiration

Cellular respiration refers to biochemical process in cells which is transformation of oxygen and nutrition to ATP. It powers cellular processes and the carbon dioxide is produced as a byproduct.

391. Oxygen Transport

The red blood cells adsorb oxygen by attaching it to hemoglobin primarily. Minimal amount is dissolved in plasma. It is emitted in those tissues that are at the low oxygen pressure.

392. Carbon Dioxide Transport

The blood contains carbon dioxide that is dissolved in the blood plasma, in the form of bicarbonate ions and also attached to the hemoglobin. The majority of CO2 is in form of bicarbonate, to assist in maintaining the blood pH.

393. Hemoglobin

Decreases the oxygen level in body blood and contains iron. It has attachment of oxygen in the lungs and the detachment of oxygen in tissues. It is also used to buffer blood pH binding of hydrogen ions.

394. Carbaminohemoglobin

When the oxygen attaches to hemoglobin, it is replaced by carbon dioxide to make carbaminohemoglobin. It helps in transportation of CO2 to the lungs. The binding takes place at the globin site and not the iron site.

395. Partial Pressure

Partial pressure is the pressure which is applied on an individual gas present in a mixture. The exchange of gases in the lungs is determined by a variation of oxygen and carbon dioxide concentrations.

396. Tidal Volume

Normal volume of breathing is the amount of air that breathes in or out during a normal breathing. Meanwise in adults it is approximately 500 mL. It is an indication of resting respiratory ability.

397. Inspiratory Reserve Volume (IRV)

IRV is the largest volume of air which can be inhaled on top of typical inspiration. It is the additional capacity of the lungs on deep breathing.

398. Expiratory reserve volume (ERV)

ERV represents the highest amount of air which can be expelled on top of normal expiration. It demonstrates the ability to carry out a forceful breathing.

399. Residual Volume

The solution is residual volume which is the air that is left in the lungs after the disadvantages of exhalation are fully engaged. It also helps to avoid collapsing of lungs and maintain gas exchange.

400. Vital Capacity (VC)

Vital capacity is the total air that is exhaled after maximal volume of air has been inhaled. It is the tidal, inspiratory and expiratory reserve volumes added up. It measures lung efficiency.

401. Total Lung Capacity (TLC)

The peak airways volume within lungs is known as the TLC. It entails the vital capacity and residual volume. It is dependent on the age, sex, and physical fitness.

402. Dead Space

Dead space is the air that is not used in gas exchange and that is in the conducting passages. It also involves the trachea and the bronchi. It impacts on efficiency of ventilation.

403. Respiratory Rate

The counting of breaths recused per minute is known as respiratory rate. The age rate is breaths/minute, which is normal. It varies in activity, temperature and emotion.

404. Pulmonary Ventilation

Total volume of air, which is transferred in and out of the lungs in a minute, is called as the pulmonary ventilation. It is the calculated Tidal volume x Respiratory rate. The efficiency of the breathing is shown by it.

405. Chemoreceptor

Chemoreceptors are special cells which sense changes in the blood oxygen, carbon dioxide and pH. They assist in maintaining the rate of respiration with feedback to the brainstem.

406. Respiratory Center

The respiratory center is found in the medulla oblongata and the pons which regulate the breathing rhythm. It regulates the ventilation based on the needs of the body and carbon dioxide.

407. Artificial Respiration

Artificial respiration is a means to help or to, again, breathe the air in case of cessation of spontaneous respiration. It is either done manually or mechanically through ventilators.

408. Resuscitation

Resuscitation is emergency measures aimed at revival of breathing and circulation. CPR is an act that combines chest compression and rescue breaths. It is also essential during respiratory or cardiac arrest instances.

409. Spirometer

A spirometer is a machine that is employed to measure the lung capacities and lung volumes. It is useful in evaluation of respiratory diseases like asthma or COPD. It measures the flow of air as people breathe in.

410. Apnea

Apnea can be defined as a nonbreathing or a pause of breathing. It may happen when sleeping or when the airways are blocked, neurological problem or when the respiratory muscles fail to perform their functions. With extended ones, it happens due to oxygen deficiency resulting in fatigue, heart stress or, even organ damage. At an early stage in such disorders as sleep apnea, early diagnosis is crucial.

411. Urinary System

The urinary system ensures the internal homeostasis of the body when it filters the blood, eliminates the metabolic waste, controls water, electrolyte, and pH levels. It consists of kidneys, ureters, urinary bladder

and urethra. The combination of these organs brings about the production, storage and elimination of urine. This system is necessary in the process of detoxification and homeostasis.

412. Kidney

Kidneys are two bean shaped organs which are situated each side of the spine at the back abdominal cavity. They clear blood, eliminate toxins and balance of fluids and electrolytes. Millions of nephrons are found in each kidney and they are known to do filtration and reabsorption. They also release hormones that control the blood pressure and the production of red blood cells.

413. Nephron

The so-called structural and functional component of the kidney is a nephron, which forms urine. This is composed of glomerulus, Bowman capsule, renal tubules, and collecting duct. Blood is filtered in each nephron, useful substances are reabsorbed and the wastes are secreted. It is important in ensuring the fluid and electrolyte balance.

414. Glomerulus

The glomerulus is a group of capillaries that occur in the nephron that starts the process of filtration. It permits the flow of water and small molecules into Bowman capsule and it does not allow blood cells and big proteins to pass through. The result of this filtration process is the first filtrate which will be urine.

415. Bowman's Capsule

The Bowman capsule is an envelope made up of two layers which surrounds the glomerulonephrite. It mobilizes the filtrate generated by the glomerular filtration and sends it to the tubule of the kidneys. It occurs along with the glomerulus to constitute the renal corpuscle the initial site of urine formation.

416. Proximal Convoluted Tubule (PCT).

The major portion of the reabsorption happens in the PCT which is the initial part of the renal tubule. It recaptures the water, glucose, amino acids and the essential ions to the blood. It would also launch metabolic wastes such as creatinine into the tubular fluid.

417. Loop of Henle

The loop of Henle goes to the renal medulla and it plays an important role in concentration of urine. The water is reabsorbed in the descending limb with sodium and chloride ions being carried by the ascending limb. Such a counter current mechanism is useful in keeping the osmotic gradient of the kidney.

418. Distal Convoluted Tubule (DCT)

The DCT controls the level of electrolytes and acid base. It absorbs sodium and calcium and preloads potassium and hydrogen ions. Its activity is regulated by several hormones such as parathyroid hormone and aldosterone to be in homeostasis.

419. Collecting Duct

Urine of various nephrons is gathered at the collecting duct and directed towards renal pelvis. It regulates water reabsorption at the effect of antidiuretic hormone (ADH). This process defines the end result of urine concentration and volume.

420. Renal Cortex

The outer part of the kidney is called the renal cortex and it contains glomeruli, Bowman capsules and tubules divided into convoluted ones. It is well endowed with blood vessels and it is the main location of filtration and reabsorption process necessary in the formation of urine.

421. Renal Medulla

The renal medulla is the inner section of the kidney which is designed in the form of renal pyramids. It has loops of Henle and collecting ducts that are the means of concentration of the urine by maintaining the movement of water and salt.

422. Renal Pelvis

Renal pelvis is a funnellike cavity which holds urine collected by the collecting ducts which are then emptied in the ureter. It is an intermediate between the kidney and the urinary tract.

423. Ureter

Ureters are two tubes that conduct urine, in each kidney to the urinary bladder, they are slender and muscular in nature. The peristaltic contractions are rhythmic and bow urine downwards and during movement their oblique penetrate the bladder, and this prevents backward flow.

424. Urinary Bladder

The urinary bladder is the hollow organ of the body, which stores urine temporarily and is muscular. The urine fills its elastic walls and the reverse. Sphincters and the detrusor control the storage and the release of the urine.

425. Urethra

The urethra is a tubular passage, which transfers urine out of the bladder into the outside. It is also an avenue of the semen in males. The length and structure are different across sexes and are modified so that they become effective in excretion.

426. Urine Formation

The formation of urine takes place through three process namely; filtration, reabsorption, and secretion. These measures are useful in eliminating wastes without losing important materials. The urinary make up is an indication of renal performance and general metabolic equilibrium.

427. Glomerular Filtration

The glomerular filtration happens at the glomerulus where the blood pressure causes the plasma to pass through the capillary walls and into Bowman capsule. This leaves large molecules (protein) in the blood and filtrate water and small solutes.

428. Tubular Reabsorption

The reabsorption of useful substances to the blood is referred to as tubular reabsorption. This mainly takes place in the proximal convoluted tubule and works in averting the wastage of important nutrients including glucose and ions.

429. Tubular Secretion

In the tubular secretion, further wastes are removed by the tubular including hydrogen ions, potassium, and some drugs among others are eliminated into the tubular fluid. This is carried out in the distal tubule and collecting duct, and serves to ensure electrolyte and pH balance.

430. Micturition

Exempting the bladder is known as micturition or urination. It entails the reflexes that are involuntary and also those that are voluntary. The brain lets the urethral sphincters relax and the detrusor contract and force the urine out.

431. Micturition Reflex

This is a reflex of the spinal bladder emptying. The bladder wall contains stretch receptors and the contraction of the detrusor muscle and relaxation of the sphincter is initiated. By means of the conscious control, urination can be deferred until the right moment.

432. Antidiuretic Hormone (ADH)

The secretion of ADH or vasopressin takes place by the anterior pituitary gland. It raises reabsorption of water in the collecting ducts but minimizes the water collected. Stimulation of its release occurs due to dehydration or existence of high blood osmolality.

433. Aldosterone

Aldosterone, which is produced by the adrenal cortex favors the reabsorption of sodium and excretion of potassium in the kidneys. It assists in the regulation of the blood pressure and fluid balance.

434. RAS renin angiotensin system.

The mechanism of hormone that controls blood pressure and fluid balance is called RAS. When blood pressure decreases, renin is discharged to cause angiotensin II synthesis which eventually causes vasoconstriction and is associated with the release of aldosterone.

435. This can be called Juxtaglomerular Apparatus (JGA).

in the nearness of the glomeruli, a special zone oozing renin is known as the JGA. It checks the blood pressure and sodium level which keeps kidney perfusion and homeostasis.

436. Osmoregulation

Osmoregulation ensures that the body retains a state of water and salt. The ADH and aldosterone help in balancing the urine output depending on the state of hydration.

437. Acid-Base Balance

The kidneys maintain the blood pH balance as well by excretion of hydrogen ions and reabsorption of bicarbonate. This keeps internal environment constant which is required in the work of enzymes.

438. pH Regulation

Hypokalemia or alkalosis is prevented with renal regulation of pH levels. Kidneys maintain the blood pH level to be around . by regulating the amount of excretion and retention of hydrogen ions and bicarbonate respectively.

439. Urea

The major nitrogenous waste that is produced as a result of protein metabolism in the liver is urea. The kidneys help to filter it which is released in urine. Its amount measures the rate of breakdown of the kidneys and proteins.

440. Creatinine

Creatinine is a metabolite byproduct associated with the muscle. The kidneys do not reabsorb it and thus it is filtered, therefore one of the main indicators of renal functioning.

441. Ammonia

The breakdown of amino acids to form ammonia then into urea takes place in the liver. The presence of excessive ammonia in blood showcases that there is a problem with the liver or kidney.

442. Electrolyte Balance

The kidneys balance such electrolytes as sodium, potassium, calcium, and chloride. This equilibrium promotes muscular activity, nerve activity and osmotic stability.

443. Urinalysis

Urinalysis is a diagnostic test that depends on the presence of urine composition. It helps to evaluate the kidney and metabolic wellbeing and detects anomalies (indicators of glucose, protein, or infection).

444. Diuresis

The effect of high urine is termed as diuresis. It may be caused by excessive consumption of liquids or diuretic medication, or hormonal alterations. It assists in clearing surplus salts and water.

445. Oliguria

Oliguria can be described as excessively low urine discharge that tends to be lower than 400 mL in a day. It can point to either dehydration, kidney problems or blockage.

446. Polyuria

Polyuria refers to excessive urine excretion; in most cases, this is in excess of 2.5 liters daily. As it is widely observed, it can be seen in diabetes mellitus or diabetes insipidus.

447. Anuria

Anuria refers to the total or near elimination of the production of urine. It is an indicator of acute renal failure or urological blockage of the urinary tract.

448. Nephritis

Nephritis is kidney inflammation as a result of an infectious or an autoimmune reaction. It impedes filtration which results in proteinuria, hematuria and edema.

449. Kidney Stones

Kidney stones this is the formation of solid deposits of minerals in the urinary tract. They produce a great deal of pain, and even lead to infection of urine. Recurrence can be avoided by proper hydration.

450. Urinary Tract Infection (UTI)

UTI can be referred to as a bacterial infection of any single part of the urinary system and is normally caused by E. coli which results in burning sense of urination, frequent desire, and fever. Kidney damage can be avoided through early treatment.

451. Endocrine System

Endocrine system comprises glands which secrete hormones directly to the blood and these maintain the normal body functions like metabolism, growth and reproduction. In contrast with exocrine glands, it does not have ducts and it responds to chemical signal. It supports the equilibrium of the body and balances the long term physiological processes.

452. Hormone

A hormone refers to a chemical substance that is released by endocrine glands and flows through a blood to carry out its action in organs. It interacts with certain receptors in order to cause cell reactions. Metabolism, growth, reproduction and homeostasis are regulated by hormones.

453. Exocrine Gland

The exocrine glands flow their secretion via a duct onto the epithelial surfaces, or body cavities. This can be in form of salivary, sweat and sebaceous glands. They have a role on lubrication, digestion and protection.

454. Endocrine Gland

The endocrine glands refer to glands that do not have ducts which liberate hormones directly in bloodstream. The most illustrative ones are pituitary, thyroid and adrenal glands. Hormonal control in the body helps them to control key body functions.

455. Pituitary Gland

The pituitary, also referred to as the master gland, is the gland that is situated at the bottom of the brain and controls other glands in the body. It also secretes growth, reproduction and metabolism hormones. It possesses anterior lobes as well as posterior lobes.

456. Hypothalamic- Pituitary Axis

This is an axis between the hypothalamus and the pituitary gland, which mediate the neuroendocrine functions. The hypothalamus secretes regulatory hormones, which regulate pituitary to control stress, reproduction and metabolism.

457. Anterior Pituitary

The anterior pituitary (adenohypophysis) synthesizes a number of hormones, such as the GH, TSH, ACTH, FSH, LH and prolactin. It controls the growth, thyroid activity, adrenal activity and reproduction.

458. Posterior Pituitary

Oxytocin and ADH that the hypothalamus produces are stored and released by the posterior pituitary (neurohypophysis). It regulates the water homeostasis and uterine birth contractions.

459. Growth Hormone (GH)

GH increases tissue repair, cell growth and synthesis of protein. It stimulates the growth of bones and muscles among children and maintains metabolism among adults. It is excess, which leads to gigantism or acromegaly.

460. Thyroid - Stimulating hormone (TSH).

In order to stimulate the thyroid gland to secrete thyroxine (T) and triiodothyronine (T) TSH is released by the anterior pituitary. It controls the metabolism, growth and energy production.

461. Adrenocorticotropic Hormone (ACTH)

The ACTH causes adrenal cortex to secrete the glucocorticoid hormones such as cortisol. It aids the stress management, glucose metabolism, as well as inflammation.

462. Luteinizing Hormone (LH)

LH is a gonadotropin, which causes ovulation in females and production of testosterone in males. It is vital to reproductive health and hormone control.

463. Follicle Stimulating Hormone (FSH).

FSH stimulates the growth of follicles in ovaries and Sperm production tubes in testes. It interacts with LH to control sexual puberty and fertility.

464. Prolactin

Anterior pituitary causes secretion of prolactin which facilitates secretion of milk after birth. It has an effect on immune response as well as reproductive functions.

465. Oxytocin

Oxytocin facilitates contraction of the uterus during delivery and release of milk into the breast when feeding a child. It is related to emotional attachment and regulation of stress as well.

466. Antidiuretic Hormone (ADH)

ADH released by the hypothalamus under the influence of the posterior pituitary, controls the water retention in the kidneys. It assists in balancing fluid and blood pressure.

467. Thyroid Gland

The thyroid that is found in the neck secretes T3, T4, and calcitonin. It controls the metabolism, growth, and energy equilibrium.

468. Thyroxine (T4)

The thyroxine is a key thyroid hormone that regulates the metabolism, proteins production and growth. It is broken down to T3 in the tissues.

469. Triiodothyronine (T3)

T is the active form of thyroid hormone which helps to regulate the metabolism, oxygen intake and production of energy by the cells. It has an effect on the body temperature and growth.

470. Calcitonin

Calcitonin is produced by the thyroid parafollicular cells, and decreases the blood calcium level by preventing bone resorption. It acts contrary to parathyroid hormone.

471. Parathyroid Gland

The parathyroids are small glands found behind the thyroid that secrete parathormone (PTH) that controls the level of calcium and phosphates.

472. Parathormone (PTH)

PTH elevates the blood calcium by promoting bone resorption, and raising the calcium uptake by kidneys and small intestines.

473. Adrenal Gland

Adrenal glands are found over each kidney, where there is an outer layer which is called cortex and an inner layer called medulla. The presence of these hormones is secreted to regulate stress, metabolism and electrolyte balance.

474. Adrenal Cortex

The cortex synthesizes the corticosteroids like cortisol, aldosterone and androgens. These hormones deal with metabolism, inflammation, as well as sodium retention.

475. Adrenal Medulla

Catecholamines (epinephrine and norepinephrine) are secreted by the medulla gland and make the body ready to fight or run.

476. Cortisol

Cortisol is a gluco-corticoid hormone which controls stress reaction, glucose metabolism and immunity. The chronic increase becomes the inhibitor of immunity.

477. Aldosterone

Aldosterone, a mineralocorticoid, enhances sodium absorption and excretion of potassium in the kidneys keeping the body and blood fluid and pressure in balance.

478. Epinephrine

Epinephrine that is also known as adrenaline, raises the rate of the heart, the blood pressure and the levels of energy due to the occurrence of the stress or emergencies.

479. Norepinephrine

Norepinephrine is a hormone, neurotransmitter, which increases alertness, vasoconstriction and blood pressure in case of stress.

480. Pancreas

The pancreas operates as a gland of endocrine and exocrine glands. Its islets produce glucose to control glucose by secretion of insulin and glucagon.

481. Islets of Langerhans

These groups of cells of the pancreas include α, β and δ cells, which synthesize glucagon, insulin and somatostatin, respectively.

482. Insulin

Insulin reduces blood glucose by facilitating uptake and production of fat by the cell and glycogen. Its lack is involved in diabetes mellitus.

483. Glucagon

The glucagon increases the level of glucose in the blood by activating the decomposed glycogen in the liver and the release of glucose. It acts opposite to insulin.

484. Somatostatin

Somatostatin decreases insulin, glucagon and GH secretions keeping the hormones in check with metabolic activities.

485. Pineal Gland

The pineal gland is situated in the brain and it secretes melatonin, that controls the circadian rhythms and sleep cycles.

486. Melatonin

Melatonin regulates the sleep-wake rhythm and seasonal biological cycles. Its formation is promoted when in the dark.

487. Thymus Gland

Thymus is very important in childhood immunity where it produces thymosin that stimulates the growth and development of T-cells and immune protection.

488. Thymosin

Thymosin helps in growth of T-lymphocytes which are necessary in adaptive immune responses.

489. Endocrine Feedback Mechanism.

Feedback loops, primarily negative feedback, ensure hormonal balance, i.e. the amount of hormones secreted depends on the amount of hormones.

490. Hormonal Imbalance

This happens when hormone levels are excessively large or too small leading to such disorders as diabetes, hyperthyroidism, or Cushing disease.

491. Hyperthyroidism

A state of over secretion of thyroid hormone resulting into high metabolism rates, weight reduction, and irritability.

492. Hypothyroidism

Due to a lower thyroid activity, it leads to fatigue, gainness, and slowing metabolism.

493. Cushing's Syndrome

The effects of excessive cortisol concentration which results in obesity, hypertension, and muscle weakness.

494. Addison's Disease

As a result of adrenal insufficiency, which causes fatigue, low blood pressure and electrolyte imbalance.

495. Diabetes Mellitus

It is a chronic disease that is characterized by insulin resistance or lack, which leads to high blood glucose levels and metabolic abnormalities.

496. Diabetes Insipidus

Deficiency of ADH is the characteristic which is characterized by excessive urination and thirst (not accompanied by glucose involvement).

497. Acromegaly

Brought about by too much GH in adults and results in swollen hands, feet and facial characteristics.

498. Gigantism

Proliferation of skeletal growth in childhood, which was a result of excessive secretion of GH.

499. Dwarfism

Developed due to a deficiency of GH that results in stunted development with normal proportions of the body.

500. Goiter

Goiter is a condition that is characterized by excessive enlargement of the thyroid gland. It is usually caused by a deficiency of iodine, imbalance of the hormones or autoimmune diseases like grave disease. It can be normal, decreased or increased thyroid functioning depending on the cause. Complications can be avoided by early diagnosis and dietary replacement with iodine.

501. Reproductive System

Reproductive system makes it possible to produce the gametes, secrete sex hormones and to complete the reproduction of the species sexually. In a man, it manufactures and transfers sperm, and also in a woman, manufactures ova, assists in fertilization, pregnancy, and childbirth. The hormonal regulation guarantees good functioning and health of the reproductive system.

502. Testes

Testes are the male gonads which are oval in shape, and those are found in the scrotum. These have two major roles, which are the production of sperm in the seminiferous tubules and the production of testosterone by the interstitial (Leydig) cells. They prefer being in the extra body position that ensures the optimum temperature to execute spermatogenesis.

503. Scrotum

The scrotum is a skin and muscle pouch which accommodates the testes. It controls the testicular temperature by contracting and relaxing of dartos and cremaster muscles. This is an essential thermal regulation in the formation of healthy sperm.

504. Epididymis

The epididymis is a coiled pipe that is located behind every testis on the outer side. It is where sperm matures, storage as well as transportation. They are fertilized through it and the sperm develop abundance of motility and the capacity to fertilize.

505. Vas Deferens

Vas deferens is an organ or a tube which is made of muscles capable of carrying mature sperm in the ejaculatory duct and erection to the epididymis. It also makes part of the spermatic cord and helps in the propulsion of sperms by the use of peristaltic movements.

506. Seminal Vesicle

Seminal vesicles are male glands that become paired that produce a fructose rich seminal fluid that is used to make sperms move. Their secretions contain prostaglandins and proteins, which make them add to the volume of semen and their fertility.

507. Prostate Gland

The prostate gland is an enclosure of the higher urethra just underneath the urinary bladder. It produces a watery, alkaline secretion that neutralizes the acidity of the vagina and increases the sperm motility. Health It is important to its reproductive and urinary functions.

508. Penis

The male copulatory organ is the penis which deposits sperm in the female reproductive tract. It has erectile tissue which gets engorged with blood during arousal in order to penetrate. It is also the end off the urinary tract.

509. Semen

Semen consists of a sticky liquid that consists of sperm, seminal vesicles, prostate and bulbourethral glands secretion. It feeds and carries sperm which helps fertilization. It has a pH and composition that are vital on sperm viability.

510. Spermatogenesis

Spermatogenesis is a multiphase process of developing the sperm cells is in the seminiferous tubules. It entails the mitotic cell division of spermatogonia, the meiotic reduction of the said cell to bring about the formation of spermatids which in turn develop to become spermatozoa. FSH and testosterone control this process.

511. Spermatozoa

Spermatozoa are gametes or male reproductive bodies that are mature, motor and composed of the head, midpiece, and tail. The genetically coded material of the head and the energy producing mitochondria of the midpiece, and the movement, propelled by the tail, to the ovum, constitute the male and female organs.

512. Ovaries

The female gonads that are found on both sides of the uterus are the ovaries which are almond shaped. They generate the ova (eggs) and they excrete hormones estrogen and progesterone which control menstruation, ovulation as well as secondary sex characters.

513. Fallopian Tubes

The fallopian tubes are also referred to as oviducts, as they move the ova between the ovary to the uterus. They usually conceive in the ampullary part of the body. The muscular contractions combined with an inner ciliated lining aid in the movements of the ovum towards the uterine cavity.

514. Uterus

The uterus is a hollow, shape like organ (pears haped) that lies in the pelvic cavity and is a muscular organ. It allows a supportive condition of embryo implantation and fetus development. The inner lining is called endometrium and it becomes thickened every cycle through the influence of hormones.

515. Cervix

The lower but slim section of the uterus which leads to the vagina is referred to as the cervix. In its male counterpart, it has mucus secreted in varying viscosity around the period of the menstrual cycle to help or limit the entrance of the sperm. It also enlarges during child giving birth so that the baby passes through.

516. Vagina

Vagina is a muscular and elastic canal which plays the role of female copulatory organ, channel through which menstrual flows occur and the delivery door. It has an acidic environment and this covers against infections.

517. Mammary Glands

Mammary glands are glands of the breast that produce milk (lactation) which is a hormonal process regulated by prolactin and oxytocin. They are important to the after birth development as they feed the newborn baby.

518. Menstrual Cycle

Mestrual cycle is a reoccurring pattern of hormonal and physiological processes within females, which commonly persists 28 days. It also makes the body ready to ovulate and even conceive, and subsequently lose the uterine lining when the fertilization process fails.

519. Follicular Phase

The first half of the menstrual cycle is the follicular phase whereby FSH stimulates ovarian follicles growth. An increase in estrogen also stimulates the growth of the endometrion to present a receptive site of implantation.

520. Luteal Phase

After the ovulation process, the ruptured follicle is converted to corpus luteum that secretes progesterone. This is the hormone that maintains the endometrium. In case of an unsuccessful fertilization, the degeneration of the corpus luteum occurs which results in menstruation.

521. Ovulation

Ovulation is the discharge of a mature ovum in the ovarian follicle via the fallopian tube. It is caused by the increase in luteinizing hormone (LH) and, as a rule, it takes place in the middle of the menstrual cycle, being the fertile period.

522. Fertilization

Fertilization involves the process through which an ovum is fused with a sperm cell to give a zygote. It normally takes place in the fallopian tube and is the onset of embryonic growth. The zygote forms and next trails to the uterus where it is implanted.

523. Zygote

The zygote is the initial cell attained diploid in fertilization, which possesses genetic data of both parents. It divides into cells creating an embryo.

524. Implantation

The process through which the growing embryo is implemented to the uterine wall is known as implantation. It enables the fetus and the mother to share nutrients and gases.

525. Embryo

The embryo is simply a growing organism since implantation to a period of four months of gestation. The formation of the major organs and body systems starts at this point.

526. Fetus

The developing human is known as the fetus and it is the developing human between the ninth week and the birth. It experiences the organ and system growth and maturation.

527. Pregnancy

The process of pregnancy is termed as the duration between fertilization and delivery that takes about weeks in humans. It entails hormonal, physiological and anatomical changes.

528. Placenta

Placenta is a temporary organ but an important organ which provides the attachment between the unborn fetus and the uterus of the mother. It allows gaseous exchange of oxygen, nutrients and waste products between maternal and fetal blood without coming in direct contact. It also secretes critical hormones that include human chorionic gonadotropin (hCG) and progesterone that help to preserve pregnancy and promote the development of the fetus.

529. Parturition

Childbirth, also known as parturition is the pathophysiological process by which the fetus and placenta are discharged out of the uterus. A complex change of hormonal activities is triggered by it, especially oxytocin which provokes uterine contractions. This is separated into three stages which include: dilation, birth of the baby and the placenta expelling.

530. Lactation

Lactation can be defined as the secretion and production of the milk through the mammary gland, after delivery of a child. It is mainly controlled by the hormone prolactin which boosts the production of milk but the release of the milk is achieved by the hormone oxytocin, which activates the myoepithelial cells to contract thus releasing milk. Lactation gives vital nutrients and antibodies required by the neonatal development and immunity.

531. Genetics

Genetics is the branch of the biological science that examines the aspects of heredity, and how organisms have different traits. It discusses how properties are inherited by a new generation using genes and research on the molecular processes by which DNA, RNA, and proteins control the activities and the inheritance of cells to a new generation.

532. Chromosome

The DNA is a highly organized threadlike assembly of DNA and other proteins known as histone that is found in the cells in the cell nucleus. It comprises genetic material in the form of genes and it ensures proper replication and sharing of DNA in case of cell division. Each human being is expected to have 23 pairs comprising of chromosomes.

533. Gene

A gene is a given section of the DNA which is the coded instructions necessary to manufacture proteins or useful RNA molecules. It is the basic unit of heredity which regulates the creation of biological characteristics and cellular functions. Disorders can be variations or inherited characteristics brought about by mutation in genes.

534. DNA (Deoxyribonucleic Acid)

DNA is the gene that contains and passes through men in almost all living organisms. It is a structural molecule in the form of a double helix with each molecule comprising of nucleotides that contain adenine (A), thymine (T), cytosine (C), and guanine (G). The cellular function, reproduction, and heredity are controlled by the DNA as it contains the blueprint of protein synthesis.

535. RNA (Ribonucleic Acid)

RNA is a single stranded type of a nucleic acid which is necessary in translation of genetic information to proteins. It occurs in various forms, one is the messenger RNA (mRNA), another is the transfer RNA (tRNA) and the third one is the ribosomal RNA (rRNA), and each of these carries out a particular function during the process of gene expression and protein translation in cells..

536. Nucleotide

The structural nucleotide of the nucleic acid of DNA and RNA is called a nucleotide. It has a nitrogenous base, a five-carbon sugar (either deoxyribose or ribose), one or more phosphate ions on it. Genetic

messages are found within the order of nucleotides and are necessary to support the activities and the inheritance of cells.

537. Double Helix

The double helix refers to the ladder and twisted thoughts of the DNA that are made up of two complementary strands and are twisted around each other. Hydrogen bonds between base pairs adenine pairing with thymine and cytosine pairing with guanine makes the strands stick together giving it stability and ensures accurate replication.

538. Gene Expression

Gene expression is the biological phenomenon that is involved in the conversion of the genetic code in DNA to functional products i.e. proteins. It entails two key processes, the process of transcription, which entails the process of transcription of DNA into mRNA and translation is the process where mRNA is decoded into specific proteins that carry out cellular functions.

539. Codon

A codon is a group of consecutive nucleotides on a mRNA molecule, which encode a specific amino acid during protein synthesis. The genetic code comprises codons including those that indicate the beginning and end of translation, which guarantee proper assembling of the chain of polypeptide.

540. Transcription

Transcription development of DNA strand occurs when the genetic sequence of a DNA strand is replicated in a complementary mRNA through the impact of the enzyme RNA polymerase. This step takes place in the nucleus, and it represents a starting point of the gene expression process that allows activating the genetic information stored in DNA and transferring it to the protein making machine.

541. Translation

Translation is the cellular process which decodes the order of the mRNA to a specific chain of amino acids which creates a protein. The ribosomes are the location in which translation occurs and tRNA molecules carry amino acids into the ribosomes and arrange them by sequences of codons to guarantee the correct production of proteins.

542. Protein Synthesis

This process is important since the synthesis of proteins is one of the most basic biological processes, which requires a transcription of DNA into the mRNA and then the translation of the mRNA into a protein. It is through this process that cells generate enzymes, structural proteins and signaling molecules required in cell growth, repair and during metabolic regulation.

543. Ribosome

A ribosome is a complex formation of molecular structure that aids in the synthesis of proteins consisting of ribosomal RNA and proteins. It interacts with mRNA and is responsible in the connection of amino acids transported by tRNA that guarantees proper translation of genetic information into functional polypeptides.

544. Genetic Code

Genetic code is the universal combination of rules by which a sequence of nucleotides in the mRNA is followed to translate into particular amino acid. It is almost the same in all living beings and therefore it has evolved to be conserved, being accurate in the formation of proteins.

545. Mutation

A mutation is a permanent alteration of the DNA sequence which can change the structure of a gene or even the functioning of a gene. These changes may be spontaneous or as a consequence of environmental factors such as radiation or chemicals. Mutations will help in genetic diversity, evolution and in certain instances they will help in hereditary diseases.

546. Dominant Trait

The presence of a dominant allele in the genotype of an organism results in the expression of a dominant trait in that organism. It hides the manifestation of a recessive allele and it controls the phenotype even in the heterozygote. The examples are brown eye color and widow hairline.

547. Recessive Trait

Recessive trait can only be observed in cases whereby two alleles of the recessive one are inherited. It is still concealed when having a dominant allele as well as comes out in individuals who are homozygous of the trait. Such diseases as albinism and cystic fibrosis are recessivedominant.

548. Inheritance Pattern

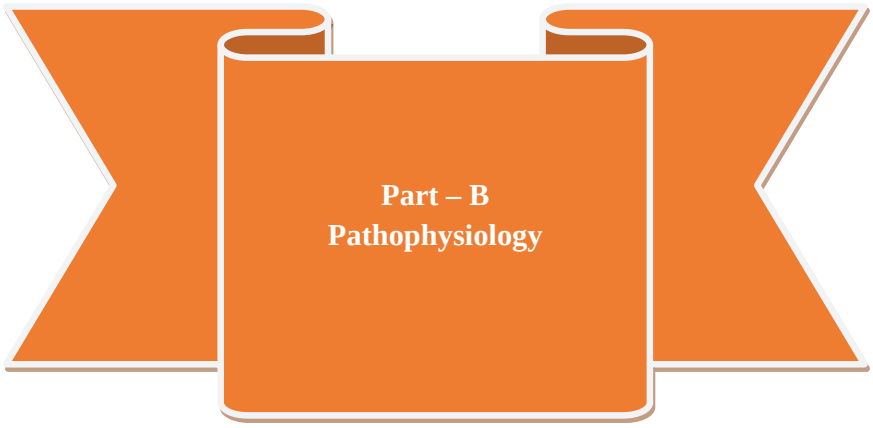
An inheritance pattern is a description of how the genetic traits or disorders are passed down the genes. Major ones will be autosomal dominant, autosomal recessive, and Xlinked, which are directed by the position and activity of certain alleles to be found in the chromosomes.

549. Genotype

The genotype denotes the total number of genes or alleles makeup of a participant that defines its hereditary capacity. It affects the expression of the traits and it is in combination with environmental factors which shape the characteristics of the organism.

550. Phenotype

Phenotype is the external or observable manifestation of the genetic composition of an organism. It includes both physical characteristics, biochemical features and behavioral tendency that depends on the genotype and the external environmental condition.


Part – B
Pathophysiology

551. Cell Injury

The term cell injury is defined as the structural and functional damages that are caused to cells whenever they are subjected to deleterious factors like toxin, hypoxia, or physical injury. In case of mild and short term stress, it can be reversible. Continuous or acute injury causes irreparable damages and death of cells. The procedure interferes with the normal metabolism leading to dysfunction of the organs. It is the origin of majorities of the diseases.

552. Cellular Adaptation

The capacity of cell to adapt in response to environmental stress is termed as cellular adaptation. These variations aid cells to be in a state of homeostasis and survive in unsympathetic environments. There are atrophy, hypertrophy, hyperplasia and metaplasia. The adaptation normally becomes reversible on removal of the stimulus. It is the normal defense mechanism of the body to the prevailing stress.

553. Homeostasis

Homeostasis is the body mechanism that ensures that the body remains stable even when exposed to external forces. It entails a strict control of temperature, pH and electrolytes and fluid balance. Feedback systems provide control to cells, tissues and organs to maintain stasis. Hormonal imbalance will result in illness and abnormality. It is a necessity of normal cellular functioning and health.

554. Feedback System

A feedback mechanism is the biological control that balances body functions with the help of sensor, control and effector parts. It senses variations with the normal and starts corrective processes. Feedback systems assist in physiological stability and coordination among the body organs. They work by hormonal means and nerve. The disturbances may lead to systemic and metabolic disorders.

555. Negative Feedback

One of the processes that are used to regulate the body is negative feedback which is the process that undoes a change to restore balance in the body. In the cases where a variable is not normal, remedial measures minimize the deviation. Examples of them include temperature control and blood glucose control. It does not cause overreaction, and it is stable. The most useful homeostatic regulation in physiology is negative feedback.

556. Positive Feedback

Positive feedback boosts or builds up an original change rather than overturns it. It takes processes to extremes instead of creating equilibrium. Such examples are blood clotting and contractions of the uterus during childbirth. It is rare, but is an important component of certain biological processes. Positive feedback is destructive when it goes out of control and leads to instability.

557. Etiology

The cause and origin of diseases is termed as etiology. It assists in establishing both genetic, environmental, infectious, as well as lifestyle factors that cause illness. Etiology is an understanding that informs prevention and treatment of it. Diseases can be single, as well as multi. In clinical diagnosis accurate etiology identification is the basic requirement.

558. Pathogenesis

Pathogenesis is a process involved in the development of diseases that gives a progression starting with the triggering agent and ending with the ultimate events. It is associated with the changes on the molecular, cellular, and tissue levels. The process is the way of how etiological factors create symptoms and structural changes. It facilitates the association between cause and clinical effect. Knowing of pathogenesis can be used to design specific treatments.

559. Cell Membrane Damage

The damage of the cell membrane takes place when the lipid bilayer is interfered with by physical, chemical or biological agents. The result of this is loss of selective permeability, ion imbalance as well as leakage of cellular contents. Tear membranes cause impaired cell viability and cell signaling. It is one of the necrosis cell death characteristics. Severity of injury may not easily be restorable.

560. Mitochondrial Damage

Damage to mitochondria inhibits production of energy by cells through oxidative phosphorylation. It leads to the degradation of ATP and rise in resources of reactive oxygen species (ROS). Energy failure can lead to apoptosis or necrosis that can be caused by the cell. Toxins and hypoxia are especially very susceptible to mitochondria. One of the major factors that can be applied to inhibit tissue injury is the protection of the mitochondrial functionality.

561. Ribosomal Damage

Damage of ribosomes disrupts protein synthesis, which affects the repair and growth of cells. It may be caused by toxins, the viral infections, or oxidative stress. Injured ribosomes inhibit translation whereby accumulation of misfolded proteins occurs. This inhibits cell metabolism and increases apoptosis. Ribosomal integrity is necessary in normal cellular functioning.

562. Nuclear Damage

Damage to the cell nucleus takes the form of structural and genetic changes in the nucleus of the cell. These causes are radiation, toxins and viral infections. It can cause either chromatin clumping, fragmentation or pyknosis of the DNA. Transcription and replication is impaired by nuclear injury. Unfavorable nuclear damage can cause permanent death to cells.

563. Oxidative Stress

The oxidative stress is a condition that develops when the level of production of the free radicals is more than the body defenses against them. It enhances lipid, proteins, and DNA destruction that results in cell dysfunction. Longterm oxidative stress is an age related process as well as causes numerous ailments such as cancer and atherosclerosis. These harmful molecules are neutralized with the help of antioxidants. The oxidant to antioxidant balance is important to the health of the cells.

564. Free Radicals

Free radicals are volatile molecules that have unpaired electrons and are easily reactive to elements of the cell. They come into existence naturally in the course of metabolism or through exposures to toxins and radiations. Several excesses of free radicals lead to oxidation of biomolecules. Antioxidants are neutralized by the use of the body. Constant disproportion results in degenerative illnesses.

565. Lipid Peroxidation

The oxidative degradation of membrane lipids by the free radicals is known as lipid peroxidation. It impairs cell integrity and fluidity of membrane and causes cell injury. The reaction produces reactive aldehydes which cause further damage to proteins and DNA. It is a significant cause of ischemia, aging and neurodegenerative disorders. This reaction can be prevented by antioxidants such as vitamin E.

566. Necrosis

Necrosis is an unregulated cell death due to devastating destruction. It is associated with the swelling, rupture of the membranes and cell leakage. This is normally followed by inflammation as a result of immune cells action. There are coagulative, liquefactive, and caseous necrosis. It is opposed to an apoptosis, a programmed process.

567. Apoptosis

Programmed cell death is called Apoptosis which is critical in development and tissue homeostasis. It removes the spoiled cells or unwanted cells without bringing about inflammation. The morphological changes include shrinkage of cells, condensation of chromatin and the development of apoptotic bodies. Genetic and biochemical pathways regulate Apoptosis. Failure to regulate it may result in cancer or degenerative illnesses.

568. Autolysis

Autolysis is the process of cell suicide arising by self digestion of a cell using cell specific enzymes. Cell loss can also occur in loss of membrane integrity when lysosomal enzymes can cause cell destruction by degrading cellular parts. It usually happens after death or in case of serious injury. Autolysis is not similar to necrosis because it is not characterized by inflammation. It applies in histopathology in the analysis of tissues.

569. Cell Swelling

Early cell injury is cell swelling which is reversible. It comes about as a result of ion pumps failure hence water build up within the cell. Microscopic appearance of the cytoplasm is pale and swelled. Long term swelling may evolve into necrosis. It may be a consequence of hypoxia, or the exposure to toxins.

570. Hydropic Degeneration

Severe swelling of cells is known as hydropic degeneration that is caused by unwanted and overstretched intracellular water. The disorder is caused by membrane loss to integrity and ATPs depletion. Organelles are displaced and vacuoles are developed on the cytoplasm. It can be reversed provided that the cause is eliminated at an early stage. Normalized in the hepatic and kidney cells undergoing hepatic and kidney hypoxic injury.

571. Intracellular Accumulation

Intracellular accumulation is the process where abnormal substances are amassed in the cells. These can be lipids, proteins, glycogen or even pigments. It arises as a result of metabolic anomaly or excessive contact with poisonous agents. Constant accumulation may affect the functioning of the cell. The examples are hemosiderosis and fatty liver.

572. Fatty Change

Fatty change or steatosis is the unnormal triglyceride accumulation in the parenchymal cells. It occurs mostly in the liver as a result of alcohol, toxins or any metabolism disorder. Under microscopy, the cells are seen to be swollen with lipid vacuoles. Otherwise, it may cause cirrhosis or liver failure. The intervention is reversible through early intervention.

573. Pigment Accumulation

The buildup of pigments in tissues is a deposition of colored substances that occurs in the case of exogenous (carbon, tattoo ink) and endogenous (melanin, hemosiderin, bilirubin) pigments. It is an expression of impaired metabolism or damage. The excessive deposition may be a sign that there is a disease like hemochromatosis or jaundice. According to their nature, the pigments can be either harmful or safe. They are used in the pathological diagnosis.

574. Glycogen Storage

Glycogen storage involves excessive deposition of glycogen in cells as a result of deficiency of enzymes/hormonal imbalance. It is typical of glycogen storage disorders as well as diabetes mellitus. Cytoplasm is vacuolated and clear in appearance. Diffuse pildering is reversible. Serious ones lead to discrimination of organs and disability.

575. Calcification

Deposition of calcium salts in tissues and not in bone is called calcification. It can either be a normal aging process or can be brought about by disease. The presence of pathological calcification disrupts the

functioning and elasticity of tissues. It is either dystrophic or metastatic. Detection does tend to add to detecting a background metabolic or tissue damage.

576. Dystrophic Calcification

Dystrophic calcification is present in necrotic or damaged tissues in case of normal blood calcium levels. It is a local response of cell injury during which calcium reacts with phospholipids. It is usually found in atherosclerotic plaques and in old scars. It is rather a sign of previous tissue damage as opposed to body imbalance. Microscopic deposits can be seen on the radiographs.

577. Metastatic Calcification

Elevated levels of calcium are caused to deposit in normal tissues as the metastatic calcification. It is linked to hyperparathyroidism, kidney failure or vitamin D overdose. The affected organs in most cases are kidneys, lungs and gastric mucosa. The procedure reveals systemic disturbance of the metabolism. Otherwise, uninjured tissues are found unlike dystrophic type.

578. Acidosis

Acidosis is a pathology in which there is low than normal level of acid in blood as a result of too much acid or loss of base. It can be, either, metabolic (renal or diabetic) or respiratory (CO_2 retention). It is characterized by loss of concentration, fatigue and dyspnea. Experimental acidosis has deleterious effects on the cardiac rate and enzyme activity. Homeostasis is ensured by correction in time.

579. Alkalosis

When the loss of acid or excess of the bases increases the blood pH, then there is alkalosis. It may be respiratory (hyperventilation caused) or metabolic (vomiting or diuretics caused). Alkalosis disrupts the electrolyte balance that leads to cramping of muscles or irregular heartbeat. Kidneys and lungs strive to make up. Chronic alkalosis should be clinically corrected.

580. Electrolyte Imbalance

When the levels of sodium, potassium, calcium, or chloride are below normal or above normal, it leads to electrolyte imbalance. It influences the conduction of nerves, muscle activity and fluid balance. Diseases such as dehydration, conditions of kidney disorder, or hormone dysfunction may cause the diseases. The manifestations are weakness as far as cardiac arrhythmias. Early correction and detection is very important in preservation of homeostasis.

581. Enzyme Leakage

When cellular or organelle membranes are damaged, enzyme leakage will happen as the intracellular enzymes will be released into the bloodstream. It is a valuable diagnostic tool to give a clue about tissue injury, e.g. the increased liver enzymes in hepatitis or cardiac enzymes in myocardial infarction. The magnitude of the enzyme leaks indicates the amount of damages on the cells. It shows dysfunction of the membranes through loss of permeability and dysfunction of the metabolic process.

582. Atrophy

The atrophy is shrinkage of the size of the cell and its functional capacity as a result of a low work load, ineffective feeding or blood flow. It may involve individual cells or a complete organ. Physiological and pathological atrophies are naturally prevalent in old age and disease respectively. It is a survival tool of saving energy. At advanced stages, it can result into permanent tissue damage.

583. Hypertrophy

Hypertrophy refers to the enlarged tissue or organ mass which is gained without multiplication of cells. It normally happens in nondividing cells like the muscles. Examples of common ones would be skeletal muscle hypertrophy due to exercise and cardiac hypertrophy due to hypertension. It is caused by hyperfunctional or hormonal stimulation. It is an adaptive process, which can be pathological when it is too much.

584. Hyperplasia

Hyperplasia is a term that is used to describe the process in which there is a proliferation in the number of cells in an organ or tissue that is usually caused by hormonal stimulation or chronic irritation. It is observed when there is physiological conditions of the endometrial growth and pathological conditions such as benign prostate hyperplasia. When the stimulus is stopped, the process is regulated as well as reversible. Hyperplasia turned out of control may lead to neoplasia or dysplasia.

585. Metaplasia

The reversible cell type change between cells of one kind to a type more adapted to stress than before is called metaplasia. It usually takes place in the epithelial tissues, e.g., the substitution of respiratory ciliated cells with squamous cells in smokers. It is a protective process that is likely to affect functionality. Constant irritation may result in malicious change.

586. Dysplasia

Dysplasia is the abnormal cell growth, size and structure in tissues and is regarded as a pre cancerous change. It is caused by genetic mutation and chronic inflammation. Dysplastic cells are lost in uniformity and orientation. It is commonly found in the lining of the walls of the epithelium like the cervix. It may lead to carcinoma in situ provided it is not addressed.

587. Inflammation

Inflammation is a body defense mechanism in the event that there has been an extraction or infection of the tissue. It attempts to destroy the cause, get rid of traumatized cells and cause repair. It is a process that entails vascular, cellular and chemical components. Excessive inflammation suppresses but at the same time the tissues can be damaged. It is also accompanied by redness, swelling, hotness, pain, loss of functionality.

588. Acute Inflammation

The short term and instant reaction to an injury or infection is known as acute inflammation. It is characterized by quick alterations in the vessels, formation of exudate and invasion by the neutrophils. When the potentially harmful agent is eliminated, the process is solved rather fast. Such cases are skin cut or bacterial infection. It can result in healing, the formation of an abscess or chronic inflammation in case it remains unresolved.

589. Chronic Inflammation

Chronic inflammation is the lasting reaction to the chronic injury or infection. It is characterized by the presence of macrophages, lymphocytes and fibroblast as opposed to neutrophils. The activity results in fibrosis and destruction of tissues. Regular cases such as the tuberculosis and rheumatoid arthritis are common examples. The degenerative and autoimmune diseases are frequently caused by chronic inflammation.

590. Granulomatous Inflammation

Granulomatous inflammation is a specific type of chronic inflammation, which involves the development of granulomas nodules of macrophages in the middle of which lymphocytes are localized. It is found in such conditions as tuberculosis, leprosy and sarcoidosis. In order to protect against agents that are nondestructible, granulomas are formed. They are a local immune reaction but can have an adverse effect on the functioning of organs.

591. Inflammatory Studies on Clinical Signs.

The classical physical dysfunctions of inflammation as have been described by Celsus are redness, heat, swelling, pain and dysfunction. This is caused by vascular dilation, fluid buildup and chemical mediators which cause these signs. They are used to determine the evidence of inflammation and its extent. It is necessary to identify such features during clinical diagnosis.

592. Rubor

Rubor implies redness, which is one of the characteristics of inflammation as a result of increased blood circulation (hyperemia) because of vasodilation of arterioles. It is among the first visible ones of tissue damage. The redness is a sign of improved supply of oxygen, nutrients and immune cells to the location. Rubor is subsidised after the (inflammation) has healed.

593. Tumor (Swelling)

In the changes of inflammation, tumor means local swelling as a consequence of exudate deposition and cell invasion. It is caused by a rise in vascular permeability which allows the entry or penetration of plasma proteins and fluids within tissues. The edema produces pain and limited movement. As the healing advances, it is a reflex reaction, which fades away.

594. Calor

Calor refers to heat which is produced due to the elevated blood flow and activity in the site of inflammation. It represents the local increase in temperature as a result of vasodilation and immune response. The warmth assists in increasing the speed of chemical reactions and defense. Nevertheless, calor may affect the nearby tissues in an unpleasant way when it becomes excessive.

595. Dolor

Dolor is pain, which is one of the cardinal manifestations of inflammation caused by the stimulation of nerve endings to bradykinin and prostaglandins (chemical mediators). Pressure and swelling are also a source of pain. Suffering will act as an alert system to reduce additional harm. There is relief because of subsidement of inflammation.

596. Functio Laesa

The fifth classical sign of inflammation is Functio laesa which means loss of function. It is an upshot of suffering, tissue swelling, and damage of the inflamed site. The functional impairment has different severity and location. This process of inflammation is improved by repair of normal tissue architecture. The chronic inflammations can also result in irreversible dysfunction.

597. Vascular Permeability

Vascular permeability is the capability of blood vessels to permit entry of fluids, proteins and White Blood cells to tissue. Inflammation causes elevated permeability since there is endothelial contraction and releases of mediators. This causes exudates and edema. The procedure assists in providing immune elements though with the result of tissue swelling.

598. Vasodilation

Vasodilation is the expansion or expansion of blood vessels that are witnessed at the onset of inflammation. It elevates the blood to the injured part, which results in the area to appear red and warm. It stimulates the supply of immune cells and nutrients through the action of histamine and nitric oxide. Despite its positive effects in the first stage, vasodilation may lead to edema in its overdoing.

599. Chemotaxis

Chemotaxis is the specific movement of the immune cells to an injury or infection location relative to a chemical gradient. Chemoattractants include such substances as parts of complement and cytokines. It makes leukocytes specific when attacking pathogens. The immune defense and wound healing is dependent on chemotaxis.

600. Diapedesis

Diapedesis This is where the leukocytes squeeze using the flecks of the endothelial cells of the walls of capillaries to reach inflamed tissues. It takes place when they get attracted to the vessel wall as a result of chemotaxis signals. This is done through stages of adhesion, rolling and migration. Immune surveillance and control of infections vanish at this point of diapedesis.

601. Leukocytosis

Leukocytosis is the heightening of the number of white blood cells in the case of inflammation or infection. It is the defensive mechanism by the body to get rid of the toxic substances. Depending on the cause, it can be neutrophil increase, lymphocytes, or monocyte increase. Chronic leukocytosis may be a symptom of chronic disease or leukemia.

602. Phagocytosis

The process of ingestion and digestion of foreign being or microbe by a specific category of cells is known as phagocytosis, and can be identified to occur in neutrophils and macrophages. It entails identification, consumption and obliteration of targets. This is dependent on the lysosomal enzymes and reactive oxygen species. Phagocytosis plays a key role in the innate immunity and repair.

603. Mediators of Inflammation

Inflammatory mediators are biochemical compound that control the process of vascular and cellular activities in inflammation. These are histamine, cytokines, prostaglandin and complement proteins. These brokering agents enhance vasodilation, permeability as well as migration of leukocytes. They may be both transient and tenacious depending on the stimulus. Mediator activity has to be balanced and the healing is guaranteed.

604. Histamine

Histamine is a vasoactive amine which is deposited in mast cells and basophils. When released it is vasodilating in addition to allowing vascular permeability to increase. It is amongst the pioneering mediators of acute inflammation. History Also causes asthma and allergic reaction. Antihistamines are used in countering its excessive effects.

605. Prostaglandins

Prostaglandins are lipid based mediators, which are produced out of the arachidonic acid. They alter the inflammatory condition by causing vasodilation, pain, and fever. Various prostaglandins play certain functions in vascularity and platelet aggregation. Their synthesis is blocked by nonsteroidal antiinflammatory drugs (NSAIDs). Tissue homeostasis is necessary due to controlled prostaglandin activity.

606. Cytokines

Cytokines are tiny proteins that are released by immune cells and are involved in the arrangement of the inflammatory and immune responses. The examples are interleukins, interferons, and tumor necrosis factor. They are either locally or systemically active in regulating cell growth, differentiation and communication. This may result in tissue damage as a result of excessive Cytokine release that is referred to as cytokine storm.

607. Complement System

A system of plasma proteins that complement is known to increase immune protective mechanisms by facilitating opsonization, cell lysis, and inflammation. The activation is either by classical pathway, alternative, or lectin pathways. It is an intermediary between natural and adaptive immunity. Autoimmune diseases may be caused by dysregulation. The system is crucial towards pathogen clearance.

608. Interleukins

Interleukins are a type of cytokines which help in the interaction between the white blood cells. During the immune responses, they control the cell activation, proliferation, and differentiation. Certain interleukins such as IL and IL stimulated fever and inflammation. There are those like IL that repress the immune functions. Their homeostatic action is assured due to the functions of balance.

609. Tumor Necrosis Factor (TNF)

TNF (tumor necrosis factor) is a potent cytokine whose production is mainly caused by the macrophages during the inflammatory process. It induces endothelial activation, fever, and apoptotic effects of infected cells. TNF is at the center of autoimmune diseases such as rheumatoid arthritis. Although necessary in the defense mechanism, too much TNF may lead to systemic inflammations and shock.

610. Bradykinin

Brady kinin is a peptide mediator which raises the vascular permeability of the vascular system when substances are inflamed, causes pain and produces the process of vasodilation. It is formed as a result of enzymatic cleavage of plasma kininogen. Bradykinin poses part in the swelling and pain at the point of injury. It is not long lasting but strong in its action. Kininase enzymes are counteracting its effects.

611. Wound Healing

Wound healing refers to the biological process used to replace integrity of the tissues following injury. It goes through inflammatory stages, proliferative stages and remodeling stages. The cells that are vital include fibroblasts and endothelial cells. Ability to heal well requires the supply of blood, nutrition, and no infection. This may lead to chronic ulcers or scars which are an outcome of impaired healing.

612. Regeneration

Regeneration refers to full replacement of damaged cells in tissue with the same cells thus normal functioning is maintained in regeneration. It is found primarily in tissues that are highly mitotic in nature, i.e. liver and skin. The proliferation of cells in the process is triggered by growth factors. Regeneration is the opposite of repair which develops scar tissue. It represents ideal healing.

613. Repair

In case of an inability to regenerate damaged tissue, repair consists of substituting it by fibrous scar tissue. It entails the proliferation of fibroblasts, deposition of collagen and angiogenesis. As much as it restores the structural integrity, it can be partially lost in terms of its functions. The healing process is sluggish and it can result into deformity or stiffness.

614. Granulation Tissue

In the wound healing process, a newly formed connective tissue is called Granulation tissue. It is pink and granular, as it has a lot of capillaries and fibroblasts. The tissue offers a scaffold on the epithelial regenerative ability and on the deposition of collagen. The indications of healing are healthy granulation. It subsequently develops into a scar tissue.

615. Fibroblast

Fibroblasts are cells involved in the production of collagen and extracellular matrix in wound healing, and they are involved in the production of fibroblast connective tissue. They grow factors make them migrate to an injured area. They are active, which assist in strengthening and closing wounds. When it is over production can result in fibrosis or keloid. Tissue resilience depends on the presence of fibroblasts.

616. Collagen Formation

During the wound healing process, collagen formation constitutes a very important process in which the fibroblasts produce collagen fibers to reinforce new tissue. It gives tensile strength and support. In order to crosslink collagen, vitamin C is required. Over deposition results into scarring. Even collagen synthesis guarantees tough healing.

617. Scar Formation

Scar formation takes place when the normal tissue is removed by fibrous connective tissue after injury. It replenishes integrity though in many cases it has no original use and elasticity. Depending on the conditions of healing, scars can be flat under raised, or sunken. Excessive production of collagen causes hypertrophic scars or keloids. Old scars become pale and hardened as they get old.

618. Keloid

A keloid is a pathologic excess of scar tissue and is growing out of the perimeter of the wound. It occurs when collagen is exuded too much in the healing process. Keloids are full, tender and can either itch or hurt. They are usually prevalent in a dark complexion. It could be reduced by surgical or corticosteroid therapy.

619. Primary Intention

Primary intention healing takes place when surgical or minor wounds that are clean and have close edges heal fast. Easy loss of tissue and reduced chances of infection lead to fine linear scars. It entails epithelial regeneration instead of the formation of a granulation tissue. Closure is accomplished with the help of sutures or adhesives. Such is the most effective method of curing.

620. Secondary Intention

The secondary intention occurs on wounds that have massive tissue loss or infections. The wound edges are never sewn up and instead, granulation tissue fills in the gap. Healing is delayed and it produces much

scarring. It needs wound rehabilitation and drainage. Secondary intention provides healing at the time when primary healing cannot be done.

621. Atherosclerosis

Atherosclerosis is an artery disease that is chronic, which involves the deposition of lipids and the formation of the plaque in the walls of the arteries. It causes constriction, lack of elasticity, and difficulty in the movement of blood. Among the major risk factors, high cholesterol, hypertension, and smoking can be distinguished. The situation causes heart attacks and strokes. Preventive lifestyle modification and medication is effective in controlling the progression.

622. Arteriosclerosis

Arteriosclerosis can be described as the overall thickening and hardening of the arterial walls, which is caused by age or hypertension. It decreases the elasticity and elevates the resistance to the vessels. It does not always imply the deposition of lipids as is the case with atherosclerosis. The condition puts one in a predisposed position to cardiovascular diseases. Its onset can be slowed down with regular physical activity and blood pressure control.

623. Endothelial Injury

The first take place in vascular diseases such as atherosclerosis is endothelial injury. Endothelial injury affects the protective barrier of the latter, facilitating platelet adhesion and inflammation. Some of the causes are smoking, high blood pressure and hypertension, and hyperlipidemia. Continuous damage causes thrombosis and the formation of the plaque. This includes the endothelial integrity by maintaining its health.

624. Lipid Plaque

A lipid plaque is any form of a fatty deposit that is present in the walls of an artery as a result of atherosclerosis. It comprises of cholesterol, foam cells and connective tissue. Gradually it constricts the lumen of the vessels and limits the blood circulation. The rupture of the plaque may result into thrombosis and acute ischemic events. Under diet and statin treatment, accumulation of the plaque is prevented.

625. Thrombosis

Thrombosis refers to the appearance of a clot of blood in a vessel which hinders normal circulation of blood. It is caused by endothelial injury, stasis, or hypercoagulability Virchow triad. Free floating thrombi may cause infarction or embolism. Anticoagulant treatment and movement are some of the preventive measures.

626. Ischemia

Ischemia: This is the decrease of blood flow to tissues which causes oxygen deficiency as well as accumulation of metabolic wastes. It can be reversible in case blood supply is replenished in time. The

long term ischemia leads to the cell death and necrosis. The most frequent are the blockage of the arteries and thrombosis. The loss of oxygen depends on the period and magnitude of the clinical outcomes.

627. Hypertension

Hypertension is a condition of continuously high blood pressure to a level that is not normal in a human body. It is caused by greater resistance of blood vessels, which is usually caused by the narrowing of arteries or hormonal disproportion. Cardiovascular complications are caused by chronic hypertension which puts strain on the heart, kidneys and the arteries. Depending on its cause, it is divided into primary (essential) and secondary. The lifestyle management and regular monitoring are the key ones in its control.

628. Systolic Pressure

The peak pressure that is caused on the arterial walls as a result of ventricular heart contraction is called systolic pressure. It is the pressure upon which the heart pumps the blood in the body. In adults, normal systolic pressure is approximately mmHg. The increase in the systolic values is in most cases an initial indication of high blood pressure. It is a crucial measure of heart condition.

629. Diastolic Pressure

The lowest pressure in the arteries was during the relaxation phase of the heart at rest in between beats. It is an expression of the stiffness of the blood vessels and the pliability of arteries. Normal diastolic pressure levels are about mmHg. Higher diastolic values may indicate the high vascular tone, whereas low values may signal the poor perfusion..

630. Congestive Heart Failure (CHF)

CHF is one such condition whereby the heart is no longer capable of pumping the required amount of blood to supply the body. It may be as a result of coronary artery disease, hypertension or past myocardial infarction. Fluid retention in the lung and body tissues results into edema, fatigue, and shortness of breath. The priorities of the management include the enhancement of cardiac output and a decrease in fluid overload.

631. Ischemic Heart Disease (IHD)

Ischemic heart disease is a condition that is a result of insufficiency of blood supply to the myocardium caused by blockage of coronary arteries. This causes lack of oxygen and poor functioning of the heart muscle. Significant ones are atherosclerosis and thrombosis. It may present itself as angina pectoris or myocardial infarction. Prevention is based on the risk factors control (hypertension, obesity, and smoking).

632. Angina Pectoris

Angina pectoris is a medical condition which is characterized by chest pain or discomfort of the chest due to inadequate blood supply to the heart muscle. It is the condition when the demand of oxygen is greater than its supply as it is frequently caused by the constriction of the coronary artery. The pain can either radiate to the jaw, the neck, or the arm and is normally caused by exertion or stress. On rest or nitroglycerin are soothing. It is a premature symptom of ischemic heart disease.

633. Myocardial Infarction (MI)

The heart attack also referred to as Myocardial infarction occurs when a coronary artery is blocked completely causing death of heart tissues. This obstruction is normally occasioned by the formation of thrombus over a torn atherosclerotic plaque. The symptoms are severe chest pains, sweating and dyspnea. Early medical treatment revitalizes the blood circulation and limits the amount of damage to the heart.

634. Coronary Artery Disease (CAD)

Coronary artery disease is the progressive blockage or constriction of coronary arteries as a result of the accumulation of a plaque. Crunched coronary circulation restricts oxygen flow into the myocardium resulting in ischemia. CAD is a significant pathogen of heart attack and heart failure. Management is done through lifestyle change, administration of drugs and surgical procedures such angioplasty.

635. Arteriosclerosis

The hardening and inelasticity of arteries are referred to as arteriosclerosis resulting in reduced blood circulation. It matures over time and as one gets old it can be related to hypertension and diabetes. Such constriction of the arteries augments cardiac workload and ischemic potential. Prevention involves keeping to an adequate diet, physical exercise.

636. Atheroma

An atheroma is a deposition of fat in the arterial wall which has been deposited because of the accretion of lipids, cholesterol and cell debris. It is the symptoms of atherosclerosis and it is the reason behind the constriction of arteries. With time, the atheromas may become calcified or tear up resulting in thrombosis. To avoid cardiovascular complications, early detection and lipids control is necessary.

637. Plaque Rupture

Rupture of the fibrous cap of an atherosclerotic lesion is termed as plaque rupture by which the contents of the atherosclerotic lesion get exposed to the blood flow. This causes platelet aggregation and formation of thrombus that could obstruct the artery. Myocardial infarction is one of the significant causes of acute coronary syndromes that are the results of plaque rupture. Recurrence is prevented with the assistance of stabilizing the plaques with medications.

638. Pulmonary Edema

Pulmonary edema is a disorder where fluid gets accumulated in the alveoli of the lungs thereby disrupting the gasses exchange. It is usually caused by left sided heart failure when the pressure goes on until it

returns to the pulmonary circulation. The signs consist of shortness of breath, cough, and sputum which has a frothy look. The goals of treatment include a decrease in the number of fluids retained in the body and the increase in cardiac activity.

639. Cardiomegaly

Cardiomegaly can be defined as the enlargement of the heart abnormally as a result of an overload of work or as a result of a disease condition. It is either in hypertension, in valvular disease or in cardiomyopathy. The large chamber in the heart lowers the efficiency in cardiac chambers and ultimately causes heart failure. It is diagnosed by means of imaging (Xray or echocardiography).

640. Left Ventricular Failure

Left ventricular failure is caused by inability of the left ventricle to pump the blood with the required effectiveness into the systemic circulation. The blood accumulates in the lungs leading to congestion of the lungs and dyspnea. It is a follow up of myocardial infarction or chronic hypertension. There are diuretics, vasodilators and cardiac contractile Bands.

641. Right Ventricular Failure

Right ventricular failure is as a result of the inability of the right ventricle to pump blood to the lungs. This causes congestion of the veins, peripheral edema and hepatomegaly. Usual ones are chronic lung disease or the secondary effects of left heart failure. The objective of treatment is to decrease pulmonary resistance and treatment of fluid retention.

642. Asthma

Asthma is a permanent airway inflammatory condition that is associated with reversible bronchoconstriction. It leads to the wheezing effect, coughing and diminishing of breath, particularly when an individual is subjected to allergens or when he/she is exercising. The disease is caused by an effect of hyperactivity of bronchial smooth muscles. The long term treatment is bronchodilators and anti inflammatory drugs.

643. Bronchoconstriction

Constriction of bronchi involves the contraction of smooth muscles of the bronchi, thus, narrowing it. It narrows the passage of air to lungs and creates difficulty in breathing. These causes are allergens, cold air and exercise. Bronchodilators are able to soothe it as it is one of the main characteristics of asthma.

644. Chronic Obstructive Pulmonary Disease (COPD).

COPD is an irreversible progressive lung disease which is characterized by chronic airflow obstruction. It involves such conditions as emphysema and chronic bronchitis. Smoking is the leading cause. Patients are subjected to cough, sputum, and shortness of breath. It should be diagnosed at the earliest stage and be stopped in order to reduce the pace of the disease.

645. Emphysema

Emphysema is characterized by irreversible dilation of air spaces located outside of the terminal bronchioles with destruction of alveolar walls. It minimizes the amount of surface area required to exchange gases hence causing hypoxia. Mainly smoking, which leads to damage of lung tissue is the leading cause. It manifests itself with barrel chest, dyspnea and chronic fatigue.

646. Chronic Bronchitis

Chronic bronchitis is characterized by cough and the production of sputum that remains persistent in a period of three months including two years. It is caused by the long running irritation of airways which is usually caused by smoking or contamination. The inflammation results into the overproduction of mucus and obstruction of the airways. The management involves the use of bronchodilators and prevention of irritants.

647. Dyspnea

The experience of labored breathing that is subjective is called dyspnea. It may be caused by pulmonary, cardiac or metabolic diseases. Asthma, COPD or heart failure are some of the conditions that will trigger dyspnea. The severity is between mild exertional dyspnea to acute respiratory dyspnea. The management relies on the cause of the problem.

648. Hypoxia

Hypoxia is the low level of the supply of oxygen to tissues inside the body, which worsens the metabolism of cells. It can come as a result of respiratory failure, anemia, or circulatory impediment. Hypoxia in the long term causes organ failure or necrosis. Oxygen therapy and early recognition are extremely important to recovery.

649. Cyanosis

Cyanosis refers to the bluish color of skin and the mucous membrane as the result of lower oxygen saturation of blood. This is obvious when the level of deoxygenated hemoglobin is above g/dL. It can be a pointer of cardiac or respiratory dysfunctions. Central cyanosis is characterized by lips and tongue whereas peripheral cyanosis is characterized by extremities.

650. Wheezing

Wheezing refers to the high pitched whistling that is caused during breathing because of the constriction of airways. It is usually linked with asthma, COPD or allergic reaction. The sound is common when expiring but may also manifest itself when inhalation is taking place. Bronchodilators and anti inflammatory medications can be treated.

651. Cough Reflex

The cough reflex is a self protective mechanism which helps in removing any irritants and secretion in the respiratory tract. It entails the stimulation of the senses of airways, and contracting of respiratory muscles. Coughing constantly can either be as a result of infection or long term lung disease. Depressants or expectorants are applied depending on the etiology.

652. Pulmonary Function

Pulmonary function refers to the efficiency of lungs in ventilation and gas exchange. It is measured through tests that assess lung volumes, capacities, and airflow rates. Reduced pulmonary function indicates restrictive or obstructive lung disease. Maintaining respiratory health requires proper exercise and avoidance of pollutants.

653. Renal Failure

Renal failure is the inability of the kidney to work, which results to waste products accretion in the blood. It can be acute or chronic as it is reversible and long lasting. The major causes include hypertension, diabetes and nephrotoxic drugs. These include swelling, weakness and reduced urine flow.

654. Acute Renal Failure

Acute renal failure or acute kidney injury is an acute reduction in renal activity in a period of hours or days. It is caused by decreased blood flow, obstruction, or damage of nephrons directly. The reversibility depends on an early diagnosis. Among the management are repair of the underlying cause and electrolyte balance.

655. Chronic Kidney Disease

The chronic kidney disease is the slow and irreparable deterioration of the kidney functioning within months or years. It usually occurs as a result of diabetes and hypertension. The onset of symptoms is late which consists of uremia and anemia. In severe cases, dialysis or kidney transplantation is inevitable.

656. Glomerulonephritis

GN is the inflammation of glomeruli in the kidney which is usually as a result of immune complex deposition. It causes proteinuria, hematuria and hypertension. The condition is both acute and chronic and it may deteriorate into renal failure. In the case of treatment, the inflammation and blood pressure are controlled.

657. Nephron Damage

Nephron damage is caused in cases of injury of functional units of the kidney by toxins, ischemia, or infection. It decreases the ability of filtration and reabsorption resulting in the build up of metabolic wastes. Continuous damage may develop to be chronic kidney disease. Some precautions would be hydration and the absence of nephrotoxic substances.

658. Uremia

The term uremia is a term used to represent the presence of nitrogen products within the blood that originate as a result of kidney failure. It causes nausea, exhaustion and confusion of mind. Pericarditis or coma may result as severe uremia happens. These toxic substances are removed in the body with the assistance of dialysis.

659. Azotemia

The Azotemia is a biochemical situation that is marked by high blood nitrogen urea and creatinine. It states that glomerular filtration rate (GFR) is lower. Mild azotemia can be asymptomatic, which may ascend into uremia in case of no treatment. The early treatment will help to avoid irreversible kidney damage.

660. Oliguria

Oliguria can be defined as a reduction in the amount of urine in which the urine produced is usually lower than mL per day in adults. It arises as a result of dehydration, renal ischemia or obstruction. Ongoing oliguria means the failure of kidney to perform its function. The treatment is based on the correction of the loss of hydration and the underlying cause.

661. Polyuria

Polyuria is the presence of the surplus or excessive production of the urine which tends to reach more than 3 liters daily. It can be found in diabetes mellitus, diabetes insipidus or it can be a reaction to diuretics. Untreated the condition causes dehydration and electrolyte imbalance. It is important to identify the cause of management.

662. Proteinuria

Proteinuria is the appearance of excessive protein in the urine which means that the glomerular laboratory barrier was damaged. It is an important tip off sign of kidney, hypertension or diabetes. Repeated proteinuria should be investigated in depth with regard to the kidney. The loss of protein is minimized with control of the blood pressure and glycemia.

663. Hematuria

Hematuria is the existence of red blood in the urine hence the appearance of the urine turning pink, red or brown. It can be as a followup of the infection of the urinary tract, stones, and glomerular disease. Microscopic hematuria is observed in urinalysis whereas gross hematuria is observed naked to the eye. Correct diagnosis is used to diagnose the underlying pathology.

664. Dialysis

Dialysis refers to a medical procedure whereby the waste, toxins and excessive fluids are extracted in the blood when the kidneys cease to perform their right functions. Depending on the process used, it could be

hemodialysis or peritoneal dialysis. The frequent sessions prevent electrolyte imbalance and occurrence of uremia. It is a life supportive treatment of the end stage renal disease.

665. Renal Transplantation

Renal transplantation, which is a surgical procedure, is the replacement of the diseased kidney by a healthy donor kidney. It provides the best long term cure to the end stage renal failure. There is need to have immunosuppressive drugs that prevent graft rejection. Transplant donation will restore abnormal functions of the kidney and will increase quality of life.

666. Hematology

Hematology is the medical field that is the subject of study of blood, organs comprising of blood and other disorders associated with them. It dwells upon the diagnosis and treatment of red and white blood cells, platelets, bone marrow, and coagulation system diseases. Hematology is critical towards the diagnosis of anemia, leukemia, and clotting diseases. The laboratory analysis and microscopy are mandatory diagnostic materials in this sphere.

667. Anemia

Anemia is a condition that is associated with reduced number of red blood cells or redundant hemoglobin level. This decreases the oxygen solubility of blood resulting in fatigue, pallor, and dyspnea. It can be caused by blood loss, deficiency of nutrients or the troubles with the bone marrow. Diagnosis is done through estimation of hemoglobin and the use of peripheral blood smear.

668. Iron Deficiency Anemia

Iron deficiency anemia is a condition caused by the lack of enough iron to help in supplementing normal hemoglobin. It may be as a result of poor diet, persistent blood loss or malabsorption. Symptoms are, frailty, paleness in the skin and brittle nails. Dietary correction and iron efforts are successful with regard to restoration of regular hematologic functionality.

669. Megaloblastic Anemia

Megaloblastic anemia refers to the fact that red blood cells in the bone marrow are abnormally big and immature (i.e. megaloblasts). It is caused by the lack of vitamin B12 or folic acid and this problems with the synthesis of DNA. Such clinical conditions are glossitis, fatigue, and neurological disorders. Most of the hematologic abnormalities are reversed through the use of early supplementation.

670. Vitamin B Deficiency

Malfunctioning of the red blood cell production and impaired neural functioning are the effects of vitamin B deficiency. It can be caused by dietary deficiency, pernicious anemia or malabsorption. The symptoms consist of cognitive impairment, weakness, and paresthesia. The condition is corrected with the use of replacement therapy with oral or injectable vitamin B.

671. Folic Acid Deficiency

The deficiency of folic acid disturbs the production of nucleic acid resulting in megaloblastic anemia. It is widespread in pregnancy, alcoholism or malnutrition. The clinical presentations are anemia, glossitis and neural tube defects in the unborn. This deficiency is preempted and treated with the use of folic acid supplementing.

672. Sickle Cell Anemia

Sickle cell anemia is a genetic disease resulting due to mutation of β globin gene of hemoglobin. It leads to acute crises and the sickle shaped red cells which hinder the microcirculation. The complications will be anemia, infection, and damage to organs. The management is hydration, oxygen therapy, and prevention of vaso-occlusive episodes.

673. Thalassemia

Thalassemia is a hereditary blood disease that is characterized by impaired production of hemoglobin chains. It causes bone defects and microcytic hypochromic anemia as a result of the enlargement of the marrow. Severe forms need to be treated with regular blood transfusion and iron chelation. Prenatal screening helps in the prevention.

674. Hemoglobinopathy

Hemoglobinopathy is defined as an inherited defect of molecules of hemoglobin structure. These involve thalassemia and sickle cell disease. The mutated hemoglobin influences transportation of oxygen and stability of the cells. The significance of genetic counseling and molecular testing is in the diagnosis and family planning.

675. Hemophilia

Hemophilia is a hereditary bleeding disorder, which is caused by lack of coagulation factor, primarily factor VIII (Hemophilia A) or IX (Hemophilia B). It results in excessive bleeding and hemorrhages on joints following trivial injuries. Therapy of management includes substitution of the factors of clotting, as well as prevention of trauma.

676. Coagulation Factor

Plasma proteins that are necessary in the formation of blood clots are called coagulation factors. They follow one after another in a cascade which works towards converting fibrinogen into fibrin and they stabilize a clot. Lack of or malfunction of these factors develops into bleeding disorders. The coagulation activity of laboratory diagnoses is determined by laboratory coagulation tests.

677. Platelet Dysfunction

Platelet dysfunction is a condition that is characterized by a defect in the number or functions of the platelets, which hinders the formation of clots. It can be genetically determined or become different in the

case of drugs, toxins, or the system disease. Petechiae, easy bruising and bleeding of the mucosa are the symptoms. Platelet transfusion is applied in the more severe cases.

678. Endocrine Disorders

The over production or under production of hormones released by the endocrine glands leads to endocrine disorders. They interfere with metabolic, reproduction and growth functions. Examples of this are commonplace in diabetes, thyroid disease and adrenal dysfunction. Diagnosis and management are performed by the administration of hormonal tests and imaging techniques.

679. Diabetes Mellitus

Diabetes mellitus is a persistent metabolic condition that is defined by hyperglycemia literally known as the lack or resistance to insulin. It influences metabolism of carbohydrates, fat and protein. Abnormalities in the long run include retinopathy, nephropathy, as well as neuropathy. Management entails dietary control, physical activities and insulin or oral hypoglycemics.

680. Insulin Resistance

The insulin resistance develops when the body cells do not respond to the insulin effectively and result in the increased level of glucose in blood. This is one of the major characteristics of type 2 diabetes and metabolic syndrome. Its development is caused by obesity, sedentary lifestyle and genetics. The exercise and weight management enhance insulin sensitivity.

681. Hyperglycemia

An elevated blood glucose level is a condition known as hyperglycemia and commonly observed in unmanageable diabetes. It is caused by the decreased insulin action or secretion. Continuous hyperglycemia destroys blood vessels and nerves. check on blood sugar and medication adherence are very crucial to prevent.

682. Hypoglycemia

Hypoglycemia is the state of the unnaturally low glucose level in the blood, which is below 70 mg/dL. It can result as a consequence of high insulin quantity, lack of meals, or physical activity. It is characterized by sweating, shakings and confusion. The situation is corrected by consumption of glucose immediately. Cases that are severe may need intravenous dextrose.

683. Diabetic Ketoacidosis (DKA)

Diabetic ketoacidosis is a severe complication of overt diabetes rife in hyperglycemia, generation of ketones as well as metabolic acidosis. It arises when the body cannot utilize insulin and has to carry out combustion of fat thus generating ketones. It has such symptoms as dehydration, nausea, and fruity breath odor. Timely intervention with fluids and insulin is life saving..

684. Thyroid Disorder

The thyroid disorders comprise several diseases that deal with the production of thyroid hormones and they include hypothyroidism and hyperthyroidism. They affect metabolism, growth as well as energy regulation. Hormonal disproportions may be accompanied by goiter and nodules. Diagnosis is carried out by T3, T4 as well as TSH examination and upper or lower hormone replacement/ suppressive treatment.

685. Hyperthyroidism

Hyperthyroidism is a condition that occurs due to overproduction of thyroid hormones which speed up metabolism hence loss of weight, tachycardia, and anxiety. The commonest cause is grave disease. Treatment is with use of the antithyroid drugs, radioactive iodine or surgery. Thyroid stability is ensured by monitoring thyroid functions.

686. Hypothyroidism

Lowering the production of thyroid hormone leads to hypothyroidism that decelerates the rate of metabolism. Symptoms encompass the fatigue, cold intolerance and gain of weight. It can either be as a result of iodine deficiency or autoimmune thyroiditis. A lifetime treatment of levothyroxine levels back the hormones to balance.

687. Goiter

Goiter is a disease associated with unnatural increase in the size of thyroid gland usually because of lack of iodine or deficiency of some hormones. It can either be diffuse or nodular. Large goiters, benign as they tend to be, may cause compression symptoms. Iodine deficiency Iodine supplementation prevents endemic goiter.

688. Graves' Disease

Graves disease is an autoimmune disease that causes the overproduction of thyroid hormone which causes hyperthyroidism. Clinical impact would be encompassing goiter, loss of weight and exophthalmos (bulging eyes). It is directed more to women. The relevant treatment includes antithyroid medications or radioiodine therapy.

689. Myxedema

Myxedema is a condition of extreme hypothyroidism in adults, which is accompanied by thickening of the skin, swelling and lethargy. It is brought about by long term insufficiency of thyroid hormones. It can further develop to threatening life myxedema coma. The syndrome can easily be reversed through hormone replacement therapy.

690. Cretinism

Cretinism is as a form of congenital hypothyroidism in infants which results as a result of maternal deficiency of iodine or thyroid agenesis. It brings about retarded growth, mental impairment as well as

rough facial features. Supplementation of thyroid hormone early on helps in avoiding irreparable damages in the development.

691. Sex Hormone Disorder

Sex hormone disorders are the disequilibrium between the level of estrogen, progesterone, and androgen. They influence reproductive activity, sex organs and mood. These may be brought about by endocrine tumors or gonadal failure. The normal physiological balance is achieved through hormonal treatment.

692. Estrogen Deficiency

Estrogen deficiency is the process that takes place once the production of the hormones of the ovary reduces, which may happen during menopause or ovarian dysfunction. It causes hot flushes, bone loss and menstrual abnormalities. Hormone replacement therapy can also be given to alleviate symptoms and avoid osteoporosis.

693. Androgen Deficiency

Male production of low levels of testosterone causes androgen deficiency, which makes men less sexually active and weak, as well as infertile. It may be as a result of testicular or pituitary malfunctions. Testosterone replacement therapy aids in normal sexual and normal metabolic functioning.

694. Menstrual Irregularity

Menstrual anomaly is described as the changes in the length, flow or frequency of menstrual cycle. It can be caused by hormonal imbalance, stress, thyroid disorder or polycystic ovary syndrome (PCOS). Regular menstrual cycles show that a person is stable hormonally whereas irregularity should be medically examined.

695. Nervous System Disorder

The nervous system diseases include structural or functional anomalies in the brain, spinal cord or peripheral nerves. Typical examples involve the epilepsy, stroke, and the Parkinson disease. The symptoms include weakness, and paralysis as well as cognitive impairment. The diagnosis is based on the imaging, electrophysiology, and the clinical assessment.

696. Epilepsy

Epilepsy is a neural ailment, which is long lasting and characterized by recurrent, unexplained convulsions as a consequence of abnormal electrical release in the brain. The causes may be genetic predisposition, trauma, and infection. Treatment includes anticonvulsant drugs and change of lifestyle. Early diagnosis guarantees more control of seizures.

697. Seizure

Seizure is a sudden and uncontrolled electric disorder in the brain, which changes consciousness, behavior or movement. This may be either focal or generalized depending on the brain part. The frequent

precipitants are stress, fever or lack of sleep. When underlying causes are sought, it is necessary to do it as quickly as possible.

698. Parkinson's Disease

Parkinson is a progressive neurodegenerative disease, which is accompanied by tremors, rigidity and bradykinesia. It is the product of deterioration of dopaminergic neurons in the substantia nigra. The therapy involves dopamine replacement therapy, and physiotherapy to cope with the symptoms.

699. Dopamine Deficiency

Deficiency of dopamine results in motor control abnormality, moods or rather mood disturbance and cognitive functions. Parkinson's disease, and certain psychiatric disorders, are characteristics that are hall marks. Medication increases the level of dopamine thereby enhancing neural transmission and reduction of symptoms.

700. Tremor

A tremor is spontaneous and rhythmic movement of body parts that are normally involuntary like hands, head or voice. It can be related to such neurological pathology as essential tremor or Parkinson disease. Tremors aggravate upon anxiety or fatigue. Depending on cause, it has been treated with either betablockers or dopamine agonists.

701. Rigidity

Rigidity is the higher resistance of passive movement of muscles which is a significant feature of neurological diseases such as Parkinson disease. It comes about when there is recurrent muscle contraction that is occasioned by the imbalance of neurotransmitter activity within the brain especially the loss of dopamine. When rigidity is present, the person will have decrease in flexibility, stiffness and they will feel they can not make smooth movements. It has the possibility of influencing either side or both sides of the body.

702. Stroke

Stroke is a medical emergency which happens when the blood supply to an area of the brain is cut off or does not flow to deliver oxygen and other nutrients to newly deprived neural tissue. Consequently, this causes brain cells to start dying in a few minutes, and in most cases, paralysis, speech disabilities, or loss of senses occur. Strokes are usually divided into ischemic and hemorrhagic. Early medical treatment is essential in order to restrict the brain damage and optimize recovery.

703. Ischemic Stroke

An ischemic stroke will occur when a blood clot or a plaque blocks a cerebral artery, and thus, blood fails to supply the brain tissue. This kind is the greatest fraction of stroke cases. Due to the lack of oxygen, local cell infarction of the brain takes place. Examples of major risk factors are atherosclerosis, diabetes,

and hypertension. The survival and recovery can be significantly enhanced with the early use of clot dissolving drugs.

704. Hemorrhagic Stroke

A hemorrhagic stroke happens when a poorly developed blood vessel bursts releasing blood into or near the brain. The pressure of increasing blood would inflate the intracranial space and harm to the adjacent neurons. Ordinarily, it is a result of high blood pressure, aneurysms or head trauma. The management aims at curbing the bleeding, stabilizing the blood pressure and cutting the intracranial pressure.

705. Depression

Depression is the mood disorder, which is marked by the constant sadness, the lack of interest, and emotional depletion. It is an outcome of multifactor confounding of genetic predisposition, imbalance in biochemistry and the impact of environmental stress. Lack of neurotransmitters like serotonin and norepinephrine are some of the causes of its development. The treatment is characterized by psychotherapy, antidepressant drugs, and lifestyle change.

706. Schizophrenia

Schizophrenia is a chronic mental illness which alters the way one thinks perceives and feels. It is characterized by speech disorganization, delusions and hallucinations. It is a condition that is caused by the abnormal functioning of dopaminergic and glutamatergic pathways of the brain. Constant therapy and psychosocial support are of utmost importance in managing the symptoms and integrating with the society by using antipsychotic drugs.

707. Alzheimer's Disease

Alzheimer is a progressive neurodegenerative disease resulting into memory impairment, behavioral changes and cognitive disorganization. It would have been related to the accumulation of amyloid-beta plaques and neurofibrillary tangles in the brain. Despite its irreversibility, the disease can be slowed down and treated with pharmacological methods to improve the quality of life when diagnosed in the initial stages.

708. Dementia

Dementia defines various states implying the progressive weakening of the memory, reasoning, and ability of day to day functioning. It can be caused by infirmity of the brain due to Alzheimer disease, stroke, or traumatic brain injury. The symptoms evolved with time and they impacted the communication, judgment, and personality. When applied in supportive care as well as cognitive therapies, the patient may enjoy independence to a longer duration..

709. Neurodegeneration

The gradual loss of neurons in terms of function or structure can be called neurodegeneration which can result in a neurons death. It is one of the prominent signs of various chronic diseases such as Parkinson,

Alzheimer and Huntington diseases. Some of the underlying mechanisms include oxidative stress, dysfunction of mitochondria and accumulation of abnormal proteins. The contemporary studies put the focus on neuroprotective substances to delay the development of the disease.

710. Gastrointestinal Disorder

The gastrointestinal systems are inclusive of numerous diseases that prevail over organs of the digestive system such as the stomach, intestines, liver, and pancreas. They may be as a result of infection, inflammation or food causes and structural defects. The changes in bowel movement and bloating, nausea, and abdominal discomfort are also frequent symptoms. Treatment is based on whether it is an underlying cause and could comprise of a medication, change of diet, or surgery.

711. Peptic Ulcer

Peptic ulcer is an injury that is directed towards the lining of the stomach or its upper small intestine as a result of excess acid or infection by Helicobacter pylori. There can also be long term usage of non steroidal anti-inflammatory drugs (NSAIDs). The patients are usually reported to experience burning pains in the epigastric and indigestion. The treatment includes antiinfection antibiotics and acid suppressing drugs like proton pump inhibitors.

712. Gastritis

Gastritis is a condition of inflammation of the stomach mucosa and it can either be acute or chronic in nature. It is usually caused by the infection of H. pylori, use of alcohol or continued use of NSAIDs. The symptoms contain amalgamation of nausea, vomiting and aching in the upper abdomen. The management involves the removal of causative factors and acidreducing treatment so as to encourage the healing of the mucosal lining.

713. Helicobacter pylori

Helicobacter pylori is a type of bacterium that is spiral with a shape that goes inside the lining of the stomach and is one of the leading causes of gastritis and peptic ulcers. It endures the acidic environment through the manufacture of an enzyme named urease neutralizing the stomach acid. Diagnosis is through breath tests, bowel samples or endoscopic biopsy. To eliminate it, the combination antibiotic therapy and acid suppression are needed.

714. Acid Secretion

The secretion of acid gets to be the method through which parietal cells in the stomach discharge hydrochloric acid (HCl) into the lumen of the stomach. This acid ensures the digestive process and offers unfavorable condition to the pathogens. Improper secretion may lead to ulcers whereas excessive secretion may result in poor absorption of nutrients. This is controlled by hormones like gastrin, histamine and acetylcholine.

715. Mucosal Barrier

The mucosal barrier is a defensive mechanism or a lining that covers the stomach and intestines, which prevent an individual to digest themselves through gastric acid and enzymes. It contains bicarbonate, mucus and epithelial cells that are tightly attached together. Any trauma to this barrier may cause gastritis or formation of ulcer. It must be maintained by having an adequate blood supply and production of prostaglandins.

716. Antacid

Antacids are acid neutral drugs taken to neutralize the excess stomach acid to provide prompt remedies to heartburning and acid indigestion. Usually available ones are magnesium hydroxide, aluminum hydroxide, and calcium carbonate. Although effective on a short term basis, the overuse can lead to constipation or electrolyte imbalance.

717. Proton Pump Inhibitor (PPI)

Proton pump inhibitors are strong types of acid lowering medications that hinder the action of an enzyme known as H+/K+ ATPase in the parietal cells of the stomach. They are common of use in the treatment of peptic ulcer disease, gastroesophageal reflux disorder (GERD), and gastritis. These are omeprazole, pantoprazole and esomeprazole. Prolonged use can incline to the deficiency of the vitamin and minerals.

718. Dyspepsia

Dyspepsia can be regarded as the very indigestion, which is pain in the upper abdomen following meals. It can be a consequence of acid reflux and stress or functional gastric diseases. The complaints are common such as bloating, nausea, and early satiety. Symptom management is normally done by lifestyle change and antiacid drugs.

719. Inflammatory Bowel Disease (IBD)

Inflammatory bowel disease is a long term inflammation disorder and mainly, it affects the gastrointestinal tract. It comprises of Crohn disease that may affect any of the GI tract and ulcerative colitis which affects the colon. The dysfunction is caused by immune homeostasis, genetic vulnerability and environmental influences. The long term therapy is directed to the use of anti-inflammatory and immunosuppressive treatment to sustain remission.

720. Crohn's Disease

Crohn disease is a form of IBD that involves inflammation anywhere on the gastrointestinal tract, in the greatest number of cases, ileum, and colon. It causes fistulas, strictures and ulcers. The symptoms are malabsorption and pain in the abdomen. The medical approach is centered on the decrease of inflammatory condition via the corticosteroids or biologics.

721. Ulcerative Colitis

Ulcerative colitis is a persistent IBD condition which involves the colon and rectum resulting in persistent inflammation of the mucosa. These are bloody diarrhea, cramping in the abdomen and fatigue. The illness

predisposes one to colon cancer. Aminosalicylates as well as immunomodulators are included in treatment.

722. Diarrhea

Diarrhea It is the passing of liquid or loose stool more than three times in a day. It can be caused by infection, intolerance of food or inflammatory diseases. Long lasting diarrhea may lead to electrolyte imbalance and dehydration. Recovery is achieved through the use of rehydration and dietary management.

723. Malabsorption

Malabsorption refers to loss of small intestinal nutrient absorption as a result of deficiency of enzymes or damage to the mucosa. Such common causes include celiac disease and Crohn's disease. The symptoms are weight loss, steatorrhea and anemia. The management relies on the cause and support by food.

724. Steatorrhea

Steatorrhea entails the existence of too much fat in the stool rendering the stool bulky, pale, and smelly. It presents a sign of fat intestines malabsorption caused by pancreatic deficiency or damage of the mucosal intestine. Diagnosis is made by stool fat analysis. The management involves dietary change and enzyme replacement.

725. Jaundice

Jaundice is a yellowish tint of the skin and eyes which is due to the high quantity of bilirubin in the blood. It can be caused by liver disease, obstruction of the ducts of the bile or even by hemolysis. These are prehepatic, hepatic and post hepatic jaundice. Liver function diagnostics and imaging must be used to diagnosis.

726. Hyperbilirubinemia

Hyperbilirubinemia is a condition that exerts an excessively high level of bilirubin in blood. It is as a result of increased production, reduction in conjugation or blocking of the bile flow. Constant high level can cause jaundice. Therapy is aimed at the correction of the underlying liver/haemologic disease.

727. Hepatitis

Hepatitis is inflammation of the liver which is a result of viral, alcoholic or auto immune reaction. It may be acute or chronic thus resulting to fibrosis and cirrhosis without treatment. Ordinary ones include fatigue, jaundice and nausea. Prevention involves the administration of vaccination and the prevention of hepatotoxin.

728. Hepatitis A Virus (HAV)

HAV is an acute viral hepatitis of fecal-oral mechanism by the use of contaminated food or water. It does not result in chronic infection. The symptoms are fever, jaundice and abdominal pain. It has a full recovery and can be prevented by means of vaccination and hygiene.

729. Hepatitis B Virus (HBV)

Acute and chronic liver disease is caused by HBV that is spread via blood and body fluids. Cirrhosis or liver cancer may develop as a result of chronic infection. The virus infiltrates the host DNA and hence it becomes hard to eradicate. The effect of vaccination has long term protection.

730. Hepatitis C Virus (HCV)

HCV is a bloodborne virus, which in most people makes them experience chronic hepatitis. The chronic infection may result in a cirrhosis and hepatocellular carcinoma. Most of them can be cured using antiviral treatment with directacting agents. No vaccine is available yet.

731. Hepatitis D Virus (HDV)

HDV is dependent on HBV to replicate and takes place as either a coinfection or a superinfection. It complicates the severity of hepatitis and speeds up the destruction of the liver. It can be prevented by the means of HBV vaccination since HDV could not infect in the absence of HBV.

732. Hepatitis E Virus (HEV)

HEV is spread through infected water and it mainly results in acute hepatitis. It is self limiting yet may be extreme in the case of the pregnant. The preventive measures involve safe drinking water and sanitation. In the majority of cases, no particular antiviral treatment is needed.

733. Alcoholic Liver Disease

The effects of acute alcohol abuse are fatty liver, hepatitis and cirrhosis which culminate to alcoholic liver disease. Toxic metabolites including ethanol are produced through the process of metabolism, which destroy the hepatocytes. These symptoms are jaundice, fatigue and ascites. Management is the most important factor of abstinence.

734. Fatty Liver

Fatty liver; Hepatic steatosis develops as a result of alcoholism, obesity, or metabolic syndrome in which there is the accumulation of fat in the liver. It could develop to steatohepatitis or cirrhosis. Childhood phases are reversible as there is lifestyle change and weight control.

735. Cirrhosis

The non inmoorbile scarring of the liver tissue which results as a result of unremitting damage of the liver through hepatitis, alcohol, or toxins. It causes dysfunction of the liver and portal hypertension. Ascites and variceal bleeding are some of the symptoms. The ultimate treatment is liver transplanting.

736. Fibrosis

Fibrosis is the pathological process of connective tissue excessive deposition in an organ in response to chronic inflammation or injury. It is a precursor of cirrhosis in the liver and it plays havoc with normal construct. Progression can be avoided by early identification and antifibrotic treatment.

737. Portal Hypertension

Portal hypertension is high blood pressure in the portal vein brought about as a result of cirrhosis or blockage. It brings about varices, ascites and splenomegaly. The treatment prevents complications with the help of betablockers, endoscopic therapy, or even shunt surgery.

738. Ascites

Ascites is known as the effusion of fluid in the peritoneal cavity that is usually caused by cirrhosis and portal hypertension. It causes discomfort and abdomen distension. The options involve salt restriction, diuretics, and paracentesis.

739. Hepatocellular Carcinoma (HCC)

HCC is the primary liver cancer that mostly occurs as a result of chronic hepatitis or cirrhosis. The symptoms consist of weight loss, jaundice, and abdominal mass. The diagnosis is done through imaging and AFP levels. It can be cured by means of surgical resection or transplantation.

740. Rheumatoid Arthritis (RA)

RA is an autoimmune disease resulting in chronic inflammation of synovial joints in addition to causing pain, swelling and deformity. It mainly admits of small joints symmetrical to each other. The hyperactivity of immune cells destroys the tissue of the joints making it to erode away. It involves DMARDs and biologic agents in the treatment.

741. Autoimmune Disorder

Auto immune disorder arises when the immune system attacks the self cells. Examples of these include lupus, RA and type-1 diabetes. Both genetic and environmental factors lead to development. Management is concentrated on the immunosuppression and the symptom management.

742. Synovial Inflammation

The typical feature of arthritis is synovial inflammation since the synovial membrane becomes thickened and filled with immune cells. The result of this is pain, swelling and low joint movement. Prolonged inflammation leads to destruction of cartilages, erosion of the bones.

743. Joint Deformity

Due to chronic inflammation, erosion, or damage of joint structures, joint deformity occurs. Ulnar deviation and swanneck fingers are some of the deformities that are common in RA. Maintenance of function is provided by physical therapy and surgical remedy.

744. Osteoporosis

Osteoporosis is described by the decrease in the bone mass and density that leads to the high risk of fractures. It manifests itself because of the variation of hormones, age, or deficiency of calcium. The preventive measures incorporate sufficient levels of calcium and vitamin D, and body exercises. Drugs such as bisphosphonates make the bones stronger.

745. Bone Demineralization

Reduction of calcium and phosphate in the bone tissue loosening up of the structure is referred to as bone demineralization. It is found in such ailments as osteoporosis or hyperparathyroidism. It makes one vulnerable to fractures. The healing process is assisted with nutritional and hormonal therapy.

746. Fracture

A fracture is a discontinuity occurring in the bone exposed to trauma, stress or pathology. Inflammation, formation of callus, remodeling are involved in healing. Surgery fixation and immobilization provide adequate recovery and alignment.

747. Bone Density

The density of the bones is the number of mineral matter per square centimeter of the bones. Fracture risk is augmented by bone density and this is determined through DEXA scan. Exercising and nutrition on a regular basis can ensure that the bone is well maintained.

748. Calcium Metabolism

The process of calcium metabolism comprises the process of balancing the amount of calcium in the body by the help of parathyroid hormone, vitamin D, and calcitonin. It plays a crucial role in the wellbeing of the bones, muscle performance as well as nerve signaling. Lack of balance results into such disorders as osteoporosis or hypocalcemia.

749. Gout

Gout is a metabolism disorder that is defined by the uric acid crystals deposited on the joints and this leads to inflammation and a lot of pain. It usually affects the big toe and is caused by the abnormality of the purine metabolism. The therapies involve NSAIDs, colchicine, and uric acid lowering medications.

750. Uric Acid

Uric acid is a waste substance, which is produced by the decomposition of purines that are present in food and cells of the bodies. It is released through the kidneys. High concentration of uric acid may result in

development of crystals around the joints, resulting in gout. Its level is controlled with the aid of maintaining hydration and low purine diet.

751. Tophi

In chronic gout, tophi are collected as uric acid crystal hard deposits under the skin. They usually seem to form in joints, ears or tendons. Tophi may lead to pain, inflammation and deformation of the joints. With appropriately made medical treatment, the level of uric acid can be reduced and prevented.

752. Arthritis

Arthritis can be defined as inflammation or swelling of the joints leading to pain, swelling and stiffness. It incorporates several osteoarthritis, rheumatoid arthritis and gouty arthritis. The disease can either be secondary to age, autoimmunity or infection. The medications used include anti-inflammatory medications and physical therapy.

753. Cancer

Cancer is a category of illnesses that is indicated by an uncontrolled increase in cell growth and capacity to disseminate or affect other organs of body. It may occur as a result of gene mutation in control of cell division. Treatment is possible through surgery, chemotherapy or radiation which is done early and thus, there is an increase in survival rates.

754. Oncology

Oncology refers to it as a branch of medicine which focuses on the study, diagnosis, as well as treatment of cancer. It includes medical, surgery and radiation oncology. Oncologists deal with the prevention of cancer and its early detection, as well as treatment procedures. Oncologic research seeks to come up with personalized and targeted treatment against cancer.

755. Neoplasm

Neoplasm or tumor is an undesirable mass in the form of tissue due to uncontrolled increase of cells. It may or may not be cancerous (noncancerous). Neoplasms can develop of any organ and can be of different growth rate and aggressiveness. Histopathological examination is usually necessary in diagnosis.

756. Benign Tumor

A benign tumor refers to a noncancerous growth, which is localized and does not spread in the edges of the surrounding tissue. It is a slow growing bacterium and its capsule is usually distinct. Whereas benign tumors are harmless in most cases, there are benign tumors that may lead to complications owing to the compression of the surrounding structures.

757. Malignant Tumor

Malignant tumor is composed of malignant or cancerous cells that have the ability to invade the neighboring tissues and extend to the distant body cells (metastasis). It is a fast growing cellular atypical, capsule free change like lesion. Malignant tumors are dangerous conditions that have to be addressed as soon as possible and in multiple ways.

758. Metastasis

Metastasis occurs when the cancer cells which were found at the original site are thrown away in the distant organs through blood or lymphatic vessels. It is the next step towards the developed stage of any type of cancer and complicates treatment. Typical sites of metastasis are the liver, lungs and the bones. This needs to be done by prevention and early detection.

759. Carcinoma

Carcinoma is a form of malignant tumour that has its origin in the epithelial lined organs and glands. It encompasses squamous cell carcinoma and adenocarcinoma which are subtypes. The most prevalent form of cancer is carcinomas which may spread out via lymphatic.

760. Sarcoma

Sarcoma refers to a cancerous neoplasm of connective tissues during which bone, muscle, fat or cartilage are the connective tissues formed. It is not so common as compared to carcinomas and is likely to be transmitted via the bloodstream. The treatment is usually done through surgery, chemotherapy, and radiation.

761. Leukemia

Leukemia is one of the cancers of blood forming tissues, which is predominantly in white blood cells. It causes improper increase of the immature leukocytes, decreasing the normal blood cell counts. These symptoms comprise fatigue, bleeding and infections. Treatment (mainly chemotherapy and bone marrow transplantation) is used.

762. Lymphoma

Lymphoma is a cancerous condition of the lymphatic system which includes lymph nodes and lymphocytes. It is categorized into the Hodgkin lymphoma and the non Hodgkin lymphoma. Symptoms are common characteristics such as swelling of lymph nodes painlessly, fever, night sweats. Methods of therapy involve immunotherapy and chemotherapy.

763. Carcinogenesis

Incidentally, carcinogenesis is the process which is multistep and involves the transformation of normal cells into cancer cells. It entails initiation, promotion and progression phases which are instigated by genetic mutations and environmental influences. Awareness about carcinogenesis can be used to come up with prevention methods of cancer.

764. Tumor Suppressor Gene

The tumor suppressor genes control the division of cells and inhibit their uncontrolled growth. In case of mutation of these genes or their inactivation, the cells proliferate in an abnormal way, which results to cancer. The examples are p and RB genes. One of the concerns in cancer research is the restoration of their functioning.

765. Oncogene

The mutated or overexpressed gene is known as oncogene and during cancer development, it allows unregulated division of the cell. They have their basis in the expression of regular protooncogenes that are implicated in the growth of cells. Treatment specific therapies are used to target the activity of oncogenes to stop tumor development.

766. Mutation

A mutation is the alteration of the DNA sequence and it has the capability to modify gene action. Mutations can be spontaneous or can be as a result of mutagen exposures such as radiations or chemicals. Although some harmlessly, the others have the ability of causing genetic diseases or cancer.

767. Chemotherapy

Chemotherapy is a therapy of cancer that involves cytotoxic drug to kill fast growing cells. Its administration can be done orally or intravenously in cycles. Some of its side effects are immunosuppression, nausea, and loss of hair. This is usually used together with surgery or radiations to achieve improved results.

768. Radiation Therapy

Radiation therapy involves energy rays that are of high intensity used to destroy cancer cells and tumors. It destroys the DNA of malignant cells making replication unable to take place. Localization of treatment is done to ensure that the surrounding tissues are affected as much as possible. The side effects might include side effects as well as fatigue and skin irritation.

769. Immunotherapy

The immunotherapy improves the immune system of the body in order to detect and kill cancer cells. It contains monoclonal antibodies, inhibitors of check points, and vaccines. It has been proven to be very effective in melanoma cancer and lung cancer. Immunotherapy turns out to be a contemporary targeted method of cancer treatment.

770. Infectious Disease

Infectious diseases: they are diseases that are caused by microorganisms i.e. bacteria, virus, fungi or parasites. They may be transmitted both directly and indirectly, between people. The symptoms are dependent on the pathogen. There is preventive vaccination, sanitation and hygiene.

771. Pathogen

Any microorganism that can cause a disease in a host organism is known as a pathogen. Significant classification is defined in bacteria, viruses, fungi, protozoa. Pathogens attack the body, avoid immunity, and are released toxins. The immune defense mechanisms utilize the body to fight them.

772. Bacteria

Bacteria are one celled prokaryotic organisms and may be harmless commensals or pathogenic species. Some of the diseases such as typhoid and tuberculosis are caused by pathogenic bacteria. Antibiotics are used against them, which is becoming a significant dilemma.

773. Virus

A virus is a tiny infectious entity that is submicroscopic that is made up of genetic material covered by a coating of protein. It needs a host cell to be alive, in order to reproduce. Viral diseases are mild cold to severe diseases such as the HIV/AIDS. The major way of preventing it is through vaccination.

774. Fungi

Fungi are eukaryotic microorganisms which may induce infections particularly in immunocompromised human beings. Some fungal diseases that are common include candidiasis and aspergillosis. They grow well in humid and warm temperatures. Treatment is done with antifungal drugs.

775. Protozoa

The protozoa are eukaryotic parasites founded on single cell that cause malaria and amoebiasis. Their spread is usually by the use of infected water, food or by bite of an insect. Antiparasitic drugs and prophylaxis such as sanitation are used to treat it.

776. Meningitis

Meningitis is inflammation of the meninges, the membranes which protect the brain and the spinal cord. It may either be bacterial or viral. Characteristics are fever, neck stiffness as well as headache. Bacterial meningitis is essential in the prompt antibiotic therapy.

777. Bacterial Meningitis

The severe infection of bacteria, including Neisseria meningitidis or Streptococcus pneumoniae, is known as bacterial meningitis. It may cause damage to the brain or even death in case of treatment being not followed. Prevention of E. coli Outstanding measures include vaccination and early administration of antibiotics.

778. Viral Meningitis

Viral meningitis is a less severe disease that is brought about by viruses such as enteroviruses or herpes simplex. It finds its way out and is usually treated without requiring any specialized cure. The symptoms include fever and stiffness of the neck. Recovery is advised by encouraging care and rest.

779. Encephalitis

Encephalitis is inflammation of the brain tissue, which in most cases comes about as a result of viral infections like herpes or arbovirus. The symptoms are fever, confusion and consequent seizures. Extreme ones may lead to brain damage. The therapy is aimed at antiviral treatment and supportive treatment.

780. Typhoid Fever

Typhoid fever is an outbreak infection that is a systemic infection of Salmonella typhi, which is spread in contaminated water and food. It is characterized by a long lasting fever, abdominal pains and rash. There is a necessity of early detection and antibiotic treatment. Transmissions are prevented by vaccination and hygiene.

781. Salmonella typhi

The pathogenic bacterium that causes the typhoid fever is Salmonella typhi. It enters the intestinal cells and infects through the bloodstream. The mode of transmission is the fecal oral route. On the side of control, there is sanitation, vaccination, and proper handling of food.

782. Leprosy

Leprosy or Hansen Disease is a chronic infection that develops because of Mycobacterium leprae. It impacts on the peripheral nerves, mucosa and skin. The symptoms consist of lesions and nerve damage of the skin. Treatment of the disease at an early stage by use of multidrug therapy can treat the disease and avoid deformities.

783. Mycobacterium leprae

Mycobacterium leprae is a slow bacterium that is involved in the infection of skin and peripheral nerves. It is not able to grow in artificial medium and is mainly transmitted during lengthy contact. Multidrug treatment has significantly lowered the cases in different parts of the world.

784. Tuberculosis (TB)

Mycobacterium tuberculosis causes Tuberculosis which is a chronic infectious disease. It mostly attacks the lungs but it may spread to other organs. The symptoms are weight loss, cough and fever. Cure is possible only with long term use of antibiotic therapy.

785. Mycobacterium tuberculosis

TB is caused by Mycobacterium tuberculosis which is a bacterium that is acid fast. It is transmitted by aerosols of the sick people. The bacteria are able to stay idle in the body over a period of years. Prevention entails the vaccination of BCG and the control of the uses of the public health.

786. Pulmonary Tuberculosis

The pulmonary TB is the most common type of tuberculosis and it exists in the lungs. It presents in the way of prolonged cough with sputum, fever, and pain in the chest. Diagnosis is established by the Chest X rays and sputum tests. Combination antibiotic therapy in form of several months is the treatment.

787. Extrapulmonary Tuberculosis

Extrapulmonary TB is an occurrence where M. tuberculosis is transmitted to body organs that are not lungs like lymph nodes, kidneys, or bones. It is frequent in the case of immunocompromised persons. It also requires prolonged treatment as compared to pulmonary TB.

788. Granuloma

In response to chronic infection or inflammation, e.g. in TB or sarcoidosis A granuloma is a localized aggregation of immune cells. It aids in the control of the pathogens, which are hard to eradicate. Microscopic examination helps in making a diagnosis.

789. Caseous Necrosis

Caseous necrosis Tuberculosis brings about tissue death seen as cheese like. It is caused by tissue destruction through immune response. Its occurrence in affected tissues is proved with histological research.

790. Urinary Tract Infection (UTI)

UTIs are infections of urine and are normally caused by E. coli, the symptoms include burning urine, frequency and fever. They are more vulnerable to women because of the short urethras. Therapy is in the form of antibiotics and hydration.

791. Cystitis

Cystitis is the inflammation of the urinary bladder, which is normally occasioned by the infection of bacteria. It is manifested by dysuria, urgency and suprapubic pain. Prevention is by good hygiene and increased fluid intake. With the help of antibiotic treatment, one recovers quickly..

792. Pyelonephritis

Pyelonephritis is kidney infection and that of the renal pelvis caused by the ascending infections by bacteria. The symptoms involved include flank pain, fever, and chills. It may cause renal scarring when unattended to. Granting of long term antibiotics in severe cases is given.

793. Bacteriuria

Bacteriuria is bacteria in the urine as detected by the culture examination. It can either be symptomatic or asymptomatic. Recurrent bacteriuria may also indicate infection which needs treatment with antibiotics. Frequent observation is very crucial particularly in pregnant women.

794. Dysuria

Dysuria is painful or painful urine flow which is usually caused by an infection or inflammation of the urinary tract. It can be in conjunction with such diseases as cystitis or urethritis. Symptoms are cured by adequate hydration and antibiotics.

795. Sexually Transmitted Disease (STD).

Sexually transmitted diseases refer to the types of infections that are distributed during sexual involvement with bacteria, viruses, or parasites. Examples of these are HIV, gonorrhea and syphilis. Their prevention and control require practicing safe sex, screening regularly, and treatment at an early stage.

796. AIDS (Acquired Immunodeficiency Syndrome).

AIDS corners the most developed phase of HIV infection, which is the underdeveloped immune system. The patients fall prone to opportunistic infections and some forms of cancers. Antiretroviral therapy (ART) is beneficial towards suppressing viral production and it helps a great deal in the way of increasing life expectancy.

797. CD4 Cells

The T-helper lymphocytes are further divided into CD4 cells which facilitate the coordination of the immune. The HIV infection gradually kills these cells and makes one to be immunodeficient. The important aspect of immune status monitoring is CD4 count that is used to determine the immune state and to inform the therapy.

798. Opportunistic Infection

The infection is opportunistic when the disease starts and is caused by microbes which are harmless in a normal state due to the compromised immunity of the body. This kind of infections is common among HIV/AIDS and the immunosuppressed. These are tuberculosis, candida and pneumocystis pneumonia. The preventive measures include immune restoration and prophylaxis.

799. Kaposi's Sarcoma

Kaposi sarcoma is a vascular cancer associated with Human Herpesvirus (HHV) and mostly correlated with HIV/AIDS. It manifests itself in the form of purplish or dark lesions of the skin or mucosal surfaces. The pathogenesis of the disease is due to the proliferation of endothelium and deteriorates in immunosuppression.

800. Syphilis

Syphilis is an ongoing sexually transmitted disease that is caused by Treponema pallidum. It has primary, secondary, latent and tertiary stages when left unattended. The clinical manifestations include painless ulcers; systemic and neurological complication. Longterm sequela is prevented by early therapy with antibiotics.

801. Treponema pallidum

The bacteria causing syphilis and known as Treponema pallidum is a spiral motile bacterium. It is not able to grow in the artificial medium and is transmitted through sexual intercourse or transplacent. Diagnosis is done through serological tests (VDRL and FTAABS).

802. Chancre

Syphilis is first marked by a chancre, which manifests itself at the place of infection. It is a typical, painless and firm lesion acquired in a few weeks after exposure, and cures on its own. The T. pallidum organisms are very high and make the ulcer highly infectious.

803. Gonorrhea

Neisseria gonorrhoeae is the cause of Gonorrhea or sexually transmitted disease. It attacks the genital tract, rectum or the throat and has purulent discharge and painful urination. When not treated it may cause infertility or complications in the system. Timely administration of antibiotics means recovery.

804. Neisseria gonorrhoeae

The Neisseria gonorrhoeae is a gram negative diplococcal species which is attached to mucosal cells by means of pili and surface proteins. It induces inflammation, genital infections. The laboratory diagnosis is done by culture or nucleic acid amplification testing (NAAT).

805. Pelvic Inflammatory Disease (PID).

PID is an infection of the upper female genital tract, which is often caused by N. gonorrhoeae or Chlamydia trachomatis. It impacts on the uterus, fallopian tubes and ovaries causing pain, fever and infertility. Timely administration of antibiotics prevents scarring and ectopic pregnancy.

806. Chlamydia

One of the most common STDs is chlamydia developed on the grounds of Chlamydia trachomatis. It has a tendency to be asymptomatic although it may lead to urethritis, cervicitis, or PID. In men it can cause epididymitis and in women infertility. Infection is proved by the use of PCR, and one of the frequent treatment options is azithromycin.

807. Genital Herpes

Genital herpes is a viral disease, which is primarily instigated by Herpes Simplex Virus type (HSV). It causes blisters and painful ulcers of the genitals. The virus sets a dormant system in the nerve cells and

may become active after a time interval. Antiviral medications assist in minimizing the risk of spread and the epidemics.

808. Human Papillomavirus (HPV)

HPV is a DNA virus, which infects the epithelial tissues and is transmitted by sexual contact. The strains of warts are low risk, whereas the ones that lead to cancers to the neck and other centers are highrisk(and). Preventative measures can be done by vaccination and frequent Pap screening.

809. Condyloma Acuminatum

The term condyloma acuminatum is used to denote genital warts that are being caused by HPV (type and). Such lesions are soft and flesh coloured in nature, and either single or in groups around the genital or anal area. They are not severe but contagious and can reoccur even after treatment.

810. Antimicrobial Therapy

Antimicrobials therapy has drugs such as antibiotics, antivirals, antifungals or antiparasitics that kill or prevent the growth of pathogens. Selection of drugs is based on identification and susceptibility tests of organism. Resistance is a result of misuse and correct prescription and compliance is essential.

811. Antibiotic Resistance

As a result of this, antibiotic resistance is associated with the development of resistance of bacteria to antimicrobial drugs. Such mechanisms are mutation and transfer of genes. Multidrugresistant tuberculosis and MRSA may present an extreme health risk to humans. Countermeasures are important measures rational antibiotic use and infection control.

812. Vaccination

Vaccination exposes the antigens to the immunity system and develops protection against certain pathogens through the formation of memory. It avoids or minimizes the severity of disease and this is the main focus of the world public health. Vaccines are either live attenuated, inactivated or they may be recombinant.

813. Immunization

Vaccination Immunization refers to the unnatural or natural development of immunity toward a disease. It produces antibody and memory of the immune system and offers prolonged immunity. Diseases such as polio, HPV infection and measles have considerably been decreased through the immunization programs.

814. Nosocomial Infection

Hospital acquired infection or nosocomial infection, is a medical condition that appears during hospital stay and is not present at hospital admission. Typical instances are urinary tract infections, surgical site infections and ventilator associated pneumonia. Their occurrence is prevented using strict aseptic protocols and hygiene protocols.

815. Sepsis

Sepsis is a life threatening systemic response to infection which is associated with general inflammation and dysfunction of the body organs. It is due to the over release of cytokines and immunogenic activity. Symptoms that occur early are fever, tachycardia and hypotension. This is essential to avoid stemming out of septic shock and death, and to achieve this, the diagnosis and antimicrobial therapy should proceed expeditiously.

816. Septicemia

The term septicemia means proliferation and the existence of the inflammatory pathogenic microorganisms in the blood. It may result into systemic infection, high fever, chills, and even septic shock. The reasons are entry of bacteria via wounds, catheters or surgical sites. It is necessary to administer antibiotics on time to achieve positive results.

817. Fever

Fever or pyrexia is a high body temperature which is caused by infections and inflammation. It arises because of the intervention of the pyrogens on the hypothalamic temperature setpoint. This raises the level of immunity and prevents the growth of microbes. High or persistent fever can be the symptom of underlying disease of severe nature.

818. Pathophysiology

Pathophysiology is actually the study of functional modifications and biochemical changes, which have taken place in the body as a result of disease or injury. It is a gap between basic physiology and clinical medicine through the understanding of processes underlying the symptoms and signs. The pathophysiology makes the study helpful in proper diagnosis and correct therapeutic intervention.


Part- C
Pharmacology

819. Pharmacology

Pharmacology, the science of drugs and their actions in relation to the biological system are the branches of medicine that examine the aspects of drug interactions. It investigates the pathway of absorption, distribution, metabolism, and excretion of drugs, their effects on the cell and organ. The discipline aids in the comprehension of action mechanisms and treatment applications. It is an interdisciplinary science between medicine, biology, and chemistry. Healthy and safe usage of drugs is also directed by pharmacology.

820. Drug

A drug is any chemical substance that in the case of introduction in the body creates the biological effect. It can be applied in the diagnosis, prevention, treatment, or alleviation of the diseases. The drugs are natural, synthetic, as well as semisynthetic. Their actions are dependent on dose, pathway, and physiology of the patient. Any therapeutic drugs are highly tested before they are approved.

821. Pharmacokinetics

Pharmacokinetics can be referred to as the study of the way the body works on a drug in terms of absorption, distribution, metabolism and excretion (ADME). It also defines the initiation, peak, and persistence of an action of a drug. Age, liver ability, and genetic diversity are some of the factors that affect pharmacokinetics. Knowledge of it assists in dose modifications. It creates a basis to personalized medicine.

822. Pharmacodynamics

The pharmacodynamics is a concept that describes how the effects of drugs are brought about in the body as a result of interaction with certain receptors or enzymes. It involves the investigation of dose response relationships and action of drugs. The theory assists in estimating the effects of treatment and adverse effects. Its sensitivity to the receptor and drug concentration affects it. The pharmacodynamics supplements the pharmacokinetics in clinical practice

823. Therapeutics

Therapeutics refers to the use of drugs and other interventions in order to alleviate symptoms, cure illness or enhance quality of life. It aims at establishing the best possible gains with slight side effects. The discipline combines drug knowledge with patient related variables. Therapeutic measures can be either in the form of medication, surgery or lifestyle change. The end product is the restoration of health.

824. Toxicology

Toxicology refers to the branch of science involving disturbing impacts of drugs and chemicals on life. It determines dose toxicity, injury mechanisms and safe exposures. In development and safety evaluation of

drugs, toxicological analysis plays a vital role. Risks are identified with the help of acute and chronic toxicity. It also aids clinical control of cases of poisoning.

825. Clinical Pharmacology

Clinical pharmacology is the branch of pharmacology which deals with study of drugs in the human being with regard to therapeutic effectiveness as well as safety. It puts laboratory results into the patient care. Drug interactions, adverse effects and drug efficacy are assessed by clinical pharmacologists. The field is important in the formulation of dosing rules. It guarantees the rational and evidencebased application of medicines used in health care.

826. Essential Drugs

Essential drugs are drugs that fulfil the priority healthcare needs of a population. Their choice is based on the concepts of safety, efficacy and cost effectiveness. A model list provided by the World Health Organization (WHO) is regularly updated to provide guidance to the countries. Access to their treatment is fair due to their accessibility. They constitute the support of the health systems of people.

827. Drug Discovery

The discovery of new potential therapeutic agents is known as drug discovery and can be described as the scientific research process of identifying new agents against possible disease causes. It entails identification of targets, compound screening and optimization of leads. The contemporary drug discovery employs the use of molecular biology, computational models and pharmacogenomics. It is an initial step before the preclinical testing. This is aimed at discovering effective and safe new drugs.

828. Drug Development

Drug development encompasses all processes that ensure the bringing of a new drug through the discovery process to the market. It includes the preclinical research, clinical trials and regulatory approval. The procedure guarantees the safety, efficacy and standards of quality. It is an expensive and lengthy process that is under stringent rules. The development of laboratory discoveries into therapies in the real world is successful.

829. Drug Evaluation

Drug evaluation determines the pharmacological characteristics of a drug, the therapeutic potential, and the safety profile of a drug. It entails laboratory, animal, as well as human research. Dosing, toxicity and efficacy are determined during preclinical and clinical evaluations. The process assists the regulation authorities to make approval decisions. Loyalty to market monitoring of safety is guaranteed through continuous evaluation.

830. Drug Administration

Drug administration is termed as the process of introducing a drug into the body in order to obtain the intended effect. The procedure relies on the nature of the drug and the health state of a patient. The

administration routes are oral, intravenous and intramuscular among others. Effective absorption and treatment of the patient are guaranteed by proper administration. It is needed to be accurate in order to prevent mistakes and negative outcomes.

831. Oral Route

The oral route method sees the application of the drug in the mouth and is absorbed via the gastrointestinal tract. The most used and handy method is the one. It can however be influenced by food, pH or first pass metabolism. The most frequently used oral forms are the use of tablets, capsules, and liquids. It would suit best stable drugs that are not destructible in gastrointestinal conditions.

832. Parenteral Route

Parenteral route involves the direct delivery of drugs to blood or tissues with the help of injection. It does not follow the digestive system and this ensures that it is absorbed quickly and fully. The most common ones are intravenous, intramuscular and subcutaneous. This technique can be applied on emergency drugs and those which are ill absorbed. It involves sterile technique in order to avoid infection.

833. Topical Route

Topical administration is the utilization of a drug, which comes into direct contact with the skin or mucous membrane. It gives localized or occasionally systemic effects as a result of absorption. They can be in the form of creams, ointments and patches. It reduces side effects on the system and avoids the gastrointestinal tract. Topical drugs have common applicability in dermatology and pain management.

834. Inhalation Route

Drugs are absorbed into the body via the breathing system in the inhalation route. It has speedy course of action owing to vast surface area and affluent blood supply of the lungs. They can be in form of aerosols, vapors and inhalers. It is mostly applied in the treatment of respiratory illnesses such as asthma. There is also proper technique to achieve the maximum drug delivery.

835. Sublingual Route

The sublingual route entails the application of a drug under the tongue to absorb the drug through the mucous membrane. It permits quick absorption into the systemic circulation bypassing the initial metabolism. This is the best path where drugs that require fast action like nitroglycerin are involved. It is convenient and well bioavailable. It however is applicable in small lipid soluble drugs only.

836. Rectal Route

Rectal route The drug gets introduced through the rectum either as suppositories or as enemas. It is applicable whereby oral administration is not feasible because of either vomiting or unconsciousness. It is to a degree evading firstpass metabolism, enhancing bioavailability. The route has both local and systemic effects. It finds application in pediatrics and palliative care.

837. Intravenous Injection

The drug is administered in intravenous injection as it introduces a drug into the bloodstream, giving it immediate action. It has percent bioavailability and dosage accuracy. It applies in the case of emergency as well as ill absorbed drugs. It, however, needs effective administration and sterility. Effects of adverse effects manifest very fast when there is dosing error.

838. Intramuscular Injection

Intramuscular injection entails the application of a drug into the muscle tissue and then it gets into the blood. It enables slow and prolonged release compared to intravenous release. The usual locations are deltoid and gluteal muscles. It is commonly utilized in the case of vaccinations and hormonal doses. Techniques are appropriate to avoid pain and tissue damage.

839. Subcutaneous Injection

subcutaneous injection is a drug that is applied into the layer of fat beneath the skin. The route of absorption takes longer and is sustained compared to the intramuscular routes. It should be used with insulin, heparin and some of the vaccines. It can be self administered with the least form of discomfort. Nonetheless, the recurrence of the injection can result in irritation or lipodystrophy.

840. Agonist

An agonist refers to a substance that attaches itself to a receptor and therefore activates the receptor to release a biological response. It imitates the process of natural endogenous compounds. Full agonists have the maximally distributed effect, whereas partial agonists have the sub maximal effect. They are instrumental in the process of physiological process therapeutic modulation. Their strengths are based on affinity of receptors.

841. Antagonist

Being able to block the effect of an agonist, antagonist attaches itself to a receptor, which does not activate it. It inhibits or suppresses the activity of endogenous drugs or substances. Antagonists may or may not be competitive or noncompetitive based on how they get bound. They are applied in reversing an overdose and also in the control of the physiologic response. Betablockers, antihistamines are usually common examples.

842. Competitive Antagonism

Competitive antagonism is the case when an antagonist and an agonist are competing over the same receptor cake. The agonist concentration can be used to overcome the inhibition. It moves the dose response curve to the right, but still does not decrease the maximal effect. The interaction between them is inversible. It plays a role in the interpretation of drug interactions and dosage.

843. Non- Competitive Antagonism

The noncompetitive antagonism is where an antagonist binds with irreversibly or in another site to allow an agonist to not bind and transmit a complete response. High levels of agonists are unable to reverse its effect. It reduces the maximum response with no changes in the receptor affinity. Longterm receptor blockage is done with such antagonists. They continue to do so until other receptors are formed.

844. Partial Agonist

A partial agonist will activate the receptors but even cause a lesser response to that of a full agonist. It is an agonist in the unavailability of a complete agonist, and an antagonist in the availability of an agonist. It is helped along by this duality in reduction of overstimulation. Partial agonists assist in the establishment of physiological balance. One famous example is buprenorphine.

845. Inverse Agonist

The inverse agonist is an agonist that occlusively binds to the receptors but has an opposite effect. It stabilizes the receptor at an inactive state lowering basal activity. These agents come in handy where the receptors have constitutive activity. Inverse agonists also determine therapeutic advantages in the anxiety disorder and gastric acid disorder. They are really different with mere antagonists.

846. Spare Receptor

The receptors that are not occupied even in case of a maximal response are referred to as the spare receptors. They enhance responses to agonists of the tissues. They permit complete response with reduced doses of drugs increasing efficiency. The idea can be used to understand the differences in tissue responsiveness. It also has an impact on the design of the studies on dose response in pharmacology.

847. Receptor Sensitivity

The sensitivity of receptors is the capacity of a receptor to respond to a drug or endogenous ligand. It can be up or downregulated (chronic) as a result of exposure. Therapeutic efficacy and tolerance depend on changes in sensitivity. Homeostasis of receptors is essential to enable a constant effect of drugs. The variability in sensitivity is the reason behind the difference in responses of patients.

848. Drug Tolerance

Drug tolerance is slower reaction to drug following repeated use of drugs. It needs more doses in order to produce the same effect. The occurrence of tolerance may be as a result of metabolic adaptation or receptor desensitization. This is usually witnessed with the narcotics, alcohol and sedatives. The issue of tolerance can be understood to avoid dependence and withdrawal symptoms.

849. Drug Dependence

Drug dependence describes a state whereby the body becomes used to a drug and the body cannot run its normal functions without taking that specific drug. Abrupt cessation of the drug will result in withdrawal symptoms. It may be either physical or mental. Addiction to opioids, alcohol or sedatives is a common

thing that develops in the course of their longterm use. To deal with withdrawal, it is necessary to receive medical attention carefully.

850. Drug Addiction

Drug addiction is a brain disorder or psychological chronic habitual and behavioral disorder that leads to addiction towards excessive seeking and taking of drugs despite the damaging effects. It is characterized by alteration in the reward systems in the brain, craving and loss of control. There is an addiction that impacts both human body and psyche. It is unlike dependence since it has strong psychological motivation. Rehabilitation is aimed at behavioral therapy and support.

851. Tachyphylaxis

Tachyphylaxis is a rapid drop in drug response following repeated administration within a short duration of time. It is in contrast to tolerance and it develops rapidly and may disappear with rest. It can be caused by receptors desensitization or mediator depletion. Tachyphylaxis is usually demonstrated by drugs such as ephedrine and nitrates. This effect can be avoided through rotating or dividing doses.

852. Idiosyncrasy

The idiosyncrasy is an abnormal and unpredictable response to drug which is observed in only a few individuals. It is normally attributed to disparities in the genetic makeup which influences metabolism or/and sensitivity to the receptors. The response is not based on dose and pharmacological action of the drug. As an illustration, hemolysis in the G6PD deficient patients, especially following the use of primaquine, is idiosyncratic. Genetic screening will assist in the determination of at risk individuals.

853. Drug Allergy

Drug allergy is the hypersensitivity (immune mediated) reaction to any given drug. Low doses will elicit a response following previous sensitization. The symptoms are mild rashes to the severe anaphylaxis. The frequent allergens are the penicillin and the sulfa drugs. The offending drug should be avoided on identification. Antihistamines or corticosteroids might be needed in terms of emergency treatment.

854. Hypersensitivity Reaction

Hypersensitivity reaction Hypersensitivity reaction is an immune system response that is extreme and ends up destroying tissues in the event of exposure to an antigen. This reaction can be initiated by drugs that can serve as antigens or haptens. It either can be immediate (Type I) or delayed (Type IV). This ranges between skin eruptions up to systemic shock. Diagnosis plays a very important part in avoiding reoccurrence.

855. Drug Hypersensitivity

The drug hypersensitivity is specifically immune mediated adverse drug reaction. It is preceded by sensitized occurrence, even therapeutic doses of the same. The response can be both antibodies or T4 cell. The symptomatic signs are fever, rash, urticaria or organ inflammation. Detecting the causal agent and

ceasing it is also a major management process. There is a cross reactivity that needs to be taken into consideration during therapy.

856. Membrane Transport

Membrane transport refers to the movement of drugs across biological membrane in the quest to find their target sites. It may either be passively diffused, facilitated diffused, actively transported or endocytosed. Transport is affected by factors like lipid solubility, size and ionization. Knowledge of these mechanisms will be useful in predicting absorption and distribution. Effective action of drugs is guaranteed by efficient transport.

857. Passive Diffusion

Passive diffusion entails a transfer of drug molecules between a region of high concentration to low one without consuming any energy. This is the most widespread route of lipid soluble drugs absorption. The rate is pegged on membrane permeability and concentration gradient. It will go on till equilibrium is achieved. It is an important process of the absorption of oral drugs.

858. Facilitated Diffusion

Increased cellular penetration of some drugs or molecules into cells facilitated by carrier proteins without requiring energy is also possible through facilitated diffusion. It is based on concentration gradient and is faster than the passive diffusion. Transport is saturated and specific. This is the case of vitamins and glucose. It increases absorption of those substances that are not able to freely diffuse through lipid membranes.

859. Active Transport

Active transport involves molecules and works against their concentration gradient with the energy typically provided by ATP. It involves carrier proteins, and it is essential in the absorption of ions and nutrients. Such drugs as levodopa have active modes of transport. Drugs in some tissues may accumulate in the process. Metabolic blockers are able to inhibit it.

860. Endocytosis

Endocytosis entails an incident involving the encompassment of molecules of drugs within cell membranes to create a vesicle in which elements are transported into the cell. It should be utilized in large or complicated molecules such as proteins and antibodies. It has two ways; pinocytosis and phagocytosis. The mechanism enables delivery of drugs that are target oriented. It is less fast but essential in the transport of macromolecules.

861. Drug Absorption

Drug absorption: this is whereby a drug moves into the systemic circulation after it is administered. It is influenced by such factors as solubility, pH and route. Onset and intensity of action are dependent on the

rate of absorption. Absorption occurrence is in the small intestine in which oral drugs are absorbed. Absorption optimality has therapeutic effectiveness.

862. Bioavailability

Bioavailability workforce the proportionality of a given dose that is delivered into the circulation system in active nature. It is 100 percent in the case of intravenous drugs and less in the case of oral though it depends on the firs tpass metabolism. Bioavailability is influenced by such factors as formulation and food intake. It dictates concentration and performance. Bioavailability would be predictable thus guaranteeing uniform therapeutic effects.

863. First Pass Metabolism

First pass metabolism takes place when drugs orally used are metabolized in the liver or the small intestinal wall before entering the systemic circulation. It induces the available concentration of the drug in terms of active drug to be used in treatment. Propranol and nitroglycerin are the drugs with a high first pass metabolism. This effect can be avoided by other routes such as a sublingual or parenteral route. It plays an important role in the determination of doses.

864. Drug Distribution

Drug distribution refers to the development of a process in which a drug is transported to body in different tissues and fluids through the bloodstream. It relies on permeability of tissues, blood flow and affinity to plasma proteins. Distribution has an influence on onset, action duration, and intensity of action. Lipid soluble drugs are easy to cross membranes. The modeling of distribution assists in the targeting of certain organs.

865. Volume of Distribution

Volume of distribution (Vd) is an imaginary figure which relates the quantity of drug in the body with the plasma concentration of drug. It is an indication of the extent to which a drug spreads out into tissues. High Vd drugs are far distributed and low Vd drugs are trapped on plasma. It guides dosing regimens. Alteration of body fluid influences Vd.

866. Plasma Protein Binding

Plasma protein binding is described as the process of reversible binding of drugs to the blood plasma proteins, such as albumin. The unbound drugs are the only pharmacologically active drugs. Large binding will lower available drug concentrations and retard clearance. It may lead to drug interactions in the situation when substituted by other compounds. Drugs that have altered affinity in disease states have influence on dosing.

867. Blood-Brain Barrier

The blood-brain barrier (BBB) refers to a sort of barrier that regulates blood to brain tissue passage. It permits penetration of lipid soluble as well as small molecules and limits the accessibility of toxins and

polar medications. This selectivity allows the protection of the neural tissues but restricts CNS drug delivery. There are specialized transporters that are useful in facilitating the passage of specific drugs across the BBB.

868. Placental Transfer

Placental transfer is a process wherein the drugs are transferred between maternal and fetal blood through the placenta. The drugs with low molecular weight and lipid solubility have an easy crossover. Certain medications could result in malformation or fetal toxicity. This transfer is an issue that must be understood in order to have safe medication use during pregnancy. The placenta is not a complete isolation.

869. Drug Metabolism

The biochemical processes that the body undertakes to alter drugs is known as drug metabolism mostly occurring in the liver. It uses lipophilic drugs and converts them into hydrophilic version to be excreted easily. Metabolism is able to activate, inactivate or synthesize toxic metabolites. Important roles are played by enzymes such as cytochrome P. These genetic variations affect the rate of metabolism, effectiveness of drugs.

870. Biotransformation

Biotransformation is a transformation of the chemical structure of drugs in body in such a way that, they are eliminated easily by the body. It entails enzymatic reactions which convert active drugs into inactive or less poisonous substance. This is done primarily in the liver though there are instances where lungs and kidneys are also involved. It influences drugs duration and effect. In some cases, prodrugs must be active through biotransformation.

871. Enzyme Induction

Enzyme induction is where the volume or the tracks of production of metabolic enzymes are elevated either by a medication or chemical. This increases its metabolism or other medication making them less effective. It may result in treatment failure or change in dose. This is normally caused by wellknown inducers such as rifampicin and phenobarbital. The inducers impact the drug kinetics when exposed over an extended period of time.

872. Enzyme Inhibition

Inhibition of the enzyme occurs when a certain substance reduces the activity of enzymes that decompose drugs. It results in retention and possible toxicity of the drugs. Metabolism is impaired by inhibitors, such as cimetidine or ketoconazole. The interaction is significant in multi pharmacy. This is because through monitoring and dose adjustment, adverse outcomes can be avoided.

873. Cytochrome P450

The enzyme Cytochrome P450 is a very large family of liver enzymes which apply the oxidative metabolism to most of the drugs. It contributes immensely toward elimination and drug clearance. The response of individuals to CYP is affected by genetic variation in enzymes. These enzymes are inhibited or induced by some drugs and hence interactions. The knowledge of the P pathways in personalized medicine is crucial.

874. Conjugation Reaction

A conjugation reaction is a Phase II reaction in which a drug or drug metabolite reacts with an endogenous molecule such as glucuronic acid. It synthesizes inactive metabolites that are water soluble to excrete them. Conjugated increases drug clearance and decreases toxicity. Often oxidation or reduction reactions are followed by it. There are adverse effects of defects in conjugation.

875. Phase I Reaction

Phase I reactions entail alteration of the drugs in form of oxidation, reduction, or hydrolysis. The reactions use primary processes that uncover or add functional group on the drug molecules. Cytochrome P enzymes are the chief catalysts of them. Phase I can either inactivate or conjugate the drug. There is still a possibility that some of the metabolites are pharmacologically active or toxic.

876. Phase II Reaction

Phase II reactions are reactions which entail conjugation of drug or Phase I metabolites with polar solvents in order to increase water solubility. Usually glucuronides, sulfates and acetates are common conjugates. These responses are through excretion through urine or bile. They usually give rise to dormant metabolites. Lack of Phase II enzymes would influence the cleaning power.

877. Drug Excretion

Excretion of drugs refers to the procedure through which the drugs and their periodicals leave the body. Important pathways are renal routes, biliary routes, and pulmonary routes. Kidney is the most significant body organ by its action of cleaning, secretion, reabsorption. Effective excretion avoids build up and toxicity. Reduced renal clearance changes the drug clearance.

878. Renal Clearance

Renal clearance is a measurement of the amount of clearing plasma of drug by the kidneys per time. It is based on glomerular filtration, tubular secretion and reabsorption. Examples of drugs of penicillin are excreted primarily on the renal route. It is useful in bailing out the dose of impaired patients with kidneys. The clearance values assist in treatment of drugs.

879. Hepatic Clearance

Hepatic clearance This is the speed with which the liver eliminates drugs in the blood. It relies on blood flow in the liver, enzymes, and capacity of binding. Most drugs that are highly metabolized such as

propranol have high hepatic clearance. Dose modification is necessitated by liver disease which decreases this ability. It is important to the first pass metabolism.

880. Kinetics of Elimination

Kinetics of elimination indicate the rate at which a drug is eliminated in the body. It may be directed by the first order or zero order kinetics. In first order kinetics rate of elimination is proportional to concentration whereas in zero order it does not depend on concentration. The knowledge of these kinetics will help in forecasting dosing schedule. Elimination defines the duration of action of the drug.

881. Half Life

Half life is a time interval that a drug takes to decrease the plasma concentration by a half. It shows the duration of stay of a drug within the system. The long acting drugs require lower dosing. Half life is influenced by factors such as excretion and metabolism. It assists in dosing patterns and the steady states.

882. Steady State Concentration

The steady state level of concentration occurs where the rate of administering the drug is identical to the rate of elimination. It assures a regular therapeutic action devoid of build up. It normally develops following repeated doses which are half lives. The stabilization of the condition will ensure there is no toxicity or failure of treatment. It is the necessity of drug therapy management in the long term.

883. Dose Adjustment

Dose adjustment refers to the act of adapting the dosage of drugs depending on the patient related factors, such as age, weight, kidney or liver condition. It is safe and effective in changing physiological situations. The use of drug levels in monitoring assists in making changes. Small dose eliminates side effects. It is an information pillar of specific pharmacotherapy.

884. Loading Dose

A loading dose involves larger dosage which is administered to quickly reach the therapeutic drug concentration. It is applied in the situation when it is needed to act immediately. Subsequently, the doses are maintained constant due to maintenance doses. Long half life drugs usually necessitate loading doses. Calculation could help eliminate toxicity and at the same time, act fast.

885. Maintenance Dose

A maintenance dose is defined as the normal dose to keep the therapeutic levels constant following a loading dose. It substitutes the elimination of the drug in the body. The rate varies according to half life and rate of clearance. Seeking appropriate care will lead to the efficacy persistence and avoid under/ overdosing. Chronic treatments heavily depend on it.

886. Drug Receptor

A drug receptor is a certain protein or macromolecule which is bound by drug to have a biological effect. Receptors may either be found on cell membrane or within a cell. Potency and efficacy of drugs is determined by drug receptor interaction. They are differentiated according to form and purpose. The knowledge of receptors assists in the designing of specific medicines.

887. Receptor Theory

Receptor theory describes the mechanism of drugs to get an effect as a result of interacting particularly with receptors. It entails affinity, efficacy as well as occupancy. The strength of response is dependent on the binding and activation of receptors. The theory aids in the understanding of the agonists, antagonists, and partial agonists. It is a basic fact in contemporary pharmacology.

888. Receptor Classification

Receptors are categorized as based on structure, mechanism and signaling pathway including ion channel linked, G protein coupled, enzyme linked, and intracellular receptors. All the above types mediate different cell responses. Classification helps to predict drug action and the side effects. It also determines the design of selective therapeutic agents.

889. Ion Channel Receptor

Ion channels receptors are proteins which create holes in cell membranes, and the ions are subject to flow through such holes when it is changed by ligands. They facilitate the rapid transmission at the synapses within the nervous system. They could be nicotinic and GABA receptors. Medications of these pathways have an effect on excitability or neurotransmission. They play a vital role in anesthesia and treatment of epilepsy.

890. Enzyme Linked Receptor

Enzyme linked receptors are proteins on the cell surface, which signal cell based enzymes into action. The recent type is the receptor tyrosine kinase (RTK). They are involved in the differentiation, growth and metabolism of the cell. These receptors are associated with dysregulation which is related to cancers. Oncology and metabolic disorders make use of drugs that target them.

891. JAKSTAT Pathway

One such signaling pathway is the JAKSTAT pathway where cytokine receptors activate Janus kinases (JAKs) followed by activation of STAT transcription factors. It controls immune response, cells growth and differentiation. The dysfunctions result in autoimmune disorders and cancers. The drugs that are similar to this pathway are employed in hematologic and inflammatory disease.

892. Non Possible Targets.

Transcription factor receptors are intracellular receptors which when bonded to their ligands directly affect expression through gene control. The examples are steroid and thyroid hormone receptors. Protein

synthesis that occurs during metabolism and development is regulated. The receptors on which drugs are acting are slow though prolonged acting. They are essential endocrine therapeutic targets.

893. Signal Transduction

Signal transduction is the mechanism of transmitting an external signal through a receptor into the response of the cells. It entails cascade release of biochemical reactions and secondary messengers. The process controls metabolism, immune and growth activity. These pathways can be promoted or suppressed using drugs. The appropriate signaling is the guarantee of the cellular homeostasis.

894. Second Messenger

The second messengers are molecules that are intracellular that communicate between receptors and target proteins. Some of the common examples are cyclic AMP, IP and calcium ions. They boost the original signal which causes physiological responses. Disease may result as a result of abnormal signaling. There are numerous drugs that alter second messenger systems.

895. Cyclic AMP (cAMP)

One of the important second messengers is cyclic AMP that is synthesized by adenylate cyclase, which is the product of the ATP. It stimulates protein kinase A and this affects metabolism, heart rate, and secretion of hormones. The cAMP signaling is used by many hormones and neurotransmitters. These processes can be facilitated or suppressed by drugs which mediate the cAMP level. It is found at the core of GPCR signaling.

896. Inositol Triphosphate (IP)

The second messenger that activates the actions of calcium ions release by the endoplasmic reticulum is IP. It is produced as a result of breaking down phospholipids with the help of phospholipase C. The signal of calcium mediated by IP controls the contraction of muscles, secretion as well as cell growth. The impairment of this pathway causes different diseases. It acts together with DAG in signal transduction.

897. Diacylglycerol (DAG)

DAG is a second messenger that is made of lipids and IP is made out of phosphatidylinositol. It removes protein pinacolone C triggering the phosphorylation of the target proteins. DAG serves a cell growth, secretion and differentiation. Its signaling pathway is crucial to the neural and immune functions. Over activation may add up to cancer and inflammatory conditions.

898. Calcium Signaling

Calcium signaling is the effect whereby calcium ions (Ca^{2+}) are signaling transducer in cellular communication. Varying the intracellular calcium contents causes physiological reactions such as contraction of muscles, release of neurotransmitters and enzyme activation. The ion channels, pumps and storage organelles tightly regulate it. Calcium signaling malfunctions may cause such disorders as cardiac arrhythmias and neurodegeneration.

899. Dose Response Curve

The relationship that existed between drug dose and pharmacological response in the relationship should be graphically expressed by a dose response curve. It assists in identifying the strength of efficacy of a drug. Most of the times, a general increase in the dose corresponds to an increase in the response and then the plateau occurs. This principle plays a critical role in ascertaining the therapeutic and toxic doses.

900. Therapeutic Index

The therapeutic index (TI) is the measure of the safety of the drug and it indicates the difference between the toxic dose (TD) and the effective dose (ED). The larger TI of a drug shows that it is safer because there is room between dose and harmful and effective dosage. Narrow TI drugs are those that need high alertness in order to avoid toxicity. It is a parameter which is very critical in clinical pharmacology.

901. Potency

Potency is defined as a volume of medicine which is needed to create a particular effect. A more potent drug will have the required effect with a lower dosage compared to a less potent drug. It is pegged upon the binding and the intrinsic action of the drug on receptors. Therapeutic superiority is not always correlated with potency.

902. Synergism

Synergism is observed when there is the combined effect of two drugs, which is higher than the effect of each drug individually. It may also prove helpful in treatment e.g. antibiotics combining to increase killing of bacteria. Nevertheless, it can also contribute to the development of negative outcomes in case of an unchecked increase. Combination drug regimens heavily make use of the phenomenon of synergistic interactions.

903. Hostility (Drug Interaction)

The antagonism is the inhibition of the effect of another drug. It may be by blocking receptors, physiological opposition or chemical neutralization. Antagonism which is competitive is reversible and that which is noncompetitive is nonreversible. It is important to know about the antagonistic drug interactions and therapeutic failures to be able to manage them.

904. Additive Effect

Additive effect is observed when a pair of drugs act in a way that they generate effects that are equal to the sum of the two drugs. As an illustration, when ibuprofen is used alongside paracetamol, one is not likely to develop too much toxicity but the pain reliever is improved. The concept is commonly used in the polypharmacy practice to achieve safer therapeutic synergy.

905. Drug Interaction

Drug interaction is a kind of activity involving the adjustment of the drug effect of a drug taken with another drug. The interactions may be pharmacokinetic (othing absorption, metabolism or excretion) or pharmacodynamic (thing receptor response). They can cause decreased efficacy or cause toxicity. Such risks are reduced with the help of clinical monitoring.

906. Pharmacokinetic Interaction

Pharmacokinetic interplay deals with absorptive, distributive, metabolic or excretional changes in drugs. An example is enzyme inducers such as rifampicin that lower plasma concentrations of other drugs that are administered together. These interactions change; adopting a change in drug concentration and therapeutic response. Their considerations are very critical when administered through multidrug therapy.

907. Pharmacodynamic Interaction

Pharmacodynamic interactions Pharmacodynamics interplay is when drugs alter the actions of one another in the receptor or system level. They can either be synergistic, additive or antagonistic. Indicatively, CNS depression is augmented through a combination of sedatives. The interactions define compatibility between drugs as far as therapy is concerned.

908. Adverse Drug Reaction (ADR)

ADR refers to an unpleasant or unwanted side effect of the drug taken in an appropriate dosage. It has the predictable (type A) and unpredictable (type B) responses. ADRs can also be monitored and used to instruct on the withdrawal of drugs or dose changes that will improve the patient safety. Pharmacovigilance is important in postmarketing ADRs detection.

909. Toxic Reaction

Excessive exposure to drugs, whereby one becomes toxic due to over exposure of the drug, or damaged organs as a result of prolonged exposure. Some are frequently dose dependent and predictable. Among others, these are hepatotoxicity due to paracetamol and nephrotoxicity due to aminoglycosides. Recovery is necessary in the initial stages of detection and care.

910. Idiosyncratic Reaction

An idiosyncratic reaction is a unique or unpredictable reaction to drug to some individuals. It is frequently because of genetic/metabolic variations, and not dose/mechanism. The reactions can be serious and unassociated with the pharmacology of the drug. Pharmacogenomics is useful in identifying the vulnerable patients.

911. Hypersensitivity Reaction (Drug).

This is the immune mediated adverse reaction which is caused by drug exposure. It has the allergical manifestations such as rashes, anaphylaxis, or serum sickness. These reactions may take place when a small dosage is given subsequent to sensitization. Hypersensitivity is controlled by avoidance and desensitization regimes.

912. Drug Induced Toxicity

Toxicity is caused by drugs when an organ or tissue is injured by direct or metabolic effects of a drug. The examples are liver damage due to the use of isoniazid or kidney damage due to NSAIDs. According to its severity, it can be reversible or irreversible. The function of monitoring of organs is applied in the reduction of risks during the therapeutic process.

913. Teratogenic Effect

When a drug is applied to the mother, which results in perinatal defects in the fetus, this is termed as a teratogenic effect. Thalidomide and isotretinoin are teratogens that disrupt the development of the fetus. Such effects especially affect the first trimester. Therefore, pregnant women are not exposed to teratogenic drugs.

914. Mutagenic Effect

Mutagenic effects are caused by the genetic mutation resulting in the use of drug in germ or somatic cells. These mutations may be cancerous or inherited. Some of the alkylating and cytotoxic agents are mutagenic. Mutagenic risks are reduced through screening in the drug development.

915. Carcinogenic Effect

One of the effects of a substance that may occur after a long duration is a carcinogenic effect. Hormones, and alkylating agents are some drugs, which are known carcinogens. Before drug approval, the carcinogenicity is required to be tested to guarantee safety. This is aided by continuous surveillance that would aid in the early identification of such effects.

916. Pharmacovigilance

Pharmacovigilance is the regular observing, noticing, and averting of negative drug responses. It provides information collected and analyzed on the safety of drugs in the postmarketing position. Pharmacovigilance helps regulatory bodies to revise safety labels, recall products. The necessity of patient safety and the wellbeing of the people is critical.

917. Clinical Trial

A clinical trial is a study that is done to test the safety, efficacy, and dosage of a drug on human beings. It moves through specified stages ahead to sanction. Trial procedures are ethically guided in order to safeguard study subjects. They define the evidence based medicine.

918. Preclinical Testing

Preclinical test includes laboratory and animal tests which are performed prior to human testing. It assesses the pharmacokinetics, toxicity and efficacy. The information of this stage establishes the progress of a drug to the clinical assessment. This will guarantee that only potential and secure compounds will go to human testing.

919. Phase I Trial

The first human trials are Phase I trials which are carried out on healthy volunteers to determine the safety, tolerability, and pharmacokinetics. They are used in the establishment of the highest tolerated dose and adverse effect profile. Succeeding in this step permits the steps forward to the therapeutic tests.

920. Phase II Trial

Phase II trials entail a limited number of patients with the aim of investigating drug effectiveness and the best dose. It gives some preliminary information on therapeutic benefits. The side effects are monitored in this phase. The drug is evaluated by larger segments in case of positive results.

921. Phase III Trial

Phase III trials are a multicenter investigation that is carried out on varied patient groups. They prove the efficiency and safety of drugs in comparison with current treatments or placebo. Regulatory approval is based on data of these trials. This is a stage that establishes clinical worthiness of a new drug.

922. Phase IV Trial

Postmarketing trials, also known as phase IV are done after a drug is approved. They observe the safety in the long term, the side effects, which were uncommon, and the practical effectiveness. The results may result in the change of labeling or drug discontinuation. This step is very important to the continued pharmacovigilance..

923. Drug Discovery Phase

The drug discovery phase entails the process of identifying new chemical or biological objects that have a possible therapeutic activity. It involves the process of identifying targets, screening of compounds and optimizing of leads. The step is essential to the contemporary pharmaceutical innovation.

924. Drug Screening

Drug screening is a screening process that determines the countless number of compounds with the desired pharmacological effects. This is fastened by high throughput screening techniques. Leads with good potential are then maximised regarding potency and safety. Screening guarantees an efficient way to develop drugs in terms of resources.

925. Randomized Control Trial (RCT).

RCT is a study that has a gold standard design since subjects are selected and randomly participate to either treatment group or a control group. Randomization eliminates the chances of biasness and reliable outcome. RCTs have a strong evidence base on the effectiveness of drugs and their safety in clinical care.

926. Placebo Controlled Trial

Placebo controlled trial is used when the effects of an active drug are compared with an inactive substance (placebo). It assists in deciding whether the effects of drugs are above the psychological expectations. These trials play a very important role in testing the therapeutic authenticity.

927. Double Blind Study

There is no information about who is treated or who is not in a study with a new drug in a double blind study as no one is informed about this. This discourages reporting and evaluation biasness. Clinical research outcomes are objective and reliable due to the design of the study being double.

928. Drug Safety Monitoring

Drug safety surveillance requires the constant evaluation of adverse effects during and following the clinical use. It encompasses regulatory oversight and reports which are spontaneous. This provides efficacious treatment in general and prevents the adverse effects in a timely manner.

929. Peripheral Nervous System (PNS).

The extra brain nerves and spinal nerves that are associated with the central nervous system are called the PNS that connects the central nervous system to the body. It incorporates both sensory and motor pathways in the body that cause voluntary and involuntary actions. Maximum lesion of the PNS may lead to neuropathies and sensory loss.

930. Sweet. Autonomic Nervous System (ANS).

The ANS is in control of bodily processes that are beyond control like the rate of heartbeat, digestion, and the secretion of glands. It is divided into two, the sympathetic and the parasympathetic. ANS targeting drugs are predominantly applied to the cardiovascular and respiratory therapy.

931. Sympathetic Nervous System

The sympathetic system makes the body ready to fight or even flee. It raises the energy release, pulse and blood pressure. Adrenergic medication replicates these effects whereas blockers diminish them in high blood pressure.

932. The Parasympathetic nervous system is the second nervous system.

The parasympathetic facilitates the functions of rest and digest, although the heart rate is slowed down and it boosts digestion. It is primarily an acetylcholine agonist on muscarinic receptors. It is hetero pathologically modified with the help of parasympathomimetic and parasympatholytic drugs.

933. Somatic Nervous System

The voluntary skeletal muscles are the muscles of the body, which are regulated by the somatic nervous system through the motor neurons. It translates reflexion and examine behavior. The neuromuscular blockers are effective here when conducting surgical anesthesia.

934. Neurotransmitter

A neurotransmitter is a chemical based compound that is secreted by the neurons to pass information between the synapses. These are acetylcholine, dopamine and serotonin. They control mood, cognition and muscle control.

935. Acetylcholine

The acetylcholine (ACh) is a significant neurotransmitter of central and peripheral nervous systems. It controls the contraction of the muscles, the parasympathetic functions, and the thoughts. ACh modulators are applied in the myasthenia gravis and Alzheimer disease.

936. Norepinephrine

The norepinephrine is one of the major neurotransmitters of the sympathetic nervous system which is a hormone. It ramps up the glucose release, heart rate and blood pressure. Several therapies target receptors of adrenergic agonist and blockers.

937. Epinephrine

Epinephrine (adrenaline) is a hormone as well as a neurotransmitter that controls emergency response of fight or flight. It has effect on alpha and beta adrenergic receptors. It has clinical use that includes cardiac arrest and the treatment of anaphylaxis.

938. Dopamine

Dopamine is a neurotransmitter, which takes part in the desire, motivation, and motor coordination. The dopaminergic medications play a crucial role in mental disorders and Parkinson disease. Its lack of balance is to do with schizophrenia and addiction.

939. Serotonin (HT)

Serotonin controls the mood, gastrointestinal motility, appetite and sleep. It does so via a variety of receptor subtypes of the brain. SSRIs such as antidepressants promote the action of serotonin to boost the mood.

940. GABA

The most important neuronal inhibitor in the CNS is the GABA. It suppresses the neuronal excitability and prevents the seizures. GABA action enhancing drugs are employed as anxiolytics and anticonvulsants.

941. Glutamate

The primary excitatory neurotransmitter in CNS is Glutamate. It contributes to learning, memory as well as synaptic plasticity. Over release of glutamate leads to stroke and epilepsy neurotoxicity.

942. Glycine

Glycine is a neurotransmitter, which is inhibitory in nature and located in the brainstem and spinal cord. It regulates transmission of the motor and sensory. Glycine receptors drugs can be used as therapies in spasticity.

943. Co-Transmission

Co-transmission is when the release of neurons takes place in more than one neurotransmitter. It events out synaptic communication and varied physiological consequences. Theory narrows down on knowledge of the nervous system mechanism.

944. Neurohumoral Transmission

Neurohumoral transmission This is the chemical communication of neurons and the target cells by the use of neurotransmitters or hormones. It is the basis of all the neural control processes. Autonomic and CNS activity can be altered using drugs that act upon this process.

945. Cholinergic Receptor

Receptors of acetylcholine which are cholinergic are referred to as nicotinic or muscarinic receptors. They control the parasympathetic reactions and neuromuscular activities. There are several therapeutic agents that either are agonists or anti agonists of these receptors.

946. Adrenergic Receptor

The catecholamines that react with the adrenergic receptors include epinephrine and norepinephrine. They are classified into alpha and beta subtypes which mediate cardiovascular effects and metabolic effects. The adrenergic drugs play a significant role in the treatment of asthma, hypertension, and cardiac failure.

947. Nicotinic Receptor

The nicotinic receptors are ionic channels that have a response to acetylcholine and nicotine that are ligand gated. They occur at neuromuscular junction, autonomic ganglia as well as the brain. Depolarization and muscle contraction is rapid due to the cause of activation. Medications that act on these receptors are applied in the treatment of anesthesia and cessation of smoking.

948. Muscarinic Receptor

The muscarinic receptors are G- protein coupled receptors that are activated by acetylcholine and muscarine. They mediate the parasympathetic activity including the contraction of smooth muscle and secretion of glands. These receptors can be divided into subtypes (M M). Such effects are blocked by muscarinic antagonists such as atropine.

949. Alpha Receptor

Alpha receptors are adrenergic receptors that are sensitive to norepinephrine and epinephrine. The alpha receptors trigger the vasoconstriction, and alpha receptors suppress the release of neurotransmitters. The alpha blockers are used in hypertension as well as in benign prostatic hyperplasia. In their presence, there is a change in sympathetic activity.

950. Beta Receptor

Beta receptors are adrenergic divided into β1, β2 and β3 receptors of which β1 receptors stimulate heart rate, β2 mediate bronchodilation, and β3 receptors regulate lipolysis. The beta agonists and antagonists are commonly applied in heart and lung treatment. They are directly modulated, influence of which on the cardiac output and the airways is directly observed.

951. Parasympathomimetic Drug

The parasympathetic nervous system is simulated by the effects of parasympathomimetic drugs, which are similar to the effects of acetylcholine. Their effects are stimulated in muscarinic receptors resulting in contraction of the pupil, slowed heart rate and secretion by the glands. Such agents apply in glaucoma and urinary retention. Examples will be pilocarpine and bethanechol.

952. Parasympatholytic Drug

Parasympatholytics inhibit the activation of parasympathetic nerve by antagonizing the acetylcholine in muscarinic receptors. They cause enlargement of the pupil, dry mouth and accelerated heart rate. Atropine and scopolamine are the typical representatives in preanesthetic medication and in the treatment of bradycardia

953. Sympathomimetic Drug

The sympathomimetics are an effective agitator of adrenergic receptors, emulating the activities of the sympathetic nervous system. They accelerate the heart rate, expand bronchi and elevate the blood pressure. The drugs such as adrenaline and salbutamol are under this category. They are applied in asthma, cardiac arrest and hypotension.

954. Sympatholytic Drug

Sympathetics drugs also suppress the sympathetic activity by blocking the adrenergic receptors or decreasing the release of neurotransmitters. They reduce the heart rate and blood pressure. Common ones are beta blockers and alpha blockers that find application in the management of both high blood pressure and anxiety.

955. Neuromuscular Junction

The motor neuron and the skeletal muscle fiber synapse is called the neuromuscular junction. Acetylcholine that is discharged by the neuron attaches to nicotinic receptors, which causes contraction in the muscle. The drugs that work in this effect may cause paralysis during surgery or ameliorate myasthenia gravis.

956. Skeletal Muscle Relaxant

Skeletal muscle relaxants lower the tone of muscle and spasms. These include periphery at the neuromuscular junction or centrally on the spinal pathways. In clinical practice, they are applied in muscle spasms, surgery and in spastic disorders. Some of the examples exist in baclofen and dantrolene.

957. Depolarizing Blocker

Succinylcholine is used as depolarizing blockers and leads to sustained depolarization of the nicotinic receptors. This inhibits any other contraction by the muscle leading to paralysis. Their actions are fast acting but fast wearing and are therefore recommended in short surgery.

958. Non Depolarizing Blocker

The nondepolarizing blockers compete with acetylcholine in the nicotinic receptors but they do not depolarize. This inhibits contraction of the muscle resulting to relaxation. Drugs such as pancuronium and vecuronium are administered in the course of anesthesia. Anticholinesterases cannot be reversible.

959. Local Anesthetic

Local anesthetics inhibit sodium channels by blocking the conductivity of nerves in the neuronal membrane. It will avoid the transmission of pain without any consciousness loss. Ordinary examples are lidocaine and bupivacaine. These are applied in dental, minor and regional surgeries.

960. Sodium Channel Blocker

Sodium channel blockers do not allow sodium ions to enter the body as a part of nerve or cardiac action potential. They have the effect of local anesthesia in nerves, and of antiarrhythmic in the heart. They stabilize abnormal electrical activity, abnormal excitable membranes.

961. Myasthenia Gravis

Myasthenia gravis is an autoimmune patient of neuromuscular disease that is produced by antibodies targeting nicotinic receptors. It causes fatigue and weakness of the muscles. There are anticholinesterase medications and immunosuppressants used to treat.

962. Anticholinesterase Drug

Anticholinesterases act as inhibitors of the acetylcholine enzyme, and are used to extend the effect of acetylcholine on the synapses. They are applied in the treatment of myasthenia gravis, glaucoma, and Alzheimer. The most notable illustrations are neostigmine and physostigmine. Redundant consumption may lead to cholinergic crisis.

963. Glaucoma

Glaucoma is a collection of eye disorders that consequence in most instances, the escalation of intraocular pressure that causes the damage of optic nerve. Pressure is lowered with the aid of parasympathomimetic and carbonic anhydrase inhibitor medications. With early treatment, the sight cannot be completely lost.

964. Miotics

Miotics are medications and they impact the pupil, which constrict and stimulate muscarinic receptors in the eye. They augment the efflorescent humor in the eyes and reduce the intricate optical pressure. Pilocarpine is a miotic that is widely used as a part of the glaucoma management.

965. Mydriatics

Mydriatics enlarge the pupil by inhibiting the parasympathetic or by activating sympathetic that stimulate. They are enlisted in ophthalmic tests and surgical practices. Common mydriatic drugs are atropine and phenylephrine. It should not be used in the long run in glaucoma patients.

966. Central Nervous System (CNS)

CNS is the brain and the spinal cord which is involved in processing and coordinating all the activities of the body. It controls consciousness, motor dexterity and feeling. Neurological and psychiatric disorders are treated by a large number of drugs that target CNS pathways.

967. Blood Brain Barrier (CNS)

The selective barrier of the brain is blood brain barrier (BBB), a selective barrier that is comprised of endothelial cells which limits drug entry to the brain. Polar drugs are not allowed to cross easily, and lipid soluble and small molecules do. The BBB shields the nerve tissue and interferes with delivery of neuropharmacological agents to the CNS.

968. Neurotransmission (CNS)

CNS neurotransmission refers to transference of neurons through chemical signals using neurotransmitters. It regulates emotion, cognition and sensation perception. This process is regulated by drugs to cure such conditions as epilepsy, anxiety, and depression.

969. Excitatory Neurotransmitter

Excitatory neurotransmitters facilitate depolarization of neurons and this favor the release of generation of action potential. Glutamate and acetylcholine are some of the major examples. Hyperirritability can result in neurotoxicity or seizures.

970. Inhibitory Neurotransmitter

The inhibitory neurotransmitters decrease the excitability of the neurons preserving the CNS equilibrium. Inhibitory transmitters include GABA and glycine. Lack of the latter can lead to anxiety or convulsive disorder.

971. General Anesthetic

General anesthetics cause temporary inability to perceive and sense. They tend to operate within the CNS receptors and inhibit the activity of the neurons. They are inhalational and intravenous anesthetics such as halothane and propofol. Adequate doses cause patient safety in surgery.

972. Pre Anesthetic Medication

Prior to anesthesia, preanesthetic drugs are given to cut back anxiety, pain and secretion. Popular ones are benzodiazepines, opioid, and anticholinergics. They guarantee an easy induction and anesthetic recovery.

973. Inhalation Anesthetic

The inhalation anesthetics are volatile substances that are used to cause anesthesia by inhaling via the respiratory system. These examples are nitrous oxide and sevoflurane. They are also controlled depth of anesthesia though have to be monitored in regard to respiratory depression.

974. Intravenous Anesthetic

Anesthetics that are intravenously administered cause rapid anesthesia because of their administration directly into the blood. They include propofol, thiopental and ketamine. They are used in situations where the procedures are brief or induction is preceded by inhalational agents.

975. Sedative

Sedatives relax the central nervous system and decrease the level of anxiety without making one sleepy. They do so through improving the GABAergic transmission. The most common stimulants that are used in preoperative or anxiety management are benzodiazepines and barbiturates.

976. Hypnotic

The effect of hypnotics is more depressive of the CNS activity than the action of the sedatives, which leads to sleep. They have insomnia and sleep disorders prescriptions. Such drugs as zolpidem or temazepam are common. Excessive use leads to addiction and dependency.

977. Benzodiazepine

Benzodiazepines are CNS depressants which augment activity of GABA giving it anxiogenic, anticonvulsive, and hypnotic effects. The most typical ones are diazepam and lorazepam. They are less dangerous than barbiturates but would result into dependence when used over a long period.

978. Barbiturate

Barbiturates are CNS depressants, and they extend the effect of GABA mediated chloride channels. They cause anesthesia, sedation or control of seizures. They are less frequently used since they are very toxic and may be dependent.

979. Central Effecting Relaxant of Muscles.

These medications inhibit muscle spasm by solving spinal reflexes and nullify muscle strength. They are applied in such conditions as spasticity and back pains. The examples are tizanidine and baclofen.

980. Antiepileptic Drug

Antiepileptics manage the seizures with the help of stabilization of neuronal membranes and decrease of excitability. They are through sodium channel inhibition or GABA enhancement. Frequently used drugs are valproate, carbamazepine and phenytoin.

981. Seizure Control

Seizure control is a process that aims at inhibiting or suppressing the excess release of electrical impulses in the brain. It is done by means of antiepileptic medication, altering the way of life, and occasionally surgery. Remission requires continuous therapy to be maintained.

982. Sodium Channel Modulator

They prevent recurrent neuronal activation, preventing depolarization of sodium influx. They normalize membranes and cripple seizure activity. The archetypes of the sodium channel modulators are phenytoin and lamotrigine.

983. GABA Enhancer

GABA stimulants boost the inhibitory neurotransmission by extending the action or imitating the actions of GABA. The medications, such as benzodiazepines and valproate, belong to this category. They can be used in managing epilepsy and anxiety.

984. Alcohol

Alcohol (ethanol) is a CNS depressant that is stimulating GABA and inhibiting NMDA receptors. It produces relaxation effect at low doses and deteriorates coordination and judgment at higher doses. Dependence and liver damage occurs in case of chronic use.

985. Disulfiram

Disulfiram finds its application in the alcohol aversion therapy. It block the effects of aldehyde dehydrogenase producing unpleasant effects (flushing, nausea) whenever one drinks alcohol. This prevents relapse among the alcohol dependent patients.

986. Psychopharmacology

Psychopharmacology is the health science dealing with the interaction of drugs with mood, behavior and mental performance. It lays the foundation on the treatment of psychiatric disorders like depression and schizophrenia. It is a branch that incorporates neuroscience and pharmacology.

987. Antipsychotic Drug

To treat psychotic disorders, the antipsychotics are administered to regulate the dopamine and serotonin pathway. They minimize hallucinations, delusions and agitation. The examples are risperidone and haloperidol.

988. Schizophrenia Treatment

Antipsychotic drugs are used in the management of schizophrenia and they block the dopamine D receptors. Rehabilitation is also imperative on psychosocial therapy. Formulations with long acting improves compliance and limits of relapse.

989. Dopamine Blocker

The dopaminergic transmission in the brain is blocked by dopamine blockers which suppress the psychotic symptoms. They are applied in the case of schizophrenia, mania, and nausea. Nonetheless, they might result in extrapyramidal side effects.

990. Typical Antipsychotic

Common antipsychotics, including chlorpromazine, are strong blockers of D receptors which decrease positive symptoms of schizophrenia. They are more exposed to movement disorders. They work though they are not as popular as atypical drugs.

991. Atypical Antipsychotic

Individual antipsychotics have an effect on both dopamine and serotonin receptors effectively treating both positive and negative symptoms of schizophrenia. Some of them include clozapine and olanzapine. They do not have many side effects on the motor side and are accompanied by a weight gain.

992. Antidepressant Drug

Generation of antidepressants rebalances the neurotransmitters in the mood disorders. They operate on the serotonin, norepinephrine pathways or dopamine. The general classes are SSRIs, SNRI and TCAs. Frequent use is the only one that is needed to be effective.

993. MAO Inhibitor

The monoamine oxidases are blocked by the monoamine oxidase inhibitors. They are applied in the treatment of depression that is resistant to other forms of treatments. Their use should be closely monitored because dietary and drug interactions can take place.

994. SNRI (Serotonin-norepinephrine reuptake inhibitor)

SNRI are antidepressants whose effect causes a rise in the concentration of serotonin and norepinephrine in the brain clefts, as they inhibit the reabsorption of these antagonists in the brain. It is a twofold mechanism that enhances the mood, energy, and alertness. They are normally used in treating depression,

anxiety disorders and neuropathic pain. They can be venlafaxine and duloxetine. The side effects can be nausea, insomnia or hypertension.

995. Anti-Anxiety Drug

Antianxiety or anxiolytic drugs are those medications which minimize the effects of anxiety, tension and nervousness. They have the effect of stimulating inhibitory neurotransmission (e.g. via GABA receptors) or acting on serotonin pathways. Categories that are used frequently are benzodiazepines and SSRIs. The treatment of such drugs is generalized anxiety disorder, panic disorder, phobias. Its use should be cautious when long term because it causes dependence.

996. Anxiolytic Agent

Anxiolytics are a line of medications that allow reducing anxiety and bringing in a state of calmness without leading to sedation at the therapeutic levels. They are mainly acting on the central nervous system, particularly in an augmentation of the transmission of GABAergic. One of them is diazepam and buspirone. The nonbenzodiazepine anxiolytics are favored in the chronic management of anxiety in comparison to benzodiazepine anxiolytic because of the reduced risk of addiction.

997. Anti-Manic Drug

Manik episodes of bipolar disorder are treated with the help of anti-maniac medications. They stabilize the mood and avoid dramatic swings in mood. The traditional mood stabilizer is lithium and such anticonvulsants as valproate or carbamazepine are also utilized. These medications control the neurotransmitter release and intracellular signaling pathways. Mainly, toxicity should be prevented by monitoring frequently..

998. Lithium Carbonate

Lithium carbonate is a mood stabilizing medication that is primarily applied to bipolar disorder to regulate manic episodes and depression episodes. It does it by working through the serotonin levels, norepinephrine levels and through working on intracellular second messengers. Lithium has a low therapeutic index, which means that it has a low dose range. These side effects are tremors, hypothyroidism and renal effects.

999. Hallucinogen

Psychoactive substances, psychoactive drugs, sometimes causing visual or auditory hallucinations are the hallucinogens. They primarily work on serotonin (HT A) receptors. The most typical examples are LSD, psilocybin and mescaline. When they are researched as representatives of therapeutic potential, they may create psychological suffering or bad trip in uncontrolled conditions.

1000. Psychedelic Drug

Psychedelic drugs are the subclass of hallucinogens that cause the altered state of mind, distortion of senses and spiritualities. They regulate the action of the serotonin receptor and neural connections. Examples include LSD and DMT.

1001. Parkinson's Disease Drug

The medications of the Parkinson disease are also used to replace the loss of dopaminergic in the brain in order to ease motor symptoms like tremors, rigidity and bradykinesia. There are treatment methods such as dopamine precursors (levodopa), dopamine agonists, MAOB/inhibitors, and COMT/inhibitors. These are medicines which are used to control the symptoms but not to cure the disease.

1002. Levodopa

The best drug in the treatment of Parkinsonism disease is levodopa as it is a precursor of dopamine which the dopamine itself can not cross the blood brain barrier. It also restores the amount of dopamine found within the striatum which enhances motor activity. It is usually used with carbidopa in order to inhibit peripheral metabolism. When used in the long run, it can cause dyskinesia.

1003. Carbidopa

Carbidopa is as well administered together with levodopa in the treatment of Parkinson. It blocks the peripheral decarboxylase of levodopa to avoid an early process of levodopa decarboxylase to dopamine when it is external to the brain. This increases the levels of levodopa to CNS and minimizes other side effects like nausea and vomiting. It fails to penetrate through the blood brain barrier.

1004. Dopamine Agonist

Dopamine stimulators act in a direct mechanism or stimulate dopamine receptors in the brain imitating the effect of dopamine. They are applied in either early Parkinson disease or as the additional agents to levodopa treatment. One is pramipexole and another one is ropinirole. They can lead to such side effects as hallucinations, nausea, or impulse control disorders.

1005. COMT Inhibitor

COMT inhibitors prevent enzyme that breaks down levodopa and dopamine to strengthen their action in the treatment of Parkinsonism diseases. They increase levodopa response time and minimize the symptoms of wearing off. These are entacapone and tolcapone. Frequently monitoring is necessary because of the possible hepatotoxicity.

1006. MAOB Inhibitor

Monoamine oxidase B (MAO B) activity blockers the degradation of dopamine in the brain and thus increase its supply in the brain in Parkinson disease. They are also adjunctly applied with levodopa. Selective agents are selegiline and rasagiline. They have the potential to prevent the progression of the disease and stimulate the motor symptoms with the minimum side effects.

1007. Anticholinergic (CNS)

Central anticholinergic medications block muscarinic acetylcholine receptors in the brain, and cause tremors and rigidity to be less prominent in the presence of Parkinson. They assist in balancing dopamine and acetylcholine functions of the basal ganglia. Benztropine and trihexyphenidyl are the examples. Its application is weak in the elderly because of cognitive side effects.

1008. Alzheimer's Disease Drug

Therapeutic interventions in the Alzheimer disease include drugs that attempt to minimize the cognitive deterioration of the disease through cholinergic functions or excitotoxicity. These are classes of acetylcholinesterase inhibitors (donepezil, rivastigmine) and of NMDA receptor antagonists (memantine). These medicines are not curative and only improve quality of life and mental performance.

1009. Acetylcholinesterase Inhibitor

The acetylcholinesterase inhibitors block the degradation of acetylcholine in the synaptic clefts and stimulates the cholinergic transmission in the brain. They are applied on Alzheimer disease and myasthenia gravis. Such an example is donepezil and rivastigmine. Side effects entail nausea and bradycardia as well as gastrointestinal upsets.

1010. NMDA Receptor Antagonist

The antagonists of NMDA receptors prevent the excess of glutamate action that leads to excitotoxic neuron damage. An example of the primary one is memantine utilized in moderate to serious Alzheimer disease. It assists in the cognitive function and memory. It is also tolerated and in most cases synergistically used with acetylcholinesterase inhibitors.

1011. CNS Stimulant

Stimulants of the CNS are associated with raising alertness, attention and energy through facilitating the dopaminergic and noradrenergic transmission. They are applied in ADHD, narcolepsy and some cases of depression. The examples are amphetamines and methylphenidate. Dependence, insomnia and cardiovascular are some of the side effects associated with overuse.

1012. Nootropic Drug

Smart drugs, (also known as nootropics) are stimulants that assist the brain in its cognitive processes, namely memory, concentration and learning, without any sense of sedation or psychostimulation. They enhance neuro plasticity and neuronal metabolism. These are the modafinil and piracetam. They are applied in dementia, cognitive, and attention disorders.

1013. Opioid Analgesic

Opioid analgesics are effective and powerful analgesics and work on μ-opioid central nervous system receptors. They change the perception about pain and emotional reaction to it. These are morphine,

codeine and fentanyl. Its use is associated with serious risks of tolerance and dependence as well as respiratory depression, and, therefore, it must be used with caution over a long period.

1014. Hemodynamics

Hemodynamics is a study on how blood moves and what forces of movement are used by the blood to water the body in a cardiovascular system. It encompasses blood pressure, resistance and also the cardiac output parameters. The adequate hemodynamic balance guarantees the adequate tissue perfusion and oxygenation. Deformities can cause such disorders as shock or high blood pressure.

1015. Cardiac Electrophysiology

Cardiac electrophysiology is the branch of cardiology which researches the heart electrical activities that regulate its rhythm and rate. It consists in the production and transmission of action potentials by using the conduction by a pacemaker and a conduction tissue. It is a system that maintains synchrony between atria and ventricles contraction. The disturbances may lead to arrhythmias or conduction blocks.

1016. Action Potential

Action potential refers to a rapid fluctuation of electrical membrane potential of the cardiac cells which causes depolarization and repolarization. It causes contraction of the cardiac muscle as a result of evoking the influx of calcium ions. Variation of action potentials occurs in different cardiac cells. The drugs that do act on these phases aid in the management of arrhythmias.

1017. Cardiac Cycle

One cycle of the heart function is the cardiac cycle comprising of the contraction (systole) and relaxation (diastole) of the arterial chambers (atria) and the ventricles. It doensures that blood comes through the lungs and systemic circulation continuously. A normal adult in a restful condition takes about . seconds in each cycle. Adequate coordination keeps the heart active.

1018. Myocardial Contractility

The contractility of the heart muscle in response to a zero amount of preload and afterload is known as myocardial contractility. It is dependent on the levels of availability of calcium ions and myocardial energy stores. Greater contractility boosts the volume of stroke and lesser contractility causes heart failure. Such drugs as digoxin act by enhancing contractile power.

1019. Stroke Volume

The volume of blood that is expelled by the heart with every beat is referred to as stroke volume, on average among adults is about mL. It is based on preload, afterload and myocardial contractility. Stroke volume makes a significant contribution to the cardiac output. Fluid imbalance or cardiac dysfunction may be the cause of variations.

1020. Cardiac Output

The total amount of blood that is ejected by the heart in one minute is known as cardiac output which is a product of stroke volume and heart rate. It is one of the most important pointers to cardiovascular performance and tissue perfusion. Adults have normal heart output of approximately L/min at rest. Changes point to the cardiac or circulatory defects.

1021. Ejection Fraction

Ejection fraction (EF) represents a percentage of the volume of enddiastolic volume that is ejected under systole. Normal EF is between to and this is an indication of the efficiency of pumping of the heart. Decreased EF is systolic dysfunction that is frequent in heart failure. It is an essential diagnostic and prognostic value in the sphere of cardiology.

1022. Preload

Preload is the extent of the change in cardiac muscular fibers during the end of the diastole before the contraction. It is based on the venous return as well as enddiastolic volume. The best preload improves the stroke capacity through FrankStarling mechanism. Too much of preload on the other hand may cause signs of heart failure and congestion of the lungs..

1023. Afterload

Afterload is the force which is required by the left ventricle to push the blood into the aorta. It is mainly affected by the systemic vascular resistance and aortic pressure. Increase in afterload causes cardiac workload and oxygen demand. Vasodilators are drugs that are taken to lower the afterload during heart failure and hypertension.

1024. Frank Starling Mechanism

The Frank Starling mechanism explains the correlation between the distention of myocardial fibres and the contraction force. With an increase in preload the resultant increase in cardiac output is attributed to increase in actinmyosin interaction. Such an innate characteristic aids the heart to work with the changes in venous return. Nonetheless, overstretching will affect performance and lead to decompensation.

1025. Left Ventricular Failure

Left ventricular failure is a case of ineffectiveness of the left ventricle in being able to pump blood effectively to the circulatory system. This results in congestion of the lungs, dyspnea and orthopnea. Such common causes are myocardial infarction and chronic hypertension. Management aims at enhancing contractility and lowering afterload as a way of treating to alleviate symptoms.

1026. Right Ventricular Failure

In right ventricular failure, the right ventricle does not pump blood properly thus causing venous congestion throughout the body. There is edema, jugular venous distention and hepatomegaly in patients. It usually progresses as a result of leftsided heart failure or pulmonary hypertension. Treatment encompasses diuretics and treating underlying causes of pulmonary/cardiac.

1027. Cardiomegaly

Cardiomegaly is a pathological increase in the size of the heart, which was observed by the help of imaging Xray or echocardiography. It may be caused by chronic hypertension, valvular or heart failure. The disorder is an indication of compensatory hypertrophy or enlargement of heart chambers. Prolonged cardiomegaly has the risk of decreased efficiency of the heart.

1028. Edema

Edema refers to excessive fluid that gets accumulated in the interstitial fluid and is common in heart failure, liver problems or kidney problems. In heart diseases, it is caused by the high venous pressure and fluid retention. The right heart failure results in the appearance of peripheral edema whereas pulmonary edema is indicative of a left sided involvement.

1029. Digitalis Glycoside

Digitalis glycosides are a group of cardiac glycosides derived out of Digitalis species, which is mainly used to treat heart failure and to treat arrhythmias. They amplify the myocardial contractile force by suppressing Na +/K +receptors:Na +/K +ATPase, raising the intracellular calcium concentrations. The most popular agent is digoxin. Among the toxicity are nausea, arrhythmias and eye sight problems.

1030. Digoxin

Digoxin is a potent cardiac glycoside agent that is applied to treat congestive heart failure and atrial fibrillation. It enhances the cardiac output through heightening the contractility and slowing the heart rate through the vagal stimulation. It has a small therapeutic index, which should be dosed attentively. Keeping track of serum levels and electrolytes are used to avoid being toxic.

1031. Positive Inotropic Agent

Positive inotropic agents amplify the strength of the cardiac muscle contraction and it is used to boost the cardiac output of heart failure. Examples are digoxin, dopamine and dobutamine. They do that by raising the intracellular calcium, or cAMP. Excessive use can lead to arrhythmias so they are used with caution under medical care.

1032. Cardiotonic Drug

Cardiotonic medications enhance the strength of the heart contractions and enhance the pumping method in the heart. They find application in such cases as congestive heart failure to boost heart output. A typical example is the cardiac glycosids and phosphodiesterase inhibitors. Their intervention prevents symptoms dyspnea and fatigue, as well as enhances the capacity to exercise.

1033. Phosphodiesterase Inhibitor

Phosphodiesterase inhibitors act on the phosphodiesterase PDE enzyme and result in a rise in the cAMP levels in the cardiac muscle due which an improvement in contractility and vasodilation in the heart is

caused. Shortterm treatment of acute heart failure includes agents, such as milrinone. The latter produces fast hemodynamic effect at the cost of arrhythmias at long term use.

1034. Milrinone

Milrinone is a bipyridine derivative that is an effective phosphodiesterase inhibitor that is a positive inotropic and vasodilator. It results in augmenting cardiac output and decreasing pulmonary veins resistance. Their applications include acute decompensated heart failure and are only used to provide transitory assistance before actual therapy is administered. One of the possible side effects is hypotension.

1035. Dobutamine

Dobutamine is an artificial catecholamine that stimulates b adrenergic receptor selectively to enhance myocardial contractility and stroke volume. It is applied in a cardiogenic shock and acute heart failure to resuscitate supply. In contrast, it produces a little vasoconstriction as opposed to dopamine. Constant attention should be observed during the intravenous infusion.

1036. Vasodilator

Vasodilators are drugs that cause relaxation of the vascular smooth muscles which result to the dilation of blood vessels and decrease in peripheral resistance. They decrease afterload and enhance the heart output in heart failure and high blood pressure (hypertension). Widely used ones are hydralazine and nitrates. The possible side effects are hypotension and reflex tachycardia.

1037. ACE Inhibitor

Angiotensinconverting enzyme (ACE) inhibitors help inhibit the conversion process of the angiotensin I to angiotensin II, which in turn lowers vasoconstriction and secretion of aldosterone. They reduce blood pressure, as well as cardiac workload during heart failure. Some examples are enalapril and lisinopril. Among undesirable effects, it is worth noting cough and hyperkalemia.

1038. Angiotensin Receptor Blocker (ARB)

ARBs prevent binding of angiotensin II to AT receptors which result in vasodilation and decreases sodium retention. They are used as substitutes of patients who are not tolerant to ACE inhibitors. Losartan and valsartan are drugs that are able to control the high blood pressure and heart failure. They are more welltolerated and are less sideeffected.

1039. BetaBlocker

Betablockers are an inhibitor of badrenergic receptors, which slows down the heart rate, myocardial contractility, as well as oxygen demand. They are applicable in high blood pressure, angina, irregular heart beat and heart failure. Among them are metoprotерol and propranol. Prolonged use is effective in the survival of patients with heart failure but needs a careful dose adjustment.

1040. Diuretic Therapy in CHF

Diuretics are utilized to treat congestive heart failure and aid in the excretion of sodium and water in the organism, decreasing the blood volume and venous pressure. Pulmonary congestion is fast relieved using loop diuretics such as furosemide. They do not enhance survival but only the symptoms. Electrolytes check will be essential in order to avoid dehydration and hypokalemia.

1041. Hypertension

Hypertension Hypertension is the chronic and high blood pressure within arteries that is above the normal physiological rates ($\geq$140/90 mmHg). It elevates the probability of stroke, myocardial infarction and renal disease. The cause of primary hypertension is unknown, whereas secondary is caused by some underlying disorders. It is treated with lifestyle modification and antihypertensive medication.

1042. Blood Pressure Regulation

Blood pressure regulation is an antagonistic process among cardiac output, vascular resistance and the blood volume. It is regulated by neuronal (baroreceptor reflex), hormonal (RAAS, ADH) and by renal processes. When they are regulated properly, tissue perfusion is adequate with no destruction of vessels. There results dysregulation, which causes hypo or hypertension.

1043. Baroreceptor Reflex

Baroreceptor reflex is an autometric based mechanism taking place rapidly and resisting the variation of blood pressure. Niche receptors of the carotid sinu and aortic arch monitor the changes in pressure and relay them to the medulla. Sympathetic activity is augmented when the pressure in the blood decreases so as to rectify this situation. This reflex provides cardiovascular short term homeostasis.

1044. Vasomotor Center

The vasomotor centre is in medulla oblongata which controls the tone of the vessels and the blood pressure in the arteries. It harmonizes sympathetic and parasympathetic activities to either constrict or dilate the vessels. Stimulation results in high peripheral resistance and blood pressure. Medications that work on this center allow tackling high blood pressure and shock.

1045. Alpha Adrenergic Blocker

Alpha adrenergic blockers block alpha receptors on vascular smooth muscle, which causes blood pressure to decrease and causes the vasodilation. Their application is in hypertension and benign prostatic hyperplasia. Agents of common use are prazosin and doxazosin. Postural hypotension and dizziness are some of the side effects that cause the essential dose modification.

1046. Calcium Channel Blocker

The calcium channel blockers inhibit the influx of calcium ions into the vascular and cardiac smooth muscles. They lead to vasodilation, lower myocardial contractility and slow down the heart rate. These agents have been shown to work in hypertension, angularina and arrhythmia. Verapamil, diltiazem and amlodipine can be used.

1047. Renin Angiotensin System

Blood pressure and fluid balance is regulated by the rennin angiotensin system (RAS). Angiotensinogen is transformed to angiotensin I by Renin which is secreted by kidneys and later transformed to angiotensin II a virulent vasoconstrictor. Angiotensin II will also proceed to stimulate secretion of aldosterone, which retains sodium. RAS inhibitors are a significant antihypertensive.

1048. Thiazide Diuretic

Thiazide diuretics belong to the action of distal convoluted tubule in preventing the sodium chloride reuptake. They help to decrease plasma volume as well as peripheral resistance, and decrease the blood pressure. The most common one is hydrochlorothiazide. Taken Over a long period, it assists in the treatment of mild moderate hypertension and edema with the occurrence of hypokalemia.

1049. Loop Diuretic

Loop diuretics prevent the activity of the Na +K Cl transporter in the thick ascending limb of the loop of Henle. They generate a strong diuresis and are prescribed in cases of heart failure, pulmonary edema and kidney failure. The prototype drug is furosemide. Electrolyte imbalance particularly the hypokalemia is a serious issue.

1050. PotassiumSparing Diuretic

Potassium sparing diuretics influence the distal nephron and prevent the reabsorption of sodium and retain potassium. They usually have other diuretics in order to avert hypokalemia. They are spironolactone and amiloride. Spironolactone is also an aldosterone antagonist which is applied in heart failure and hyperaldosteronism.

1051. Sedentary Acting Antihypertensive.

Central acting antihypertensives reduce blood pressure by activating alpha adrenergic receptors in brainstem, and hence decreases sympathetic outflow. They slow down the heart rate and vascular resistance. Common examples of drugs include clonidine and methyldopa. Side effects include sedation and dry mouth.

1052. Clonidine

Clonidine is an aagonist centrally acting which cuts down the sympathetic jarring, which in turn abates the heart rate and causes a vasodilation. It is quite efficient in reducing blood pressure and is also applied in opioid withdrawal and ADHD. Sudden stopping can result in a rebound hypertension condition and therefore the doses should be tapered off gradually.

1053. Methyldopa

Methyldopa is a centrally acting antihypertensives agent that is an alpha adrenergic agonist and is safe especially in pregnancy. It gets converted to a methyl norepinephrine that blocks the sympathetic nerve

activity. The medication decreases the peripheral resistance without significant impact on the heart rate and cardiac output. They include fatigue and hemolytic anemia.

1054. Vasodilator (Direct Acting)

Direct acting vasodilators are involved in relaxing vascular smooth muscles by modifying intracellular calcium or nitric oxide. They lower the resistance and pressure of arteries within short periods. Examples are hydralazine and minoxidil. They are applied to severe hypertension and emergencies in hypertension under the control conditions.

1055. Hydralazine

Hydralazine is a direct actin arterial vasodilator which reduces the level of afterload and blood pressure due to the relaxation of the arteriolar smooth muscle. It is used together with beta blockers and diuretics to allow the prevention of reflex tachycardia and fluid retention. One should use it especially with pregnancy associated hypertension but it can lead to lupuslike reactions.

1056. Minoxidil

Minoxidil is a strong arterial vasodilator that is applicable in both severe or refractory hypertension. It stimulates potassium channels of the vascular smooth muscle resulting in hyperpolarization and relaxation. It may cause hypertrichosis making extensive topical use of the drug to grow hair in advance. Fluid retention and tachycardia reflexos are widespread.

1057. Antianginal Drug

Antianginal drugs help the relief of the chest pains transpired by myocardial ischemia either through the betterment of oxygen supply or lessening oxygen demand. These are nitrates, beta blockers, and calcium channels blockers. The agents enhance exercise tolerance and minimize anginal attacks. The type of therapy is determined by angina.

1058. Myocardial Ischemia

Myocardial ischemia is a condition whereby the blood supply of the heart muscle cannot be able to sustain the oxygen needs of the heart muscle. It causes chest pain (angina) and in case of long lasting complications, myocardial infarction. Among the causes, there are atherosclerosis and coronary spasm. Treatment includes lifestyle modifications, pharmacotherapy in the restoration of perfusion.

1059. Angina Pectoris

Angina pectoris: this refers to chest pains caused by a temporary nonfatal myocardial ischemia. It presents as pain, heaviness and or pains, which radiate to the arm or jaw. It is a typical condition that arises when one is under stress or exercising. The basis of its pharmacological treatment is made up of nitrates and beta blockers.

1060. Stable Angina

Stable angina is known to be characterized by regular and foreseeable instances of chest pain that are caused by strenuous activities or emotional traumas. It is caused by cardiac arterial fixed, atherosclerotic constriction. The pain then disappears with rest or nitroglycerin. Preventive measures involve risk factors and anticardiacal therapy in the long term.

1061. Unstable Angina

Unstable angina is a health condition that manifests as unforeseen and progressive chest pains and is also a medical emergency. It implies the rupture of the plaque and the partial thrombosis without the complete occlusion. Lack of treatment of the condition may result in myocardial infarction. Anti platelet and anticoagulant treatment are the essential aspects of the treatment.

1062. Variant Angina

Prinzmetal angina or variant angina is a condition that is caused by the temporary coronary spasm resulting in the absence of blood to the myocardium. It is frequently at rest and displays elevated ST segment on ECG. Treatment is by nitrates and calcium channel blockers. The use of betablockers is usually avoided because of the aggravation of vasospasm.

1063. Nitroglycerin

Nitroglycerin is a nitrate which releases nitric oxide leading to dilation of the venous and arteries. It lowers the demand of myocardial oxygen by lowering the preload and afterload. It is the medication of the choice when dealing with acute attacks of angina. Aside effects are common, among them, are headache, flushing and hypotension.

1064. Isosorbide Dinitrate

Isosorbide dinitrate is an organic nitrate that is applied as prophylaxis and long term treatment of angina pectoris. It causes vasodilation by the effects of nitric oxide. It is long acting as opposed to nitroglycerin. The tolerance can be acquired after constant use that requires dose free periods.

1065. Beta Blockers in Angina

Beta blockers slow down heart rate, contractility and myocardial oxygen use hence preventing anginal attacks. They have a highly effective role in the case of stable angina rendering them contraindicated in the variant angina. Widely used drugs include such drugs as metoprolol and atenolol. They enhance survival after the heart attack.

1066. Calcium Antagonists

Calcium antagonists also known as calcium channel blockers inhibit the inflow of calcium into the cardiac and vascular cells resulting in vasodilation and reduction of the myocardial workload. They are applicable in every type of angina particularly the variant angina. Amlodipine and diltiazem are both popular agents, which are used both prophylactically and in the management of blood pressure.

1067. Ranolazine

A more recent antianginal medication, Ranolazine, is an antianginal that obstructs the late sodium current in cardiac cells making the amount of calcium calmed in to the cells less. It enhances the myocardial relaxation and efficiency without influencing the heart rate and blood pressure. It is primarily applied as an adjunct treatment of chronic angina.

1068. Antiarrhythmic Drug

Antiarrhythmic drugs are drugs, which normalize heart rhythm through alteration of the ion channel activities and conduction. According to the Vaughan Williams system, they are united into four big classes. The drugs treat arrhythmias including atrial fibrillation, tachycardia, ventricular ectopy. Suitable choice is also essential as a result of pro arrhythmic risks.

1069. Arrhythmia

An arrhythmia refers to a cardiac rhythm abnormality (aberrant cardiac impulse rate, rhythm) or orchestration (cardiac conduction). It may lead to palpitations, syncope or sudden cardiac arrest. As causes may be electrolyte imbalances, ischemia or drug toxicity. Therapy is done using pharmacological measures or electrical current such as cardioversion.

1070. Bradycardia

Bradycardia is defined as slow heart rate which in most cases is below 60 BPM. It may be physiological, such as an athlete, or pathological following the disease of the conduction system or drug influence. Extreme cases of bradycardia can lead to dizziness and hypotension. In chronic cases pacemaker treatment may be necessary.

1071. Tachycardia

Tachycardia is an irregular heartbeat rate that is above 100 beats in one minute. It could either start out at the atria or ventricles and could be a result of stress, fever or cardiac pathology. Constant tachycardia decreases the efficiency of the heart and supply of oxygen. It is controlled with the help of betablockers and antiarrhythmic drugs.

1072. Atrial Fibrillation

Atrial fibrillation (AF) is a general arrhythmia, which can be described as atrial trachteries and ventricular irregularity. It predisposes the thromboembolism and stroke. The management involves a control of the rate, itself, rhythm correction and anticoagulation. The medications used include amiodarone and betablockers.

1073. Ventricular Fibrillation

Ventricular fibrillation is a life threatening complication in which rapid and irregular contractions of the heart occurs which stops cardiac production. It leads to cardiac arrest immediately unless it is suddenly treated. The first line of treatment is defibrillation that should be followed by antiarrhythmic therapy.

1074. Sodium Channel Inhibitor (Class I)

Antiararrhythmics of the class I category inhibit fast sodium channels in the cardiac cells which reduce the rate of depolarization and conduction velocity. They have been divided into IA, IB and IC categories according to their kinetic type. Examples include quinidine, lidocaine and flecainide. They must be monitored by ECG because they are proarrhythmic.

1075. Beta Blocker (Class II)

Class II antiarrhythmics consist of betablockers: the drugs prevent the sympathetic effects on the heart, decrease automaticity and conduction. They work on the supraventricular arrhythmias and the postmyocardial infarction arrhythmias. Such examples are propranol and metoprostol. They are beneficial in terms of survival, but are contraindicated in gross heart block.

1076. Class III Potassium Channel Blocker (Class III)

The Class III antiarrhythmic drugs are blockers of potassium channels, which extend repolarization and refractory period. They come in handy in ventricular and atrial arrhythmia. Examples of these include amiodarone and sotalol. They are effective but need to be monitored to eliminate possible toxicities, in particular, thyroid and pulmonary toxicities.

1077. Calcium Channel Blocker (Class IV)

Class IV antiarrhythmics block slow calcium channels especially at the SA and AV nodes, slowing down the conduction velocity. They work well in the supraventricular tachyarrhythmias. The agents are verapamil and diltiazem. Negative inotropic effects should ensure that they are avoided in heart failure.

1078. Amiodarone

Amiodarone is an antiarrhythmic which is broad spectrum and has all the four classes of the Vaughan Williams. It increases the duration of action potential and refractory period. It is applied in supra ventricular and ventricular arrhythmia. When taken long term it can lead to thyroid dysfunction, pulmonary fibrosis or cornal deposits.

1079. Lidocaine

Lidocaine is a sodium blocking IB antibiotics agent, and it reduces the duration of action potentials. It is mostly applied in the treatment of ventricular arrhythmias particularly after myocardial infarction. Its administration via an intravenous route causes minimum effects on the atrial tissue. There can be neurological toxicity that occurs at high dosage.

1080. Quinidine

Quinidine is an antiarrhythmic class IA which decreases the speed in which the depolarization occurs and increases the duration in which the repolarization process takes place. It can be used in atrial and ventricular arrhythmia. Nevertheless, it can lead to such undesired outcomes as cinchonism (tinnitus, headache) and torsades de pointes. It is no longer used, as substitutes have been found which are safer.

1081. Antihyperlipidemic Drug

Antihyperlipidemic medications reduce the high level of lipids in blood to block atherosclerosis and heart diseases. The notable ones are statins, fibrates, niacins and bile acid sequestrants. These agents are aimed at cholesterol production or improve the lipid clearance. The lifestyle change is used in addition to pharmacological treatment.

1082. Hyperlipidemia

Hyperlipidemia is a metabolic disease that is marked by the increased level of lipids cholesterol and triglycerides or both in the blood. It raises the chances of atherosclerosis and heart attack diseases. The causes are either genetics or diet or secondary conditions. The management involves control of the diet and lipid medications.

1083. LDL Cholesterol

Lowdensity lipoprotein (LDL) cholesterol is also referred to as bad cholesterol as it will carry cholesterol to the peripheral tissues and the growth of plaque. The level of LDL is also a significant risk of atherosclerosis. Statins have been proven to lower the LDL by blocking its liver synthesis.

1084. HDL Cholesterol

The good cholesterol is referred to as high density lipoprotein (HDL) cholesterol that is known to be involved in taking cholesterol back to the liver to be excreting it. The greater the level of HDL, the lower the risk of cardiovascular. Witnessing exercise, nutritious diet and some medications such as niacin have the ability to raise HDL.

1085. Statin

First line lipid lowering agents are statins which inhibit HMG CoA reductase which is the critical enzyme in the production of cholesterol. They have positive effects of lowering LDL and triglycerides and slightly increasing HDL. Examples on this are atorvastatin and simvastatin. They are also anti inflammatory and also plaque stabilizing.

1086. HMG CoA Reductase Inhibitor

The inhibitors of HMG CoA reductase are used to prohibit the rate limiting enzyme in the production of cholesterol in the liver. This causes an increase in the level of LDL receptors and an improvement in the clearance of the circulating LDL. The most popular medications of this kind are statins. The possible side effects include myopathy and hepatotoxicity.

1087. Fibrate

Fibrates stimulate peroxisome proliferator-activated receptor-alpha (PPARa) which augments lipoprotein lipase and augmentation of triglycerides breakdown. They especially work in hypertriglyceridemia. Examples are gemfibrozil and fenofibrate. When they are combined, they may induce myopathy that statin induces.

1088. Bile Acid Sequestrant

The intestine has bile acids which bile acid sequestrants bind, resulting in the nonreuptake of these acids. This compels liver to expend more cholesterol in the production of bile acids hence reducing the plasma LDL levels. A typical example is cholestyramine. The side effects are gastrointestinal discomfort and constipation.

1089. Niacin

Niacin (vitamin B) inhibits hepatic VLDL and LDL production and elevates the HDL levels. It is among the most efficient agents of increasing the HDL cholesterol. Notwithstanding, it can have the effects of flushing, pruritus and hyperglycemia. Long acting forms reduce adverse effects.

1090. PCSK Inhibitor

PCSK inhibitors are monoclonal antibodies that inhibit the degradation of the hepatic LDL receptors, increasing the stories of the LDL of the blood. An example is alirocumab and evolocumab. They are applied in patients with familial hypercholesterolemia and who are statinintolerant. All these injectable drugs are quite acceptable and effective.

1091. Omega Fatty Acids

Existing in fish oils, omega fatty acids lower the levels of triglycerides and act as antiinflammatory agents and antithrombotic agents. They enhance the functioning of the cardiovascular and endothelium. Supplementation applies positively in hypertriglyceridemia and secondary cardiac disease prevention. They are not usually dangerous and not intolerable.

1092. Atherosclerosis

Atherosclerosis can be defined as a persistent disease of the arteries that does result in the formation of the plaque in the wall of the vessel as a result of the lipid deposition and inflammation. It results in poor blood circulation that causes ischemic disorders like damaging angina and stroke. High LDL levels, smoking and hypertension are some of the risk factors. Prevention is done through lifestyle change and drugs that are used to lower the levels of lipid.

1093. Shock

Shock is a critical condition that is manifested by poor blood circulation to tissues and hence deprivation of oxygen and dysfunctional cell body. It causes hypotension, tachycardia, and organ failure in case of not

being treated. Usually it is caused by blood loss, infection or heart failure. There is early management that aims at the restoration of perfusion and oxygen delivery.

1094. Hypovolemic Shock

This is because of excessive the loss of fluid or blood, which decreases the volume of circulation and perfusion of tissues. Most of the cases are attributable to hemorrhage, burns, or dehydration. It causes a tendency of hypotension and weak pulse as well as cold and clammy skin. Therapy is done through rapid fluid replacement and management of fluid loss.

1095. Cardiogenic Shock

Cardiogenic shock is caused by failure of the heart to pump efficiently, which usually happens as a result of heart failure or myocardial infarction. It causes the decrease of the cardiac output, hypotension, and the pulmonary congestion. The treatments are management and inotropic support together with treatment of the underlying cardiac cause.

1096. Septic Shock

Septic shock is a dangerous infectiontriggered inflammatory reaction of the body of the system with vasodilation and capillary leakage. It causes low blood pressure, fever and dysfunction of the organs. There is treatment of antibiotics, vasopressors, fluid therapy to resume circulation.

1097. Vasopressor

Vasopressors, the drugs, which tighten the blood vessels and increase the blood pressure in shock. Ordinary subjects are the norepinephrine, dopamine and vasopressin. They work primarily on alpha adrenergic receptors to enhance perfusion on vital organs.

1098. Dopamine in Shock

Dopamine is an inotrope, vasopressor and enhances cardiac output and renal perfusion during shock. It is stimulated at low doses to increase renal blood flow and at high doses, it raises the blood pressure by constricting blood vessels. It is commonly applied in the treatment of cardiogenic and septic shock.

1099. Norepinephrine (Shock Therapy)

The initial vasopressor used in treating septic shock is norepinephrine because the hormone is an effective alphaadrenergic vasoconstrictor. It increases systemic vascular resistance and blood pressure and maintains perfusion in the organ. Controlled dosing is to be remembered by continuous micro infusion of IV.

1100. Hematinic

Hematinics are the medications to stimulate the production of hemoglobin and the volume of red blood cells. They are administered in case of iron, folate or vitamin B deficiency. Examples can be ferrous sulfate, folic acid and cyanocobalamin.

1101. Iron Supplement

The iron supplement replenishes the iron stores of irondeficiency anemia. These are necessary in hemoglobin production and in transportation of oxygen. Oral preparations such as ferrous sulfate are widely used, whereas the parenteral form is used in the severe cases.

1102. Folic Acid

Vitamin B or folic acid plays a crucial role in the synthesis of DNA and red blood cells. It is lacking and it brings about megaloblastic anemia. The problem is that one should be supplemented during pregnancy and in those diseases where there is a great rate of cell turnover.

1103. Vitamin B

Vitamin B (cyanocobalamin) helps preserve the operation of the nerves and the formation of red blood cells. Deficiency is manifested as pernicious anemia and neurological malfunction. Its administration is done orally or parenterally based on absorption capability.

1104. Erythropoietin

Erythropoietin is a hormone released by the kidneys that is a glycoprotein and it helps cause an increase in the production of red blood cells in bone marrow. These artificial analogs cure anemia in the chronic kidney disease and chemotherapy patients. It enhances oxygencarrying and decreases the requirements of transfusion.

1105. Hemostasis

Hemostasis, a process by which the body prevents the loss of blood, is a process that involves vasoconstriction, platelet plug and coagulation. It keeps the blood fluid and stops unwarranted loss in case of injury. The defects may cause hemorrhage or thrombosis.

1106. Coagulation Cascade

The process of coagulation cascade entails a series of activation of clotting factors that change fibrinogen into fibrin. It has intrinsic, extrinsic, as well as common pathways. Normal operation guarantees normal formation of clots and repairing of the vascularity.

1107. Prothrombin

Prothrombin (Factor II) is a plasma protein that is changed into thrombin as a result of coagulation. fibrinogen is then digested into fibrin, a stable clot by thrombin. It is necessary in its production in the liver with the help of vitamin K.

1108. Fibrin

Fibrin is an insoluble protein that results because of the activity of thrombin over fibrinogen. It creates a web which solidifies the blood clots. Fibrinolysis degrades fibrin later in order to normalise blood flow.

1109. Coagulant

The coagulants refer to agents that enhance clotting of blood. They contain vitamin K, protamine sulfate and clotting factors of the plasma. The drugs are applied in the treatment of bleeding disorders and as anticoagulants reversal.

1110. Anticoagulant

Anticoagulants inhibit the development of blood clotting by blocking the clotting factors. They are applied in such ailments as DVT, pulmonary embolism and atrial fibrillation. Examples of these are common heparin, warfarin and direct oral anticoagulants.

1111. Heparin

Heparin is a parenteral anticoagulant, which increases activities of antithrombin III, preventing the action of thrombins and factor Xa. It works quickly and is applied in the prevention of thrombosis. This use of aPTT as a monitor also carries a safe dosing.

1112. Low Molecular Weight Heparin (LMWH).

LMWHs, including enoxaparin, are specific factor xa inhibitors that have less bleeding risks compared to unfractionated heparin. Their pharmacokinetics are predictable with increased halflives. They are used as prophylaxis in DVT and also in the operating theatre.

1113. Warfarin

Warfarin is an anticoagulant that is taken as an oral preparation preventing clotting factors that are dependent on vitamin K. It is applied in the prevention of thrombosis at long term. Periodic check of the INR is necessary in order to prevent bleeding.

1114. Direct Thrombin Inhibitor

Such agents as dabigatran directly block thrombin and block fibrin formation. They are substitutes to warfarin in stroke prevention of atrial fibrillation. Their consequences are foreseeable and they have fewer interactions with foods.

1115. Factor Xa Inhibitor

Factor Xa inhibitors are rivaroxaban and apixaban that prevent the transformation of prothrombin to thrombin. They are orally administered anticoagulants with predetermined dosages and no regular monitoring is to be undertaken. Used in DVT and PE treatment.

1116. INR (International normalized ratio)

INR is a universal scale used to check the efficacy of warfarin therapy. An adequate anticoagulation is provided because a therapeutic range (usually 2.0-3.0) is not too high or too low.

1117. Fibrinolysis

Fibrinolysis is the degradation of clots of fibrin enzyme which are broken down into fibrin by plasmin. It has patency of the vascularity posthealing. Over activation can result in bleeding, and lack of the same will result in thrombosis.

1118. Fibrinolytic Drug

Using fibrinolytic drugs, the existing clots are dissolved by the activation of plasminogen to plasmin. They have to be utilized in myocardial infarction, pulmonary embolism, and stroke. Optimal administration is efficacious.

1119. Streptokinase

The Streptokinase is an enzyme of bacteria, which transfigures the plasminogen into plasmin, which causes the destruction of the clots. It is applied in myocardial infarction in the acute and thromboembolism but can lead to allergic responses.

1120. Urokinase

The plasminogen is directly activated by the action of urokinase which is a human enzyme. It is applied in catheter clearance and pulmonary embolism. It is less antigenic as compared to streptokinase.

1121. Alteplase (tPA)

Alteplase is a tissue plasminogen activator which is a recombinant plasminogen that has binding capacity to fibrinogen. The drug of choice during an acute stroke and ischemic stroke is in case it is given during . hours.

1122. Antiplatelet Drug

Antiplatelet drugs prevent platelet aggregation depressing the risk of arterial thrombosis. They are applied in myocardial infarction, stroke and post stent. Aspirin and clopidogrel are commonly used drugs.

1123. Aspirin

Aspirin permanently blocks COX enzyme, inhibiting thromboxane A and platelet aggregations. It is prescribed at small amounts in the prevention of cardiovascular events. With longterm use, gastric irritation can be experienced.

1124. Clopidogrel

One of the PY receptor antagonists, which inhibits ADP mediated platelet aggregation, is clopidogrel. In the two antiplatelet therapy, it is frequently used with aspirin following the placement of stents.

1125. Glycoprotein IIb/IIIa Inhibitor.

Such medication as abciximab inhibits platelet receptor GP IIb/IIIa and does not allow fibrinogen to bind and prevents platelet aggregation. They are applicable in the acute coronary syndromes and angioplasty.

1126. Plasma Volume Expander

Plasma expanders are used to replace the volume of blood in case of hypovolemia. These contain colloids and crystalloids which sustain oncotic pressure and enhance perfusion. Used in shock and burns.

1127. Dextran

Dextran is a polysaccharide plasma expander, which elevates the blood volume and viscosity. It enhances blood circulation but could result in anaphylaxis or disrupt cross matching of blood.

1128. Gelatin Solution

Gelatin colloidal solutions have an effect of reducing plasma. They raise plasma volume on future and are applied in cases of hypovolemic shock. There is a low possibility of allergy reactions.

1129. Hetastarch

It is because Hetastarch is a synthetic colloid which supports oncotic pressure and plasma volume. It is given as a replacement of the volume, but it can affect the coagulation or renal performance in case of a longterm usage.

1130. Crystalloids

Crystalloids are a liquid of salts which have been dissolved in water (such as normal saline or Ringer lactate). They are applied to fluid resuscitation, dehydration and shock. They spread very fast through compartments.

1131. Colloids

Large molecules, which are still contained in the vascular space, are present in the colloids and attracts the water due to the oncotic pressure. This can be albumin and dextran. They also increase the plasma volume better than crystalloids.

1132. Diuretic

Diuretics stimulate the levels of production of urine by suppressing sodium and water reabsorption. They use them to treat heart failure, edema, and hypertension. These are thiazides, loop, and potassiumsparing diuretics classes.

1133. Thiazide

Thiazide type diuretics suppress the reabsorption of sodiumchloride in distal convoluted tubule. They are initial antihypertenseives and avoid loss of calcium. Example: hydrochlorothiazide.

1134. Loop Diuretic (Furosemide)

Loop diuretics interfere with Na + K +Cl alimony on the thick ascending limb of the loop of Henle. Furosemide has a rapid effect in edema and congestion of the lungs in heart failure.

1135. Osmotic Diuretic (Mannitol)

Mannitol elevates the osmotic pressure in the renal tubules, and it attracts water into urine. It is applied in treating intracranial and intraocular pressure. Should not be used in cases of anuria and pulmonary edema.

1136. Carbonic anhydrase inhibitor is a substance that inhibits the enzyme Carbonic anhydrase.

Such medicines, such as acetazolamide, block carbonic anhydrase in the proximal tubule and decrease the reabsorption of bicarbonate. Taken in glaucoma, altitude sickness and metabolic alkalosis.

1137. PotassiumSparing Diuretic

Their stimulation occurs on the distal nephron in order to inhibit the loss of potassium during sodium excretion. This can be amiloride and triamterene. Usually applied together with loop or thiazide diuretics.

1138. Aldosterone Antagonist

Aldosterone receptors are blocked by spironolactone and eplerenone which stimulates sodium loss and potassium retention. They are applied in hypertension, CHF and hyperaldosteronism.

1139. Antidiuretic

Antidiuretics decrease the amount of liquid secreted into the tubule of the kidney by increasing the reabsorption of water in the renal tubule. They are applied to diabetes insipidus and nocturnal enuresis. Such examples are vasopressin and desmopressin.

1140. Vasopressin

The Vasopressin (ADH) activates water reabsorption in the collecting duct through the V receptors. It also brings on vasoconstriction by use of V receptors. This is used in diabetes insipidus and vasodilatory shock.

1141. Desmopressin

Desmopressin is a synthetic antivasoconstrictant, selective V synthetic analog of vasopressin, which cannot induce vasoconstriction, thus resulting in antidiuresis. It is applied in diabetes insipidus and haemorrh discoes.

1142. Diabetes Insipidus

Diabetes insipidus has excessive urination and thirst that results because of ADH deficiency or renal insensitivity. It causes electrolyte imbalance and dehydration. Desmopressin and proper hydration are treated.

1143. Autacoid

Autacoids are biologically active acting local agents, having an effect on the immediate cells, but not getting into the blood in high concentrations. They control the physiological processes like inflammation, pain, and the smooth muscle tone. Examples are history, serotonin, prostaglandins and the bradykinin. They are brief in their actions and constrained by themselves.

1144. Local Hormone

Local hormones are chemical mediators that are produced and released inside the tissues to impact on the neighboring cells. They are locally acting unlike the endocrine hormones and are degraded very fast. They are histamine, nitric oxide and prostaglandins used in the development of inflammation and homeostasis.

1145. Histamine

Histamine is an aminelike biogenic amine, which is contained in the mast cells and basophils and which is released during allergic responses and tissue damages. It leads to hypertrophy of the vessels, hypercapillary permeability and relaxation of smooth muscles. It binds by using a particular histamine receptor (HH).

1146. H1 Receptor

These receptors are found in endothelium, smooth muscles and in central nervous system (H). Their stimulation leads to the expansion of the blood vessels, constriction of bridges, as well as allergic effects such as itching and swelling. The H1 blockers are applied in motion sickness and allergies.

1147. H2 Receptor

H1 receptors exist in parietal cell in the stomach, and in this case, they control the secretion of hydrochloric acid. They also control the rate of heart and the vascular tone. H2 blockers, e.g., ranitidine and famotidine are being used in the treatment of peptic ulcers and GERD.

1148. H3 Receptor

The H3 receptors are found in the central nervous system and peripheral nervous system operating as presynaptic receptors. They suppress the issue of histamine and other neurotransmitters. H3 modulation can be applied in sleep-wake jurisdiction and cognitive dissonance.

1149. Histamine Antagonist

Histamin antagonists inhibit the microphrine receptors in order to avert allergic and inflammatory reactions. They are receptor selective H or H blockers. Uses, which are common, are in the cases of allergy, motion sickness, and disorders associated with acid.

1150. The First generation Antihistamine

Antihistamines including diphenhydramine and chlorpheniramine are First generation antihistamines that enter the bloodbrain barrier and lead to sedation. They relax allergies, rhinitis and urticaria symptoms. Nevertheless, due to their anticholinergic properties, they cause dry mouth and drowsiness.

1151. General purpose antihistamine (Second Generation)

The antihistamines of the second generation, like cetirizine and loratadine are relatively peripheral H receptor selective and have minimal sedative effects. They are also more favorable in the management of allergic disorders in the long run since their safety profiles are more favorable.

1152. Diphenhydramine

Diphenhydramine is an antagonist of the first generation of H that has great anticholinergic and sedative properties. It is applied in allergy, sleeplessness and motion sicknesses. It is too drowsy hence can only be used during the day.

1153. Cetirizine

Cetirizine is second generation antihistamine whereas it has a low CNS effect and is thus nonsedative. It is an effective treatment of allergic rhinitis and urticaria at the inception of treatment to one dose a day. It offers fast and longterm action.

1154. Loratadine

Loratadine is an H receptor blocker that is a long acting non-sedating agent. It has a broad application in rhinitis of allergic and chronic urticaria. The drug has little drug interaction and it does not symptoms affect alertness.

1155. Hydroxytryptamine (Serotonin)

Serotonin is an autacoid and neurotransmitter by tryptophan that controls mood, sleep, and tone of the vascular system. It also affects platelet aggregation and business motor activities. The phenomena are associated with abnormal levels, which are connected with depression and migraine.

1156. HT Receptor

The HT receptors are a type of receptors of serotonin, which have different subtypes (HTHT). Some of the effects that they mediate include vasoconstriction, anxiety control, and emesis control. The effect of drugs that affect these receptors is used in the treatment of depression and migraines.

1157. Serotonin Agonist

Serotonin agonists also bind HT receptors to recap physiological processes of serotonin. Tryptans Sumatriptan (e.g., sumatriptan) are HTB/D agonists selective that are applied in the acute treatment of migraines by bringing about constriction of the cranial vascalculature.

1158. Serotonin Antagonist

The serotonin antagonists block the serotonin receptors so that they prevent its activities. They find application in nausea (ondansetron) and prophylaxis in migraine resulting as a result of chemotherapy. They assist in stabilizing the level of neurotransmitters.

1159. Prostaglandin

Prostaglandins refer to lipid molecules that are formed as a result of the arachidonic acid through the COX system. They control inflammation, smooth muscle tone as well as platelet aggregation. Synthetic analogues are therapeutically used in induction of labor and gastric protection.

1160. Prostaglandin E2

During inflammation PGE produces vasodilation, fever and pain. It ensures capillary gastric mucosa and renal blood circulation. It is also applied clinically in the cervical ripening and induction of labor.

1161. Prostaglandin F2α

Prostaglandin F2α causes contraction of the uterus and bronchoconstriction. In obstetrics it is employed in inducting labor as well as controlling post partum bleeding. This over release could lead to dysmenorrhea.

1162. Thromboxane A2

Platelets produce thromboxane A2 (TXA2) that facilitates vasoconstriction and platelet aggregation. It is important in hemostasis and thrombosis. Aspirin permanently suppresses its production inhibiting COX-1.

1163. Leukotriene

The leukotrienes are inflammatory mediators which are formed by the arachidonic acid through the lipoxygenase pathway. They induce bronchoconstriction, mucus secretion and inflammation in airways in asthma. The blocking of their receptors enhances breathing.

1164. Montelukast

Montelukast is an oral leukotriene receptor blocker that is used in asthma changes of a chronic nature or in seasonal allergies. It enhances the airway clearance and decreases symptoms that are independent of bronchodilator influence. It is acceptable in children and adult population.

1165. Zafirlukast

Zafirlukast is a selective leukotriene D receptor inhibitor which inhibits airway inflammation and constriction. It is employed in the treatment of asthma prevention. Monitoring of liver functions is needed in the longterm usage.

1166. Angiotensin

Angiotensin is a peptide hormone, which raises the blood pressure by constricting the blood vessels and releasing aldosterone. Its active form is Angiotensin II which is formed by ACE of angiotensin I. It has an important contribution to fluid and electrolyte balance.

1167. Bradykinin

Bradykinin is a peptide mediator, which interacts or brings about vasodilation, high vascular permeability and pain. It adds to the inflammatory and the ACE inhibitor induced cough. It has a low enzymatic breakdown which makes the action shortlived.

1168. Substance P

Substance P is a neuropeptide, which transmits the pain and inflammatory reactions. It calculates on neurokinin receptors and increases the plasma leak and vasodilation. Antagonists are developed in treatment of pain and nausea.

1169. NonSteroidalAntiInflammatory Drugs (NSAID).

NSAIDs come with the ability of blocking (inhibiting) cyclooxygenase (COX) enzymes, which lead to the production of prostaglandin. They give out analgesic, antipyretic and antiinflammatory properties. Generally, it can be ibuprofen, aspirin, and diclofenac.

1170. COX Enzyme

Cyclooxygenase (COX) takes part in changing arachidonic acid into prostaglandins and thromboxanes. There are two major isoforms COX-1 (physiologic) and COX-2 (inducible). The NSAIDs principally act on it.

1171. COX-1 Inhibitor

COX-1 inhibitors inhibit the production of prostaglandins that take part in gastric protection and platelet aggregation. Aspirin and indomethacin are some of the drugs that result in gastric irritations as a result of this inhibition.

1172. COX-2 Inhibitor

COX-2 inhibitors are selective in their ability to block the inductive type of the enzyme that causes inflammations and pain. A typical example of product is celecoxib that has less gastrointestinal side effects but has the possibility of cardiovascular risks.

1173. Aspirin (NSAID)

Aspirin permanently suppressed the production of prostaglandin and thromboxane by blocking COX-1 and COX-2. It is administered as a low dosage analgesic, antipyretic medication and cardioprotectant. It can lead to gastric ulcers when used over a long period of time.

1174. Ibuprofen

Ibuprofen is a reversible COX which has antiinflammatory effects, analgesic effects, and antipyretic effects. It is mostly applied in arthritis management, pain management and fever management. It is safer in the gastrointestinal tract as compared to aspirin.

1175. Diclofenac

Diclofenac is a strong NSAID that is applied in rheumatoid arthritis, osteoarthritis and pain in the muscles. It suppresses COX as well as lipoxygenase systems. When taken long term, it can have an impact on the liver.

1176. Indomethacin

Indomethacin is a potent COX inhibitor and it has good antiinflammatory properties. It is applied in gout, ankylosing spondylitis and closing of patent ductus arteriosus in newly born babies. Side effects are headache and GI discomposure.

1177. Naproxen

Naproxen is an NSAID man of action that is long acting in chronic inflammations. It is a sustained analgesic medication with a dosage of twice a day. It is associated with poor gastrointestinal irritation: it is usually well tolerated.

1178. Antipyretic

Antipyretics lower the fever by working in the hypothalamic heat regulatory control. They tend to heat sink by means of sweating and vasodilation. Ordinary used agents are paracetamol and NSAIDs.

1179. Analgesic

Analgesics do not cause a loss of consciousness by having an effect on pain. Their mechanisms are suppressing the mediators of pain or regulating the CNS pathways. They are paracetamol, NSAIDs, and opioids.

1180. Antiinflammatory

Antiinflammatory agents inhibit the production of the mediators, cell migration and tissue damage. They consist of corticosteroids, NSAID, which is applied in arthritis and allergic problems. .

1181. Antigout Drug

Antigout medications decrease the level of uric acid or lower the level of inflammation in the gout attacks. These are uricosuric agents, xanthine oxidase inhibitors as well as colchicine. They are aimed at eliminating recurrent gouty arthritis.

1182. Gout

Gout is a metabolic disorder that is a result of the deposition of uric acid crystal in the joints causing inflammation and pain. It also has a tendency to affect the big toe and may cause chronicity. The condition is controlled through dietary control and medication.

1183. Hyperuricemia

Hyperuricemia means an increase of uric acid in the blood which is a predisposing factor to gout and stones in the kidney. It is caused by an excess production of uric acid or a decrease in excretion of uric acid. Medicine drugs, such as allopurinol, help in keeping at bay levels.

1184. Xanthine Oxidase

Xanthine oxidase is an enzyme that is involved in changing xanthine and hypoxanthine to uric acid. Its blocking helps to decrease the formation of uric acid, as well as gout attacks. Allopurinol and febuxostat have their pharmacological target.

1185. Allopurinol

Allopurinol is an xanthine oxidase inhibitor used in the management of chronic gout. It reduces the production of uric acid and inhibits the deposition of the crystals. Prolonged treatment minimizes the development of tophus and damage of joints.

1186. Febuxostat

Febuxostat is found to inhibit selectively xanthine oxidase, and hence lower the level of uric acid. It is taken instead of allopurinol especially in companies with renal failure. Liver functioning must be observed on a regular basis.

1187. Colchicine

Colchicine also prevents the polymerization of micro tubules, which inhibits the migration of leukocytes and inflammation in gout. It is not taken prophylactically and is used in the case of acute attacks. The consequences of high dosages include gastrointestinal upsets.

1188. Uricosuric Agent

Uricosuric agents enhance the uric acid excretion through its tubular reabsorption. Are classical examples which are used in chronic gout: Probenecid. Kidney stones can be avoided when one is well hydrated.

1189. Antirheumatic Drug

The antirheumatic drugs lessen symptoms and decelerate rheumatoid arthritis. These are NSAIDs, corticosteroids and DMARDs. The long term use suppresses inflammation and destruction of joints.

1190. Disease-Modifying antireumatic drug (DMARD).

DMARDs also modify the development of rheumatoid arthritis, and it inhibits the occurrence of immune based inflammation. Some of them are methotrexate, sulfasalazine and hydroxychloroquine. They help to avoid the destruction of the joints and maintain the functionality.

1191. Methotrexate

Methotrexate is a folate antagonist, as well as, cornerstone DMARD in rheumatoid arthritis. It suppresses the immune cell proliferation by inhibiting the synthesis of DNA. Low dosage once a week dosage keeps in check inflammation and the toxicity is manageable.

1192. Endocrine Gland

Endocrine glands are glands which have no duct instead of the secretion, the endocrine glands secrete hormones into the blood to control body operations. These hormones affect growth, metabolism, reproduction as well as homeostasis. Endocrine glands such as the pituitary, thyroid, adrenal, and the pancreas are major ones. Their secretions affect the target body organs that are far away. Any dysfunction of these glands causes hormonal imbalance and other associated disorders.

1193. Hormone

A hormone is a chemical messenger manufactured by endocrine glands which are spread throughout the blood to manage physiological functions. They affect the way an organism metabolises, develops, mood and reproduction. Individual hormones interpose on the specific receptors on the target tissues. This is seen with examples of insulin, estrogen and adrenaline. Hormonal imbalance leads to such diseases like diabetes or hypothyroidism.

1194. Hormone Receptor

Hormone receptors are proteinaceous structures found on cell membrane or internally, which recognizes certain hormones. It is a binding that causes the body to respond to control the physiological functions. Hormonal specificity and sensitivity is provided by receptors. They can be the insulin receptors and the thyroid hormone receptors. A malfunction or a mutation of these receptors may impair endocrine signaling.

1195. Feedback Mechanism

The feedback system is useful in ensuring there is a balance in hormones by controlling the hormone secretion depending on the needs in the body. The commonest type is negative feedback which prevents additional release of the hormone upon reaching sufficient levels. Positive feedback enhances release of hormones in the short run as is in the case of childbirth. The system provides homeostasis and effective regulation of the endocrine.

1196. Pituitary Gland

The pituitary gland commonly referred to as the master gland is found at the bottom point of the brain and controls other endocrine glands. It produces the hormones such as GH, ACTH, TSH, LH and FSH. Different functions such as reproduction, stress response, and growth are operated by the anterior and posterior lobes. Gigantism or hormonal deficiency may be a product of received pituitary disorders.

1197. Anterior Pituitary Hormone

Some of the main hormones produced by the anterior pituitary are the growth hormone (GH), prolactin, ACTH, TSH, LH and FSH. These hormones control the growth, metabolism, adrenal, thyroid, and reproduction. There is a response to the secretion mediated by feedback loops, where hypothalamic releasing factors control them. Disproportions might lead to an endocrine illness such as acromegaly or infertility.

1198. Growth Hormone (GH)

The growth hormone manufactured by the anterior pituitary spurred growth, repair and metabolism of the cells. It stimulates fat burning, growth of the bones and production of proteins. GH levels are highest when one is a child and they drop as one ages. An overdose of GH causes gigantism or acromegaly and underdose brings dwarfism. It also has an effect on insulin and glucose metabolism.

1199. Somatostatin

Somatostatin is an inhibitory hormone that is produced in the hypothalamus, sugar pancreas and gastricintestinal area. It inhibits the discharge of development hormone, insulin, glucagon and gastrointestinal hormones. Somatropins are clinically applied to the treatment of acromegaly and some tumors in the form of somatostatin analogs. Hormonal and metabolic equilibrium is ensured by its regulatory action.

1200. Thyroid Gland

The thyroid gland in the neck is responsible in producing thyroxine (T4) and triiodothyronine (T3), which controls metabolism, growth and energy. It also secretes calcitonin that decreases the levels of calcium within the blood. The correct intake of iodine is a requirement to thyroid action. Hypothyroidism, hyperthyroidism, and goiter are some of the disorders.

1201. Thyroxine (T4)

T4 (thyroxine) is the main hormone that is secreted by the thyroid gland. It is a prohormone to triiodothyronine (T3) which is a factor in metabolism, growth and energy consumption. T4 enhances the amount of oxygen intake and growth of protein. The levels of it are controlled by TSH in the pituitary. A deficiency of T4 leads to hypothyroidism; and its excess leads to hyperthyroidism.

1202. Triiodothyronine (T3)

The active thyroid hormone which determines the cellular metabolism and energy involvements is triiodothyronine (T3). It increases oxygen metabolism, thermogenesis and protein synthesis. Peripheral conversion of T4 into T3 takes place. Its disproportions cause metabolic conditions, such as hyperthyroidism or hypothyroidism, influence of the heart rate, weight, and heating and cooling.

1203. Antithyroid Drug

Antithyroid drugs whose production is standardized to inhibit the production of thyroid hormones have been used in the treatment of hyperthyroidism. They inhibit the incorporation of iodine into thyroglobulin which decreases the production of T3 and T4. Popular drugs are propylthiouracil and methimazole. The medications are used to normalize thyroid functioning and could be administered prior to surgery or radioactive iodine treatment.

1204. Propylthiouracil

Propylthiouracil (PTU) is an antithyroid drug, which suppresses the production of thyroid hormones and conversion of T4 to T3 peripherally. It is applied in hyper thyroidism and thyroid storm. The preference is given to PTU when the pregnancy is with an early age because of reduced teratogenicity. Side effects are liver toxicity and agranulocytosis.

1205. Methimazole

Methimazole is also an antithyroid medication that blocks thyroid peroxidase decreasing the production of T3 and T4. It is widely used when treating hyperthyroidism and the Graves disease. It is of longer action and has fewer side effects on the liver, compared to PTU. It is however not advisable during early pregnancy.

1206. Iodide Therapy

Iodide therapy is the high dose therapy that uses the high doses of iodine to inhibit the secretion of thyroid hormone and reduce the size of the thyroid gland. It is administered prior to surgery of the thyroid, or in an emergency of thyrotoxic crisis. Iodide decreases the vascularity of the glands and is a hormone depleting mineral. Nevertheless, excessive usage may result in the socalled escape phenomenon which results in another hyperthyroidism..

1207. Radioactive Iodine

Radioactive iodine (I-131) is used to selectively destroy overactive thyroid tissue in hyperthyroidism or thyroid cancer. It accumulates in thyroid cells and emits radiation that causes localized ablation. The therapy is effective, noninvasive, and often permanent. Side effects may include hypothyroidism requiring lifelong hormone replacement.

1208. Parathyroid Hormone (PTH)

The parathyroid glands release PTH which controls the calcium and phosphate levels. It enhances blood calcium by enhancing bone resorption, renal reabsorption as well as vitamin D activation. A deficiency in

PTH will result in low calcium in the bloodstream whereas excess will result to hypercalcemia. PTH is an extremely important factor in the metabolism of the bones and minerals.

1209. Calcitonin

Calcitonin is a parafollicular cell hormone that secreted into the blood which suppresses blood calcium levels. It suppresses the activities of osteoclastic which lowers bone resorption and augments of calcium production by kidneys. It is a natural competitor of PTH. Calcitonin is also therapeutically employed in the treatment of osteoporosis and the Paget disease.

1210. Vitamin D

Vitamin D is a fat soluble vitamin which is essential in the absorption of calcium and phosphate by the intestines. It stimulates the immune activity and mineralization of the bones. Calcitriol is the active form and it is produced in the kidneys at the instigation of PTH. Lack of it results in rickets or osteomalacia whereas excess results in hypercalcemia.

1211. Adrenal Gland

Adrenal glands are endocrine glands that occur one above each kidney. They are divided into two, one of them being cortex and medulla. Steroid hormones such as cortisol, aldosterone and androgens are produced by the cortex whereas catecholamines such as adrenaline and nor adrenaline are produced by the medulla. These hormones conduct the responses to stress, metabolic responses as well as the blood pressure.

1212. Adrenal Cortex

The outer layer of the adrenal gland which secretes corticosteroids is called the adrenal cortex. It contains three regions (zona glomerulosa secretes aldosterone, zona fasciculata secretes cortisol, and zona reticularis secretes androgens). The cortex is also very important in the electrolyte equilibrium, metabolism, and adaptation to stress.

1213. Adrenal Medulla

Adrenal medulla refers to the inner part of the adrenal gland which consists of the chromaffin cells. It releases catecholamines, i.e. adrenaline and noradrenaline in the case of stress or fight or flight. These hormones elevate the heart rate, blood pressure, and values of glucose, to prepare the body to be ready to do any physical exercise immediately.

1214. Cortisol

The adrenal cortex produces the hormone cortisol which is a glucocorticoid hormone. It controls the metabolism, immune response and adaptation to stress. It enhances the production of glucose, inhibits the process of inflammation and prevents blood pressure. An overproduction of cortisol in the long term causes the syndrome of Cushing, whereas in the short term, the syndrome causes the deficiency of cortisol, which is referred to as the Addison disease.

1215. Aldosterone

Aldosterone is a hormone that is secreted by the adrenal cortex and is a mineralocorticoid hormone that controls potassium and sodium. It increases potassium excretion and sodium reabsorption in the kidneys hence controlling blood volume and blood pressure. It has a reninangiotensin system in control of its secretion. Hyperaldosteronism and dehydration are caused by excess and deficiency respectively.

1216. Adrenaline (Epinephrine)

Epinephrine or adrenaline is a catecholamine produced by the adrenal medulla when one is stressed. It raises heart rates, airways, rise blood glucose and raises blood circulation to muscles. It has been clinically employed in cardiac arrest, anaphylaxis, and in asthma emergencies because of its fast science activity.

1217. Noradrenaline (Norepinephrine)

Noradrenaline is a catecholamine which is a both hormone and neurotransmitter. It mainly leads to vasoconstriction which raises the blood pressure when one is stressed. It supplements the actions of adrenaline by keeping a regular tone of the veins. Medically, it is applied to treat shock therapy as a vasopressor to regain circulation.

1218. Addison's Disease

Addison disease is the disease that develops due to the insufficiency of the adrenal cortex which results in the low level of cortisol and aldosterone. It has such symptoms as fatigue, low blood pressure, hyperpigmentation, and weight loss. It needs the lifetime corticosteroid replacement therapy. An untreated adrenal crisis can manifest itself as a result of stressful situations.

1219. Cushing's Syndrome

Cushing syndrome is a disease condition caused by a sustained exposure to elevated cortisol levels either exogenously caused by elevated cortisol secretions or by corticosteroid medication. Some of the common symptoms are obesity, moon face, muscle wasting, hypertension, and hyperglycemia. Treatment involves the use fewer corticosteroids or removal of adrenal/pituitary tumors through surgery.

1220. Glucocorticoid

The glucocorticoids are steroid hormones that control metabolism, immune response as well as the reaction to stress. These are cortisol, prednisolone and dexamethasone. They suppress the immune activity and inflammation. They are used in curing asthma, arthritis, autoimmune disease therapy; however, it has side effects, and after a long period of use, it can cause osteoporosis and hyperglycemia.

1221. Mineralocorticoid

Mineralocorticoids are corticosteroids, which regulate the electrolyte and fluid balance. The principal mineralocorticoid is aldosterone which facilitates retention of sodium and secretion of potassium through

the kidneys. They aid in keeping the blood pressure and hydration. Lack of it leads to the Addison disease but its excess results in high blood pressure and swelling.

1222. Androgen

The sex hormones secreted are androgens which are male hormones produced by the adrenal cortex and testes. The major androgen is testosterone which is what make men sexual, builds muscle and bones. The females also yield low levels. The surplus of Androgen leads to hirsutism and acne, whereas its lack has an impact on libido and fertility.

1223. Estrogen

The primary female sex hormone is estrogen which is produced by the ovaries. It controls menstrual cycles, secondary sexual characteristics as well as the health of the bones. It is also helpful to reproductive tissues and heart condition. Menopause causes estrogen deficiency that causes osteoporosis and hot flushes usually treated using hormone replacement therapy.

1224. Progesterone

Progesterone refers to a female hormone that is mainly produced by placenta and the corpus luteum. It also helps in the preparation of the uterus to carry out pregnancy and sustenance of the endometrium. It also obstructs the contractions of the uterus during gestation. Contraception and hormone therapy Synthetic progesterone analogs have found their way into contraception and hormone therapy.

1225. Testosterone

The main male sex hormone is testosterone which is produced by Leydig cells within the testes. It stimulates the spermatogenesis, development of the muscles and secondary sexual characteristics in the males. It has an effect on mood and libido too. The lack of it results to infertility and loss of strength, whereas its overload results to aggression and acne.

1226. Pancreas (Endocrine Role)

The pancreas plays a dual role of both an endocrine and exocrine gland. It has an endocrine function secretion of insulin, glucagon, and somatostatin of the islets of Langerhans. These are hormones which control the blood glucose. The malfunction of the pancreatic endocrine activity results in diabetes mellitus or hypoglycemia.

1227. Insulin

Insulin is a pancreatic hormone which is a peptide containing hormone secreted by beta cells. It helps cells to absorb glucose allowing the body to store energy in the forms of glycogen and fat. Insulin reduces the level of sugar in the blood and helps in the production of proteins. The lack or the resistance leads to diabetes mellitus, which has to be controlled with insulin.

1228. Glucagon

Glucagon is a pancreatic alpha cell secretion of a peptide hormone which increases the level of blood glucose. It increases the breakdown of glycogen and release of glucose by the liver when they are starving. The antagonistic effect of glucagon to insulin helps in keeping the glucose levels normal. It is also administered to treat emergency care on severe hypoglycemia.

1229. Somatostatin (Pancreatic)

Pancreatic delta cells produce Somatostatin which suppresses insulin, glucagon and gastrointestinal secretions. It assists to control the digestion process and glucose breakdown. Somatropins analogs such as octreotide are medically implemented in the treatment of hormone producing tumors and gastrointestinal bleeding.

1230. Diabetes Mellitus

Diabetes mellitus is a metabolic disease that is typified by persistent hyperglycemia caused because of insulin resistance or deficiency. It causes dysfunctional carbohydrate, lube and protein metabolism. The symptoms are polyuria, polydipsia and loss of weight. There are complications in longterm which occur in the eyes, kidneys, nerves and blood vessels.

1231. Type-1 Diabetes Mellitus

The diabetes type occurs as an autoimmune disease in which the pancreatic beta cells are destroyed causing complete insulin deficiency. It is normally acquired at the stage of childhood or adolescence. Diabetics must have insulin lifelong treatment. The typical symptoms are excessive thirst, frequent urination as well as tiredness.

1232. Type-2 Diabetes Mellitus

The combination of it with insulin deficiency relative insulin deficiency leads to type diabetes. It is frequently associated with obesity, unhealthy dieting and sedentary way of life. Oral hypoglycemic drugs, lifestyle modification and insulin are also management. The case may result in cardiovascular and renal complications in the uncontrolled cases.

1233. Hypoglycemia

Hypoglycemia is defined as the abnormality of low levels of blood glucose, which is normally less than mg/dL. It may be caused by overload of insulin, fasting or extreme exercising. The symptoms used are sweating, dizziness, confusion and tremors. Extreme cases may lead to seizures or coma and in this case glucose should be administered immediately.

1234. Hyperglycemia

Hyperglycemia is a disease where the blood sugar level is increased and is commonly observed in diabetes mellitus. It arises because of the absence or insensiveness of insulin. Chronic hyperglycemia destroys blood vessels, nerves and organs. The symptoms comprise excessive thirst, excessive urination as well as blurred vision. Treatment entails insulin or antidiabetics.

1235. Insulin Resistance

Insulin resistance is a condition that avails unfavorable reaction of cells to insulin that results in increased blood glucose. It is one of the characteristics of type-2 diabetes and metabolic syndrome. These factors are obesity, genetics and sedence. Insulin sensitivity is enhanced by lifestyle modifications and insulin sensitizing drugs such as metformin.

1236. Oral Hypoglycemic Drug

In diabetes type-2, oral hypoglycemic agents reduce glucose in the blood. These are sulfonylureas, biguanides, thiazolidinedione and DPP inhibitors. These agents either stimulate the release of insulin or enhance the sensitivity of insulin or reduce the absorption of glucose. They are combined with diet and exercise therapy.

1237. Metformin

Metformin is an oral antidiabetic medication of the first line, which is a biguanide. It inhibits hepatic glucose production, enhances the insulin sensitivity, and enhances the glucose uptake by cells. It does not lead to hypoglycemia and is beneficial in maintenance of weight. It has a wide application in the treatment of type-2 diabetes and metabolic syndrome.

1238. Sulfonylurea

Sulfonylureas are orally administered hypoglycemic drugs which are known to stimulate the secretion of insulin by the pancreatic beta cells. Examples of common drugs are glimepiride and glipizide. They work in the earlystage type-2 diabetes yet can lead to the hypoglycemia and weight gain. Frequent blood glucose monitoring is vital in the treatment.

1239. Thiazolidinedione

TZDs including pioglitazone are insulin sensitizing drugs that stimulate the PPARg receptors. They increase muscles and fat uptake of glucose. TZDs are prescribed in type-2 diabetes yet have an adverse effect of retaining fluids and weight gain. Their usage is contraindicated with heart failure patients.

1240. DPP-4 Inhibitor

Dipeptidyl peptidase-4 (DPP-4) inhibitors extend the lifespan of incretin hormones and increase insulin secretion and decrease glucagon levels. These examples are sitagliptin and vildagliptin. They are acceptable orally acting type-2 diabetes agents with few risks of causing hypoglycemia and weight.

1241. Bronchial Tree

The bronchial tree is the network of airways that are present inside the lungs. It starts with the trachea branches out to bronchi which further branches into smaller bronchioles. These are the routes that take air to the alveoli where the gaseous exchange takes place. The organism provides effective circulation of air

in the lungs. The mucous and smooth muscle control the means of air passage and prevent the attack of pathogens.

1242. Bronchoconstriction

Bronchoconstriction refers to the constriction of airways as a result of contraction of smooth bronchial muscles. It causes a decrease in volume of the air, dyspnoea, and wheezing, which is usually observed with asthma or allergic reactions. This reaction is brought about by chemical messengers such as histamine, leukotrienes and acetylcholine. Bronchodilators, i.e., beta agonists, can reverse it. The chronic bronchoconstriction may cause higher oxygen exchange to be impaired.

1243. Bronchodilation

Increase in bronchial airways due to relaxation of smooth muscle is known as bronchodilation. It improves breathing and increases ease during breathing particularly in obstructive diseases such as asthma. Beta adrenergic agents and xanthines cause bronchodilation. The process is caused by high cyclic AMP that results in relaxation of muscles. It is a significant respiratory drug of pharmacotherapy.

1244. Asthma

Asthma is a chronic airway inflammatory disorder that is marked by reversible airflow blockage, hyperactivity. It presents itself in forms of wheezing and coughing coupled with shortness of breath. Such triggers are allergens, cold air, and exercise. The inflammatory cells eosinophils and mast cells are important. The approach to treatment is concerned with bronchodilators and corticosteroids in order to improve inflammation.

1245. COPD or chronic Obstructive Pulmonary Disease.

COPD is a chronic obstructive respiratory disease, which is comprised of chronic bronchitis and emphysema. It causes not altogether reversible airflow constriction. The primary reason is prolonged exposure to such irritants as cigarette smoke. The signs are dyspnea, persistent cough and sputum. Treatments are bronchodilators, corticosteroid, and oxygen therapy.

1246. Bronchial Hyperresponsiveness

This is the airway that is overreactive to stimuli. It is a characteristic of asthma and a consequence of inflammation of airways on a long term basis. The state enhances the allergenicity, cold air, and irritants hypersensitivity. Histamine and leukotrienes are the mediators that increase muscle contraction. The sensitivity is reduced in the longrun by using anti inflammatory medications.

1247. Airway Inflammation

The airway inflammation is the swelling, secretion of mucus, and immune cells infiltration into the respiratory tract. It leads to the blockage and hyperirritability of airways. The chronic inflammation destroys elasticity of the bronchial wall. Usually it is caused by infections, allergens, and pollutants. The major medications that are applied to manage this condition include corticosteroids.

1248. Bronchospasm

This is the sudden contraction of bronchial smooth muscles which results in the narrowing of an airway. It leads to cough, wheezing and difficulty of breathing. It is a significant symptom in asthma attacks often brought by allergens, irritants or drugs. Because bronchospasm is caused by tightening the airway muscles, beta agonists and anticholinergics alleviate bronchospasm by loosening them. The rapid treatment is essential in critical cases.

1249. Anti-Asthmatic Drug

Anti asthma medicines are the medicine that prevents or gives relief to asthma symptoms. They do this by inhibiting bronchospasm, by reducing inflammation or by relaxing of airway muscles. These are bronchodilators, corticosteroids and leukotrienes antagonist. The long term treatment is meant to manage the symptoms and prevent exacerbation. The appropriate breathing routine improves treatment.

1250. Beta-2 Adrenergic Agonist

These medications activate beta receptors of bronchial smooth muscle as relaxation and bronchodilation. They form the core of the treatment of asthma and COPD. The short acting agents such as salbutamol relieve symptoms in a short duration and the long acting prevent symptoms. These are enhanced by their mechanism of raising the rate of cyclic AMP in muscle cells. Some of these side effects include tremors and tachycardia.

1251. Salbutamol

Salbutamol is a shortacting beta-2 agonist which is administered as a reliever in asthma and COPD to relieve bronchospasm. It works within several minutes and up to several hours. It widens the bronchial muscles and enhances the airflow by stimulating the beta-2 receptors. It may be taken in the form of inhalers, nebulizers, orally. The excessive use can cause tolerance and some side effects such as palpitations.

1252. Terbutaline

Terbutaline is a selective beta-2 adrenergic agonist which causes bronchodilation. It is applied in the treatment of asthma, bronchitis and COPD. It dilates smooth muscles, and enhances oxygen supply. The preterm labor can also be reduced by the drug. The usual side effects are tremors and elevated heart rate.

1253. Salmeterol

Salmeterol is a longacting beta-2 agonist (LABA), which offers a range of 12 hours of bronchodilation. It finds application as preventive treatment in COPD and asthma. It does not prevent acute attacks but prevents nocturnal or exercise induced symptoms. Corticosteroids are often used together with it in order to better control. Pathway of entry guarantees local effect and a minimum number of systemic effects.

1254. Formoterol

Formoterol is a long acting beta-2 agonist which is employed in the maintenance therapy of asthma and COPD. It manifests itself quickly and with a long effect. It dilates smooth muscles of the airway and enhances breathing. When used together with inhaled corticosteroids such as budesonide, it is very common. Frequent usage prevents the exacerbations, but not acute cure..

1255. Methylxanthine

The methylxanthines are the bronchodilators which contain theophylline and aminophylline. They act by preventing phosphodiesterase resulting to the rising levels of cyclic AMPs. This produces bronchodilation and relaxation of smooth muscles. They are also weakly acting antiinflammatory agents. Their dose is sensitive and constant attention to their dosage is worthwhile.

1256. Theophylline

Theophylline is an inducement form of methylxanthine that is applied in longterm asthma and COPD. It dilates bronchial muscle, enhances the effectiveness of contractile diaphragm and decreases airway responsiveness. Metabolism It is hepatolithic, and its safety margin is low. Plasma level needs to be monitored in order to prevent toxicity. The side effects are cardiac arrhythmias andinsomnia.

1257. Aminophylline

Aminophylline is an inappropriate soluble compound of theophylline that is utilized in bronchodilation. It is used via mouth or intravenous injection in severe acutely asthmatics. It has the effect of inhibition of phosphodiesterase and relaxation of airway muscles. It enhances also mucociliary clearance. Doses can give rise to nausea, tremours, as well as palpitations in high doses.

1258. Anticholinergic (Respiratory)

The respiratory anticholinergics inhibit the muscarinic receptors within the airways, which prevent bronchoconstriction by acetylcholine. They are primarily applied in the management of COPD. These are agents that enhance airflow and lessen the mucus secretions. They can be ipratropium and tiotropium. They come on slowly as compared to beta agonists but last longer.

1259. Ipratropium Bromide

Ipratropium bromide is anticholinergic bronchodilator of short acting and in COPD and occasionally with asthma. It inhibits M receptors in bronchial smooth muscle in order to inhibit constriction. It is not deeply absorbed in the body and thus can be used via inhalation. When used in combination with beta agonists, it has an extended effect. It is non shaky and nontachycardiac.

1260. Tiotropium

Tiotropium is a long acting muscarinic antagonist (LAMA) that is applied in the maintenance of COPD. It offers onceday time bronchodilation that is hours. It is selective in blocking airways M3 receptors. It decreases the exacerbations and the lung performance. One of the side effects is dry mouth.

1261. Leukotrienes Receptor Antagonist

The drugs inhibit the leukotrienes receptors which block bronchoconstriction and inflammation. They are applied in the longterm management of asthma, particularly the allergic or the exercise induced asthma. When used together with inhaled steroids, they enhance the air flow and diminish symptoms. They are zafirlukast and montelukast. They are administered as oral once per day.

1262. Montelukast (Respiratory)

Montelukast is an orally administered leukotrienes receptor inhibitor that is used in asthma and allergic runny nose. It inhibits the restrictions of the airways and inflammation provoked by leukotrienes. It works in mild persistent asthma and preventive measures against exercise induced attacks. It is very acceptable and is child friendly. One of the mild effects is headache.

1263. Zafirlukast (Respiratory)

Zafirlukast is a leukotrienes receptor blocker which decreases airways inflammation and constriction. It has application in asthma prophylaxis management. It aids in reduction of reliance on inhaled corticosteroids. This is administered orally, and its bioavailability is good. It can hardly result in increasing liver enzymes.

1264. Corticosteroid (Inhaled)

The inhaled corticosteroids are antiinflammatory in nature and cause a decrease in the swelling and mucus in the airways. They provide the foundation of asthma treatment in the long run. Their effect is inhibition of the release of inflammatory mediators. These would be beclomethasone, budesonide, and fluticasone. It lowers oral thrush by proper rinsing of the mouth following inhalation.

1265. Beclomethasone

Beclomethasone is a corticosteroid inhaler that is used to control asthma that cannot be cured in writing. It reduces inflammation of the airways and prevents the asthma attacks. Consistency will support the function of the lungs and limit the frequency of symptoms. It is generally used together with bronchodilators to enhance its effectiveness. In the local area, there are oral candidiasis and hoarseness.

1266. Budesonide

Budesonide is a powerful inhaled corticosteroid, which is applied in asthma and COPD. It is topically effective and has little absorption. It lowers mucus, hyper responsiveness of airways and inflammation. It comes in form of combination with formoterol too. Prevention and not acute relief should be once sustained.

1267. Fluticasone

Fluticasone is a corticosteroid synthetic compound that is applied to asthma, COPD and allergic nose. It acts through the inhibition of inflammatory cells. It enhances the functioning of airways and eliminates

exacerbation. It is very local and less systemic bio available. The adrenal suppression needs to be monitored in case of longterm usage.

1268. Mast Cell Stabilizer

Mast cell stabilizers inhibit the discharge of histamine and other mediators of inflammation. They find application in the prophylaxis of asthma caused by allergies. Examples are cromolyn sodium and nedocromil. These medications fail to work in the case of acute attacks. Frequent preexposure therapy to allergens decreases asthma attack.

1269. Cromolyn Sodium

Cromolyn sodium is a mast cell stabilizer that is applied in asthma that is caused by allergies. It inhibits the degranulation process of mast cells and inhibits the release of histamine. It is administered to prevent and not to cure acute attacks. It is administered through inhalation and has few side effects to the system.

1270. Nedocromil

Nedocromil is an antiinflammatory effector that stabilizes the mast cell, as well as blocking the release of the mediators. It is prophylactically used to treat bronchial asthma and allergy. It decreases the airway hyperactivity in the long run. It is used to administer inhaled into the air to act locally. Frequent intake is used to avoid asthma attacks.

1271. Anti-IgE Therapy

Anti-IgE treatment aims at inhibiting the immunoglobulin E in order to stop allergic inflammation. Omalizumab is an immunoglobulin, a monoclonal antibody that attaches onto the circulating IgE decreasing the allergic response. It is applied to severe persistent asthma which is not responsive to the normal therapy. It reduces the rate of exacerbation and corticosteroid intake. The therapy is administered subcutaneously.

1272. Omalizumab

Omalizumab is a recombinant monoclonal antibody that is applied in asthma of allergic nature. It also binds free IgE and thus they are prevented to be attached on mast cells and basophils. This minimises bronchospasm and allergic inflammation. Subcutaneous injection is done on a routine basis every few weeks. It has a great contribution to the quality of life of long term asthma patients.

1273. COPD Management

Treatment of COPD involves corticosteroids, lung medication and change of lifestyle. The long acting LABAs and LAMAs are keeping the airways open. The most imperative intervention is smoking cessation. Pulmonary rehabilitation and oxygen therapy increase survival. Early signs and frequent observation bring down complications.

1274. Long Acting Beta Agonist (LABA)

LABAs are respiratory relaxation agents that offer long term effects of relaxation of airways. They are applied as maintenance therapy of asthma and COPD. These can be salmeterol and formoterol. The use of inhaled corticosteroids is always done in combination with them in the management of asthma. They have a peak of 12 hours and above.

1275. Long-Acting muscarinic antagonist (LAMA).

The muscarinic receptors are blocked by LAMAs over a prolonged period with persistent bronchodilation. Tiotropium is a widespread LAMA used to treat COPD. They enhance the quality of life, reduce exacerbations, and better airflow. Taking the medication once a day makes it more compliant. The side effects are dry mouth and irritation of the throat.

1276. Phosphodiesterase Inhibitor

These medications block PDE enzyme so as to enhance the amount of cyclic AMP cells in the airways. They have bronchodilatory as well as antiinflammatory effects. The primary example of roflumilast is applied in COPD. They decrease the exacerbations in severe ones. As a side effect, it could cause gastrointestinal irritation.

1277. Roflumilast

Roflumilast is a PDE oral inhibitor in the case of severe COPD and chronic bronchitis. It reduces inflammation and secretions of mucus. It does not act as a bronchodilator, but potentiates the action of other agents. Flares are minimized with frequent use. Side effects comprise nausea and loss of weight.

1278. Expectorant

Expectorants facilitate the removal and loosening of the mucus in the respiratory system. They enhance bronchial secretions, which makes sputum to cough freely. Such agents are guaifenesin and potassium iodide. They are applied in the treatment of productive cough and bronchitis. Their effect is increased by adequate hydration.

1279. Guaifenesin

Guaifenesin is a popular expectorant and it increases the quantity and decreases the mucus density. It helps in successful coughing and soothes the clearance of the airways. It has been used in the respiratory infection and bronchitis with a symptomatic effect. It can also be found in the cough syrups. The few side effects render it safe to be used habitually.

1280. Potassium Iodide (Expectorant)

Potassium iodide is a mucolytic and expectorant which liquefies thick mucus. It increases the secretion of the bronchial glands, which helps in the clearing of the mucus. It is used in bronchitis chronic and asthma, as well as enhances airflow. Monitoring is necessary when iodine toxicity occurs in the course of the longterm use. It can be mildly antiseptic in nature as well.

1281. Mucolytic

Mucolytics dismantle the structure of mucus, lowering viscosity through clearance. They are applied in COPD, cystic fibrosis and bronchitis. Some of the commonly used agents are acetylcysteine and bromhexine. They increase the actions of expectorants. Direct airway action is given by nebulized preparations.

1282. Acetylcysteine

Acetylcysteine is a mucolytic, which separates the disulfide bond of mucus thus lowering its viscosity. It is applied in the treatment of rhinitis of the bronchi as well as antidote with acetaminophen poisoning. It works by clearance of mucus when administered through inhalation or orally. It is also an antioxidant by replacing glutathione. Minor irritation can be seen as a result of inhalation.

1283. Bromhexine

Bromhexine is a manmade mucolytic, which is used to boost the secretion and degradation of mucus. It thin out sputum and it becomes easy to expectorate. It is applied in the bronchitis and other respiratory illnesses that produce mucus. Periodic dosing enhances the hygiene of the airways. It is additionally used along with other cough cures.

1284. Ambroxol

Ambroxol is a bromhexine metabolite possessing high potency of mucolytic as well as antioxidant effects. It enhances the movement of mucus and is weakly anesthetized in the throat. It is applied in asthma and chronic bronchitis. It increases the penetration of the antibiotics in the respiratory tissue.

1285. Antitussive

The action of antitussives is on the cough center in the medulla which inhibits the coupling reflex. They are applied to dry coughs unaffecting the product. Among the agents, one can mention codeine, dextromethorphan, and noscapine. They are symptomatic agents and enhance rest. Excess use may bring in drowsiness or addiction

1286. Dextromethorphan

Dextromethorphan is a nonopioid antitussive which has an action on the medullary cough center. It is not addictive as the opioids. With large application in cough syrups, it is also effective in dry coughs that are irritating. It is not to be used together with the MAO inhibitors. It can make one feel dizzy or drowse.

1287. Noscapine

Noscapine is a natural opium alkaloid, which suppressed cough, but did not produce a narcotic effect. It controls the coughing center of the brain. It is used in case of mild to moderate cough dry but only has a few side effects. It is not addictive and it can be used on longterm. Occasional nausea may occur.

1288. Benzonatate

Benzonatate is an antitussive, which is peripheral and anesthetizes the stretch receptors in the lungs. It decreases cough reflex without influencing the central nervous system. It alleviates chronic coughing as a result of breathing intoxication. Capsules should not be chewed in order to prevent numbness of the throat.

1289. Nasal Decongestant

Nasal decongestants cause a narrowing of enlarged blood vessels of the nasal mucosa and a reduction of nasal blockage. They enhance pulmonary circulation and minimize cardinality of colds and allergies presence. The agents involve phenylephrine and oxymetazoline. Redundant congestion can be achieved by congestion overuse. Drugs come as sprays, drops or in oral preparations.

1290. Pseudoephedrine

Pseudoephedrine is a nasal congestant that is an oral syphomimetic decongestant. It decongests the colds, sinusities and allergies. It causes adrenergic receptors, which soften swelling and mucus. Insomnia and palpitations are some of the side effects. The use of it is regulated because of the possibilities of abusing it.

1291. Phenylephrine

Phenylephrine is a selective alphaadrenergic which is applied in the form of a nasal decongestant. It causes nasal mucosal edema to be reduced and breathing is made better. It comes in nasal drop, spray and in the oral form. It gives a temporary decrease in congestion. Overswelling can result in rebound swelling.

1292. Oxymetazoline

Oxymetazoline is an alpha receptoracting decongestant of the nose, which has a longacting effect. It gives fast and long term relief up to 12 hours. It is used in rhinitis and sinususoids that are allergic, decreasing the nasal stuffiness. Excessive use leads to reinventing congestion and nasal irritation. It is used as nasal spray as a topical agent.

1293. Xylometazoline

Xylometazoline is a decongestant nasal topical agent that causes the blood vessels of mucosa to constrict. It provides prompt decongesting effect on the nose caused by cold or allergy. Its duration is of approximately 8-10 hours which is why it can be used at night. It should not be used at prolonged periods to avoid the rebound congestion.

1294. Respiratory Stimulant

Stimulant of the respiratory system leads to the acceleration of the speed and volume of breathing. They take action on either the respiratory center on the medulla or in the peripheral chemoreceptors. Employed in respiratory depression or apnea caused by drugs. Doxapram and nikethamide are some of the common agents. Their application is only on emergencies or controlled states.

1295. Doxapram

Doxapram is a respiratory stimulant, which causes chemoreceptors in the carotid bodies. It elevates the respiratory rate as well as tidal volume. It acts swiftly in case of intravenous administration. When it is taken in high doses it can lead to convulsions or hypertension.

1296. Nikethamide

Nikethamide is a central nervous system stimulates which has a mild effect on enhancing respiration. It was applied in treating respiratory and circulatory depression. It has a briefterminated action and is not as powerful as doxapram. Its medical use has been restricted due to safety reasons. It can provoke tremors and agitation at a high level of dosage.

1297. Carbon Dioxide Therapy

Carbon dioxide therapy is a method to induce respiration through controlled inhalation of CO2 . It enhances the drive to respire by the stimulation of the chemoreceptors. Applied to such problems as apnea or respiratory depression. Constant observation is a must in the course of therapy.

1298. Hypoxia

Hypoxia refers to a state where the body tissues have lack of adequate oxygen. It can be caused by respiratory, gluttonous or hematological factors. The symptoms include dyspnea, cyanosis, and confusion. In the case of long hypoxia, the organs can be damaged. The primary line of treatment is the oxygen therapy.

1299. Apnea

Apnea refers to a total stop of the breathing be it through choice or force. It may take place either when one is asleep, in anesthesia or due to neurological disorders. Apnea over a long period leads to hypoxia and it can be fatal. Therapy involves encouraging breathing and managing the cause of the problem. Cases that are severe require constant monitoring.

1300. Gastrointestinal Tract (GIT)

The gastrointestinal tract (GIT) is an organ system that is involved in digestion and absorption of nutrients. It comprises of the mouth, esophagus, stomach, intestines, and its related glands. It does mechanical and chemical food break down. Secretions and enzymes help in the digestive activity. The correct operation of the GIT is one of the key factors of supporting the whole metabolism.

1301. Peptic Ulcer Disease (PUD)

The peptic ulcer disease is the abbreviation of open sores that occur on the surface of the stomach, or duodenum as a result of the activity of acid and pepsin. The biggest causes are Helicobacter pylori infection and NSAID. The symptoms involve burning pains in the epigastric, nausea and bloats. The

approach entails the acid inhibition and elimination of H. pylori. The changes of lifestyle contribute to recovery as well.

1302. Gastric Acid Secretion

Gastric acid secretion is how the parietal cell lining of the stomach makes hydrochloric acid. This acid helps in the digestion and fighting against infection. It is controlled by gastrin, acetylcholine and by histamine. The excessive secretion may result in ulcers or reflux. Antiacid secretions are seen in proton pump inhibitors and H-2 blockers.

1303. Proton Pump Inhibitor (PPI)

PPIs block H+/K + ATPase enzyme in gastric parietal cells thus inhibiting acid secretion. They are the strongest acidblocking agents with peptic ulcer and GERD. Such frequent PPIs are omeprazole and pantoprazole. They facilitate ulcer healing and symptomatic lessening. The prolonged use can have an impact on the absorption of calcium and intestinal microbiota.

1304. Omeprazole

Omeprazole is a proton pump imprisoner that is applied in treatment of refluxions and ulcers. It permanently inhibits the level of acid secretion of the gastric parietal cell. When given as an oral form, it has a longterm acid replacement. It belongs to the eradication therapy of H. pylori. Side effects are headache and mild gastro intestinal upsets.

1305. Pantoprazole

Pantoprazole is a longacting proton pump inhibitor that is used widely. This inhibits the secretion of gastric acid through the proton pumps. Applicable in GERD, Zollinger-Ellison syndrome and ulcer disease. Its drug interactions are also less than omeprazole. Normally it is given once daily prior to meals.

1306. Lansoprazole

Lansoprazole is a PPI which suppresses the secretion of gastric acid. It connects with the proton pump located in the stomach lining and avoids the formation of the acid. Indicated in case of peptic ulcer, GERD and erosive esophagitis. It presents speed of symptom amelioration and healing of the mucosal. Nutrient malabsorption should be observed in the longterm use.

1307. H Receptor Antagonist

The antagonists of H receptors inhibit the histamine in gastric parietal cells. It reduces the amount of acid secreted as well as pepsin. Examples of which are ranitidine and famotidine. They find application in posttraumatic ulcers in the peptic, gastritis, and reflux. They are less powerful than the PPIs and they are more rapid.

1308. Ranitidine

Ranitidine is a H receptor blocker used to reduce the amount of acid secreted into the stomach. It has been commonly applied in the treatment of ulcer and GERD. It gives immediate relief against heartburn and indigestion. Its usage has reduced because of safety fears of impurities. Such substitutes as famotidine are preferred nowadays.

1309. Famotidine

Famotidine is a H receptor antagonist having a long duration of acid repression. It has good effect in the treatment of gastric and duodenal ulcers. It is more powerful than cimetidine in terms of safety. Mild headache and constipation are some of the common side effects. It is frequently used to treat nocturnal acid control.

1310. Cimetidine

Cimatidine is the initial H receptor antagonist that is presented as a treatment of peptic ulcers. It suppresses secretion of gastrointestinal acid and enhances ulcer healing. It however regulates cytochrome P enzymes hence leading to drug interactions. The effect of longterm use could be gynecomastia and confusion among the elderly. It is no longer in use unlike safer agents.

1311. Antacid

Antacids are those substances that counterbalance the excessive acid in the stomach making them quick to relieve the heartburn and acid discomfort. Usually used formulations are aluminum, magnesium or calcium salts. They find application in dyspepsia and peptic ulcer disease. Excessive use may modify the electrolyte homeostasis. They should be administered after meals to have longterm effects.

1312. Magnesium Hydroxide

Magnesium hydroxide is an antacid and a laxative. It nullifies gastric acid and it also relieves constipation by attracting water in the intestines. It brings prompt symptomatic relief in acidity. Too much amount may lead to diarrhea. It is also used together with aluminum hydroxide to counter bowel effects.

1313. Aluminum Hydroxide

The aluminum hydroxide is a slowacting antacid which offers longterm acid neutralization. It creates a lining of protective layer on the stomach. Usually to reduce whichever side effects are used in combination with magnesium hydroxide. With long term use, constipation and phosphate loss may occur. It is helpful in the treatment of ulcers and gastroduodenoscopy.

1314. Sucralfate

Sucralfate is a cytoprotective material which develops as an ecchymotic lining over the ulcer sites. It attaches to proteins in the bottom of the ulcer which protects it against acid and pepsin. It does not interfere with acid secretion. It facilitates recovery and prevents chances of reoccurrence. The most side effects is constipation.

1315. Misoprostol

Misoprostol is a prostaglandin E analog which secures gastric mucosa. It decreases the amount of acid secreted and increases the amount of mucus and bicarbonates. It finds application in the prevention of ulcer caused by NSAID. Should not be taken during pregnancy because it brings about uterine contractions. It can lead to the abdominal cramps and diarrhea.

1316. Helicobacter pylori Infection.

The H. pylori infection is a significant cause of peptic ulcer disease and gastritis. The bacteria destroys the lining of the stomach resulting into inflammation. Diagnosis includes urea breath or stool antigen test. The combination of antibiotics and acid suppressing drugs is the solution. Recurrence of ulcers is prevented by eradication.

1317. Triple Therapy (H. pylori)

The common therapy of H. pylori infection is triple therapy. It is a proton pump blocker that is combined with two antibiotics, typically clarithromycin and amoxicillin or metronidazole. Treatment lasts 10-14 days. It kills infection and encourages the healing of ulcerations. This requires patient compliance in order to be successful.

1318. Laxative

Laxatives refer to the substances that facilitate bowel movement and help in alleviating constipation. They work by accelerating bowel movement, fecal mass or water content. The excessive use can cause electrolyte imbalance and dependence. These laxatives are stimulant, osmotic and bulk forming. Chronic conditions should be under the medical advice of their use..

1319. Bulk-Forming Laxative

Laxatives that bulk up are those that gain water and become swelly in the intestines thus increasing the stool bulk. Some of them include psyllium husk and methylcellulose. They replicate the consumption of the natural fibre and encourage the soft defecation. Indicated as best in sustained constipation. To make sure that intestinal blockage is prevented, one has to be adequately hydrated.

1320. Stimulant Laxative

The stimulative laxatives directly enhance the intestine motility and secretion. They perfrying a nervous system are that of the enteric nervous system and stimulate peristalsis. They are efficient in the short time period of constipation relief. There will arise bowel dependence and electrolyte imbalance when used chronically.

1321. Osmotic Laxative

Osmotic laxatives cause water to enter intestines osmotically which soften stool and facilitate the evacuation. e.g., lactulose and magnesium sulfate. Applicable in the case of acute constipation and

hepatic encephalopathy. Excessive use may result in dehydration and loss of electrolyte. They have action in hours of administration.

1322. Stool Softener

Stool softeners, e.g. docusate sodium, enhance the penetration of water/fat into stool. They relax bowel movement but do not promote peristalsis. Applicable in patients following operation and cardiac patients that ought not to strain. Generally mild and safe. Its use is not recommended unless under the guidance of the doctor.

1323. Bisacodyl

Bisacodyl is a stimulant laxative, which has effects on the colon, increase the motility and secretion. It is applied as short term remedy to constipation and bowel rectal preparation prior to surgery. Acts within hours orally. Excessive use can bring about cramps and fluid imbalance. Best used occasionally.

1324. Lactulose

Lactulose is an osmotic laxative which is also known to lower the blood ammonia levels. It is applied in constipation that is chronic as well as hepatic encephalopathy. It fosters development of positive intestinal bacteria. The side effects are common such as bloating and flatulence.

1325. Senna

Senna refers to a natural stimulant laxative which is derived out of Cassia plants. It has an effect on the large intestine to increase peristalsis. Applicable in constipation that is of short term nature and bowel cleansing. The excessive use may cause pain in the abdomen and ionic imbalance. It is most appropriate to be periodically used to relieve symptoms.

1326. Castor Oil

Castor oil is a stimulant laxative which speeds up the intestinal motility through release of ricinoleic acid. It evacuates the bowel in a very fast manner in a few hours. Contraindicated in chronic constipation because it causes cramps. One should not take it when one is pregnant. Sometimes applied as bowel cleansing agent.

1327. Antidiarrheal

The antidiarrheal agents decrease the fluid loss and fecal frequency of diarrhea. They do it by decelerating the motility of the intestines or adsorbing toxins. Two of the common ones are the loperamide and kaolinpectin. They are symptomatic in action though they are not to be taken in infectious diarrhea without the guidance of a doctor. Proper hydration is of great importance.

1328. Loperamide

Loperamide is an opioid of the synthetic type of reducing gut motility during diarrhea. It exerts an action on intestinal opioid receptors but not on the central nervous system. Is used as fast acting medication in

chronic or traveler diarrhea. The nursing home should not be used during bacterial infections. The sideeffects are mild and dosedependent.

1329. Diphenoxylate

Diphenoxylate is an antidiarrheal agent which is an opioid derivative. It reduces bowel movement and increases transit time. In combination with atropine to eliminate abuse. Efficient with non infectious diarrhea. In children, anticoagulant can lead to CNS symptoms of depression and respiratory distress, overdose.

1330. Kaolin-Pectin

Kaolin-pectin is a conventional antidiarrheal antidiarrheal adsorbent. Kaolin takes up toxins, and pectin avoids aggravated mucosa. It is mildly beneficial in diarrhea which is noninfectious. It is harmless yet weaker compared with drugs in modern times.

1331. ORS

ORS is a combination of salts and glucose in an equal amount as a method of dehydration diarrhea prevention. It replenishes electrolyte and water losses through increased absorption of the intestinal absorption. WHO recommended to all age groups. Available and life saving when used in acute diarrheal illness. This is to be continued with feeding.

1332. Appetite Stimulant

Stimulants of appetite enhance food consumption and urge. They either inhibit or stimulate the work of the hypothalamus or affect the action of neurotransmitters. Applied in the wasteful states, cancer, or anorexia. An example is cyproheptadine and the megestrol acetate. In the longterm usage, the drug should be monitored concerning its metabolic effects.

1333. Cyproheptadine

Cyproheptadine is an historantihistamine, an appetite stimulator. It has effects that inhibit serotonin receptors and stimulate food intake. Applied in patients with underweight and cachexia. Then also effective in allergy, and migraine.

1334. Megestrol Acetate

Megestrol acetate is a progestin which is synthetic and promotes weight gain and appetite increase. Cancer and AIDS associated anorexia is treated with it. It increases fat deposition and the energy levels. The treatment can result in edema and hyperglycemia in the long run. Orally administered in suspension or tablet.

1335. Appetite Suppressant

The appetite suppressants will decrease the level of food intake and they work in the central nervous system. They are applied in managing short term obesity. Such frequent medications include phentermine

and orlistat. They are supposed to have diet and exercise. The longterm usage has cardiovascular and psychological risks.

1336. Phentermine

Phentermine is an agent that inhibits the appetite by boosting the release of noradrenaline which is a sympathomimetic agonist. It makes one feel less hungry and avoids weight gain. Its side effects are insomnia, palpitations and dependency. It should not be taken along with MAO inhibitors.

1337. Orlistat

Orlistat is a lipase inhibitor and it prevents intestinal absorption of fat. It is used in managing weight in the long run. It decreases dietary break down of triglycerides. These side effects are common like oily stools and flatulence. The tolerability is improved by there being a lowfat diet.

1338. Digestant

Digestants are substances that help in digestion by substituting or secretion of natural enzymes. Applied in the conditions of impaired pancreatic or gastric functioning. Such examples are pepsin and pancreatin.They improve digestion of proteins, fats, and carbohydrates. Must be taken with meals for best effect.

1339. Pepsin Preparation

Pepsin is a proteolytic enzyme that is made up of the gastric mucosa. It aids in the digestion of proteins to peptides. It was employed as a gastritis or hypochlorhydria digestive supplement. Can be taken in the form of a liquid or a tablet. A best preparation is with acid or hydrochloric acid.

1340. Pancreatin

Pancreatin refers to a combination of the pancreatic enzymes such as amylase, lipase and protease. It helps in the stomach digestion of patients with insufficiency of the pancreas. Enhances the intestinal intake of nutrients in cystic fibrosis and chronic pancreatitis. Should be taken with food. Oral mucosa irritation can turn out as a result of high doses.

1341. Carminative

The carminatives get rid of the flatulence by removing the gaseous contents of the gut. They act through relaxation of smooth muscles and decrease of tension of surface. Some of the common carminatives are simethicone and dill oil. Applied on bloating, indigestion and colic. As a rule, harmless, few side effects.

1342. Simethicone

Simethicone is an antifoaming agent made of silicone which is used as a carminative. It decreases the tension of gas bubbles on surfaces in the gut facilitating their release. Indicated in bouts and in the case of post surgery bloating. It does not penetrate into the system. Safe for infants and adults.

1343. Dill Oil

Dill oil this is a natural carminative that is made out of Anethum graveolens. It is a relaxant of the intestinal smooth muscle and a decrease in the gas. On the use of which as an indigestion and colic. Complicated in a large number of plant formulations of the digestive tract. Relatively safe and tolerable.

1344. Emetic

Emetics are drugs that cause vomiting to get the toxins ingested out. They do this by energizing the vomiting center or the stomach. These include ipecacuanha and apomorphine. They are used within a limited number of cases of poisoning being under medical supervision. Should not be used in the case of corrosive or petroleum poisoning.

1345. Ipecacuanha

Taken is ipecacuanha a natural emetic, derived out of the root of Cephaelis ipecacuanha. It causes vomiting, irritating the stomach and wetting the emetic center of the brain. Was used in the management of the poisoning in the past. In case of overdose, the severe effect is vomiting and cardiac toxicity. Its medical use is now rare.

1346. Apomorphine

Apomorphine is a centrally acting emetic and an agonist of dopamine. It causes vomiting as a result of its stimulation of the chemoreceptor trigger zone. Its application is in emergency management of poisoning and treatment of Parkinsonism. Fast acting when injected underneath the skin. It can induce psychrosomnias and airway dilation.

1347. AntiEmetic

Antiemetic drugs are those that inhibit or suppress nausea and vomiting. They would take action on the vomiting center or chemoreceptor trigger zone. Typical ones are the dopamine and serotonin antagonists. Stomachache medication of motion sickness, chemotherapy, and nausea in the posturative phase. Choice is reliant on the causal element.

1348. Metoclopramide

Metoclopramide is an antagonist of dopaminergic and prokinetic agent. It increases the emptying of the stomach, and decreases nausea. Adjacent to both drugs and surgery. The side effects when used long term can be extrapyramidal. Being administered through injection or orally.

1349. Domperidone

Domperidone alleviates nausea and motility in blocking dopamine receptors in the gut and the brain. It has a low probability of going through the bloodbrain barrier compared to metoclopramide. Covered in dyspepsia and gastroparesis. As a rule, poorly absorbed with limited CNS side effects. Should be contraindicated in heart diseases.

1350. Ondansetron

Ondansetron is a HT receptor antagonist, which is an antiemetic. It inhibits cancer induced nausea and vomiting as a result of chemotherapy or surgery. It stimulates on the vagal nerves and the brainstem. Admits and has a high safety profile. May produce mild headache or constipation.

1351. Granisetron

Granisetron is an effective serotonin HT antagonist applied in the prevention of severe vomiting. It is particularly useful in nausea that is caused by chemotherapy. Administred as a pretreatment prior to the treatment. Has a long duration of action. Side effects are few and far between with headache and constipation being the major exceptions.

1352. Motion Sickness

Motion sickness takes place because of a sensory discrepancy between inner ear and eye messages when in motion. The symptoms are vomiting, nausea and dizziness. It is induced by car, ship, or air travelling. Antihistamine or anticholinergic drugs such as dimenhydrinate are given. Both prophylactic and pretravel dose are preventative.

1353. Dimenhydrinate

Dimenhydrinate is an antihistamine that is employed as the preventive and treatment motion sickness. It works by inhibiting histamine and acetylcholine in the vesiculate system. It minimizes nausea, dizziness as well as vomiting. Ordinarily, the side effects include drowsiness and dry mouth. normally minutes prior to traveling.

1354. Chemotherapy

Chemotherapy can be defined as the use of some chemical agents to treat either an infectious/malignant illness. In infections, it attacks microorganisms without attacking host tissues whereas in cancer, it attacks or suppresses fast replicating cells. It contains antivirals, anticancer drugs, antifungals, as well as antibiotics. It is founded on selective toxicity. There is minimal resistance and toxicity by taking the right dosage and combination of drugs.

1355. Selective Toxicity

Selective toxicity refers to the quelling or retarding effect of a drug that causes adverse effects to pathogens rather than as much harm to host cells. It is the basis of antimicrobial treatment. Agents do this by attacking the configurations of microorganisms or enzymes that are not found in human beings e.g. bacterial cell walls or ribosomes. The more selective the drug is the safer. Penicillin will be a good example of high selective toxicity.

1356. Chemotherapeutic Index

The ratio of toxic dose to the effective dose of a drug (TD50/ED50) is known as the chemotherapeutic index. It is a measurement of the safety of a drug. When the index is high, it means that it is more safe to use in clinical practice. Narrow index drugs should be carefully monitored in order to prevent toxicity. It assists in the choice of best therapeutic agents.

1357. Bactericidal Agent

Bactericidal agents are directly involved in killing bacteria by interfering with the normal operation of functions of cells e.g. cell wall formation, DNA replication. These include penicillins, cephalosporins and amino glycosides. They are used when there is a life threat infection and when there is immunocompromised patients. The faster bacterial death will cause infection control faster. Nevertheless, they can lead to the release of endotoxins of Gramnegative infections.

1358. Bacteriostatic Agent

The bacteriostatic agents also prevent the growth and reproduction of bacteria and never kill them. They depend on the immune system of the host to have ultimate eradication. They can be tetracyclines and sulfonamides. They are applicable in mild to moderates infection. Immune condition and drug concentration determine their efficacy.

1359. Spectrum of Activity

The range of microorganisms influenced by an antimicrobial agent is referred to as spectrum of activity. Narrowspectrum drugs work on particular bacteria (e.g., penicillin on Grampositive), whereas the broadspectrum drugs affect both Grampositive and Gramnegative microorganisms (e.g., tetracycline). Depending on the type of infection and the diagnostic results, there is selection. Excessive use of general agents encourages resistance.

1360. Resistance Mechanism

Antimicrobial resistance takes place through mechanisms that help microorganisms to withstand action of antimicrobials. These are enzyme production (blactamase), target alteration, low permeability and efflux pumps. The identification may be inherent or may occur as a result of mutation or via the plasmid transfer. It causes failure of treatment and superbugs transmissions. Developing resistance can be checked through rational use of antibiotics.

1361. Sulfonamide

Sulfonamides are antimicrobial personnelized agents which suppress the production of folic acid of bacteria. They are analogs of paraaminobenzoic acid (PABA) as structures. Good activity in Gram positive and Gram negative bacteria. It is usually supplied in the case of urinary tract and respiratory infections. The side effects are crystalluria, hypersensitivity and blood dyscrasias.

1362. Sulfamethoxazole

Sulfamethoxazole is a sulfonamide, long acting and it acts by inhibiting bacterial dihydropteroate synthase. It inhibits the formation of folate stopping bacterial growth. Trimethoprim is often used together with that of ketoconalazole. Applied to the urinary, respiratory and gastrointestinal infections. The side effects are rash and gastrointestinal disorders..

1363. Trimethoprim

Trimethoprim is an antibacterial which prevents dihydrofolate reductase which is important in folic acid production. It combines synergistically with sulfamethoxazole to increase the action on bacteria. Active against Gramnegative bacteria, particularly often against the thin acidic tract of the diseases. Usually, such side effects as the skin rash and blood dyscrasias occur.

1364. Cotrimoxazole

Cotrimoxazole is a : mixture of sulfamethoxazole and trimethoprim in the form of fixed dose. It gives the synergistic and widespectrum antibacterial effect. Applied in the urinary, respiratory and gastrointestinal infections. In addition effective in Pneumocystis jirovecii pneumonia. Increase in side effects comes as nausea, rash and hematological toxicity.

1365. Penicillin

Penicillin is a lactam antibiotic which prevents bacterial synthesis of cells by binding with penicillinbinding proteins. It works excellently in Grampositive bacteria. Applied in skin, respiratory and soft tissue infections. Resistance occurs due to production of blactamase. The predominant adverse effect is the hypersensitivity reactions.

1366. Amoxicillin

Amoxicillin is an antimicrobial agent which is a broadspectrum penicillin resistant to Grampositive as well as Gramnegative bacteria. It suppresses the synthesis of bacteria cell wall and oral use has acid stability. Usually used to combat breathing and urinary infections. Applied together with clavulanic acid in order to achieve resistance. The side effects consist of diarrhea and allergy.

1367. Ampicillin

Ampicillin is an extended antibacterial ampicillin that is semisynthetic. It finds application in infections, which are caused by E. coli, H. influenzae, and Salmonella. Usually used with sulbactam to stop the blactamase degradation. It is given as a liquid orally or parenterally. May is a rashinducing drug particularly when used in viral infection.

1368. Penicillinase

Penicillinase (blactamase) is a bacterial enzyme that disintegrates the blactam ring of penicillins making them ineffective. Bacterial strains that are resistant to these compounds produce them, e.g., Staphylococcus aureus. Its existence restrains its clinical application of penicillin blactaminase inhibitors such as clavulanic acid are employed to inhibit this mechanism.

1369. Cephalosporin

Cephalosporins are blactam antibiotics which are structurally related to penicillins. They prevent the synthesis of cell wall of the bacteria and most blactamases are resistant. Divided into generations with respect to the spectrum and the potency. Applied to the respiratory, urinary and skin infections. As a rule, the most tolerated but can result in hypersensitivity.

1370. Cefalexin

Cefalexin is a first generation cephalosporin with efficacy mostly against Grampositive bacteria. It is applied in the skin, respiratory, and urinary infections. Orally via a good absorption. Side effects comprise mild gastrointestinal with upsets and rash. It may be crosssensitive to penicillin.

1371. Ceftriaxone

Ceftriaxone is a third generation cephalosporin that has wide spectrum activity. The Grampositive and Gramnegative organisms are susceptible to it. Usually used in meningitis, gonorrhea as well as severe respiratory infections. It is administered orally and has high halflife. Generally one safe yet can lead to biliary sludge.

1372. Cefepime

Cefepime is a fourth generation cephalosporin that has a broadened gram negative coverage. It is resistant to most blactamases and gets within the bloodbrain barrier. Acted as pneumonia obtained in the hospital, sepsis, and complex infections. Administered intravenously. Side effects are minor, such as, rash and diarrhea.

1373. Chloramphenicol

Chloramphenicol is a very common antibiotic and is a broadspectrum antibiotic, which prevents protein synthesis through binding of the S ribosomal subunit. It is used in severe infections such as the meningitis and the typhoid fever. Largely, its application is constrained by possible bone marrow supression, as well as aplastic anemia. It penetrates well through the bloodbrain barrier.

1374. Macrolide

The Macrolides are antibiotics that cause an inhibition of the protein synthesis by bacteria by binding with the S ribosomal subunit. They work with Grampositive coccus and atypical pathogens. Some of the popular ones are erythromycin and azithromycin. Respiratory infection and soft tissue infection Usage. They are safe substitutes of penicillin allergic patients.

1375. Erythromycin

Erythromycin is an antibiotic based on macrolide and is applied in cases of respiratory, skin, and soft tissue infections. It prevents bacterial synthesis of proteins and works with Mycoplasma and Chlamydia.

It is a substitute of penicillin allergic patients. Side effects comprise of gastrointestinal damage and liver enzyme increase.

1376. Azithromycin

Azithromycin is a longacting macrolide, which is well penetrated in tissues. It is successful with the respiratory and sexually transmitted infections. Should be given once a day because of a long half life. Less gastrointestinal effects, compared to erythromycin. Excessive use can potentially assist in resistance.

1377. Clarithromycin

Clarithromycin is a semisynthetic macrolide that has a better acid stability and a greater potency. It is applicable in the respiratory, skin and H. pylori. It suppresses the production of bacterial proteins by attaching to the ribosome of S size. Not especially impresive even if resulting in nausea and metallic taste. Comprise of triple therapy of ulcers.

1378. Quinolone

The quinolones are synthetic antibacterial agents which can stop the bacterial DNA gyrase and topoisomerase IV. They inhibit the replication and repair of DNA. The first quinolones such as nalidixic acid have an effect predominantly on Gramnegative bacteria. The more recent fluoroquinolones have broader spectrum. They are employed in the urinary and respiratory infections.

1379. Nalidixic Acid

The quinolone prototype is nalidixic acid which is used in inhibiting bacterial DNA gyrase. It performs well primarily on Gram negative urinary pathogens. Applied in simple cases of urinary tract infections. Rapidly excreted in urine. It has side effects of nausea and headache; should not be used with children.

1380. Fluoroquinolone

Fluoroquinolones are the quinolones that have been altered with fluorine that gives them an increase in potency and spectrum. They prevent the synthesis of bacterial DNA through attacking DNA gyrase. Active against Gramnegative, Grampositive and atypical bacteria. Examples that are common in use are ciprofloxacin and levofloxacin. Side effects are tendon injury and CNS derangements.

1381. Ciprofloxacin

Ciprofloxacin is a secondgeneration fluoroquinolone which is broadspectrum. It acts against Gram negative and Pseudomonas aeruginosa. Applied in urinary, gastrointestinal and respiratory infections. Well absorbed orally. Photosensitivity and dizziness are some of the side effects.

1382. Levofloxacin

Levofloxacin is a third generation fluoroquinolone, which is effective against grampositive and gram negative bacteria. Applied in respiratory, urinary and skinbased infections. Its oral bioavailability and

tissue penetration is excellent. The side effects consisted of insomnia and inflammation of tendons. Should not be used in a child and pregnant woman.

1383. Tetracycline

The tetracyclines are broadspectrum antibiotics which prevent bacterial synthesis by attaching to the S ribosomal subunit. They work against Rickettsia, Chlamydia and Mycoplasma. Achieved by the use of acnes, respiratory, and zoonotic infections. May result in photosensitization and discolouration of teeth among children.

1384. Doxycycline

Doxycycline is a tetracycline, which is long acting and is used in respiratory, urinary, and act as a vectorborne infection. It is superbly orally absorbed and distributed in the tissues. Possessed preferential in malaria prophylaxis and treatment of acne. Less gastrointestinal side effects as compared to older tetracyclines. Should not be used during pregnancy and children.

1385. Minocycline

Minocycline is a lipophilic and high CNS penetrating semisynthetic tetracycline. Acne and grampositive bacterial infection. It has an effect of antiinflammatory elements as well. The longterm effect can result into dizziness and pigmentation. Resistance may be problematic with its use.

1386. Aminoglycoside

Aminoglycosides are bactericidal antibiotics, which are used to prevent bacterial protein synthesis, binding to the ribosomal S subunit. Their main effects are against Gram negative aerobic bacteria. Popular antibiotics are gentamicin and amikacin. They are known to bring about nephrotoxicity and ototoxicity and they need to be monitored using serum levels..

1387. Gentamicin

Gentamicin is a very strong aminoglycoside which is used on severe Gramnegative infections. It interferes with the synthesis of proteins of bacteria and leads to a quick death of cells. Used systemically as an administration. Some of the toxic effects involve hearing early and kidney destruction. Close attention and care should be paid to drug levels during therapy.

1388. Amikacin

Amikacin is a widespectrum aminoglycoside that is not sensitive to a variety of enzymes inactivating aminoglycosides. Successful in multidrugresistant and hospital acquired infections. Every sepsis, pneumonia, urinary infections. Parenterally given with frequent renal inspection. It is not as toxic as aminoglycosides and aminoglycosides.

1389. Antitubercular Drug

Antitubercular drugs are drugs that are employed in treating infections, which are brought about by Mycobacterium tuberculosis. They do it through preventing the synthesis of cell walls, RNA or energy metabolism in the bacterium. The normal therapy involves the combination of isoniazid, rifampicin, pyrazinamide, and ethambutol. The combination therapy prevents resistance and completely eradicates it. The duration of treatment is normally six months or even more.

1390. Isoniazid

Isoniazid is an antitubercular medication, which can be taken as the firstline decision and acts by blocking the formation of mycolic acid, which is a part of the mycobacterial cell wall. It is very effective and applied in both the active and latent TB infections. Its toxicity risk is different in different people as metabolized by acetylation in the liver. The adverse effects are hepatotoxicity and peripheral neuropathy that can be avoided by the use of vitamin B supplementation.

1391. Rifampicin

Rifampicin is an antimalarial antitubercular bactericidal drug based on an antimicrobial mechanism of action which inhibits RNA polymerase (depending on DNA) in mycobacteria. It is one of the important drugs in short course TB therapy, and leprosy or meningococcal prophylaxis. It generates discoloration of body fluids in orange and hepatotoxicity. Rifampicin causes enzyme induction which results in serious drug interactions.

1392. Pyrazinamide

Pyrazinamide is another first line antitubercular agent which works well in acidic conditions on semidormant mycobacteria. It interferes with the production of membrane potential and energy of the M. tuberculosis. When it is used with other medications it reduces the duration of therapy. Side effects common to it they cause hepatotoxicity, hyperuricemia, and arthralgia.

1393. Ethambutol

An enzyme, known as arabinosyl transferase, is an enzyme used in the cell wall formation in the mycobacteria, and it is the one that is inhibited by Ethambutol. Combination therapy is applied to avoid resistance. Active against actively growing bacilli of TB. Optic neuritis is the primary undesirable effect resulting in reversible partial loss of redgreen color discrimination. It is advised to monitor the eyes on a regular basis.

1394. Streptomycin

Streptomycin is an aminoglycoside antibiotic agent that is utilized as a secondline antituberculotic drug. It inhibits the synthesis of bacterial proteins and attaches to the S subunit of ribosome. It is used to treat extracellular TB bacilli by virtue of parenteral usage. Neuropathies Ototoxicity: This is a significant adverse effect that occurs when the drug penetrates the ear. It is largely applied in difficult or challenging TB cases.

1395. MultiDrug Resistant TB (MDRTB)

MDRTB is the tuberculosis that is caused by the strains that are resistant to at least to isoniazid and rifampicin. It is a consequence of inadequacy or poor treatment. Secondline medications, such as levofloxacin, bedaquiline and linezolid, are needed by the management over a long period of time. MDRTB presents the world with health problems in terms of cost and poor cure rates.

1396. Antileprotic Drug

The antileptics are medications that are taken to manage Mycobacterium lepris disease. They are dapsine, clofazimine and rifampicin. Multidrug therapy (combination therapy) is prescribed to avoid resistance and relapsing. The therapeutic period also depends on type of disease. Nerve damage and deformity is thwarted with early and continued therapy.

1397. Dapsone

A sulfone of Dapsone is a drug used to inhibit dihydropteroate synthase preventing folate production by M. leprae. It forms a foundation of the treatment of leprosy. There is a longlasting usage leading to hemolytic anemia particularly in the GPD deficient persons. It is also applied in the treatment of the dermatitis herpetiformis and some skin infections. It is vital to monitor blood on a regular basis.

1398. Clofazimine

Clofazimine is a water insoluble dye of riminophenazine that is bactericidal to M. leprae. It works by attaching to bacterial DNA and production of reactive oxygen products. It possesses antiinflammatory effects which are applicable in the reaction of leprosy. Side effects Major side effects are skin change in color and gastrointestinal disturbances. It is included in the multidrug leprosy regimen of WHO.

1399. Rifampin (Leprosy)

Rifampin is the most potent bactericidal medication against M. leprae; however, this is a derivative of rifamycin. It suppresses the RNA synthesis by preventing the RNA polymerase. Multidrug therapy of leprosy incorporates a single dose every month. Side effects encompass hepatotoxicity and orange red color of the body fluids. With compliance comes good cure.

1400. Antifungal Agent

Antifungal agents prevent or destroy pathogenic fungi by functional cell wall ergosterol synthesis or cell membranes. There are the classes of polyenes, azoles and echinocandins. They are applied in the treatment of mycoses of the systems and superficially. They are amphotericin B and fluconazole, common agents. Selection of drugs relies on area of infections and fungi.

1401. Amphotericin B

Amphotericin B is a polyene antifungal, which attaches ergosterol in fungal membranes and it creates pores which lead to cell leakage. The drug is the one of the serious systemic fungi. It is absorbed ineffectively orally and with poor absorption it is administered intravenously. Some of the adverse effects are nephrotoxicity, fever, and chills. The toxicity is minimized towards liposomal forms.

1402. Nystatin

Nystatin is a polyene antibiotic, which is binding to the ergosterol in fungus leading to the breakdown of the membrane. It is applied topically or orally in the treatment of candidiasis of the mouth, skin and vagina. Not systemically absorbed so that it can be used on the local basis. There are minor side effects, but these consist of gastrointestinal problems in case of oral administration.

1403. Ketoconazole

Ketaconazole is an antifungal that is an imidazole which prevents ergosterol synthesis in fungi by inhibiting the fungal cytochrome P enzymes. It is used to treat systemic and superficial mycoses. Its systemic level of use has reduced because of hepatotoxicity and endocrine effects. It has since found most of its topical use in dermatophytosis and seborrheic dermatitis.

1404. Fluconazole

Fluconazole is a triazole antifungal, which is both orally bioavailable and not very toxic. It suppresses the formation of ergosterol and is applied to systemic and mucosal candidiasis, cryptococcal meningitis and prophylaxis of immunocompromised patients. It is able to cross bloodbrain barrier. Such side effects as mild hepatotoxicity are possible.

1405. Itraconazole

Itraconazole is a triazole and general antifungal that blocks the production of the ergosterol. It is employed in aspergillosis, histoplasmodo m and dermatophyto. Taken orally in combination with food. Side effects are gastrointestinal disturbances and cardiac toxicity when used on a longterm basis. Also avoided in patients of heart failure.

1406. Antiviral Drug

These drugs are antiviral drugs that prevent the multiplication of viruses by the host cells. They do this by inhibiting viral DNA/RNA synthesis or proteinase or viral entry. Precision on viral enzymes reduces host toxicity. These are acyclovir (herpes), zidovudine (HIV) and oseltamivir (influenza). Development related to resistance is a significant issue.

1407. Acyclovir

Acyclovir is a guanosine analog which blocks viral DNA polymerase as well as halting chain elongation. It is applied in the case of herpes simplex and varicellazoster. Delivered by mouth, topically or by intravenous route. It is selective in responding on infected cells. Some of the adverse effects are mild nausea, or nephrotoxicity at high doses.

1408. Zidovudine

Nucleoside reverse transcriptase inhibitor (NRTI) used in the treatment of the HIV virus is called Zidovudine (AZT). It suppresses viral DNA reproduction which lessens viral multiplication. It is an

important ingredient of anti retroviral therapy (ART). Some of the undesirable outcomes are anemia, myelosuppression and fatigue. Frequent check of blood is advisable during therapy.

1409. Oseltamivir

Oseltamivir is a neuraminidase inhibitor which is used as a preventive and treatment of influenza A and B. It prevents release of viruses in infected cells thereby restricting the infection. Given orally and ideally within hours of clinical manifestation in order to be effective. The side effects are mild such as nausea and headache. There is the possibility of resistance when overused.

1410. Anthelmintic Drug

Anthelmintic drugs are used to eradicate parasitic worms by compromising the energy metabolism, neuromuscular reactions or an integument. They find use in nematode infections, cestode infections and trematode infection. Some of them include praziquantel, mebendazole, and albendazole. Good sanitation and hygiene are used as addition to treatment to stop reinfection.

1411. Albendazole

Albendazole is a Benzimidazole anthelmintic and a broadspectrum agent which blocks micro tubule generation by helminths. It affects the intake of glucose and causes death of the parasites. Active with roundworm, tapeworms and hydatid disease. Given orally, normally as a single dose. It has mild abdominal pain and dizziness on the side effects.

1412. Mebendazole

Mebendazole works by preventing the development of microtubules as well as intestinal helminths absorption of glucose. It is applied in the treatment of infections brought about by Ascaris, Enterobius, and Trichuris. In most cases, it is in the form of a short oral course. Side effects are few mainly in the gastrointestinal tract. Contain not to be used during pregnancy.

1413. Praziquantel

Praziquantel enhances trematode and cestode calcium permeability followed by paralysis and subsequent parasite death. It has been tackled against tapeworm and schistosomiasis. As an oral administration, it is well tolerated. The side effects include headache, stomach upsets, temporary dizziness.

1414. Antimalarial Drug

Antimalarial medications are used to deal with plasmodium species at different stages of their life cycle. There are blood schizonticides (chloroquine), tissue schizonticides (primaquine) and the artemisinin T. Combination therapy decreases the resistance. They are both used as prophylaxis and treatment. The adverse reactions are relative to the agent.

1415. Chloroquine

Chloroquine prevents heme polymerase in the Plasmodium leading to toxic heme buildup in the parasites and eventual death. It is useful in case of sensitive strains of P. vivax and P. ovale. Prophylaxis and treatment of malaria. Such side effects include visual disturbance and pruritus. The use of it is restricted in numerous areas.

1416. Primaquine

Primaquine Primaquine is a tissue schintic object used to deal with hypnozoites of P. vivax and P. ovale. It eliminates dormant liver phases and therefore avoids relapse. Should not be used in the case of GPD deficiency as there is a danger of hemolysis. The usual side effects are nausea and stomach pain. Administration is always to be done after blood schizonticide therapy.

1417. Artemisinin

Artemisinin and their analogs (artemether, artesunate) are very strong antimalarials, which are obtained with the help of Artemisia annua. They release free radicals which destroy proteins of parasites. Artesunate is part of artemisinin based combination therapy to treat resistant P. falciparum. Rapidonset and low toxicity. May will result to mild gastrointestinal upset.

1418. Quinine

Quinine is a natural alkaloid acting in the interference with the replication of parasite DNA. It is applicable in case of acute or resistant malaria. Taken either by mouth or by intravenous injection. Side effects are tinnitus, eye problem and nausea (cinchonism). It has a low therapeutic index, and therefore has to be closely monitored.

1419. Antiamoebic Drug

Entamoeba histolytica is an agent that is treated using antiamoebic drugs. They do it on tissue or luminal stages of the parasite. They are metronidazole, tinidazole and paromomycin. Combination therapy is adequate so as to eradicate both intestinal and hepatic. Healthy hydration and nutrition contributes to recovery.

1420. Metronidazole

Metronidazole is a derivative of nitroimidazole, which is an anaerobe and protozoan killer. It leads to the breakage of the DNA strands by forming toxic metabolites. Indications in amoebiasis, giardiasis and trichomoniasis. Side effects consist of metallic taste, nausea and alcohol disulfiram reaction. Well taken orally and diffused extensively.

1421. Tinidazole

Tinidazole is analogous to metronidazole that has less halflife which gives a possibility of taking the drug only once a day. It interferes with the DNA synthesis of protozoa and aaerobic bacteria. Its use is in amoebiasis, giardiasis, and bacterial vaginosis. More tolerable and only a few gastrointestinal effects. Not to take in the first trimester of pregnancy.

1422. Paromomycin

Aminoglycosidebased antibiotic is known as paromomycin, which is applied as a luminal amoebicide. It suppressed the growth of proteins of E. histolytica and other protozoa. Given orally in case of intestinal infections and usually after metronidazole treatment. Limiting systemic toxicity because of improper introduction through the gut. Side effects include low grade nausea.

1423. Urinary Tract Infection (UTI)

UTI is an urinary tract infection which is mainly brought about by E. coli. It impacts the kidneys, urethra or the bladder. The symptoms consist of dysuria, frequency, and urgency. Diagnosis: urine culture is accurate. Antibiotics that are used in treatment include nitrofurantoin or norfloxacin. Proper hydration helps a person to recover.

1424. Nitrofurantoin

Nitrofurantoin is a urinary antiseptic that is degrading to the bacterial DNA and ribosomal proteins. It finds application primarily in prophylaxis and lower UTIs treatment. Compacted on the urine, and thus useless with systemic infections. Some of the side effects are nausea and pulmonary fibrosis with long term use. Should be avoided in renal ineffectiveness.

1425. Norfloxacin

Norfloxacin is an antibiotic antimicrobial, which is a fluoroquinolone and inhibits bacterial gyrase DNA. It works in the infection of the urine and gastrointestinal tract. It is available as an oral drug and reaches high urine levels. Widespread side effects are gastrointestinal upsets and dizziness. Excessive use may foster the resistance of bacteria.

1426. Chemotherapy of Malignancy

Treatment of malignancy through chemotherapy includes the use of cytotoxic drugs which are used to destroy or stop the proliferation of cancer cells. Agents act upon multiplying cells with a high rate by destroying the synthesis of DNA, mitosis, or metabolism. There can be curative, palliative and adjuvant therapy. These have adverse effects that include suppression of bone marrow, alopecia and nausea.

1427. Alkylating Agent

The cytotoxic drugs are known as alkylating agents, which form covalent bonds with DNA and present them, making it impossible to be replicated or transcribed. They also intervene on every stage of the cell cycle and are utilized in many types of cancers. Some of the commonly used agents are cyclophosphamide and chlorambucil. Side effects have been reported to include the bone marrow suppression, and secondorder malignancies.

1428. Cyclophosphamide

Cyclophosphamide is a derivative of nitrogen mustard which cross links the DNA strands preventing the division of cells. It is applied in lymphomas, cancer of the breast and auto immune diseases. launched in the liver into the active metabolites. Alopecia, hemorrhagic cystitis, and bone marrow suppression are some of the toxicities. The toxicity is decreased by hydration and mesna.

1429. Antimetabolite

Antimetabolites are structural analogs of regular metabolites that prevent the synthesis of the DNA or RNA. Their activities occur at the Sphase of the cell cycle. The tendencies are folate antagonists, purine, and pyrimidine analogs. Applied in solid tumors and leukemia. Myelosuppression and mucositis come under toxicity.

1430. Methotrexate (Anticancer)

Methotrexate is an antagonist to folate, which suppression is done through blocking of dihydrofolate reductase which prevents the DNA synthesis. It is applied in the treatment of leukemia, choriocarcinoma and the case of autoimmune diseases. Available as an oral or parenteral. These have adverse effects, which include hepatotoxicity, myelosuppression, and mucosal ulcers. Toxicity is countered with Folinic acid rescue.

1431. Antitumor Antibiotic

Antitumor antibiotics are natural or seminatural compounds which disrupt the DNA replication. They create free radical or insert strands of DNA. These are doxorubicin and bleomycin. Applied in different malignancies, e.g. breast and lung cancer. The toxicities include bone marrow and cardiotoxicity.

1432. Doxorubicin

Doxorubicin (Adriamycin) is an anthracycline antibiotic which intercalates DNA and topoisomerase II. It produces free radicals which destroy the cancerous cells. Droplet appliances in breast, ovarian and hematologic cancer. Key side effect is cardiotoxicity which is cumulative. In order to avoid heart damage, dexrazoxane is taken.

1433. Vincristine

Vincristine is a vinca alkaloid, which prevents microtubules formation, preventing the formation of the mitotic spindle. It is cell cycle specific of Mphase. It is used in lymphoma, pediatric cancers and leukemia. Peripheral neuropathy and constipation are some of the major toxicities. The myelosuppression is rather mild.

1434. Paclitaxel

Paclitaxel stabilizes microtubules by suppressing mitosis through inhibiting de polymerization. It is an extract of the Pacific yew tree that is helpful in breast, ovarian, and lung cancer. Being administered in the form of an intravenous injection. The side effects are neuropathy, alopecia and bone marrow suppression.

1435. Cisplatin

Cisplatin is a platinum containing substance that interacts with the DNA to crosslink which suppresses replication. It finds application in testicular, ovarian and bladder cancers. Requested intravenously with hydration to decrease renal toxicity. The other side effects are nausea, ototoxicity and neuropathy. Another, a safer dose is carboplatin.

1436. Monoclonal Antibody

Monoclonal antibodies are specifically designed protein which binds to antigens of cancer cells. They augment immune destruction or inhibit growth signalling pathways. These are trastuzumab and rituximab. They are very selective and less toxic to the system. Infusion reactions, immune reactions can take place.

1437. Targeted Therapy

Targeted therapy includes drugs that are specific in targeting of the molecular pathways that must be required by tumors to survive and grow. They are the agents such as tyrosine kinase and monoclonal antibodies. It has less harmful impact on normalized cells than the conventional chemotherapy. Genetic profiling is done individually to make choices on drug.

1438. Biosimilar Drug

A biologic product is a biosimilar drug that is very similar to an approved reference biologic in safety, in terms of purity, and in efficacy. They were developed since original biologics expired their patent protection making them less expensive to treat. Comparable studies are also lengthy and needed to gain regulatory approval. Cases of biosimilars of trastuzumab and filgrastim exist..

1439. Mucolytic Agent

Mucolytic agents refer to medicinal agents which decrease the viscosity and viscocity of mucus at the respiratory system hence coughing becomes simpler to remove. They perform the task of degrading mucoproteins and disulfide bonds of mucus secretions. These medications are specifically helpful in the treatment of such condition like chronic bronchitis, cystic fibrosis and bronchiectasis. Frequent use increases clearance of the airways and reduces the efficiency to breathe. These common examples are bromhexine, acetylcysteine and ambroxol.

1440. Bromhexine

Bromhexine is a mucolytic and the expectorant medication which helps to remove the mucus in the respiratory system. It works by depolymerizing mucopolysaccharide fibers hence lessening the viscosity of mucus. The drug also increases ciliary movements, which is better in moving the mucus. It is regularly utilized in asthma, bronchitis and chronic obstructive pulmonary disease (COPD). Bromhexine can be found in tablet and syrup form of administration.

1441. Ambroxol

Ambroxol is a product of bromhexine which is a strong mucolytic and expectorant. It causes the production of surfactants in the lungs to take place and the mucosial clearance is amplified, which causes the much easier expulsion of mucus. There are also minor effects of the drug which include antiinflammatory and local anesthesia. Ambroxol is frequently used in the treatment of productive cough as a result of respiratory infection and chronic bronchitis. It is easily tolerated and comes as a syrup, tablet and inhalation.

1442. Salbutamol

Salbutamol, or albuterol is a short acting badrenergic receptor agonist (SABA) that is a bronchodilator. It dilates bronchial smooth muscle resulting in fast deconstriction of bronchial sphincter. Salbutamol finds its main application in asthma, COPD and exercise induced bronchoconstriction. It is either administered through inhalation, tablet or nebulization. Such side effects as tremors, palpitations, and mild tachycardia are common.

1443. Terbutaline

Terbutaline is an agonistic of badrenergic having bronchodilatory and uterine relaxant effects. It works through b receptor relaxation of bronchial smooth muscle resulting in relaxation of the airways. Terbutaline is applied in the treatment of preterm childbirth, asthma and bronchitis. It offers rapid relieving the wheezing and shortness of breath. The medication may be taken orally, by subcutaneous route or inhalation.

1444. Formoterol

Formoterol is a longactingbagonist (LABA) which offers lasting bronchodilation of a duration of up to hours. It dilates airway smooth muscle and enhances the airflow in asthmatic and COPD patients. Formoterol unlike salbutamol is long acting but it also takes a short time to act. It is usually applied together with inhaled corticosteroids to treat during the maintenance therapy. The regular usage aids in the management of chronic respiratory symptomatology.

1445. Theophylline

Theophylline is a derivative of methylxanthines which is a bronchodilator, preventing the phosphodiesterase enzymes, and raising the level of cyclic AMP. It also increases the diaphragmatic contractility and is mildly antiinflammatory. Theophylline is indicated in asthma that is chronic, COPD and nocturnal bronchospasm. It has a limited range of its therapeutic practices, which necessitates serum level monitoring. Side effects can be found in the form of nausea, insomnia, and arrhythmias of the heart.

1446. Aminophylline

Aminophylline is a blend of theophylline and ethylenediamine increasing the dissolvability of the activity. It is a bronchodilator and smooth muscle relaxant that results in raising intracellular cyclic AMP. Aminophylline is administered in an exacerbation of asthma attack and COPD when it is required to provide quick relief. Under the care of the medical personnel, it may be given intravenously or orally. The reason why it should be monitored is because it has a small therapeutic index.

1447. Montelukast Sodium

Montelukast sodium is a leukotrienes receptor antagonist which is known to inhibit the action of leukotrienes which cause the airways to become inflamed as well as the bronchoconstriction. It is being employed as a preventive and maintenance treatment of asthma and allergic rhinitis. The medication decreases edema, mucus and eosinophil leuksotaxis of the airway. Montelukast is used orally and is normally taken at night once a day. It is fairly welltolerated and can be used to control asthma in a longterm context.

1448. Zileuton

Zileuton is a lipoxygenase inhibitor which prevents leukotrienes production out of arachidonic acid. It inhibits bronchoconstriction and inflammation by leukotrienes, which are involved in the chronic asthma. The medication is employed in the maintenance treatment but not in the acute attacks. The liver functioning should also be checked on a regular basis because of hepatotoxicity possibilities. Zileuton has been proposed as an alternative to patients who have become ineffective to corticosteroids.

1449. Fluticasone Propionate

Fluticasone propionate is an inflammatory and immunosuppressive potent inhaled corticosteroid. It prevents release or production of inflammatory cytokines and airway hyperresponsiveness of COPD and asthma. The medication offers lasting treatment by reducing the swelling and the level of mucus in the airways. Combination with bronchodilators is applied. Oral thrush and hoarseness are also side effects which can be reduced by rinsing the mouth after use.

1450. Budesonide

Budesonide is an inhaled corticosteroid that is highly popular in treating asthma and chronic obstructive pulmonary disease (COPD). It works by suppressing release of inflammatory mediators and reduction of airway hyper reactivity. Budesonide decreases the amount of mucus and edema and offers longterm parents with respiratory symptoms. High initial systemic metabolism in the liver implies that its effects are minimal in the system. Rinsed mouth inhalation is a method of minimizing local fungal infections such as a fallacy of the oral appearance.

1451. Beclomethasone Dipropionate

Beclomethasone dipropionate is an example of a synthetic glucocorticoid that is mostly used as an inhaled corticosteroid as asthma prophylaxis. It inhibits the inflammatory cell infiltration preventing exacerbations and inhalation of airways, which causes inflammatory airway disease. The drug does not respond in acute attacks but is important in the maintenance therapy. Beclomethasone can also be used to enhance the functioning of the lungs and lower the use of systemic steroids. The side effects locally can be hoarseness and oral thrush without much difficulty and thus can be prevented by river rinsing after inhalation.

1452. Omalizumab

Omalizumab is a recombinant humanized monoclonal antibody, which is an immunoglobulin E (IgE). It acts as an antigenic sward that prevents the binding of IgE to the mast cells and basophils further eliminating allergic inflammation and hypersensitivity reactions. The drug is applied in severe asthma caused by allergy and chronic idiopathic urticaria that is nonresponensive to the traditional treatment. It is administered subcutaneously and serves to reduce the rate of asthma attack. Constant observations must be done to block uncommon anaphylactic responses.

1453. Cromolyn Sodium

Cromolyn sodium is also a mast cell stabilizer which inhibits deactivation of histamine and other allergic inflammatory mediators. It is applied in the prevention of bronchial asthma, allergic rhinitis, and conjunctivitis. The medicine does not alleviate acute bronchospasm and assists in the prevention of symptoms on a chronic basis. Cromolyn is safe with a low systemic absorption. Continued use before exposure to allergens has the best therapeutic effect.

1454. Antitussive Syrup

The socalled antitussive syrups are the compounds that suppress a cough by acting on the cough center in the medulla oblongata. They are applicable in the treatment of nonproductive coughs that are not productive and may inflame the throat or else interfere with sleep. These syrups can be coded in the middle, such as codeine or dextromethorphan, or peripheral calming agents, such as glycerin and honey. The use of them should always be a concern during effective coughs in order to prevent the hanging of mucus. Effective and safe use is achieved by taking the correct dosage and by consulting the doctor.

1455. Codeine Phosphate

Codeine phosphate is a natural opiate and central antitussive and has the ability to suppress cough reflex through the medullary center. It is a weak analgesic as well, which is normally used as part of analgesics. Codeine is also useful in treatment of dry cough but can lead to drowsiness and constipation and when abused, dependence. One should apply it very carefully in children and patients who are depressed on the respiratory level. Control of prescription is useful in avoiding abuse and dependence.

1456. Dextromethorphan

Dextromethorphan is a nonopioid antitussive which is a central acting antitussive that suppresses coughing without developing dependence. It is often applied in the case of overthecounter cough syrups that deal with dry and scratchy coughs. The drug possesses good safety profile over codeine and they is no notable analgesic or sedative effect. But can result in a dizziness or a slight euphoria when over used. It is effective in the provision of symptomatic cough when taken as instructions.

1457. Benzonatate

Benzonatate is a peripherally acting antitussive which inactivates the stretch receptors of the respiratory tract effect on the cough reflex. It is a nonnarcotic which is applied in the symptomatic treatment of dry cough. The medication is capable of giving longlasting cough suppression and not a central nervous

system depression. The pill is to be swallowed without chewing to prevent numbness or choking in the mouth. It is a substitute of opioidbased antitussives that have fewer side effects.

1458. Phenylephrine Hydrochloride

Phenylephrine hydrochloride is another aadrenergic agonist that is used as a nasal decongestant that constrains the blood vessels of the nasal mucosa. It assists in clearing the stuffy nose of cold, allergy and sinususitis. When used parenterally, the drug raises the blood pressure as well since it acts as a vasoconstrictor. Excess use of nasal sprays may result in regressive congestion (rhinitis medicamentosa). It comes in an oral, topical and injectable form.

1459. Oxymetazoline

Oxymetazoline is a topical nasal decongestant that is long acting and works on a and partial a adrenergic receptors. It stimulates the quick constriction of the vas, making it less swollen and less clogged in its nose up to hours. The medicine is applied in allergic rhinititis, sinusitis, and common cold. When used longer than three days, it will result in rebound congestion. Oxymetazoline offers good symptomatic benefits when deployed as it is advised by the medical advice.

1460. Xylometazoline

Xylometazoline is a nasal decongestant topical product, which is a adrenergic receptor agonist, inducing the exploration of the nasal mucosal vessels. This will lessen congestion and enable the easy breathing when one gets a cold or sinus infection. Its action takes place within several minutes and may last to hours. Excess will cause rebound congestion or mucosal congestion. It must not be used in excess amounts in order to avoid rhinitis medicamentosa.

1461. Pseudoephedrine

Pseudoephedrine is an oral sympathomimetic amine and gives relief to nasal and sinus congestion. It works on aaaadrenergic receptors in which it causes vasoconstriction in the respiratory mucosa, breceptors in which it causes bronchodilation. The medication is yet effective in allergic rhinitis and sinusitus though it may increase the blood pressure and heart rate. Potential misuse is because it is converted to methamphetamine. Dispensing that is controlled can be used to curb abuse..

1462. Diphenhydramine Hydrochloride

Diphenhydramine hydrochloride is the firstgeneration antihistamine that has both anticholinergic and sedative effects. It is applied in allergic rhinitis, common cold and in combination with cough preparations. It inhibits sneezing, itch and rhinorrhea by blocking the action of H receptors. The common side effects are sedation and drowsiness. It is also used in the treatment of motion sickness and light insomnia.

1463. Chlorpheniramine Maleate

Chlorpheniramine maleate is an H antihistamine, and it is commonly used to treat allergies like rhinitis, urticaria, and hay fever. It decreases the effects of histamine bombs such as sneezing, discharge of nose, and tearful eyes. It is less drying as compared to other firstgeneration antihistamines, but its use does hamper alertness. It is usually added to mix cold remedies. Precaution is taken in patients having glaucoma or urinary retention.

1464. Omeprazole

Omeprazole is a proton pump inhibitor (PPI) that permanently blocks the H +/K + ATPase gastric parietal cell enzyme and lowers acid secretion. It is applied in the treatment of peptic ulcer disease, gastroesophageal reflux and ZollingerEllison syndrome. The medication offers protracted levels of acid inhibition and ulcer recovery. When the medicine should be used, it should be done prior to meals as it is best absorbed. In the long term, the use can influence the calcium uptake and cause infection.

1465. Pantoprazole

Pantoprazole is also a selective proton pump inhibitor which reduces the amount of gastric acid secretion by inhibiting the last stage of acid secretion. It is usually also used in acidpeptic disorders and erosive esophagitis. Pantoprazole is well bioavailable and is safe. It gives good management of heartburn and helps in avoiding the reoccurrence of ulcers. Prolonged use should be followed up with regards to electrolyte upsets.

1466. Rabeprazole

Rabeprazole is an enhanced benzimidazole analog, which inhibits the enzyme of acid secretion, H + /K ATPase system produced by the gut. It acts onset more rapidly in comparison to other PPIs. The medication finds its use in GERD, peptic ulcers, and regimes of eradicating Helicobacter pylori. Rabeprazole is interchangeable, tolerated and has light side effects such as headache or diarrhea. Vitamin B deficiency needs to be monitored in the course of longterm therapy.

1467. Esomeprazole

The Sisomer of omeprazole is called esomeprazole and has better acid suppressive properties because it gives more uniform effect when it comes to butting off the gastric proton pumps. It is applied in treatment of GERD, esophagital erosion, and duodenal ulcers. The medication increases the healing of mucosa and increases the control of symptoms. Esomeprazole is normally administered once in a day with no food. After a longterm use, hypomagnesemia and intestinal infections can be predisposed.

1468. Lansoprazole

Lansoprazole is a proton pump inhibitor that prevents the secretion of gastric acid because it forms a strong binding to the H +/K + ATPase enzyme present in the parietal cells. It is prescribed in the treatment of ulcers, reflux disease, and hypersecretory diseases. The medication is fast acting and has a facilitating effect on the healing of the mucosa. Lansoprazole capsules ought to be swallowed as a whole in order to increase their effectiveness. The prolonged usage is problematic as it is associated with possible malabsorption of the minerals.

1469. Cimetidine

Cimetidine is the original clinically employed H receptor antagonist that is inhibitor of gastric acid secretion through histamine. It is used as a prescription with peptic ulcer disease, reflux esophagitis and prophylaxis of stress ulcer. The medication reduces the level of basal and stimulated acid secretion. Nonetheless, it has the ability to suppress cytochrome P enzymes thus causing drug interactions. Newer H blockers such as famotidine are frequently taken which are more tolerable.

1470. Ranitidine

Ranitidine is an antagonist acting on the histamine H receptor and it inhibits the secretion of acid gastric by inhibiting the histamine activity in the parietal cells. It is available in the treatment of peptic ulcer disease, GERD and ZollingerEllison syndrome. It has fewer drug interactions and side effects as compared to cimetidine. Ranitidine helps in healing the mucosal lining and stops the symptoms fast. Its application has also reduced in the world, owing to impurity reasons (NDMA contamination).

1471. Famotidine

Famotidine is an effective H receptor blocker which prevents gastric acid secretion. It has the application in the treatment of peptic ultracerrosis disease, dyspepsia and acid reflux disorders. The use of famotidine is better than that of cimetidine and ranitidine because this drug is stronger and does not interact much with other drugs. It is long acting and less central nervous system active. Even in the case of longterm administration, the drug is accepted very well.

1472. Sucralfate

Sucralfate is an agent that is gastroprotective in nature and develops an amorphous layer over the ulcers protecting them against acid and pepsin. It enhances healing of the mucosa without any changes in the gastric acidity. Its application is specifically known in the case of duodenal ulcers and prevention of stress ulcers. It ought to be consumed without food so that it can be as effective as possible. One of the side effects includes constipation, and it should not be taken in combination with antacids.

1473. Misoprostol

Misoprostol is a prostaglandin e analog to boost mucosal defense by enhancing the production of the secretions bicarbonate and mucus. It also suppresses the production of gastric acid guarding against ulcers brought about by NSAIDs. The drug should not be used during pregnancy because it has got uterotonic effect that can lead to abortion. Misoprostol has been prolongingly applied along with mifepristone as a medical induction method to abort the fetus. The side effects include diarrhea and cramping.

1474. Laxative

Laxatives are drugs that ensure that bowel movements are promoted and constipation is relieved. They work by augmenting the bulk of in the stool, softening of stool consistency or by stimulating intestine movement. Widely available ones are bulkforming, osmotic and stimulant laxatives. Excessive usage will

cause electrolyte imbalance and dehydration. Safe and effective relief on this is encouraged by having proper hydration and dietary fiber.

1475. Bulkforming Laxative

Laxatives that are bulkforming, including psyllium and methylcellulose, influence the fecal mass by absorbing water to produce a soft, bulky stool, which is believed to trigger peristalsis. They imitate the impacts of dietary fiber and are said to be the safest kind to be used in the longterm. Such agents are slow acting and enhance regularity without making one dependent. Enough fluid should be taken to avoid obstructing the intestines. They are perfect in the chronic constipation management.

1476. Stimulant Laxative

Such stimulant laxatives as senna and bisacodyl have a direct effect on the intestine mucosa to stimulate peristalsis and increase stool passing rate. These are useful in shortterm use in relieving constipation, though they can lead to abdominal cramping. The chronic use may cause laxative dependence or electrolyte imbalance. These are commonly applied in the prediagnostic procedures such as colonoscopy. Special care is required in young children and old patients.

1477. Osmotic Laxative

Lactulose and polyethylene glycol are examples of osmotic laxatives that absorb water into the lumen of the intestines in an osmotic manner, making the stool soft and caused a defecation. They are useful in constipation in the liver (lactulose) and chronic constipation. These are fast acting agents that may result in bloating or dehydration when used excessively. To prevent electrolyte imbalance, one should stay hydrated.

1478. Antidiarrheal Agent

Antidiarrheal agents are applied to decline the occurrence and intensity of diarrhea by either reducing the intestinal motility or enhancing fluid intake. Examples are; loperamide, bismuth subsalicylate and kaolinpectin. These are used by giving symptomatic relief though not in case of infectious diarrhea unless the cause is ascertained. When overused, the result is constipation. Oral rehydration is the standard management in diarrhea management.

1479. Loperamide Hydrochloride

Loperamide hydrochloride is an synthetic opioid receptor agonist which provides the intestine wall to slow down peristalsis and enhance the absorption of more water. It has good control of noninfectious diarrhea without effects of central nervous system. The medication increases the transit period, which is beneficial in the formation of better stool. Its contraindications include children below two years and when infected by bacteria in enterocolitis. Paralytic ileus may result as an outcome of overdose.

1480. Bismuth Subsalicylate

Bismuth subsalicylate is a gastrointestinal agent and GI protectant and a weak antidiarrheal. It operates by lining the stomach, decreasing the stomach inflammation, and binding toxins of bacteria. The salicylate group has an effect of antibacterial activity and antisecreatory effect against Helicobacter pylori whereas bismuth is antiinflammatory. It is combined with peptic ulcer and traveler diarrhea in the combination treatment. Turning of stool and tongue black is an innocent side effect.

1481. Metoclopramide

The Metoclopramide is a D receptor antagonist dopamine antiemetic and prokinetic. It improves gastric emptying, and raises the lower esophageal sphincter tone that is applicable in gastroesophageal reflux and gastroparesis. It precludes nausea and vomiting by inhibiting the D receptors in the chemoreceptor trigger zone (CTZ). With prolonged usage, there will be extrapyramidal symptoms or tardive dyskinesia. One should take it with precaution in neurological conditions.

1482. Domperidone

Domperidone is a peripheral dopamine people D receptor blocker that increases gastrointestinal movement and has an antiemetic activity. It does not enter the bloodbrain barrier to a large degree, making it a minimal side effect as compared to metoclopramide. It helps in emptying of the stomach and nausea caused by dyspepsia or vomiting of drugs. The longterm use can elevate the level of prolactin, which causes galactorrhea. It is much favored because it is better tolerated.

1483. Ondansetron

Ondansetron is a HT receptor antagonist that is selective and inhibits nausea and vomiting, especially, which is caused by chemotherapy, radiations, and surgical procedures. It works by blocking the serotonin receptors in chemoreceptor trigger zone and gastrointestinal tract. It has high effectiveness and low sedation level with a high level of tolerance. Taken side effects are common side effects that include constipation and headache. It brought revolution to the antiemetic treatment of cancer care.

1484. Granisetron

Granisetron is an effective and specific antagonist of serotonin HT receptors to prevent nausea and vomiting resulting because of chemotherapy of cancer or because of the conditions following an operation. It has a prolonged action time as compared to ondansetron. The medication has both a central and peripheral effect of suppressing emetogenic pathways. It has a good tolerance, and its side effects are also few like mild headache or dizziness. Its oncedaily dosage enhances compliance of the patient.

1485. Cisapride

Cisapride is a prokinetic drug whose effects are on the gastrointestinal motility, because of its stimulation of the HT receptors that boost the secretion of the acetylcholine. It had been applied before in gastroesophageal reflux disease (GERD) and in chronic constipation. It has however been removed in most countries because it is likely to lead to cardiac arrhythmias by QT lengthening. Domperidone is now preferred to be used because it is safer.

1486. Supplement of Digestive Enzyme.

Enzyme supplements that are available in the market are made of natural or synthetic enzymes such as amylase, protease, and lipase, to help in the breakdown of carbohydrates, proteins, and fats. They are used in pancreatic insufficiency, cystic fibrosis or chronic pancreatitis. Such preparations enhance the absorption of nutrients and helps in elimination of bloating or indigestion. Medical check ups should be done to guarantee the dosage and effectiveness of regular use.

1487. Pancreatin

Pancreatin is a combination of digestive enzymes extracted in pancreas of pigs or cows such as amylase, lipase, protease. Such as an enzyme replacement therapy of patients with malabsorption syndromes and pancreatic insufficiency. The medicine promotes digestion of the food nutrients and removes steatorrhea. Pancreatin needs to be administered with meals. High doses may result in gastrointestinal irritation.

1488. Simethicone

Simethicone is an antifoaming agent that is used to treat bloating, gas, and discomfort, which results because of excess intestinal air. It works by decreasing the surface tension of the gas bubbles thus making them coalesce and be forced out by the same process. It is nonabsorbable, pharmacologically inert and safe in the use of both adults as well as infants. The Simethicone is usually used together with antacids and digest preparations. It gives a symptomatic relief without modifying the gastric acidity.

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Mr. Yash Srivastav earned a Master of Pharmacy (M. Pharm) in pharmaceutics from the Goel Institute of Pharmacy & Sciences (GIPS), Lucknow, Uttar Pradesh, India, where he completed his pharmacy department post-graduate studies. He currently teaches at the Shri Venkateshwara University, Uttar Pradesh, India, as an Assistant Professor and Pursuing PhD. in Pharmaceutical Science from Lovely Professional University (LPU) a UGC-approved University. He has published 140 plus Publications including Review Articles, Research Articles, Indian Patent, Indian Patent Grant, India Copyright, International Design Patent (UK design Patent with Grant), Canadian Copyright, International Book Chapters and 14 Books included Modern Pharmaceutical Analytical Techniques, Molecular Pharmaceutics, Modern Pharmaceutics, Research Methodology and Biostatistics, Regulatory Affairs, Pharmaceutics Practical-1, Pharmaceutics Practical-2, Advanced Biopharmaceutics & Pharmacokinetics, Pharmaceutical Terminology-Vol. 1st, Computer Aided Drug Delivery System, Drug Delivery Systems (DDS), Cosmetics and Cosmeceutical, Standard book, Pharmaceutical Sciences & Diploma Pharmacy Exit Exam MCQs Book (Pharmacy) (Pharmacy) in Reputed Publications. He was awarded Delhi Ratan Award 2025, Desh Ratan Award 2025, Pride of India Award 2025, Excellence Achiever Award, Vishwa Ratan Samman, Merit Certificate of Excellence Award, Dr. APJ Abdul Kalam Indian Icon Award, Swami Vivekanand Adarsh Ratna Samman and Emblem of Excellence Awards Winner. He has the Official Education Department of the Manavadhikar Suraksha Avm Sanrakshan Organization and National Allied and Healthcare Professionals Association (NAHPA) District: President Siddharthanagar, Uttar Pradesh, India. In addition to attending National and International conferences and attending pharmacy-related workshops, he presented research and review papers at the National and International seminars. This Medical Terminology: A Comprehensive Guide to Anatomy, Physiology, Pathology, and Pharmacology Book, is dedicated to our parents and our rising star pharmacy students, and thanks to GOD, who gave me the energy to prepare this book.

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