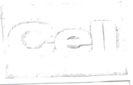
What are living things made of?

Cells, Tissues, Organs, and Systems

CELL



- The structural and functional unit of the body is called cell. It is the smallest unit of life that is classified as a living thing

Types of cell

There are three types of cells

1. Eukaryotic (Human) and
2. Prokaryotic (Bacteria)

- All organisms are composed of one or more cells.

Tissue

Human body tissue consists of groups of cells with a similar structure working together for a specific function.

Organ

A group of tissues that perform a specific function or group of functions.

Organ System

In biology, an organ system is a group of organs that work together to perform one or more functions. Each does a particular job in the body, and is made up of certain tissues

cells

⇩ work together in

tissues

⇩ work together in

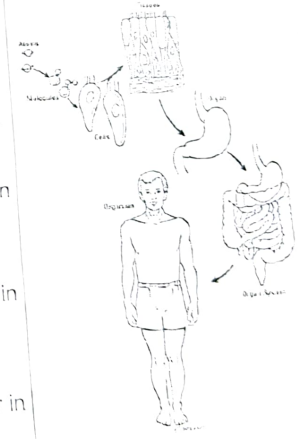
organs

⇩ work together in

organ systems

⇩ work together in

organisms



Organization of Life

Cell → Tissue → Organ → Organ System → Organism*

- **Cell**: Smallest unit that can carry out life's activities
- **Tissue**: Group of cells working together to perform specific job
- **Organ**: Group of tissues working together to perform specific job
- **Organ System**: Group of organs working together to perform specific job

*Organism can be made of one cell or many organ systems.

Organization of Human Body

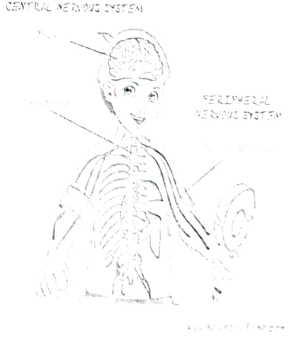
Cell	Tissue	Organ	Organ System
Cardiac Muscle Cell	Cardiac Muscle	Heart	Circulatory System

Major system of the body

1. Nervous System
2. Digestive System
3. Respiratory system
4. Cardiovascular system
5. Reproductive system
6. Excretory system
7. Immune system
8. Musculo skeletal system
9. Endocrine system

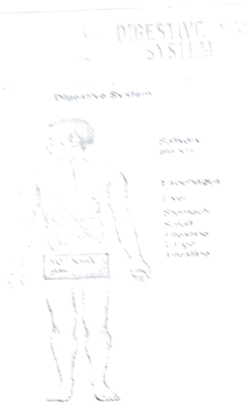
Nervous system

- The nervous system is the master controlling and communicating system in the body.
- The nervous system controls and coordinates all essential function of the body.
- Responds and adapts to changes that occur both inside and outside the body.



Digestive System

The digestive system is the group of organs in the body those are responsible for getting food into the body, break down of food so that the nutrients can be absorbed by the body and excrete wastes from the body.

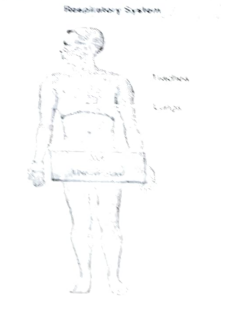


Cardiovascular System

The system that carries oxygen and nutrients to all cells in the body and takes wastes away from the cells; it consists of the heart, blood vessels and blood.

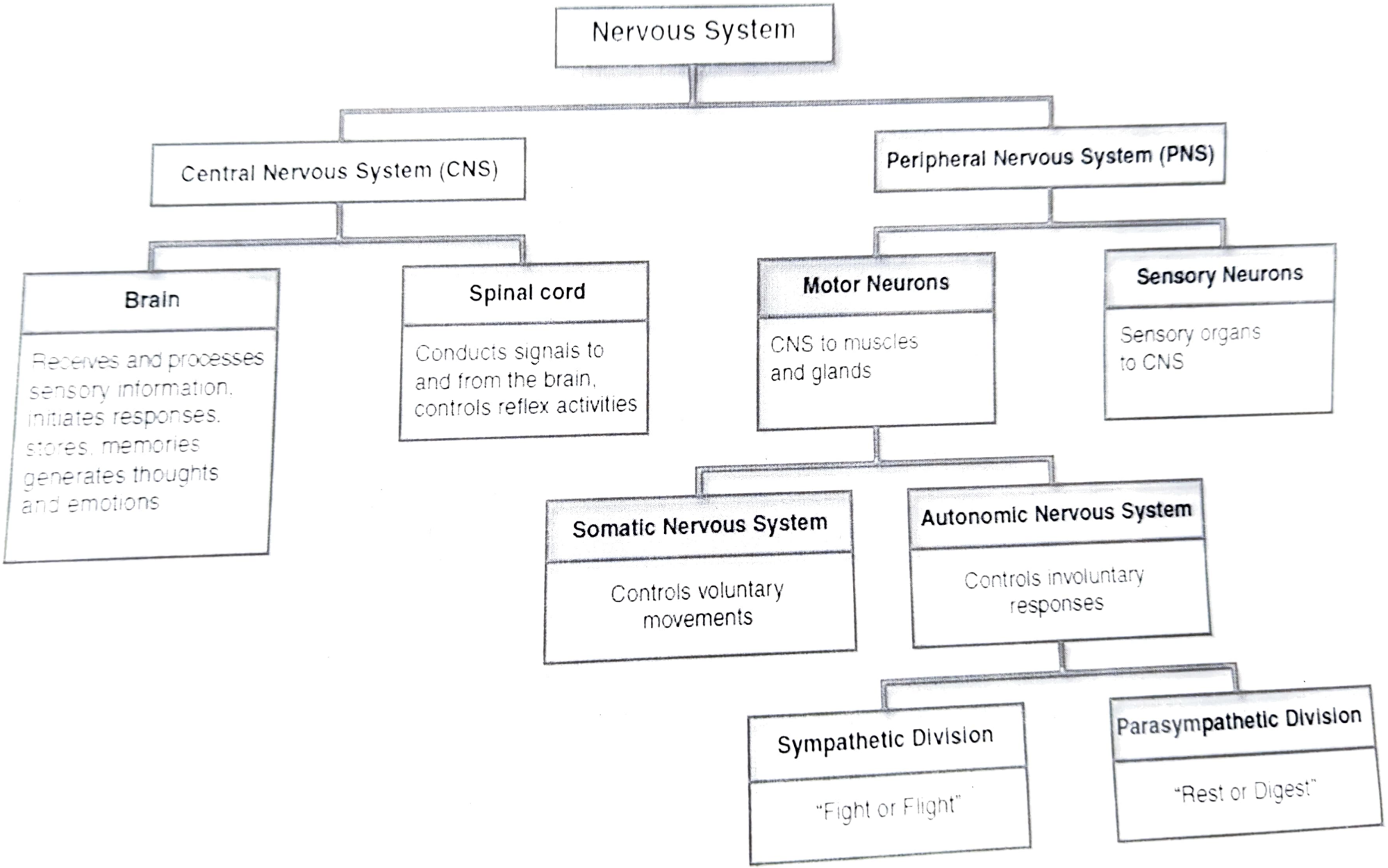
Respiratory System

The system involved in the inhalation of and diffusion of oxygen into the blood stream, and the removal of carbon dioxide from the body via exhalation.



Excretory System

The system responsible for the removal of excess water and waste from cell reactions in the body.


Nervous System
Central Nervous System (CNS)
Peripheral Nervous System (PNS)
Brain
Receives and processes sensory information, initiates responses, stores memories generates thoughts and emotions
Spinal cord
Conducts signals to and from the brain, controls reflex activities
Motor Neurons
CNS to muscles and glands
Sensory Neurons
Sensory organs to CNS
Somatic Nervous System
Controls voluntary movements
Autonomic Nervous System
Controls involuntary responses
Sympathetic Division
"Fight or Flight"
Parasympathetic Division
"Rest or Digest"

NERVOUS SYSTEM

The nervous system is a complex network of nerves and cells that carry messages to and from the brain and spinal cord to various parts of the body.

NEURON

Neuron:
Neuron is the structural and functional unit of nervous system.

Function:
Motor: It carries impulse away from the body.
Sensory: It carries impulse towards the body.

Importance of nervous system

- It controls the rapid and first activities of the body e.g. muscular activity.
- It helps in adjustment of the body with the external environment.

Disease

Insomnia: Sleep disorder.
Somnolence: Excessive sleep.
Anxiety: Painful restlessness in disease.
Tension: Mental strain suppressed of mental spirit.
Depression: Lowness of mental spirit.
Phobia: Any obsession of fear / abnormal fear.
Schizophrenia: A mental disorder characterized by psychomotor disturbance.
School phobia: Fear arise from attending school.
Tremor: An involuntary trembling.

Classification of Nervous System

The nervous system includes both the Central nervous system and Peripheral nervous system.

1. **Central**
   a. Brain
      i. Fore brain
      ii. Mid brain
      iii. Hind brain
   b. Spinal Cord
2. **Peripheral**
   a. Somatic
      i. Spinal nerves
      ii. Cranial nerves
   b. Autonomic
      i. Sympathetic
      ii. Para sympathetic

Related drugs of nervous system in Alco Pharma

Brand name	Generic name	Strength
Tensnil Tab.	Clobazam	10 mg
Brozep Tab.	Bromazepam	3 mg
Anflu Tab.	Nortriptyline + Fluphenazine	0.50 mg + 10 mg
Tixol Tab.	Flupentixol + Melitracen	0.50 mg + 10 mg

Cardiovascular System (CVS)

Cardio means heart and vascular means blood vessels. Cardiovascular system is a transport system in the body by which the blood being circulated under different pressure gradient created by pumping mechanism of heart .

Composition of CVS

The cardiovascular system is composed of-

- Heart
- Blood and
- Blood vessels

Function of CVS

i. Circulates oxygen to the cells and removes carbon dioxide from the body
ii. Transports nutrients to the tissue
iii. Protects the body against disease and infection
iv. Regulates body temperature
v. Removes the waste products
vi. Transports hormones to cells and organs

Heart

The heart is a muscular organ that is responsible for pumping blood throughout the blood vessels to the body.

Chambers and Valves of Heart

Chambers

The heart has four chambers-

i. Right Atrium
ii. Right Ventricle
iii. Left Atrium
iv. Left Ventricle

Valves

The heart has four valves-

i. Tricuspid Valve
ii. Pulmonary Valve
iii. Mitral Valve
iv. Aortic Valve

Blood

Blood is a connective tissue that delivers necessary substances such as nutrients and oxygen to the cells and transports metabolic waste products away from those same cells.

Composition of Blood

Blood is composed of two main constituents-

1. Plasma
2. Cellular components
   a. Red blood cell (RBC)
   b. White blood cell (WBC)
   c. platelet

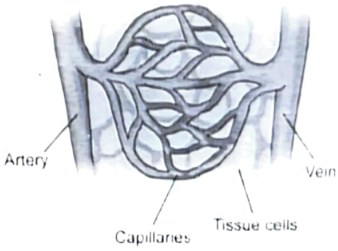
Type of Blood based on Oxygen

A. **Oxygenated blood** : Blood that is filled with oxygen.
B. **Deoxygenated blood** : Blood that has no or little amount of oxygen.

Blood Vessels

There are three types of blood vessel in the human body

1. Artery
2. Vein
3. Capillary



Artery: Arteries carry blood away from the heart. Arteries carry oxygenated blood, except for pulmonary artery. The largest artery is the aorta.

Vein: Veins are blood vessels that carry blood toward the heart. Veins carry deoxygenated blood, exceptions are the pulmonary vein. The largest veins are the superior and inferior vena cava.

Capillaries: Capillaries are the smallest type of blood vessels in the body. Capillaries deliver nutrients and oxygen to tissues and remove the byproducts of cellular reactions, such as carbon dioxide and water.

Heart & Blood Circulation

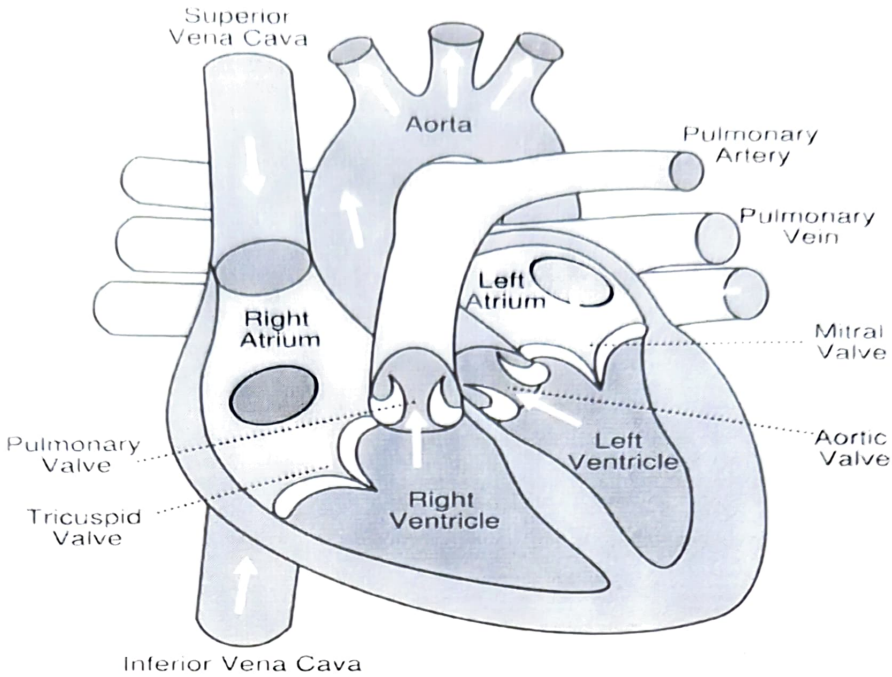


Fig: Heart

Blood pressure (BP)

Blood pressure (**BP**) is the pressure of circulating blood on the walls of blood vessels.

Classification of Blood pressure

1. **Systolic pressure:** It is the maximum pressure during systole. Normal systolic pressure is 120 mm of Hg.
2. **Diastolic pressure:** It is the minimum pressure during diastole. Normal diastolic pressure is 80 mm of Hg.

Heart rate

The number of heart beat per minutes is called heart rate.

Normal heart rate:

Adult (range)	: 60-100 /min.
Average	: 72 /min.
In foetus	: 140-150 /min.
In new born	: 130-140 /min.
In children	: 80-120 /min.
In old age	: 75-80 /min.

Anti-Histamine: Anti-Histamine are drugs that block the action of Histamine.

Histamine: Histamine are a substance that plays an important role in allergic reaction.

Brand Name	Generic Name	Strength	Pack Size
Alagra	Fexofenadine Hydrochloride	30, 60, 120, 180 & 30 mg/5 ml	30's, 50 ml
Aloran	Desloratadine	5 mg	50's
Levocet	Levocetirizine Dihydrochloride	5 mg	50's
Noler	Cetirizine Dihydrochloride	10 mg & 5 mg/5 ml	50's, 60 ml
Rupaler	Rupatadine	10 mg	20's

Alagra Tablet

Indication of Alagra: Symptomatic treatment of-

1. **Seasonal Allergic Rhinitis**
2. **Chronic Idiopathic Urticaria**

Mechanism Action of Anti-Histamine:

Anti-Histamine

↓

Binds with H_1 Receptor

↓

Blocks H_1 Receptor

↓

Inhibits all the action of Histamine

Dosage Guideline:

Age	Disease	Dose
Adult and Children aged 12 years or older	Seasonal Allergic Rhinitis, Chronic Idiopathic Urticaria	60 mg or 10 ml twice daily (A dose of 60 mg once daily is recommended as the starting dose in patients with decreased renal function) or 120 mg once daily. **In severe case:** 180 mg once daily
Children 6 months to 2 years	Chronic Idiopathic Urticaria	15 mg or 2.5 ml twice daily
2 to 11 years	Seasonal Allergic Rhinitis, Chronic Idiopathic Urticaria	30 mg or 5 ml twice daily

Rupaler Tablet

Indication of Rupaler: Symptomatic treatment of-

1. Seasonal Allergic Rhinitis
2. Perennial Allergic Rhinitis
3. Chronic Idiopathic Urticaria

Mechanism of Action of Rupaler:

Rupaler both histamine and platelet activating factor (PAF) antagonist.

Platelet Activating Factor:

PAF causes bronchoconstriction which leads to increase vascular permeability that contributes to increase mucous secretion. It also acts as mediator in the inflammatory process.

Dosage Guideline:

10 mg once daily

Blood Pressure

Blood pressure is the measurement of force applied to the artery walls

The pressure is determined by the force & amount of blood pumped **(CO)** & the size and flexibility of the arteries **(PR)**.

BP = Cardiac output x Peripheral resistance

Types of Blood Pressure:

Systolic pressure: It is the maximum pressure during systole. It is about, 100-140 mm of Hg.

Average: 120 mm of Hg.

Diastolic pressure: It is the minimum pressure during diastole. It is about, 60-90 mm of Hg.

Average: 80 mm of Hg

Cardiac output (C.O)

The amount of blood that is ejected by each ventricle per minute is called cardiac output. (5-6 liters/min)

C.O = Stroke volume × Heart rate

= (70-80) ml × 72/minutes

= 5-6 Liters/minute

Stroke volume

Volume of blood pumped out by each ventricle in each beat is called stroke volume. It is about 70-80 ml.

Peripheral resistance

Peripheral Resistance is the sum of the resistance of all peripheral vasculature in the systemic circulation

Antihypertensive Drugs:

Drugs or agent that are used to management the hypertension is called Antihypertensive drugs.

Drugs that available in Alco Pharma:

Brand Name	Generic Name	Strength	Dosage form
Amdin	Amlodipine	5 mg & 10 mg	Tablet
Cardilock	Atenolol	50 mg	Tablet
Amdin Plus	Amlodipine + Atenolol	5 mg + 50 mg	Tablet
Capotril	Captopril	25 mg	Tablet
Clopidol	Clopidogrel	75 mg	Tablet
Clopidol Plus	Clopidogrel + Aspirin	75 mg + 75 mg	Tablet
Losa	Losartan Potassium	25 mg & 50 mg	Tablet
Losa 50 Plus	Losartan Potassium + Hydrochlorothiazide	50 mg + 12.5 mg	Tablet
Atovin	Atorvastatin	10 mg & 20 mg	Tablet
Rosvin	Rosuvastatin	10 mg	Tablet

Amdin

Amlodipine 5 mg & 10 mg Tablet

Mechanism of Action:

Blocks Calcium channel in the cardiac muscle and vascular muscle.

Indication:

1. Hypertension
2. Chronic stable angina
3. Vasospastic angina

Dosage and Administration:

The usual initial antihypertensive oral dose of Amdin is 5 mg once daily with a maximum dose of 10 mg once daily.

Amdin Plus

(Amlodipine 5 mg + Atenolol 50 mg) Tablet

Mechanism of Action:

Amlodipine blocks Calcium channel in the cardiac muscle and vascular muscle and Atenolol blocks Beta (β_1) receptor in cardiac muscle.

Indication:

1. Hypertension
2. Angina Pectoris
3. Arrhythmia

Dosage & Administration:

The recommended dose of Amdin Plus is one tablet daily.

Clopidol

Clopidogrel 75 mg Tablet

Mechanism of Action:

Clopidol (Clopidogrel) is a selective Adenosine diphosphate (ADP) receptor antagonist to inhibit platelet aggregation.

Indication:

1. Atherosclerotic disease (ischemic stroke, myocardial infarction or established peripheral arterial disease).
2. Prophylactically in patients at the risk of thrombo-embolic disorders such as myocardial infarction and stroke.

Dosage and Administration:

The recommended dose of Clopidol is 75 mg once daily, with or without food. No dosage adjustment is necessary for elderly patients or patients with renal disease.

Atovin

Atorvastsatin 10 mg & 20 mg Tablet

Mechanism of Actiion:

Atovin is a selective and competitive inhibitor of HMGCoA reductase. As a result decreases in cholesterol synthesis and increases LDL cholesterol uptake by liver cells and thus reduces amount of cholesterol in blood.

Indication:

1. Primary hypercholesterolemia
2. Prevention of cardiovascular diseases (Stroke, Myocardial infarction and Coronary heart diaeses).

Dosage and Administration:

The recommended starting dose of **Atovin** is 10 or 20 mg once daily. Patients who require a large reduction in LDL-C (more than 45%) may be started at 40 mg once daily.

Losa/Losa 50 Plus

Losartan Potassium

Mechanism of Action:

Losartan is a selective, competitive angiotensin II receptor type 1 (AT1) receptor antagonist

Indication:

1. Hepertension
2. Heart Failur

Dosage and Administration:

The recommended dose of Losa is 50 mg once daily. No dosage adjustment is necessary for elderly patients or patients with renal disease.

Hyddrochlorothiazide

Mechanism of Action:

Hydrochlorothiazide is a thiazide diuretic. Thiazides affect the renal tubular mechanisms of electrolyte reabsorption, directly increasing excretion of sodium and chloride in approximately equivalent amounts. Indirectly, the diuretic action of hydrochlorothiazide reduces plasma volume, with consequent increase in plasma renin activity, in aldosterone secretion, in urinary potassium loss and decreases in serum potassium.

Indication:

1. Fluid retention (edema) in people with congestive heart failure
2. High blood pressure (hypertension)
3. Cirrhosis of the liver
4. Kidney disorders

Dosage and Administration of Losa 50 Plus:

The usual starting dose is one tablet once daily. More than two tablets are not recommended. Maximum antihypertensive effect is attained about three weeks after initiation of therapy.

Prepared By:
Tamanna Taharin
Trina Product
Executive,PMD

Topic: Cephalosporin Antibiotic

Antibiotics: The word "antibiotics" comes from the Greek anti (against) and bios (life).An antibiotics is a drug that kills or slows the growth of bacteria.

Some common terms related to antibiotics:

- Bactericidal Antibiotic: Bactericidal, meaning that they work by killing bacteria.
- Bacteriostatic Antibiotic: Bacteriostatic, meaning that they work by stopping bacteria multiplying.
- Broad-Spectrum Antibiotic: Broad-Spectrum Antibiotics are effective against a broad range of bacteria.
- Narrow- Spectrum Antibiotics: Narrow- Spectrum Antibiotics are only effective against a narrow range of bacteria.
- Antibiotic-Resistance: Antibiotic-Resistant bacteria are germs that are not killed by commonly used antibiotics.
- Gram-Positive Bacteria: Gram-Positive Bacteria are bacteria that give a positive result in the gram stain test. Gram-Positive Bacteria take up the crystal violet stain used in the test.
- Gram-Negative Bacteria: Gram-negative bacteria are a group of bacteria that do not retain the crystal violet stain used in the gram staining method.

Cephalosporin Antibiotic: Cephalosporin's are a group of broad spectrum, semi-synthetic bata-lactam antibiotics derived from the mould cephalosporium.

Mechanism of Action: Inhibit bacterial cell wall synthesis.

Our Cephalosporin Antibiotic:

Product Name	Generic	Dosage from & Strength
Betasef	Cephradine	Capsule:250mg,500mg PD:125mg/1.25ml PFS:125 mg/5m1,250mg/5ml
Axetil	Cefuroxime	Tablet:125mg,250mg,500mg PFS:125mg/5ml
Axeclav	Cefuroxime+ Clavulanic acid	Tablet:250mg+62.50mg,500mg+125mg&125mg+31 .25mg/5ml
Oticef	Cefaclor	Capsule:500mg PD:125mg/1.25ml PFS:125mg/5ml
Cepdoxim	Cefpodoxime	Capsule:100mg,200mg PFS:40mg/5ml
Saver	Cefixime	Capsule:200mg,400mg PFS:100mg/5ml

Oticef

Oticef is a preparation of cefaclor, a second generation cephalosporin antibiotic. Oral broad spectrum antibiotic.

Indication:

- Acute otitis media
- Lower respiratory tract infections, including pneumonia.
- Upper respiratory tract infections, including pharyngitis and tonsillitis.
- Urinary tract infections, including pyelonephritis and cystitis.
- Skin and soft tissue infections.

Dose & Administration:

Age	Oticef Suspension	Oticef Paediatric Drops
1 month-1 year	1/2 tea spoon (2.5ml)t.i.d	1/4 tea spoon(0.625ml)t.i.d
1. year-5 year	1 tea spoon (5ml)t.i.d	1 / 3 tea spoon(1.25ml)t.i.d
Over 5 year	2 tea spoon (10ml)t.i.d	½ tea spoon(2.5ml)t.i.d

Adult: The usual recommended dose is 250 mg-500 mg every 8 hours

Axeclav

Axeclav is a combination of cefuroxime Axetil and Clavulanic Acid. Cefuroxime is a bactericidal second generation cephalosporin antibiotics.

Indication:

RTI:

- ✓ **Pharyngitis/Tonsillitis.**
- ✓ **Acute bacterial otitis media.**
- ✓ **Acute bacterial chronic bronchitis.**

SSTI:

- ✓ **Skin and skin structure infections.**

UTI:

- ✓ **Urinary Tract Infections.**

Others:

- ✓ **Bone and joint infections.**
- ✓ **Intra-abdominal and Gynecological sepsis.**
- ✓ **Early Lyme disease.**

Dosage Guideline:

The usual dose is 250-500 mg twice daily.

Asthma

Asthma is a chronic (long-term) lung disease that inflames and narrows the airways.

Symptoms:

- Coughing.
- Wheezing.
- Chest tightness.
- Shortness of breath.

Causes:

- Allergens from dust, animal fur, cockroaches, mold, and pollens from trees, grasses, and flowers
- Irritants such as cigarette smoke, air pollution, chemicals or dust in the workplace
- Medicines such as aspirin or other nonsteroidal anti-inflammatory drugs and nonselective beta-blockers
- Viral upper respiratory infections, such as colds
- Physical activity, including exercise

Antiasthmatic Drugs:

The drugs which are indicated for the treatment of asthma. They may be useful either in the treatment or prevention of asthma attacks.

Sl. No.	Brand Name	Generic Name	Dosage form & Strength
01	Mokast	Montelukast Sodium INN	**Tablet:** 4 & 10 mg
02	Lebrod	Levosulbutamol Sulphate INN	**Tablet:** 1 mg & 2 mg **Syrup:** 1 mg/5 ml (100 ml)

Mokast

Montelukast Sodium

Composition:

Mokast 10 mg tablet: Each tablet contains Montelukast Sodium INN equivalent to Montelukast 10 mg.

Mokast 4 mg tablet: Each Chewable tablet contains Montelukast Sodium INN equivalent Montelukast 4 mg.

Mechanism of Action:

Montelukast is a selective and orally active leukotriene receptor antagonist that inhibits the cysteinyl leukotriene ($CysLT_1$) receptor.

Cysteinyl Leukotrienes have been correlated with the pathophysiology of asthma and allergic rhinitis. Cysteinyl Leukotrienes may cause airway edema, smooth muscle contraction and cellular activity associated with the inflammatory process, which contribute to the signs and symptoms of asthma. By blocking leukotrienes to bind with $CysLT_1$ receptor Montelukast improves asthma symptoms, helps control asthma and improves seasonal allergy symptoms.

Indications:

- Prophylaxis of asthma and management of chronic Asthma.
- Symptomatic relief of seasonal allergic rhinitis

Dosage Guideline:

Prophylaxis of Asthma:

Adults and Child (15 years of age and over): 10 mg daily once daily in the evening.

Children (6-14 years of age): 5 mg daily once daily in the evening.

Children (6 months-5 years of age): 4 mg daily once daily in the evening.

Seasonal Allergic Rhinitis:

Adults and Child (15 years of age and over): 10 mg daily once daily in the evening.

Clinical Advantages:

- Significantly reduces asthma symptoms
- Effectively controls asthma and allergic rhinitis.
- Improves lung function.
- Offers most economic price.
- **Approved by FDA to pregnancy category B.**

Therapeutic Class: **Antiasthmatic**
Dosage form: **Tablet**

Strength: **4 mg and 10 mg**

Pack Size:
Mokast 4:2x10's
Mokast 10:2x10's

Price:
Mokast 4: 120 Tk. /Pack
Mokast 10: 200 Tk. /Pack

Detailing approach for Mokast:

Dear Sir/Madam,
আপনার প্রতিদিনের **practice** এ এমন অনেক patient পেয়ে থাকেন যারা Asthma-য় আক্রান্ত। Asthma -য় রোগীদের বিভিন্ন ধরনের সমস্যা দেখা দেয় যেমন: Trouble in Breathing, Cough, Chest pain, Fatigue etc. To control Asthma symptoms, Alco pharma offers Mokast Tablet, A preparation of Montelukast. ১০০ জন Asthmatic Patient দের উপর ৪ সপ্তাহব্যাপী একটি Study তে দেখা গেছে Asthma related symptom যেমন Wheezing, Coughing and tightness of chest কমানোর ক্ষেত্রে Mokast (Montelukast) Ketotifen থেকে অধিকতর কার্যকরী। এছাড়াও Mokast (Montelukast) Lungs function যেমন FEV & PEFR এর significantly improve করে। আরো একটি study তে দেখা গেছে Asthma with allergic rhinitis patients এর ক্ষেত্রে ৮৩% পর্যন্ত allergic rhinitis symptom improve করেছে। সুতরাং Mokast (Montelukast) effectively reduces Asthma symptoms. এছাড়া single daily dose এবং তুলনামূলক দাম কম থাকার কারণে patient দের long term treatment cost কমায়।

Asthma তে আক্রান্ত patient দের treatment এ Mokast এর Benefit এর কথা বিবেচনা করে আমি আপনার কাছে দিনে ০১ টি Prescription support আশা করছি।

Anxiolytic Drug

A drug used for the treatment of anxiety and its related psychological and physical symptoms.

Alco Pharma Offers

For the treatment of anxiety & depression and its related disorders

Brand Name	Generic Name	Strength
Brozep	Bromazepam	3 mg
Tensnil	Clobazam	10 mg
Epizam	Clonazepam	0.5 mg & 2 mg
Tixol	Flupentixol + Melitracen	0.5 mg + 10 mg

Tixol

Flupentixol 0.5 mg + Melitracen 10 mg Tab.

Indication

Tixol is indicated in anxiety along with depression and apathy.

These includes:

- Psychogenic depression.
- Depressive neurosis.
- Masked depression.
- Psychosomatic affections accompanied by anxiety and apathy.
- Menopausal depressions.
- Dysphoria and depression in alcoholics and drug addicts.

Mechanism of Action

Flupentixol

Flupentixol exerts its **antipsychotic action by blocking post synaptic Dopamine receptor** in the limbic system. It is a potent antagonist of D1 & D2 receptors. Flupentixol is an alpha adrenergic receptor blocker and depresses many hypophyseal and hypothalamic hormones. It also blocks Prolactin inhibitory factor (PIF) and results in hyperprolactinemia.

Melitracen

Melitracen **acts by decreasing reuptake of Norepinephrine and Serotonin** at the synapse resulting in high concentration of these neurotransmitters at the post-synaptic end. Thus it produces its **antidepressant effect.**

Tixol

Flupentixol 0.5 mg + Melitracen 10 mg Tab.

Dose

Adult: In general 2 tablets per day (morning and Noon). Morning dose can be double for the severe cases.

Elderly: 1 tablet in the morning.

Maintenance Dose: Usually 1 tablet in the morning.

Children: Not recommended.

Epizam

Clonazepam

Indication

Epizam is indicated for the treatment of –

1.Anxiety disorders
2.Insomnia
3.Panic disorders
4.Epilepsy
5.Social phobia
6.Mania
7.Posttraumatic stress disorder (PTSD)

Epizam

Clonazepam

Mechanism of Action

Clonazepam

Binds with gamma aminobutyric acid (GABA) receptor in the brain

Enhance the activity of GABA

(GABA, a neurotransmitter act as a nerve calming agent)

Inhibition of synaptic transmission across the central nervous system

Slow down or stop nerve signals in the brain

Dosage and Administration

Dosage must be determined in each patient according to clinical response and tolerance.

Seizure Disorder:

Adults: The initial dose should not exceed 1.5 mg/day divided into three doses. Dosage may be increased in increments of 0.5 to 1 mg every three days until seizures are adequately controlled. Maintenance dosage should be individualized for each patient depending upon response. A recommended maintenance dose for adult is 8-10 mg/day in three divided doses. Dosages in excess of 20 mg /day should be administered with caution.

Children: The initial dose for infants and children (up to 10 years of age or 30 kg of body weight) should be between 0.01 and 0.03 mg/kg/day and should not exceed 0.05 mg/kg/day given in two or three divided doses.

Panic Disorder:

Adults: The initial dose is 0.25 mg twice daily. Increased to 1 mg per day in two divided doses after 3 days. Maximum dose should not exceed 4 mg /day in two divided doses.