CHAPTER 08

HUMAN HEALTH & DISEASES
HEALTH

• A state of complete physical, mental and social well-being

• Health is affected by
  – Genetic disorders
  – Infections
  – Life style: food & water we take, rest and exercise, habits we have or lack, etc.
1. Infectious diseases:
Ex: AIDS, Tuberculosis, Influenza

2. Non-infectious diseases:
Ex: cancer, Deficiency diseases, degenerative diseases, allergies

- Pathogens
- Etiology: The study of symptoms of disease
Important factors to maintain good health

- Balanced diet
- Personal hygiene and regular exercise
- Awareness about diseases
- Vaccination (immunisation) against infectious diseases
- Proper disposal of wastes
- Control of vectors
Common bacterial diseases

Typhoid (enteric fever) & Pneumonia

- Bacteria like *Streptococcus pneumoniae*, *Diplococcus pneumoniae* and *Haemophilus influenzae* cause disease pneumonia in humans.

- **Mode of infection**: occurs through sputum (Phlegm) of patient. Enter the lungs by inhaling contaminated air or aerosols or droplets.
Common bacterial diseases

- **Dysentery** - *Shigella dysenteriae*,
- **plague** - *Enterobacter yersinia*,
- **diphtheria** - *Cornyebacterium diphtheriae*,
- **Leprosy** - *Mycobacterium leprae*,
- **Anthrax** - *Bacillus anthracis*,
- **Tetanus** - *Clostridium tetani*, etc.,
Viral diseases:  Common cold:  other viral diseases

- Flu/influenza- Myxovirus influenzae, small pox- Variola virus, Dengue- Flavi virus, etc
Protozoan diseases: Malaria

Amoebiasis (amoebic dysentery)

Kala azar (Black fever/dum dum fever) - *Leishmania donovoni* *(bite of sandfly)*,
Sleeping sickness - *Trypanosoma gambiense*,
Diarrhoea - *Giardia intestinalis*, etc
Helminthes: Ascariasis
Filariasis (Elephantiasis)

- Fungal diseases
- Ring worm (Tinea)
  - Microsporum
  - Trichophyton
  - Epidermophyton
Measures to prevent infectious diseases

- Maintenance of personal hygiene
- Maintenance of public hygiene
- Prevention of close contact with infected persons
- The elimination of vectors and their breeding places.
- Use of mosquito nets, introducing fishes like Gambusia in ponds
- Spraying insecticides in ditches, drainages, etc
- Using vaccines, antibiotics and drugs
Measures to prevent infectious diseases
Measures to prevent infectious diseases
IMMUNITY

• body defence or immunity (Resistance power of the body against diseases).

• Immunology.

• Types: (i) Innate immunity and (ii) Acquired immunity.
IMMUNITY

- Innate Immunity (Non specific immunity): The defensive mechanism present by birth, effective against wide range of infective agent
  - Physical barriers: Skin, Mucus membrane
  - Physiological barriers: HCl, Saliva, tears, lysozyme, Sweat-sudorific gland, Oil-Sebaceous gland
  - Cellular barriers: PMNL(Neutrophils), Monocytes, NK cells, Phagocytes.
  - Cytokine barriers: Interferons (IFN’s)
Antibody mediated immunity (AMI)

- B-cell contact antigen
  - Plasma cells
  - Memory cells
  - Secondary
  - Primary
  - Antibody
  - Immune response

Cell mediated immunity (CMI):

- Helper T-cells, Cytotoxic or Killer T-cells
- Suppressor T-cells
Active immunity

• **Natural** – Infection:

• **Artificial** – Vaccination:

• **Vaccine**:

• **Edward jenner** – Small pox

Passive immunity

• **Natural**: Mother to child–Colostrum (IgA) or by placenta (IgG)

• **Artificial**: Through injections
Allergies

- **Allergens:** Dust, pollen, mites, etc.
- **Symptoms:** sneezing, watery eyes, running nose, itching, rashes, difficulty in breathing, etc.
- **Auto immunity:** Rheumatoid arthritis, Multiple sclerosis, Graves disease (thyrotoxicosis)
Components of human immune system

- lymphoid organs
- Lymphoid tissues
- cells and
- soluble molecules like antibodies.
Acquired immuno deficiency syndrome (AIDS) Modes of transmission
People with high risk of infection
Replication of HIV or retrovirus
Diagnostic tests: ELISA,
Prevention of AIDS: WHO, NACO & NGO’s
Cancer

- **Oncology.** Extra moss of tissue – **Tumor**
  - **Benign tumor** & **Malignant tumor:** Metastasis.
  - Characteristics of cancer cells

- **Types of Cancer:** Carcinoma, Sarcoma, Lymphoma, Leukemia

- **Carcinogens:**

- **Cancer detection and diagnosis**

- **Treatment of cancer**
DRUGS AND ALCOHOL ABUSE

• Any chemical compounds that alter the biochemical or physiological or psychological processes of organism are called **drugs**.

• **3 groups of drugs:**
  – Opioids
  – Cannabinoids
  – Cocaine or Coca alkaloids
Drug abuse

• Tobacco - **Nicotine**

• **Adolescence** - Causes of drug abuse in adolescence:
  • withdrawal symptoms

• **Effects** of Drug/Alcohol Abuse:
Prevention and Control

“prevention is better than cure”

• Avoiding undue peer pressure
• Education and counseling
• Looking for danger signs
• Seeking professional and medical help
• Seeking help from parents and peers:
Endoparasites like Ascaris are not digested in our gut due to

1. Presence of thick chitin coating
2. Presence of thick cuticle coating
3. Presence of mucilaginous capsule
4. Due to alkaline secretions
A classic case of Mary Mallon is concerned with the following disease

1. Cholera
2. Typhoid
3. Malaria
4. Filariasis
Read the statements A and B, choose the correct choice of answer

• **Statement A:** Some diseases that attack in childhood do not attack again.

• **Statement B:** Memory cells play an important role in the above disease control.
OPTIONS

1. Both statements A and B are true and B is the reason for A
2. Both statements A and B are true and B is not a reason for A
3. Only A is correct and B is wrong
4. Both the statements are wrong.
Antibody mediated immunity (AMI)

- B-cell contact antigen → Plasma cells
  → Memory cells
  → Antibody
  → Secondary immune response
  → Primary immune response
In which one of the following options examples are correctly matched with their particular type of immunity?

(1) Saliva in mouth and tears in eyes = Physical barrier
(2) HCl in stomach = Active immunity
(3) Polymorpho-nuclear leukocytes and monocytes = Cellular barriers
(4) Anti-tetanus and anti-snake bite injections = Physiological barriers.
Which of the following diseases is due to an allergic reaction?

1. Enteric fever
2. Hay fever
3. Skin cancer
4. Goiter
Allergens are

1. Infectious and increase secretion of IgE antibodies
2. Infectious and increase secretion of IgM antibodies and histamines
3. Non-infectious and increase the secretion of IgG antibodies
4. Non-infectious and increase secretion of IgE antibodies and histamines
Match the disease in Column I with the appropriate pathogen/prevention in Column II

<table>
<thead>
<tr>
<th>Column I</th>
<th>Column II</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. Amoebiasis</td>
<td>(i) Treponema palladium</td>
</tr>
<tr>
<td>b. Pneumonia</td>
<td>(ii) Use only hygienic food and water</td>
</tr>
<tr>
<td>c. Cholera</td>
<td>(iii) Haemophilus influenzae</td>
</tr>
<tr>
<td>d. Syphilis</td>
<td>(iv) Vibrio coma</td>
</tr>
</tbody>
</table>
OPTIONS

1. a-(ii), b-(iii), c-(iv), d-(i)
2. a-(i), b-(ii), c-(iii), d-(iv)
3. a-(ii), b-(iv), c-(i), d-(iii)
4. a-(ii), b-(i), c-(iii), d-(iv)
Ringworm in humans is caused by

1. Fungi
2. Nematodes
3. Viruses
4. Ascaris
Read the statements A and B, choose the correct choice of answers

• **A**: Heavy drinkers become dehydrated with increased urine output & thirst.
• **B**: Alcohol decreases the secretion of ADH.

1. Both statements A and B are true and B is the reason for A
2. Both statements A and B are true and B is not a reason for A
3. Only A is correct and B is wrong
4. Both the statements are wrong.
Cortex

Descending limb of loop of Henle

Outer medulla

Inner medulla

Thick segment of ascending limb

Thin segment of ascending limb

Collecting duct

NaCl

H₂O

H₂O

HCO₃⁻

H₂O

K⁺

H⁺

NaCl

NH₃

H⁺

Urea

BIOLOGY
Which one is not belongs to helminthes

1. Taenia
2. Trypanosoma
3. Fasciola
4. Ascaris
The abundant antibody present in our blood is

1. IgM
   - IgM: 5 to 10 % - the first antibody responsible for primary immune response

2. IgG
   - IgG: 70 to 75% - Only antibody that can pass through placenta

3. IgA
   - IgA: 10% provides local immunity
   - IgD: 1 to 3%

4. IgE
   - IgE: Less than 1%, allergic reactions.
Widal test is used for diagnosis of

1. Typhoid
2. Cancer
3. AIDS
4. Malaria
Diagram shows _(A)_ disease caused by pathogen _(B)_

<table>
<thead>
<tr>
<th>A</th>
<th>B</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Ascariasis</td>
<td>Ascaris</td>
</tr>
<tr>
<td>2. Filariaasis</td>
<td>Wuchereria</td>
</tr>
<tr>
<td>3. Elephantiasis</td>
<td>Culex</td>
</tr>
<tr>
<td>4. Ascariasis</td>
<td>Wuchereria</td>
</tr>
</tbody>
</table>
An insect bite may result in inflammation of that spot. It is triggered by alarm chemicals such as

1. Histamine and dopamine
2. Histamine and kinins
3. Interferon and opsonin
4. Interferons and histones
A vector born disease is

1. AIDS
2. Influenza
3. Kala-azar
4. Tuberculosis
AIDS is characterized by sharp reduction in number of --- cells & --- cells act as HIV factory respectively

1. Helper T-cells & macrophages
2. Killer T-cells & Helper T-cells
3. Suppressor T-cells & macrophages
4. B-lymphocytes & Helper T-cells
Match the types of immunity listed in Column I with the examples listed in Column II.

Choose the answer that gives the correct combination of alphabets of the two columns:
<table>
<thead>
<tr>
<th>Column I</th>
<th>Column II</th>
</tr>
</thead>
<tbody>
<tr>
<td>Types of immunity</td>
<td>Example</td>
</tr>
<tr>
<td>A. Natural active</td>
<td>p. Immunity developed by heredity</td>
</tr>
<tr>
<td>B. Artificial passive</td>
<td>q. From mother to foetus through placenta</td>
</tr>
<tr>
<td>C. Artificial active</td>
<td>r. Injection of antiserum to travelers</td>
</tr>
<tr>
<td>D. Natural passive</td>
<td>s. Fighting infections naturally</td>
</tr>
<tr>
<td></td>
<td>t. Induced by vaccination</td>
</tr>
</tbody>
</table>
OPTIONS

1. A = t, B = s, C = r, D = p
2. A = s, B = t, C = q, D = r
3. A = s, B = r, C = t, D = q
4. A = p, B = q, C = r, D = t
One of the following reduces haem-bound oxygen in blood.

1. Alcoholism
2. Injection of heroin
3. Smoking
4. Malarial infection
In the following structure of biomolecule identify different labels designated as alphabets

1. A-antigen binding sites, B-heavy chain, C- Light chain and D-Antigen.

2. A-Antigen binding site, B-light chain, C-Heavy chain and D-Disulphide bond
3. A- Antibody binding site, B-light chain, C-heavy chain and D-Disulphide bond

4. A- Antigen binding site, B- heavy chain, C-Light chain and D-Disulphide bond.
B-cells and T-cells of immune system are produced respectively in

1. Spleen & Thymus
2. Both in Bone marrow only
3. Bone marrow & thymus
4. Thymus & Bone marrow
The disorder in which both B-lymphocytes and T-lymphocytes are not formed is

1. SCID
2. AIDS
3. Cystic fibrosis
4. Muscular dystrophy
Vaccination protects a person from disease because it

1. Helps in better digestion
2. Increases RBC count
3. Induce antibody production
4. Induces antigen production
The chemical structure belongs to one of the following:

1. Morphine
2. Smack
3. Cannabinoids
4. LSD
Fish Gambusia is helpful to control the spread of following diseases.

A - Dengue  
B - Cholera  
C - Chikungunya  
D - Malaria

1. Only A, B and C  
2. Only D  
3. Only A and D  
4. Only A, C and D.
Identify different alphabets with correct labeling in the following diagram

1. A- Viral RNA,
   B- Viral DNA,
   C- Reverse transcriptase and
   D – Host DNA

2. A-Viral DNA,
   B- Viral RNA,
   C- DNA polymerase and D- Host DNA.
Identify different alphabets with correct labeling in the following diagram

3. A - Viral RNA, B- Viral DNA, C-Reverse replicase and D-Host DNA.

4. A – Viral RNA, B-Viral DNA, C- Reverse transcriptase and D- Pathogen DNA
Match the following disease with their mode of infection.

**A**

P - Rabies
Q - influenza
R - Tetanus
S - Syphilis

**B**

A – Contact with soil
B – Sexual contact
C – animal bites
D – droplets of sneezing.
OPTIONS

1. P-B, Q-C, R-D and S-A.
2. P-D, Q-C, R-A and S-B.
3. P-C, Q-D, R-A and S-B.
4. P-C, Q-A, R-D and S-B.
Heroin is \( \text{(A)} \) also known as \( \text{(B)} \) and obtained by acetylation of \( \text{(C)} \).
Papaver somniferum (Poppy plant)

- Smack or Heroin:
- White crystalline, odourless bitter compound
Which person is suffering from malaria disease according to given symptoms?

1. Raju suffering from abdominal pain, constipation, Stools with excess of mucus.
2. Suma suffering from sustained fever, stomach pain, head ache, loss of appetite
3. Ram suffering from chill & high fever recurring every 3 to 4 days.
4. Latha with nasal congestion & discharge, sore throat and cough.
Quinine used for treatment of malarial fever is extracted from:

1. *Atropa belladonna* leaves
2. *Cinchona officinalis* bark
3. *Cinchona officinalis* leaf
4. *Rauwolfia serpentina* roots
At which stage of HIV infection does one usually show symptoms of AIDS?

1. When infecting retrovirus enters host cells
2. When viral DNA produced by reverse transcription
3. When HIV damages T-lymphocytes in large numbers
4. Within 15 days of sexual contact with an infected person
Pneumonia differs from Common cold in that

1. Pneumonia is communicable & common cold is due to climatic variations
2. Pneumonia can be controlled by nutritional diet & common cold is not
3. Pneumonia caused by a virus & common cold caused by Haemophilus influenzae
4. Pneumonia pathogen infect alveoli & common cold affects upper respiratory tract
Which one is the source of LSD?

1. Fungi
2. Bacteria
3. Virus
4. Protozoa
Swine Flu is caused by

1. HIV
2. H1N1
3. Herpes zoster
4. Mumps virus
Inactive cancer gene is called

1. Transposon
2. Proto-oncogene
3. Tumour promoter gene
4. Tumour suppressor gene
A person after a snake bite is immunized by administering

1. Wide spectrum antibiotics
2. Preformed antibodies
3. Vaccine
4. Interferons
Surgical removal of thymus of a newborn shall result in failure of

1. AMIS
2. CMIS
3. First line of body defense
4. Second line of body defense
Character of acquired immunity is

A. differentiation of self and non-self
B. specificity of antigen
C. retains memory
D. Performs Phagocytosis

1. Only A, B & C
2. 2. Only B and C
3. Only C & D 4. All these
AIDS was first reported in __(A) at __(B) and HIV is discovered by ___(C)  

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>B</td>
<td>C</td>
</tr>
<tr>
<td>1. 1981</td>
<td>Africa</td>
<td>L. Montagnier</td>
</tr>
<tr>
<td>2. 1983</td>
<td>U.S.A</td>
<td>L. Montagnier</td>
</tr>
<tr>
<td>3. 1983</td>
<td>Africa</td>
<td>Gaetan Dugas</td>
</tr>
</tbody>
</table>
Cells of immune system that kills antigen by pore formation are

1. Helper T-cells
2. Cytotoxic T-cells
3. Suppressor T-cells
4. B-cells
Study of mode of transmission of diseases is

1. Parasitology
2. Epidemiology
3. Nosology
4. Immunology
following chemical is extracted from a plant for the chemo-therapy treatment of cancer

1. Vintristin from *Vinca rosea*
2. Vincristin from *Catharanthus roseus*
3. Vincristin from *Cannabis sativa*
4. Vintristin from *Opium*
Cirrhosis of liver is caused by the chronic intake of

1. Alcohol
2. Opium
3. Tobacco
4. Heroin
AZT is used in treatment of

1. Malaria
2. AIDS
3. T.B.
4. Kala-azar
Pair of viral diseases are

1. Ringworm, AIDS
2. Typhoid, Tuberculosis
3. Amoebic Dysentery, common cold
4. Common Cold, AIDS
Which are the correct sentences out of X, Y & Z?

X - The period between 12-18 years of a child is a bridge linking childhood & adulthood.

Y - Adolescence stage is observed only in drug addicts.

Z – Adolescence is a very vulnerable phase of mental and psychological development of an individual.
OPTIONS

1. X, Y & Z are right.
2. X & Z are right & Y is wrong.
3. X & Y right & Z is wrong.
4. X, Y & Z are wrong.
Which one of the following options gives the correct matching of a disease with its causative organism and mode of infection?

<table>
<thead>
<tr>
<th>Disease</th>
<th>Causative Organisms</th>
<th>Mode of Infection</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Elephantiasis</td>
<td>-Wuchereria malayi</td>
<td>With contaminated water and food</td>
</tr>
<tr>
<td>2 Malaria</td>
<td>-Plasmodium falciparum</td>
<td>Bite of female Anopheles mosquito</td>
</tr>
<tr>
<td>3 Typhoid</td>
<td>-Salmonella typhi or</td>
<td>Inhaling droplets aerosols</td>
</tr>
<tr>
<td>4 Pneumonia</td>
<td>Streptococcus Pneumoniae</td>
<td>House fly</td>
</tr>
</tbody>
</table>
Following statement is correct with respect to Plasmodium

1. Sexual reproduction occurs in man, hence he is primary host.
2. Asexual reproduction occurs in man hence he is primary host.
3. Sexual reproduction occurs in mosquito hence it is primary host.
4. Asexual reproduction occurs in mosquito, hence it is primary host.
Life cycle of plasmodium
Benign tumour is the one which

1. Shows metastasis
2. Are undifferentiated and non capsulated
3. Differentiated and non capsulated
4. Are undifferentiated and capsulated
Following surface glycoprotein is absent in cancer cells

1. Fibrinogen
2. Fibronectin
3. Nectofibrin
4. Contact inhibitor fibrin.
Which of the following is an autoimmune disease

1. Hemophilia
2. Allergy
3. Rheumatoid arthritis
4. Cancer
Select correct statement regarding kidney transplantation

1. Donor is treated with immuno-suppressants.
2. Cell mediated immune system is responsible for graft rejection
3. B-cells are responsible for graft rejection
4. The acceptance or rejection of a kidney depends on specific interferons.
Where will you look for the sporozoites of the malaria parasite?

1. RBC of infected man
2. Salivary glands of freshly moulted female Anopheles mosquito
3. Saliva of man
4. Saliva female Anopheles mosquito
The first line of body defence is represented by:

1. Lymphocytes
2. biochemical defence
3. Antigens
4. surface barriers.
What is the location of Salmonella typhi during diseased condition?

1. Stomach
2. Kidney
3. Liver
4. Intestine
Which of the following does not belong to the lymphatic system:

1. Pituitary
2. bone marrow
3. Thymus
4. spleen
When memory cells respond to the same antigen again by quickly producing more memory cells and plasma cells, this is known as:

1. primary immune response
2. tertiary immune response
3. secondary immune response
4. specific body defence