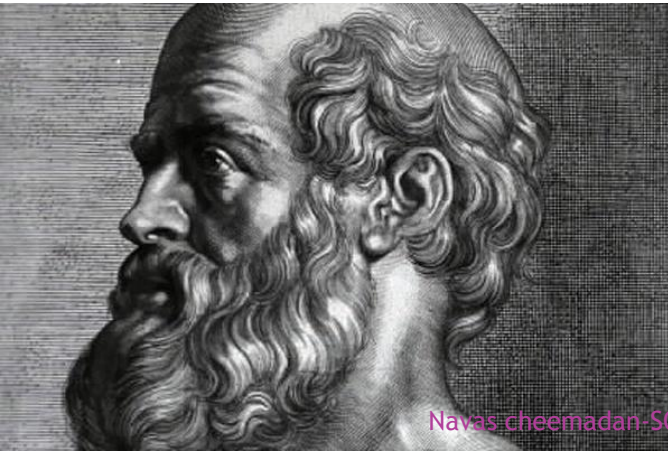


HUMAN HEALTH AND DISEASE

NAVAS CHEEMADAN
HSST ZOOLOGY
SOHSS-AREEKODE

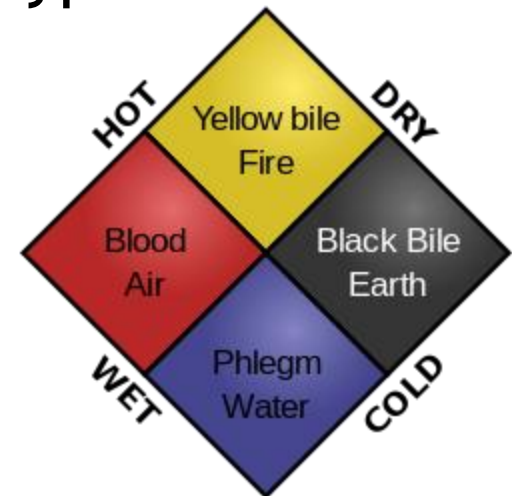
HEALTH-CLASSICAL THOUGHTS

- According to early Greeks like Hippocrates as well as Indian Ayurveda system of medicine health is a state of body and mind where there was a balance of certain 'humors'.



GOOD HUMOR HYPOTHESIS

- ◉ Person with **black bile** belong to **hot personality** and **would have fever**
- ◉ The discovery of **blood circulation** by **William Harvey** using experimental method and the demonstration of **normal body temperature** in a person with **black bile** using **thermometer** disproved this hypothesis of health



- In later years, biology stated that mind influences, through neural system and endocrine system, our immune system and that our immune system maintains our health



HEALTH

- ◉ According to WHO (1948)-health is
“a state of complete physical, mental and social well-being “
- ◉ Health also increases longevity of people and reduces infant and maternal mortality
- ◉ Health is affected
 - i) Genetic disorders
 - ii) Infections
 - iii) Life style



ADVANTAGE OF GOOD HEALTH

- ◉ They are more efficient at work
- ◉ This increases productivity and brings economic prosperity.
- ◉ Health also increases longevity of people
- ◉ It reduces infant and maternal mortality



FACTOR'S NEEDED TO MAINTAIN GOOD HEALTH

- ◉ Balanced diet
- ◉ Personal hygiene
- ◉ Regular Exercise
- ◉ Yoga Practice
- ◉ Awareness about disease
- ◉ Vaccination
- ◉ Control of vectors
- ◉ Proper disposal of waste
- ◉ Consumption of hygienic food and drinking resources



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DISEASE

- ◉ When the functioning of **one or more organs or systems** of the body is adversely affected, characterised by various **signs and symptoms**, we called it as **disease**.
- ◉ So Disease is a distured state of mind and body
- ◉ Disease can be classified into

A)Infectious disease

it can easily spread from one person to another

B)Non-Infectious disease

It will not spread from one person to another

Eg: Cancer



COMMON DISEASE IN HUMAN

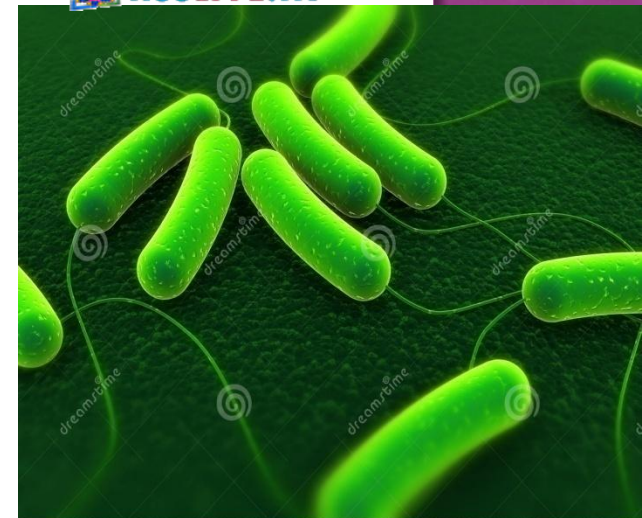
- ◉ **PATHOGEN** : The disease causing organism is called pathogen
- ◉ The pathogen that enter the gut have the ability **to survive** in the stomach at low pH and **various digesting enzyme**
- ◉ **Etiology** : The study of the causes of disease





1. BACTERIAL DISEASE

- Typhoid fever
- Pneumonia
- Dysentery,
- Plague,
- Diphtheria



a) TYPHOID FEVER

Pathogen

:*Salmonella typhi*

Part of the body it infect

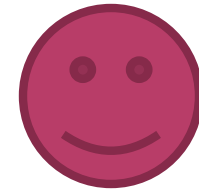
:Small intestine , migrate to other organs through blood

Mode of spread

:Food, water

Symptoms:

- sustained high fever (39-40*c),
- weakness,
- Head ache,
- Constipation,
- Stomach pain,
- Intestinal perforation may occur in sever case.



- Typhoid fever could be confirmed by **widal test**
- **Marry Mallon** nicknamed **Typhoid marry** was a cook by profession and was **a typhoid carrier** who continued to spread typhoid for several years through the food she prepared



b)PNEUMONIA


Pathogen

Streptococcus pneumoniae
Haemophilus influenzae

Part of the body it infect

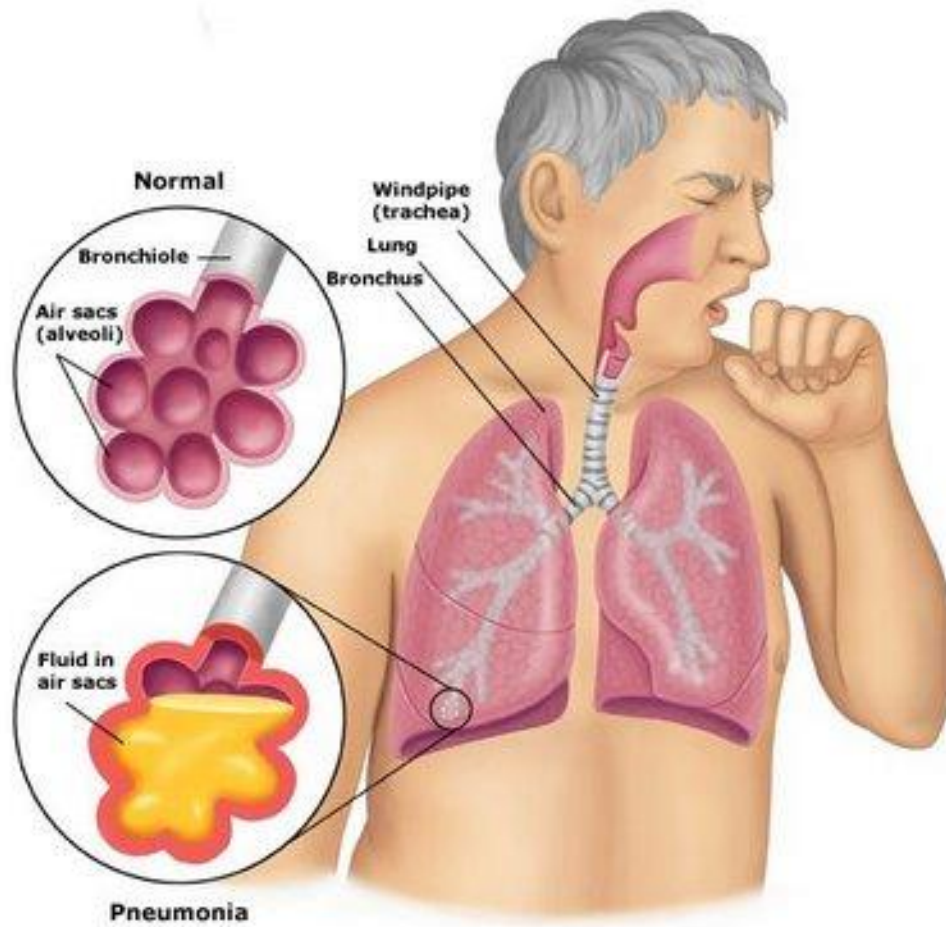
alveoli of the lungs.
As a result the alveoli get filled with **fluid** leading to severe problems in respiration

Mode of spread

By  inhaling the **droplet/aerosols** of the infected person or sharing the glasses and utensils with an infected person

Symptoms:

Fever, chills, cough, head ache, In severe cases, **the lips and finger nails** may turn gray to **bluish in colour**



c) DYSENTERY

⦿ Pathogen : shigella

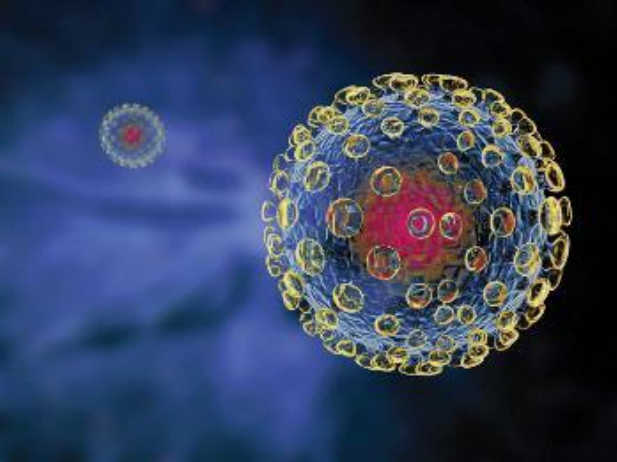
d) PLAGUE (BLACK DEATH)

Pathogen : *Yersinia pestis*

e) DIPHTHERIA

Pathogen : *Corynebacterium diphtheriae*





2.VIRAL DISEASE

 **HSSLive.IN**



A)COMMON COLD



Pathogen

Rhino viruses

Part of the body it infect

nose and respiratory passage but not the lungs



Mode of spread

Droplets resulting from **cough or sneezes** of an infected person are either inhaled directly or transmitted through contaminated objects such as **pens, books, cups, doorknobs, computer keyboard or mouse, etc.**, and cause infection in a healthy person.

Symptoms

Nasal congestion and discharge, sore throat, hoarseness, cough, headache, tiredness, etc which usually last for **3-7 days**



b) AIDS (ACQUIRED IMMUNO DEFICIENCY SYNDROME)



- AIDS was first reported in 1981
- AIDS is caused by the **Human Immuno deficiency Virus** (HIV), a member of a group of viruses called **retrovirus**, which have an **envelope** enclosing the **RNA genome**
- in the last twenty-five **years** or so, it has spread all over the world **killing more than 25 million persons**



Transmission of HIV-infection generally occurs by

- (a) sexual contact with infected person,
- (b) by transfusion of contaminated blood and blood products,
- (c) by sharing infected needles as in the case of intravenous drug abusers
- (d) from infected mother to her child through placenta.



HIV 101

Without treatment, HIV (human immunodeficiency virus) can make a person very sick and even cause death. Learning the basics about HIV can keep you healthy and prevent transmission.

HIV Can Be Transmitted By



Sexual Contact



Sharing Needles
to Inject Drugs



Mother to Baby
during pregnancy, birth,
or breastfeeding

HIV Is **NOT** Transmitted By



Air or Water



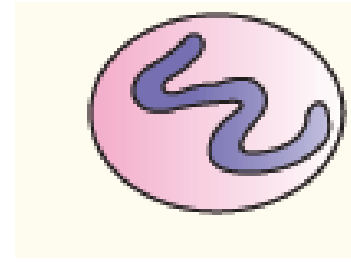
Saliva, Sweat, Tears, or
Closed-Mouth Kissing



Insects or Pets



Sharing Toilets,
Food, or Drinks



people who are at high risk of getting HIV infection includes -

- i) individuals who have multiple Sexual partner
- ii) drug addicts who take drugs intravenously,
- iii) Individuals who require repeated blood transfusions and
- iv) children born to an HIV infected mother..




It is important

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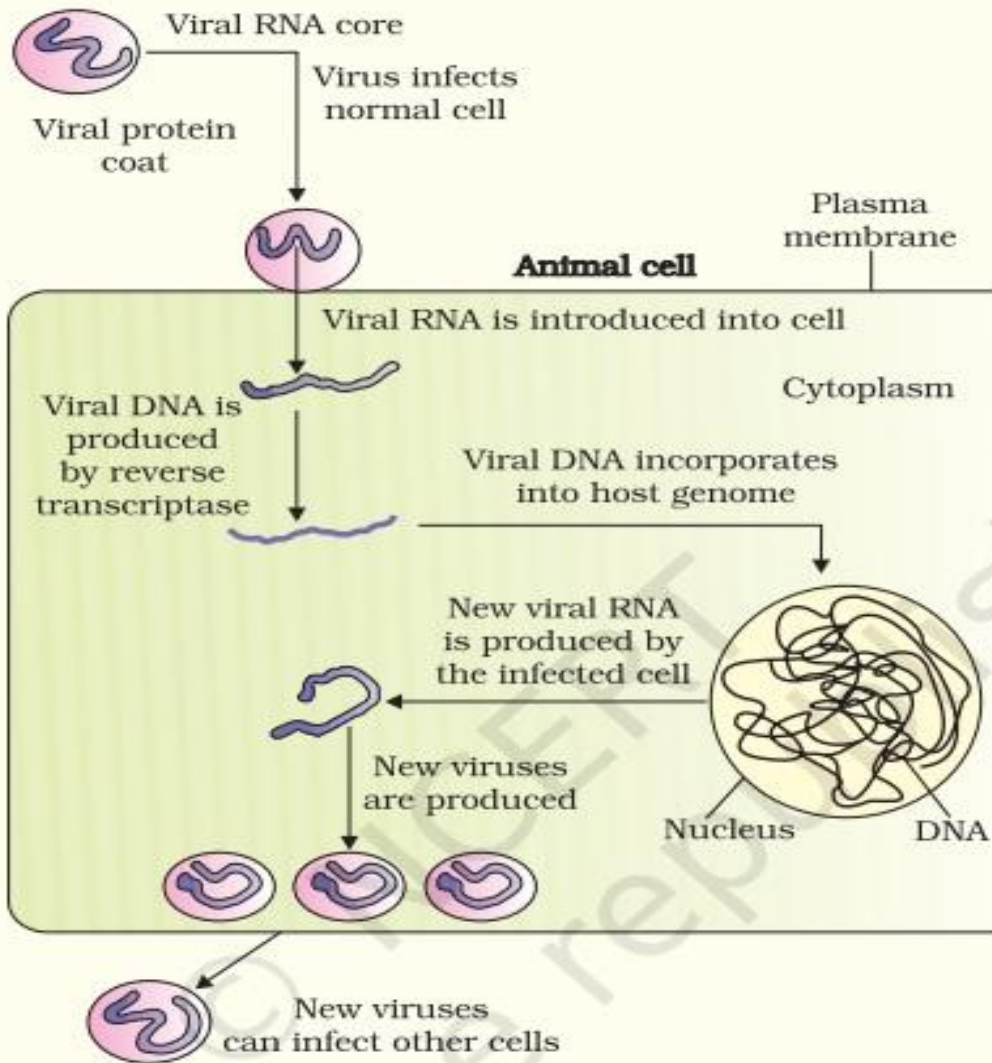
- ⦿ HIV/AIDS **is not** spread by mere **touch or physical contact**; it spreads only through **body fluids**.
- ⦿ There is always a time-lag between the infection and appearance of AIDS symptoms. This period may vary from a few months to many years (**usually 5-10 years**).



LIFE CYCLE OF HIV

- 01-Virus getting into the body of the person
- 02-the virus enters into **macrophages**
- 03-Viral RNA Introduce into the macrophage. 
- 04-where RNA genome of the virus replicates to form viral DNA with the help of the enzyme **reverse transcriptase**.
- 05-This viral DNA gets incorporated into host cell's DNA and directs the infected cells to produce virus particles
- 06-The macrophages continue to produce virus and in this way acts like **a HIV factory**.
- 07-The cell release HIV
- 08-Simultaneously, HIV enters into **helper T-lymphocytes** (TH), replicates and produce progeny viruses.
- 09-The progeny viruses released in the blood attack other helper T-lymphocytes.
- 10-This is repeated leading to a progressive decrease in the number of helper T lymphocytes in the body of the infected person.

Retrovirus



NOTE: Infected cell can survive while viruses are being replicated and released




SYMPTOMS



- ⦿ Due to decrease in the number of helper T lymphocytes, the person suffers from **bouts of fever, diarrhoea and weight loss.**
- ⦿ Due to decrease in the number of helper T lymphocytes, the person starts suffering from infections that could have been otherwise overcome such as those due to bacteria especially *Mycobacterium, viruses, fungi and even parasites like Toxoplasma.*
- ⦿ The patient becomes **so immuno-deficient** that he/she is unable to protect himself/herself against these infections.



- ◉ A widely used diagnostic test for AIDS is **enzyme linked immuno-sorbent assay (ELISA)**.
- ◉ Confirmatory test for AIDS : **Western blot**
- ◉ Treatment of AIDS with **anti-retroviral drugs** is only partially effective. They can only prolong the life of the patient but cannot prevent death, which is inevitable. 

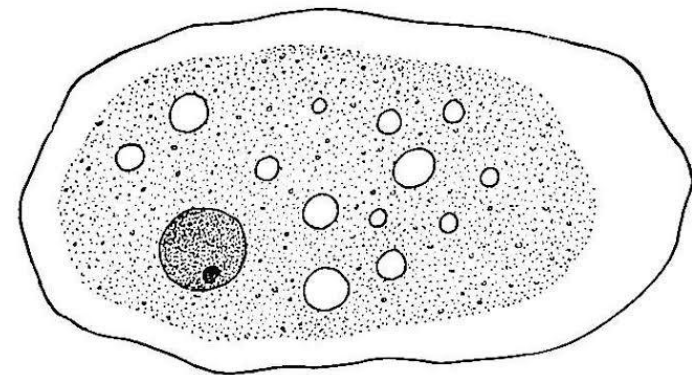
PREVENTION OF AIDS

- ⦿ 01-Making blood (from blood banks) safe from HIV,
- ⦿ 02-ensuring the use of only disposable needles and syringes in public and private hospitals and clinics,
- ⦿ 03-free distribution of condoms,
- ⦿ 04-controlling drug abuse,
- ⦿ 05-advocating safe sex
- ⦿ 06- promoting regular check-ups for HIV in susceptible populations,

“don’t die of ignorance”



3.PROTOZOAN DISEASE



a) MALARIA

Pathogen

Plasmodium vivax,
Plasmodium malaria,
Plasmodium falciparum

Part of the body it infects Liver, RBC

Spread

Female Anopheles
mosquitoes



Symptom

Recurrent fever

- ◉ *Plasmodium falciparum* is most serious and fatal

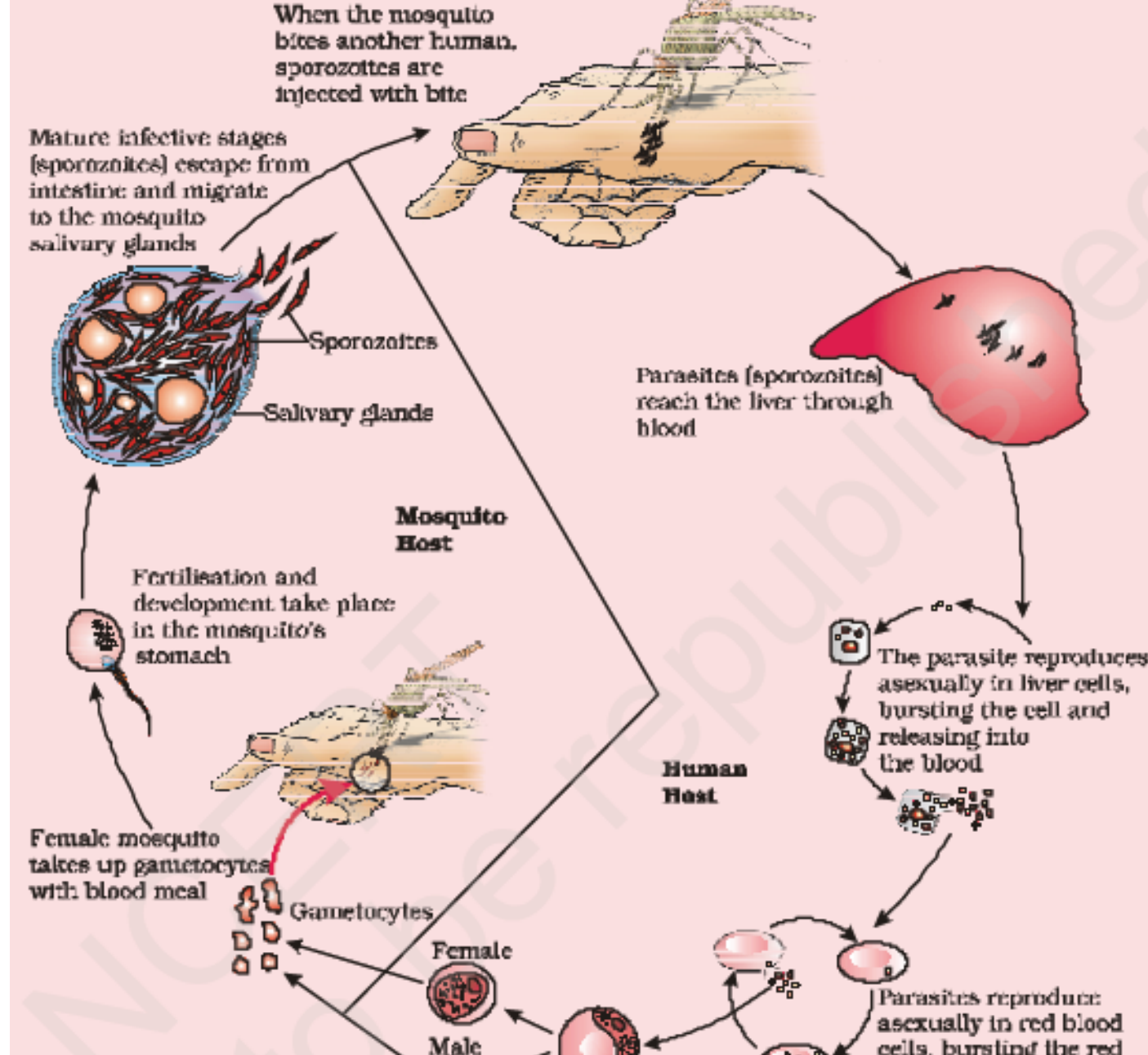
LIFE CYCLE OF PLASMODIUM

- 01-Plasmodium enters the human body as **sporozoites (infectious form)** through the bite of infected **female Anopheles mosquito**.
- 02-The parasites **initially multiply within the liver cells** and then attack the **red blood cells (RBCs)** resulting in their rupture.
- 03- The rupture of RBCs is associated with release of a toxic substance, **haemozoin, which is responsible for the chill and high fever recurring every three to four days.**
- 04-When a female *Anopheles* mosquito bites an infected person, these parasites enter the mosquito's body and undergo further development.
- 05-The parasites multiply within them to form **sporozoites that are stored in their salivary glands.**

THE MALARIAL PARASITE REQUIRES **TWO HOSTS**



- ⦿ - 01-human -Asexual stage
- ⦿ 02-mosquitoes -Sexual stage.





navas clip1.mp4

EXTRA SHOTS....

- Ronald Ross was an Indian-born British medical doctor who received the Nobel Prize in Medicine in 1902 for his work on malaria . His discovery of the malarial parasite in the gastrointestinal tract of mosquito led to the realisation that malaria was transmitted by mosquitoes



b) AMOEBIASIS (AMOEBIC DYSENTERY)

Pathogen

Entamoeba histolytica

Part of the body it infect

large intestine

Mode of spread

- Houseflies act as mechanical carriers and serve to transmit the parasite from faeces of infected person to food and food products, thereby contaminating them.
- Drinking water and food contaminated by the faecal matter are the main source of infection.

Symptoms

constipation, abdominal pain and cramps, stools with excess mucous and blood clots.



4. HELMINTH DISEASE



a) ASCARIASIS

Pathogen

ASCARIS

Part of the body it infect

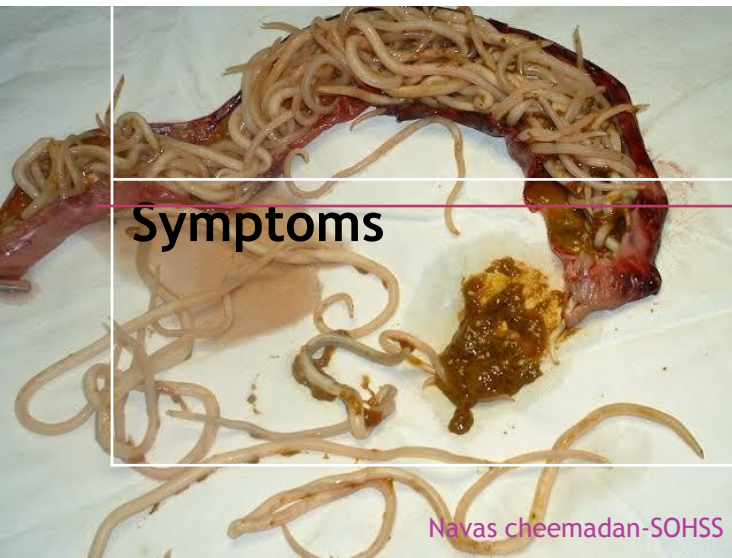
Intestine

Mode of spread

The eggs of the parasite are excreted along with the **faeces of infected persons** which contaminate soil, water, plants, etc. A healthy person acquires this infection through contaminated water, vegetables, fruits, etc

Symptoms

internal bleeding, muscular pain, fever, anemia and blockage of the intestinal passage



b) ELEPHANTIASIS OR FILARIASIS

Pathogen

Wuchereria bancrofti
Wuchereria malayi

Part of the body it infect :

lymphatic vessels of the lower limbs

Mode of spread :

The pathogens are transmitted to a healthy person through the bite by the female mosquito vectors

Symptoms:

The genital organs are also often affected, resulting in gross deformities.



C) EYE WORM

Pathogen :Loa loa



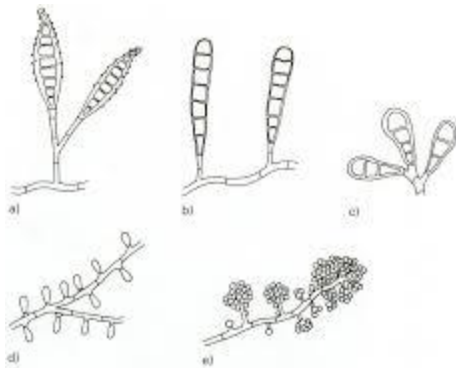


Fig. 6.8 Dermalophyte spore forms: (a) macroconidia of *Microsporum*; (b) macroconidia of *Trichophyton*; (c) macroconidia of *Epidermophyton*; (d) macroconidia along sides of vegetative hyphae (on thyrsus); (e) macroconidia in grape-like bunches (on grappe)

5. FUNGAL DISEASE



RING WORM

Pathogen

*Microsporum, Trichophyton
Epidermophyton*

Part of body it infect

Skin

Spread

Ringworms are generally acquired from soil or by using towels, clothes or even the comb of infected individuals

Symptoms

Appearance of dry, scaly lesions on various parts of the body such as skin, nails and scalp are the main symptoms of the disease. These lesions are accompanied by intense itching

- Heat and moisture help these fungi to grow, which makes them thrive in skin folds such as those in the groin or between the toes.



prevention and control of infectious diseases

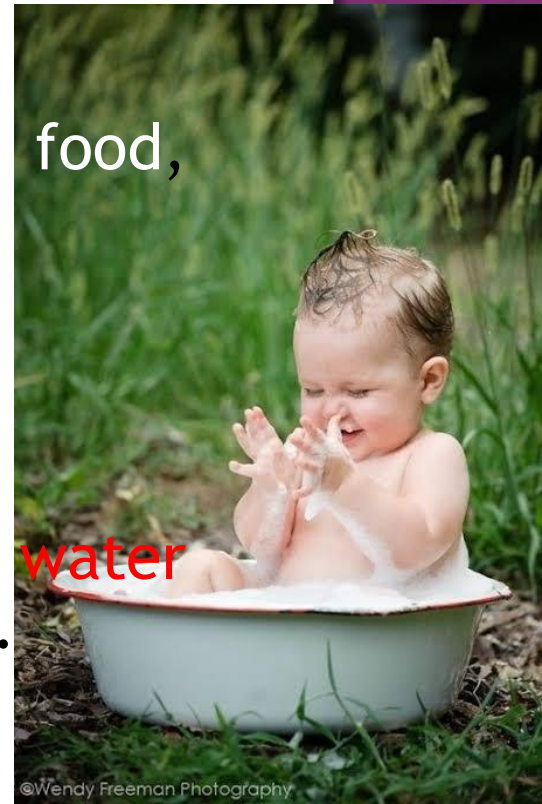
01- For infectious agents are transmitted through food and water

a)Maintenance of personal hygiene.


- It include
 - keeping the body clean;
 - consumption of clean drinking water, food, vegetables, fruits, etc.

b)Maintenance of Public hygiene

- It includes
 - proper disposal of waste and excreta;
 - periodic cleaning and disinfection of reservoirs, pools, cesspools and tanks.

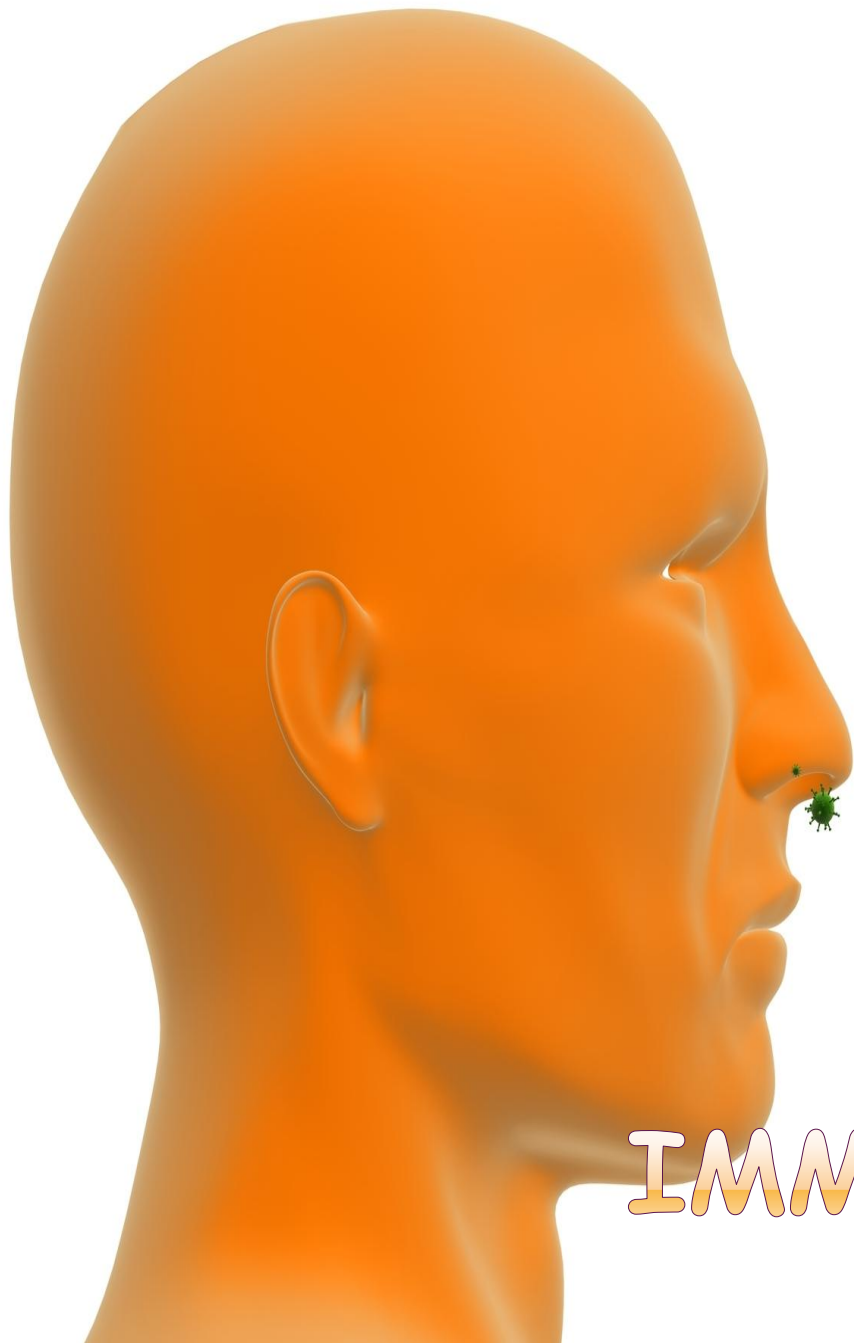


02- For Air Born Diseases

- ⦿ Maintenance of Public hygiene 
- ⦿ Maintenance of personal hygiene. ,
- ⦿ closecontact with the infected persons or their belongings should be avoided.

03-For Disease transmitted through insect vectors

- ◉ control or eliminate the vectors and their breeding places.
- ◉ Avoiding stagnation of water in and around residential areas,
- ◉ Regular cleaning of household coolers,
- ◉ Use of mosquito nets,
- ◉ Introducing fishes like *Gambusia* in ponds that feed on mosquito larvae,
- ◉ Spraying of insecticides in ditches, drainage areas and swamps, etc.
- ◉ Doors and windows should be provided with wire mesh to prevent the entry of mosquitoes.
- ◉ Such precautions have become all the more important especially in the light of recent widespread incidences of the vector-borne (*Aedes mosquitoes*) diseases like **dengue and chikungunya** in many parts of India



IMMUNOLOGY

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COMING SOON....

