



INTRODUCTION

- Disease and infections which are naturally transmitted between vertebrates animals and humans-**WHO 1959**
- **Zoonoses**: derived from **the Greek words**
- Zoon-Animal & Noson-disease
- Zoonoses was coined and first used by **Rudolf Virchow (1880)** who defined it for communicable diseases




Rudolf Ludwig Carl Virchow

- Animals can carry harmful germs, such as **bacteria, fungi, parasites, and viruses**. These are then shared with humans and cause illness.
- Zoonotic diseases are spread worldwide.
- The World Health Organization (WHO) estimates that
- **61% of all human diseases are zoonotic in origin**
- **75% of new diseases** discovered in the last decade are also zoonotic.



TYPES OF ZOOSES

- **Viral Zoonoses**:- Rabies, influenza, monkey pox, KFD (kyasanus forest disease) , yellow fever
 - **Bacterial Zoonoses**:- Lyme disease, anthrax, plague, salmonellosis.
 - **Fungal Zoonoses**:- Histoplasmosis, cryptococcosis, superficial dermatophytes.
 - **Parasitic Zoonoses**:- Toxoplasmosis, trypanosomiasis, leishmaniasis
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MODE OF TRANSMISSION

- **Directzoonoses**- e.g. Rabies, Toxoplasmosis.
- **Cyclozoonoses**- e.g. Echinococcosis, taeniasis.
- **Metazoonoses**-e.g., Plague, arbovirus infections, leishmaniasis.
- **Saprozoonoses**-e.g. Histoplasmosis, cryptococosis



TRANSMISSION OF ZONOTIC DISEASES

Zoonotic diseases are more commonly encountered in children because they may provoke biting or scratching, go barefoot during warm weather, and may not wash their hands following handling household pets.



Dogs or cats with roundworms or hookworms may put children at risk of contracting zoonotic diseases.

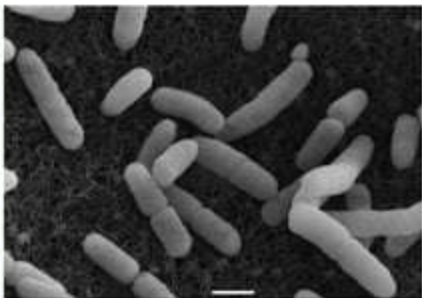
Contact with food or water, soil or sand contaminated by the fecal matter of infected animals can create an environment in which disease may be transmitted.



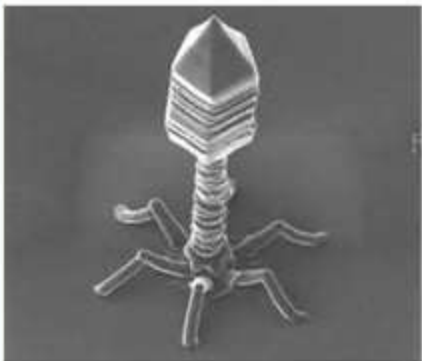
These parasites may cause Visceral, Ocular, Neural and Cutaneous Larva Migrans in humans.



CAUSES



Penpals.web.unco.edu



Pinterest.com

BACTERIA

FUNGI

VIRUS

PARASITE



Gettyimages.ae



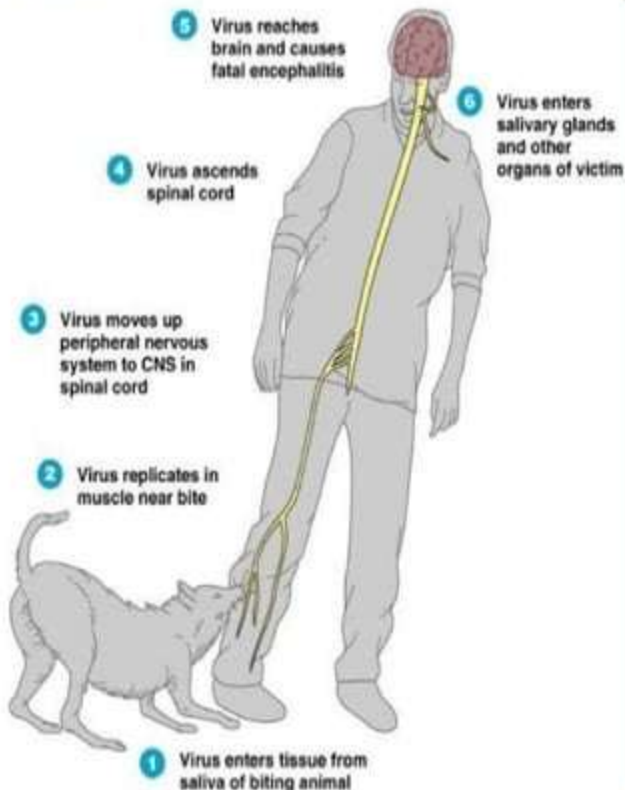
Researchgate.net

VIRAL ZOOONOSES




RABIES

- Lyssavirus
- Infects all mammals, but main reservoirs are wild and domestic canines, cats, skunks, raccoons, and bats.
- **Transmission:**
- bite of rabid animal, virus saliva on skin wound or mucous membranes
- Corneal transplant
- Airborne transmission
- In India, dogs are the main vectors, accounting for 95 % of the reported cases
- WHO 50,000 human deaths are reported worldwide every year, with 60 % of these cases being reported from India.



SYMPTOMS

- 1 to 3 months after the virus enters the body , the **virus move toward the brain**. They include:
 - Pain or tingling at the bite site
 - Fever
 - Headache
 - Nausea and vomiting
 - Depression
 - As virus begins to **multiply in spinal cord** and brain, neurological symptoms that include:
 - Anxiety
 - Confusion
 - Excessive saliva production
 - High level of excitement
 - Insomnia
 - Paralysis of lower legs
 - Hydrophobia
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DIAGNOSIS

In Animals

- ❑ The diagnosis from the affected brain.
- ❑ Diagnosis methods for detection
- ❑ Direct florescent antibody
- ❑ Mouse inoculation technique
- ❑ Tissue culture

In Human

- ❑ Clinical diagnosis three are stages;
- ❑ Prodromal
- ❑ Excitement (furious)
- ❑ Paralytic (dumb).
- ❑ The very first clinical symptom is neuropathic pain .
- ❑ Samples of saliva, serum, and skin biopsies of hair follicles at the nape of the neck

PREVENTION

- Keep your pet away from other stray dogs.
- Vaccination
- Maintain distance with wild animals.
- Prevent bats from living places
- Wildlife rabies control programs including vaccination (trap/vaccinate/release or delivery of oral vaccines).




TREATMENT

Pre-exposure prophylaxis

- The people who are considered as high risk group need pre-exposure prophylaxis. These groups includes.
- Veterinarian
- Animal handlers
- Laboratory workers

Post-exposure prophylaxis

- Wash wound and scratches.
 - One dose rabies immune globulin and five doses rabies vaccine
 - Rabies immune globulin contains antibodies from blood donors who were given rabies vaccine. The rabies vaccine works by stimulating a person's immune system to produce antibodies that neutralize the virus.
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BACTERIAL ZOOONOSES



LYME'S DISEASE


- **Lyme disease** - transmitted through the bite of a **tick** infected with a bacterium called **Borrelia burgdorferi**.
- In 1981, **Willy Burgdorfer** identified the disease causing bacterium in the intestinal tract of a tick.
- The bacterium was named after him: **Borrelia burgdorferi**
- **Ticks** get the bacterium by biting infected animals.



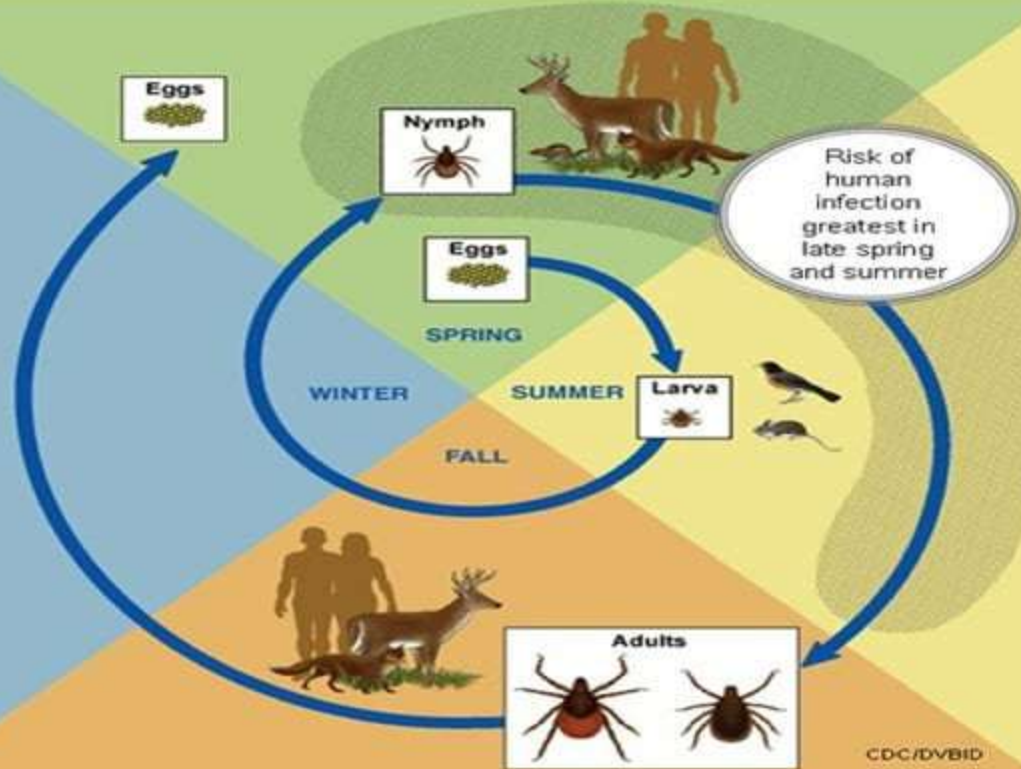
https://en.wikipedia.org/wiki/Lyme_disease



SYMPTOMS(EARLY & LATE STAGE)

- Early localised Lyme disease Known as erythema migrans (EM)
 - Ringshaped,
 - Red-coloured,
 - Spreading skin rash (bulls-eye rash)
 - It spread to joints or to the nervous system.
 - Late-stage Lyme disease acrodermatitis chronica atrophicans (ACA)
 - Dark red or purple skin.
 - Neuroborreliosis and Lyme carditis, headaches, muscular pain and fatigue.
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LIFE CYCLE




DIAGNOSES

- Doctors diagnose Lyme disease based on symptoms and a history of tick exposure.
- Two-step blood tests are helpful
- EIA
- Western blot test
- Few weeks of infection, the test may be negative, as antibodies take a few weeks to develop.



PREVENTION

- Tick-Safe Landscaping techniques should be for
 - Homes
 - Parks
 - Fields
 - Recreational areas
 - Drier environments.
 - Removing leaf litter
 - Clearing tall grass and brush around houses
 - Wooded area

 - The use of pesticides to control tick populations is another option.
 - Wear appropriate clothing
 - Long-sleeved shirt
 - Pants, socks
 - Removing plants that attract deer
 - Lists of deer-resistant plantings are available from garden centers, nurseries, or local extension agents.
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ZOONOSES

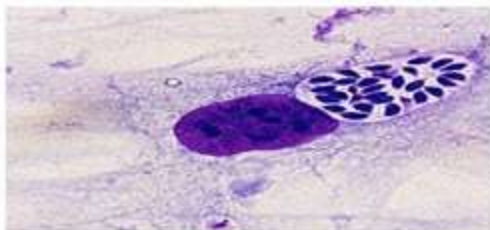


(TOXOPLASMOSIS)

- Toxoplasmosis , caused by *Toxoplasma gondii*
- Discovered by 1908 by Nicolle and Manceaux, in Tunis, on a Gundi (*Ctenodoactylus gundi*).
- It 1939 that Wolf, Cowen and Paige were to conclude that *toxoplasma gondii* had an effect on humans.
- Found in most warm blooded animals of any age, sex or species. Birds, sheep, goat, cattle, pigs etc cats are the most common
- **Symptoms**, including swollen lymph node ,blurred vision, muscle pains, Seizures, Lung problems that may resemble tuberculosis . pregnant women or animals causing abortions .
- 30 % of human population worldwide is chronically infected with *T. Gondii*

GONDII

○ Tachyzoite



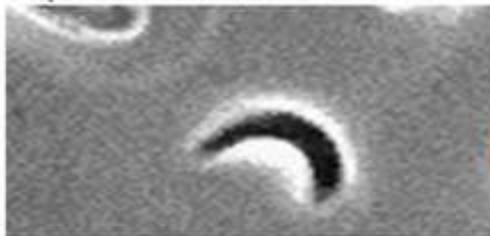
<http://slideplayer.com>

○ Bradyzoite



<http://Scientificamerican.com>

○ Sporozoite



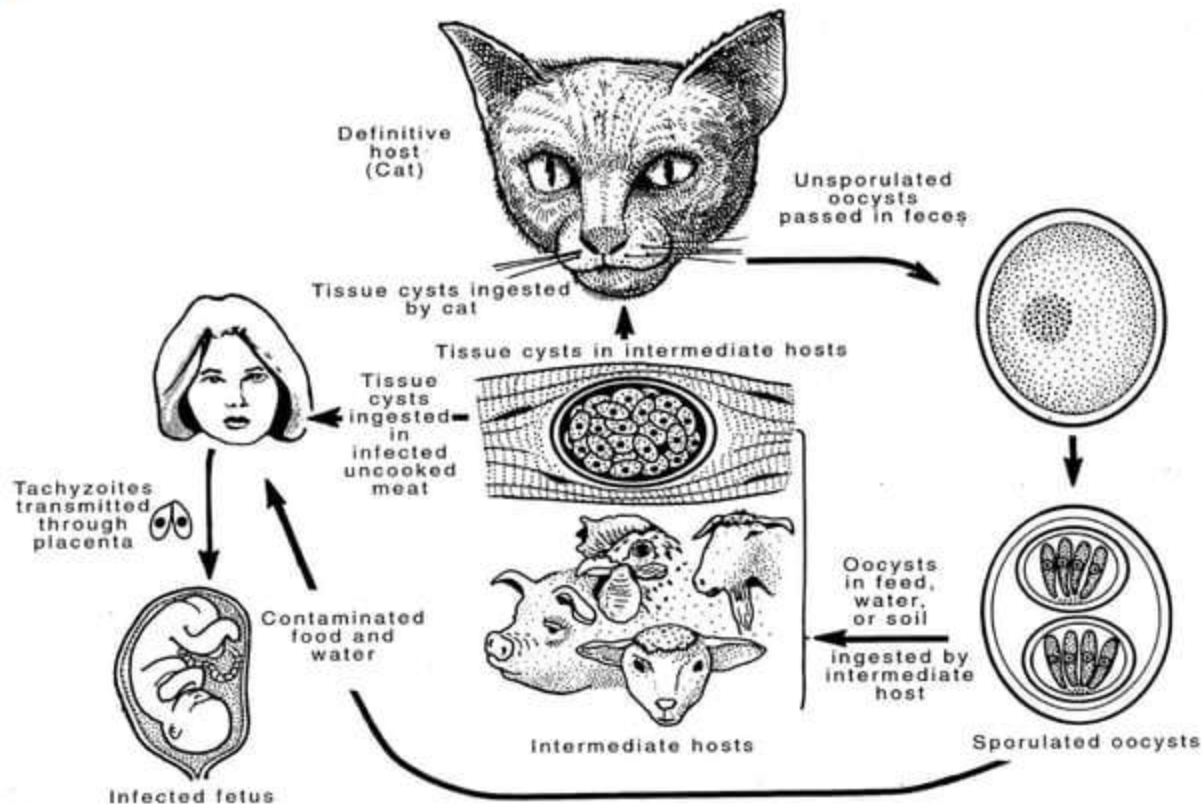
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TRANSMISSION

- Transmission occur in three ways
 - (a) Fecal-oral
 - (b) Eating contaminated food
 - (c) Transplacental
- The parasite can only produce oocytes when infecting a cat. The organism then multiplies in the wall of intestine and produces oocysts during the intrainestinal infection cycle



LIFE CYCLE



DIAGNOSIS

Serological assays

- T. gondii infection usually shows non-specific clinical symptoms in most individuals, whose diagnosis mainly relies on serological tests. A variety of serological tests, such as
- Dye test (DT)
- Modified agglutination test (MAT)
- Enzyme-linked immunosorbent assays (ELISA)
- Immunosorbent agglutination assay (ISAGA)

Microscopic diagnosis

- Detection of T. gondii in fecal, water, environmental and tissue samples has examine by microscopes.
- In light microscopy Giemsa and Haematoxylin and Eosin (HE) staining.



PREVENTION

- Wear gloves when handling soil.
- Wash hands with soap and water after outdoor activities
- Wash cutting boards, sinks, knives and other utensils that touched the raw meat.
- Keep cats indoors and feed them dry or canned food rather than allowing them to have access to wild birds and rodents
- Clean litter box everyday



TREATMENT

Clinical cases are treated with antibiotics such as:

- Clindamycin,
- Azithromycin
- Pyrimethamine

antibiotics can suppress actively dividing parasites, they cannot destroy tissue cysts and are unlikely to completely eliminate *T. gondii* from the body.



FUNGAL ZOOONOSES



HISTOPLASMOSIS

- Histoplasmosis caused by the fungus *Histoplasma capsulatum*
- “Darling’s disease” a tribute to its founder , stephen Darling in 1950.
- The fungus lives in the environment, particularly in soil that contains large amounts of bird or bat droppings.
- We get sick when we breathe in spores that the fungus produces. These spores are settle in lungs
- Those who have weakened immune system the infection can became serve, especially if it spread from the lungs to the other organ.



SYMPTOMS

Acute pulmonary histoplasmosis

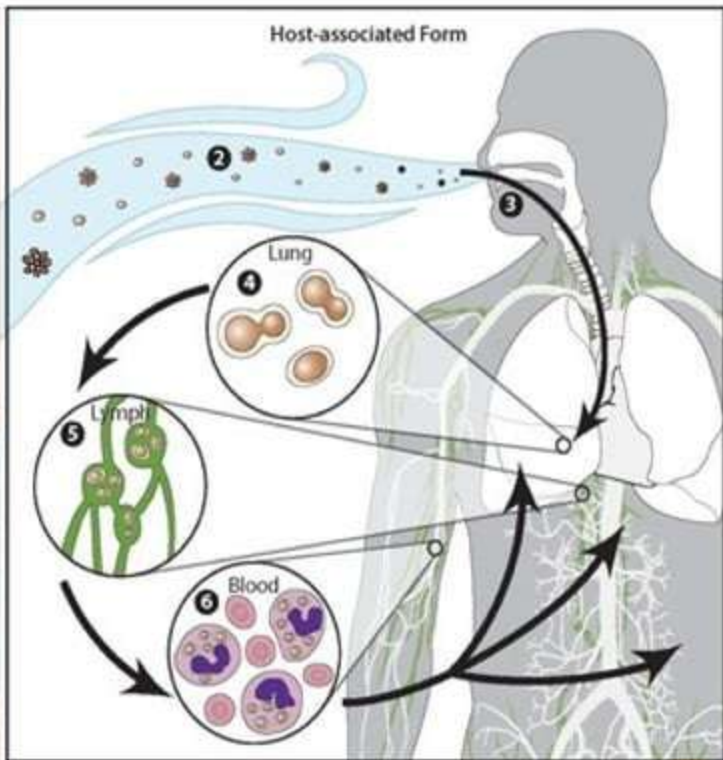
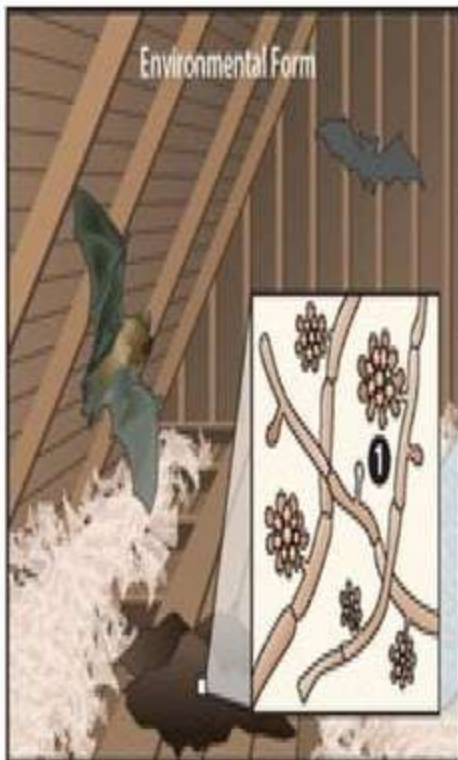
- Flu-like symptoms
- Headache
- Cough
- Fever
- Muscle pain
- Chest pain
- Breathing difficulties

Chronic pulmonary histoplasmosis

- Hepatomegaly
- Malaise
- Anorexia
- Liver and spleen enlargement
- Mucosal ulcers
- Weight loss
- Weakness




LIFE CYCLE



DIAGNOSES

- There are a series of tests which can be done to determine the presence of infection as well as to show the presence of *H. capsulatum*
 - Bronchoscopy,
 - Chest x-rays and
 - Chest CT scans


 - Testing for the presence of histoplasmosis can be done through:
 - Biopsies of the skin,
 - Lungs,
 - Liver
 - Bone marrow,
 - Blood
 - Urine tests to detect foreign proteins and
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PREVENTION

You can reduce your risk of infection by avoiding high-risk areas. These include:

- Construction sites
- Renovated buildings
- Caves
- Pigeon or chicken coops

If you can't avoid high-risk areas, there are steps as:

- Spray sites with water before working or digging in them.
 - Wear a respirator mask when there is a high risk of exposure to spores.
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TREATMENT

If you have trouble breathing or are infected for longer than one month, treatment may be necessary. You will likely be given an oral antifungal medication. The most commonly used drugs are:

- Ketoconazole
- Amphotericin B
- Itraconazole



CONCLUSION

- Zoonotic diseases are a scary reality, but there are things that we can do to protect ourselves from them. For our animals, vaccinations are the first line of defence against disease, also, keep an eye on where your animal goes, and what they come in contact with.
- For humans, be sure to always wash your hands after handling animals, and before eating or drinking. Also, be aware of animals around that may bite or scratch you.
- The world health organization estimates that 61% of all human diseases are zoonotic in origin. About 75% of the new diseases discovered in last decade are zoonotic.
- Therefore, it is important to have a thorough knowledge about the common zoonotic diseases, their global morbidity estimates, common modes of transmission to humans, clinical and laboratory diagnosis as well as preventive measures.

