

Principles of Disease

Principles of Disease and Epidemiology

- Pathology:
- Etiology: The study of the cause of a disease
- Pathogenesis: The development of disease
- Infection:
- Disease: An abnormal state in which the body is not functioning normally

Normal Microbiota and the Host

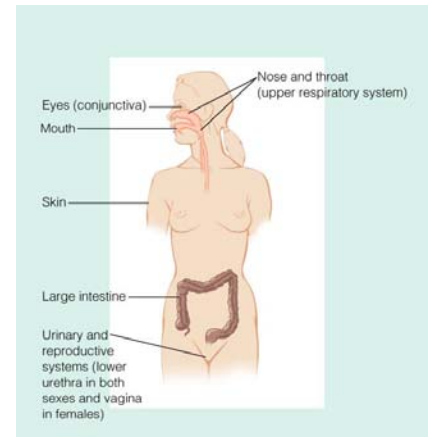
- Transient microbiota may be present for days, weeks, or months.
- Normal microbiota permanently colonize the host.
- Symbiosis is the relationship between normal microbiota and the host.

Symbiosis

- In commensalism, one organism is benefited and the other is unaffected.
- In mutualism, _____
- In parasitism, one organism is benefited at the expense of the other.
- Some normal microbiota are opportunistic pathogens

Normal Microbiota and the Host

- Locations of normal microbiota on and in the human body.
- Microbial antagonism is a competition between microbes.
- Normal microbiota protect the host by:
 - Occupying niches that pathogens might occupy
 -
 -
- Probiotics are live microbes applied to or ingested into the body, intended to exert a beneficial effect.



Koch's Postulates

- Koch's postulates are used to prove the cause of an infectious disease.
- 1. suspect microbe always found in diseased individual never in healthy one.
 - (exceptions - _____)
- 2. be able to culture microbe on artificial medium in lab (_____)
- 3. pure cultures of microbe must be able to cause the disease in test animals
- 4. reisolate same microbe from experimentally infected animal

Classifying Infectious Diseases

- Communicable disease: A disease that is spread from one host to another.
- Contagious disease: A disease that is easily spread from one host to another.
- Noncommunicable disease: A disease that is not transmitted from one host to another.

Occurrence of Disease

- Endemic disease: Disease constantly present in a population.
- Epidemic disease: Disease acquired by many hosts in a given area in a short time.
- Pandemic disease:
- Herd immunity:

Severity or Duration of a Disease

- Acute disease:
- Chronic disease:
- Latent disease: Disease with a period of no symptoms when the patient is inactive.

Extent of Host Involvement

- Local infection: Pathogens are limited to a small area of the body.
- Systemic infection:
- Focal infection: Systemic infection that began as a local infection.
- Bacteremia:
- Septicemia: Growth of bacteria in the blood

- Toxemia:
- Viremia:
- Primary infection: Acute infection that causes the initial illness.
- Secondary infection: Opportunistic infection after a primary (_____) infection.
- Subclinical disease: No noticeable signs or symptoms (inapparent infection, asymptomatic).

Reservoirs of Infection

- Reservoirs of infection are continual sources of infection.
 - Human —
 - Carriers may have inapparent infections or latent diseases.
 - Animal — Rabies, Lyme disease
 - Some zoonoses may be transmitted to humans.
 - Nonliving — Botulism, tetanus
 -

Transmission of Disease

- Contact
 - Direct: Requires close association between infected and susceptible host.
 - Indirect: Spread by fomites (_____).
 - Droplet: Transmission via airborne droplets.
- Vehicle: Transmission by an inanimate reservoir (_____).
- Vectors: Arthropods, especially fleas, ticks, and mosquitoes.
- Mechanical: Arthropod carries pathogen on feet.
- Biological: Pathogen reproduces in vector.

Nosocomial (_____) Infections

- Are acquired as a result of a hospital stay.
- 5-15% of all hospital patients acquire nosocomial infections.

Common Causes of Nosocomial Infections

	Percentage of Nosocomial Infections	Percentage Resistant to Antibiotics
Gram (+) cocci	51%	29%-89%
Gram (-) rods	30%	3-32%
<i>Clostridium difficile</i>	13%	
Fungi	6%	

How can nosocomial infections be reduced? Study Objectives

1. Define: Pathology, Etiology, Pathogenesis, Infection, and Disease.
2. Explain the relationship between transient microbiota, normal microbiota and the host including symbiotic relationships.
3. Describe Koch's postulates.
4. Define: Communicable disease, Contagious disease and Noncommunicable disease.
5. Define: endemic, epidemic, and pandemic disease.
6. Describe the extent of host involvement in terms of local, systemic, primary and secondary infection.
7. Define: bacteriemia, septicemia, toxemia, viremia, and subclinical disease.
8. Describe the ways in which infectious diseases are transmitted.
9. What is a nosocomial infection?
10. How can nosocomial infections be reduced?