

What are Pathogenic bacteria?

Pathogenic bacteria: are bacteria that can cause infection. Although most bacteria are harmless or often beneficial, some are pathogenic.

What distinguishes a pathogen from a non-pathogen?

The human bodies are host to many microbes, most of which do not cause disease and many of which are beneficial. Pathogens such as *Staphylococcus*, *Vibrio cholera* and *Mycobacterium tuberculosis* differ from normal non-pathogenic microbes by causing damage to the host.

Some Important Terms

Disease: Any deviation from a condition of good health and well-being.

Infectious Disease: A disease condition caused by the presence or growth of infectious microorganisms or parasites.

Infection: Multiplication of an infectious agent within the body. Multiplication of the bacteria that are part of the normal microbiota of the gastrointestinal tract, skin, etc, is generally not considered an infection. On the other hand, multiplication of pathogenic bacteria (eg. *Salmonella* species) even if the person is asymptomatic is deemed an infection.

Acute Infection: An infection characterized by sudden onset, rapid progression, and often with severe symptoms.

Chronic Infection: An infection characterized by delayed onset and slow progression.

Primary Infection: An infection that develops in an otherwise healthy individual.

Secondary Infection: An infection that develops in an individual who is already infected with a different pathogen.

Localized Infection: An infection that is restricted to a specific location or region within the body of the host.

Systemic Infection: An infection that has spread to several regions or areas in the body of the host.

Clinical Infection: An infection with obvious observable or detectable symptoms

Subclinical Infection: An infection with few or no obvious symptoms.

Normal flora (Microbiota): Microbes that colonize the body and usually do not cause disease.

Opportunistic pathogens: Microbes that normally do not cause disease, but capable of causing disease only when the host's resistance is impaired (ie, when the patient is "immunocompromised" A host with weakness or defects in the innate or adaptive defenses).

Frank pathogens: Microbes that always cause disease. toxins or when toxins are produced from bacteria during infection.

Pathogenicity: The ability of an infectious agent (a microbe) to cause disease.

Virulence: The degree of pathogenicity in a microorganism

The quantitative ability of an agent to cause disease. Virulent agents cause disease when introduced into the host in small numbers. Virulence involves adherence, invasion, and toxigenicity.

Adherence (adhesion, attachment): The process by which bacteria stick to the surfaces of host cells. Once bacteria have entered the body, adherence is a major initial step in the infection process. The terms adherence, adhesion, and attachment are often used interchangeably.

Invasion: The process whereby bacteria enter host cells or tissues and spread in the body.

Toxigenicity: The ability of a microorganism to produce a toxin that contributes to the development of disease.

Reservoir of Infection: The source of an infectious agent

Carrier: A person or animal with asymptomatic infection that can be transmitted to another susceptible person or animal.

Fomites: Any inanimate object capable of being an intermediate in the indirect transmission of an infectious agent.

Animal Vectors: An animal (nonhuman) that can transmit an infectious agent to humans

Two types: Mechanical and Biological

Mechanical animal vectors: The infectious agent is physically transmitted by the animal vector, but the agent does not incubate or grow in the animal; e.g, the transmission of bacteria sticking to the feet of flies

Biological animal vectors: The infectious agent must incubate in the animal host as part of the agent's developmental cycle; e.g, the transmission of malaria by infected mosquitoes.

Direct Mechanisms of Disease Transmission

Directly From Person to Person

Examples:

Direct Skin Contact

Airborne (Aerosols)

Indirect Mechanisms of Disease Transmission

Examples:

Food & Waterborne Transmission

Fomites

Epidemiology: The study of the transmission of disease

Communicable Disease: A disease that can be transmitted from one individual to another

Noncommunicable Disease: A disease that is not transmitted from one individual to another.

Endemic Disease: A disease condition that is normally found in a certain percentage of a population

Epidemic Disease: A disease condition present in a greater than usual percentage of a specific population

Pandemic Disease: An epidemic affecting a large geographical area; often on a global scale.

The suffix “-emia”: A suffix meaning “presence of an infectious agent”

Bacteremia = Presence of infectious bacteria

Viremia = Presence of infectious virus

Fungemia = Presence of infectious fungus

Septicemia = Presence of an infectious agent in the bloodstream.

The suffix “-itis”: A suffix meaning “inflammation of” Examples:

Pharyngitis = Inflammation of the pharynx

Endocarditis = Inflammation of the heart chambers

Gastroenteritis = Inflammation of the gastrointestinal tract