Terms Used in Medical Bacteriology

Pathogenic	organism that can cause disease
Opportunistic pathogen	microbes that generally do not cause harm --> ex:// HIV, AIDS, chemo patients, long-term antibiotics
Normal microbiota	microbes that generally do not cause harm --> ex:// *Lactobacillus* spp., *E. coli* (gut)
Virulence	severity of disease/degree of harm --> quantitave measure of the ability to cause disease
Toxicity/-toxigenicity	ability to produce toxins
Invasiveness	ability to enter into host tissues, multiply and spread
LD_50	Measure of virulence --> number of organisms or number of ug toxin needed to kill 50% of animals
Virulence factor	properties of bacteria that can contribute to the ability of the bacteria to cause disease --> ex:// toxins, lipopolysaccharide (LPS), flagella

Terms Used in Medical Bacteriology (cont)

Infection	colonization of bacteria (microbe has entered host and replicated)
Disease	follows infection, occurs when host cells are damaged

Overview of Steps to Infection and Disease

1.) How do pathogens enter human host?

> respiratory tract, GI tract, bloodstream (through broken skin), sexually transmitted, transplacental, eyes

2.) Pathogens penetrate host defenses and multiply

> sd

3.) Some basic host defense mechanisms

> - Resistance of host depends on age, immune system health, antibiotic/drug use, and lifestyle of host
> - normal flora --> takes up space, compete w/ pathogens for space and nutrients, some secrete inhibitory compounds that prevent growth of pathogens

Factors that Influence Potential Risk of Infection

1.) Host immune system and host defenses

> - strong vs. compromised
> - infects --> weak, poorly developed immune systems

2.) Ability of pathogen to adhere to, colonize and replicate

> - can it remain in host?

3.) Ability of organism to cause disease

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3.) Ability of organism to cause disease

> - are the appropriate virulence factors expressed?
> - ex:// *Corynebacterium diphtheriae* causes diptheria when it has a gene encoding DT (diphtheria toxin)

4.) Number of pathogens

> - highly virulent pathogen vs. avirulent pathogen
> - ex:// *Salmonella* needs 1000s of cells to cause disease vs. *Shigella* which only needs 10 cells

Normally Sterile Areas of the Body

Central nervous system, bone/marrow, organs (brain, heart, spleen, liver, kidney, pancreas, ovary), fluids (joint, pericardial, peritoneal, pleural) muscle

Urinary Tract

Vagina

- *Lactobacillus* spp. is part of the normal microbiota
- *Lactobacillus* produces lactic acid, which lowers pH
- it also produces hydrogen peroxide (H_2O_2) (decomposes into toxic oxygen radicals)