

CONCEPT: PATHOGENS & DISEASES: BACTERIA

Introduction to Bacteria

◆ **Bacteria:** _____-celled microorganisms found inside and outside of the body.

- Some are beneficial while others are *pathogenic* - cause _____.
- Classified by _____: cocci (round), bacilli (rod-shaped), and spirilla (spiral).



◆ **Antibiotics:** medications used to kill bacteria.

- Due to overuse and misuse of antibiotics, antibiotic-_____ bacteria have emerged.

EXAMPLE





Which of the following statements about bacteria is true?

- a) All bacteria can be pathogenic.
- b) Bacteria cannot survive outside of the host.
- c) All bacteria become resistant to antibiotics, regardless of how antibiotics are used.
- d) Bacteria are classified into spirilla, cocci, and bacilli shapes.

CONCEPT: PATHOGENS & DISEASES: BACTERIA

Bacterial Infections

- ◆ Pathogenic bacteria cause diseases by invading tissues and/or producing _____ that damage cells.
 - **Colonization:** bacteria or other pathogens establish themselves in/on a host _____ causing illness.

Bacterial Infections			
Infection/Disease		Symptoms	Transmission
MRSA		<ul style="list-style-type: none">▸ Skin infection: inflammation, pain, fever.▸ Can spread to bloodstream, bones, and other organs.	<ul style="list-style-type: none">▸ Skin-to-skin or contact with surfaces.<ul style="list-style-type: none">- Enters through cuts/wounds.▸ Common in _____ care settings.
Methicillin-resistant <i>Staphylococcus aureus</i>			
Strep Throat		<ul style="list-style-type: none">▸ Sore throat & white patches on _____.▸ Fever, headache, swollen lymph nodes.	<ul style="list-style-type: none">▸ Respiratory droplets.
<i>Streptococcus</i>			
Meningitis		<ul style="list-style-type: none">▸ Inflammation of membrane covering _____ & spinal cord.▸ Fever, severe headache, stiff neck.	<ul style="list-style-type: none">▸ Respiratory droplets.▸ Direct contact with saliva or nasal secretions.
<i>Streptococcus</i> or <i>Neisseria</i> but viral is more common.			
Pneumonia		<ul style="list-style-type: none">▸ Inflammation of _____.▸ Fever, shortness of breath, cough, fluid build up in lungs.	<ul style="list-style-type: none">▸ Respiratory droplets.▸ Direct contact with contaminated surfaces.
Causes: bacteria, virus, fungi, chemicals.			

EXAMPLE


A 20-year-old student is brought to campus clinic by his roommate with complaints of intense headache, light sensitivity, fever and extreme neck pain. Which is the most appropriate action?

- a) Treat student for possible strep throat infection with antibiotics.
- b) Drink plenty of liquids and rest in a dark room.
- c) Evaluate both students for possible meningitis and treat immediately if applicable.
- d) Recognize possible meningitis and treat the 20-year-old with antibiotics.

CONCEPT: PATHOGENS & DISEASES: BACTERIA

Tuberculosis

- ◆ Leading infectious disease killer worldwide, affecting _____-income countries.

Bacterial Infections		
Infection/Disease	Symptoms	Transmission
Tuberculosis (TB)		
	<ul style="list-style-type: none">▸ Infection of respiratory system.▸ Fever, cough, weight loss, fatigue.	<ul style="list-style-type: none">▸ Respiratory droplets. <p>Note: 1/4 of world pop. has _____ TB.</p>


Latent TB

Inactive form of TB bacteria and is not contagious.

- Treated with _____ months long antibiotic combination regimen.

Escherichia Coli (O157:H7)

- ◆ Most *E. coli* bacteria are _____ and reside in the intestines of humans and animals.
 - *E. coli* O157:H7 is a type that produces a _____ toxin and causes severe illness and even death.
 - Treated with hydration and electrolytes.

<i>E. coli</i> GI Infection		
Infection/Disease	Symptoms	Transmission
<i>E. coli</i> (O157:H7)		
	<ul style="list-style-type: none">▸ Bloody diarrhea, stomach cramps, vomiting.	<ul style="list-style-type: none">▸ Consumption of contaminated:<ul style="list-style-type: none">- _____cooked ground beef.- Produce and water.

EXAMPLE



Select correct statement about *E. coli* O157:H7.

- a) A specific type of *E. coli* bacteria that produces a harmful toxin and leads to severe illness in humans.
- b) Resides in the intestines of all humans and animals. Is treatable with antibiotics.
- c) Can not be transmitted through ingestion.
- d) A harmless type of *E. coli* bacteria that can cause illness if it overgrows in intestines.

CONCEPT: PATHOGENS & DISEASES: BACTERIA

Tick-Borne Infections

- ◆ Ticks pose multiple disease threats by carrying pathogenic bacteria that infect humans and pets through _____.
- Both treated with antibiotics.

Tick-Borne Infections		
Infection/Disease		Symptoms
Lyme Disease		<ul style="list-style-type: none">▪ Bull's _____-shaped rash.▪ Fever, muscle aches, arthritis.▪ Irregular heartbeat, neurological disabilities.
Rocky Mountain Spotted Fever		
_____		<ul style="list-style-type: none">▪ Fever, headache, muscle aches, rash.▪ Seizures, coma.

EXAMPLE

Avery went hiking in the woods with a few of his friends last weekend. A few days later he started to feel really tired and had stiffness in his joints. He also noticed a start of a rash on his calf that had spread in a circular pattern. What is Avery most at risk of?

- a) Meningitis b) Lyme disease c) MRSA d) Rocky Mountain spotted fever

PRACTICE

After having a surgery, a patient develops an infection and soon experiences chest pain, cough, and fluid accumulation in the lungs. Which diagnosis best explains these symptoms?

- a) Tuberculosis b) MRSA c) Pneumonia d) Severe allergies

PRACTICE

Which of the following statements about tuberculosis is incorrect?

- a) Majority of people with TB do not have symptoms and are not contagious.
- b) TB is caused by a bacterial infection and is easily treated with a few doses of antibiotics.
- c) World Health Organization estimates that a quarter of the world's population has latent TB.
- d) TB is highly contagious and is spread through respiratory droplets from infected people.