Microbiology: A Clinical Approach, Second Edition
Chapter 1 What is Microbiology and Why Does it Matter?
Question Bank

Multiple Choice

1. The most common means by which multi-drug resistant tuberculosis is transmitted is
A. Through the use of contaminated needles or syringes
B. By dispersal of aerosols containing droplets carrying causative bacteria
C. By inhaling spores of the causative agent
D. By ingesting undercooked ground beef
E. By individuals who fail to wash their hands after using the lavatory

Answer: B
Diffiuculty: 1
Feedback: The portal of entry and exit of *Mycobacterium tuberculosis* is the upper respiratory tract and the organism does not sporulate. The only choice, therefore, is droplet transmission.

2. Which of the following is true of enterohemorrhagic bacteria contracted from ground beef?
A. It may be the result of ingesting *Escherichia coli* 0157:H7
B. It causes short-lived symptoms of food poisoning and is never life threatening
C. It is always antibiotic-resistant
D. It affects only the gastrointestinal tract of young children and the elderly
E. It is still a risk even if the ground beef is cooked thoroughly

Answer: A
Difficulty: 1
Feedback: The enterohemorrhagic bacteria is often the *E. coli* strain in "A". The disease can be life threatening and is sometimes resistant to antibiotics. It can affect people of any age but is most severe in children and the elderly. Fully cooked ground meat destroys the bacteria.

3. A term reserved for a disease that is acquired in a clinical setting is known as a(n) _____ infection.
A. Enterohemorrhagic
B. Contagious
C. Multidrug-resistant
D. Nosocomial

E. Acute

Answer: D
Feedback: Although the other disease indicated, can be acquired in clinical settings as well as in the community, only nosocomial diseases are, by definition, acquired solely in clinical settings.
Difficulty: 1

4. A(n) _____ is the general term that describes someone who does not become sick when harboring an infectious pathogen, but has the potential to transmit the infectious pathogen to others.
A. Carrier
B. Bioterrorist
C. Opportunist
D. Food handler

Answer: A
Feedback: A carrier is someone who harbors an infectious pathogen but does not show symptoms. Pathogens may also be carried or spread by bioterrorists or food handlers but they do not harbor the pathogen. A bioterrorist may carry pathogens in a closed container and food handlers may carry germs on their hands without succumbing to illness as the pathogens have not entered his body. Opportunist usually refers to non-pathogenic microorganisms normally resident on the human body which can cause disease under certain conditions.
Difficulty: 1

5. Which of the following explains the dramatic decrease in death rates attributed to infectious disease during the twentieth century?
A. Advances in public health
B. Chlorination of drinking water
C. Use of antibiotics
D. Effective vaccine programs
E. All of the choices

Answer: E
Feedback: All the listed activities have led to a decrease in death rates, particularly in children.
Difficulty: 1

6. The general term for the ability of an organism to overcome host defenses and cause disease is associated with the _____ of a pathogen.
A. Peptidoglycan
B. Latency

C. Virulence
D. Innate immune response
E. Natural habitat

Answer: C
Feedback:
Virulence is the ability of pathogens to overcome the body's defenses and establish themselves in the host. Peptidoglycans can induce inflammation, some diseases exhibit latency where they remain dormant for long periods, and the innate immune response is the initial host defense and can prevent disease from occurring. The natural habitat of a pathogen describes the environment where the pathogen naturally occurs.
Difficulty: 2

7. Microorganisms that normally colonize skin and mucous membranes can be
A. Commensal
B. Nonpathogenic
C. Mutualistic
D. Protective against pathogens
E. All of the choices

Answer: E
Feedback: Many microorganism colonizing skin and mucous membranes are nonpathogenic, meaning that they do not cause disease, and can also provide protection against pathogens. These microorganisms may form mutualistic relationships in which both species involved benefit from the relationship, or commensal relationships where one species benefits while the other is unaffected.
Difficulty: 1

8. Which of the following is a ***mismatched*** pair?
A. *Bacillus anthracis* — respiratory disease
B. *Escherichia coli* — bloody diarrhea
C. *Mycobacterium tuberculosis* — food poisoning
D. Avian influenza — human flu
E. *Yersinia pestis* — plague

Answer: C
Feedback: *M. Tuberculosis* causes a respiratory disease not food poisoning . All the other matches are correct.
Difficulty: 2

9. The overarching term that describes the study of the factors responsible for the prevalence and transmission of infectious diseases is
A. Pathogenesis
B. Epidemiology
C. Immunology
D. Virology

Answer: B
Feedback: Epidemiology requires knowledge of all the other choices.
Difficulty: 1

10. An example of how a pathogen is transmitted to a new host is via
A. Air
B. Food
C. Water
D. Insects
E. All of the choices

Answer: E
Feedback: Transmission involves pathogens moving in milieu. For example, food can carry pathogenic organisms and is therefore considered a vehicle of disease transmission. Other possible vehicles are water, air, blood, body fluids, drugs, and intravenous fluids given to a hospitalized patient.
Difficulty: 1

11. Which substance or process decreases the virulence of a bacterial pathogen in a host?
A. Peptidoglycan
B. Adaptive immune cells
C. Virulence factor
D. Binary fission
E. Toxins

Answer: B
Feedback: Adaptive immune cells can generate antibodies or destroy viruses. All the other choices are properties of the pathogen, which increase virulence.
Difficulty: 1

12. Temperature, pain, redness, and swelling are the hallmarks of
A. Inflammation
B. Virulence

C. Nosocomial infections
D. Immunological memory
E. None of the above

Answer: A
Feedback: Virulence does not always lead to these symptoms. Neither do many nosocomial infections. Immunological memory also plays no part. The symptoms are the hallmarks of inflammation.
Difficulty: 1

13. If a person is immunocompromised, it is very likely that he or she may be
A. A carrier
B. An AIDS patient
C. Disease-resistant
D. Lacking sugar
E. Lacking minerals

Answer: B
Feedback: The main characteristic of AIDS is the loss of central aspects of the immune response.
Difficulty: 1

14. What is the general term for the first obstacles to infection which can prevent the pathogenic organism from doing harm?
A. Nosocomial response
B. Virulence factor
C. Host defense
D. Toxins
E. Digestive enzyme

Answer: C
Feedback: Host defense is one of the most important parts determining success of the infectious process.
Difficulty: 1

Essay

Instructors Note – the following questions may require students to obtain information from external resources.

15. In early June of 2013, people in the Middle East were worried about a new coronavirus which at that time had led to about 50 confirmed cases, 30 of whom had died. The virus could spread from patient to patient in hospitals and soon patients arriving from the Middle East were spreading it to Europe. Give your best guess as to the means by which the virus is transmitted.

Answer: The coronavirus in this case was Middle East Respiratory Syndrome Coronavirus (MERS-Cov). Some transmission possibilities include hand-to-hand contact, droplets in coughs and sneezes, close contact such as kissing, and through inanimate objects like door knobs and toys.
Feedback: Further information on the MERS virus can be found on the CDC website.
Difficulty: 5

16. A rapid rise has recently occurred in the number of tuberculosis patients and in the problems of treating this disease. What factors are contributing to this?

Answer: The main problems are the increased use of injected illegal drugs, which allows the disease to spread via needles, and the increased incidence of AIDS, which destroys the immune protection against tuberculosis. Poor socioeconomic conditions and migration also play a role.
Difficulty: 5

17. The appearance of insect-borne diseases in more northerly climates can be attributed to what aspects of climate change? Which diseases are of most concern?

Answer: Climatic factors which affect infectious disease include temperature, humidity and CO_2 concentration and increases in these factors have occurred over the last 10 years with an increase in the incidence of insect-carried diseases. Insect-borne diseases, such as malaria, are of particular concern as climate related changes in insect vector habitat ranges brings such diseases into new areas where the human population has no experience of these diseases, resulting in these becoming emerging diseases in these areas. Increased temperature and humidity allows insects to breed more easily and survive winters in northern climates, and this leads to larger populations of these insects in more frequent contact with humans. Along with the expansion of insect habitat have come epidemics of West Nile virus, dengue virus and bunyavirus.
Difficulty: 5