

BACTERIAL INFECTIONS, ANTIBIOTICS AND ANTIMICROBIAL RESISTANCE



WHAT ARE BACTERIA?

- Bacteria are microscopic, single-celled organisms
- Hundreds of different bacterial species, and many trillions of individual bacteria live in the human body and are normally harmless, or even helpful to humans
- Only a few kinds of bacteria cause disease or inflammation. They are called pathogens



WHAT ARE BACTERIAL INFECTIONS?

- Pathogenic bacteria cause many common bacterial infections such as pneumonia, and skin infections
- Bacterial infections can be spread in different ways. Some infections can be passed from one person to another, some are transmitted by insects or animals, and some are caused by exposure to contaminated food or water, or by exposure to organisms in the environment
- The symptoms of a bacterial infection vary depending on the type of bacteria and the location of the infection. The most common symptoms are:



Fever



Fatigue



Diarrhea



Muscle aches



Coughing

- Certain risk factors or medical conditions increase the chances of developing infectious diseases. These include:



Age



Malnutrition



The use of medications that weaken the immune system



Other medical conditions such as HIV or AIDS, certain types of cancers or other diseases affecting the immune system

WHAT ARE ANTIBIOTICS?

- An antibiotic is a type of medicine that kills bacteria or stops bacterial growth
- Most bacterial infections, including bacterial pneumonia and skin infections, can be effectively treated with antibiotics; however, viral and fungal infections do not respond to antibiotic treatment so your doctor will not prescribe an antibiotic for these types of infections
- Antibiotics are grouped into classes according to their chemical structure or shape and how they kill bacteria or stop bacterial growth
- Each antibiotic is effective only against certain bacteria, so doctors consider which bacteria are likely to be the cause of infection before selecting the appropriate antibiotic to be prescribed

WHAT IS ANTIBIOTIC RESISTANCE?

- Antimicrobial resistance (AMR) occurs when bacterial infections no longer respond to treatment with antibiotics

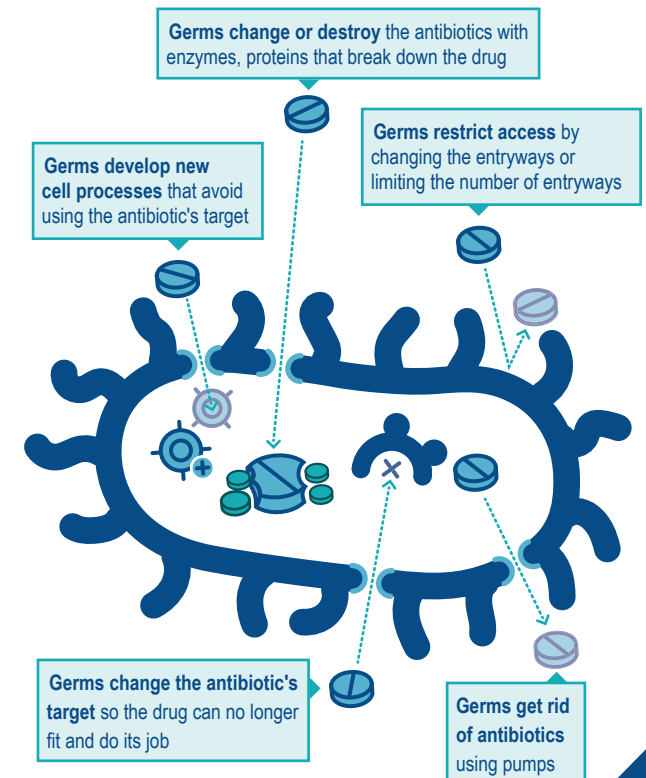


Figure above: Main mechanisms of resistance

WHAT IS ANTIBIOTIC RESISTANCE?

- Over time, some bacteria can adapt and develop mechanisms that allow them to neutralize or “resist” the effects of an antibiotic
- These changes allow bacteria to survive and multiply despite treatment with antibiotics, thus preventing the infection from being cured
- In general, the more often antibiotics are used the more likely it is that bacteria will develop resistance
 - Taking a specific antibiotic increases the chances of developing infections in the future that are resistant to that antibiotic
- Infections caused by antibiotic-resistant bacteria can spread quickly, and are often harder to treat



More than 2.8 million antibiotic-resistant infections occur in the United States each year



AMR PREVENTION

To reduce the development of resistance, there are several actions that can be taken:



The spread of bacterial infection can be reduced through proper hygiene, such as handwashing, wound cleaning, and cleaning shared items and surfaces



Antibiotics should be used only when necessary and for as short a time as possible to adequately treat the infection



It is important to take antibiotics exactly as your doctor prescribes them. You should finish the prescribed treatment, and not miss doses



You should not take any antibiotics prescribed for someone else because the antibiotic might not be appropriate for your type of infection. Taking the wrong antibiotic can cause a delay in receiving the correct treatment, which may allow bacteria to multiply and cause the infection to get worse



Antibiotics should not be given to people who do not have a bacterial infection. Giving antibiotics for infections not caused by bacteria does not make people better but does help create resistant bacteria



Antibiotics are ineffective against viral or fungal infections and should not be prescribed for these types of infections



Many common respiratory tract infections such as colds, the flu, COVID-19, are caused by viruses and cannot be treated with antibiotics



Do not insist on antibiotics if the doctor says they will not help

ADDITIONAL RESOURCES



CDC Antibiotics Aware

<https://www.cdc.gov/antibiotic-use/week/toolkit.html>

CDC Antibiotics use

<https://www.cdc.gov/antibiotic-use/print-materials.html>



CDC AMR



<https://www.cdc.gov/drugresistance/index.html>

All links above connect to a third party website. The content and information contained on third party websites are not owned or controlled by Paratek and/or any of its subsidiaries.

HERE ARE SOME QUESTIONS YOU MAY WANT TO ASK BEFORE TAKING ANTIBIOTICS:

- Is my infection bacterial or viral? Can you test for that?
- Are there vaccinations that can protect me from bacterial infections?
- If I have an allergic reaction to an antibiotic, does that mean there's antibiotic resistance?
- Are there local patterns of antibiotic resistance?