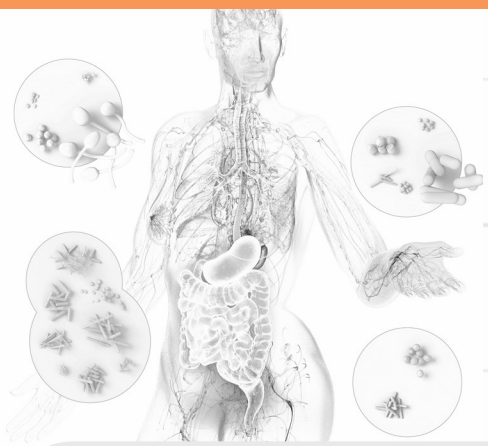
Antibiotic Resistance (AR) Solutions Initiative: Microbiome

CDC's AR Solutions Initiative will measure the impact of antibiotics on the human microbiome to better understand the relationships among antibiotics, antibiotic resistance, and human health.



Antibiotics are life-saving medicines, but they can also change, unbalance, and disrupt your microbiome.

The microbiome is a community of naturally-occurring germs in and on our bodies—on our skin, in our gut, in our mouths or respiratory tracts, and in our urinary tracts.

Image at left used with permission from Bryan Christie Design.

The effects of antibiotics on your microbiome are like a fire in a forest.

1. A healthy microbiome helps protect you from infection. Improved antibiotic use and a healthy microbiome can keep us and our communities well.
2. Antibiotics disrupt your microbiome, wiping out both good and bad bacteria.
3. Tough-to-kill bacteria—like MRSA, CRE, and *C. difficile*—can take advantage of this disruption and multiply.
4. With this overgrowth of resistant bacteria, your body is primed for infection. Once colonized, you can easily spread the resistant bacteria with others.

By only using antibiotics when needed, we can avoid unnecessary disruption, better keep our microbiome and ourselves healthy, and avoid unnecessary risk for infections.

Understanding how the microbiome and infections are connected is the next frontier in protecting the public's health. Together with researchers, CDC is answering:

How do antibiotics disrupt a healthy microbiome?

How does a disrupted microbiome put us at risk?

How can tailoring antibiotic use protect the microbiome?

Learn more about CDC's investments to study the microbiome at www.cdc.gov/drugresistance.