



State of Colorado  
Department of Public Health and Environment

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Patient Safety Initiatives  
Drug-Resistant Infections Background Information  
January 2008

## Overview

The Health Facility Acquired Infections Initiative was not developed as a mechanism to report drug-resistant infection rates to the public. The department is involved in some drug-resistance organism surveillance activities through the Center for Disease Control and Prevention's (CDC) Emerging Infections Program that monitors the incidents of illnesses, such as MRSA (Methicillin-resistant *Staphylococcus aureus*). Information on the findings of different Emerging Infections Program can be found through the department website at [www.cdphe.state.co.us/dc/eip/index.html](http://www.cdphe.state.co.us/dc/eip/index.html) and through the CDC website at [www.cdc.gov/ncidod/osr/site/eip/index.htm](http://www.cdc.gov/ncidod/osr/site/eip/index.htm).

Although state-wide drug-resistance infection rates are not available, the department understands the public is interested in learning more about emerging infections. To help facilitate this, the information below describes what bacteria are, what drug-resistance means, common drug-resistant bacteria and how health facilities are working to protect the public from becoming infected with these bacteria.

## What are Bacteria?

Everyone carries a number of germs, called bacteria. Usually, these bacteria are harmless. Sometimes, however, they can invade the body resulting in infections.

Usually when an infection happens, drugs called antibiotics are used to kill these bacteria. But some strains of bacteria are not killed by commonly used antibiotics. They are said to be resistant to the drugs. The treatment of some illnesses is getting harder due to drug-resistant bacteria. Simply put, drug-resistance means that the bacteria that cause many illnesses are outsmarting the drugs we have to treat them.

Common drug-resistant bacteria are:

- Methicillin-resistant *Staphylococcus aureus* (MRSA);
- Vancomycin-resistant enterococci (VRE);
- *Clostridium difficile*; and
- *Acinetobacter*.

Many of these bacteria can live on or in people without causing illness; this is referred to as colonization.

Below is an explanation of the bacteria listed above.

### **Methicillin-resistant *Staphylococcus aureus***

*Staphylococcus aureus* or staph is a common kind of skin bacteria. Occasionally, staph can get into the body and cause an infection. This infection can be minor (such as pimples, boils and other skin conditions) or serious (such as blood infections or pneumonia). Methicillin is an antibiotic drug commonly used to treat staph infections. Some strains of staph are not killed by methicillin. If the staph infection is not killed by methicillin then it is called methicillin-resistant *Staphylococcus aureus*, or MRSA. MRSA infections are harder to treat than other types of staph infections.

MRSA occurs most frequently among persons in hospitals and health facilities (such as nursing homes and dialysis centers) who have weakened immune systems, open wounds (such as a bedsore) or a tube (such as a urinary catheter) going into their body. MRSA infections that occur in otherwise healthy people who have not been recently (within the past year) hospitalized or had a medical procedure (such as dialysis, surgery or catheters) are known as community-associated (CA)-MRSA infections. These infections are usually skin infections, such as abscesses, boils, and other pus-filled lesions.

MRSA is spread by skin to skin contact but is no more dangerous than other bacteria that healthy people carry on their skin. Frequently hospitalized people and people over 65 are at an increased risk of becoming infected with MRSA.

### **Vancomycin-resistant enterococci**

Enterococci are bacteria that are normally present in the human intestines and in the female genital tract and are often found in the environment. These bacteria can sometimes cause infections. Vancomycin is an antibiotic drug commonly used to treat infections caused by enterococci. Some strains of enterococci are not killed by vancomycin. If the enterococci infection is not killed by vancomycin then it is called vancomycin-resistant enterococci or VRE. Most VRE infections occur in hospitals.

VRE can live in the human intestines and female genital tract without causing disease, referred to as colonization. However, sometimes, it can be the cause of urinary track infections, blood stream infections and wound infections.

People at increased risk of becoming infected with VRE include:

- Those who have been previously treated with vancomycin;
- Those who are hospitalized and receive prolonged antibiotic treatments;
- Those with weakened immune systems;
- Those who have undergone surgery; and
- Those with medical devices that stay in for some time.

Most VRE infections can be treated with other antibiotics. The treatment of VRE is determined by laboratory testing to determine which antibiotics are effective. People who are colonized with VRE do not usually need treatment.

VRE is usually passed to others by direct contact with stool, urine or blood containing VRE. It can also be spread indirectly via the hands of healthcare providers or on contaminated environmental surfaces. VRE usually is not spread through casual contact such as touching or hugging. VRE is not spread through the air by coughing or sneezing.

### **Clostridium difficile**

Clostridium difficile (C. dif) is a bacterium that causes diarrhea and more serious intestinal conditions. There are diseases that result from C. dif infections such as colitis, more serious intestinal conditions, sepsis, and rarely death.

People in good health usually do not get C. dif disease. People who have other illnesses or conditions requiring prolonged use of antibiotics and the elderly are at greater risk of acquiring this disease. C. dif is generally treated for 10 days with antibiotics prescribed by a healthcare provider. Infected people can spread the disease to others; however, only people that are hospitalized or on antibiotics are likely to become ill.

### **Acinetobacter**

Acinetobacter is a group of bacteria commonly found in soil and water. It can also be found on the skin of healthy people. Outbreaks of Acinetobacter infections typically occur in intensive care units and healthcare settings housing very ill patients. Acinetobacter infections rarely occur outside of healthcare settings.

Acinetobacter causes a variety of diseases ranging from pneumonia to serious blood or wound infections and the symptoms vary depending on the location of the infection. Individuals can also become colonized with Acinetobacter.

Acinetobacter poses very little risk to healthy people; however, people who have weakened immune systems may be more susceptible to infections. Acinetobacter can be spread to

susceptible persons by person-to-person contact, contact with contaminated surfaces, or exposure in the environment.

Acinetobacter is often resistant to many commonly prescribed antibiotics. Decisions on treatment of infections with Acinetobacter should be made on a case-by-case basis by a healthcare provider. Acinetobacter can live on the skin and may survive in the environment for several days.

Individuals who think they may have one of the bacterial infections listed above should consult their physicians.

### **Stopping Drug-Resistance and the Spread of Bacteria**

Many health facilities have been monitoring the risk of drug-resistant bacteria in their facilities in order to implement appropriate interventions. Most health facilities often use similar strategies to combat the spread of drug-resistant bacteria. Some of these strategies include:

- Setting and following hygiene standards
  - Hand washing, glove and gown wearing, etc.
- Active Surveillance
  - Checking for bacteria when patients are checking into the facility.
- Contact Precautions
  - Isolating infected patients to prevent the spread of bacteria.
- Disinfecting surfaces
  - Killing bacteria that may continue to live on surfaces in patient care areas.

The public also has a part to play in stopping the spread of these bacterial infections. Their role includes:

- Proper use of antibiotic drugs:
  - One of the main causes of drug-resistance is the overuse and incorrect use of antibiotics. Antibiotics are often incorrectly used to treat colds, flu, and bronchitis. Antibiotics do not cure or help these illnesses because these illnesses are almost always caused by viruses.
  - Using antibiotics wisely will keep these life-saving drugs working.
- Proper hand hygiene:
  - Frequent hand washing is vital in stopping the spread of bacteria.
  - Wash with soap and water.
  - Scrub hands for at least 30 second.
- Disinfect surfaces:
  - Frequently clean areas of the home where bacteria can live.
  - Use a household disinfectant or a mixture of one-fourth cup bleach and one quart of water to clean those areas and surfaces that are touched frequently.
- Stay healthy:
  - Eat right;
  - Exercise;
  - Avoid stress; and
  - Quit smoking.

Adapted from information contained on the following Web sites:

[www.cdc.gov](http://www.cdc.gov)

[www.getsmartcolorado.com](http://www.getsmartcolorado.com)