MRSA

Definition - By Mayo Clinic staff

MRSA infection is caused by Staphylococcus aureus bacteria — often called "staph." MRSA stands for methicillin-resistant Staphylococcus aureus. It's a strain of staph that's resistant to the broad-spectrum antibiotics commonly used to treat it. MRSA can be fatal.

Most MRSA infections occur in hospitals or other health care settings, such as nursing homes and dialysis centers. It's known as **health care-associated MRSA, or HA-MRSA.** Older adults and people with weakened immune systems are at most risk of HA-MRSA. More recently, another type of MRSA has occurred among otherwise healthy people in the wider community. This form, **community-associated MRSA, or CA-MRSA,** is responsible for serious skin and soft tissue infections and for a serious form of pneumonia

Symptoms

Staph skin infections, including MRSA, generally start as small red bumps that resemble pimples, boils or spider bites. These can quickly turn into deep, painful abscesses that require surgical draining. Sometimes the bacteria remain confined to the skin. But they can also penetrate into the body, causing potentially life-threatening infections in bones, joints, surgical wounds, the bloodstream, heart valves and lungs.

Causes

Antibiotic resistance

Although the survival tactics of bacteria contribute to antibiotic resistance, humans bear most of the responsibility for the problem. Leading causes of antibiotic resistance include:

- **Unnecessary antibiotic use.** Like other superbugs, MRSA is the result of decades of excessive and unnecessary antibiotic use. For years, antibiotics have been prescribed for colds, flu and other viral infections that don't respond to these drugs, as well as for simple bacterial infections that normally clear on their own.
- **Antibiotics in food and water.** Prescription drugs aren't the only source of antibiotics. In the United States, antibiotics can be found in livestock. These antibiotics find their way into municipal water systems when the runoff from feedlots contaminates streams and groundwater.
- **Germ mutation.** Even when antibiotics are used appropriately, they contribute to the rise of drug-resistant bacteria because they don't destroy every germ they target. Bacteria live on an evolutionary fast track, so germs that survive treatment with one antibiotic soon learn to resist others. And because bacteria mutate much more quickly than new drugs can be produced, some germs end up resistant to just about everything. That's why only a handful of drugs are now effective against most forms of staph.

Tests and diagnosis

Doctors diagnose MRSA by checking a tissue sample or nasal secretions for signs of drug-resistant bacteria. The sample is sent to a lab where it's placed in a dish of nutrients that encourage bacterial growth (culture). But because it takes about 48 hours for the bacteria to grow, newer tests that can detect staph DNA in a matter of hours are now becoming more widely available.

In the hospital, you may be tested for MRSA if you show signs of infection or if you are transferred into a hospital from another health care setting where MRSA is known to be present. You may also be tested if you have had a previous history of MRSA.

Treatments and drugs

Both hospital- and community-associated strains of MRSA still respond to certain medications. In hospitals and care facilities, doctors often rely on the antibiotic vancomycin to treat resistant germs. CA-MRSA may be treated with vancomycin or other antibiotics that have proved effective against particular strains. Although vancomycin saves lives, it may become less effective as well. Some hospitals are already seeing strains of MRSA that are less easily killed by vancomycin.

In some cases, antibiotics may not be necessary. For example, doctors may drain a superficial abscess caused by MRSA rather than treat the infection with drugs.

Prevention

Hospitals are fighting back against MRSA infection by using surveillance systems that track bacterial outbreaks and by investigating products such as antibiotic-coated catheters and gloves that release disinfectants.

Still, the best way to prevent the spread of germs is for health care workers to wash their hands frequently, to properly disinfect hospital surfaces and to take other precautions, such as wearing gowns and gloves when working with people infected with resistant bacteria.

In the hospital, people who are infected or colonized with MRSA are placed in isolation to prevent the spread of MRSA. Visitors and health care workers caring for people in isolation may be required to wear protective garments and must follow strict hand-washing procedures.

What you can do in the hospital

Here's what you can do to protect yourself, family members or friends from health care-associated infections.

- Ask all hospital staff to wash their hands or use an alcohol-based hand sanitizer before touching you — every time.
- Wash your own hands frequently.
- Make sure that intravenous tubes and catheters are inserted under sterile conditions, for example, the person inserting them wears a gown, gloves and mask and sterilizes your skin first.

What you can do in your community

Protecting yourself from MRSA in your community — which might be just about anywhere — may seem daunting, but these common-sense precautions can help reduce your risk:

- **Wash your hands.** Careful hand washing remains your best defense against germs. Scrub hands briskly for at least 15 seconds, then dry them with a disposable towel and use another towel to turn off the faucet. Carry a small bottle of hand sanitizer containing at least 60 percent alcohol for times when you don't have access to soap and water.
- **Keep personal items personal.** Avoid sharing personal items such as towels, sheets, razors, clothing and athletic equipment. MRSA spreads on contaminated objects as well as through direct contact.
- **Keep wounds covered.** Keep cuts and abrasions clean and covered with sterile, dry bandages until they heal. The pus from infected sores may contain MRSA, and keeping wounds covered will help keep the bacteria from spreading.
- **Shower after athletic games or practices.** Shower immediately after each game or practice. Use soap and water. Don't share towels.
- **Sit out athletic games or practices if you have a concerning infection.** If you have a wound that's draining or appears infected — for example, is red, swollen, warm to the touch or tender — consider sitting out athletic games or practices until the wound has healed.
- **Sanitize linens.** If you have a cut or sore, wash towels and bed linens in a washing machine set to the "hot" water setting (with added bleach, if possible) and dry them in a hot dryer. Wash gym and athletic clothes after each wearing.
- **Get tested.** If you have a skin infection that requires treatment, ask your doctor if you should be tested for MRSA. Doctors may prescribe drugs that aren't effective against antibiotic-resistant staph, which delays

treatment and creates more resistant germs. Testing specifically for MRSA may get you the specific antibiotic you need to effectively treat your infection.

- **Use antibiotics appropriately.** When you're prescribed an antibiotic, take all of the doses, even if the infection is getting better. Don't stop until your doctor tells you to stop. Don't share antibiotics with others or save unfinished antibiotics for another time. Inappropriate use of antibiotics, including not taking all of your prescription and overuse, contributes to resistance. If your infection isn't improving after a few days of taking an antibiotic, contact your doctor.