



Supporting Documentation
MRSA Infection

Deadly Superbugs

By Lisa Collier Cool

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Deadly Superbugs

They can be transmitted by a hug or a handshake, on a playground or in a locker room. And can kill within 72 hours.

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Full of Life

Drew Griggs was full of energy on January 31, 2005, as he headed to the gym. The 16-year-old was a starting kicker on his Dublin, Georgia, high school football team, the Fighting Irish. But the gridiron season was over, and it would be fun to join his friends for a Monday night pickup basketball game. After shooting hoops for a while, he went home feeling a little ill and told his parents, Bonnie and Paul, that he might be coming down with the flu. Although the brawny young athlete wasn't one to complain, his mom checked his temperature. It was 99. Nothing to worry about. He'd probably be fine in a day or two.

On Wednesday, Drew woke up with a stuffy nose, a cough and a mild fever. He stayed home from school. In the afternoon, while Bonnie was picking up her son's homework, her cell phone rang. "Mom, I can't breathe," Drew gasped. "Dad's taking me to the doctor." Bonnie rushed to the MD's office, where an x-ray showed that the teenager's lungs were congested. Suspecting pneumonia, the doctor sent the family to the ER, where doctors slipped an oxygen mask over Drew's face. When that didn't help, he was transferred by ambulance to a larger hospital, in Macon, Georgia, while Bonnie and Paul followed in their car.

"I thought they'd give him antibiotics, and that would fix it," says Bonnie, a physical education teacher. At the second hospital, doctors tried one treatment after another, with no success. At 1:30 a.m., they had to put Drew on a respirator. But even on life support, his oxygen level kept dropping. By morning, it was so dangerously low that there was only one option left: moving him to a medical center in Atlanta to be hooked up to a heart-lung bypass machine. "When we saw him at the third hospital, he'd started to turn blue. They gave him a 30 percent chance of living, because his lungs were shutting down from extreme infection," says Bonnie. "That hit us so hard, we were in complete shock."

But why was Drew so sick? Tests, including cultures of his phlegm, revealed that he had pneumonia triggered by a sometimes fatal bacterial infection known as methicillin-resistant *Staphylococcus aureus* (MRSA). "I thought only sick people in the hospital got that," says Bonnie. For decades, that was true: MRSA was dubbed a superbug because many common antibiotics couldn't eradicate it. The bug prowled medical centers and nursing homes, typically targeting elderly, debilitated and chronically ill patients. Now an even more dangerous form of staph infection, known as community-associated MRSA (CA-MRSA), is striking otherwise healthy people who haven't been in a hospital, with an unusual number of outbreaks among athletes on sports teams. And kids are at particular risk, although no one is sure why.

CA-MRSA: An Epidemic

"Over the past three to four years, CA-MRSA has become an epidemic that's sweeping the country," says Robert Daum, MD, an infectious-disease specialist at the University of Chicago Comer Children's Hospital, who was one of the first researchers to discover and study community strains. (There are more than a hundred of them.) "This isn't something unleashed in hospitals. Community strains are genetically distinct from hospital staph, and even more virulent." Unlike the hospital bug, they produce toxins that kill white blood cells -- the body's main infection fighters, says Dr. Daum. "That makes them a double threat. It's not just a question of giving the right antibiotics. We're seeing aggressive, rapidly progressing cases. A child can be healthy and playing with his toys in the morning, and dead from this infection that night."

MRSA is so widespread that 2.3 million Americans carry the bacteria in their noses without symptoms, the Centers for Disease Control and Prevention reported in 2006. CA-MRSA carriers can infect others, or suddenly become ill themselves if the bacteria burrow past the body's defenses. Any break in the skin's protective barrier -- a razor nick, a scratch, even nose picking (which may injure nasal passages) -- can set the stage for a staph infection.

Getting the flu can also allow the bug to jump from the nose to the lungs, says Blaise Congeni, MD, director of infectious diseases at Akron Children's Hospital in Ohio. "During the flu season, we frequently see severe CA-MRSA infections," Dr. Congeni says. "Because kids' resistance is down due to the flu, they can't fight off the bacteria, which can sometimes lead to potentially fatal pneumonia."

Months before Drew Griggs got sick, he had developed a skin infection after a scrape during football practice. Experts reviewing his case now think that infection may have been an undiagnosed bout of CA-MRSA, which can sometimes clear up on its own in mild cases. Drew appeared to be battling the flu when staph-induced pneumonia set in.

Labeled a lethal menace in 1999, after four children in North Dakota and Minnesota died of it, the superbug is now responsible for 59 percent of skin and soft-tissue infections seen in emergency rooms, researchers reported last year. "This is an astonishingly high case rate," says Henry Chambers, MD, chief of infectious diseases at San Francisco General Hospital. He and other experts advocate increased government funding for the development of new antibiotics or, better still, a vaccine. "People are bent out of shape about bird flu, but CA-MRSA is already here and, in my opinion, ranks second only to HIV as a public health threat," Dr. Chambers says. "The drugs we've relied on to treat common infections no longer work. And if we're not smart about using the few weapons we have left, this superbug will definitely morph again, to become resistant to even more antibiotics."

Doctors are already finding the bacteria hard to defeat. CA-MRSA infection has a nasty habit of recurring, adds Dr. Congeni. "Just this week, a patient came in with his seventh episode. People are scared and frustrated because they can't get it out of their homes. Sometimes one family member will get it, then another."

Unimaginable Tragedy

CA-MRSA typically causes boils, pimples or pus-filled swellings often mistaken for spider bites. It can trigger large abscesses that need to be surgically drained, and in extreme cases, it can lead to life-threatening joint, lung, muscle or bone infections, says Dr. Daum. "We're also seeing alarming syndromes, particularly in kids, including bloodstream infections and flesh-eating bacteria that leave the lungs riddled with holes, like Swiss cheese."

That's what happened to two-month-old Madeline Reimer and Andy Zack, 11. Both kids started off with seemingly minor problems. Madeline had a runny nose and a cough. Andy fell off his bike, banging his hip. A couple of days later, the sixth grader from Youngstown, Ohio, had a fever of 104 and was in such excruciating pain that he could barely walk. The baby girl from Plainfield, Illinois, turned pale and limp, says her mom, Beth Reimer. "I called 911, and they told me to do CPR. At one point, her eyes closed, and she lost all muscle tone. I thought she'd died in my arms. My husband and I were in hysterics, trying to get her to breathe."

Paramedics revived Madeline, who was airlifted from one hospital to a second. She was put on life support and vancomycin, a powerful IV antibiotic often effective against MRSA.

Andy, an energetic boy who loves to play soccer and ride his mountain bike, was hospitalized with a massive infection, says his dad, John Zack, a software engineer. "When they said he needed a hip operation to drain pus, I was crying because I was scared that he'd never walk or play again. I quit my job to stay at the hospital and take care of him."

As Andy lay in bed, with an eight-inch surgical incision in his thigh, he suddenly got short of breath. A scan showed fluid buildup in his chest. "The doctor said the infection was eating holes in the lower lobe of his lung and that if he didn't have another surgery, he'd die. I'd never been so terrified in my life," says John. "I couldn't believe one little bump on his bike could unleash an infection like this."

Beth Reimer got even bleaker news. CA-MRSA had destroyed one of her daughter's lungs and was starting to attack the other one. "I knew in my heart that she wasn't going to make it. Her little body faded so quickly. On her last day, July 22, 2005, the whole family was there to cherish every moment with her. We sang 'You Are My Sunshine.' Just before her final breath, she opened her eyes and looked right at me -- that was such a blessing."

After Madeline's death, her twin brother, Luke, came down with a runny nose. "I was beside myself with fear that I was going to lose another child," Beth says. Although Luke tested positive for the superbug, as did his mother, he recovered in a few days, while Beth had no symptoms.

Weaned Off Life Support

As a precaution, the entire family, including an older son and Beth's husband, Kenneth, were treated with heavy-duty antibiotics and a nasal ointment. "I'm haunted by the thought that I might have innocently passed this on to my baby," says Beth. However, doctors never pinpointed the source of her daughter's infection.

John, too, worries that he may have infected his child, given the elder Zack's history of boils, one of which swelled into a softball-size abscess. But he's never been diagnosed with CA-MRSA, since his doctor didn't do any cultures. How the bacteria invaded Andy's body isn't entirely clear either; the accident didn't leave any visible wound. But the youngster had cracked a bone in his foot in another bike mishap, two weeks earlier. Both injuries may have been contributing factors, says Dr. Congeni, Andy's doctor. "It's easier for this infection to occur in traumatized tissue."

After doctors drained fluid from Andy's chest, his breathing quickly improved. Ten days after being admitted to the hospital, he took his first shaky steps, and five days later, he went home, limping a little. "Seeing my son walk again was like having a thousand-pound weight lifted off my shoulders," says John. Seven weeks later, in October 2006, Andy had recovered enough to return to school. Although the limp has disappeared, the doctor says it might take years for his lungs to fully heal. "He's maybe 85 percent as healthy as he used to be, and gets winded more easily, but he still runs around and rides his bike. You just can't keep that kid down!"

These days, the parents of Drew Griggs, the high school athlete, also have a lot to cheer about. After 18 days in an induced coma, first on a bypass machine, then a regular respirator, he improved enough to be weaned off life support. "We were so elated when the doctors said he was going to make it," says Bonnie. "At first, he was so weak that when we asked him questions, all he could do was nod."

After a month, Drew left the hospital in a gurney and spent a week in a rehab facility. "His muscles had just wasted away," his mom says. The six-foot-one-inch teenager's weight dwindled from his normal 159 pounds to 118. "He was just skin and bones." At 16, he had to relearn how to walk, dress and feed himself.

As the Griggses drove their son home from rehab on March 9, 2005, they spotted handmade signs his friends had placed along the sides of the road. One word at a time, the signs formed a message: "Welcome home, Drew! It's been a long way, but you finally made it back home." At his house, over a hundred people were waiting to greet him. Buoyed by the outpouring of support, Drew battled his way back to fitness and started playing football again in the middle of the 2005 season. When he kicked off in his first game, he got a standing ovation. The Fighting Irish went on to win the state championship in 2006.

Now that Drew is healthy, he's determined to stay that way. Before a game, he sanitizes his helmet with disinfectant wipes and suits up in a freshly laundered uniform. "I clean my gym locker every day and am very particular about hygiene," says the soon-to-be freshman at Valdosta State University, where he's got a spot on the football team. Drew takes two showers a day and washes his hands at every opportunity. "This germ hit me out of nowhere and could have taken my life. I tell people that you just can't be too careful. This thing is out there, and you don't know where it might be hiding."

How to Protect Your Family

CA-MRSA is usually spread by skin-to-skin contact with infected people (while playing sports like football or wrestling, for example, as well as giving hugs and handshakes). Doctors recommend these steps to lower your risk:

Keep your hands clean. Washing with soap and warm water several times a day is the single best way to combat staph. Teach kids to rub their hands briskly under running water for at least 15 seconds (about the amount of time it takes to recite the alphabet). Carry alcohol-based hand sanitizer for times when soap and water aren't available. It's also helpful to keep kids' fingernails short and to discourage nose picking.

Cover cuts and scrapes. Any wound should be washed with soap and water, then covered with dry, sterile bandages until it heals. Apply a clean dressing daily. Pus from infected sores can contain CA-MRSA, so it's also important to wash your hands after changing bandages to avoid spreading staph.

Don't share personal items. Tell your kids not to use friends' and teammates' towels, washcloths, clothing, uniforms or razors. People who appear perfectly healthy can still be CA-MRSA carriers. Shared sports equipment, such as helmets and gym mats, should be cleaned with an antibacterial solution after every use.

Sanitize gym clothing and linens. If anyone in the family has a cut, sore or infection, wash bedding and towels in hot water with added bleach. Wash sports clothing and washable athletic gear with laundry detergent after each use. Drying laundry in a hot dryer, not on a clothesline, also helps kill bacteria.

Remember flu shots. Since the flu lowers resistance to CA-MRSA, getting vaccinated every year helps protect against both diseases. The best time to get the shot is in October or November. Flu shots are approved for kids over six months of age.

Get tested. If you have a skin infection that needs medical treatment, ask the doctor to check for CA-MRSA, which responds only to certain antibiotics. Many MDs prescribe the wrong drugs because they don't do a test. That can worsen the infection. Until recently, diagnosis typically involved doing a culture. But it takes up to 48 hours to grow the bacteria in a lab, meaning that people could continue to spread the infection while waiting for lab results.

In April of this year, the FDA approved the one-hour Xpert MRSA test, which uses DNA technology to check the nose for the superbug. That gives hospitals a fast, reliable way to screen patients for MRSA before admission. Next year, the test's manufacturer, Cepheid, expects approval of a DNA test for use on tissue samples from infected areas, giving doctors another tool for rapid diagnosis.

Be sure to take all your prescribed medication -- even if your skin heals. Bacteria you leave alive today can morph into tomorrow's superbugs.

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