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# THE CrossFit JOURNAL

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## Skin Infections and the CrossFit Athlete

Ripped hands and bloody shins give bacteria a way into your body. Dr. Mike Ray explains what's going on and offers his tips on how you can avoid nasty infections.

By Dr. Mike Ray CrossFit Flagstaff

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Rodney Hamby

*The pull-up bar was a larger diameter than she was used to, but she wasn't going to slow down for that—especially not visiting a new gym. During the last round of pull-ups, she was vaguely aware that she had injured her hands, but she didn't really look at them until the workout was over. Even then, she didn't think much of it; she'd torn much worse plenty of times before, and now she just had blisters on both palms, though the one on the right did open up and drain a little. She squeezed out some clear fluid and left it at that. Besides, her doctor had just convinced her to update her tetanus immunization—something she had been reluctant to do.*

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JoeRenev



***Rough hands are the result of hard work, but if you tear, you need to take some precautions to prevent infections.***

As athletes, many in the CrossFit community like to think of themselves as protected from disease. It's certainly true that being fit provides us with resistance and a remarkable resilience with regard to illness, but we can still get sick. There is good evidence the immune system is enhanced by exercise, though there is also evidence that "extreme" exercise (however that may be defined in medical literature) could actually suppress immunity. The clinical significance of this effect is unclear.

Athletes remain susceptible to infection. Bacterial skin infections, generally termed "cellulitis," most commonly occur when bacteria enter through a break in the skin (which may be so small as to have been unnoticed at the time of injury) and begin to multiply, leading to inflammation and damage. Unchecked, cellulitis can spread to progressively larger regions of skin, potentially entering the bloodstream or involving other structures. Occasionally, an abscess may develop. This is a pocket of pus, comprising bacteria and dead cells, that forms at or under the surface of the skin. An abscess may exist independently of cellulitis or with it. Conversely, cellulitis may exist with or without an abscess.

*For the first day she wasn't too worried. The blister on her left hand never did drain, though the one on the right looked worse within a few hours. Then, her right hand started to hurt more. She had, of course, continued to work out, so she figured she had overdone it on an already-vulnerable area. But was the skin near the blister on her right hand becoming a little red? It was getting so she couldn't hold onto a bar.*

The bacteria that most commonly cause cellulitis are streptococcus species and staphylococcus aureus. The latter bacteria give rise to the term "staph infection." Some species of staph aureus have developed resistance to the antibiotics once most commonly used to treat cellulitis and are termed "methicillin-resistant staph aureus" or "MRSA."

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**If you haven't had a  
tetanus shot in 10 years,  
get one.**

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One concern with any bacterial skin infection is the possible development of tetanus, caused by another bacterium, clostridium tetani. Tetanus is very unlikely in an individual who has an up-to-date tetanus immunization.

Rarely, a person who has cellulitis may have a much more dangerous and rapidly spreading condition ominously and very appropriately termed necrotizing fasciitis. Necrotizing fasciitis is caused by a variety of bacteria and advances rapidly between layers of soft tissue (the fascia). It constitutes a life- and limb-threatening emergency.

*That night, her right hand was really hurting. The burning made it hard to sleep, and she woke up every few hours. Checking her palm under the bathroom light, she could see it was definitely redder. Even though the blister had drained, there still seemed to be some fluid, maybe under another layer. It was getting really tender to the touch. Something was not right. In the morning, she would have to get it looked at.*

A medical evaluation of a possible skin infection will include—aside from the usual vital signs and review of previous medical issues, medication allergies and other information—a history to determine any injury that may have occurred, including the possibility of a foreign body (such as a splinter) in the wound. The patient will be asked his or her tetanus status and will receive an exam. The medical provider will be looking for evidence of an abscess or foreign body and will try to determine if any other structures are involved and how extensive the infection is. This will involve palpating the wound, checking that nearby tendons and joints are functioning properly, assessing the spread of redness, and checking lymph nodes.

Tetanus immunization (which is universally packaged with a diphtheria vaccine and referred to as “dT”) should generally be updated every 10 years, though with any significant laceration or infection the recommendation is to receive a booster if it has been more than five years. These days, with the resurgence of whooping cough (pertussis), the Centers for Disease Control suggests using a vaccine also containing the pertussis vaccine at least once as an adult. This combination is referred to as “Tdap”. Either one doesn’t really hurt that much to receive but will make you feel like you were punched in the arm the next day or two. There is no evidence to suggest any connection between autism and this or any other vaccine.

If an abscess is identified or suspected, it must be drained because antibiotics alone will not penetrate the abscess. Generally, a local anesthetic is injected into the area around the abscess, a painful procedure in itself. Then a needle may be used to confirm the presence and location of the abscess, and an incision is made to drain the pus. More sizable abscesses will be packed with strips of gauze to keep the incisions from closing and allow them to continue to drain, though this practice has recently been called into question. The packing is generally changed every day or two as the wound heals. A really large abscess, or one in an area where nearby structures are at risk for damage, may require drainage in the operating room under a general anesthetic.



***This is the infection at its worst. Note the redness around the wound and the general swelling of the palm (especially evident at the base of the fingers), but the drainage is clear.***



***The wound is getting much better after about four days on antibiotics. You can see where the blister was unroofed to ensure drainage and assess for any pus.***



***The infection after about nine days of antibiotics.***

Courtesy of Dr. Mike Ray

She saw the doctor first thing in the morning, actually getting him out of bed, so great was her concern. In daylight it was pretty obvious the redness extended about two centimeters from the blister itself, and there might even be a little streaking onto her wrist. The doctor had her flex and extend all her fingers and her wrist and checked the lymph nodes in her armpit. He pushed on the wound—which really hurt—and agreed there seemed to be a little fluid deeper in. They discussed a local anesthetic, but for now he was just hoping to drain any fluid through a needle hole, and they agreed the anesthetic would hurt as much or more than just using one needle stick to drain it. He did probe around in there a lot more than she thought necessary but only got a few more drops of fluid, and it was blood-tinged but clear, not pus. Rather than dig deeper in her palm, the doctor recommended starting oral antibiotics immediately. He prescribed her Bactrim DS, two pills twice per day, and gave her some ibuprofen right away. She was a little reluctant to take the latter, not wanting to blunt the effects of her most recent training, but the hand really hurt, and in the end she relented.



Caroline M. Foresman/CrossFit Chesapeake

**Bacteria can enter through small tears too small to see, so proper hygiene is essential even if you don't see blood.**

If the care provider suspects cellulitis or other infection, the patient is started on antibiotics. Abscesses that occur without cellulitis do not benefit from antibiotics. Before the emergence of MRSA, cellulitis was usually treated with a penicillin or a similar antibiotic such as cephalexin, also known as Keflex, and these medications are still used for certain infections. Nowadays, at least in the United States, people are most likely to receive a prescription for either trimethoprim-sulfamethoxazole (also known as Septra or Bactrim) or doxycycline or clindamycin, either alone or with another antibiotic.

A 10-day course of oral antibiotics will clear up most mild cases of cellulitis, but more significant infections, especially those involving delicate structures like the hand or on the face, may require intravenous antibiotics, most frequently vancomycin, though other antibiotics effective against MRSA may be used. When a patient is started on IV antibiotics, he or she is most commonly hospitalized overnight.



Cody Settle

**Suck it up and wash your tears immediately to prevent infection.**

Many factors may alter the antibiotic selections described above, including a patient's allergies, particular wound circumstances (such as a wound occurring in fresh or salt water), or the resistance profile of bacteria in a community.

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**If it is a wound of any significance, bandage it.**

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The redness on the skin may be outlined with an indelible marker to allow for easy assessment of progress. Once antibiotics are started, the redness should start to recede within a day or so. If it continues to get worse, something else needs to be done. This might include re-assessment for abscess or foreign body, change in antibiotic, or a switch to intravenous antibiotics. The usual duration of antibiotics for an established skin infection is around 10 days.

*Her hand continued to hurt for several days after starting the antibiotic. It even seemed like after the first day it might have become a little worse, both in terms of the pain and the redness. Her doctor wondered aloud about starting intravenous treatment, but she really wanted to try a little longer on the oral medication. By the second day, it seemed a little better, and by the third it was hurting a lot less. A week after she started the antibiotics, her hand didn't hurt at all anymore and she was able to work out again, though she avoided thick pull-up bars until her hand was completely healed. Her doctor was visibly relieved, and one night at dinner I confessed it was a lot harder on me to treat my wife and see her discomfort than it was to manage most of my patients.*



Staff/CrossFit Journal

***If a minor wound starts to get red and painful, get it checked immediately.***

### Take Steps to Avoid Infection

The best cure is prevention, and the first step in the gym is basic hygiene. Infection is only possible if an organism is present. If a bar or other piece of equipment is especially dirty, clean it. If it is bloody, disinfect it. The discussion here has been centered on skin infections, but it is conceivable that HIV or hepatitis could be transmitted as well. Standard household or commercial cleaners should be sufficient for general cleaning. Use something containing an antiseptic like bleach or iodine for blood.

If you haven't had a tetanus shot in 10 years, get one. Ask your care provider if you should get the pertussis vaccine.

Try to have at least somewhat clean hands when working out. Some workouts might make that difficult if you're carrying sandbags, flipping a tire or doing bear crawls, but I try to at least wash my hands before exercising. Please don't hear that I recommend against these movements; I don't. The idea is to use what reasonable precautions you can.

Do your best to avoid injuries, especially to the hands. Use one of the many taping techniques to protect yourself if you know you will be doing a lot of pull-ups, or tape your wrists for false-grip muscle-ups. If you tear your hands, scrape your shins or suffer some other abrasion or cut, assuming it doesn't need medical attention immediately, wash it with soap and water. This step alone—cleaning the wound carefully—will dramatically reduce the risk of infection and is my single most important recommendation.

If it is a wound of any significance, bandage it, ideally after applying some antibiotic ointment. Really try to protect it during your next workout.

If you start to notice redness or worsening pain and tenderness, get it checked.



Tyler Jones

***Cleaning your equipment regularly will also reduce the chances of infections.***

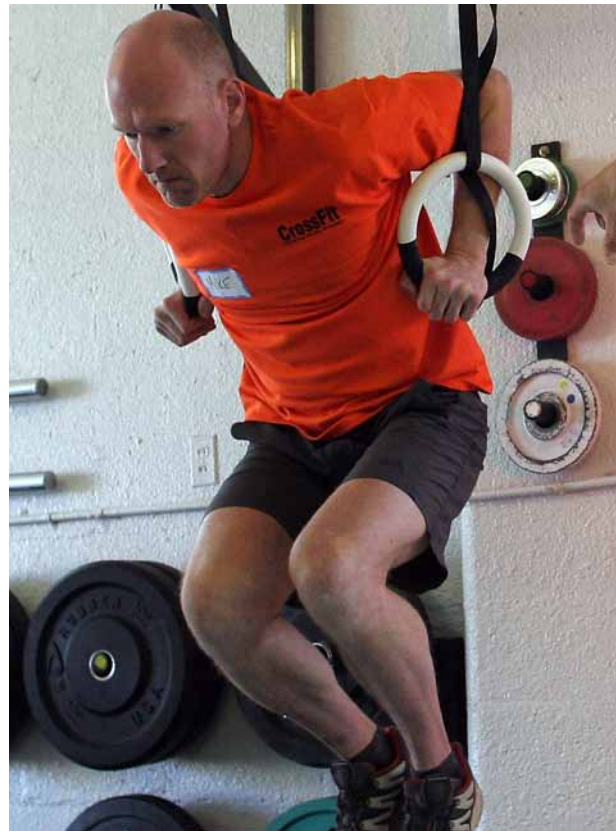
Here are the most important points:

- Be up to date on tetanus immunization.
- Wash your hands before a workout, and clean equipment if it needs it.
- If you get an injury, clean it thoroughly with soap and water, and then bandage it. Use common sense about what you can manage yourself and what needs medical attention.
- If an injury is getting worse and not better, have it checked. Ask your care provider if you should be given antibiotics for MRSA.



### **About the Author**

*Dr. Mike Ray is the co-owner of [CrossFit Flagstaff](#). He enjoys everything from adventure racing to rock climbing, martial arts, trail running and beyond. He is married to Lisa Ray, who finished 44th in the 2009 CrossFit Games and is a member of CrossFit HQ's traveling certification staff.*



Courtesy of Dr. Mike Ray