

# Skin Infections in Remote Environments: Why One Program Developed New Staph Protocols

## What Is It?

Staphylococcus aureus, aka staph, is a bacteria that can cause an infection. MRSA is methicillin-resistant Staphylococcus aureus- a different strain that is resistant to several types of antibiotics. Though MRSA is often divided into two categories, HA (Hospital Acquired) and CA (Community Acquired), the differences in these strains and where/how they are actually found have been blurred over time. Generally speaking, CA-MRSA is more likely to be associated with skin infections in young people that have not been hospitalized recently, and is becoming more prevalent<sup>1</sup>.

The presence of staph bacteria is not necessarily a cause for alarm- the CDC estimates that one in every three people carry it in their nose, and two out of one hundred carry MRSA<sup>2</sup>.

## Why Is It A Problem?

When an infection does take place it can cause serious injury or death, however rare, if not treated properly- and late diagnosis of a MRSA strain in particular means a delay in effective treatment. Like with many medical issues, remote environments often lack the resources to diagnose and treat staph infections in a timely manner. The aspects of wilderness programs that make them unique, like close living quarters and decreased personal hygiene opportunities, encourage the development and spread of skin infections. Ultimately only a culture tested in a lab can confirm staph/MRSA diagnosis, so treatment decisions in remote environments are often based on speculation. With infection rates of MRSA and other antibiotic resistant staph strains increasing globally, it is an issue that will require ongoing attention.

## What Does It Look Like?

While it should be noted that an opening in the skin is not necessary for an infection to exist, most staph infections present with a cut or bump that is red, swollen, painful, and pus-filled. The area may be warm to the touch, may have red streaks in the skin nearby, and can be accompanied by a fever. Often staph infections are mistakenly confused with spider bites, as the infection can cause an abscess in the skin that looks like an unusual bump or bite.



Abscess caused by MRSA      Swelling caused by MRSA infection on palm      Blisters caused by bullous impetigo      Cellulitis

## How Is It Treated?

Whenever possible, consult local medical authorities for proper testing and treatment. Where location and resources prevent this, telemedicine options (particularly if photographs are available) are a good alternative. However, providing basic first aid for wound care should not be delayed while seeking further medical opinions.

The wound care we are able to provide in the field typically involves the following:

- Cleaning the area with soap and water and/or alcohol wipes
- Application of a hot compress
- Application of ointment with sterile Q-tip (see handout for details)
- Marking the skin or photographing to track progress
- Dressing with bandage to prevent irritation/contact with surfaces or people
- Documenting care provided
- Administration of oral antibiotics if directed by a physician

An infection is considered contagious until the wound has closed and is no longer draining. It should not be necessary to restrict the infected patient from activities if the area can be kept covered and standard hygiene practices are in place<sup>2</sup>.

## Who Are We?

ActionQuest runs three 17-21 day programs per summer in the British Virgin Islands, with approx. 450 participants in total plus 50 staff. Teens ages 12-18 grouped by age and grade live on 50ft boats and learn to sail, scuba dive, windsurf, waterski/wakeboard, and cook, clean, and participate fully in the running of the vessels (up to sixteen operating at a time). ActionQuest places a strong emphasis on experiential education, leadership development, and personal integrity/responsibility during each program.



Previous/current medical staff include WFR, EMT, Paramedic, and MPIC certification levels. GXG utilizes Remote Medical International's telemedicine service.

## Our Biggest Hurdles

- **Pre-trip disclosure-** knowledge of any skin issues and/or recent hospitalization prior to participant arrival is based on self-disclosure by parents.
- **Student disclosure-** while we strive to create an atmosphere in our program that encourages the sharing of any issues with our staff, medical or otherwise, our dependence on our participants recognizing a skin issue and telling us about it can cause a delay in treatment.
- **Social Environment-** though we try to utilize appropriate risk management procedures without fear or “scare tactics,” once we do learn about a skin issue it can be challenging to address it while maintaining a culture with the other participants that isn’t teasing or ostracizing to those affected.
- **Physical environment-** our activities are predominantly water-based in a tropical environment, therefore our living conditions and personal items are frequently damp. These conditions are also an obstacle to wound dressing/bandaging.
- **Program Size-** with up to 200 students and staff at a time spread throughout different locations, ensuring uniformity of treatment, documentation, and communication of illnesses can be challenging, as well as the management of shared program gear.
- **Diagnosis-** proper diagnosis, and therefore appropriate treatment, requires a lab culture, which requires an adequate tissue sample. Our location and services available means we can’t always ensure that this test can be done.
- **Local medical resources-** we utilize small clinics and the emergency room of a small hospital, which often lack specialists in dermatology and/or infectious diseases. Our telemedicine service has access to these specialists, but they are not able to perform the necessary lab tests. Often we have to combine these services with our own knowledge/previous experiences to request specific tests and medicines be considered.
- **Lack of definitive cause-** because we ultimately have no way of knowing what caused the infections (staph bacteria has even been found in the sand on beaches), we don’t know what to target specifically to stop it, and therefore also can’t attribute any successes to our procedures.

## What’s Next

We are continuously evaluating our procedures and looking for ways to improve. Recent initiatives include: ensuring our current cleaning procedures are implemented properly in the field, analysis of “green” alternative cleaning products, research into an industrial fogging device, post-trip medication documentation, and a more easily searchable clinic run database. While we still experience skin infections on our programs, we are not aware of any confirmed MRSA cases since 2011.

## What Happened To Us?

While we have always been aware of, and have experienced, general skin infections, in 2011 our program experienced an outbreak of MRSA. Ultimately 16 students and staff received confirmed diagnoses, whether during our program or after returning home. These infections ranged from being manageable with topical or oral antibiotics, to treatment requiring hospitalization and surgery. It is impossible to know whether patient zero came colonized with MRSA into the program, or was exposed to it during the trip. Either way, the rapid spread to other program participants and the seriousness of the illnesses was an eye-opening experience and caused widespread change in our policies and protocols.

The CDC tracks HA-MRSA. Check with your state for any infectious disease reporting requirements.

## What Did We Do About It?

Our biggest focus was, and still is, prevention. This comes in many forms, including education, personal and program hygiene expectations, and cleaning/disinfecting protocols. While ActionQuest does not have a designated program doctor, we solicited advice from several healthcare professionals during this process. The addition of Hibiclens showers and Mupirocin ointment were suggestions directly from a physician.

	Before	After
<b>Pre-trip</b>		
<b>Students</b>	Nothing	Paragraph in “final letter” email to all students and parents, reminder during program meeting with Director on first full day of trip
<b>Staff</b>	Discussion of minor rashes, basic first aid training	MRSA/staph infection, hygiene, and cleaning product training modules, first aid plus specific wound care and documentation training
<b>On Program Hygiene</b>		
<b>Supplies</b>	1 towel, regular body wash	4 towels (three fresh and one salt water managed by staff), regular body wash and one bottle Hibiclens soap, laundry bag
<b>Showering</b>	Ocean showers with 10 seconds fresh water rinse	Ocean showers with 20 seconds+ fresh water rinse, full fresh water showers, fresh water showers with Hibiclens
<b>Laundry</b>	Time permitting, optional salt water bucket with fresh water rinse	Laundry service halfway through trip, additional laundry line and clothespins provided for more efficient daily drying opportunities
<b>Linens</b>	Encouraged “taco” practice, change halfway through trip	Enforced “taco” practice, additional bottom sheets provided for common area sleeping, easier access to spares for more frequent changes if necessary
<b>Air Conditioning</b>	Use discouraged	Use encouraged in evenings and rainy nights
<b>On Program Gear</b>	Personal Flotation Devices (PFDs) provided for all participants, cleaned after season	PFDs marked and assigned to individual participants, cleaned between each trip and after season
<b>On Program Cleaning</b>	Sponges, paper towels, cleaning spray	More sponges, more paper towels, disinfecting wipes, antibacterial/antimicrobial cleaning spray, alcohol based hand sanitizer, hand soap refills more accessible
<b>On Program Medical</b>	First aid ointment (ie Neosporin)	Aquaphor and Mupirocin ointments
	Gloves accessible	100 pairs gloves per boat, with more easily accessible
	No documentation unless clinic visit required	Documentation of all basic first aid and clinic visits
	Antibiotics carried by Director	Additional backup antibiotics carried that are more effective against MRSA strains
<b>Post-trip</b>	No documentation	Preemptive communication with all parents on affected boats, data tracking in spreadsheets and Salesforce

## What You Can Do

Short term and long term

- Review/evaluate your current policies
- Share and discuss your findings with peers (including us please!)
- Educate everyone- including participants, parents, field staff, and office staff
- Track data to find patterns
- Stay up to date on infection control research
- Help prevent superbugs- use antibiotics appropriately

## Key Points

- Staph bacteria is normal, until infection occurs
- Infections have a wide range of severity
- Prevention and early recognition are important
- Lab cultures are the only conclusive diagnosis
- Treatment does not always require antibiotics
- If it does, taking the right one the right way is crucial
- Infection rates in the community are rising

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This information has not been reviewed by a doctor, and should not be used in place of a professional medical opinion.