Foot Blisters Part 1: prevention

Now that we’re getting into warmer weather, many of us are running or walking more. Indeed, as I’m typing this, the Pittsburgh Marathon is just a few days away. Which means... more blisters!

You can get blisters from chemical and thermal burns, from frostbite, from poison ivy, and on your hands from rope burns or from gardening/chopping wood. But let’s concentrate on friction blisters on the feet.

There’s a reason that newbies are called “tenderfeet” and perhaps because that’s because their feet haven’t toughened up yet. Or, maybe, it’s because they don’t know how to prevent blisters. But now we know lots about how to prevent blisters.

Those who run ultramarathons know a lot about preventing blisters; they wear inner thin five-toed liner socks inside outer socks inside running shoes that are larger than their usual size. They also sometimes grease up their feet with Vaseline or various proprietary snake oils.

If you don’t want to go to such extremes, there are other things you can do. You can wear wool socks instead of cotton socks. Cotton socks tend to hold moisture against your foot, which makes blisters more likely. Cotton, unlike wool, tends to mat down into hard plaques that rub against your foot.

Murray Hamlet, DVM, was Research Director at the Army Research Institute of Environmental Medicine in Natick, MA in the early 1990s. He was very interested in foot blisters: a big problem in basic training. He researched the available sock systems, including coarse Ragg wool socks with thin, slippery liners (what he and I learned to hike and climb in), and a variety of commercially-available socks. He and his colleagues developed a new military sock that reduced blisters significantly, based in large part on the trekking-sock design of Rohner of Switzerland. This new design featured terrycloth-type loops, like the padding inside many commercial boot socks, but unlike those socks and like the Rohner socks, on the outside of the sock. This allowed most of the movement between foot and boot to occur between this “nap” and the boot, rather than against the foot where the movement and friction heating and damage might cause blistering. Although the socks were made from a fairly fine, soft wool, the terrycloth-like loops on the outside were twisted quite tightly.

In 1992, they tested this prototype using Marine recruits at Parris Island. The new design, with an added thin, slick polyester inner liner sock, was tested against standard Marine socks (a blend of wool, cotton, nylon and Spandex), and against a standard Marine sock with the same thin liner. Recruits with the prototype and liner had a lower blister incidence than recruits with the standard sock (risk ratio=1.8, p<0.01) and recruits with the standard sock with a liner sock (risk ratio=2.0, p<0.01). Subsequent unpublished testing showed that, with the new design, a liner sock was not needed.

You can get military-style socks from military suppliers like TechSpun. You can also buy socks like SmartWools, with a terry-loop nap inside, and wear the socks inside out. However, the loops in most such socks are not twisted as tightly as those in the military “Hamlet Socks” nor in the Rohner socks (which I wear all the time) that provided inspiration for the new military sock design. It’s not a perfect substitute, but enough to help prevent blisters.

Next time: treating foot blisters
Foot Blisters Part 2

Last time, we discussed how to prevent foot blisters, including improvised military-style Hamlet socks by wearing SmartWool socks inside out.

I should add that a lot of things have been tried to prevent blisters, and most of them don’t work. For example, treating your feet with an antiperspirant didn’t help in one study,¹ and though it helped a bit in another study, it was so irritating to the feet that people quit using it.²

A patented product called Blist o Ban helps prevent blisters compared with nothing, but nobody has compared it to as-needed moleskin.³ There are Band-Aids specifically for blisters, but no research on them; I’ve tried them and then gone back to moleskin, which I can cut to whatever size and shape I want.

So what do you do if this isn’t enough?

The first thing is to recognize when you’re getting a hot spot, a proto-blister if you will. It’s usually on the heel or the toe, especially the little toe. There’s a saying in medicine that “if there are many ways to treat something, either they all work, or none of them work.” I’ve heard of many different ways to treat hot spots, from relatively-expensive Spenco Second Skin gel patches, to a bit of cheap duct tape. But the longest-lasting tradition is to use Dr. Scholl’s Moleskin, and that’s what I use. Don’t get that thick soft MoleFoam, it won’t last more than a few hours. Get the thin wool adhesive felt Moleskin. Many drugstores carry a generic version which seems to work OK. Some people like to use duct tape, though elastic athletic tape conforms better (“Kinesiology Tape,” such as Strength Tape or KT tape) but there is no evidence that they are better than the traditional moleskin.

Whether you use Second Skin, Moleskin, or tape, there are certain tricks to get it to stick. If you do it right, you can sometimes get moleskin to stick for several days.

The first trick is to make sure the area is dry, and that you’ve removed the natural oils that tend to prevent the moleskin from sticking. An alcohol prep pad followed by a rubbing with a dry sleeve or shirrtail (hey, being realistic here) seems to work pretty well.

The second trick is to apply some tincture of benzoin. If you aren’t familiar with it, think of it as rubber cement for the skin. If you put some on the hot spot, then wait for a minute for it to try to apply the moleskin, the moleskin will stick for about twice as long. I’ve tried carrying the swabs like we have in the ED, but the package tends to leak, and even if you’ve protected it inside a zipper plastic bag, the mess can be appalling. I’ve had much better luck with the crushable ampules; you can get them for ~$1 each on amazon.com in small or medium lots.

The third trick is to cut the moleskin in an oval; this prevents sharp corners that can peel up the entire bit of moleskin. A pair of Swiss Army Knife scissors does a nice job of cutting out ovals.

So much for hot spots. Next time, what to do once you have a real blister.

Foot Blisters Part 3

Last time, we discussed how to treat hotspots with moleskin.

If the blister is just starting to form, you can still put moleskin on it. The problem is that sometimes when you peel off the moleskin, you peel off the top of the blister too. Ouch.

To avoid this, first cut out an oval of moleskin slightly larger than blister. Then, cut out a second and considerably larger oval. Attach these to each other, sticky side to sticky side, then carefully stick it to the blister area. This way, there is no adhesive on the blister proper, just around it.

We know that blisters heal best if you can get the top to adhere back to the skin underneath; small blisters may heal if you treat it as above, but for larger blisters, a good way to get it to adhere is to drain it three times within the first 24 hours after it forms. A standard way to drain blisters in the field is to swab the blister and the tip of a pocket-knife blade, with an alcohol prep, and then to make a tiny pinhole right at the edge of the blister. If you have proper medical equipment at hand, Betadine and a 25 gauge needle work as well.

If the blister top has irretrievably ripped, then it’s best to get it all trimmed off. In the field, Swiss Army Knife scissors seem to be the tool of choice. In the ED, it’s a pair of forces and scissors from a suture removal kit.

The question is what to put on it after this. Antibiotic ointment doesn’t seem to make any difference.

Some people talk about injecting the blister with cyanoacrylate or tincture of benzoin. There is no evidence for this practice, and I suspect it falls within the Constitutional prohibition of cruel and unusual punishment.

Cyanoacrylate stings when you put it on, but may speed healing slightly. Cyanoacrylate is available in many forms: Krazy Glue, Super Glue, Dermabond, Indermil, or my favorite, Marathon Skin Protectant which is virtually indistinguishable from Dermabond but much cheaper, and available without a prescription, as it’s not marketed for wound repair.

Spenco Second Skin gel pads are reportedly soothing, but there are no peer-reviewed studies, and no evidence they speed healing of friction blisters. They are marketed both for hot spots and for ruptured blisters. When I tried it, Second Skin lasted just a fraction of the time a good piece of moleskin lasts. I was not impressed.

Marathon Skin Protectant is my choice for ruptured blisters in the field, covered with moleskin, with an upside-down oval of moleskin in the center as described last month. In the ED, Dermabond or Indermil will work. As the blister continues to leak, though, you may need to reapply in a day or so.

My daughter Laurel and I just spent last week hiking on the Appalachian Trail in Shenandoah National Park. We ran into more than a dozen people who were hiking the entire 2000-mile trail, from Springer Mountain in Georgia to Mount Katahdin in Maine. A pertinent observation: about half the through-hikers this year are wearing “toe-socks” with individual knitted toes. They are convinced they prevent blisters. The other half aren’t convinced and wear regular socks.

One poor woman with not-the-best footgear had a full-thickness 1x2” blister on the ball of her foot, and was laid up for a few days in Front Royal, VA. We didn’t meet her. But one of the other through-hikers, Soulful Sal (who was hiking with his brother, Hammertoe... through hikers all adopt trail names) showed me a cellphone photo of her foot. I sent my two ampules of Marathon Skin Protectant along the trail with him to help treat her foot. Hope she makes it to Mount Katahdin.