BLISTER
PREVENTION

FOOT FRICTION BLISTERS

Unpredictable
and **Inevitable**

or

Predictable
and **highly**
preventable

BLISTER
PREVENTION

Do You Want To Be Able To

Predict exactly **where** & **when** you'll get friction blisters on your feet & **why**?

Know exactly how to prevent each one so you can **100% take them out of the equation** for your next race, event, game or adventure?

Why It Matters

Too many people give in to the **perceived inevitability** of blisters, because they can't work out why the prevention they used didn't work.

So they suffer through unnecessary pain, they don't enjoy their activity as much as they should, their performance suffers, they may even turn down opportunities or pull out of events as a result of the uncertainty, and sit through unnecessary downtime waiting for their blisters to resolve. And they **give up on blister prevention.**

BLISTER
PREVENTION

Blisters are predictable and 100% preventable.

You just have to start by understanding the real cause.

Because cause informs prevention... it has to!

This is the critical piece of the puzzle that is misundersood.

BLISTER
PREVENTION

It's time to say goodbye to the **heat-moisture-friction** paradigm of blister causation

And Say Hello To The Shear Paradigm

BLISTER
PREVENTION

How Do I Know?

I get blisters very easily on my feet. Things all came to a head when I was a podiatrist with 15 years under my belt. I realised I was doing all the right things, but it wasn't helping. There was nothing in my education or experience that helped me get on top of my own foot problem, when it was literally my job to do this for other people.

It was then that I decided to knuckle down and figure this out. And I did. What I realised was we're starting with a misunderstanding of what actually causes blisters, and this is leading to the widespread recommendation and use of less-than-ideal preventions, leading to blisters in spite of them. Whilst completely missing other prevention opportunities.

This Simple Refocus Is The First Step That's Needed

I've tested this for the last 15-20 years by providing blister education, prevention and treatment at 6-day ultramarathons; and providing education and advice to people of all ages, with all sorts of foot shapes and functional peculiarities, who are involved in all types of sports and activities, from all around the world. So they can finally make sense of their blister issues and get on top of them.

BLISTER
PREVENTION

Do You Want To Be Able To

Predict exactly **where** & **when** you'll get friction blisters on your feet & **why**?

Know exactly how to prevent each one so you can **100% take them out of the equation** for your next race, event, game or adventure?

Resources

Are you getting blisters yourself? Need help?
blister-prevention.com

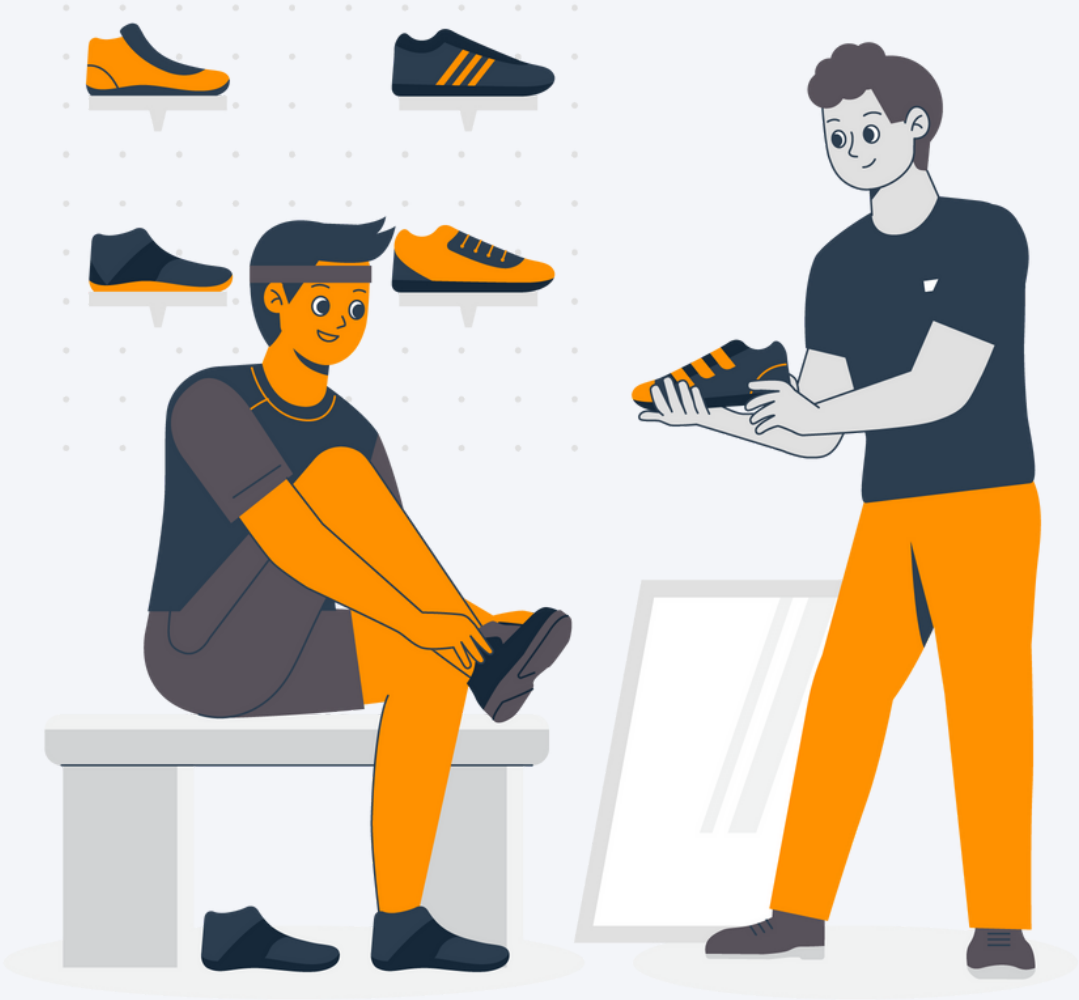
Is it your job to fix other people's foot blisters, I can help!
pro.blister-prevention.com

Contact me
blister-prevention.com/pages/contact

Or comment below.

A Message To Every Footwear Retailer

WHY YOUR CUSTOMERS BLAME YOU FOR THEIR FOOT BLISTERS



BLISTER PREVENTION

Rebecca Rushton BSc(Pod)

FOOT BLISTERS

What's the first piece of advice anyone gets when they complain of a foot blister?

"Your shoes don't fit properly. Go buy a new pair."

And they do. They buy pair, after pair, until they simply can't justify another.

As a footwear retailer, it must be just as frustrating.

Sure, you sell a few more pairs of shoes. However, you have to deal with complaints and bad reviews, both in-store and online.

But are those complaints fair?

"IT'S YOUR SHOES"

This one piece of off-the-cuff advice really annoys me. Because 99.9% of the time, albeit well-meaning, it's provided without any elaboration whatsoever. Has the advice-giver even looked at your shoes? Or your feet? Where your blister is?

Friends, teammates, coaches, the next-door neighbour... it's hard-wired in us. But is the advice helpful? Is it even true?

HERE'S WHAT I SAY

If you get this blister advice from someone, ask them: "What is it about these shoes that's causing my blisters?" Ask them to be specific. Is it because they're too:

- Big
- Small
- Narrow
- Wide
- Old
- New
- Stiff
- Flexible
- Cheap
- Expensive

Or is it the:

- Heel pitch
- Midsole
- Tread
- Stitching
- Upper material
- Lining material
- Innersole
- Laces
- Colour [okay, I'm joking]

Seriously though, without looking at your shoes or even your feet and where your blister is, how on earth can they tell you anything about your shoes that's even remotely helpful? How do you know what features to avoid when you're trying the next pair on? Who's to say the next pair you buy won't have the same problem?

I'm sure you can recognise how baseless this off-the-cuff advice is? And just how freely it's given!

The reality is, shoes (and footwear retailers) often get the blame, when they shouldn't.

AGGRO AT THE SHOE SHOP

I saw a lovely man a few years back. He'd done several big walks to raise money for charity. He had started training for his next big event and was having trouble with foot blisters all of a sudden. Two pairs of new shoes later and he was in the same predicament. He drove 7 hours to consult with me about his blisters – that's dedication!

This man bragged about how he got refunds on two pairs of shoes after heated arguments with the owner of his local shoe store – for selling him bad shoes that gave him blisters. Cringe!

SURE, BLISTERS ARE FRUSTRATING

Especially when you haven't had a big issue with them previously. And especially in spite of spending several hundred dollars on new shoes.

I had a look at his shoes (the third pair by this stage). As far as I was concerned, there was absolutely nothing wrong with the shoes. They appeared to be a good fit, were fit for purpose and weren't that dissimilar to his old ones. I implemented a very simple blister prevention strategy and on telephone follow up 4 weeks later, his training was going well and was happily blister-free.

It wasn't his shoes that were the problem!

> *It wasn't his shoes that were the problem!*

BLISTER PREVENTION

SURE, SOME SHOES MIGHT CAUSE A PERSON TO GET BLISTERS

- Fault: A tiny fraction of the shoes you sell might be faulty, but it would be a very very tiny percentage.

- Poor choice: A poor choice may have been made by your customer that resulted in a less than optimal fit. We all know that rather than prioritising comfort, your customers often prioritise price, colour, appearance, the recommendation of a friend or a flashy online article.

YOU'RE DOING YOUR BEST

You and I both know, it's highly unlikely any reputable footwear retailer like yourself would recommend a shoe that wasn't a great fit. You'd rather not make the sale. It's not in your best interest.

However:

- You're hardly going to refuse a customer if they insist on the 9s when clearly the 10s are a better fit.
- You're not going to refuse your customer if they want shoe X because it comes in red, even though it's not quite fit for purpose or it's a narrower fit than they really need.

Ultimately, it's your customer's decision.

> *But it puts you in an awkward position if all of a sudden, they start getting blisters.*

YOU CAN GET BLISTERS EVEN WITH OPTIMAL FIT

As a podiatrist, it's fair to say I know a bit about feet and shoes and how shoes should fit feet. But no matter what shoes I get, and I'm talking about running, walking, athletic, hiking, casual and dress shoes, I will get blisters at the back of my heel when I walk. And at the edge of my big toe knuckle when I play hockey.

BLISTERS AREN'T INEVITABLE IF YOU CAN'T GET OPTIMAL FIT

Some people will never achieve perfect shoe fit. No one with a bunion or hammertoe or Haglund's deformity ever will - no last replicates these shapes. Sure, you can get shoes that are extra depth and width, but none of them provide perfect fit for deformity. Nevertheless, this does NOT mean they are destined to suffer from blisters.

SHOE FIT IS IMPORTANT, BUT IT'S NOT EVERYTHING

If your customer is serious about preventing blisters, they need to leave no stone unturned in their efforts to get the best fit possible. **This is where they need your expertise.**

But if you have a customer who is at their wits end with blisters, in spite of your best efforts with footwear selection, help them understand there's more to blister causes and prevention than meets the eye.

WHAT'S NEXT?

To find out what really causes blisters (it's not always just about shoes) and where the opportunities for successful prevention are, tune in to watch **How To Help More With The Most Common Injury In Sport,** with podiatrist, Rebecca Rushton.

WATCH NOW

bit.ly/blistermc

BLISTER PREVENTION

We All Have A Part To Play In Helping Our Customers Overcome Their Foot Blister Issues

LEARN MORE IN THE **FREE** BLISTER PREVENTION COURSE

"I'm 100% confident this video will change the way you think about, and talk to your customers about, foot blisters. "

~ Rebecca

Register Now

Register now to watch the Blister Prevention video

WATCH NOW

bit.ly/blistermc

BLISTER PREVENTION

TAPING FOR BLISTER PREVENTION DOESN'T WORK

(AT LEAST NOT HOW YOU THINK IT DOES)

Discover why most podiatrists, athletic trainers, and sports medicine practitioners have got it wrong and what you can do to actually help!

Written by
Rebecca Rushton BSc(Pod)

BLISTER PREVENTION

Introduction

The use of adhesive tape on the feet to prevent blisters is an extremely common intervention used by clinicians and individuals alike (1–5). Considering its widespread use, we actually know very little about taping as a blister prevention strategy.

Go to any podiatrist with blister issues and you'll be getting your feet taped. And we'll show you how to do it yourself. I'm no different. It's hard-wired in us! It makes logical sense. It stops the rubbing.

My Blister Situation

So, in 2008, when my heels would blister on my 30-minute morning walks, and taping wasn't stopping this from happening, I was confused. There's absolutely nothing rubbing my skin because the tape was covering it. So why was I still getting blisters?

Was it a problem of my taping technique? I didn't think so. With 15 years experience under my belt as a podiatrist, I was pretty confident I was taping as good as anyone. And it was 100% intact at the end of my walks, so it's not like it had given way and exposed an area of my skin.

Was it a problem of the wrong type of tape? There are a plethora on the market. I was using Elastoplast rigid strapping tape, or Fixomull Stretch, or both, sometimes with a bandaid or Compeed underneath the tape as well, depending on the state of my blister. Yet my heels remained in a perpetual state of blister recovery.

Which tape works best?
It's an obvious question.
The truth is, we don't know.

- Paper tape / Micropore
- Fixomull (CoverRoll) Stretch
- Hypafix
- Elastoplast Rigid Strapping Tape
- Leukotape P
- Leukotape K
- Leukotape Classic
- Strappal
- Tensoplast
- Athletic Tape
- RockTape / RockTape H2O
- KinesioTex / KT Tape
- StrengthTape
- Elastikon
- Moleskin

Research On The Effectiveness Of Blister Prevention Taping

This will be quick, I assure you!

Brennan and Richie have stated that the scientific evidence behind the use of adhesive tape for blister prevention is lacking (6,7).

Since then, Lipman et al published two prospective randomized comparative studies on the use of 3M Micropore paper tape (also known as surgical tape) to prevent blisters in ultramarathon runners (4,5). Subjects were competitors of Racing the Planet 250km, 7-day self-supported ultramarathons were the subjects. Both studies used the same outcome measure: if the first blister developed on an untaped area, the intervention was deemed successful; if the first blister developed underneath a taped area, the intervention was deemed unsuccessful.

Results

- The first study (136 subjects) found the paper tape did not prevent blisters
- The second study (128 subjects) found it did prevent blisters

The main differences between each study was:

- **The first study compared one taped foot to the other untaped foot**
  - Paper tape was applied to “the majority of common blister sites” on one randomly selected foot, with the untreated foot acting as the control. Ninety subjects finished the study. All participants developed blisters. No protective effect with paper tape was demonstrated. In fact, blister incidence was higher on the experimental foot, with 47 runners (52%) sustaining blisters on the taped foot versus 35 runners (38%) sustaining blisters on the control foot. Eight participants sustained blisters on both feet.

- **The second study compared taped areas of one foot to untaped areas of the same foot**
  - Paper tape was applied to a randomly selected foot, either to participants’ blister-prone areas, or to one randomly selected location if there was no blister history. This time, the un-taped areas of the same foot served as the control, not the contralateral foot. Eighty three percent of participants developed blisters. Of the 109 participants completing the study, 8 participants sustained blisters on taped areas, 74 participants sustained blisters on un-taped areas and 7 participants remained blister-free. These results demonstrated paper tape was effective in reducing blister incidence when applied to areas of the foot deemed blister prone by the participant.

The limitations of both studies included:

- No blinding
- Unable to rule out the intervention being used inappropriately
- Inability to rule out additional strategies being used in conjunction with the intervention tape
- Data collection by questionnaire

One discussion item mentioned in both papers was that of the tape’s low adhesion. It was seen as:

- A benefit in one way – in that if a blister formed underneath the tape, then removing the tape was unlikely to tear the blister roof.
- A limitation in another way – in that it was not uncommon that the tape came off prematurely, particularly in wet conditions.

What Does This All Mean?

The Lipman et al research represents one of the few randomized prospective studies showing the preventive effects of a single intervention to prevent blisters (4,5).

Obviously more is needed to:

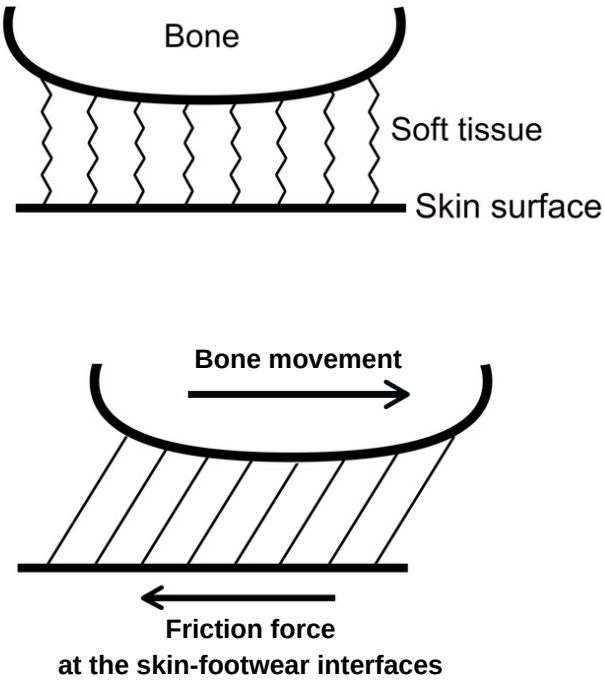
- Corroborate the results for paper tape (does it help or doesn't it)?
- Test other types of tape used in blister prevention that vary in flexibility, thickness, material composition.
- Determine if taping technique has any effect on outcomes
- Determine whether there are anatomical locations where taping is more likely to be successful than other locations.

How Does Taping Prevent Blisters?

If blisters are caused by heat, moisture and friction, then, intuitively, taping prevents the friction component. It stops anything from rubbing the skin.

The problem is, blisters aren't caused by heat moisture and friction. And "rubbing" is the wrong definition of friction to be using.

Blisters are an intraepidermal tear caused by repetitive shear distortion (7–17). Friction is involved, but it's the more scientific definition of friction we should be using when discussing friction blister causation – the force that resists the movement of one surface over another (18–22). This is an error made not just by the lay population - it's not uncommon in academic literature (5,23,24).



Without going into too much detail, you don't need anything to rub across the skin for blisters to form. In fact, the opposite is true. How do you think lubricants work? They encourage rubbing, only it's a low friction rub. But that discussion is for another day.

JUST TO REPEAT THIS IMPORTANT FACT:

Blisters are an intraepidermal tear caused by repetitive shear distortion.

They're not a superficial-to-deep wear injury caused by rubbing, and they're not a burn caused by the heat generated from rubbing (8–12,26–28).

We've known all of this definitively since 1973 when Stanley Comaish published his investigation into blister causation for the British military in The Lancet (8).

It's just that, the facts have been lost in translation over the years thanks to the contradictory double meaning of friction.

So, if tape doesn't prevent blisters by stopping rubbing, how does it work? Because although taping didn't 100% stop my blisters, it did help to some degree.

If Not Rubbing, Then What?

Once I got my head around the fact that blisters aren't caused by rubbing, and that this could not be how taping worked as a blister prevention strategy, my focus shifted to the coefficient of friction (COF).

Remember that scientific meaning of friction – the resistance to movement between two surfaces. I assumed tape must make it more slippery, like Vaseline does (29), except probably not as markedly as Vaseline does, obviously.

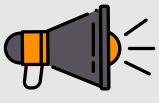
It turns out, this is unlikely, but we don't have enough information to be sure.

Unfortunately, friction data of tapes used in blister management is lacking. A 1995 friction blister literature review by Knapik et al (11) discussed the assumed friction reducing effects of tapes, moleskin and certain dressings for preventing foot blisters. However, there is question regarding how effectively some of these materials reduce friction (2,30). Moleskin is made from a cotton fabric and many tapes are made from cotton including RockTape®, KT Tape® and some athletic tapes (30–33). Cotton is known for poor moisture management capabilities (34,35) and moisture is known to increase COF (10,16,44–46,36–43). A wet cotton tape adhered to the foot and interfacing with a damp sock does not strike me as favourable for a low-friction environment.

The following year, Polliack and Scheinberg published some friction data for blister dressings, and moleskin (47).

Product	*Manufacturer*	*Average CoF*†	*Difference, %*	*Thickness, mm*	*No. of tests*
Bursatek bandage	Advanced Wound Systems, Newport, OR	0.57	—	6	3
Dr Scholl's Moleskin Plus	Schering-Plough Crop, Kenilworth, NJ	0.69	+21	31	3
Moleskin	PPR Inc, Brooklyn, NY	0.94	+64	26	3
Band-Aid	Johnson & Johnson, New Brunswick, NJ	1.01	+77	22	3
Band-Aid Plastic	Johnson & Johnson	1.03	+80	18	3
2nd Skin Blister Pads	Spenco Medical Corp, Waco, TX	1.04	+82	35	3
New-Skin	Medtech, Jackson, WY	1.05	+84	9	4
Nexcare Comfort	3M Health Care, St Paul, MN	1.08	+89	35	3
Dr Scholl's Blister Treatment	Schering-Plough Corp	1.20	+110	32	3
Blister Block (Compeed)	Johnson & Johnson	1.37	+139	40	3
Tegaderm	3M Health Care	1.54	+169	1.5	3

†CoF indicates coefficient of friction/ 237-g normal applied load to end probe.
‡Compared with the Bursatek device.

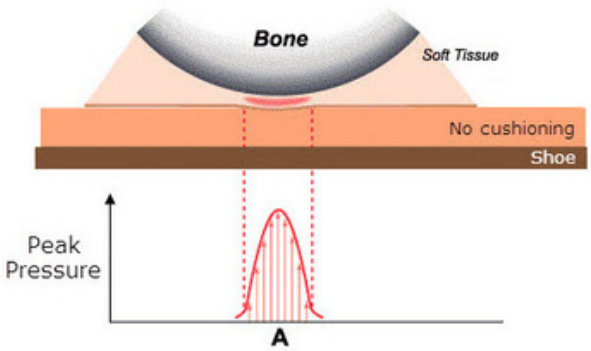


The frictional properties of tapes are not even available from tape manufacturers. To be fair though, none of the tapes I've mentioned at the start of this article are made specifically for blister prevention, except moleskin. Musculoskeletal injuries are their primary use. This represents a huge area for improving our understanding of how blister taping works. And provide some guidance on which tapes might work better than others by way of reducing friction levels.

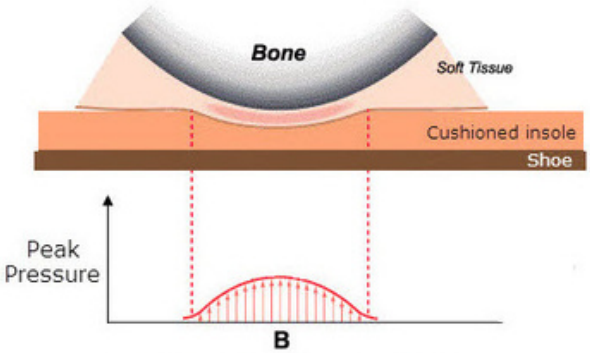
An Alternative Mechanism: Shear Load Spreading

Back in 2013, Marty Carlson, CPO, of Tamarack Habilitation Technologies Inc. and I were discussing blister prevention and he mentioned “shear load spreading” as a potential mechanism of action for tape (48). The concept assumes that by adhering a material to an area of skin larger than the bony prominence or blister site itself (which we clearly do when we tape), shear gradients are reduced as the shear load is spread over a wider area. Theoretically, a rigid tape would perform this function more effectively compared to a flexible tape (2). It is worth noting that paper tape used in the two Lipman et al studies of 2014 (4) and 2016 (5) is non-elastic and would therefore be considered a rigid tape.

So, just as cushioning spreads the vertical load (normal force) over a larger area to reduce peak pressure per unit area (14) as pictured below, because tape is adhered to the skin, it likely spreads the horizontal load (friction force) over a larger area to reduce peak shear distortion per unit area. I’m sure you’ll recognise, for example, that a cushioned insole reduces plantar pressure a little, not by a lot. Similarly, we could expect taping to reduce the horizontal load by a little, not a lot.



No cushioning causes high peak pressure



A cushioned insole spreads the load over a larger area resulting in a lower pressure peak

An Alternative Mechanism: Shear Load Spreading

It must be said, to date, no research and very little commentary exists of this ‘shear load spreading’ mechanism of blister prevention. Hoffman mentioned it briefly in his 2016 (3) blister management review and I discuss it in 2103 (48), 2019 (2) and 2020 (30). A similar shear load spreading effect with a thickened stratum corneum has been described by Sanders et al in 1995 (49). The authors state: “The thickened stratum corneum means that there is a greater volume through which to distribute the shear load between the skin surface and immediately above the basement membrane. With a greater volume of stratum corneum, shear stress gradients are lower; thus, the skin is at lower risk of failure.”

Most of us recognise that a callous far from guarantees blister prevention. In fact, a callous is a good indicator that a blister will occur if activity levels increase suddenly (3,50). Considerable shear deformation occurs within the stratum spinosum in spite of an overlying callous. Similarly, significant shear occurs in spite of taping, but we can expect the peak to be somewhat reduced.

My heels

This puts into context how my heels would still blister even though they were taped. Taping will reduce peak shear load a little, but a significant amount of shear is still happening under there. For my skin which is relatively blister-prone, it wasn’t enough – the reduction didn’t come in under my blister-causing threshold. But for others not so blister prone, the small reduction in peak shear is enough to come in under their blister-producing threshold and therefore taping it is an effective strategy for them.

Wrapping Up

Taping is arguably the most common blister prevention strategy out there. Yet very little is known about its mechanism of action.

Here's what we do know:

- It doesn't prevent blisters by stopping things from rubbing the skin.
- It probably doesn't prevent blisters by reducing friction levels (COF).
- It more than likely reduces peak shear to a small degree by spreading it over a larger area.
- That small reduction will be enough to help some people, but not everyone. Some of us will blister even with taping in place.

Conclusion

Clearly, we have a little more work to do in understanding how preventive blister taping works, how it doesn't work, which tape is best in which conditions, which foot regions respond more favourably to taping, and specifics about material composition and application technique. For a modality that is arguably the most common blister prevention used, it's odd that we know so little about it.

It is important we set realistic expectations for ourselves, our patients and our athletes, around taping. And consider additional or alternative strategies based on their mechanism of action.

Help Your Patients More With The Most Common Foot Injury In Sport

GRAB SOME FREE CPD

Watch the video + download the patient handout + save your CPD certificate

Your patients will thank you for it!

BLISTER PREVENTION

In The Free Course, You'll Discover:

1) The real reason you're not already helping your patients with their blisters
You're focusing on the wrong cause of blisters. This misinformation is widespread in the lay and academic literature. I'll show you why and how to get past it.

2) Why your patients are stuck in the impossible relentless pursuit of trying to keep their feet cool and dry when they exercise
The heat-moisture-friction paradigm of blister causation has been over-simplified, to the point of being incorrect. I'll show you why that's a problem.

3) Why taping is less useful than you think
I'll show you where our fixation with taping comes from, and explain the evidence for how it doesn't work, how it might work and how it probably works, based on the evidence.

4) The prevention framework I use with every single blister
This framework will help you provide an informed prevention strategy for every blister, for every client, no matter what their active pursuit.

5) How easy blister prevention and treatment can be
I can get runners back on the race track, running pain-free, with weightbearing blisters. I've also helped athletes over email and Facebook Messenger to implement nothing but a single layer of prevention to their blister treatment to double/triple their sporting output, pain-free, in spite of unhealed weightbearing blisters. It's often THAT easy!

6) Why you don't need to be anyone special to manage blisters better
You just need to be someone who cares enough to look at blisters from a different angle.

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BLISTER PREVENTION

WHAT SPORTS MEDICINE PROFESSIONALS ARE SAYING ABOUT BLISTER PREVENTION

Congratulations on putting together a fantastic resource which is easy to navigate and offers the most comprehensive educational tool about friction lesions I have ever seen.

~ Doug Richie, DPM

I highly recommend this course for all podiatrists, especially those working with the active or athletic population. Blister management is an important skill to bring to the sports medicine team, and it's a skill that podiatrists are perfectly positioned to deliver. Effectively managing blisters can make a significant impact on the overall health and performance of athletes across a range of sports. This is the ultimate course you need to give you those skills.

~ Kent Sweeting (Sports Podiatrist) Performance Podiatry & Queensland Orthotic Lab

This is truly a thorough and complete resource on everything blisters, offering practical treatment solutions and careful explanations supported with scientific reference. The course content is clear and well guided. For any Podiatrist working with athletes and those active, the skills and additional resources this course provides are a welcomed and valuable addition.

~ Darryn Sargant (Sports Podiatrist) PEAK Podiatry

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BLISTER PREVENTION

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BLISTER TREATMENT
BLUEPRINT

The 5-Step System For Treating Foot Blisters

Insights For Podiatrists, Athletic Trainers, Wilderness Medics, Race Medics and Other Sports Medicine Professionals

Rebecca Rushton BSc(Pod)

BLISTER PREVENTION

This guide is intended as a refresher for sports medicine practitioners charged with helping people with blister management.

The Challenge

At ultramarathon events, I see the worst blisters that need the best treatment to keep the athlete running. The challenge is even more intense in remote and wilderness settings, where:

- gear is limited
- advanced medical support is not available
- you don't have access to the patient at all times
- where the patient can't simply pull out of the event, jump in their car and drive home to nurse their own injuries.

I'm sure you've seen some nasty foot blisters in your time, too. I know it can be a bit confronting. And a bit overwhelming, trying to figure out the best course of treatment to keep this athlete on their feet.

Thankfully, no matter how bad the blister is, choosing the correct treatment is actually quite easy. There are 5 simple steps to follow:

The 5 Step System

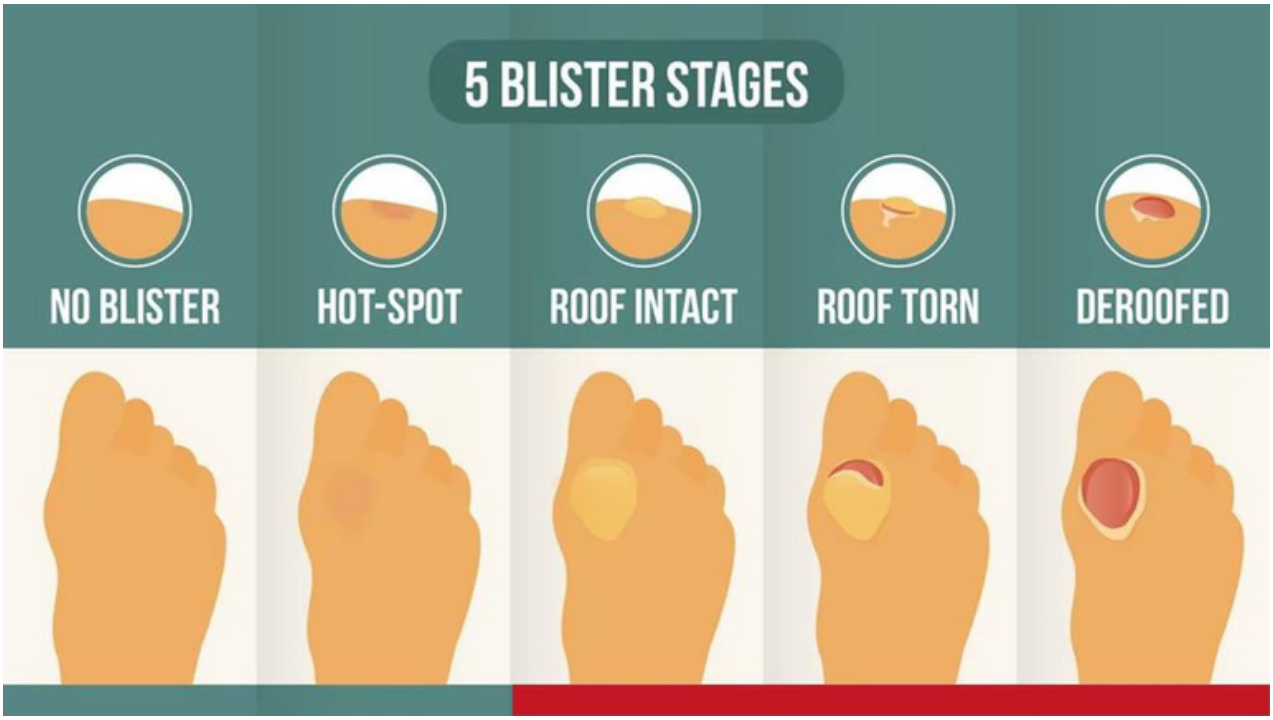
STEP 1: Identify Your Blister Stage
STEP 2: Apply An Antiseptic
STEP 3: Choose The Right Dressing
STEP 4: Change Your Dressings At The Right Time
STEP 5: Monitor Regularly For Infection

STEP 1: Identify Your Blister Stage

The 3 Stages Of Blisters

ALWAYS start with looking at the **integrity of the blister roof.**
Is it:

1. Intact
2. Torn
3. Deroofed



If you start here by identifying the integrity of the skin of the blister roof, you can be confident you'll be making the right choices in steps 2-5 of the treatment process and providing the very best first aid for every blister.

STEP 2: Apply An Antiseptic

If your blister is torn or deroofed, you will need to apply an antiseptic to prevent infection?

(This step is unnecessary for intact blisters as the intact skin will keep germs out.)

Povidone iodine (eg: Betadine) is the most popular antiseptic. Or if you're in the USA, you can use an antibiotic ointment like Neosporin (in Australia, we need a doctors prescription for topical antibiotics).

I prefer a liquid antiseptic because it can soak into all the nooks and crannies, rather than just sit on the surface like an ointment. I recommend either:

- Single use swabs - they're light, low bulk and single use, great for when you're providing the blister care.
- The 15ml bottle with built-in eye-dropper - great for people providing their own blister care.

Of course, if you don't have access to either an antiseptic or topical antibiotic, at least rinse your blister with saline (salty water) or clean running water. In fact, this should be the very first thing you do if your blister and the surrounding skin is dirty.

STEP 3: Choose The Right Dressing

Here's the formula for dressing-choice based on the blister roof:

- Intact blister - Island dressing
- Torn blister - Island dressing
- Deroofed blister - Hydrocolloid blister plaster

Island dressings

You'll be familiar with island dressings. They're any dressing where there's an absorbent, non-stick pad in the middle, surrounded by tape on all sides to keep dirt and grime out.

When applying, just make sure the island is big enough so there's no tape on the blister roof. Otherwise, the risk is you'll tear the blister roof when you remove the dressing.

Hydrocolloid blister plasters

Hydrocolloids are for deroofed blisters only - deroofed blisters that are still weeping. They are adhesive, waterproof dressings that are designed to have full contact with a wound and to stay on for a few days at a time. The weepiness from the blister base combines with the hydrocolloid particles of the plaster to provide an optimal healing environment.

I've been to events where the race medic wants hydrocolloids banned. The reason is, they are often used incorrectly, resulting in a more difficult blister to treat. I can't overstate the importance of the following three points enough:

- Don't use them as a prevention strategy
- Don't use them on an intact or torn blister
- Always apply fixation tape around the periphery

STEP 4: Change Your Dressing At The Right Time

ISLAND DRESSINGS

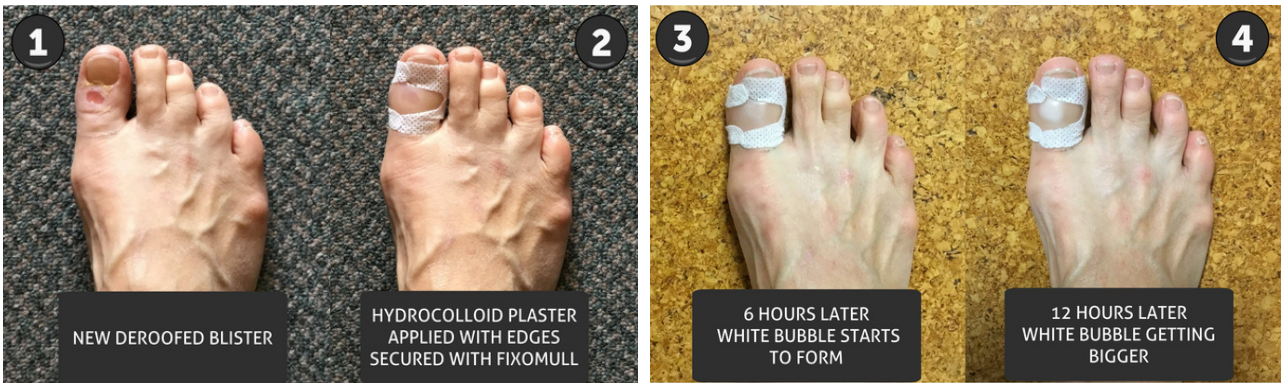
I prefer to use basic island dressings that are not waterproof. The reason is, they tend not to stick as well and when they loosen, dirt can get in under the dressing. Plus, people tend to put the occlusive waterproof ones on and leave them on too long. The result is the skin macerates, making everything worse. Leave waterproof island dressings for really high risk situations and make sure they're being inspected and changed frequently.

Island dressings need to be changed when you see strike-through. Strike-through is when the island is visibly soiled with blister fluids, blood or water from the environment (eg: showering, rain, puddles). Once strike-through occurs, it provides an easy path for bacteria to pass through the dressing and into your blister to cause infection. Depending on many factors, you may need to change your dressing anywhere between every hour to once a day.

STEP 4: Change Your Dressing At The Right Time (cont)

HYDROCOLLOID BLISTER PLASTERS

Hydrocolloid blister plasters are waterproof. They only need to be changed when the white bubble reaches the edge of your plaster. Here's a visual example of the white hydrocolloid bubble forming.



At that point, the seal is broken and germs have an entry point under the plaster and into the blister. Depending on how weepy the blister base is, this could take anywhere from a few hours to 5 days. It's perfectly fine to leave a hydrocolloid on for up to a week.

If, however, the blister is very weepy and requires dressing changes any more frequently than 24 hourly, use island dressings instead. Change them frequently, when strike-through occurs. When the weepiness reduces, then switch to a hydrocolloid. Otherwise you're just wasting these premium plasters.

STEP 5: Monitor Regularly For Infection

It can take a few days to over a week for initial healing to occur. At this point, the skin is intact, albeit rather tender skin, but it is no longer weepy. This is the point when infection is no longer a risk (assuming a blister doesn't reform: *hint, prevention is necessary*).

Until then, it can get infected. So at every dressing change, be sure to take a good look at your blister and the surrounding skin for signs of infection.

Signs of blister infection include:

- Pus – the blister fluid will be more yellow and stringy (see image below). Normal blister fluid is clear and thin.
- Increased pain, swelling, redness or warmth.
- Red streaks extending from the blister (medical urgency required)

OK, Let's Look At The 3 Blister Stages And Discuss Their Treatment

- Intact
- Torn
- Deroofed






• INTACT BLISTER ROOF

A blister will start off with its roof intact. How long it remains intact is subject to many variables. On the bright side, the best thing about an intact blister roof - if there is a good thing about a blister - is it can't get infected if it stays like this. Because the roof is intact, and that skin is keeping the blister fluid in AND keeping germs out. So protecting the blister roof is our main concern right now.

- Island dressing
- Monitor for changes

All in all, the aim of treating this blister is to protect the roof.

• TORN BLISTER ROOF

What happens if you <u>don't</u> **protect your intact blister roof?**

Ideally, keep the torn blister roof in place - it provides some protection to the raw blister base.

It will tear. And that's when the alarm bells should start ringing, because as soon as it tears, it's open to infection. Remember, the in-shoe environment is a dirty environment at the best of times. There are germs lurking around on the skin just waiting for an opportunity to strike. As a result, an antiseptic is required to prevent infection. Plus, as the hours and days pass, remember to monitor for signs of infection. Just because it's not infected now doesn't mean it won't be infected in 2 hours or 2 days time.

- Antiseptic
- Island dressing
- Change before **strike-through**
  - If in doubt, 1-2 times per day
- Monitor for infection

Dressing **strike-through** is the saturation and leaking of wound fluids through a non-waterproof dressing. It is often due to leaving the dressing on for too long and can cause a number of complications including an increased risk of cross-infection and maceration of the surrounding skin.

All in all, the aim of treating this blister is to <u>prevent infection</u>.

• DEROOFED BLISTER

What happens if you <u>don't</u> **protect your torn blister roof?**

A deroofed blister is more painful, more open to infection and takes longer to heal.

The blister roof will rub right off to reveal the raw weepy blister base. A deroofed blister is more painful, more open to infection and takes longer to heal, especially if you let it scab. However, to facilitate healing, we do have an opportunity to step this up a notch with a hydrocolloid blister plaster. Hydrocolloids provide an optimally moist wound environment to allow strong, flexible, resilient skin to grow back over that raw blister base. Plus they're waterproof and can be left on for several days at a time (depending on how weepy it is).

- Antiseptic
- Hydrocolloid blister plaster
- Change when white bubble reaches edge of plaster
- Monitor for infection

All in all, the aim of treating this blister is to get good skin healing.

Well Done!

You've successfully implemented exceptional foot blister first aid. By following this 5-step system, you can be confident you're helping to make foot blisters better (not worse).

Wrapping Up: The 5 Step System

STEP 1: Identify Your Blister Stage
STEP 2: Apply An Antiseptic
STEP 3: Choose The Right Dressing
STEP 4: Change Your Dressings At The Right Time
STEP 5: Monitor Regularly For Infection

What's Next?

That depends on whether you want to provide meaningful pain-relief as your patient pulls their shoes back on, returns to their feet and gets back out on the track.

If you want to provide that kind of relief, you're going to have to stop the blister-causing forces. That means implementing some layers of prevention.

Blister Treatment = First Aid + Blister Prevention

Following is a real-life example of how much difference this makes to an ultrarunner...

Treatment + Prevention

I met Matt at a 48 hour ultramarathon in Adelaide Australia in 2014. He was on the verge of pulling out of the race with a couple of extremely painful blisters under the ball of his foot.

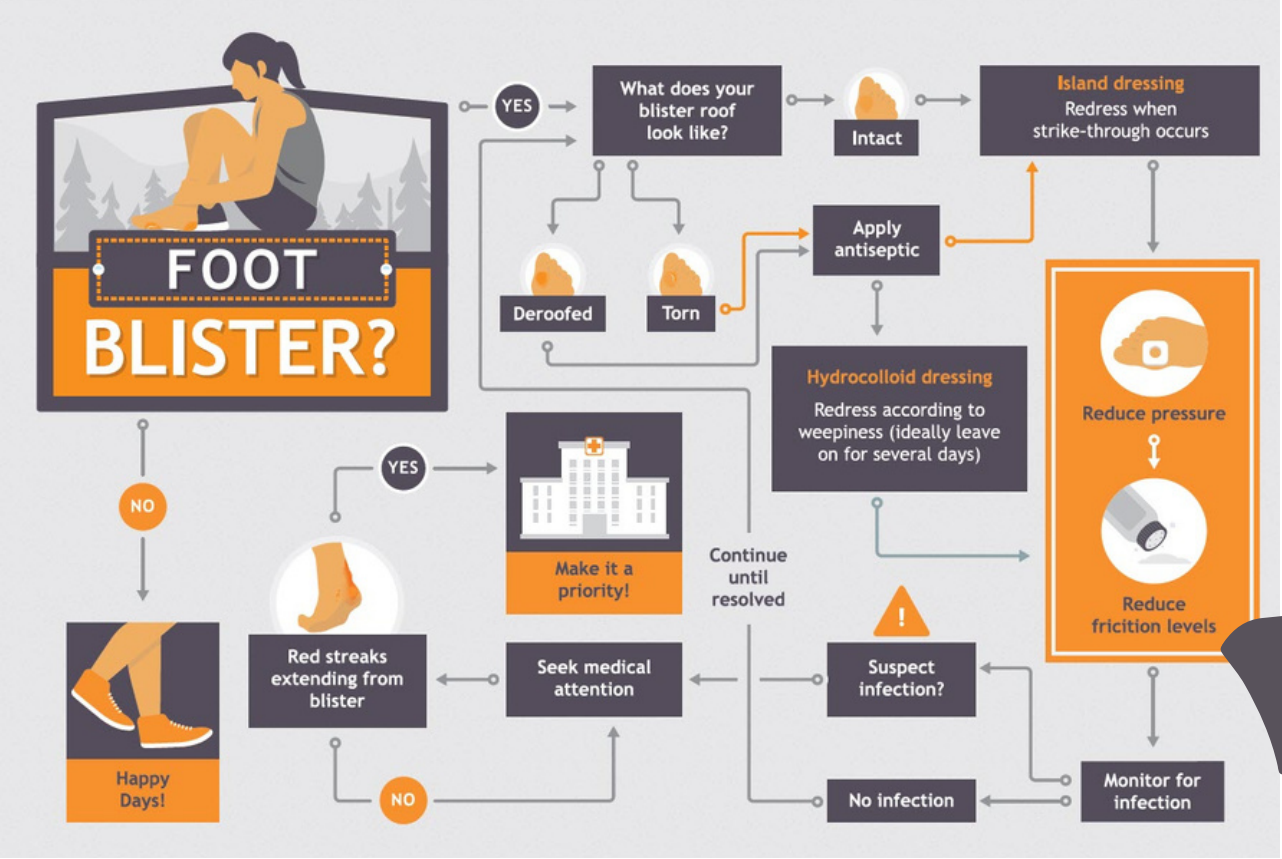
After enduring a scorching bitumen surface for 135km, I had developed 2 x 20c coin-sized blisters under the forefoot of my right foot. After all the various, typical 'blister remedies' suggested by the collective experience on the track, it become such an issue I could not even stand on it, let alone move. My race was done! Next morning after throwing in the towel, I was convinced by another runner to go see Rebecca at 8am. Certain that it wouldn't make any difference, I hobbled my way over to her tent to present my dilemma.

At 8:10am, Rebecca had finished with my foot. I stood, and could noticeably tell the difference immediately. I could walk! I decided to shuffle around for one lap to test it out. By the back straight I was unable to feel any discomfort in the area and had returned to a full run.

Without Rebecca's treatment, my race was over. In the final 3.5hrs of the race, I was able to put on another 34km to the tally due the treatment.

This type of effect only ever comes when you incorporate "prevention" techniques into your "treatment".

Combining the treatment system you've just learned with prevention techniques



How To Take The Pain Away And Heal Faster

You now know how to do everything in this graphic... **except for what's in the orange box** on the right. These are the important methods and products of blister **prevention**. They're the things that took Matt's pain away so he could run another 34kms pain-free.

Add these to your treatment to take the pain away and help heal your blisters faster, even with continued weightbearing activity!

BLISTER TREATMENT
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Grab some FREE CPD and ...

Help Your Patients More With The Most Common Foot Injury In Sport

Watch the video + download the patient handout + save your CPD certificate

In this course, you will discover...

1) The real reason you're not already helping your patients with their blisters
You're focusing on the wrong cause of blisters. This misinformation is widespread in the lay and academic literature. I'll show you why and how to get past it.

2) Why your patients are stuck in the impossible relentless pursuit of trying to keep their feet cool and dry when they exercise
The heat-moisture-friction paradigm of blister causation has been over-simplified, to the point of being incorrect. I'll show you why that's a problem.

3) Why taping is less useful than you think
I'll show you where our fixation with taping comes from, and explain the evidence for how it doesn't work, how it might work and how it probably works, based on the evidence.

4) The prevention framework I use with every single blister
This framework will help you provide an informed prevention strategy for every blister, for every client, no matter what their active pursuit.

5) How easy blister prevention and treatment can be
I can get runners back on the race track, running pain-free, with weightbearing blisters. I've also helped athletes over email and Facebook Messenger to implement nothing but a single layer of prevention to their blister treatment to double/triple their sporting output, pain-free, in spite of unhealed weightbearing blisters. It's often THAT easy!

6) Why you don't need to be anyone special to manage blisters better
You just need to be someone who cares enough to look at blisters from a different angle.

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BLISTER
PREVENTION