

## **The Ultramarathon Runner's Medical Kit**

Volker Scheer, MD

Trail and ultramarathon running has gained popularity in recent years with an almost fivefold increase in ultramarathon participation in the past decade.<sup>1</sup> This has consequently led to an increase in medical problems, injuries and even fatalities. Older athletes and athletes with pre-existing medical conditions are now participating regularly in these events. Many races take place in remote and challenging environments with their own unique risks.<sup>2,3</sup> Therefore it is important for athletes to be aware of and be self-sufficient and prepared for medical problems either in training or competition. Runners should be knowledgeable about preventing minor medical conditions and treating them and carry their own medical kit.

This document will give some general advice on how to prepare and cater for minor medical issues, what things to consider carrying in the medical kit and also some advice about pre-trip planning. Some medications and dosages may differ from country to country and need to be reviewed accordingly to local guidance or by asking your physician. If in doubt, or if there are any pre-existing medical conditions, allergies, etc., this should be further discussed with your health care provider and additional guidance sought.

The medical kit needs to contain all important devices or medication for treating common medical problems, but should not be too bulky or heavy to impair athletic performance. This may need to be adapted to the different needs during training and competition.

### **Type of race and training**

When planning for a race it is important to take several general measures into consideration. For example, is the race fully-supported or semi-supported or non-supported? A fully supported race tends to have more comprehensive medical cover and resources than a non-supported race. Some races will have mandatory items to be carried in the personal medical kit, so it is important to be aware of them prior to the race and purchase them if required. It is also important to plan and know the race and the environment where it takes place. Races in the heat, desert or jungle will place different demands on the body than races in cold environments or in altitude. When running at altitude, prior acclimatisation is key in reducing the risk of acute mountain sickness, but if symptoms arise a descent to lower levels is important.<sup>3</sup> Sometimes acetazolamide (Diamox) is used for prevention of altitude sickness, however this is a banned substance (WADA) and should not be used.<sup>4</sup> The same principle applies for training runs, especially for longer ones, where a medical kit should be carried and adapted to its needs.

### **Pre-trip planning**

Things to consider when planning for a race especially when travelling abroad are: having medical insurance (especially with coverage for rescue from remote environments and repatriation), being up to date with vaccinations and carrying emergency contact details and mobile phones and phone numbers. If travels are going to a more exotic location, there may

be a need for antimalarial prophylaxis or more specific vaccinations. Ideally, undergoing a pre-participation screening by a sports physician can help minimize risks and provide the opportunity to speak about specific medical risks with an expert. It may be helpful to write emergency contact details on the back of the race number alongside pre-existing medical conditions, medications and allergies. Carrying a wristband with this information may also be helpful. For any pre-existing medical conditions, sufficient medication should be carried in your medical kit, especially asthma, heart or diabetes medication. Depending where the race takes place, this may be challenging as many of the medications should be stored in a specific temperature range and may not retain effectiveness if stored outside this range - for more specific information one should seek advice from the manufacture or a sports physician.

### **Minor medical problems**

Most commonly the athlete will encounter minor medical problems that can be treated with little medical knowledge and equipment. This can make the difference between finishing a race or having to withdrawal. It can also have an impact on athletic performance.

### **Blisters**

The most common medical problems are blisters affecting up to 76% of runners and in some instances even more.<sup>5-8</sup> It is an important reason for poor performance and one of the commonest reasons for race withdrawal.<sup>9</sup> If you know that you are likely to suffer from blisters, prevention is always best. There are many different ways to try to prevent blisters and different methods will work for different people - so far there is no conclusive scientific evidence which methods work best.<sup>6</sup> Some measures include preventative taping, different type of socks and different fabrics, antiperspirants, lubricants, wearing comfortable shoes, avoiding excessive training loads, not carrying heavy back packs, and getting your nutrition right.<sup>10</sup> However, there are many individual factors that may make it challenging to prevent them completely. If blisters occur, they are best treated by piercing the blister with a sterile needle on the periphery, leaving the blister roof intact and draining the fluid. Sometimes multiple holes are needed to drain the blister completely. Tape should then be applied to cover the area to allow further competition.<sup>6,8,11</sup>

### **Dermatological issues**

Other dermatologic problems include subungual hematomas, which are basically caused by small repetitive trauma to the nail, mostly from tight fitting shoes that leads to a fluid or blood collection under the nail that can be extremely painful. Piercing a hole into the nail with a needle and draining the fluid can treat this. This procedure usually reliefs the pain instantly and if done correctly, is painless in itself.<sup>2,5</sup>

Chafing is another frequently encountered problem from runners that is usually due to repetitive friction from textiles against skin and can be prevented or treated with lubrication, tape or moisturizer such as Vaseline.<sup>2,5</sup>

If running in the sun, be aware of the risk of sunburn and use sunscreen for protection or use appropriate clothing. There are some reports that runners have a greater risk of skin cancers.<sup>12</sup> Sunglasses are also important, especially in the snow where the reflection of the light can cause burns to the eye.

If you are suffering from cold sores or herpes simplex, this can often be exacerbated by stress or running. Aciclovir cream (Zovirax) is often used and this, or similar products, should be carried, if you are susceptible.

### **Musculoskeletal problems**

Musculoskeletal problems are common and mostly due to overuse. There are various reasons and mechanisms for this, but treatment strategies during competition are limited and mainly focused on symptomatic treatment which include ice and if possible rest and analgesia.<sup>2,13,14</sup> Other options may include massaging, stretching or taping depending on causative factors. During training periods the advice of an expert sports physician or physiotherapist will be important to treat the cause rather than just the symptoms. If analgesia is required, many different options exist. Certainly during competition, it is advisable to use something like paracetamol (acetaminophen) that is readily available, relatively safe and not a banned substance. Medications to avoid, especially during competitions because of potential side effect profiles are non-steroidal anti-inflammatory medications such as Diclofenac, Ibuprofen, Naproxen, etc. They may increase the risk of kidney failure, stomach ulcers and have been implicated in the pathogenesis of exercise-associated hyponatraemia, a serious medical conditions from overhydration (too much fluid intake during exercise) that has resulted in deaths.<sup>15-18</sup>

### **Allergies**

Athletes who are allergic to certain foods or other agents should carry a supply of antihistamines, such as Cetirizine, nasal sprays or eye drops. For more severe allergies, an EpiPen or steroid tablets are useful and, especially for insect bites, some topical anti-itch cream may be helpful.

### **Mosquitos**

Regarding mosquito bites, the best advice is to try to avoid getting bitten in the first place, especially in tropical environments where malaria, dengue or other such like infections are encountered. Several insect repellents are available for this, and other considerations include mosquito nets or protective clothes for exposed skin areas.

### **Gastrointestinal discomfort**

Another important problem is gastrointestinal discomfort such as nausea, vomiting, abdominal bloating or diarrhoea.<sup>2,5,10,19</sup> The cause is mostly benign but can also be part of more serious pathology. So, if these symptoms are not responding to simple measures such as increased fluid intake and simple analgesia or are getting worse, seeking help from the race doctor is advisable. Most commonly it is related to race diet and practicing with different types of foods and gels during training may be helpful. Often hand hygiene is poor during races, which can result in gastrointestinal upsets. Using an alcohol gel frequently to disinfect hands especially after going to the toilet or handling food or other objects can help prevent this. Several over the counter medications such as cyclizine for vomiting, loperamide for diarrhoea or ranitidine for reflux (heart burn) can be helpful.

### **Wound treatment**

One should also be prepared for superficial wound treatment, and as such an antiseptic solution and bandage or dressing to cover the area should be part of the medical kit.

### **Antibiotics**

Depending on individual needs, a stand by antibiotic for things like recurrent urinary tract infections or cystitis or upper respiratory tract infections may be appropriate to carry especially on foreign trips. This should be discussed with your physician.

### **Sleeping**

I would generally advice against using sleeping tablets as it may adversely impact performance the following day, but this needs to be discussed on an individual basis. Ear plugs or eye masks may be helpful.

Here is a summary list of things that I would recommended to carry in the medical kit, however this needs to be adapted on an individual basis depending on race, environment and pre-existing medical conditions:

- Regular medication
- Needle/ syringe/ safety pin/ paper clip to treat blisters or subungal haematoma
- Bandage
- Tape/blister tape
- Analgesia: Paracetamol (acetaminophen) 500 mg (max 8 tablets or 4 grams/ day)
- Antihistamine (Cetirizine 10 mg once daily)
- Alcohol gel
- Antiseptic solution
- Recommendation for each race (mandatory items)
- Specific items as needed

### **References**

1. DUV. Deutsche Ultramarathon Vereinigung. (<http://www.ultra-marathon.org/index.php>) accessed 15.07.2017.
2. Scheer BV, Murray A. Endurance & Adventure Sports Injuries: Ultra-Marathon Running Injuries. In: Doral M., Karlsson J. (Ed.) Sports Injuries: Prevention, Diagnosis, Treatment and Rehabilitation: SpringerReference ([www.springerreference.com](http://www.springerreference.com)). Springer-Verlag Berlin Heidelberg, 2013.
3. Hoffman MD, Pasternak A, Rogers IR, Khodae M, Hill JC, Townes DA, Scheer BV, Krabak BJ, Basset P, Lipman GS. Medical services at ultra-endurance foot races in remote environments: Medical issues and consensus guidelines. *Sports Med.* 2014;44(8):1055-69.
4. <https://www.wada-ama.org> (accessed 15.07.2017)
5. Scheer BV, Murray A. Al Andalus Ultra Trail: An observation of medical interventions during a 219km, 5 day ultramarathon stage race. *Clin J Sport Med.* 2011;21:444-6.
6. Scheer BV, Reljic D, Murray A, Costa RJ. The enemy of the feet: blisters in ultraendurance runners. *J Am Podiatr Med Assoc.* 2014;104(5):473-8.
7. Lipman GS, Sharp LJ, Christensen M, Phillips C, DiTullio A, Dalton A, Ng P, Shangkuan J, Shea K, Krabak BJ. Paper tape prevents foot blisters: A randomized prevention trial assessing paper tape in endurance distances II (Pre-TAPED II). *Clin J Sport Med.* 2016;26(5):362-8.
8. Lipman GS, Scheer BV. Blisters: The enemy of the feet. *Wilderness Environ Med.* 2015;26(2):275-6.
9. Hoffman MD, Fogard K. Factors related to successful completion of a 161-km ultramarathon. *Int J Sports Physiol Perform.* 2011;6:25-37.
10. Costa RJ, Snipe R, Camões-Costa V, Scheer V, Murray A. The impact of gastrointestinal symptoms and dermatological injuries on nutritional intake and hydration status during ultramarathon events. *Sports Med Open.* 2016;2(1):16.

11. Hoffman MD. Etiological foundation for practical strategies to prevent exercise-related foot blisters. *Curr Sports Med Rep.* 2016;15(5):330-5.
12. Ambros-Rudolph CM, Hofmann-Wellenhof R, Richtig E, Müller-Fürstner M, Soyer HP, Kerl H. Malignant melanoma in marathon runners. *Arch Dermatol.* 2006;142(11):1471-4.
13. Khodaei M, Ansari M. Common ultramarathon injuries and illnesses: race day management. *Curr Sports Med Rep.* 2012;11:290–7.
14. Krabak BJ, Waite B, Schiff MA. Study of injury and illness rates in multiday ultramarathon runners. *Med Sci Sports Exerc.* 2011;43:2314-20.
15. Hoffman MD, Hew-Butler T, Stuempfle KJ. Exercise-associated hyponatremia and hydration status in 161-km ultramarathons. *Med Sci Sports Exerc.* 2013;45:784–91.
16. Hew-Butler T, Rosner MH, Fowkes-Godek S, Dugas JP, Hoffman MD, Lewis DP, Maughan RJ, Miller KC, Montain SJ, Rehrer NJ, Roberts WO, Rogers IR, Siegel AJ, Stuempfle KJ, Winger JM, Verbalis JG. Statement of the Third International Exercise-Associated Hyponatremia Consensus Development Conference, Carlsbad, California, 2015. *Clin J Sport Med.* 2015;25(4):303-20.
17. Hoffman MD, Weiss RH. Does acute kidney injury from an ultramarathon increase the risk for greater subsequent injury? *Clin J Sport Med.* 2016;26(5):417-22.
18. Hoffman MD, Stuempfle KJ, Fogard K, Hew-Butler T, Winger J, Weiss RH. Urine dipstick analysis for identification of runners susceptible to acute kidney injury following an ultramarathon. *J Sports Sci.* 2013;31:20–31.
19. Stuempfle KJ, Hoffman MD. Gastrointestinal distress is common during a 161-km ultramarathon. *J Sports Sci.* 2015;33(17):1814-21.