The effectiveness of online tailored advice for the prevention of running-related injuries and promotion of preventive behaviour in Dutch trail runners: a pragmatic randomised controlled trial

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Supplementary Material

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Supplementary Material Appendix S1

***TrailS*$_6$ intervention (English version)**

Tailored advice to prevent running-related injuries in trail runners

***TrailS*$_6$**
– 6 tailored advice to keep you on the trails –

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No injury: general advice

Based on our injury monitoring system you have had no injury in the past 2 weeks. This is excellent. For the next weeks we would like to help you to maintain the 'no injury' status, in other words, we would like to help you to prevent running injuries. The advice below are scientifically evidence-based, and if you have any questions you can always contact our research team on l.hespanhol@vumc.nl.

Advice on running-related injury prevention (general advice)

Go to the respective page to access detailed information and recommendations

Trail runners at higher injury risk (be careful)

- *Runners with history of previous injuries*

Previous injuries have been considered the strongest risk factor for running injuries.[1] This means that if you have had a running injury before, you should be extra aware of the current preventive advice, because you are at higher risk to develop running injuries.

- *Inexperienced runners*

Inexperienced runners are at higher injury risk than experienced runners.[2] Most of the trail runners are experienced runners, however some of them may be inexperienced in trail running. Therefore, if you have less than 1 year of trail running experience, you should be extra aware of the current preventive advice.

Running training: avoid 'too much, too soon'

Increasing running volume or intensity 'too much, too soon' is considered one of the most dangerous characteristics causing running injuries.[3-5]

- Be careful with a 'too much, too soon' running progression.[3-5]
- We strongly advise that the running volume and intensity do not increase more than 10% per week.[3-5]

Add warming-up and cooling-down exercises

Warming-up and cooling-down exercises just before and after each running session, respectively, are considered important training components.[6, 7] We advise:

- Warming-up: steady walking and/or slow jogging, and light balance (neuromuscular) training for 10 to 20 min just before the running session.[6, 7]
- Cooling-down: steady walking and/or slow jogging for 10 to 20 min just after the running session.[6]

Implement a general conditioning training in your schedule

To be able to run successfully and free of injury, a good general conditioning is essential.[8, 9] This includes not only an appropriate running training with gradual increment, but also to get your body ready to do such activity.

- It is important to train the following skills on a weekly basis: muscle strength (especially lower limbs and hips), flexibility, balance (neuromuscular) training and core stability.
- We recommend training such skills 2 to 3 times a week.[10]
- Muscle strength training and balance (neuromuscular) training have been proved to be important training components to prevent sports injuries.[11, 12] Therefore, we would like to reinforce that an underlying muscle strength and balance (neuromuscular) training 2 to 3 times per week is strongly recommended.[10-12]

- If you want some ideas of exercises, we advise you to download the **Get Set** app. The **Get Set** app is a tool developed by the International Olympic Committee (IOC) in order to prevent sports injuries.[13] You can download the **Get Set** app for iOS at https://itunes.apple.com/app/get-set-train-smarter/id894609112?mt=8, and for Android at https://play.google.com/store/apps/details?id=org.olympic.app.getset. The exercises we advise can be found in the "Athletics" category, or you can search for the body region you are interested.

- Contact a trainer and/or a healthcare professional for guidance if necessary.

Listen to your body

One important aspect to avoid getting your body overloaded is to 'listen to your body'.[14, 15] Following the advice below will help you to avoid overtraining and injuries, and it can also improve your performance.[16, 17]

- During a running session, if you feel that your body is 'protesting' because you are training too hard, consider decreasing the running distance or intensity for that particular running session.

- If you feel that your body is overstressed or overloaded after a running session, consider making a longer recovery time until the next running session.

Shoes for trail running

In trail running, it is important to realise that the surface is usually very variable, irregular and sometimes unstable. This means that it is very important to have suitable shoes for this type of surface.

- Make sure you have suitable shoes for trail running (when you run in trails) and that they are also confortable and you feel good running with them.[18]

- Permuting more than one pair of shoes can also help to avoid running injuries.[19]

References

1. Saragiotto BT, Yamato TP, Hespanhol Junior LC, *et al.* What are the main risk factors for running-related injuries? *Sports Med* 2014;**44**:1153-63.

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19. Malisoux L, Ramesh J, Mann R*, et al.* Can parallel use of different running shoes decrease running-related injury risk? *Scand J Med Sci Sports* 2015;**25**:110-5.

Non-substantial injury

Based on our injury monitoring system, the running injury you have sustained in past 2 weeks was classified as non-substantial. A non-substantial running injury is defined as an injury leading to no or mild reductions in running volume or performance. For the next weeks we would like to help you to deal with this non-substantial injury in order to help the healing of the injury, and also to prevent this injury to become a substantial injury leading to moderate or severe reductions in running volume or performance. The advice below are scientifically evidence-based, and if you have any questions you can always contact our research team on l.hespanhol@vumc.nl.

Advice on running-related injury prevention

Go to the respective page to access detailed information and recommendations

Treatment: seek a healthcare professional

The first thing we advise you to do is to seek a healthcare professional. Then, you can have a specific and appropriate treatment for your injury, and the healthcare professional can monitor your injury and adapt the treatment as necessary.

- Pay attention: The injury may heal by itself at this stage; however, if you do not seek a health professional you may prolong the time to recover from this injury.

Running training: reduce the running volume and intensity, and build them up again slowly

The running volume and intensity directly contribute to the development of running injuries.[1-4] This means that if you continue with the same running volume and intensity your injury may get worse. We advise:

- Reduce the running volume and intensity until you can run comfortably, in other words, without feeling pain or discomfort.
- If you cannot run at all without feeling pain or discomfort, you should interrupt your running schedule for a while. Begin this process interrupting running for 1 or 2 weeks, and use more time if necessary. Do this until you can run again without feeling pain or discomfort.
- Thereafter, you should build up your running schedule again progressing your running volume and intensity gradually and slowly.
- You should not progress your running volume or intensity more than 10% per week (progressing the running volume or intensity 'too much, too soon' is considered one of the most dangerous characteristics causing running injuries).[1-3]
- If you are under treatment, discuss these advice with your healthcare professional and only build up again the running volume and intensity, or return to run after clearance.

Add warming-up and cooling-down exercises

Warming-up and cooling-down exercises just before and after each running session, respectively, are considered important training components.[5, 6] We advise:

- Warming-up: steady walking and/or slow jogging, and light balance (neuromuscular) training for 10 to 20 min just before the running session.[5, 6]
- Cooling-down: steady walking and/or slow jogging for 10 to 20 min just after the running session.[5]

Implement a general conditioning training in your schedule

To be able to run successfully and free of injury, a good general conditioning is essential.[7, 8] This includes not only an appropriate running training with gradual increment, but also to get your body ready to do such activity.

- It is important to train the following skills on a weekly basis: muscle strength (especially lower limbs and hips), flexibility, balance (neuromuscular) training and core stability.

- We recommend training such skills 2 to 3 times a week.[9]

- Muscle strength training and balance (neuromuscular) training have been proved to be important training components to prevent sports injuries.[10, 11] Therefore, we would like to reinforce that an underlying muscle strength and balance (neuromuscular) training 2 to 3 times per week is strongly recommended.[9-11]

- If you want some ideas of exercises, we advise you to download the **Get Set** app. The **Get Set** app is a tool developed by the International Olympic Committee (IOC) in order to prevent sports injuries.[12] You can download the **Get Set** app for iOS at https://itunes.apple.com/app/get-set-train-smarter/id894609112?mt=8, and for Android at https://play.google.com/store/apps/details?id=org.olympic.app.getset. The exercises we advise can be found in the "Athletics" category, or you can search for the body region you are interested.

- Contact a trainer and/or a healthcare professional for guidance if necessary.

Lay ice on the injured body region after running

RICE stands for **R**est, **I**ce, **C**ompression and **E**levation. It is a combined modality that you apply in the injured body region.

- You can apply RICE involving ice in some towel or bandage and attaching it around the injured body region with a very light compression (without pain or discomfort). The injured body region should be in elevation (if possible) and at rest.

- This procedure should be done after each running session for at least 20 min. Preferably, we suggest applying RICE twice a day for 20 min in each application (one application after the running session, and the other when you feel more convenient).[13, 14]

- Pay attention: do not apply RICE just before running, because RICE can alter pain sensation (which is an important sign to stop doing the activity), power and agility.[15] However, if you do apply RICE before running, we advise you to run only after 30 min (at least) from the RICE application, in addition to a 10 to 20 min warming-up (please see the warming-up advice).[15]

Shoes for trail running

In trail running, it is important to realise that the surface is usually very variable, irregular and sometimes unstable. This means that it is very important to have suitable shoes for this type of surface.

- Make sure you have suitable shoes for trail running (when you run in trails) and that they are also confortable and you feel good running with them.[16]

- Permuting more than one pair of shoes can also help to avoid running injuries.[17]

Additional general advice

Trail runners at higher injury risk (be careful)

- *Runners with history of previous injuries*

Previous injuries have been considered the strongest risk factor for running injuries.[18] This means that if you have had a running injury before, you should be extra aware of the current preventive advice, because you are at higher risk to develop running injuries.

- *Inexperienced runners*

Inexperienced runners are at higher injury risk than experienced runners.[19] Most of the trail runners are experienced runners, however some of them may be inexperienced in trail running. Therefore, if you have less than 1 year of trail running experience, you should be extra aware of the current preventive advice.

Listen to your body

One important aspect to avoid getting your body overloaded is to 'listen to your body'.[20, 21] Following the advice below will help you to avoid overtraining and injuries, and it can also improve your performance.[22, 23]

- During a running session, if you feel that your body is 'protesting' because you are training too hard, consider decreasing the running distance or intensity for that particular running session.
- If you feel that your body is overstressed or overloaded after a running session, consider making a longer recovery time until the next running session.

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Substantial injury

Based on our injury monitoring system, the running injury you have sustained in past 2 weeks was classified as substantial. A substantial running injury is defined as an injury leading to moderate or severe reductions in training volume, moderate or severe reductions in running performance, or complete inability to run. For the next weeks we would like to help you to deal with this substantial injury in order to help the healing of the injury and also to prevent this injury to become worse. The advice below are scientifically evidence-based, and if you have any questions you can always contact our research team on l.hespanhol@vumc.nl.

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The running volume and intensity directly contribute to the development of running injuries.[1-4] This means that if you continue with the same running volume and intensity your injury may get worse. We recommend:

- Interrupt your running schedule until you can run again without feeling pain or discomfort. Begin this process interrupting running for 2 to 4 weeks, and use more time if necessary.
- Thereafter, you should build up your running schedule again progressing your running volume and intensity gradually and slowly.
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***TrailS$_6$* intervention (Dutch version)**

Toegesneden adviezen om blessures in trail runners te voorkomen

TrailS$_6$
– 6 toegesneden adviezen om je op trails te houden –

Inhoudsopgave

Geen blessure: algemene adviezen

Op basis van onze blessureregistratie systeem heb je geen blessures gehad in de afgelopen 2 weken. Dat is uitstekend. Voor de volgende weken willen we je graag helpen om blessurevrij te blijven. Met andere woorden, we willen je graag helpen om blessures te voorkomen. Onderstaande adviezen zijn gebaseerd op wetenschappelijke inzichten. Voor vragen kun je ook direct contact opnemen met Luiz Hespanhol via l.hespanhol@vumc.nl.

Blessurepreventie adviezen

Klik bij elk advies voor extra informatie.

Trail runners met een verhoogd risico op blessures

- *Hardlopers met geschiedenis van eerdere blessures*

Eerdere blessures zijn de sterkste risicofactor voor blessures.[1] Dit betekent dat als je een eerdere hardloopblessure hebt gehad, je je extra bewust moet zijn van de preventieve adviezen, omdat je een hoger risico hebt om blessures te ontwikkelen.

- *Onervaren hardlopers*

Onervaren hardlopers hebben een hoger risico op blessures dan ervaren lopers.[2] Veel trail runners zijn ervaren hardlopers, maar een enkeling kan onervaren in trail running zijn. Als je minder dan 1 jaar trail running ervaring hebt, moet je je daarom extra bewust zijn van de preventieve adviezen.

Running training: voorkom 'te veel, te vroeg'

Het verhogen van je hardloop volume of intensiteit 'te veel, te vroeg' is één van de meest gevaarlijke factoren om blessures te krijgen.[3-5]

- Pas op en voorkom dat je in de 'te veel, te vroeg' hardloop valkuil loopt.[3-5]
- Wij adviseren het hardloop volume (duur x frequentie) en intensiteit niet meer dan 10% per week te verhogen.[3-5]

Algemene conditietraining

Een goede algemene conditie is noodzakelijk om succesvol en vrij van blessures te hardlopen.[6, 7] Dit omvat niet alleen een passende hardlooptraining met een langzame opbouw, maar ook het voorbereiden van je lichaam op het hardlopen. Om je algemene conditie te verbeteren of te onderhouden en je lichaam voor te bereiden op het hardlopen, adviseren wij het volgende:

- Het is belangrijk om de volgende vaardigheden wekelijks te trainen: spierkracht (vooral de benen en heupen), flexibiliteit (vooral de benen en heupen), balans (neuromusculaire) training, en core stabiliteit (stabiliteit van je romp).
- Oefen deze vaardigheden 2-3 keer per week.[8]
- Uit de wetenschappelijke literatuur blijkt dat spierkracht en balans (neuromusculaire) training erg belangrijk zijn om sportblessures te voorkomen.[9, 10] Voor het versterken van spierkracht en balans, is het sterk aanbevolen om de (neuromusculaire) oefeningen 2-3 keer per week te doen.[8-10]
- Als je ideeën van oefeningen wilt, dan kun je de **Get Set** app downloaden. Get Set is een app dat het Internationaal Olympisch Comité (IOC) heeft ontwikkeld om sportblessures te voorkomen.[11] Je kan de Get Set app voor iOS downloaden via https://itunes.apple.com/app/get-set-train-smarter/id894609112?mt=8, of voor Android via https://play.google.com/store/apps/details?id=org.olympic.app.getset. Wij adviseren de oefeningen in de "Athletics" categorie, maar je kunt ook naar je eigen interesse een lichaamsdeel zoeken.
- Contact opnemen met een trainer of een zorgverlener voor begeleiding, indien nodig.

Implementeer warming-up en cooling-down oefeningen

Warming-up oefening voor het hardlopen en cooling-down oefening na het hardlopen zijn belangrijke trainingsonderdelen.[12, 13] Dus adviseren wij:

- Warming-up: wandelen en/of langzaam joggen, en lichte balans (neuromusculaire) training gedurende 10-20 minuten voor het hardlopen.[12, 13]
- Cooling-down: wandelen en/of langzaam joggen gedurende 10-20 minuten na het hardlopen.[12]

Luister naar je lichaam

Het is belangrijk 'naar je lichaam te luisteren' om overbelasting te voorkomen.[14, 15] De adviezen hieronder zullen je helpen om overbelasting en blessures te voorkomen, en het kan zelfs je prestatieniveau verbeteren.[16, 17]

- Tijdens het hardlopen, als je voelt dat je lichaam 'protesteert' omdat je te hard loopt, overweeg dan je hardloopafstand of intensiteit voor deze run te verminderen.
- Als je voelt dat je lichaam na het hardlopen overbelast is, overweeg een langere hersteltijd in te lassen voor je volgende run.

Schoenen voor trail running

De grond is zeer variabel, onregelmatig en soms instabiel tijdens trail running. Dus is het erg belangrijk om geschikte trail running schoenen te hebben om in dit type terrein hard te lopen.

- Zorg ervoor dat je geschikte trail running schoenen hebt (wanneer je hardloopt op trail paden). Ze moeten comfortabel zijn en je moet je goed voelen met die trail running schoenen.[18]
- Het gebruik van meer dan één paar schoenen kan ook helpen om blessures te voorkomen.[19]

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1. Saragiotto BT, Yamato TP, Hespanhol Junior LC, *et al.* What are the main risk factors for running-related injuries? *Sports Med* 2014;**44**:1153-63.
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4. Nielsen RO, Nohr EA, Rasmussen S, *et al.* Classifying running-related injuries based upon etiology, with emphasis on volume and pace. *Int J Sports Phys Ther* 2013;**8**:172-9.

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7. Hreljac A. Impact and overuse injuries in runners. *Med Sci Sports Exerc* 2004;**36**:845-9.

8. Garber CE, Blissmer B, Deschenes MR*, et al.* American College of Sports Medicine position stand. Quantity and quality of exercise for developing and maintaining cardiorespiratory, musculoskeletal, and neuromotor fitness in apparently healthy adults: guidance for prescribing exercise. *Med Sci Sports Exerc* 2011;**43**:1334-59.

9. Leppanen M, Aaltonen S, Parkkari J*, et al.* Interventions to prevent sports related injuries: a systematic review and meta-analysis of randomised controlled trials. *Sports Med* 2014;**44**:473-86.

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12. van Mechelen W, Hlobil H, Kemper HC*, et al.* Prevention of running injuries by warm-up, cool-down, and stretching exercises. *Am J Sports Med* 1993;**21**:711-9.

13. Herman K, Barton C, Malliaras P*, et al.* The effectiveness of neuromuscular warm-up strategies, that require no additional equipment, for preventing lower limb injuries during sports participation: a systematic review. *BMC Med* 2012;**10**:75.

14. Conraads VM, de Sutter J, Roeykens J*, et al.* (Don't) just start running. *Eur J Cardiovasc Prev Rehabil* 2009;**16 Suppl 2**:S11-3.

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19. Malisoux L, Ramesh J, Mann R*, et al.* Can parallel use of different running shoes decrease running-related injury risk? *Scand J Med Sci Sports* 2015;**25**:110-5.

Niet-substantiële blessure

Op basis van onze blessureregistratie systeem heb je een beginnende blessure. Beginnende blessures zijn hardloopblessures die geen of weinig invloed hebben op trainingsvolume of prestatieniveau. Voor de volgende weken willen wij je graag helpen om met deze blessure om te gaan om te voorkomen dat deze blessure erger wordt en invloed gaat hebben op je trainingsvolume of prestatieniveau. Onderstaande adviezen zijn gebaseerd op de laatste wetenschappelijke inzichten. Voor vragen kun je ook direct contact opnemen met Luiz Hespanhol via l.hespanhol@vumc.nl.

Blessurepreventie adviezen

Klik bij elk advies voor extra informatie.

Therapie: zoek naar een zorgverlener

Allereerst, is ons advies te zoeken naar een zorgverlener (huisarts, sportarts, fysiotherapeut, enz.). Als je een zorgverlener zoekt, dan kan je van hem/haar specifiek en geschikte behandeling voor je blessure krijgen. Daarnaast kan de zorgverlener de blessure controleren en hij/zij kan indien nodig ook de behandeling aanpassen.

- Let op: de blessure kan in deze situatie vanzelf genezen, maar als je geen zorgverlener zoekt, dan kan de blessure langer duren en de genezing vertraagd worden.

Running training: verminder hardloop volume en intensiteit en bouw deze weer langzaam op

Hardloop volume en intensiteit dragen direct bij aan de ontwikkeling van hardloopblessures.[1-4] Dit betekent dat als je met hetzelfde volume (duur x frequentie) en intensiteit door blijft lopen, je blessure erger kan worden. Dus adviseren wij:

- Verminder het volume en de intensiteit van het hardlopen totdat je gemakkelijk kan hardlopen zonder pijn of ongemak.

- Als je zonder pijn en ongemak niet kan hardlopen, dan moet je je training voor een tijdje onderbreken. Begin met een onderbreking van 1 of 2 weken, en gebruik meer tijd indien nodig. Hervat de hardlooptraining alleen als je zonder pijn en ongemak kan hardlopen.

- Na deze onderbreking, kan je je hardloopvolume en intensiteit opbouwen, maar doe dat op een geleidelijke en langzame manier. Verhoog je hardloopvolume en intensiteit niet meer dan 10% per week (het verhogen van de hardloopvolume en intensiteit 'te veel, te vroeg' is één van de meeste gevaarlijke factoren om blessures te krijgen).[1-3]

- Als je onder behandeling van een zorgverlener bent, bespreek deze adviezen met hem/haar en ga pas je hardloopvolume en intensiteit opbouwen of weer beginnen met hardlopen na de goedkeuring van je behandelaar.

Algemene conditietraining

Een goede algemene conditie is noodzakelijk om succesvol en vrij van blessures hard te lopen.[5, 6] Dit omvat niet alleen een passende hardlooptraining met een geleidelijke opbouw, maar ook bereid je je lichaam voor op het hardlopen. Om je algemene conditie te verbeteren of onderhouden en je lichaam voor te bereid op het hardlopen, adviseren wij het volgende:

- Het is belangrijk om de volgende vaardigheden wekelijks te trainen: spierkracht (vooral de benen en heupen), flexibiliteit (vooral de benen en heupen), balans (neuromusculaire) training, en core stabiliteit (stabiliteit van je romp).

- Oefen deze vaardigheden 2-3 keer per week.[7]

- Uit de wetenschappelijke literatuur blijkt dat spierkracht en balans (neuromusculaire) training erg belangrijk zijn om sportblessures te voorkomen.[8, 9] Voor het versterken van spierkracht en balans, is het sterk aanbevolen om de (neuromusculaire) oefeningen 2-3 keer per week te doen.[7-9]

- Als je ideeën van oefeningen wilt, dan kun je de **Get Set** app downloaden. Get Set is een app dat het Internationaal Olympisch Comité (IOC) heeft ontwikkeld om sportblessures te voorkomen.[10] Je kan de Get Set app voor iOS downloaden via https://itunes.apple.com/app/get-set-train-smarter/id894609112?mt=8, of voor Android via

https://play.google.com/store/apps/details?id=org.olympic.app.getset. Wij adviseren de oefeningen in de "Athletics" categorie, maar je kunt ook naar je eigen interesse een lichaamsdeel zoeken.

- Neem contact op met een trainer of een zorgverlener voor begeleiding, indien nodig.

Implementeer warming-up en cooling-down oefeningen

Warming-up oefening voor het hardlopen en cooling-down oefening na het hardlopen zijn belangrijke trainingsonderdelen.[11, 12] Dus adviseren wij:

- Warming-up: wandelen en/of langzaam joggen, en lichte balans (neuromusculaire) training gedurende 10-20 minuten voor het hardlopen.[11, 12]

- Cooling-down: wandelen en/of langzaam joggen gedurende 10-20 minuten na het hardlopen.[11]

Leg ijs op de geblesseerde lichaamsdelen na het hardlopen

RICE is de afkorting van **R**est, **I**ce, **C**ompression and **E**levation. Het is een gecombineerde behandelmethode die je op het geblesseerde lichaamsdeel toepast.

- Wikkel het ijs in een handdoek of iets dergelijks en bind de handdoek met ijs rond het geblesseerde lichaamsdeel. De druk hiervan moet heel licht zijn (zonder pijn of ongemak). Leg het lichaamsdeel omhoog indien mogelijk en houd het rustig.

- Het proces hierboven moet na het hardlopen worden uitgevoerd en gedurende tenminste 20 minuten. Het is beter als je RICE twee keer per dag kan doen gedurende tenminste 20 minuten per keer (een keer na het hardlopen, en een keer wanneer het je uit komt).[13, 14]

- Let op: gebruik RICE niet net vóór het hardlopen, omdat ijs je pijnsensatie (pijn is een belangrijke indicatie dat er iets niet goed is en je je activiteit moet stoppen), power, spierkracht en hardloop behendigheid kan verminderen.[15] Dus adviseren wij dat, als je ijs of RICE gebruikt, je tenminste 30 minuten wacht na de ijs of RICE toepassing, en je na 10-20 minuten warm-up (zie de warming-up adviezen) pas gaat hardlopen.[15]

Schoenen voor trail running

De grond is zeer variabel, onregelmatig en soms instabiel tijdens trail running. Dus is het erg belangrijk om geschikte trail running schoenen te hebben om in dit type terrein hard te lopen.

- Zorg ervoor dat je geschikte trail running schoenen hebt (wanneer je hardloopt op trail paden). Ze moeten comfortabel zijn en je moet je goed voelen met die trail running schoenen.[16]

- Het gebruik van meer dan één paar schoenen kan ook helpen om blessures te voorkomen.[17]

Extra algemene adviezen

Trail runners met een verhoogd risico op blessures

- *Hardlopers met geschiedenis van eerdere blessures*

Eerdere blessures zijn de sterkste risicofactor voor blessures.[18] Dit betekent dat als je een eerdere hardloopblessure hebt gehad, je je extra bewust moet zijn van de preventieve adviezen, omdat je een hoger risico hebt om blessures te ontwikkelen.

- *Onervaren hardlopers*

Onervaren hardlopers hebben een hoger risico op blessures dan ervaren lopers.[19] Veel trail runners zijn ervaren hardlopers, maar een enkeling kan onervaren in trail running zijn. Als je minder dan 1 jaar trail running ervaring hebt, moet je je daarom extra bewust zijn van de preventieve adviezen.

Luister naar je lichaam

Het is belangrijk 'naar je lichaam te luisteren' om overbelasting te voorkomen.[20, 21] De adviezen hieronder zullen je helpen om overbelasting en blessures te voorkomen, en het kan zelfs je prestatieniveau verbeteren.[22, 23]

- Tijdens het hardlopen, als je voelt dat je lichaam 'protesteert' omdat je te hard loopt, overweeg dan je hardloopafstand of intensiteit voor deze run te verminderen.
- Als je voelt dat je lichaam na het hardlopen overbelast is, overweeg een langere hersteltijd in te lassen voor je volgende run.

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23. Bishop PA, Jones E, Woods AK. Recovery from training: a brief review. *J Strength Cond Res* 2008;**22**:1015-24.

Substantiële blessure

Op basis van onze blessureregistratie systeem heb je momenteel last van een blessure welke invloed heeft op je trainingsvolume of prestatieniveau. Voor de volgende weken willen wij je graag helpen om met deze blessure om te gaan. Dit is handig om de genezing te helpen en ook om te voorkomen dat deze blessure erger wordt. Onderstaande adviezen zijn gebaseerd op wetenschappelijke inzichten. Voor vragen kun je ook direct contact opnemen met Luiz Hespanhol via l.hespanhol@vumc.nl.

Blessurepreventie adviezen

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Therapie: zoek naar een zorgverlener

Zoek naar een zorgverlener (huisarts, sportarts, fysiotherapeut, enz.). Als je een zorgverlener zoekt, dan kan je van hem/haar specifiek en geschikte behandeling voor je blessure krijgen. Daarnaast kan de zorgverlener de blessure controleren en hij/zij kan indien nodig ook de behandeling aanpassen.

- Let op: waarschijnlijk kan de blessure in deze situatie niet vanzelf genezen, en als je geen zorgverlener zoekt, dan kan de blessure langer duren en de genezing vertraagd worden.

Running training: verminder hardloop volume en intensiteit en bouw deze weer langzaam op

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- Als je zonder pijn en ongemak niet kan hardlopen, dan moet je je training voor een tijdje onderbreken. Begin met een onderbreking van 2 of 4 weken, en gebruik meer tijd indien nodig. Hervat de hardlooptraining alleen als je zonder pijn en ongemak kan hardlopen.

- Na deze onderbreking, kan je je hardloopvolume en intensiteit opbouwen, maar doe dat op een geleidelijke en langzame manier. Verhoog je hardloopvolume en intensiteit niet meer dan 10% per week (het verhogen van de hardloopvolume en intensiteit 'te veel, te vroeg' is één van de meeste gevaarlijke factoren om blessures te krijgen).[1-3]

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Een goede algemene conditie is noodzakelijk om succesvol en vrij van blessures hard te lopen.[5, 6] Dit omvat niet alleen een passende hardlooptraining met een geleidelijke opbouw, maar ook bereid je je lichaam voor op het hardlopen. Om je algemene conditie te verbeteren of onderhouden en je lichaam voor te bereid op het hardlopen, adviseren wij het volgende:

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Leg ijs op de geblesseerde lichaamsdelen na het hardlopen

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Schoenen voor trail running

De grond is zeer variabel, onregelmatig en soms instabiel tijdens trail running. Dus is het erg belangrijk om geschikte trail running schoenen te hebben om in dit type terrein hard te lopen.

- Zorg ervoor dat je geschikte trail running schoenen hebt (wanneer je hardloopt op trail paden). Ze moeten comfortabel zijn en je moet je goed voelen met die trail running schoenen.[16]

- Het gebruik van meer dan één paar schoenen kan ook helpen om blessures te voorkomen.[17]

Extra algemene adviezen

Trail runners met een verhoogd risico op blessures

- *Hardlopers met geschiedenis van eerdere blessures*

Eerdere blessures zijn de sterkste risicofactor voor blessures.[18] Dit betekent dat als je een eerdere hardloopblessure hebt gehad, je je extra bewust moet zijn van de preventieve adviezen, omdat je een hoger risico hebt om blessures te ontwikkelen.

- *Onervaren hardlopers*

Onervaren hardlopers hebben een hoger risico op blessures dan ervaren lopers.[19] Veel trail runners zijn ervaren hardlopers, maar een enkeling kan onervaren in trail running zijn. Als je minder dan 1 jaar trail running ervaring hebt, moet je je daarom extra bewust zijn van de preventieve adviezen.

Luister naar je lichaam

Het is belangrijk 'naar je lichaam te luisteren' om overbelasting te voorkomen.[20, 21] De adviezen hieronder zullen je helpen om overbelasting en blessures te voorkomen, en het kan zelfs je prestatieniveau verbeteren.[22, 23]

- Tijdens het hardlopen, als je voelt dat je lichaam 'protesteert' omdat je te hard loopt, overweeg dan je hardloopafstand of intensiteit voor deze run te verminderen.
- Als je voelt dat je lichaam na het hardlopen overbelast is, overweeg een langere hersteltijd in te lassen voor je volgende run.

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Supplementary Material Appendix S2

Content of the preventive behaviour questionnaire

Preventive behaviour

- What do you do to prevent running injuries?
  Multiple choice:
  - Balance or other neuromuscular (proprioception) training
  - Brace
  - Cool-down
  - Flexibility training in a regular basis
  - Specialised clothes (e.g. compressive shirts)
  - Specialised insole (prefabricated or custom-made)
  - Specialised shoes for trail running
  - Specialised socks (e.g. compressive socks)
  - Strength training
  - Core stability training
  - Stretching just before running
  - Stretching just after running
  - Supervised (certified trainer or health professional) running training
  - Taping
  - Warm-up
  - Other _____

Intention

- Do you intend to follow the advice suggested by this study to prevent running injuries?

-2	-1	0	1	2
No, certainly not				Yes, certainly

Attitude

- I find following advice on running injury prevention…

-2	-1	0	1	2
Very bad				Very good
-2	-1	0	1	2
Very unpleasant				Very pleasant

- Do you believe it is possible to prevent running injuries?

-2	-1	0	1	2
No, definitely not possible				Yes, definitely possible

Subjective norm

- People from my social circle believe I should follow advice on running injury prevention.

-2	-1	0	1	2
No, definitely not				Yes, definitely

Perceived behaviour control

- If I want to follow advice on running injury prevention, I am / this will be…

-2	-1	0	1	2
Very sure I will be unable				Very sure I will be able
-2	-1	0	1	2
Very difficult				Very easy

Supplementary Material Appendix S3

Orchard Sports Injury Classification System version 10.1 (OSICS-10.1) classification of the running-related injuries

OSICS-10.1 code	OSICS-10.1 classification	Intervention % (n)	Control % (n)
ATAX	Achilles tendon injury	11.1 (15)	9.3 (14)
QMYX	Calf muscle trigger points/spasm	8.1 (11)	9.3 (14)
KZXX	Knee pain/injury not otherwise specified	7.4 (10)	16.6 (25)
TMHX	Hamstring strain	6.7 (9)	6.6 (10)
AJXX	Ankle sprains	5.9 (8)	6.0 (9)
FJPX	Plantar fasciitis strain	5.9 (8)	2.6 (4)
LZXX	Lumbar pain/injury nor otherwise specified	5.2 (7)	5.3 (8)
GZXX	Hip/groin pain not otherwise specified	5.2 (7)	3.3 (5)
FKBX	Blisters foot	5.2 (7)	2.6 (4)
QYBX	Tenoperiostitis of lower leg	4.4 (6)	2.6 (4)
FZXX	Foot pain/injury not otherwise specified	3.0 (4)	2.0 (3)
AZXX	Ankle pain/injury not otherwise specified	3.0 (4)	0.7 (1)
LZHX	Lumbar pain with hamstring referral	2.2 (3)	–
BMGX	Buttock muscle strain	1.5 (2)	1.3 (2)
QZXX	Other lower leg pain/injury not otherwise specified	1.5 (2)	1.3 (2)
BTHT	Hamstring origin tendinopathy	1.5 (2)	–
FTXX	Foot tendon injuries	1.5 (2)	–
KCMX	Knee meniscal cartilage injury	1.5 (2)	–
–	Heel spur	1.5 (2)	0.7 (1)
KGIX	ITB friction syndrome	0.7 (1)	3.3 (5)
TMXX	Thigh muscle strain/spasm/trigger points	0.7 (1)	3.3 (5)
BMGP	Piriformis muscle strain	0.7 (1)	0.7 (1)
BTXX	Buttock/pelvis tendon injury	0.7 (1)	0.7 (1)
FSMX	Metatarsal stress fracture	0.7 (1)	0.7 (1)
GMFI	Iliopsoas muscle strain/tear	0.7 (1)	0.7 (1)
KTPX	Patellar tendon injury	0.7 (1)	0.7 (1)
QMCX	Calf cramping during exercise	0.7 (1)	0.7 (1)
TZXX	Thigh pain/injury not otherwise specified	0.7 (1)	0.7 (1)
XMLX	Muscle strain lower limb	0.7 (1)	0.7 (1)
ACXX	Ankle osteochondral injuries	0.7 (1)	–
AHHX	Heel bruising/haematoma incl. fat pad contusion	0.7 (1)	–
DHXX	Thoracic soft tissue bruising/haematoma	0.7 (1)	–
FFHX	Fracture great toe	0.7 (1)	–
FHPX	Haematoma lesser toes	0.7 (1)	–
FHZX	Other foot soft tissue bruising/haematoma not elsewhere specified	0.7 (1)	–
FMXX	Foot muscle strain/spasm/trigger points	0.7 (1)	–
FSXX	Stress reactions/fractures in foot	0.7 (1)	–
GNEX	Nerve entrapment groin	0.7 (1)	–
KCBX	Mixed osteochondral and meniscal injury	0.7 (1)	–
KGPX	Patellofemoral pain	0.7 (1)	–
THXX	Thigh soft tissue bruising/haematoma	0.7 (1)	–
TKXX	Thigh laceration/abrasion	0.7 (1)	–
TMCH	Hamstring cramping during exercise	0.7 (1)	–

GMXX	Hip and groin muscle strain/tear	–	2.0 (3)
BZXX	Pelvic/buttock pain not otherwise specified	–	1.3 (2)
QMXX	Lower leg muscle injury	–	1.3 (2)
ASCX	Stress injury calcaneus	–	0.7 (1)
BGXX	Buttock and pelvis synovitis/bursitis	–	0.7 (1)
BNPX	Piriformis syndrome/sciatic nerve entrapment	–	0.7 (1)
CHXX	Chest wall soft tissue bruising/haematoma	–	0.7 (1)
FFPX	Fracture lesser toes (2 - 5)	–	0.7 (1)
FHPU	Nail bed haematoma lesser toes	–	0.7 (1)
FKXX	Foot laceration/abrasion	–	0.7 (1)
FMYX	Foot muscle trigger points, cramping, spasm	–	0.7 (1)
GJLX	Hip joint labral tear	–	0.7 (1)
KDXX	Knee dislocation	–	0.7 (1)
KJXX	Knee sprains/ligament injuries	–	0.7 (1)
KTHM	Medial hamstring tendinopathy, incl. pes anserine bursitis	–	0.7 (1)
LCXX	Lumbar disc injury (excl. degenerative disc disease LACX)	–	0.7 (1)
NCXX	Cervical disc injury	–	0.7 (1)
OMXX	Truncal muscle strain/spasm/trigger points	–	0.7 (1)
QMLX	Lateral compartment muscle injury	–	0.7 (1)
QMYP	Peroneal trigger points/spasm	–	0.7 (1)
XXXX	Injuries location unspecified or crossing anatomical boundaries	–	0.7 (1)
–	Unknown	–	1.3 (2)

OSICS-10.1: Orchard Sports Injury Classification System version 10.1.
Intervention group: 135 running-related injuries in total.
Control group: 151 running-related injuries in total.

Classification of the running-related injuries by body region

Body region	Intervention % (n)	Control % (n)
Foot	21.5 (29)	11.3 (17)
Lower leg	14.8 (20)	16.6 (25)
Knee	11.9 (16)	22.5 (34)
Achilles	11.1 (15)	9.3 (14)
Thigh	10.4 (14)	10.6 (16)
Ankle	10.4 (14)	7.3 (11)
Low back	7.4 (10)	6.0 (9)
Hip/groin	6.7 (9)	6.6 (10)
Pelvis/buttock	4.4 (6)	5.3 (8)
Lower limb	0.7 (1)	0.7 (1)
Thoracic spine	0.7 (1)	–
Chest/trunk/abdomen	–	1.3 (2)
Cervical spine	–	0.7 (1)
Crossing anatomical boundaries	–	0.7 (1)
Unknown	–	1.3 (2)

Intervention group: 135 running-related injuries in total.
Control group: 151 running-related injuries in total.

Classification of the running-related injuries by damaged tissue

Damaged tissue	Intervention % (n)	Control % (n)
Unspecified pain/injury	25.9 (35)	31.1 (47)
Muscle	21.5 (29)	29.1 (44)
Tendon	16.3 (22)	14.6 (22)
Skin and appendages	8.9 (12)	4.6 (7)
Bone/tenoperiostitis	8.1 (11)	5.3 (8)
Ligament	5.9 (8)	6.6 (10)
Fascia	5.9 (8)	2.6 (4)
Cartilage/labrum/meniscus/disc	3.7 (5)	2.0 (3)
Nerve	3.0 (4)	0.7 (1)
Fat pad	0.7 (1)	–
Joint dislocation	–	0.7 (1)
Synovitis/bursitis	–	0.7 (1)
Crossing anatomical boundaries	–	0.7 (1)
Unknown	–	1.3 (2)

Intervention group: 135 running-related injuries in total.
Control group: 151 running-related injuries in total.