

THE  
**CLIMBING**  
INJURY PREVENTION  
AND REHABILITATION  
FOR CLIMBING AND  
BOULDERING  
**BIBLE**

MANAGING INJURIES

STIAN CHRISTOPHERSEN



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# THE CLIMBING BIBLE

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# CONTENTS

FOREWORD by James Walker .....	7
<b>INTRODUCTION: THE PURPOSE OF THIS BOOK</b> .....	<b>8</b>
<b>CHAPTER 1 INJURY MANAGEMENT</b> .....	<b>12</b>
<b>HANDLING OF ACUTE SOFT TISSUE INJURIES AND OVERUSE INJURIES</b> .....	<b>15</b>
ACUTE SOFT TISSUE INJURIES .....	16
OVERUSE INJURIES .....	20
INJURY PREVENTION: MORE THAN JUST TRAINING? .....	22
<b>CHAPTER 2 THE INJURIES</b> .....	<b>38</b>
<b>INJURIES AND BODY PARTS</b> .....	<b>40</b>
FINGERS: PULLEY INJURIES .....	41
FINGERS: TENOSYNOVITIS .....	52
FINGER JOINTS .....	54
FINGERS: GROWTH PLATE INJURIES .....	60
TRAINING, WEIGHT AND NUTRITION IN ADOLESCENCE .....	64
REDs .....	66
FLEXOR MUSCLES AND LUMBRICALS .....	70
DUPUYTREN'S CONTRACTURE .....	76
HANDS AND WRISTS .....	77
ELBOWS AND FOREARMS .....	86
SHOULDERS .....	101
KNEES AND THIGHS .....	124
ANKLE SPRAINS .....	136
FEET AND TOES .....	140
<b>CHAPTER 3 PAIN AND INJURIES</b> .....	<b>142</b>
<b>WHAT IS PAIN, REALLY?</b> .....	<b>144</b>
SENSITISATION .....	146
MOVEMENT OPTIMISM .....	147
EXPOSURE .....	149
GLOSSARY .....	152
REFERENCES AND BIBLIOGRAPHY .....	154
ACKNOWLEDGEMENTS .....	158
THE 10 COMMANDMENTS OF CLIMBING .....	160

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# INTRODUCTION: THE PURPOSE OF THIS BOOK

When I was 16 years old, I had only been climbing for two years and yet I already defined myself as a climber – much of my identity revolved around being good at climbing, even though I wasn't climbing anywhere near what was then the international competition level. My social circle mostly consisted of climbers: it was where my best friends and role models were, and where I felt most comfortable and accepted. The desire to become much better than I was at that time was strong; I trained obsessively and with purpose, climbing almost every day.

I don't remember exactly when it started, but one day I began experiencing pain in the middle (PIP) joints of both middle fingers. The joints would swell after training, be stiff in the morning and be painful to touch. Experiencing pain while taking part in sport is not uncommon, so I assumed this would eventually go away. But it didn't. After a few months, I went to see a doctor who gave me an anti-inflammatory ointment and advised me to take it easy. Without receiving a specific answer about what this finger problem could be, taking it easy was out of the question for me; the junior world championships were coming up in a few months' time and making a tough decision not to climb would require much clearer advice and information than what I had been given.

A month later, I went to see another doctor and got similar results there too: no clear answers, but encouragement to rest until the issue resolved itself. So, despite having painful fingers, I continued training while applying ointment to the joints and hoping that they would get better over time.

A few months later, doctor number three decided to X-ray my fingers. When the results came back, he informed me that I had stress fractures – essentially broken bones – in the growth plates of both middle fingers. He clearly instructed me not to climb for the next six weeks, but also advised me to train everything else that didn't strain my fingers. Most importantly, he assured me that if I did this correctly, the injury would fully heal and not bother me again in the future. I skipped the junior world championships and took it relatively easy for those six weeks, doing alternative training during that summer; I never had any problems with that injury again.

This little story from 25 years ago has taught me a lot – both about athletes and healthcare professionals. About what athletes are willing to go through regardless of their level to engage in an activity they love. About the significance of the type of person they encounter among healthcare professionals when seeking help for their injuries and ailments. And about what knowledge and information is needed and available, and how it is communicated between healthcare professionals and their patients.

Looking back, it's obvious that we now have much more knowledge about climbing-related injuries than we did 25 years ago. We also have much more knowledge about sports injuries in general. So, even though the occurrence of climbing-related injuries is increasing with the growing numbers of new climbers, we – healthcare professionals, coaches and parents – have a better understanding of how to address these injuries, both in reducing the risk of injury in the first place, and managing them when they occur.

# Klatre-talent fester NM-grepet

«Det stilles stadig større krav til styrke. Hvert «flytt» er ganske krevende»

Stian Christophersen

Stadig oppover. Stian Christophersen jager mot toppen. 18-åringen hører til klatre-eliten her i landet.

METTE BUGGE  
OLAV URDAHL (foto)

**NM-favoritt.** Unggutten fra Brønnøya i Asker er villig til å satse hardt for å få et skikkelig grep om denne sporten. NM-gull under mesterskapet i Kongsberg i juniorklassen i kveld er første mål, men han stiller også i seniorklassen i morgen. Der regner han med at kameraten Martin Mobersten (19), også han fra Asker, blir den sterkeste. – Jeg klatrer på sjette året, forteller Stian.

Han legger til at han ble helt hektet på denne sporten fra første stund. Pappa var turklatrer. Stian er sportsklatrer som mener at veggene innendørs er mest utfordrende.

– Det gjelder å ha pump, sier Stian. «Pump» er utholdenhet på klatrespråket. Stian har det, og dessuten styrke og forståelse av hvordan en rute bør legges opp.

– Det stilles stadig større krav til styrke. Hvert «flytt» er ganske krevende, forklarer han.

Under NM får deltagerne fem minutter til å se gjennom ruta før de skal i aksjon. Da gjelder det fort å finne ut hvordan det lønner seg å flytte armer og ben.

– Mange tror at det gjelder å komme forrest opp til toppen, men det gjelder å komme lengst.

## I idrettstroppen

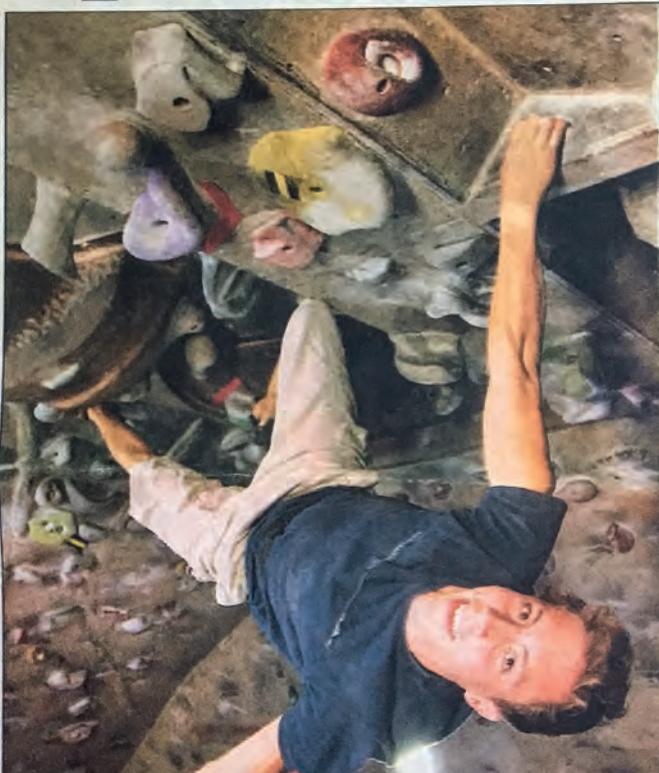
– Idretten er veldig allsidig, kommer det fra tenåringen som tidligere spilte fotball i Nesbru og deretter Holmen. Han ble lei av å møte opp til faste tider. Han ville kjøre sitt eget løp, men det betyr ikke at han sluntrer unna treningen. Stian Christophersen er med i idrettstroppen på Kolsås, og når han er ferdig med militæret i desember, bærer det ut i den store verden.

– Jeg og Martin kommer til å dra utenlands for å klatre mye, både i Spania og Frankrike.

Klatresenteret Tyrili i Oslo er hjemmebane for askerbøringen. Der får han god støtte av Miguel de Freitas, tidligere norsk landslagstrener, opprinnelig fra Portugal.

## Grepa kar.

Stian Christophersen henger høyt, men er blid. Forberedelsene til NM har foregått på Tyrili.



TIL NEDERLAND: Disse representerer Norge i junior-VM i Nederland. Fra venstre: Martin Mobersten fra Asker, Jan Fredrik Prytz fra Bamnå, Stian Christophersen fra Asker og Niclas Prytz fra Bamnå.

Firklover til junior-VM

## Klatre - kameratene

Disse gutta har lekt seg i hele sommer. De har faktisk lekt seg hver eneste dag de siste fire årene. Men fra onsdag blir det alvor. De skal representere Norge i junior-VM i Nederland.

«Jeg liker å stå på et annet medlem fra Asker og Martin Mobersten. Og etter å ha gjort det siste året i samarbeid med Kongsberg, er det nå i samarbeid med Martin Mobersten, som...

De fire leker seg rundt med en fast og en løst, som kan ta seg til å klatre som...

– Skal du bli...

‘I SKIPPED THE JUNIOR WORLD CHAMPIONSHIPS AND TOOK IT RELATIVELY EASY FOR THOSE SIX WEEKS, DOING ALTERNATIVE TRAINING DURING THAT SUMMER; I NEVER HAD ANY PROBLEMS WITH THAT INJURY AGAIN.’

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Unfortunately, when one wants to improve in a sport, injuries are a part of the game. A preventive measure can at best reduce the risk of an injury occurring, but even if we do everything right, there is still an element of chance involved. However, having more accessible knowledge can allow us to train more effectively with a generally lower level of risk; we can also recover more quickly if and when we do pick up an injury.

The aim of this book is to make a central contribution to the knowledge base that healthcare professionals can refer to when treating climbers, and also be understandable to climbers who do not have a medical background. Therefore, it will attempt to ride two horses simultaneously – by being scientifically strong yet presented simply – so that it is a valuable tool for both healthcare professionals and climbers.

I've always been fascinated by how our bodies work, but, perhaps more importantly, I've always been fascinated by working with people. After nearly 30 years as a climber – competing nationally and internationally; climbing outdoors all over the world; clinically treating patients for 15 years; training and medically managing athletes of all ages and levels, including the international elite; and writing two books on climbing training – I still feel the joy of developing myself as a professional in my field *and* as a climber.

This is why I felt it was time to write about the part of my work that deals with climbing injuries. Injuries that climbers get. Climbers who are people. People who consist not only of structural, biological and physiological aspects, but also thoughts, emotions, worries, joys and a sense of social belonging.

Therefore, this book is not solely a medical reference guide covering all of the climbing-related injuries described in scientific literature. Instead, it describes the most common climbing injuries and ailments that I encounter frequently in my clinical practice – and how they can be diagnosed and treated, and hopefully prevented. I examine these injuries from various perspectives – anatomical, physiological, psychological – encompassing topics such as the specific structures involved in injuries, pain physiology, overall load, exposure and movement optimism. The goal is for this book to collectively address all of the different factors that affect an individual who is experiencing pain or injury.

It's important to note that in all research and knowledge, there is a recurring issue that fixed protocols do not have the same effect on every individual who undergoes them. The same training protocol might be positive for some, negative for others, and some people might not experience any change at all. There can be many reasons for this, but the most important is that every person is different and unique in their own situation. A rehabilitation protocol or treatment method that works for me may not work for you. Therefore, I will be very cautious about presenting such protocols and methods as *universal* solutions; yet these protocols and methods are usually based on fundamental principles. So, if we understand the principles well enough, we can adapt the methods to fit an individual. That's why this book is based on such principles – so that the methods I've presented can become suggestions that you can customise to make them work specifically for you. I know it would be easier with a definitive answer and, if I had one, I would gladly give it to you, but we need to be humble regarding what we can actually say and claim.

This is a self-help book – a self-help book based on the best available knowledge and my personal and others' experiences from many years of climbing. It is a book for anyone involved in climbing, with or without a medical background, with the goal of reducing injury risk and helping climbers handle their injuries as effectively as possible when incidents do occur.

TO ODA AND KASPER.  
ANYTHING IS POSSIBLE.





A man with dark, wavy hair, wearing a red t-shirt and dark pants, is kneeling on a grey carpet. He is looking down at his hands, which are resting on the carpet. The background is slightly blurred, showing what appears to be a white structure. The text "INJURY MANAGEMENT" is overlaid in white, bold, sans-serif font across the center of the image.

# INJURY MANAGEMENT



PHOTO: MARTIN HOBRÄTEN

*Shaken not Stirred aka Right Martini (V12),  
Hueco Tanks, USA.*

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# HANDLING OF ACUTE SOFT TISSUE INJURIES AND OVERUSE INJURIES

We differentiate between acute injuries and overuse injuries because these different types of injuries require different approaches to treatment. However, there are some common factors for treatment and prevention, and in this chapter we will look at the management of acute injuries and overuse injuries from various perspectives.

We will examine the principles for managing acute injuries, and look at how physiological, psychological and social factors affect injuries; factors such as load management, strength training, recovery, sleep and nutrition. This chapter lays the foundation for chapter 2 which looks at specific climbing-related injuries (page 38).

# ACUTE SOFT TISSUE INJURIES

**FEBRUARY 2019.** *It is my last day in Hueco Tanks. I have never been to a better bouldering area. We have climbed a lot, and my body has taken a beating over the last ten days. Nevertheless, I feel good and ready to crush today's wishlist on East Mountain. After a quick – too quick – warm-up I go for a flash attempt on Mo Mojo (V11/8a), but fail miserably. I work through the sequence; the crux is pinching hard with my right hand while placing a high left heel hook by my left hand before deadpointing up to a left hand sidepull. The heel hook is high and close to my body, and I can feel that I really need to pull on it to get my body around the roof that the problem climbs along. However, it feels like something I've done hundreds of times before, so my surprise is great when on my next attempt I hear three distinct pops from my left hip and find myself sitting on the pad below.*

*'What happened?' my friends ask.*

*I don't have an answer at the moment because, honestly, I don't feel much pain. Endorphins have that effect on us.*

*'Did you hear that?' I reply, as I check if my left hip is still where it should be.*

*It's the start of the last day, so it would take a lot for me to stop climbing today. And there isn't really any pain. I ignore the sneaking suspicion of a hamstring injury and move on to the next boulder. After a long day of climbing, a sandstorm forces us back to the car, and only then do I notice that I am limping. The next day, my left thigh is stiff all the way up to my buttock. The flight home from El Paso to Oslo is truly one for the books. Back home, what I initially suspected is confirmed. An injury in the hamstring muscles and tendon attachment at the sitting bone.*

When tissues in our bodies are suddenly exposed to forces they cannot withstand, they become damaged to varying degrees. This tissue damage undergoes a healing process through three phases – *inflammation* phase, *repair* phase and *remodelling* phase – where the outcome of each phase affects both the next phase and the final outcome. This means that we actually want inflammation – an inflammatory response – even though, over the years, many hypotheses and models have been proposed which support the suppression of this response.

In this book we will focus on soft tissue injuries – injuries related to muscles, tendons and ligaments. Bone tissue injuries, such as acute fractures or stress fractures, are approached differently, primarily through stabilisation and immobilisation to ensure proper healing and stability.

In 1978, Dr Gabe Mirkin introduced RICE – Rest Ice Compression Elevation – as an acronym for managing acute injuries, with its goal being to reduce swelling while dampening inflammation, thereby accelerating the healing process. RICE quickly became indoctrinated in healthcare settings and society at large; it is still common practice for ice packs or compression bandages to be used immediately after someone sprains an ankle.

Like many theories, however, RICE has not stood up to scientific scrutiny over time. Indeed, rest along with cooling has been specifically shown to have negative consequences for the outcome of the inflammation phase. As W.B. Leadbetter put it: *'Inflammation can occur without healing, but healing cannot occur without inflammation.'*

---

## WHAT DOES ‘INFLAMMATION’ MEAN?

The Latin origin of the word ‘inflammation’ is *inflammare*, which means ‘set on fire’. It describes the symptoms of the inflammatory process: redness and swelling with heat and pain – *rubor et tumor cum calore et dolore*.

A common misconception is that the swelling following an acute soft tissue injury is synonymous with inflammation. However, the swelling represents the accumulation of waste products produced during the inflammatory process which have not yet been transported away from the site of the injury. This transportation is carried out by the lymphatic system, which is a one-way system where fluid is pumped through lymph vessels back to the heart. This pumping function relies on muscle activity, so actively using muscles is the best way to reduce swelling. Immobilising an injured body part therefore does not contribute to reducing swelling; this inactivity also leads to muscle deconditioning, resulting in a poorer final outcome. And it is not only muscles that suffer due to inactivity. Tendons, ligaments and bones also weaken if they are not regularly stressed, so being completely immobile after an acute soft tissue injury is not something we should do.

Nowadays, we understand that we actually want and need an inflammatory process following an acute soft issue injury, yet at the same time we want to reduce swelling and maintain muscle activity and load. We want to avoid situations that can worsen the injury and we want to avoid the use of anti-inflammatory medications, aka NSAIDs (non-steroidal anti-inflammatory drugs). This development of our understanding over time has led to an evolution from RICE to PRICE to POLICE to MEAT to MOVE\*, finally resulting in the latest acronym, **PEACE & LOVE**.

The first part, **PEACE**, applies during the acute phase in the first few days following an injury.



\*RICE = Rest Ice Compression Elevation  
PRICE = Protection Rest Ice Compression Elevation  
POLICE = Protection Optimal Load Ice Compression Elevation  
MEAT = Movement Exercise Analgesics Treatment  
MOVE = Movement Options Vary Ease

## **P**ROTECT

This involves avoiding worsening the injury. If we injure a finger while bouldering, twist an ankle or experience a sudden jerk in a shoulder, it makes sense to end the session early. Although we don't want complete rest for the injured body part, we can limit its use, the load it is under and its range of motion to reduce the risk of worsening the injury. I see that I failed miserably at this first step when I injured my leg in Hueco, although I did switch boulders after the injury.

## **E**LEVATE

Keeping the injured body part above heart level means that fluid accumulated during the inflammation phase can more easily flow back towards the heart via lymphatic system drainage, thus reducing swelling.

## **A**VOID ANTI-INFLAMMATORY MODALITIES

As described on the previous page, we are aiming for a successful inflammatory phase, rather than trying to suppress it. Therefore, we should avoid NSAIDs and cooling measures. Such interventions may reduce pain, which can certainly be desirable in some cases, but they will have no positive effect on the inflammation phase or the final outcome.

## **C**OMPRESS

Despite a lack of documentation on the effectiveness of compression bandages, they may help to reduce swelling by providing support around an injured body part. They also appear to be beneficial for quality of life during the period following, for example, an ankle sprain.

## **E**DUCATE

In a world full of internet and YouTube gurus, infinite Google search results, quick fixes and high-tech solutions, it can be difficult to know who to listen to and what information to rely on. Providing good answers related to the type of injury, timescales, prognosis and what a patient can do during the healing process is an important part of a healthcare professional's job, and this is the information we should expect when seeking professional help. The late English physiotherapist Louis Gifford suggested that there are four questions all patients want answered when seeking help:

1. What is wrong with me?
2. How long will it take to get better?
3. What can I (the patient) do?
4. What can you (the healthcare professional) do?

Good answers to these questions, based on the best available knowledge, will give us a quicker start to an active approach to healing and increase our confidence in the process. It will also reduce the need for treatment modalities and medication, while allowing the rehabilitation to progress naturally in the best possible way. Being able to answer all these questions was crucial when it came to handling my own hamstring injury.

---

While **PEACE** is reserved for the first few days following injury, soft tissue injuries then require **LOVE** in the period following the acute phase.

## **L**OAD

All tissues in the body repair themselves and build up capacity through loading. The underlying mechanism for this is called ‘mechanotransduction’, and it is now well known how mechanical stimuli increase muscle, tendon and ligament load-bearing capacity. Optimal loading during this phase involves loading the tissue without worsening the symptoms, such as pain or swelling, afterwards.

## **O**PTIMISM

Injuries rarely come at convenient times, and they can negatively affect quality of life and mood. Mental factors such as fear of movement, depression and anxiety can be major obstacles in the rehabilitation process, with a direct negative impact on the final outcome. There isn’t necessarily a close relationship between injury severity and symptoms experienced, but there is a much stronger connection between thoughts and emotions and symptoms. It’s about how we feel, but also how we handle those feelings. An optimistic mindset leads to better outcomes and prognosis, so we need to focus on the positive in a tough situation. This is one of the reasons why this book has a dedicated section on movement optimism (pages 147–148).

## **V**ASCULARISATION

Good fitness isn’t necessarily a performance factor for climbers, but after an injury it is important to start general strength and conditioning training early. This increases blood flow throughout the body, potentially reducing pain and improving motivation to continue training. Such forms of exercise also make us feel actively involved in the recovery process; with a finger injury, there is actually a lot of other training we can be doing. Not only does this positively impact the rehabilitation process, but it also makes us stronger and improves our overall physical condition.

## **E**XERCISE

Exercises that target injured tissue structures are the cornerstone of the rehabilitation process. As already explained, exercises provide the specific load to the tissue which optimises healing. Exercises that contribute to regaining strength, full range of motion and confidence in the injured body part are crucial, and should be started as early as symptoms allow.

The most important message you should take away from this section is that **acute soft tissue injuries do not require prolonged periods of rest**. They involve an acute inflammatory phase which is required for optimal healing, but it is then absolutely necessary to load the tissue from an early stage to ensure the best possible outcome. The most common climbing-related injury is an acute pulley rupture in a finger, and the principle of **PEACE & LOVE** applies greatly to this type of injury. Keep this in mind when you read the section on pulley injuries on pages 41–51.

# OVERUSE INJURIES

Whereas acute injuries have a clearly defined time of injury (often a specific event), both the cause and the time of onset are less clear in the case of overuse injuries and conditions. Simply put, overuse injuries can be the result of exercising:

**TOO MUCH, TOO OFTEN, TOO SOON and with TOO LITTLE REST.**

However, it is difficult to be certain about what is too much or too often. Therefore, we consider the load from various perspectives – physiological as well as psychological and social. Let's start with the physiological aspect.

All tissues in the body adapt in response to loading. This is why muscles become larger and can generate more force, why tendons and ligaments become thicker and stiffer, and why bones build more bone tissue. Overall, loading allows us to develop strength and resilience against higher forces. To stimulate this adaptation process, we must expose our bodies to stimuli which they are not already capable of handling. This applies to all types of training – from purely physical, to technical and mental training. If we exceed what the tissues can withstand without then providing sufficient rest so they can adapt, no adaptation will occur; instead, this repeated tissue breakdown may eventually lead to symptomatic tissue damage.

We can use our fingers as an example. By climbing on steeper wall angles and using smaller holds, we can expose our muscles, tendons, ligaments and bones to forces that can make us stronger. This leads to thicker and stiffer pulleys and tendons, thicker bones and broader joint surfaces if we rest adequately between sessions. However, without sufficient recovery, we may experience adverse reactions such as elbow tendinopathy, tenosynovitis within the flexor tendon sheaths and synovitis in the finger joints. In younger climbers who are still growing, excessive loading can cause changes and potentially fractures in the growth plates of their finger bones (read about my own experience of this on page 8). It is difficult to determine exactly where the limit is, but this is the key. If we can control the load, so that there is a balance between stress and recovery, we can both reduce the risk of injury and manage it better if and when it does occur. Rehabilitating an overuse injury is impossible without adjusting the load that caused it; therefore, all rehabilitation programmes should have load management as a fundamental principle.

A good place to start is the **LOVE** protocol (see previous page). Load management is not about a complete unloading, but rather about adjusting the different elements that make up the load. By adjusting both volume (how much we train) and intensity (how hard we train), we can continue training and climbing if we also ensure sufficient rest. Paradoxically enough, loading is a crucial part of managing overuse injuries. In most cases, there are many things we can still train that will have positive effects on our physical and mental well-being. A painful finger may lead us to reduce specific finger training and avoid steep crimping for a short period, but we can still practise technique on larger holds with gentler wall angles, practise clipping techniques while lead climbing, and work on arm strength and basic conditioning.

---

This way, we provide some reduction in load for the affected finger while simultaneously improving other aspects of our climbing through general training. This general approach to training also has a positive effect on reducing recovery time for an injured finger, and generally has a positive psychological response because we are actively doing something towards getting better.

**'IF YOU GO TOO HARD ON YOUR EASY DAYS ...  
SOON YOU WILL BE GOING TOO EASY ON YOUR HARD DAYS.'**

**KEIJO HÄKKINEN**, WORLD-LEADING RESEARCHER IN POWER TRAINING



A good method for becoming aware of and monitoring training load over a period of time, such as a week, is labelling sessions as red, yellow or green. Red represents the hardest sessions, green represents the easier sessions, and yellow sessions fall in between. A hard bouldering session for two hours would be considered a red session, and looking back over a week it is possible to see how many red sessions there have been. If there are lots of these sessions within a week, this is not a sustainable training strategy. To improve our climbing ability, we must climb a lot, which means that we must vary our training so it is more sustainable. This could still mean bouldering for two hours, but instead on gentler wall angles, or focusing on technical balance problems. It may not be as physically demanding, but it requires more technical skill.

By combining more general physical training with specific training for an affected body part, we can avoid large fluctuations in the loading rhythm. If a climber is used to climbing and training three times a week but then takes three weeks off completely, there will be a drop in training load. When they start again, they should build up towards their previous level of training load; however, this pattern of peak-drop-peak can contribute to recurring issues. We should strive to maintain a relatively steady workload with only short and moderate fluctuations periodically to vary the load. However, illness, injury, holidays and life in general can cause a drop in training intensity that deconditions us physically. Few of us are diligent enough to gradually rebuild our condition following these periods, and so this often leads to us doing too much, too soon.

Being aware of this can serve as an injury prevention measure: if we incorporate brief sessions of finger and upper-body strength training during times when we have less time or opportunity to climb, we will be much better prepared when we resume climbing again.