



**ACT  
ADJUNCT  
COMPENSATORY  
TRAINING  
FOR ROCK CLIMBERS**

**CLIMBERS'  
COMPENSATION TRAINING  
WITH A MEDICAL FOUNDATION**

Volker Schöffl, Dicki [Ludwig] Korb, Patrick Mätros

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## DICKI

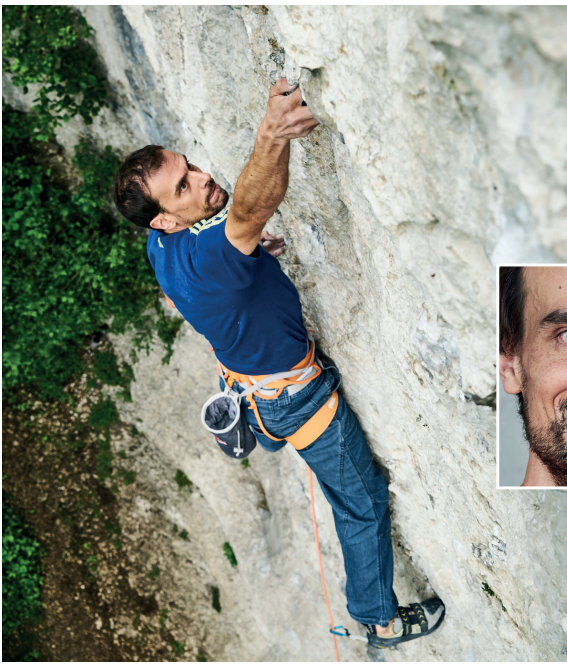
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## PATRICK

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Patrick has 20 years of climbing experience with about 200 ascents of

routes between 8a and 8c. In 2011, he was able to make one of his biggest dreams come true with an all clean first ascent of Archon (8b) in his home area, the Frankenjura. At the time of publishing, Archon is the most difficult trad route in the region and has only been repeated by Alexander Megos. ([www.kraftfactory.de](http://www.kraftfactory.de))



# THE EXERCISES

## SECTION 1: GENERAL ACT - ADJUNCT COMPENSATORY TRAINING FOR ROCK CLIMBERS

### SHOULDERS

Handstand Walkabouts	20
Sword Pull	21
Rotation Curls	22
Chest Opener	22
ACT Pull-ups	23
Wall Slides	24

### ELBOWS

Finger extensors with ACT band	25
Finger extensors and wrist rotation with ACT band	26

### WRIST

Upside-down Kettlebells	27
-------------------------	----

### CORE: ABDOMINAL AND BACK MUSCLES

Power Plank	28
Twisted Mountain Climbers on Stability Ball	29
Core Pendulums	29

### HIPS

One-legged Romanian Deadlift Variation	30
---	----

### LEGS

Active Hamstring Mobilisers	31
One-legged Chair Squats on Foam Mat	32

### FEET

Ankle Supination Rolls	33
Compass	33

## SECTION 2: INJURY SPECIFIC ACT - ADJUNCT COMPENSATORY TRAINING FOR ROCK CLIMBERS

### SHOULDERS

Sword Pull	41
Tabletop Arm Extensions	42

Resistance Band Behind the Back	42
Rotation Curls	43
External Rotation with Resistance Band	43
Handstand Walkabouts	44
Bear Walk with Arm Raises and Other Variations	45
Kneeling Neck Pulls	45
Ring Push-ups	46
Scapular Dips	46
ACT Rowing	47
ACT Rowing	48
Kneeling Neck Pulls	49
Fake Pull-ups	49
Kettlebell Overhead Press	50
Circular Handstand Push-ups	51
External Rotation with Resistance Band	51
Rotation Curls	52
Weighted Prone Internal Rotations	52
ACT Pull-ups	53
Wall Slides	54
Prone Scapular Stabilisers	55
Combined Scapular Push-ups	55

### ELBOWS

Eccentric Finger Curls with Resistance Band	57
Flexor Sling Stretch on Stability Ball	57
Wrist Extensor Training	58
Finger Extensor Training with ACT Band	58
Eccentric Variation with Hammer	59
Eccentric Finger Exercise	59
Eccentric Finger Extensor Exercise	60
Wrist Flexors with a Dumbbell	61
Eccentric Finger Curls with Resistance Band	61
Dumbbell Curls	62
Eccentric Variation with Hammer	62
Eccentric Brachialis Exercise	63
Eccentric Biceps Exercise	64
Sword Pull	64

### WRIST

Wrist Stabilisation with Kettlebell	65
Wrist and Finger Extensor Training	66





Eccentric Variation with Hammer	66
Reverse Kettlebell Push-ups	67

### FINGER INJURIES

Finger Extensor Training with ACT Band	69
Finger Extensor Training	69

### SPINE AND CORE

Core Pendulums	70
Power Plank	71
Foam Roller with Kettlebell Push and Pull	72
Shoulder Girdle Openers on Stability Ball	73
Floor Angel	73
Wall Angel	74
Overhead Squat with Bar	74
Elbow Raisers	75
Stability Ball Pretzel	76
Pretzel	76

Look Around	77
Neck Press	77

### HIPS

T-Stand Hip Rotations	78
Sideplank Leg Lift	79
ACT Squat	79
Fire Hydrants	80
Active Hamstring Mobilisers	81
Rotated Hamstring Stretch	82
T-Stand Squat	82

### KNEES

One-legged Romanian Deadlift Variation	83
One-legged Push with Barbell	84
One-legged Lunge Variation	84

### ANKLES

Ankle Supination Rolls	85
Compass	85

# INTRODUCTION

## **ACT - ADJUNCT COMPENSATORY TRAINING FOR ROCK CLIMBERS: CLIMBERS' COMPENSATION TRAINING WITH A MEDICAL FOUNDATION**

It is a well-known but often overlooked fact that climbing involves not only strong fingers but also a strong overall athletic build. Many climbers focus their training mainly on finger strength without paying attention to the fact that those fingers are attached to a body, and that body needs to be trained as well. Many injuries can be avoided by increasing overall strength, for example scapular stabilisers and core strength. Purely dead hanging on crimping fingers won't get you far! If we were to subdivide training for rock climbing into three categories, these would be specific finger-strength and climbing training, overall general strength training (including some cardio training) and a third, new component, defined as **Adjunct Compensatory Training, or ACT**.

Regarding climbing-specific and finger-strength training, we refer to various literature including "Gimme Kraft" by Dicki (Ludwig) Korb and Patrick Matros. This training can be performed either while climbing or separately (e.g. campus boarding, dead hangs etc.). Other muscles groups such as the biceps or the pecs can be trained with various general strength-training exercises like biceps curls. Don't forget that a high

cardiopulmonary capacity helps to endure the high specific training load in climbing, and thus should also be part of your training program. Both of these training styles focus on building up your strength to climb as hard as you want to, but there is a flaw in this! These methods of training are very climbing-specific and mostly focus on muscle slings and innervation patterns which operate during a climbing move. In order to withstand such trainings over a longer period of time and to prevent injuries, the antagonists and neglected muscle groups **MUST** be addressed. This is where **ACT** comes into play.

**Adjunct Compensatory Training** focuses on training the neglected muscle slings and innervation patterns within their specific range of motion, building up posture and core strength as well as balancing the athletic build of the body. The **ACT** concept was inspired by our long-time cooperation with high-level athletes. We combine our sports-medical and trainings-methodical knowledge to effectively prevent injuries and overstrain. Volker Schöffl, as the MD in the group, analyses the body from a sports-medical and biomechanical point of view. With his vast knowledge of climbing injuries (Volker Schöffl, Thomas Hochholzer, Sam Lightner Jr. "One Move Too Many") and as a highly active avid climber, he understands why certain conditions could and do lead to injuries in the long-term. Dicki and Patrick are





world-renowned climbing trainers and coaches. Coming from a top-level climbing background themselves, they focus on climbing-specific training (“Gimme Kraft”, “Kraftfactory”) and biomechanical analysis of climbing. Weaknesses in certain climbers which can be reduced through specific and adjunct training are frequently revealed by the biomechanical aspects. Combining our two fields of expertise, we have collaborated to create Adjunct Compensatory Training, which aims to rebuild neglected range of motion in muscle slings and to improve neuromuscular innervation patterns. Thus, it will help you to better withstand specific climbing training and reduce injury and the risk of overexertion. The **ACT** concept was born in 2015 and has been consistently developed further with in our group since then. In our dai-

ly work with both elite athletes and “normal” climbers, we perpetually evaluated, restructured and remodelled our exercises, structuring and fine-tuning a program which we find most effective.

The **ACT** program consists of two sections. The general section focuses on preventative exercises especially for climbers and the specific section defines the adjunct and extra exercises which you can do as an injured climber, in addition to surgical or conservative medical therapy.

The exercises comprising the general section are based on our biomechanical analysis of climbing movements, as well as climbers’ posture, build and the causes of chronic injuries over time. This collection should be an adjunct program, completed



in addition to your normal training at least twice per week. One session takes approximately 20 minutes and you should choose one or two exercises per focus from the collection. It's your decision whether you want to do this before or after a climbing session or separately on your well deserved "rest day". Alternatively, you can choose from the exemplary circuits of exercises and just follow these.

The exercises included in the specific section are designed to help your therapy in the case of an injury or overstrain. These exercises are not intended to substitute a doctor's evaluation but outline what you can do to help the healing process. It is important to remember in general and especially after surgery that you need to consult your responsible physician before proceeding; just

take this booklet along and speak with her or him. Thus, the second section of the **ACT** program has been developed for certain injuries and focuses on the specific aspects of **ACT** which are relevant to these injuries. It is possible to add some exercises from the general **ACT**, but again, especially after surgery, consult with your treating physician regarding which exercises are allowed at which stage in the rehabilitation process. The specific section helps to answer a question often asked by injured climbers: what can I do to recover? How can I supplement my rehab in addition to what the doctor or physiotherapist does? Here is the answer: **ACT**.

We want you to enjoy your climbing as much as we do ours. This should be injury-free and without negative



consequences in your future life. Of course we can't eliminate the sudden onset of a trauma, but we definitely think that we can decrease the likelihood of trauma and the onset of chronic conditions together through **ACT**. There's only one factor which we can't influence: you have to do your **ACT**, we can't do that for you!

For more comprehensive medical information on climbing-specific conditions, we refer to "One Move Too Many" (Volker Schöffl, Thomas Hochholzer, Sam Lightner Jr., Sharp End publishing, Boulder, CO, USA), the German edition "Soweit die Hände greifen" or the various other translations. For purely strength-related training, we refer to "Gimme Kraft" (Patrick Matros, (Dicki) Ludwig Korb, Café Kraft GmbH). This book here is intended as the bridge between those two ends of the spectrum of training for climbing.

Ok, let's go further into the theory behind **ACT**.

### **CLIMBING AS A SPORT WITH A HIGH DIVERSITY OF SPECIFIC MOVEMENTS**

Modern climbing and bouldering are disciplines which require a huge number of degrees of freedom in their movements. The central objective is always to solve new problems. Thus, we focus on the development of open movement and flexibility skills in sport climbing. The diversity of movements is related to the different types of rock in outdoor

climbing (e.g. granite, sandstone or limestone) which have specific textures for hand- and footholds, therefore requiring various techniques for climbing. On the other hand, in indoor climbing, which is becoming more and more popular, an endless number of different hand- and footholds in addition to the combination of walls in various angles of steepness guarantee that no two moves are identical. In this regard, modern indoor bouldering is renowned for continuing to raise the bar.

The diversity of movements including pulling, pushing, twisting and swinging makes it difficult to determine the weak points in the locomotive system of a climber which are the cause of overstress or injuries related to training for climbing.

A first evidence-based step results from a targeted analysis of specialist diagnoses of climbing injuries, overstrain injuries, and their case history. The medical centre for sport climbing in Bamberg, Germany, under the direction of mastermind Volker Schöffl, is world-renowned for injuries of this variety (Sportsmedicine Bamberg – [www.sportsmedicine.rocks](http://www.sportsmedicine.rocks)).

The next step is based on the identification of problematic patterns of movement, understanding the functional anatomy behind these movements and analysing where limited range of motion or biased muscle innervation could have led to myofascial disharmony or imbalance. Patrick Matros and Dicki Korb are the founders of the "Krafftactory",

one of the leading climbing training services. They are committed to achieving a deeper understanding of the connection between anatomy and injury; many top-level climbers seek their advice.

### THE MYTH OF ANTAGONIST TRAINING

So-called “antagonist training”, as it has come to be known, seems to be undifferentiated and is generally ineffective in achieving the goal of injury prevention. The perspective that the movements of climbing have antagonist muscles which weaken over time due to poor innervation and, as such, need to be “built up”, shows a rudimentary understanding of the functional anatomy of the human body.



### ADJUNCT COMPENSATORY TRAINING (ACT-TRAINING) - THE BETTER PREVENTATIVE ANSWER

The goal of our **ACT-Training** is to compensate biased movement patterns and strengthen the structures of the locomotive system which undergo high strain during climbing. Learning functional movement patterns and their transfer into climbing movement plays a crucial role in achieving this goal. Additionally, we try to integrate the neglected muscle groups with the primary goal of achieving maximum active control of the range of motion and innervation of muscle chains working together functionally. We cannot endorse and do not practice a simple hypertrophy strength training of the so-called “antagonist muscles”.

To get to the point, this means:

- Try to maintain a high and functional range of motion in your joints which are often stressed by imbalanced movement in sport and activities of daily life
- Try to keep a highly active neuromuscular control of this range of motion by strengthening your muscles at the edges of mobility and by implementing functional movement patterns

We don't base our exercises on their visual attractiveness or coolness factor. Unfortunately, this kind of exercise which focuses on impressive body positions or unnecessarily in-



creased instability is often shown in the tutorials available on many video channels.

We believe in good sensory control of movement and, as such, focus on the smaller, subtler movements of the exercises. This often means that the athletes have to withstand some discomfort, but this is exactly the point at which the adaption process starts.

## **ACT-TRAINING – WHAT IS IT?**

Let's take a popular exercise to clarify: The I-Y-T Exercise, which is usually done using a sling trainer.

In this exercise, you pull your whole body out of a slightly backwards-tilted position into a vertical position. This exercise is performed with the arms in three positions: elevation with the arms in maximum overhead position (the "I"), elevation with the arms at approximately 130° abduction in the shoulder joint (the "Y"), and elevation with the arms at 90° abduction in the shoulder joint (the "T").

In our opinion, this exercise doesn't adequately target our goal of balanced compensation training; there are many more cons than pros. The goal of this exercise is to strengthen specific muscle groups of the shoulder girdle, which prevent or minimise a non-functional posture of the upper-body, while simultaneously training the core.

The idea can be traced back to Vladimir Janda, neurologist and well-



known pioneer of functional movement. He described the so-called "upper cross syndrome" as a functional imbalance induced by high tone and myofascial shortening of specific muscles of the shoulder girdle (e.g. Mm pectoralis major et minor) which can't be compensated sufficiently. In many cases, this can be observed as a prominent kyphosis of the climber's back. Clinical symptoms are well known and often provoked by frequent bad posture while sitting. The muscles known as prime movers during climbing movements (Mm. pectoralis major et minor or M. latissimus dorsi) can also intensify the problem. The I-Y-T exercise aims to strengthen the "neglected" muscles in a way of "anti-movement", which initially doesn't seem like a bad idea. However, this exercise doesn't consider the very specific neglected range of motion in climbing movement regarding the aforementioned muscles and muscle slings, for ex-

ample the lack of maximum flexing in the shoulder joint (maximum opening of the shoulder-torso-angle). The I-Y-T doesn't target this problem, as you can compensate much too early with your lumbar spine since it is executed in a plank position.

Therefore, the aforementioned core aspect of this exercise, which is often proclaimed as an advantage, is actually a disadvantage! Instead, we recommend exercises which enable much better control of active range of motion in the shoulder joint, such as lifting the arms while in a heel seat. The lumbar spine is locked in this exercise and the climber can focus much better on the intended target. Nevertheless, we still work in a functional way, not isolating single muscles, which can often lead to transfer problems.

We don't reject sling trainer exercises; on the contrary, we work a lot with this device! However, we analyse every popular exercise exactly, weighing up the pros and cons to make sure that it is suitable for our goals.

This collection of exercises cannot replace a personal trainer who, based on knowledge and long-term experience, would be able to identify and treat specific and individual dysfunctional patterns. We've tried our best to document the most frequent injuries and overstress syndromes known in sport climbing and to show you exercises which have proven themselves throughout years of our work and can make you a better climber!

Train smart! ☺



# THE STUFF YOU NEED

Although we have focused on exercises which do not require much equipment, you will need a few basic things.



Dumbbell



Kettlebell



Foam Mat



Stability Ball



Foam Roller

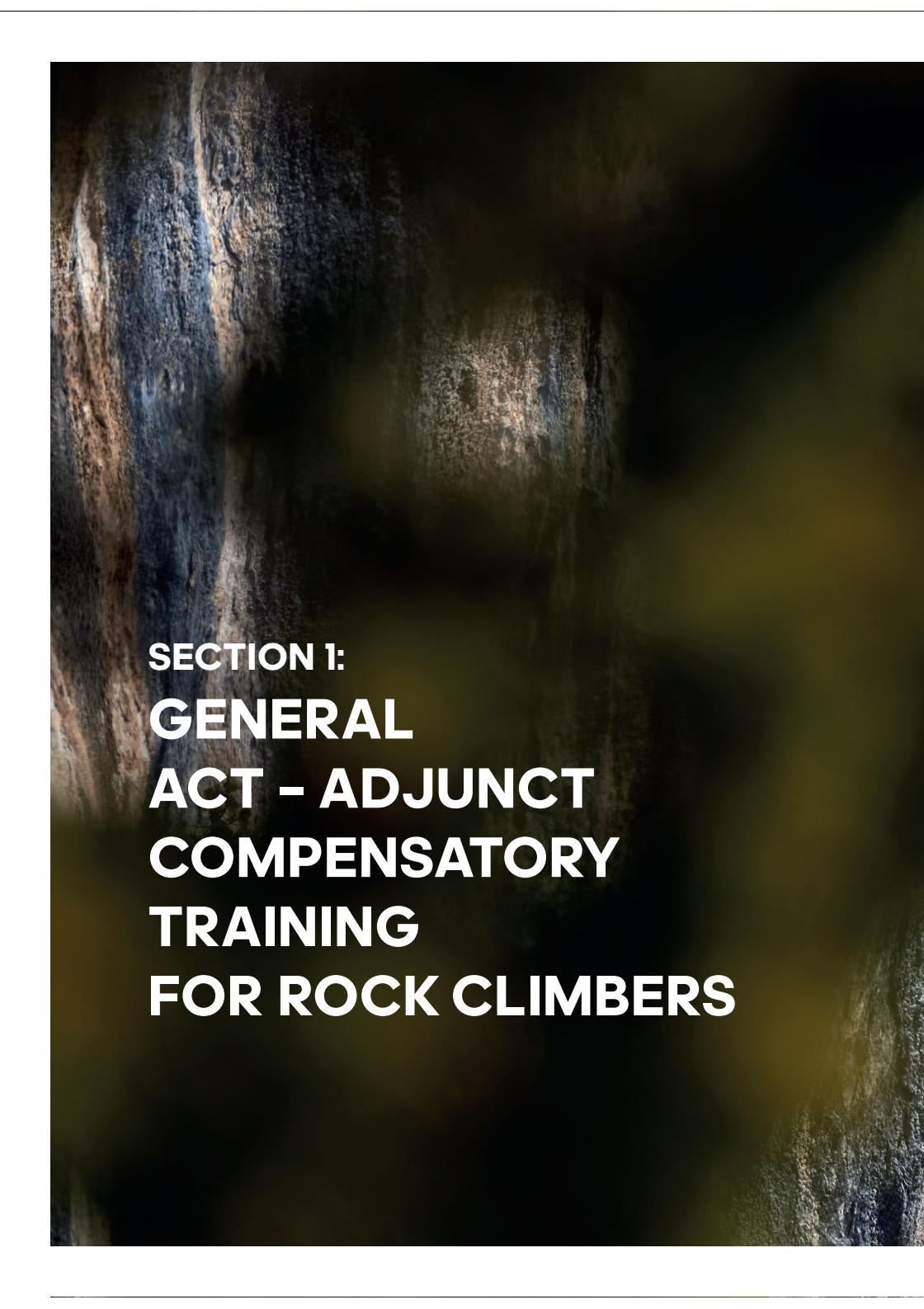


Small  
Resistance Loop  
(ACT band)



Long  
Resistance Band





**SECTION 1:  
GENERAL  
ACT – ADJUNCT  
COMPENSATORY  
TRAINING  
FOR ROCK CLIMBERS**







The general part of the ACT exercise collection is based on our biomechanical analysis of climbing movements, as well as climbers' posture, build and the causes of chronic injuries over time. This collection should be an adjunct program, completed in addition to your normal training at least twice per week. One session takes approximately 20 minutes and you should choose one or two exercises per focus from the collection. We strongly recommend varying your choice of exercises to ensure the best training outcome. It's your decision whether you want to do this before or after your climbing session or separately on your well-deserved "rest day".

There are no strict instructions for repetitions and sets for the following exercises, since this doesn't fit

in with our concept of an individually tailored training program. Additionally, an exact number of repetitions or sets for specific purposes or goals is not scientifically verifiable in most cases [e.g. Friedmann, B. German Journal of Sportsmedicine 58, 1, 2007]. It's only possible to define specific phases in which certain physiological chain reactions are more strongly trained, e.g. "time under tension" as a stimulator for muscular hypertrophy. Finer details are then set individually. In addition to suggesting an appropriate range of repetitions, we use the following parameters:

- speed of motion: static hold, dynamic (slow, medium, fast)
- intensity: low, medium, high, ARAP (as many reps as possible)