

Chapter 5

Training and Back to Training



Photo 5.1

5.1 Climbing Different Grips

5.1.1 *Strains of the Various Grips*

The position of a finger can be either straight, arched, or hooked. The hand morphology, the various grips available outdoors or indoors (CG), the climber's level, and his personal abilities are factors which determine the possibilities of seizing a hold.

The fresh climber prefers using the crimp grip. A maximum strength is liberated while gripping, and in a way, this fact reassures the athlete – emotional pole. As he gets more experience, learning new movements, his former crimp grip posture turns gradually into the open hand one. These various changes depend on his physical and emotional skills but also on his own sensations. It is important to develop all the possible tactics by training on various supports – different degrees of steepness, orientations, sizes, spaces, numbers of holds – especially outdoors in order to face any situations.

Reducing the seizing of holds to one posture – crimp grip or open hand grip – would be like decreasing the numerous possibilities available in rock climbing. In addition to finger locks and fist jams, some holds can be tackled combining the crimp and open hand grip using all the fingers in turn. These grips are essentially present outdoors, but some factors make them compulsory in CG. The steepness of a hold can require what will be called a mixed posture, that is to say, a crimp grip for some fingers and an open hand posture for others. A more developed musculature is consequently required between the deep finger flexors (DCF) and the superficial finger flexors (SCF). The finger common extensors (FCE) play a main part (cf. ch. Assessment and Safety). And later in the book, it will be demonstrated how important it is to reinforce them, to improve the stability of the joint system, and to support the strain endured, especially in the open hand posture.

To conclude, it is rare to find a hold perfectly linear as regards grips, especially in natural sites. The angles, width, depth, and steepness of the hold are various factors which give a vast number of actions to each finger. Therefore, according to these factors, the surface in contact or the necessary strength will change.

Hand morphology is also an important matter. Bearing in mind the differences between the four fingers and comparing the climbers' hands, it becomes quite understandable why some of them can't always use the open hand posture or the crimping one.



Photo 5.2 Fingers' action and position influencing factors

5.1.1.1 Open Hand Posture

This posture is not natural for a fresh climber. Indeed, the idea of “seizing the hold” refers to the image of “clinging to something” which is implied in the crimp grip.

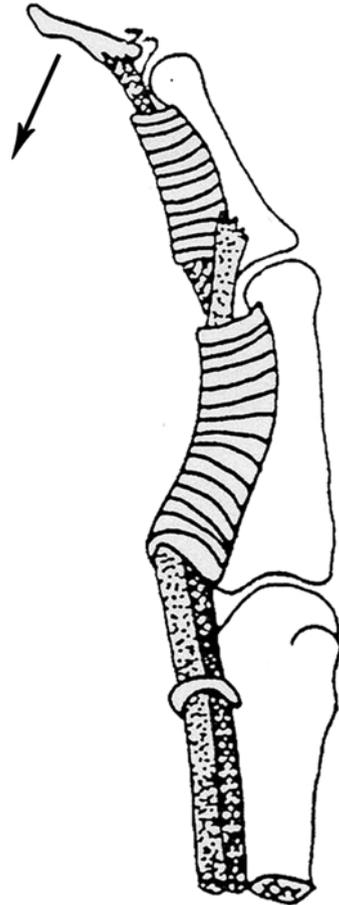
Therefore, the open hand posture requires an adjusted training time, because the climber has to maintain a perpendicular pressure to the hold, which is not so obvious according to the available surface. The pressure results from the part of the finger or the hand which is in contact to the hold. The pressure felt by a straight finger is higher on the last phalanx that is to say on P3. In that posture, the finger flexes the DIP joint with a slight flexion of the PIP joint too. According to L. Vigouroux, thanks to the open hand posture, the strain endured by the pulley is reduced – 32 times lower on A2 and 3 times on A4.

Quoting Grant and Al., Sweizer, Quaine, and Vigouroux, “considering an identical hold, no strength differences between the two postures have been reported whether at the highest intensity – used on the hold – or at the lowest point when finger muscles get tired.” Therefore, according to the shape, the size, the angle, the incline degree, and of course the climber’s skills, it is advised to use the open hand posture as much as possible.



Photo 5.3 Strength during the slope grip (Illustration inspired by Duval, *La Main du grimpeur: approche physiologique, clinique et expérimentale*, 1986)

Schema 5.1 Strength during the slope grip
(Illustration inspired by Duval, *La Main du grimpeur: approche physiologique, clinique et expérimentale*, 1986)



The strength over the two tendons FDS and FDP is equally distributed in the open hand posture. EDC strain is another parameter to be considered. For now, a specific training for these two muscles has not been reported yet. Coaches and climbers have to pay attention to the involvement of the EDC and see how to reinforce them.

Most of the time, the open hand posture requires the use of the four long fingers for large holds, which allows better contact with the surface in grips. As training goes by, the climber is able to use this posture on locked or rounded holds, adjusting the necessary number of fingers according to the size of the hold or the available surface. The open hand posture enables the climber to broaden his skills, using the four long fingers or just one finger to seize the holds.

Concerning the two-finger posture, it is more advised to use the middle finger and the ring finger. Indeed, the open hand posture maintains a better structure stability and limits the possible lesions on the pulleys in crimp grip. The middle finger prevails, and it is supported by the ring finger. These two fingers are supposed to be the strongest (Duval 1986), but they are also the most currently injured (Quaine et al.). The location of these two fingers in the longitudinal axis of the hand makes them the most convenient to be used.

Photo 5.4 The slope grip**Photo 5.5** Two fingers in slope grip position

Tendinitis and tenosynovitis are the most current injuries resulting from the open hand posture. Most of the time, tiredness or exaggerated training accounts for these lesions. Some grips on steep holds or non-ergonomic supports tend to cause this kind of trauma.



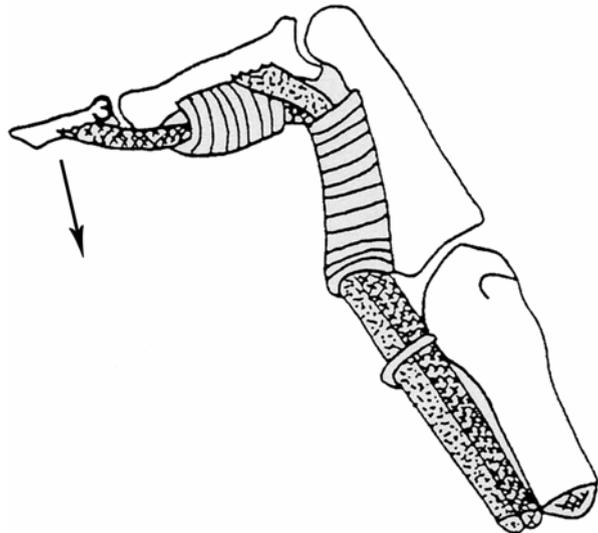
Photo 5.6 Slope grip in a broad surface

5.1.1.2 Crimp Grip

This posture which is associated to clinging seems to be more natural for the beginner climber. For the advanced climber, the choice of this posture will depend on the width of the surface of the hold. The smaller and narrower the surface is, the more appropriate crimp grip is – with one or several fingers – even if the hold is flat.

In addition to that, this posture is more convenient than the open hand posture to reach a farther hold – due to the wrist’s position which is higher.

Photo 5.7 Strength during the crimp grip (Illustration inspired by Duval, *La Main du grimpeur: approche physiologique, clinique et expérimentale*, 1986)



Schema 5.2 Strength during the crimp grip (Illustration inspired by Duval, *La Main du grimpeur: approche physiologique, clinique et expérimentale*, 1986)

In crimp grip, two cases are possible:

- The thumb is set on the index P3 phalanx. The pressure then brought on the phalanx is very strong on the surface level. But the pulleys are highly strained due to the angle of the PIP joint. In that particular case, the thumb acts like a finger locker to increase the strength.



Photo 5.8 Crimp posture

- The thumb clings to the hold and opposes its strength to that of the fingers. This posture can be compared to that of the pliers grip though in the former case the strength involved is opposite. This posture is an intermediary between the open hand posture and the crimp grip posture, because the PIP joint angle is less broad and consequently the strength involved on the pulleys is reduced. This posture of the thumb is commonly used in CG, because the added holds on the wall make it possible, either on the edge of the hold or on a steep part, or a specific part of it, or simply on the screw hole – in competitions, some climbing leaders make sure to refill it, whereas some retailers reduce the screw hole so that only the head of the screw hole can be visible. In natural sites, this posture is not commonly used and depends on the bumps on the surface.

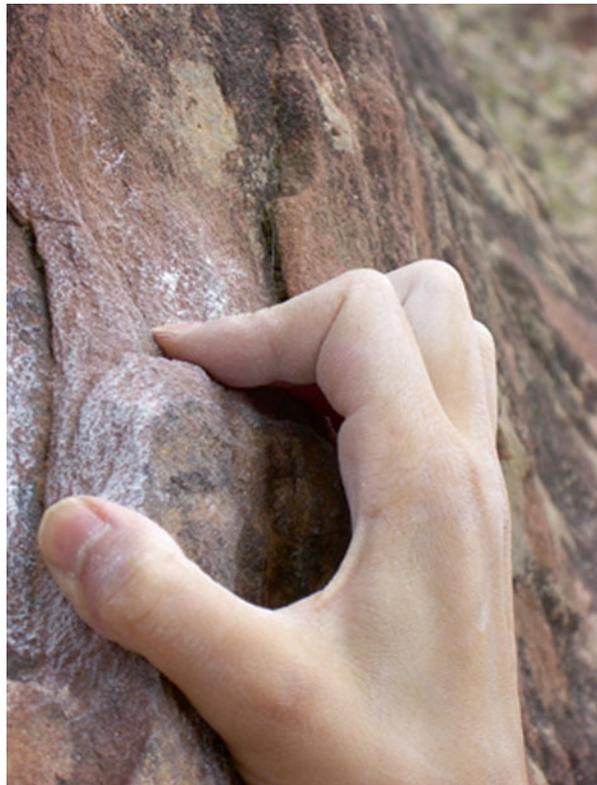


Photo 5.9 Crimp grip of the long fingers and pinch with the thumb

The crimp grip consists of a flexion of the PIP joint and a hyperextension of the DIP. Concerning the hardly hooked gripping – large holds – the pressure involved on the hold is focused on the P3 phalanx, which reduces the surface in contact.

This posture is a real strain on the A2 and A4 pulleys. According to L. Vigouroux, the A4 pulley is closer to its limit (85 %) than the A2 pulley (45 %). Indeed, the strength present on the A4 pulley is about 178.4 N, when its rupture point would be 210 N according to Lin et al. (1990). As regards the A2 pulley, the weight involved is about 200.2 N and its rupture point would be 465 N. The crimp grip posture is a real strain on the FDS muscle. FDP tendons and EDC extensors are active but to a lesser extent. Nonetheless, EDC activation is a factor to be considered as regards performances but also for the climber's health. The EDC muscle plays an important part.

The breaking off a pulley is the most common injury. In addition to the size of the hold, other factors increasing the tension of this fiber structure – angle of the hold, number of supports, etc. – or a too tiring training session or a bad preparation accounts for this kind of lesion.

5.1.1.3 Mixed Hand Posture

This posture involves a vast number of possibilities mixing crimp grips and open hand postures. For a great part and for each finger in action, this posture requires the flexor muscle DCF mobilization (in the crimp grip posture) or to an identical degree FDS, FDP, and the extensors EDC (in the open hand posture).

The mixed posture requires a more advanced level in climbing due to the specific strains endured by muscles. It can be quite traumatizing.



Photos 5.10 and 5.11 Combined grip position

5.1.1.4 Hooked Posture

This posture consists of a flexion of the PIP and DIP joints. It is a global hold, and it is usually used on large holds.

5.1.1.5 Locked Grip

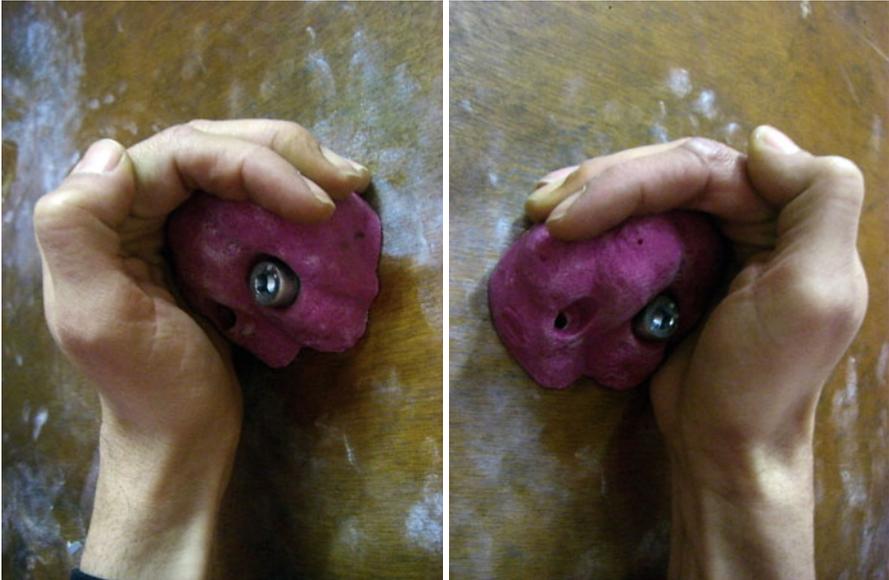
This grip usually requires the open hand posture. The climber inserts his fingers inside a hole or a crack and rotates his forearm inwardly. This phenomenon of locking reinforces the strength in presence. This grip can be painful or traumatizing for the joints (PIP sprains). The open hand grip generally improves the locking movement in seizing and consequently involves on a same level SCF and DCF without forgetting the extensors FCE.



Photo 5.12 Locked grip

5.1.1.6 Fist Grip

This way of gripping is more frequent in CG than in natural sites. The interest of this posture is that for the great part the hand flexors are involved – the palm of the hand is in contact with the surface of the hold. In that precise case, the surface in contact with the hand is large enough, so that the finger common flexors are slightly relaxed. This grip is convenient for large and rounded holds. Then it is easier to place the hand on the side above the hold and clutch the fist.



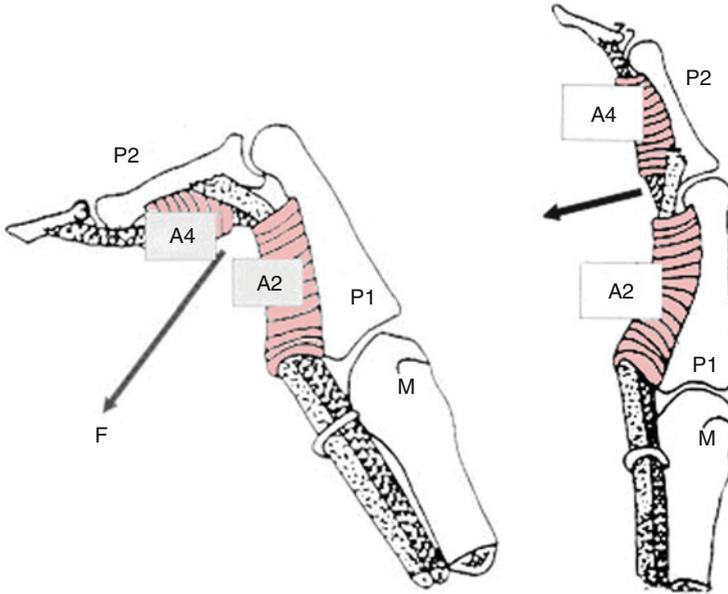
Photos 5.13 and 5.14 The knob grip



Photos 5.15 and 5.16 The knob grip

5.1.2 Crimp Grip or Open Hand Posture: Which One to Choose?

From beginner to advanced level, the climber improves his way of gripping discovering new and various holds. The fresh climber will limit his experience to the crimp grip posture, which is safer and more natural for him since the strength involved on the hold (hooked grip) allows him to be in contact to the structure.



Schema 5.3 Different grip (crimp and slope) simplifications (Illustration inspired by Voulliaume (D.), Forli (A.), Parzy (O.), Moutet (F.), *Répartition des ruptures de poulie chez le grimpeur*)

As previously explained, the open hand posture is gradually achieved through a right adaptation and training to master the proper and different weight to be applied on the last phalanx of the fingers used (P3). In open hand posture, the other phalanges (P1 and P2) can also be in contact according to the size of the hold. This method stimulates at the same time the FDS and FDP, which requires a muscular reinforcement of FDS since the tendon is much more strained in open hand posture than in crimp grip – 165. N in open hand posture versus 113.2 in crimp grip. This kind of practice requires a gradual muscular fitting.

Does that mean that it is much better to climb in the open hand position? For sure the crimp grip is a stronger strain for pulleys – especially the A4 pulley on which the risks of rupture are higher – but it is also more convenient to seize the small and not too deep holds. Besides, according to the climber's hand morphology and level, the open hand position does not always help him to maintain a hold, which makes him quite uncomfortable. Indeed, a quite long middle finger or a too short little finger may be a source of trouble. Therefore, the enlightened climber has to adapt to his morphology and his skills, combining the open hand, crimp grip, or mixed position. In order to reduce the number of lesions, the climber has to be trained in all these different techniques. Nonetheless, the advanced climber has to put forward the open hand posture to limit the tension on the pulleys. Outdoors, during high-level competitions, and to achieve good results, fingers are excessively prompted. This is why open hand posture relieves some of the finger tension especially over the pulleys. After a finger injury, during a period of reeducation, this posture combined with a proper strapping is highly recommended. The adaptation to the crimp grip posture will have to be gradual, as will be explained further in this document.



Photo 5.17

For a climbing expert, the maximal intensity measured on a same hold is identical whether he uses the open hand or the crimp grip. It would be quite interesting to train the fresh climbers to use more often the open hand posture. Climber coaches have to bear in mind this phenomenon to preserve the beginners from finger injuries. The sooner a great variety of seizing holds is learned, the more aware and less injured the fresh climbers will be. The more trained the young climber is, the more experimental he is, and eventually he becomes more qualified to choose the right and safer finger posture according to the situation throughout his future sports career.

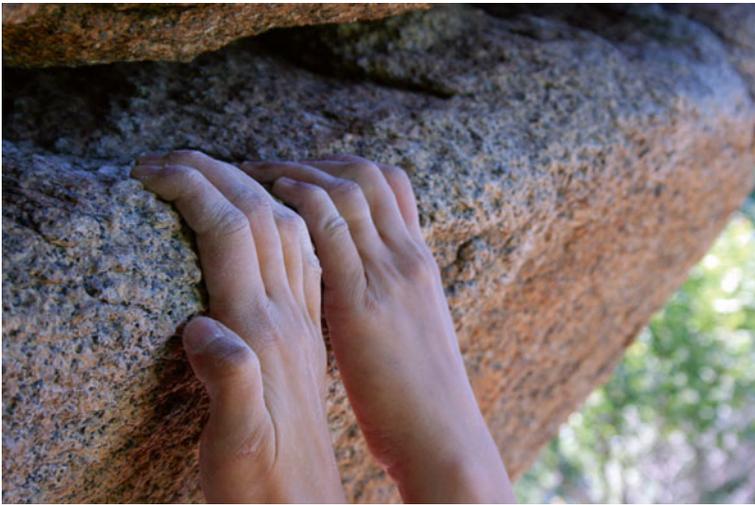


Photo 5.18

5.2 Training Basics

This part of the book will deal with a few basic principles to avoid any mistakes during training practice. Further information concerning the different fields and the training planning can be found in many other books even if a bad training planning can lead to a lesion. A good planning aims at helping the sportsman or the competitor to be fit on a D day or at maintaining the climber to be outstanding during a certain period of time.

5.2.1 *Intensity Principles*

In order to avoid an exhausting training, the athlete has to adjust the quantity to the intensity of the work. During the physical preparation (PP), the training sessions have to be numerous so that the body may get used to effort and sustain the following sessions which will be more numerous and intensive. The more voluminous is the training session, the lower the intensity has to be, and reciprocally. It is dangerous to have enormous sessions in PP with routes close to the maximal level of the climber. During a specific preparation (SP) for a competition, the athlete's training sessions are focused on the specificities of the competition. The intensity is close to the maximum level or supramaximum, and the time to recover is longer. Indeed the body needs a certain amount of energy to try the route again.

The intensity principle has to be considered throughout the session. Warming-up is a priority to prepare the different muscles and joints, though a great number of climbers tend to forget it and prefer climbing gradually. Defining a specific time to get an optimal warm-up is quite difficult. It depends on the daily physical condition, the level of tiredness, and the aim of the session. Being aware of one's own body and paying attention to any physical signs are consequently extremely important.

5.2.2 *Alternative Principles*

Alternative principles can be divided into two categories:

5.2.2.1 **Grip and Support Alternatives**

The great number of possible positions makes climbing a varied and exciting sport, especially outdoor climbing which involves a great variety of grips and movements. Each climber has his own style with his strong and weak points. The climber has to train on various supports to be as efficient on any of them but also to avoid injuries. Working an unknown posture intensively may lead to a trauma. Climbing in

different kinds of routes is a good way to broaden one's skills and to use the various joint and muscular chains and consequently to become an expert. As regards fingers, the climber has to be able to seize holds differently, especially if he wants to be highly competitive, outdoors or indoors. The repetition of the same movement is a high strain on the tendons, joints, and pulleys. Repeating over and over the same gesture remains a possible cause of injury.

5.2.2.2 Training Session Alternatives

Alternating route training, intensity and volume, is a good means to avoid psychological pressure. Indeed, if the athlete feels competent and determined and enjoys what he does, he will achieve more good results and the training sessions will be more efficient. The training sessions need to be varied including different drills even if the aim is identical. Emotionally speaking, it is generally hard for people to reproduce the same work for 3 days on. The lack of motivation may cause an injury. Giving a sense to each activity is a motivation factor. This is why the sportsman has to understand what he does to put a lot into the training session.

Alternative is the key word for a healthy body. The former helps the latter to remain in activity and to recover after a specific training session. Obviously, alternative is good for the body, but it is also a complementary way to deal with the emotional load resulting from the undergone efforts. Changing the training routes, telling himself that a hard session won't be repeated, and alternating the intensity or the volume of a session are the many means for the climber to take a deep breath.

To make the recovery easier, training cycles alternate between intensive and less intensive sessions. The issue in alternative would be to do the wrong thing. A logic principle has to be respected and depends on the different fields and the required time to recover. The training planning has to consider the notion of pleasure too.

5.2.3 Progressive Principles

The intensity and the volume of the training have to be reversed in order to avoid a habit in the body and to reduce possible trauma. After a full stop practice for whatever reasons – lesions, family matters, or personal reasons – it is dangerous to start practicing again at the highest level, because the body has more or less got out the habit of intensive efforts. Consequently, it is advised to start slowly and to increase gradually the intensity throughout the training sessions.

After an injury, the time to regain one's higher level is usually more or less double that of the rest period due to that lesion.

During a training planning and a regular practice, the principle of overweight is essential. To improve a prior factor of the performance such as the strength of the fingers, it is necessary to work on them by overloading them. For instance, the size of the grips, the number of supports, and the footholds can be reduced. Indeed, if the

climber works only on good grips and comfortable footholds, he won't develop his strength. On the other hand, once back to training, if he overworks on a hangboard or on a campus board, he might get finger lesions.

Progressive principles imply the fact that training sessions have to be global and then specific. At the beginning of each season, the coaching of a lead climber and that of a bouldering climber of the same level tends to be similar. As the season unfolds, the sessions differ completely for each climber and the training becomes more specific.

The aim is to evolve and turn quantity into specificity. The climber reduces the number of route attempts and focuses on particular movements according to the objective of the session or the cycle.

If a climber or a coach wants to make a progressive training, before defining a training session, they have to think about the tiredness factor and its impact.

5.2.4 Constancy and Continuity Principles

Usually, interrupting climbing training whatever the reason and for more than a week is bad for a good preparation. Achieving good results, whatever the level, requires a more and more complete and demanding involvement. Going back to training is always a difficult time for climbers who do not perfectly know their bodies and their limits. For the most skilled ones, it is usually a frustrating period, because they are so eager to be at the top again that they often tend to do away with reeducation phases. An interruption – even if it has been only for 2 weeks – implies a gradual return to practice in order to avoid any injuries or recurrences. Several factors such as non-strained fingers or a not complete healing enhance the possibility of a new wound. A gradual return to practice is consequently highly recommended especially in case of former lesions. Initially, fingers have not been made for rock climbing; this is why they have to be protected.

A practice interruption involving no injury is to be banned, especially for someone preparing for a competition or a precise aim. This kind of interruption requires a change in the training planning to find the right balance between the daily activities to be fit for the D day.

After an intensive cycle and to make the recovery easier, it is healthier for the body to undergo a couple of less intensive sessions and to insist on the notion of pleasure or technique rather than stop practice completely. In case of injuries, the interruption must not be definitive. In fact, to maintain one's form, a muscular training has to be followed including working out, electrostimulation, jogging, etc.



Photo 5.19

5.2.5 Specificity and Characterization Principles

Climbing training has to be specific according to each individual. This principle has been widely reported due to the fact that each athlete responds differently to a given weight. Indeed, on the one hand, for an identical weight, the amount of work can be sufficient for an athlete, but on the other hand, it can be over the top for another athlete. Quoting Weineck, “Such a training method is perfect for one but is an extra work for the other one.”

The quality of training depends on characterization. All of the sportsmen do not have the same physical capacities, needs, experiences, levels, or objectives.

Several factors have to be considered:

- Age
- Psychomotor development level
- Sports level
- Gender
- Past experiences
- Objectives
- Special field

The coach has to take a closer look at the climber’s social life. The latter’s love life, work, or future exams are important facts to be taken into account for the training planning.

5.2.6 *Knowing and Listening to One's Body*

This principle is the most complex of all the others, because only the athlete can tell how he feels and notice any pain in his body. The coach is supposed to detect any changes in the athlete's state of mind – a feeling of desire, tiredness, or pain – but he can't measure the intensity of them. It is a priority to understand that pain is a signal sent by the body to protect itself. When there is a pain, there is an injury – more or less serious. The sportsman has to tell the difference of the “good pains to the bad ones,” more precisely the ones felt in the forearms when the lactic acid is flowing.

Several parameters have to be considered:

- *Physical tiredness* due to intensive sessions, cycles, and/or extra activities outside training practice. As regards young people, the concern lays in PE or their social life which can bring an excess of tiredness.
- *Moral tiredness* results from the intensity of the last few sessions (or the last one), a lowering in motivation, or other external factors such as school/work tiredness, family matters, or social life problems.

This is why it is extremely important to talk to each athlete and help him to have a better understanding of his body. The coach has to adjust his training session according to the athlete's present state of mind. The sportsman's degree of concentration has to fit the required activities.

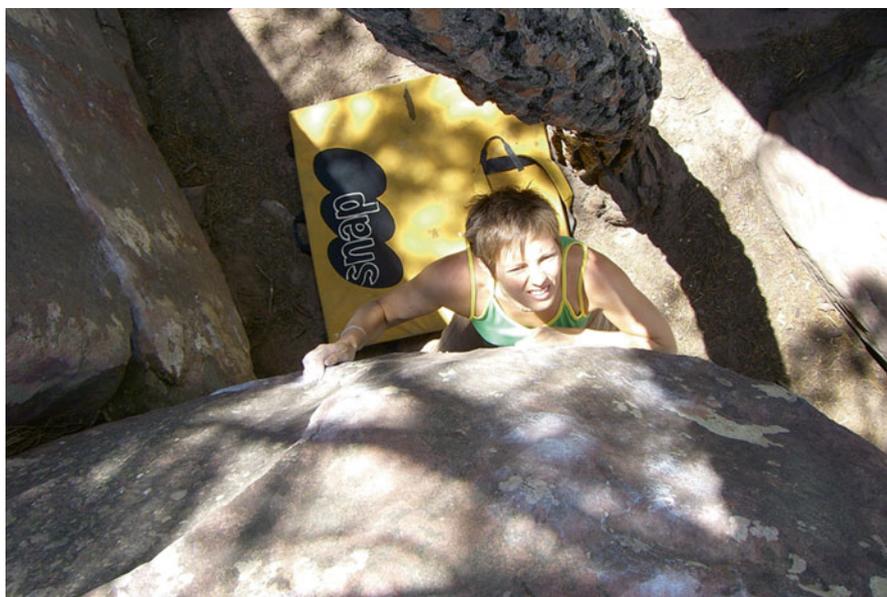


Photo 5.20

5.3 Climbing Various Efforts

Training with specific tools such as a campus board or a hangboard requires high skills to avoid any lesions. These appliances are a real strain for fingers which may endure extra weight if exercises are not well adjusted. The climber has to be precisely aware of what he is working on, because according to the field – alactic anaerobics, lactic – the effort times and the rest periods will change. If you do not rest properly after a training session based on strength, the previous effort will turn into an effort on resistance and therefore increase the risks of lesions.

In this book which deals with hand injuries, it is obviously necessary to mention a few things about the different kinds of fields so that possible lesions due to bad training practice can be reduced. Nonetheless, the subject being wide, it is hard to elaborate on the training topic, and further information will be found in other documentations.

5.3.1 Alactic Anaerobic Efforts

This effort consists of very intensive exercises on a maximal power. This category is entitled to work on strength liberating a great source of energy in a short time. During the session, adenosine triphosphate (ATP) and also a small amount of creatine phosphate (CP) are used. When they are solicited at their maximum level, the very short reserves are used out after 7 s. This lapse of time is consequently a reference time in rock climbing practice. Climbers often mention the number of movements fulfilled. It is much better to work on the notion of required effort, which is more understandable. According to the movement, the quantity may change.

The aim of the training is to remain focused on the available energy and use it efficiently.

Alactic Anaerobic Intensity Recap

Intensity: maximal or supramaximal (>100 %).

Duration of the effort: between 3 and 7 s.

Recovery: between 1 min 30 s and 3 min.

Repetition of the movement: about 10. The climber has to stop the repetitions when he notices a decrease in intensity.

Alactic Anaerobic Capacity Recap

Intensity: between 90 and 100 %.

Duration of the effort: between 7 and 15 s.

Recovery: between 3 and 8 min.

Repetition of the movements: from 6 to 10. If the climber notices a decrease in intensity, he can reduce the duration of the effort which allows a great amount of work.

5.3.2 *Lactic Anaerobic Efforts*

This category begins on the first second but on a very low intensity. The intensity is higher after 10 s. The strength in use is high but not maximal. The intensity grows from 30 to 45 s according to the required effort. The function of the training is to develop a resistance against “lactic poisoning.”

Alactic Anaerobic Intensity Recap

Intensity: maximal.

Duration of the effort: between 15 and 45 s.

Break between two repetitions: from 30 s to 3 min in order to get a partial recovery of the basic potential.

Break between two series: from 5 to 30 min in order to produce another effort of the same level.

Repetition of the movements: between two and six. It is important to judge the intensity of the effort properly. The session has to be stopped when the climber is unable to make a new effort with a sufficient intensity.

Alactic Anaerobic Capacity Recap

Intensity: the intensity has to be 80 %.

Duration of the effort: from 45 s to 2 min.

Break between two efforts: 2 min.

Number of repetitions: between 5 and 8.

Recovery between two series: 6 min.

Number of repetitions: between 6 and 8. In order to work sufficiently, the climber can reduce the duration of the effort and increase the recovery time.

5.3.3 *Aerobic Efforts*

It is false to believe that aerobics is useless in rock climbing. Of course rock climbing practice does not really appeal to aerobics, but it is nonetheless quite appropriate especially as regards PP.

Lesions being the main topic of the book, aerobics is first of all a good means to prepare the body of the athlete for the next season. All the energetic processes are developed through aerobics. But above all, it is a means to prepare ligaments and tendons for efforts.

In climbing, an increase aerobic process improves the recovery between two efforts. It can be quite useful in bouldering competitions, especially when the climber is allowed 6 min of recovery between two route attempts. Aerobics is also a good means to evacuate lactic waste – due to muscle contractions – and to improve the cardiovascular system.

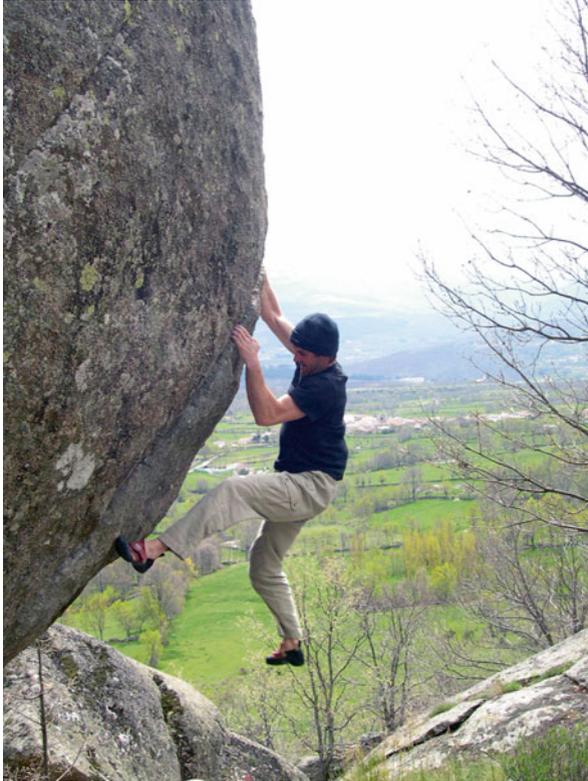


Photo 5.21

5.4 Various Competitions of Rock Climbing

Climbing competitions can be divided into three categories: speed, lead, and bouldering. In climbing terminology, a route or a boulder is done on sight, when no former attempt has been done except for the given time of observation. On the contrary, when a climbing leader performs successfully, it is called a “flash performance.”

5.4.1 Lead Competitions

In climbing, lead category is the most well known. Competitions take place in CG. The aim is to reach the top of the route. Though a limited time is required, it is the reached height which determines the rank. Time is not used to choose the winner. It is just a way to prevent too long performances. In case of equally placed athletes after the first round, the jury takes into account the height reached in the former round. If the finalists are still placed first, a super final is organized.

5.4.2 *Bouldering Competitions*

In climbing, a boulder is a short passage. The aim is to achieve a great number of passages. Two kinds of competitions exist:

- A circuit which is set for France championships and international competitions. According to the competitions and the rounds – qualifications, semi-finals, or finals – climbers have to pass between four and six boulders within 4–6 min. Between two passages, climbers are entitled to a break corresponding to the time allowed for the passages. In those kinds of competitions, climbers are isolated even during the qualifications. They are ranked according to the number of passages they have succeeded. In case of equally placed athletes, the number of attempts is first counted, then the number of areas achieved successfully (with specific holds chosen by leaders especially after a first difficult part), and, finally, the number of attempts to reach the holds in these areas.
- A contest which consists of two rounds: qualifications and finals. During the qualifications, climbers are not isolated and have to achieve a maximum of the requested passages. Then the five best qualifiers take part in a flash or an on-sight final. In finals, climbers are allowed to make as many attempts as they want.

5.4.3 *Speed Competitions*

This practice is the oldest one. The aim is to reach the top of the route as fast as possible. These competitions are rare in France but commonly practiced in East countries.

Routes are climbed with a top rope. Competitions are divided into two parts: qualifications and finals.

5.5 Outdoor Climbing

Photo 5.22 (sur la droite)



Boulder and route difficulties are classified by grades, which correspond to the technical difficulty of the passage – height, slope, succession of holds, and sizes of holds. Marks remain biased and depend on each athlete's strong and weak points. The climbers' morphology can be an advantage or a disadvantage in some passages.

In France, route rating starts on 3 and stops on 9th degree. Each degree is divided into three parts: 6a, 6b, and 6c. There are also intermediary degrees – 6a+, 6b+, and 6c+. Several difficulty levels have been applied.

As regards bouldering categories, several ways of rating are available even in France.

5.6 Training

Climbing development has led to the appearance of new specific training supports, such as the hangboard and the campus board. Obviously, they are a good means to develop finger strength and/or finger resistance intensively, but due to the extreme finger strain they require, they can be the source of new lesions, more or less serious.

5.6.1 Safety and General Precautions

Numerous factors have to be taken into account before training with these specific tools. First of all, they are addressed to very high-level climbers. A beginner is not allowed to use one of these appliances because his body won't be able to endure the strain. These tools are actually designed for highly skilled climbers (6c/7a) who lack strength and would like to progress. But above all, they are addressed to athletes who would like to achieve excellent results in competitions, outdoors or on CG for fun.

Because of growth problems – especially as regards finger cartilages – *these sorts of tools can't be used by 16-year-olds*, that is to say, until the teenager is physically mature enough to undergo the possible side effects of intensive climbing practice. This stage is hard to recognize for sure, especially when each adolescent is different from the other, but at least the age limit is a good means to reduce risks. In the long run, finger-intensive training can lead to after effects which can turn a sportsman's career short. Adolescence is the right period to develop motor learning. But this stage can't be the same for everybody, since each teenager has his own specificity and consequently will develop according to his own phases or rhythm. At that age, training consists of learning a great number of climbing movements and facing various situations, focusing on the teenager's feelings in each case. In the second puberty phase, the muscular development and the higher capacity to understand and create motor designs are perfect to improve performances. This period is ideal to learn all the climbing-specific physical skills. Just like the use of the particular appliances, the specific skills require a precise adjustment. For instance, climbing with no foot is a good exercise before dealing with the hangboard or the campus board.

The use of this specific equipment is to be banned when one goes back to climbing practice, after a complete interruption or any lesion. The extreme strain requested by these tools can lead to a recurrence or a new injury for the climber. The

body structure may not be well prepared, healed up, or strong enough to endure such a strain. These devices will be part of the specific training and won't be used before a proper reeducation and a few climbing sessions.

A gradual and complete warm-up is a good means to be more efficient during training sessions, but above all, it allows muscles and tendons to support the strain without getting injured. It has to be complete from generalities to specificities and has to last about 15–20 min. Besides, at the end of the training, it is important to stretch the muscles in order for them to regain their initial length. Repetitive contractions, especially concentric ones, tend to shorten the muscles which then become more fragile. It is a priority to bring them back to their initial size.

During a session, it is advised to combine climbing movements on artificial structures and the use of the specific equipment. This combination tends to enhance strength, without forgetting technical gestures, and mobilize the upper and lower part of the body. Consequently, it is important to make this association to get good results.



Photo 5.23 Crimp grip on a reverse hold

5.6.2 Training Safety

Training on this specific equipment requires a particular preparation due to the intense strain endured by the muscles and joints. This is why these tools can't be used at the beginning of a session, because they are a real strain not only on the flexors. The body needs a period of adjustment to deal with this kind of pressure. These specific appliances can be added during the second phase of the PP and will complete the specific training according to the category – bouldering or lead – during the SP. During the PP, the training is first global even if the types of exercises (training circuit) are supposed to reinforce muscles without neglecting the antagonist muscles to maintain a proper balance.

During the second phase of the PP, the use of these specific tools can be replaced by “no foot” exercises on a campus board, which prepare the muscles gradually to concentric and eccentric contractions. The athlete or the coach can introduce these tools little by little and for a short while, in the training.

In SP and according to the chosen objective, the preparation can be focused on these appliances by the coach. The exercises are so demanding that most of the time the athlete is close to his limits. The training sessions must not exceed 45 min or 1 h (warm-up included), and long periods of recovery between each activity or repetition have to be taken.

Whether in PP or SP, the cycle on these tools must not exceed 3 weeks and has to be followed by a recovery cycle in order to gain strength and to avoid any tendon traumas (flexors and extensors). Three sessions a week is the maximum number during a cycle. Between the sessions, the period of recovery changes according to the aim: to gain strength, 24 h; to develop resistance, 48 h; and to maintain strength, 72 h.

To reduce any possible injury, it is highly recommended not to carry extra weight, especially during strength cycles. In theory, working with additional weight might increase strength, but it is also a supplementary strain on the tendons which are first designed to support the body weight. Fingers are not designed to bear climbing weight. Consequently it is much better to work on various grips, focusing on a specific category and according to the objectives of each cycle or session. On the other hand, working on grips is a good means to work on one's strong and weak points. Using in turn the different holds (buckets, small edges, large holds, or round edges) and changing the fingers' posture (open hand or crimp grip) lead to a more global work on strength. To relieve tendon strain, it is advised to use the slope posture rather than the crimp grip.

5.6.3 Training on Specific Tools

5.6.3.1 Hangboard Sessions

Introduction

The hangboard is used to develop muscular abilities which are specific to rock climbing and precisely concern the different holds in suspension that can be reproduced with this equipment. This tool enables the climber to develop specific muscles and more precisely “no foot” training. Hanging work prevails and is a good help to emphasize a specific work on the duration of the holds. Moving on the hangboard is possible though quite limited. This training leads the climber to be more precise in his movements, since it helps the coordination and synchronization of the fingers’ opening and closing.

The hangboard is not only a training tool, but it is also a device used to end the warm-up in a more specific way. In that particular case, the climber is fitter to start the ongoing activity, but he has to follow a gradual warm-up. Likewise, the climber uses first the comfortable holds (buckets) remaining shortly suspended, and then he gradually turns to smaller holds. It is strictly forbidden to hang on tricky holds or to make extreme movements, especially when he has not warmed up properly.

Possible injuries resulting from the hangboard not only affect the fingers but also the shoulders, elbows, or other parts of the body. The warm-up has to well prepare all the joints and the different structures of the scapular belt and the arms. The hangboard is an excellent tool, but if “the golden rules” are not respected, it can be extremely dangerous for the climber’s health.

Here are a few rules to be respected:

- Never work loaded. The climber chooses smaller holds to work properly in the chosen category.
- Respect recovery time.
- Never use the crimp grip. This posture is a real strain for the fingers and is reinforced when the feet are not used.
- Train only if you are perfectly fit.
- Warm up all the joints, including the finger joints, before practicing.

Several types of exercises are possible with the hangboard, but we will focus on those improving the duration of the holds (dynamic efforts will be dealt with the campus board) and those concerning isometric efforts.

A training hangboard is chosen according to the holds which must not be “traumatizing” (“overusing”). A hangboard has to be deprived of too steep angles, and the posture of the fingers has to be convenient.



Photo 5.24 Training session with a wooden hangboard

Strength Development

After these kinds of sessions, the climber feels as if he has not done anything.

It is important to change the grips, in order to broaden one's skills and not to be limited to one particular way of seizing.

Principle: the climber hangs on holds, with one or two hands in the open hand posture. He is supposed to remain like that for 7 s maximum. To assess properly the intensity and if the hold becomes too easy, it is advised to reduce the size of it, even if the weight is reduced, rather than working loaded.

Duration of the effort: from 5 to 7 s.

Break between two efforts: 3 min minimum.

Repetitions: from 5 to 10.

Resistance Development

Training Session First Example

Principle: the exercise has to be fulfilled on the chosen holds: consequently, they must not be too small. In order for resistance to work, the climber has to remain suspended for at least 20 s.

It is possible to work with different degrees of closing arms.

Duration of the effort: between 20 and 45 s.

Break: 30 s.

Repetitions: between 5 and 8.

Break between two series: 5 min.

Number of series: 4.

Training Session Second Example

Principle: choose a hold to be able to remain suspended with one or two hands for 1 min.

Duration of the effort: 1 min.

Break between two repetitions: 2 min.

Repetitions: 3.

Break between two series: 5 min.

Number of series: 3.

5.6.3.2 Campus Board Sessions

Introduction

Just like the hangboard, the campus board is a powerful tool to work on the different anaerobics categories. Various movements, which can be fulfilled with one arm at a time or with both of them, develop dynamism, contact strength, and alactic anaerobic field.

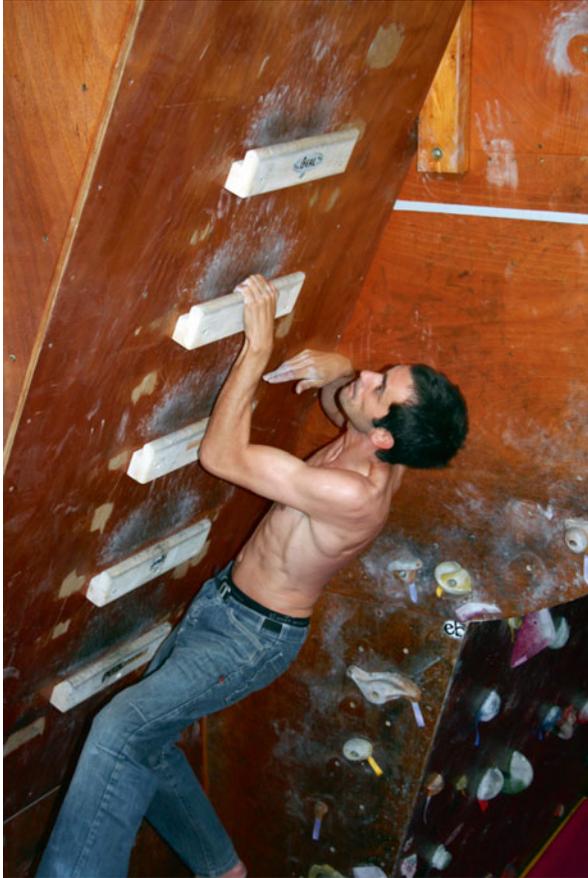


Photo 5.25 Training session on a campus board

Safety regulations and recommendations are identical to those of the hangboard. This equipment requires a specific preparation such as the “no foot” on campus board, with a variation of holds and/or similar exercises. The climber can reproduce the same kind of effort using traction bars.

This appliance is ideal to work pliometric efforts. In that particular case, it is highly recommended to be cautious with finger structures which are much requested. Indeed, when the climber lets himself go on the lower hold, an extreme contact strength is involved. Once again, a specific preparation is compulsory.

Due to the extreme strain involved, it is advised to limit the number of sessions with a campus board. To begin with, one session a week seems to be sensible. Then as the climber becomes more skilled, he can practice two or three sessions a week maximum. The cycle must not exceed 3 weeks, so that the body can recover properly.

Strength Development

Training Session First Example: Dynamic Movements

Principle: choose holds on which the climber will be able to make up to five movements. The aim is to make movements farther and farther on smaller and smaller holds.

Number of movements: from 1 to 5.

Break between two repetitions: 5 min.

Repetitions: from 5 to 10.

Training Session Second Example: Dynos

Principle: choose holds on which the climber will be able to make a dyno with two hands. The aim is to reach a distant hold and when possible to make this movement in chain. The holds have to be large enough to reduce possible injuries.

Number of movements: from 1 to 5.

Break between two repetitions: 5 min.

Repetitions: from 5 to 10.

Resistance Development

Principle: choose holds on which the climber will be able to make at least ten movements.

Number of movements: the climber has to go up and down a campus board for at least ten movements.

Break between two series: 5 min.

Number of series: 5.

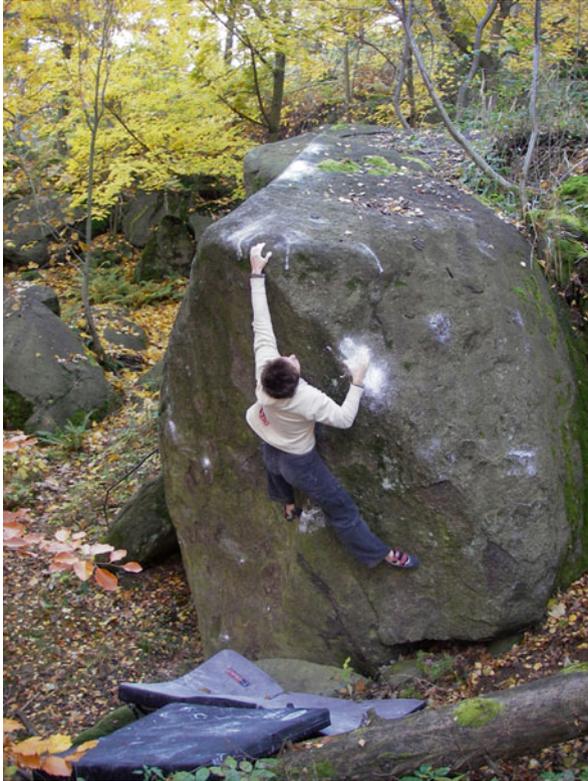


Photo 5.26

5.7 Return to Training After an Injury

Several reasons such as holidays, working life, or injuries can be the origin of an interruption in sports practice. In case of a lesion, it is quite different, and climbers and coaches have to be extremely cautious. Indeed, after an interruption, the body is not anymore used to the former practice. Therefore, it will react differently; physical abilities won't be the same, and consequently, the body won't be able to endure the former intensity and complexity required by the training. In that part of the book, we will deal with the basics of a return to training, bearing in mind that each session has to be characterized. The sportsman characteristics have to be considered, because each athlete is unique and so are his psychological state (motivations, objectives), physical abilities (skills, tiredness, recovery time, diet), anatomy (morphology, former injuries), and social life (leisure time, family, and working life).

Most of the time, the interruption is sudden due to an unexpected lesion; this is why activities have to be specific and varied once back to practice. During the interruption, family moral support is a priority to help the sportsman to accept his injury and recover faster. Physically, the dysfunction and sometimes the immobilization require a complete reeducation to the former automatism. It is necessary to regain a good form, before focusing on a more specific preparation. The amount of work will be determined according to the athlete's form and abilities. Gradually, he will be able to perform at his rhythm to avoid any recurrences. Listening to the athlete, who of course will listen to his body, will be convenient to choose the right activities and to alternate properly intensive or important sessions.

During this readjustment period, what matters is not the energy involved of the dynamic movement performed but the way the body reacts (proprioceptive or kinesthetic information). The shocks resulting from the contact of the fingers on the holds, during dynamic movements or dynos, are the cause of injuries and consequently of recurrences. These contacts can create microlesions. Learning again all these movements and handling finger contact with holds have to be done gradually, in order to regain automatism in the synchronization of the fingers.

The climber feels completely recovered once he can grip holds strongly without feeling any pain. He needs to be convinced that the injury is healed up and that he can go back to practice safely. The readjustment period is necessary to improve the climber's confidence and to lead him to the next step of the return to practice. The climber needs to trust his body and his strength. This factor is important in order to use again the part of the body which was injured instead of trying to do without it. This reaction is quite common, for instance, the climber who hurts his left hand will unconsciously use the right one, which might eventually lead to new lesions.

The readjustment period is quite changeable and depends on various factors such as the seriousness of the lesion, the characterization of the training, and the sportsman's state of mind as regards the lesion. This is why the following part of the book will give general information as regards the return to training and the requested intensity of the sessions. Of course, it is not a universal solution, and each session has to be specific for each sportsman. The organization and the specificity of the sessions will be developed on general terms, since they will be different according to the climber's strong and weak points and according to the seriousness of the lesion.

This is why before the readjustment period, the climber and the coach have to analyze the causes of the lesion. This assessment is a good means not to make the same mistake again and to plan adequate sessions. For instance, in case of injury caused by a lack of hydration, the climber has to pay attention to that phenomenon and change his way of training. According to the cause or the kind of injury, the climber has to change his technique and his preparation – use the open hand posture, for instance, to relieve the pulleys.

5.7.1 *Therapy*

Readjustment period can be divided into different stages:

- *A stage including stability exercises.* They are made with strengths slightly higher than in daily life. For a finger lesion, the first stage consists of doing traverses keeping one's feet on the ground. The climber presses his hand gently, simulating the real movements he would have done if his feet had not been on the ground. He carries on the exercise, moving on the ground and adjusting the pressure on the different holds.
- *A stage including a daily use of the wounded part.* In case of a finger injury, the climber does traverses or passages, choosing carefully the holds so that he may not feel any unbearable pain. Big footholds relieve the body and reduce the finger pressure.
- *A stage aiming at returning to climbing practice gradually.* The climber makes passages quite inferior to his regular level so that he may get used to it and feel climbing sensations again.
- *A last stage aiming at regaining one's regular level.* The climber uses his finger with the requested strength to seize the holds without feeling any pain or any fear.

On-sight regular level and maximal level will be dealt with in that part of the book. A change has to be made according to the seriousness of the injury, which will lead to a more gradual return to practice as is the case after a pulley rupture. On-sight regular level will be associated to a mark obtained at least eight times out of ten.

The difficulty level will be measured in percentages. The maximal level (regular or not) equals 100 %. Then each letter is added a value of 10 %.

Let's take this as an example: the sportsman's on-sight regular level is 7a. Here are the corresponding values.

Photo 5.27

Level/rank	Percentages
7a	100
6c	90
6b	80
6a	70
5c	60
5b	50
5a	40

The following back-to-training planning is nothing more than simple examples. They have to be adjusted according to each sportsman's experience and can't be regarded as miraculous recipes!



Photo 5.28

5.7.2 *Tendon Injuries*

In that particular case, what matters is the seriousness of the injury which is determined by the duration of the interruption of practice. During this interruption, the athlete's level and capacities have obviously decreased, which implies a specific and different return to practice. Let's make the difference between a level 1 tendinopathy requiring less than 1 month of interruption and a level 2 tendinopathy requiring more than 1 month of interruption.

When the climber has been stopped for less than a month, the readjustment period is shorter. Thanks to a gradual return to practice, the athlete has to regain his initial level quite fast.

When the climber has been stopped for more than a month, after the readjustment period, he has to go through a PP to restart on good bases.

5.7.2.1 During the Interruption

During the interruption, the finger is not allowed to be flexed. Complete rest is compulsory. The athlete can nonetheless practice swimming, which is smoother as regards tensions.

During this period of interruption, the athlete can work his extensors and flexors by electrostimulation (reeducation program) and reinforcing the other muscles involved in climbing movements.

5.7.2.2 Level 1 Tendinopathy: Interruption Between 15 and 30 Days

First Week to Third Week

1. *Physical aspects*

- The intensity of the effort must not exceed 60 and 70 % of the climber's on-sight maximal level (ML).
- The training can't exceed three sessions a week.
- On CG, the duration of the sessions is 01:30 maximum. They can last longer outdoors, but the intensity of the effort has to be decreased.

2. *Other aspects*

- Alternating open hand posture and crimp grip posture is a priority to regain sensations when fingers are seizing holds. Be careful, the small holds have to be banned.
- First of all, the training has to put forward moral and technical aspects and has to focus on climbing feelings and sensations, especially during the seizing of the holds. Throughout that time, the climber will have to trust his fingers to be sure of his complete recovery.

3. *Complementary training*

- The athlete can complete his training with electrostimulation sessions (return to practice or reeducation program) three times a week.

Throughout this period, all the finger muscles have to be warmed up properly (using a rubber ball, modeling clay, or an elastic). Hydration (before, during, and after each session) and stretching exercises (finger deep flexors, extensors, etc.) are also extremely important. After each session, it is advised to ice the finger.

Fourth Week to Sixth Week

1. *Physical aspects*

- The intensity of the effort must not exceed 70 and 100 % of the climber's on-sight maximal level (ML).
- The training can't exceed four sessions a week.
- On CG or outdoors, the duration of the sessions is 02:00 maximum.

2. *Other aspects*

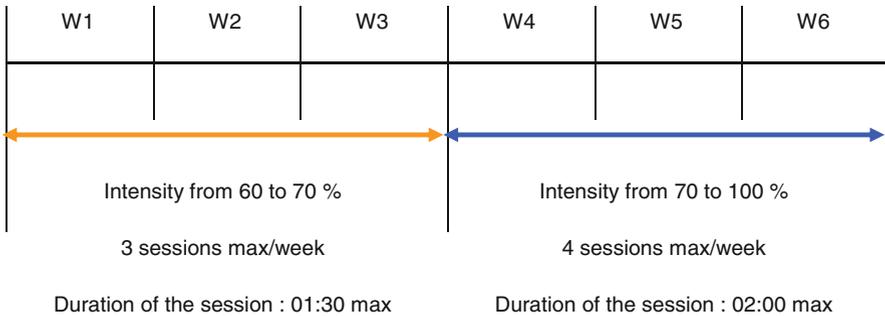
- The alternative and the variation of the different kinds of climbing and grips allow the climber to readjust his body to any situation.
- Technical, tactical, and physical aspects have to be favored, with a muscular reinforcement of the other parts of the body.

3. *Complementary training*

- Three times a week, the athlete can complete his training with electrostimulation sessions – strength or resistance program according to the athlete's field.

Hydration, warm-up, and stretching exercises are the priorities during all the sessions.

Return-to-training recap:



5.7.2.3 Level 2 Tendinopathy: Interruption Over 30 Days

First Week to Third Week

1. *Physical aspects*

- The intensity of the effort must not exceed 50 and 60 % of the climber's on-sight maximal level (ML).
- The training can't exceed three sessions a week.
- The recovery time between two sessions is 48 h minimum.
- On CG, the duration of the sessions is 01:00 maximum. They can last longer outdoors, but the intensity of the effort has to be decreased.

2. *Other aspects*

- Alternating open hand posture and crimp grip is a priority to regain sensations when fingers are seizing holds. Be careful, the small holds have to be banned.
- First of all, the training has to put forward the moral and technical aspects and has to focus on climbing feelings and sensations, especially during the gripping of the holds. Throughout that time, the climber will have to trust his fingers again to be sure of his complete recovery.
- It is advised to avoid any dynamic movements or dynos.

3. *Complementary training*

- Three times a week, the athlete can complete his training by electrostimulation sessions –return to practice or reeducation program.

The recommendations concerning the session are identical to those of a level 1 tendinitis.

Fourth Week to Sixth Week

1. *Physical aspects*

- The intensity of the effort must not exceed 60 and 80 % of the climber's on-sight maximal level (ML).
- The training can't exceed three sessions a week.
- The recovery time between sessions is 24 h minimum.
- On CG, the duration of the sessions is 01:30 maximum. They can be longer outdoors.

2. *Other aspects*

- Alternating finger postures is still recommended, but the athlete can gradually reduce the size of the holds or the number of the footholds.
- Little by little, the climber can learn dynamic movements again.

3. *Complementary training*

- Three times a week, the athlete can complete his training with electrostimulation sessions – muscular strengthening program.

Seventh Week to Ninth Week

1. *Physical aspects*

- The intensity of the effort must not exceed 80 and 90 % of the climber's on-sight maximal level (ML).
- The training can't exceed four sessions a week.

- Throughout the week, the athlete can't train more than two times, one after the other.
- On CG, the duration of the sessions is 02:00 maximum. They can be longer outdoors.

2. *Other aspects*

- The alternative and the variation of the different kinds of climbing allow the climber to readjust his body to any situation.
- Muscular strengthening has to heighten technical, tactical, and physical aspects.

3. *Complementary training*

- Three times a week, the athlete can complete his training with electrostimulation sessions – strength or resistance program, according to the athlete's field or objective.

Tenth Week to Twelfth Week

1. *Physical aspects*

- The intensity of the effort must not exceed 90 and 100 % of the climber's on-sight maximal level (ML).
- The training can't exceed four sessions a week.
- Throughout the week, the athlete can't train more than two times, one after the other.
- On CG, the duration of the sessions is 02:00 maximum. They can last longer outdoors.

2. *Other aspects*

The recommendations concerning the session are identical to the cycle W7–W9. Return-to-training recap:

W1	W2	W3	W4	W5	W6	W7	W8	W9	W10	W11	W12
←-----→			←-----→			←-----→			←-----→		
Intensity from 50 to 60 % ML			Intensity from 60 to 80 % ML			Intensity from 80 to 90 % ML			Intensity from 90 to 100 % ML		
3 sessions max/week			3 sessions max/week			4 sessions max/week			4 sessions max/week		
Duration of the session:			Duration of the session:			Duration of the session:			Duration of the session:		
01:00 max			01:30 max			02:00 max			02:00 max		

The athlete may need a couple of weeks to recover. These recovery weeks can be set between each cycle, that is to say, on the 4th week, 7th week, and/or 10th week. Of course, the next cycle will have to be postponed to the following week.

Example:

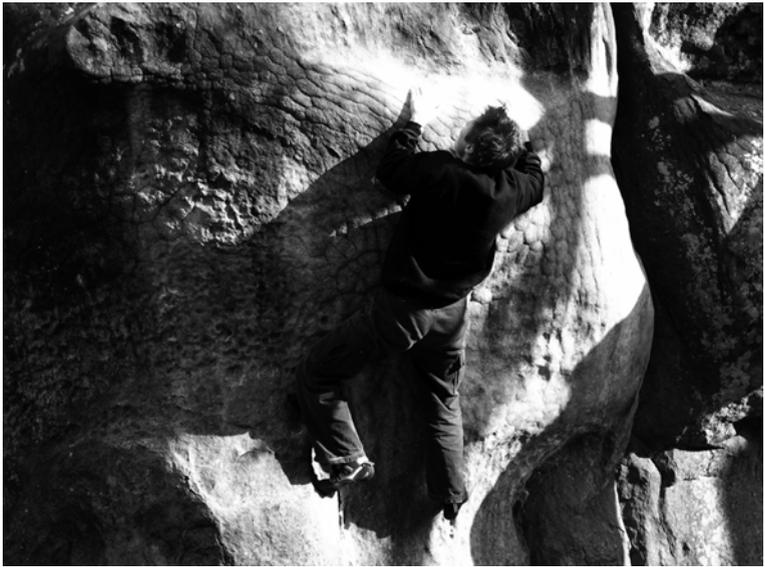
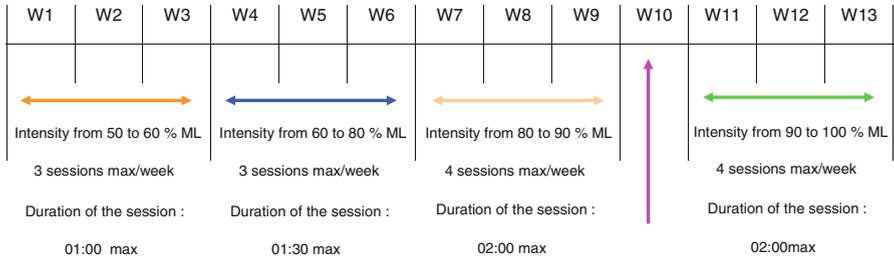


Photo 5.29

5.7.3 *Digit Pulley Injuries*

5.7.3.1 **Digit Pulley Partial Rupture**

After 30 Days of Interruption

The athlete can start a muscular reeducation by circuit training or muscle-developing exercises – without forcing the fingers to flex – completed with swimming and jogging.

Three times a week, electrostimulation (reeducation program) is a good complementary treatment for flexors and extensors.

Climbing and any finger work against resistance are prohibited.

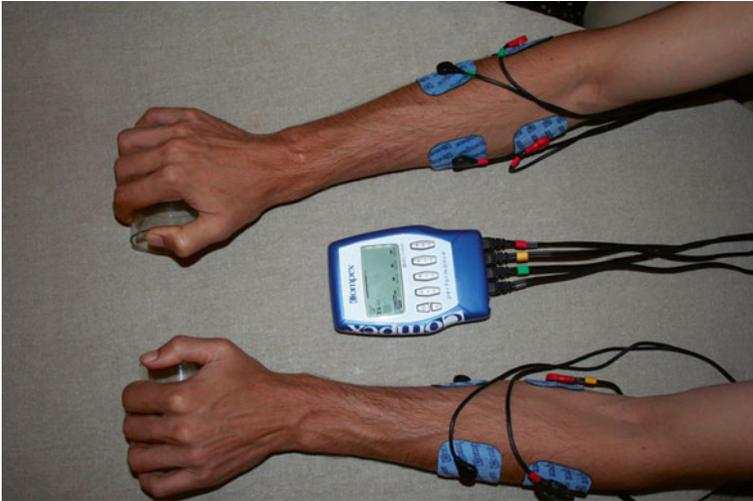


Photo 5.30 Flexor and extensor tendons electrostimulation session

After 45 Days of Interruption

After such a lesion, the climber has to become aware of the importance of changing his habits as regards hydration, warm-up, and stretching exercises.

First Week to Third Week

1. *Physical aspects*

- The intensity of the effort must not exceed 40 and 50 % of the climber's on-sight regular level (RL).
- The training can't exceed two sessions a week.
- The duration of the sessions is 01:00 maximum.
- The recovery time between the different passages have to be long.

2. *Other aspects*

- Throughout that period, the best thing to do is to train outdoors as much as possible, choosing the adequate climbing style. Round holds are essential to help the gradual return to sensations. Alternating grips improve the relearning of the hand gesture.
- The open hand posture has to prevail during the seizing of the holds. The crimp grip posture won't be used exhaustively by the third week.
- The focus is on quality, insisting on techniques, tactics, and psychology.

3. *Complementary training*

- Three times a week, electrostimulation sessions – back to training or reeducation program – can complete the training.
- During the day, flexors and extensors can be strengthened with a rubber ball or an elastic. Using the former injured finger to squeeze the ball, in the crimp grip posture, is forbidden. Actually, the ball is set in the middle of the hand, and all the fingers rub it.

Throughout this period, all the finger muscles have to be warmed up properly – using a rubber ball, modeling clay, or an elastic. Hydration (before, during, and after each session) and stretching exercises (finger deep flexors, extensors, etc.) are also extremely important. After each session, it is advised to ice the finger.

The sore is always present during the first 2 weeks. The sessions have to be focused on quality. And the psychological side prevails to help the climber deal with the pain on his return to practice.

Fourth Week to Sixth Week

1. *Physical aspects*

- The intensity of the effort must not exceed 50 and 70 % of the climber's on-sight regular level (RL).
- The training can't exceed three sessions a week.
- The duration of the sessions is 01:30 maximum.
- The recovery time between the different passages have to be long.

2. *Other aspects*

- Throughout that period and according to his capabilities, the climber can alternate CG or outdoor sessions.
- The open hand posture has to prevail during the seizing of the holds. Nonetheless, during the session, the crimp grip posture can be used on specific tasks.
- Crimp grip is practiced on large enough holds allowing the use of the slope grip posture.
- The work is principally based on quality focusing on technique, tactics, and psychology.
- From the sixth week, the athlete can practice volume training of low intensity (40 %) to practice a little more climbing. The open hand posture has to be emphasized and tiredness has to be taken into account.

3. *Complementary training*

- Three times a week, electrostimulation sessions – muscle strengthening program – can complete the training.
- During the day, flexors and extensors can be strengthened with a soft ball or an elastic.

Seventh Week to Ninth Week

1. *Physical aspects*

- The intensity of the effort must not exceed 70 and 90 % of the climber's on-sight regular level (RL).
- The training can't exceed three sessions a week.
- The duration of the sessions is 02:00 maximum on CG. They can be longer outdoors.
- The recovery time between the different passages have to be long.

2. *Other aspects*

- Open hand posture and crimp grip have to be alternated. The aim of this cycle is to regain sensations in open hand posture, as much as possible. The athlete

may have to change his way of climbing to focus on this posture. Crimp grip is practiced on large enough holds, allowing the use of the slope posture.

- The work is principally based on quality rather than quantity. Muscular strengthening is another objective of the cycle.

3. *Complementary training*

- Three times a week, electrostimulation sessions focused on the flexors and extensors –strength or resistance program – can complete the training, according to the climber’s field or objective.

Tenth Week to Twelfth Week

1. Physical aspects

- The intensity of the effort must not exceed 90 and 100 % of the climber’s on-sight regular level (RL).
- The training can’t exceed four sessions a week.
- The duration of the sessions is 02:00 maximum on CG. They can be longer outdoors.
- The recovery time between the different passages have to be long.

2. *Other aspects*

The recommendations concerning the session are identical to the cycle W7–W9. Return-to-training recap:

W1	W2	W3	W4	W5	W6	W7	W8	W9	W10	W11	W12
←-----→			←-----→			←-----→			←-----→		
Intensity from 40 to 50 % RL			Intensity from 50 to 70 % RL			Intensity from 70 to 90 % RL			Intensity from 90 to 100 % RL		
2 sessions max/week			3 sessions max/week			3 sessions max/week			4 sessions max/week		
Duration of the session :			Duration of the session :			Duration of the session :			Duration of the session :		
01:00 max			01:30 max			02:00 max			02:00 max		

The athlete may need a couple of weeks to recover. These recovery weeks can be set between each cycle, that is to say, on the 4th week, 7th week, and/or 10th week. Of course, the next cycle will have to be postponed to the following week.

Example:

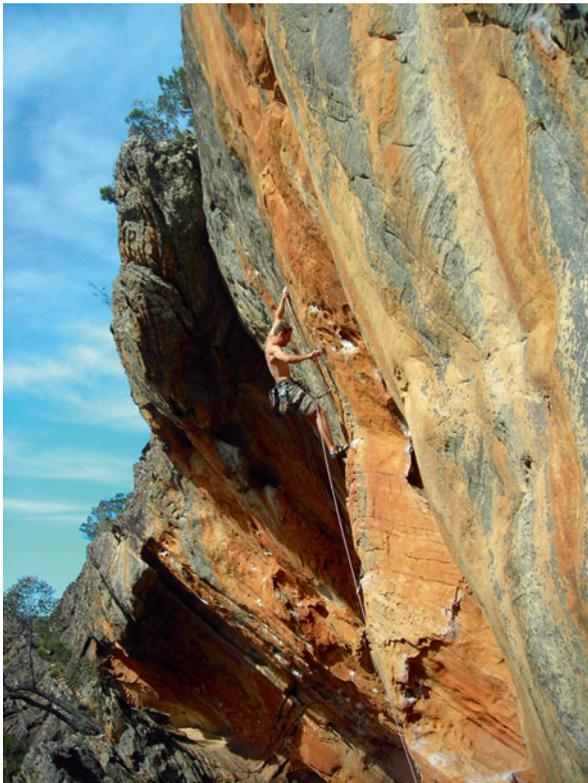
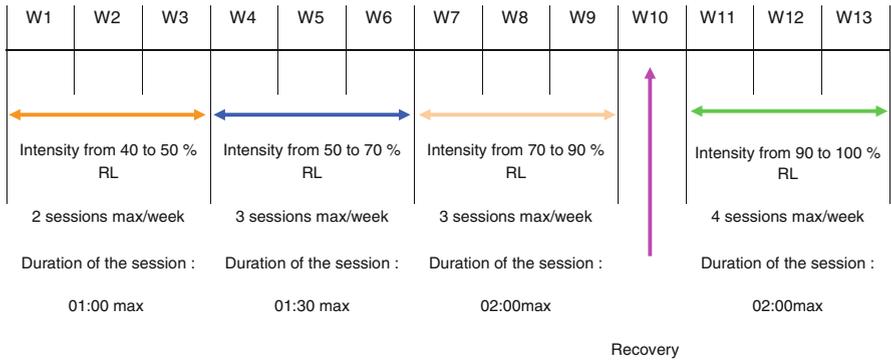


Photo 5.31

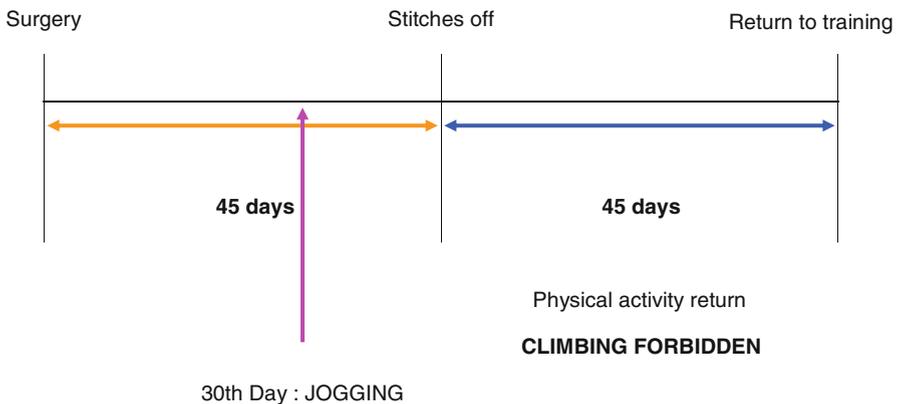
5.7.3.2 Return to Training After a Pulley Rupture Surgery

This kind of injury requires a great patience from the athlete. According to us, even if the recovery of the initial level is achieved in 80 % of the cases, the reeducation is long and painful especially at the beginning. For that sort of lesion and more particularly during the postsurgery period, the finger must not be flexed. Therefore, during the interruption (45 days after the surgery), the climber has to practice other physical activities. *But climbing and any finger work against resistance are forbidden.* Any physical activity requesting finger squeezing with devices such as a racket, a ball, or a barbell is not allowed. The finger must not undergo any shock or pressure to enable a gradual and perfect healing.

During that reeducation period and up to 90 days after the operation, the physical aspect of the training aiming at developing finger strength is banned. All the exercises requiring the use of the hangboard or campus board are strictly forbidden.

It is advised to return to practice *outdoors*, where the grips are more rounded and allow a balance of the weight on all of the fingers, including the palm of the hand. Long efforts (routes), rather than intensive ones (boulders), will be favored. *Reeducation in cliff routes seems to be the best way to readjust oneself to effort.*

Here is an example of a reeducation planning. The following information is not exhaustive and can be changed. Most of the time, duration and maximum intensity, not to be exceeded, are mentioned so that safety and healing are assured. All the information can be adjusted to a lower level, according to the athlete's physical form, state of mind, and of course pain felt during the exercises.



During the Interruption

A couple of exercises are suggested by D. Thomas. They can be done after surgery – from the 45th day to the 90th one – to reduce the after-surgery edema.

Exercise 1:



Photos 5.32 and 5.33 Total passive flexion of the repaired finger

Exercise 2:



Photos 5.34 and 5.35 Protected active flexion. The physiotherapist's thumb supports the repaired pulley

Return to Practice: 90 Days After Surgery

The return to climbing has to be gradual and smooth to help the specific reeducation of that kind of injury.

First Week to Third Week

1. Physical aspects

- The intensity of the effort must not exceed 20 and 40 % of the climber's on-sight regular level (RL).
- The training can't exceed two sessions a week. The recovery time between two sessions is 48 h minimum.
- The duration of the sessions is 30 min maximum, but it also depends on the pain previously felt during the first sessions. The athlete has to pay attention to it and must not overstress the former injured finger. The first sessions can be quite short and the climbing part quite limited.
- The recovery time between two passages has to be extremely long (5–10 min).

2. Other aspects

- The open hand posture is highly recommended. At the beginning, the crimp grip posture is forbidden to allow the athlete's body to readjust gradually.
- Sensations and moral aspect have to be put forward by the coach and the athlete. Indeed, the athlete has to trust his hand again and believe in the success of his graft. This phase, which is not automatic, is necessary to allow the athlete to deal with the next step of the return to training. The climber and the coach have to pay attention to the right balance of the different strengths. After such a lesion, it is not unusual to see the athlete overuse the limb which hasn't been injured. This behavior may lead to another injury due to the extra weight undergone by the fingers. Special attention has to be given to the choice of routes and climbing styles, to enable the climber to use the former injured limb efficiently and safely.
- It is not advised to practice on small edge slabs, such routes might be a real strain for fingers, just like overhangs by the way. This is why the choice of the right climbing style is a priority once back to practice. It is better to select vertical routes with large holds or buckets.

3. Complementary training

- It is interesting to work on finger proprioception while swimming. Crawl and breast stroke are good exercises to strengthen the fingers in an environment not too traumatizing.
- Three times a week, electrostimulation sessions – return to training program – can complete the training.

- A work on the extensors can complete the physiotherapy sessions to adjust the balance between all the fingers. This activity can be performed three times a week for 30 min.
- Throughout the week, the good thing to do is to rub a soft ball, which has to be as large as the climber’s hand.

Below is a classic example of a training week planning:

Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
Climbing	Electro-stimulation	Physiotherapy	Break	Climbing	Electro-stimulation	Physiotherapy

Throughout this period, all the finger muscles have to be warmed up properly – using a rubber ball, modeling clay, or an elastic. Hydration (before, during, and after each session) and stretching exercises (finger deep flexors, extensors, etc.) are also extremely important. After each session, it is advised to ice the finger.

It takes a long time for the pain to disappear, and sometimes it is still there several months after the return to training. The way the climber feels on open hand posture is essential. Finger muscle strengthening is not the first priority for the climber.

Fourth Week to Sixth Week

1. Physical aspects

- The intensity of the effort must not exceed 40 and 60 % of the climber’s on-sight regular level (RL).
- The training can’t exceed three sessions a week.
- The duration of the sessions is 01:00 maximum.
- The recovery time between the different passages has to be long.

2. Other aspects

- The open hand posture is still highly recommended.
- Sensations and moral aspect have to be put forward in those sessions, since they are – just like the first period – the main points as regards the athlete’s “reconstruction.”

3. Complementary training

- Three times a week, electrostimulation sessions – return to training program – can complete the training.
- Besides physiotherapy, a work on the flexors and extensors is advised.
- Swimming sessions are still pertinent.

Seventh Week to Ninth Week

1. Physical aspects

- The intensity of the effort must not exceed 60 and 80 % of the climber’s on-sight regular level (RL).
- The training can’t exceed three sessions a week.
- The duration of the sessions is 01:30 maximum. This lapse of time can be adjusted according to the athlete’s form and the pain he may feel.

2. Other aspects

- The sessions are focused on the changing of grips emphasizing on the open hand posture. The athlete has to broaden his climbing gestures by practicing on different slopes or routes – large edges, small edges, but no two-finger or one-finger pocket postures.
- The climber can train 2 days, one after the other, maximum. A recovery period of 24 h is necessary after two sessions.

3. Complementary training

- Three times a week, electrostimulation sessions – muscle strengthening – can complete the training.

Below is a classic example of a training week planning:

Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
Climbing	Electro-stimulation	Break	Climbing	Break	Climbing	Electro-stimulation

Tenth Week to Twelfth Week

1. Physical aspects

- The intensity of the effort must not exceed 80 and 90 % of the climber’s on-sight regular level (RL).
- The training can’t exceed four sessions a week. The athlete can’t train more than 2 days one after the other.
- The duration of the sessions is 02:00 maximum.

2. Other aspects

- The sessions can be focused on tactics and techniques.
- Volume sessions can be organized, but the intensity has to be slightly lowered to 60 %.

3. Complementary training

- Three times a week, electrostimulation sessions – muscle strengthening – can complete the training.

Thirteenth Week to Fifteenth Week

1. Physical aspects

- The intensity of the effort must not exceed 90 and 100 % of the climber’s on-sight regular level (RL).
- The training can’t exceed four sessions a week.
- The duration of the sessions is 02:00 maximum.

2. Other aspects

- The recommendations concerning the sessions are identical to the cycle W10–W12.

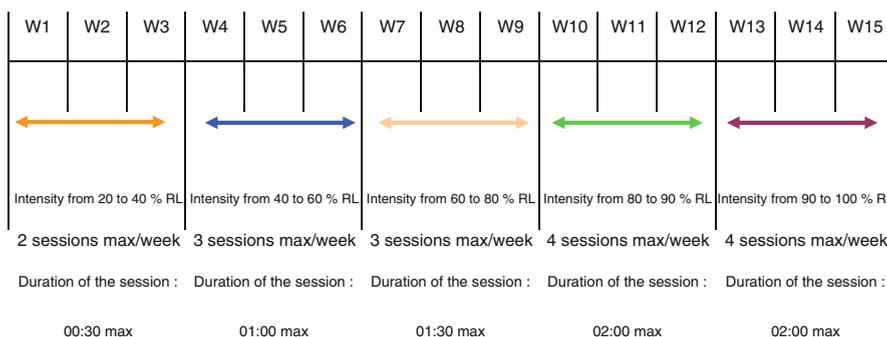
Information/Recommendations

Throughout this period, the intensity of the work depends on the athlete’s capacities and the way he has accepted his injury. If the climber has not recovered his former level, it is advised to emphasize a volume cycle, with a session in the week when the climber will be able to try more difficult passages.

Below is a classic example of a volume week planning:

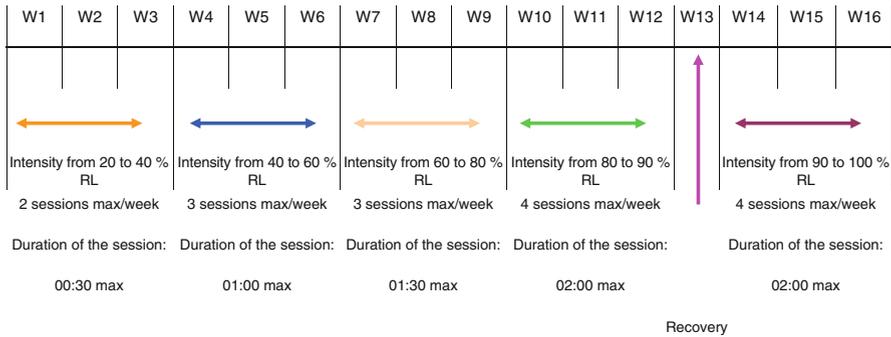
Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
Volume	Volume	Break	Volume	Break	Volume	Break
60 % max	50 % max		60 % max		50 % max	

Return to training recap



The athlete may need a couple of weeks to recover. These recovery weeks can be set between each cycle, that is to say, on the 4th week, 7th week, and/or 10th week. Of course, the next cycle will have to be postponed to the following week.

Example:



Strapping

The following example is a means to relieve A2 pulley.

The “tape” is 1 cm wide – as wide as a phalanx – and long enough to make a perfect bandage.

The “tape” is wrapped around the base of the first phalanx two times.

Under the PIP joint, the P2 phalanx is wrapped around two times.

The process is done a second time on the former wrapping under the PIP joint.



Photos 5.36 and 5.37



Photos 5.38 and 5.39



Photos 5.40 and 5.41 Digital strapping

5.7.4 *Bones Injuries*

The athlete can start a muscular reeducation by circuit training. A physiotherapist's advice and recommendations help a lot for a gradual recovery; this is why the choice of the exercises is a priority. Bone lesions usually lead to tendon stiffness due to the requested immobilization, which is quite an issue. Therefore, it is necessary to gradually prepare the fingers to climbing specifics. The physiotherapist's work aims at recovering a complete flexion and extension capacity.

Electrostimulation sessions (return-to-training program) based on flexors and extensors seem to be appropriate in that phase of reeducation to find the right balance between these two opposite movements.

Just like the other lesions, some grips are forbidden! The pressure undergone in two-finger or one-finger pocket postures is too intense, even if the climber does not use the former injured finger. Let's take the example of a ring finger fracture. If the climber uses his middle finger in a one-finger pocket posture, an important weight is automatically applied on the ring finger. During reeducation, it is important to keep one's fingers joint. Torsions on the injured fingers have to be looked after carefully.

Before going back on track, it is advised to be sure of the complete knitting of the injury. X-rays are the best means to confirm the diagnosis.

The causes of these kinds of injuries have to be found out, so that the climber may change his habits as regards the finger posture, the hydration, the warm-up, and the stretching exercises. After each session, stretching exercises are a priority to help promote recovery and enable fingers to regain their former position.

5.7.4.1 **Level 1 Bone Injuries: Functional Treatment**

First Week to Third Week

1. *Physical aspects*

- The intensity of the effort must not exceed 40 and 50 % of the climber's on-sight maximal level (ML).

- Between two training sessions, a break of 48 h minimum is required. During the first week, it is advised not to do more than two sessions. As regards the second and third week, the climber can go up to three sessions maximum.
- The first sessions have to be short, 1 h maximum.

2. *Other aspects*

- Crimp grip is to be banned. To regain a good deal of sensations, different ways of seizing have to be used – large holds, buckets, small edges. Open hand posture is recommended to avoid any torsions.
- It is highly advised to avoid any tough contacts with the fingers and supports. Dynamic movements and dynos are to be avoided.
- Throughout the cycle, pains can be felt. After the session, icing the injured part of the body is soothing.
- Psychological aspect has to be emphasized. A great part of the sessions are focused on sensations and various situations.
- What matters is the way the athlete feels. Indeed, he has to trust his hand again and believe in the healing of his injury.

3. *Complementary training*

- The climber can complete his training with electrostimulation sessions if he does not make any with a physiotherapist. The program “return to practice” or “reeducation” allows a gradual return to practice.
- Throughout the week, the climber can use a rubber ball or modeling clay to regain mobility in finger flexion and extension.
- During that period, swimming is also a good means to reinforce all the structures gradually.
- Extensor strengthening allows a better balance for the joints and the antagonist muscles involved.

Fourth Week to Sixth Week

1. *Physical aspects*

- The intensity of the effort must not exceed 50 and 70 % of the climber’s on-sight maximal level (ML).
- The training can’t exceed three sessions a week.
- The recovery time between two sessions is 48 h minimum.
- The duration of the sessions is 01:30 maximum.

2. *Other aspects*

- Throughout that period, the climber can gradually alternate open hand postures and crimp grips, insisting on open hand postures. Crimp grip has to be progressive (sixth week) and starts with slope grip (fourth and fifth week).
- One-finger pocket or two-finger postures are still banned.
- Tactics and techniques are the main objectives of these sessions.

- What matters is not the number of passages achieved but the way the climber feels as he is seizing the holds. Consequently, the priority of the session is the climber's gradual return to practice.

3. *Complementary training*

- Throughout that period, swimming practice remains a good thing to do.
- The climber can complete his training with electrostimulation sessions – muscle strengthening program.

Seventh Week to Ninth Week

1. *Physical aspects*

- The intensity of the effort must not exceed 70 and 90 % of the climber's on-sight maximal level (ML).
- The training can't exceed four sessions a week.
- The duration of the sessions is 02:00 maximum.
- The athlete can't climb two days, one after the other.

2. *Other aspects*

- Throughout that period, the climber has to alternate open hand postures and crimp grips and gradually use two-finger grips.
- What matters is quality rather than quantity. As regards the physical aspect, muscular strengthening is one of the aims of this cycle.

3. *Complementary training*

- The climber can complete his training with electrostimulation sessions on the flexors and extensors – muscle strengthening program.

Tenth Week to Twelfth Week

1. *Physical aspects*

- The intensity of the effort must not exceed 90 and 100 % of the climber's on-sight maximal level (ML).
- The training can't exceed four sessions a week.
- The duration of the sessions is 02:30 maximum.

2. *Other aspects*

- The recommendations concerning the sessions are identical to the cycle W7–W9.

Return-to-training recap:

W1	W2	W3	W4	W5	W6	W7	W8	W9	W10	W11	W12
← Intensity from 40 to 50 % ML →			← Intensity from 50 to 70 % ML →			← Intensity from 70 to 90 % ML →			← Intensity from 90 to 100 % ML →		
3 sessions max/week			3 sessions max/week			4 sessions max/week			4 sessions max/week		
Duration of the session: 01:00 max			Duration of the session: 01:30 max			Duration of the session: 02:00 max			Duration of the session: 02:30 max		

The athlete may need a couple of weeks to recover. These recovery weeks can be set between each cycle, that is to say, on the 4th week, 7th week, and/ or 10th week. Of course, the next cycle will have to be postponed to the following week.

Example:

W1	W2	W3	W4	W5	W6	W7	W8	W9	W10	W11	W12	W13
← Intensity from 40 to 50 % ML →			← Intensity from 50 to 70 % ML →			← Intensity from 70 to 90 % ML →			↑	← Intensity from 90 to 100 % ML →		
3 sessions max/week			3 sessions max/week			4 sessions max/week			Recovery	4 sessions max/week		
Duration of the session: 01:00 max			Duration of the session: 01:30 max			Duration of the session: 02:00 max				Duration of the session: 02:30 max		

5.7.4.2 Level 2 Bone Injuries: Surgery

In this part of the book, we will only deal with the physical aspect. The recommendations concerning the other aspects are identical to those given for level 1 bone injuries.

First Week to Third Week

Physical Aspects

- The intensity of the effort must not exceed 40 and 50 % of the climber's on-sight regular level (RL).
- The training can't exceed two sessions a week.
- Between two training sessions, a break of 48 h minimum is required.
- The first sessions have to be short, 1 h maximum.

Fourth Week to Sixth Week

Physical Aspects

- The intensity of the effort must not exceed 50 and 70 % of the climber's on-sight regular level (RL).
- The training can't exceed three sessions a week.
- Between two training sessions, a break of 48 h minimum is required.
- The duration of the sessions is 01:30 maximum.

Seventh Week to Ninth Week

Physical Aspects

- The intensity of the effort must not exceed 70 and 80 % of the climber's on-sight regular level (RL).
- The training can't exceed three sessions a week.
- The duration of the sessions is 02:00 maximum.
- The athlete can't climb 2 days, one after the other.

Tenth Week to Twelfth Week

Physical Aspects

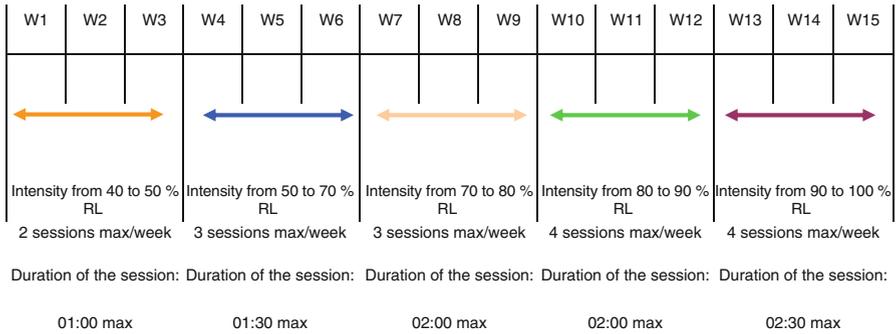
- The intensity of the effort must not exceed 80 and 90 % of the climber's on-sight regular level (RL).
- The training can't exceed four sessions a week.
- The duration of the sessions is 02:00 maximum.

Thirteenth Week to Fifteenth Week

Physical Aspects

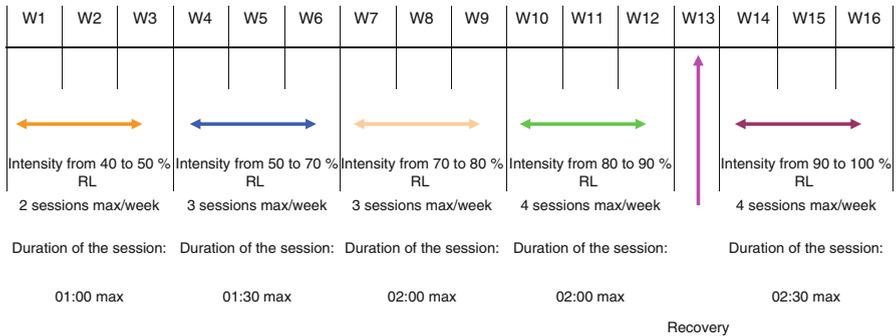
- The intensity of the effort must not exceed 90 and 100 % of the climber’s on-sight regular level (RL).
- The training can’t exceed four sessions a week.
- The duration of the sessions is 02:30 maximum.

Return-to-training recap:



The athlete may need a couple of weeks to recover. These recovery weeks can be set between each cycle, that is to say, on the 4th week, 7th week, and/ or 10th week. Of course, the next cycle will have to be postponed to the following week.

Example:



Strapping

Taping a finger is a means to relieve it for a while. Concerning this injury, it is advised to only apply that tape during the 3 weeks of the first cycle. Throughout the first 2 weeks, it is part and parcel of the session. Then during the third week, it can be removed during the warm-up but has to be applied for more difficult passages.

Thanks to that bandage, fingers are knit together and prevented from any torsion or twist. This strapping is close to a relative immobilization.

- The climber cuts off a 7-cm-long tape, as large as the P1 phalanx. First, the athlete wraps the P1 phalanx; secondly, he joints it to the next finger. The fingers have to be about the same size. Joining the ring finger to the little finger is impossible. The two finger joints have to be at about the same level, so that the climber may be able to flex his fingers properly.



Photos 5.42 and 5.43

- The same process has to be reproduced with the P2 phalanx. P2 is wrapped around once and then joint to the next finger.



Photo 5.44

5.7.5 Ligament Injuries

5.7.5.1 Back on Track

The climber has to be extremely cautious with this kind of lesion. The slope and the width of the grips require a precise position of the fingers. The strength involved may imply a work in torsion, which is quite a strain for the joints. This is why they have to be spared by choosing carefully the grips and holds. This choice can't be made outdoors, so difficulties, routes, and cliffs have to be properly selected. A bandage is recommended once back on track. After several weeks of training, the climber will be able to apply his bandage after the warm-up, for difficulties close to 80 % of his regular level on-sight.

Warm-up is a priority especially with a rubber ball or some modeling clay. This work can be done as a reeducation during a day off.

One-finger pocket or two-finger grips, with or without the former injured finger, are to be banned. It is advised to support that finger safely with another one, at least on the holds. This recommendation is to be respected for all the fingers except for the thumb or the little finger. In case of a middle finger injury, the grip has to be done with the index, the middle finger, and the ring finger, at least.

5.7.5.2 Level 1 Ligament Injuries: Less Than 21 Days of Interruption

First Week to Third Week

1. *Physical aspects*

- The intensity of the effort must not exceed 40 and 50 % of the climber's on-sight maximal level (ML).
- Between two training sessions, a break of 48 h minimum is required. During the first week, it is advised not to train more than two training sessions. As regards the second and third week, the climber can go up to three sessions maximum.
- The duration of the sessions is 01:00 maximum.
- The recovery time between each passage has to be long.

2. *Other aspects*

- Throughout that period, the best thing to do is to train outdoors as much as possible, choosing the adequate climbing style. Round holds are essential to help the gradual return of sensations. Alternating grips improve the relearning of climbing hand gestures. Large enough holds are favored since they enable the four long fingers to work. The former injured finger is supported by the other fingers to share equally the effort involved. The finger must not be twisted.
- Open hand grips have to prevail. Crimp grips won't be used exhaustively by the third week.
- The focus is on quality, insisting on techniques, tactics, and psychology.

3. *Complementary training*

- Three times a week, electrostimulation sessions – back to training or reeducation program – can complete the training.
- During the day, the flexors and extensors can be strengthened with a rubber ball or an elastic. Using the former injured finger to squeeze the ball, in crimp grip, is forbidden. Actually, the ball is set in the middle of the hand, and all the fingers rub it.

Throughout this period, all the finger muscles have to be warmed up properly, using a rubber ball, modeling clay, or an elastic. Hydration (before, during, and after each session) and stretching exercises (finger deep flexors, extensors, etc.) are also extremely important. After each session, it is advised to ice the finger.

The sore is always present during the first 2 weeks. The sessions have to be focused on quality. And the psychological aspect prevails to help the climber deal with the pain on his return to practice.

Fourth Week to Sixth Week

1. *Physical aspects*

- The intensity of the effort must not exceed 50 and 70 % of the climber's on-sight maximal level (ML).
- The training can't exceed three sessions a week.
- The duration of the sessions is 01:30 maximum.
- The recovery time between the different passages has to be long.

2. *Other aspects*

- Throughout that period and according to his capabilities, the climber can alternate CG or outdoor sessions.
- Open hand grips prevail. Nonetheless, during the session, crimp grips can be used on specific tasks. Crimp grip is practiced on large enough holds allowing the use of the slope posture.
- The work is principally based on quality focusing on technique, tactics, and psychology.
- The seizing has to be done with the four long fingers, so that the former injured finger might be supported by another finger.

3. *Complementary training*

- Three times a week, electrostimulation sessions – muscle strengthening program – can complete the training.
- During the day, flexors and extensors can be strengthened with a rubber ball or an elastic.

Seventh Week to Ninth Week

1. *Physical aspects*

- The intensity of the effort must not exceed 70 and 90 % of the climber's on-sight maximal level (ML).
- The training can't exceed four sessions a week.
- The duration of the sessions is 02:00 maximum on CG. They can be longer outdoors.
- The recovery time between the different passages has to be long.

2. *Other aspects*

- Open hand and crimp grip postures have to be alternated during the seizing of the holds. The aim of this cycle is to regain sensations in open hand posture, as much as possible. The athlete may have to change his way of climbing to

focus on this posture. Crimp grip is practiced on large enough holds, allowing the use of the slope posture.

- The work is principally based on quality rather than quantity. Muscular strengthening is another objective of the cycle.
- Three-finger grip is given a greater importance to support the former injured finger. The athlete can start using a two-finger grip.

3. *Complementary training*

- Three times a week, electrostimulation sessions focused on the flexors and extensors –strength or resistance program – can complete the training, according to the climber’s field or objective.

Tenth Week to Twelfth Week

1. *Physical aspects*

- The intensity of the effort must not exceed 90 and 100 % of the climber’s on-sight maximal level (ML).
- The training can’t exceed four sessions a week.
- The duration of the sessions is 02:00 maximum on CG. They can be longer outdoors.
- The recovery time between the different passages has to be long.

2. *Other aspects*

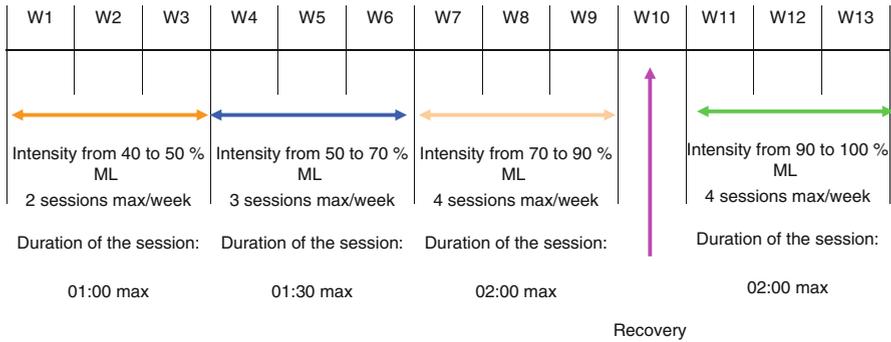
The recommendations concerning the session are identical to the cycle W7–W9.

Return-to-training recap:

W1	W2	W3	W4	W5	W6	W7	W8	W9	W10	W11	W12
←-----→			←-----→			←-----→			←-----→		
Intensity from 40 to 50 % ML			Intensity from 50 to 70 % ML			Intensity from 70 to 90 % ML			Intensity from 90 to 100 % ML		
3 sessions max/week			3 sessions max/week			4 sessions max/week			4 sessions max/week		
Duration of the session:			Duration of the session:			Duration of the session:			Duration of the session:		
01:00 max			01:30 max			02:00 max			02:00 max		

The athlete may need a couple of weeks to recover. These recovery weeks can be set between each cycle, that is to say, on the 4th week, 7th week, and/or 10th week. Of course, the next cycle will have to be postponed to the following week.

Example:



5.7.5.3 Level 2 Ligament Injuries: More Than 21 Days of Interruption

In this part of the book, we will only deal with the physical aspect. The recommendations concerning the other aspects are identical to those given for level 1 ligament injuries.

First Week to Third Week

Physical aspects

- The intensity of the effort must not exceed 30 and 40 % of the climber’s on-sight regular level (RL).
- The training can’t exceed two sessions a week.
- The duration of the sessions is 01:00 maximum.
- The recovery time between each passage has to be long.

Fourth Week to Sixth Week

Physical Aspects

- The intensity of the effort must not exceed 40 and 60 % of the climber’s on-sight regular level (RL).
- The training can’t exceed three sessions a week.
- The duration of the sessions is 01:30 maximum.
- The recovery time between each passage has to be long.

Seventh Week to Ninth Week

Physical Aspects

- The intensity of the effort must not exceed 60 and 80 % of the climber’s on-sight regular level (RL).
- The training can’t exceed three sessions a week.
- The duration of the sessions is 01:30 maximum.

Tenth Week to Twelfth Week

Physical Aspects

- The intensity of the effort must not exceed 80 and 90 % of the climber’s on-sight regular level (RL).
- The training can’t exceed four sessions a week.
- The duration of the sessions is 02:00 maximum.

Thirteenth Week to Fifteenth Week

Physical Aspects

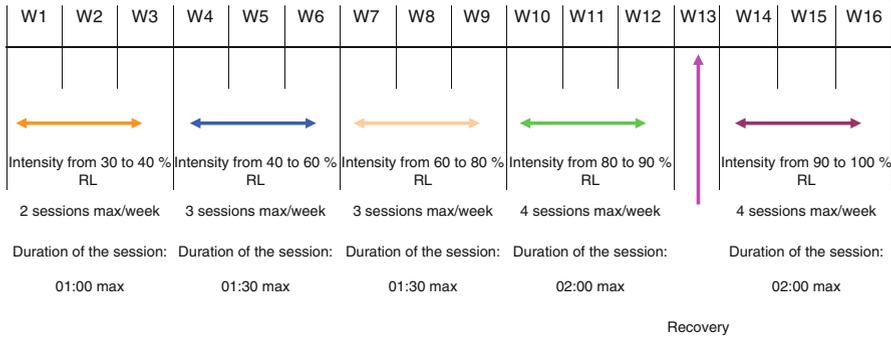
- The intensity of the effort must not exceed 90 and 100 % of the climber’s on-sight regular level (RL).
- The training can’t exceed four sessions a week.
- The duration of the sessions is 02:00 maximum.

Return-to-training recap:



The athlete may need a couple of weeks to recover. These recovery weeks can be set between each cycle, that is to say, on the 4th week, 7th week, and/or 10th week. Of course, the next cycle will have to be postponed to the following week.

Example:



Strapping

Strapping is a means to relieve a finger for a while. As regards that lesion, it is advised to apply the tape during the 3 weeks of the first cycle. Taping is part and parcel of the first 2 weeks. On the third week, the bandage can be removed for the warm-up, but it has to be done again for more difficult passages of the session.



Photo 5.45

In that case of injury, the function of the tape is to maintain the finger in the right axis and to prevent it from any lateral movements. The P2 phalanx always has to work in the same direction of P1. The PIP joint is quite similar to – on a smaller level – that of the knee, and so is the strapping.

The climber takes a 8-cm-long tape, as wide as the P1 phalanx. Then he wraps it around the phalanx, not too tight.

After, he takes another tape and reproduces the process on P2.



Photo 5.46

Next, the climber cuts off two bandages (length, 4 cm/width, 1 cm) and applies them across the joint. These bandages have to be tight.



Photo 5.47

After the athlete cuts off two small bandages (length, 3 cm/width, 1 cm). These bandages are set tightly on each side of the joint. The finger is outstretched.



Photo 5.48

The first two operations have to be reproduced on P1 and P2 to maintain the finger properly.



Photo 5.49



Photo 5.50



Photo 5.51

5.8 Recap Table

Injury	W1–W3	W4–W6	W7–W9	W10–W12	W13–W15
Tendon level 1	MI: 60–70 % ML	MI: 70–100 % ML			
	3 sessions max 01:30 max	4 sessions max			
		02:00 max			
Tendon level 1	MI: 50–60 % ML	MI: 60–80 % ML	MI: 80–90 % ML	MI: 90–100 % ML	
	3 sessions max	3 sessions max	4 sessions max	4 sessions max	
	01:00 max	01:30 max	02:00 max	02:00 max	
Pulley with no surgery	MI: 40–50 % RL	MI: 50–70 % RL	MI: 70–90 % RL	MI: 90–100 % RL	
	2 sessions max	3 sessions max	3 sessions max	4 sessions max	
	01:00 max	01:30 max	02:00 max	02:00 max	
Pulley after surgery	MI: 20–40 % RL	MI: 40–60 % RL	MI: 60–80 % RL	MI: 80–90 % RL	MI: 90–100 % RL
	2 sessions max	3 sessions max	3 sessions max	4 sessions max	4 sessions max
	30 min max	01:00 max	01:30 max	02:00 max	02:00 max

Injury	W1–W3	W4–W6	W7–W9	W10–W12	W13–W15
Bone level 1	MI: 40–50 % ML	MI: 50–70 % ML	MI: 70–90 % ML	MI: 90–100 % ML	
	3 sessions max	3 sessions max	4 sessions max	4 sessions max	
	01:00 max	01:30 max	02:00 max	02:30 max	
Bone level 2	MI: 40–50 % RL	MI: 50–70 % RL	MI: 70–80 % RL	MI: 80–90 % RL	MI: 90–100 % RL
	2 sessions max	3 sessions max	3 sessions max	4 sessions max	4 sessions max
	01:00 max.	01:30 max.	02:00 max.	02:00 max.	02:30 max
Ligament level 1	MI: 40–50 % ML	MI: 50–70 % ML	MI: 70–90 % ML	MI: 90–100 % ML	
	3 sessions max	3 sessions max	4 sessions max	4 sessions max	
	01:00 max	01:30 max	02:00 max	02:00 max	
Ligament level 2	MI: 30–40 % RL	MI: 40–60 % RL	MI: 60–80 % RL	MI: 80–90%RL	MI: 90–100 % RL
	2 sessions max	3 sessions max	3 sessions max	4 sessions max	4 sessions max
	01:00 max	01:30 max	01:30 max	02:00 max	02:00 max

Recovery weeks are not included in that recap table

Abbreviations: *ML* maximal level, *RL* at right regular level, *MI* maximal intensity

5.9 Interviews



Photo 5.52 Loic Gaidioz

Name: Gaidioz

Surname: Loic

Finger injuries: two tendinitis and a sprain

Rank:

- France champion in 2006
- 2006: World championship (5th)
- 2009: World championship (10th)

Best performances:

- Bouldering: 8b after work/8a at sight
- Cliff: 8a+ on sight
- *How long have you been climbing? How often do you train?*

I've been climbing since the age of 19. I train three to four times a week. On top of that, I also do cycling, ski touring, riding motor bikes, swimming, watching TV. But I also like staying quiet at home.

- *How did you get injured and how did you feel before the accident?*

I got two tendinitis on a zip down. I lost grip, all my fingers slid away, and I tried to hold myself back, once on the ring finger and the next time on the little finger. Actually, I felt perfectly well and all the conditions were great.

As for the sprain, I think it was due to tiredness, but I did not detect it before a while!

- *What about your return to training? Did you change some of your climbing habits?*

The finger lesions were not that serious, so I took some rest and everything went well. Besides, what happened was an accident, as it may occur while you're climbing, so it wasn't really my fault.

Actually, I didn't change anything in my way of climbing, apart from the fact that I have improved technically and physically and I haven't hurt myself since then, finger crossed of course!!!

- *Can you train again up to 100 % of your skills, or do you still feel a pain in the finger that has been hurt?*

I took several weeks of rest for each injury – 3–5 weeks – and since the complete recovery, everything's back to normal: I can force up to 100 % and I don't feel any pain.

- *To conclude, is there anything important you'd like to tell climbers, any advice?*

Learn to know your body! It may sound stupid, but it's important to detect and understand all the information given by our muscles, tendons, ligaments, and brains.

Above all, know one's limits.... It's better to cancel a planned session rather than get hurt and not be able to train for the next 3 months.



Photo 5.53 Loic Gaidioz in competitions



Photo 5.54 Juliette Danion

Name: Danion

Surname: Juliette

Finger injuries: pulley partial rupture

Rank:

- Europe champion in 2007
- 2007: Winner of the bouldering World Cup
- 2008: Bouldering France Champion

Best performances:

- Cliff: 8b+ after work/7c+ on sight
- *How long have you been climbing? How often do you train?*

I've been climbing since the age of 12. During the period of competitions, I trained three to four times a week, but now I climb twice a week.

- *How did you get injured and how did you feel before the accident?*

To tell the truth, since I've started competitions, I've had several injuries. Concerning the pulley partial breaking, it happened in China during the finale of the World Cup. I was about to start the circuit – at that time, the finale consisted of a circuit of six boulders – it was hot; I had warmed up, but not too much. And as usual, I had to wait a while before starting the circuit. On the first boulder, as I was crimp gripping on a small hold, I heard and felt a crack sound in my right little finger.

- *What about your return to training? Did you change some of your climbing habits?*

Going back to training was hard, because my finger was still painful. Doctors had advised me to stop climbing for 2 months. So when I started climbing again, to avoid the pain, I used the open hand posture essentially. First, it was difficult, but as time went by, I got used to it.

- *Can you train again up to 100 % of your skills, or do you still feel a pain in the finger that has been hurt?*

I can't use the crimp grip as I used to, and when I force a little, it's painful. Nonetheless, I got in the habit of using the open hand posture, so I think it won't stop me to keep the level I used to have before the injury. The only trouble is that I can't climb extreme routes, which requires the crimp grip, anymore.

- *To conclude, is there anything important you'd like to tell climbers, any advice?*

As I told you before, I've been injured several times and I've experimented a lot of cures, and for me, the best one remains applying ice on the painful lesion. It's at the same time a good means to avoid any new lesion or to treat one. After climbing, each time I feel a pain, I usually ice my fingers.

To finish, I'd like to add a few words about the frequency of training sessions. Young people always tend to climb too much. Fingers are not made for that, so the tougher the strain is, the more injured you get. Since I've reduced my climbing sessions, I've noticed that my fingers are much better and safer. If you don't give a rest to your fingers, your chances to get hurt are higher.



Photo 5.55



Photo 5.56 Rémi Samyn

Name: Samyn

Surname: Rémi

Finger injuries:

- Left hand little finger A2 pulley breaking
- Left hand volar plate breaking
- A great number of chronic tenosynovitis on the third and fourth finger of both hands

Rank:

- 2003 and 2005: University France Champion
- Junior World Championship (3rd)
- 2005: Bouldering World Cup (5th)
- 2005: Birmingham Bouldering World Cup (2nd)

Best performances:

- Bouldering: 8b after work
- Cliff: 8c after work

- *How long have you been climbing? How often do you train?*

I've been climbing since the age of 10, so I've been practicing in all fields – cliffs, bouldering, competitions, CG – for 15 years now. Since my finger problems, I've reduced the amount of climbing in training sessions, so today, I climb approximately three times a week. But on the other hand and of course to spare my fingers, I've increased nonspecific work such as fitness, jogging. Globally, I train 20–25 h a week, which makes ten sessions over 6 days.

- *How did you get injured and how did you feel before the accident?*

I broke my pulley and my volar plate when I was competing for the Bouldering France Championship, in Fontainebleau in 2008. I was pressing on a large hold, my left hand gripped in pliers, when suddenly I felt a big crack. That's when it happened! Before the competition and for 2 months and a half on, my both hands had been sore due to tenosynovitis on the third and fourth fingers. Nonetheless, I went on training, but I reduced the load of work, and I made sure to limit tough grips and harsh movements. Despite of that, my fingers had become fragile and painful, and the pressure of the competition was the last straw. My fifth finger, which had been overused to compensate during the previous 2 months, was injured.

- *What about your return to training? Did you change some of your climbing habits?*

I was back on track 8 weeks later, but in a very gradual way. Indeed, it took me 2 months before being able to deal with hard boulders again. First, I had to bandage my hands, then I tried easy boulders, and I iced my hands after each session.

I also had to change my climbing habits. I used open hand posture more often, I climbed three times a week but never more than 2 days one after the other, I did less boulders and more routes, and, finally, I insisted much more on the warm-up and I also listened to my body.

- *Can you train again up to 100 % of your skills, or do you still feel a pain in the finger that has been hurt?*

I've never managed to train up to 100 % of my skills. Each time I increase the pressure on my fingers by climbing more or strengthening my fingers with hanging work, or when I am extremely tired, I get hurt again! Changing my way of training allowed me to have no more tenosynovitis pains, but unfortunately, my little finger (double fracture) has remained painful even 1 year after the accident.

- *What about your return to training? Did you change some of your climbing habits?*

The best thing I could tell them is to be extremely careful, because once you've gotten hurt, whether a part of your body gets broken or torn, you never get back your full skills!

Another piece of advice from “an old guy”: be safe and make sure to get some rest especially to spare your fingers, even if you think you don't need any. In fact, the problem is that when you are young, it's easy for your body to recover quickly,

but as you're getting old, it's another story. In the end, you pay for all the mistakes you've made in your youth, but when you realize it, it's too late! It's difficult to see things in the long term, when you are 16, but it's a priority if you want to keep performing at high level. As soon as you feel a pain, you have to stop the session immediately and ice the part of the body involved. Don't hesitate to get some rest for a week, because most of the finger lesions heal up perfectly well if they are treated right away. There's nothing worse than keeping grinding and thinking that things are going to be okay despite the pain which will hopefully blur away. Finally, when you are injured, the worst thing is impatience. I know how frustrated you can feel in such periods and believe me, I've been through hardship for the last few years, but if you go too fast and don't treat your lesion properly, sooner or later you'll have to pay for it. Therefore, put up with it and be patient.

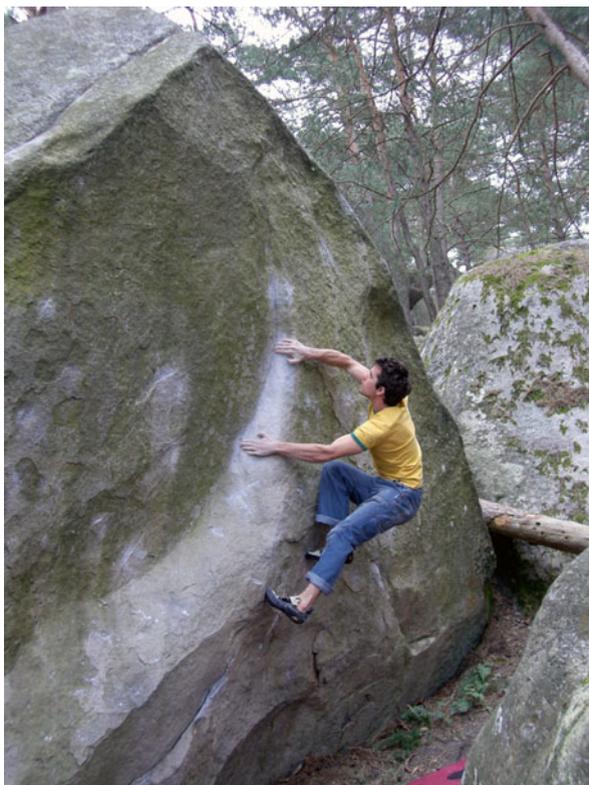


Photo 5.57



Photo 5.58 Emilie Verdier

Name: Verdier

Surname: Emilie

Finger injuries: pulley partial rupture

Rank:

- 2004 and 2005: finalist to several Bouldering World Cups
- 2004: Lecco Block European Championship (8th)
- 2005: Argentière Bouldering International Open (2nd)
- 2006: Plouha France Championship (3rd)

Best performances:

- Bouldering: 7c+ after work
- *How long have you been climbing? How often do you train?*

I've been climbing since the age of 20. I train five times a week.

- *How did you get injured and how did you feel before the accident?*

I broke my pulley partially during a training session. I crimp gripped on a small edge as I was on a steep overhang. It was right before the beginning of the competition season and I was fit and I felt good.

- *What about your return to training? Did you change some of your climbing habits?*

I had to stop everything for 45 days before going back on track. My finger was a bit stiff at the beginning, but things went better throughout the sessions. As regards my climbing habits, I try to drink a little more during the sessions, and I stretch my fingers a little longer after climbing.

- *Can you train again up to 100 % of your skills, or do you still feel a pain in the finger that has been hurt?*

Today everything's back to normal and I don't feel any pain, because I did things step by step.

- *To conclude, is there anything important you'd like to tell climbers, any advice?*

What matters is to take care of oneself with a healthy life and to listen to one's body. When you are injured, you have to stop as long as necessary, even if it's difficult especially in case of finger injuries, because in climbing fingers are so fragile and so essential at the same time.



Photo 5.59



Photo 5.60 François Lombard

Name: Lombard

Surname: François

Finger injuries: pulley full breaking with surgery on the right ring finger

Rank:

- 1994: World Cup Winner
- 1995 and 1996: Arco Master Winner

Best performances:

- Bouldering: 8b after work
- Cliff: 8c+ after work and 8b on sight
- *How long have you been climbing? How often do you train?*

I haven't been climbing in winter for 8 years now, and I've hardly climbed in summer.

- *How did you get injured and how did you feel before the accident?*

I was exhausted due to a great amount of training sessions and the pain gradually appeared, so I had an infiltration done to take part in Serre Chevalier competition. A week later, as I was practicing crimp grips on the hangboard, I heard a slight crack, but no pain. Therefore, I went on climbing for 1 month nonstop, and there was still no pain. But after that, I just couldn't climb anymore; the pain was too harsh.

- *What about your return to training? Did you change some of your climbing habits?*

The return to training was gradual throughout 6 months, then I didn't change anything in my climbing habits, and I trained over my limits as I used to.

- *Can you train again up to 100 % of your skills, or do you still feel a pain in the finger that has been hurt?*

I haven't felt any pain since the surgery. Actually, the pulley seems to be even stronger than the other ones, which happened to be tricky sometimes and forced me to get some rest.

- *To conclude, is there anything important you'd like to tell climbers, any advice?*

To speak straight, though I'm not fond of the open hand posture, what I am going to say is a biased point of view.

As regards most finger injuries, a full rest is not necessary, because even after a long break, pains will always come back.... You have to go on climbing safely but bearing in mind the "no pain at all" rule. There's no use testing oneself every other day to see if things are getting better. As doctors prescribe it 45 days to help the healing!

Finally, I'm a bit skeptical concerning taping. I've used it quite a lot, and I think that it doesn't make any difference. In a way, I even think that it slows down the inner healing. Therefore, I don't use it anymore to support pulleys; I only apply it on palms and for cracks.

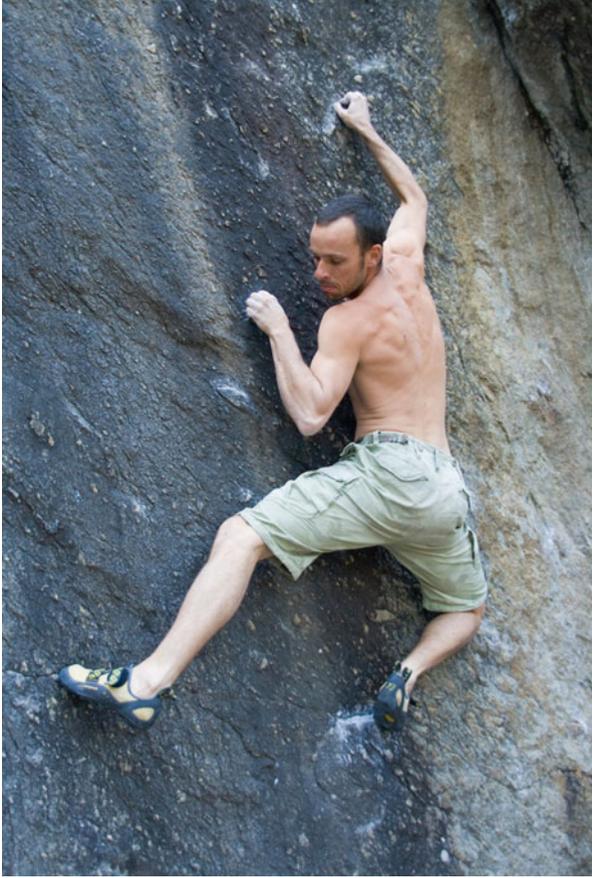


Photo 5.61



Photo 5.62 Mélanie Son

Name: Son

Surname: Mélanie

Finger injuries: tendinitis and finger sprain

Rank:

- 2003: Colmiane Master (1st)
- 2004: World Cup (5th)
- 2004 and 2005: Arco Master (1st)
- 2005 and 2006: France Vice Champion

Best performances:

- Bouldering: 7c after work
- Cliff: 8a+ after work and 7c on sight
- *How long have you been climbing? How often do you train?*

I've been climbing since the age of 13. I train five to six times a week.

- *How did you get injured and how did you feel before the accident?*

I got hurt as I was forcing to seize a far away hold in a tricky open hand two-finger posture. At that time, I was training everyday, and I lived an unhealthy life, I had a bad food diet, and I smoked.

- *What about your return to training? Did you change some of your climbing habits?*

I stopped climbing for 5 days, I bandaged my finger and I stopped using the open hand posture, and I went on climbing thinking that things will be okay. Unfortunately, I also had an elbow tendinitis and another one on the long biceps. Eventually, I had to stop for several months and follow numerous physiotherapy sessions.

- *Can you train again up to 100 % of your skills, or do you still feel a pain in the finger that has been hurt?*

Of course I can. Besides, I stopped practicing for nearly 1 year and I went back on track slowly. So now everything is back to normal.

- *To conclude, is there anything important you'd like to tell climbers, any advice?*

The first thing I would suggest is to stop immediately as soon as you feel a pain. It may sound like a silly remark, but it's not always that obvious.

Then don't hesitate to see a doctor! Your way of life is also important, and you have to pay attention to your food diet and drink water.

And the last but not the least, listen to your body and get some rest!



Photo 5.63

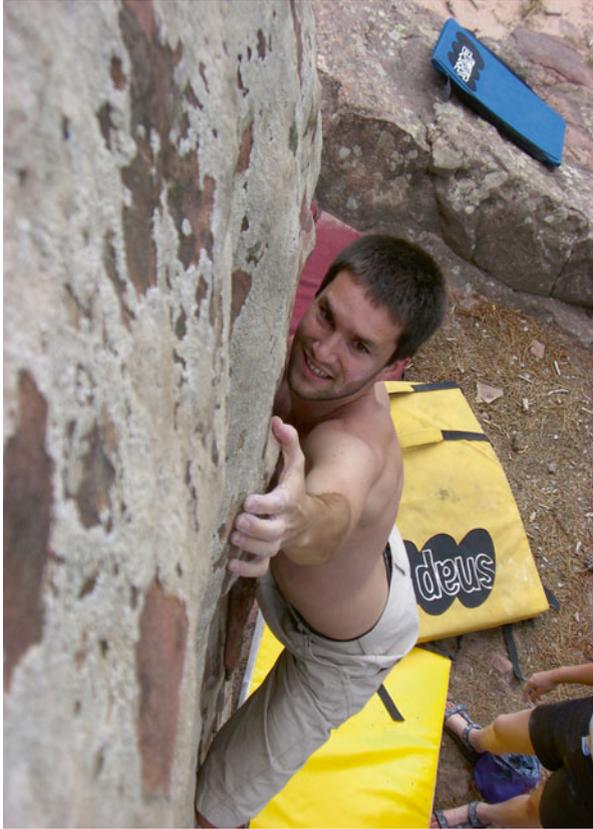


Photo 5.64