



Training Tips

This section focuses on tips for increasing the efficacy of your training--that means improving the quality of your strength training, technique training, and rest/recovery program. (Click on "Mental Wings" for tips on all-important mental training.) More features coming here soon...

- [Definition of "Training for Climbing"](#) - Walk around any crag, climbing gym, or group of two or more climbers and you are likely to hear the word "training" flying around like dynos on a route at Rifle. But just what does "training" mean in the context of climbing?

Strength & Fitness Training

- [The Training Effect](#) - "What" and "how" to train for climbing.
- [Theory on Training Finger Strength](#) - Maximum finger strength is the most valuable commodity for high-end climbers. Assuming your head and technique are together, sending hard routes often comes down to your ability to stick small edges, pull shallow pockets or hang onto slopers.
- [Lock-Off Training](#) - Better than "pull-ups"...Are you experienced?
- [H.I.T. Workout for Maximum Finger Strength](#) - Hypergravity Isolation Training (HIT) is a highly focus training method for building maximum finger strength; this is accomplished by means of a special training protocol which includes progressively adding weights to your body while climbing.



Technique & Skill Training

- [Relationship Between Skill and Fitness](#) - This knowledge is powerful--if you apply it!
- [Down-climbing Routes](#) - Possibly, the single most powerful training technique for rock climbers.
- [The Left-Right Rule](#) - A fundamental rule that you should exploit at every opportunity.
- [Enhance Recovery with the G-Tox](#) - How to deflate a "Hindenbergian" forearm pump--fast!

Nutrition & Other Factors

- [Managing Your Energy Levels](#) - Learn to use the Glycemic Index (of foods) to control energy levels and enhance recovery.
- [Nine Absolutes of Climbing Performance](#) - Climbing your best and improving most rapidly depends on the degree to which you follow these nine Absolutes.

(Tom Muller launches upward on another Campus rep.)

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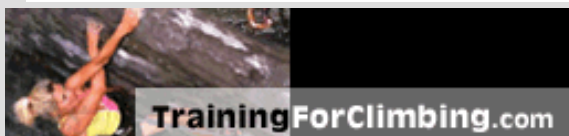
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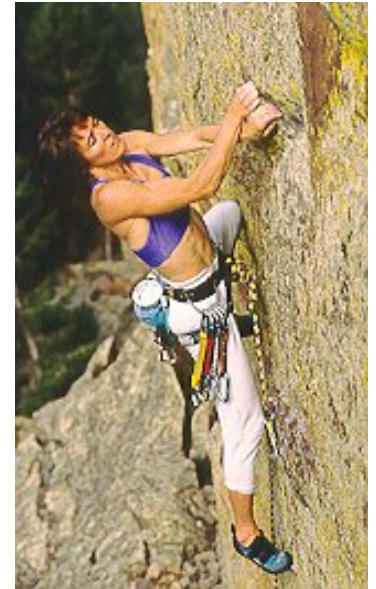


A Definition of "Training for Climbing"

Walk around any crag, climbing gym, or group of two or more climbers and you are likely to hear the word "training" flying around like dynos on a route at Rifle.

But just what does "training" mean in the context of climbing? For most, training is synonymous with building strength. I have my own definition of "training for climbing"--any practice, discipline, or exercise designed to increase one's effectiveness and efficiency on the rock. Clearly, this represents a broad spectrum of activities, and hence the wide-ranging content of TrainingForClimbing.com.

Through this paradigm I hope you will accept that training for climbing includes: bouldering to learn problem solving; climbing on a home wall to improve strength and technique; on-sighting, hangdogging, or for that matter any climbing on real rock to develop climbing skill and strategies; traveling to experience many different types of climbing; stretching for flexibility; watching your diet so that you have lots of energy, fast recovery but don't get fat; visualizing a route you are "working" as well as all other forms of mental training; resting sufficiently and listening to your body to avoid injury; evaluating yourself constantly to determine your true (physical and mental) strengths and weaknesses; and of course, performing various gym exercises that closely relate to the positions and movements common to climbing.



As you can see, strength training is just one piece in the performance puzzle. But how big of a piece? Well, it's hard to say for sure but I contend that it is far from the largest!

This may shock many climbers because their real-life experiences with failure on a climb always seem to center around a lack of strength. But what about all the underlying causes that may have led to premature fatigue and failure? Poor footwork, bad body positioning, over-gripping of holds, climbing too slow, poor focus and lack of concentration, low energy levels (due to poor diet), dehydration, and a mind "out of control" are all common causes.

The moral of the story is the best training programs for climbing include lots of climbing! Three or four days a week on rock (or an artificial wall) is more important (and more advantageous) than spending those days strength training in a gym. Evidence of this is the fact that climbers who religiously strength train at home tend to lose pure strength while on a long climbing trip but at the same time realize an increase in climbing performance--their gains in skill from climbing more frequently outweigh their losses in strength.

This is not to say that you can simply climb a lot and ignore all the other facets of performance. The best climbers clearly focus on putting the complete "puzzle" together, and this undoubtedly includes frequent strength training. This website is dedicated to helping YOU put all the puzzle pieces together and, I hope, it will help elevate your climbing to heights heretofore unknown!

(Mia Axon is an extraordinary climber, largely thanks to her all-around approach to training for climbing. Stewart Green photo.)

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The "Training Effect" (Training Principle of Adaption)

A basic principle of exercise science is that adaptation occurs in exercise only in those parts or systems of the body that are stressed by the exercise. For example, running produces favorable adaptations in the legs, heart and lungs (chest wall, actually), which improve the capacity for running. This is called the training effect. Systems not stressed show no adaptation. Even heroic amounts of running produce no favorable changes in the arms. (The adaptations produced by running do transfer somewhat to other sports that depend on the same body parts and systems, for example, bicycle riding. Despite this, the effect is not immense).

In climbing you obviously need arm strength and endurance (especially in the grip), reasonable flexibility, minimal excess weight (either as fat or muscle in peripheral areas) and ordinary cardiovascular capacity and leg strength. So the effect of running on climbing would be expected to be small but positive, primarily by keeping fat down and maintaining cardiovascular fitness.

What about other exercises such as weight training? As it happens, weight training is highly specific. For example, isometric training of the biceps at one particular elbow position (say 90 degrees) transfers very poorly to isometric biceps strength at some other angle (say 60 degrees). Doing curls at one speed (slow) produces surprisingly little improvement in strength when doing them quickly. Grip strength shows a remarkable amount of specificity depending on the shape of the grip, the positions of the wrist and elbow, and the level of the muscles above the heart, kind of contraction, etc. Consequently, driving along in your car and squeezing a rubber donut is basically useless as climbing training.

Despite all of this, certain exercises that produce arm strength or endurance can help climbing performance. The specificity of strength training gives quite a few clues as to how it can best be done.

Climbing involves using muscles at different angles and in odd, sometimes contorted positions. These angles are seldom employed in standard body building style workouts, which involve repeating the same exact symmetrical, isolated movement over and over again.

For climbing, a frequent variation in exercise format is helpful, especially after basic competence and progress has been made at the standard exercises. Do pull-ups with wide grip, narrow grip, palms out, palms in, arms at different levels, with one foot on a bench, etc. (This will perplex and sometimes annoy body-building purists--just tell them you are using the "muscle confusion principle"!)

Be cautious, though, not to exercise in uncomfortable or painful positions.

Squats are useless. They do nothing to improve climbing-specific fitness. Most people who can walk up stairs two steps at a time have all the leg strength needed for most rock climbs. There are also obvious weight concerns--few climbers would want to lug gigantic, bulging thighs up a cliff.

Whenever achieving a new grade, a burst of strength training seems to help even though the strength gained becomes unnecessary in many cases after consolidation of skill at that new level. Care must be taken not to glibly assume that problems arise from lack of strength. More often, they are due to inflexibility, lack of confidence (a feeling of strength is a great confidence builder, though) or some more easily solved gap in technique.

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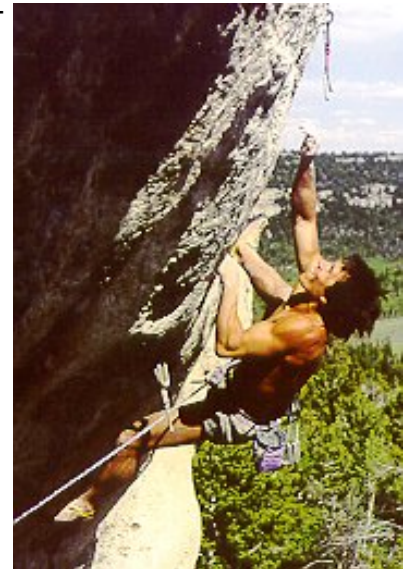


Maximum Finger Strength Training

Maximum finger strength is the most valuable commodity for high-end climbers. Assuming your head and technique are together, sending hard routes often comes down to your ability to stick small edges, pull shallow pockets or hang onto slopers. As Yaniro points out "if you cannot pull a single hard move, you have nothing to endure." Thus, strength training rules over endurance as declared in Absolute #6.

There has been much debate about the best method to train maximum finger strength. Bouldering has always been held high as a developer of finger strength. Fingerboards became popular in the late 1980s and are now joined by campus training in the 1990s. While each of these methods are somewhat effective given the right program, they all fall short of being the best at developing maximum finger strength. Here's why.

(Yaniro cranks at Wild Iris. Michael McGill photo.)



Efficacy of a finger strengthening exercise is dependent on four fundamental requisites. The more of these requisites met, the more dramatic the results. Here's a quick look at each.

- #1.) The exercise must be high intensity throughout the entire set. Intensity directly relates to the number of muscular motor units recruited and neurological activity. An exercise performed at near 100 percent intensity throughout the set is the goal.

In climbing, higher intensity is created by increasing wall angle, decreasing hold size and increasing speed of movement. However, as you get stronger there's a definite limit to how far you can go with each of these variables--wall angles past 45 degrees are too roof-like, very small holds are painful to train on and climbing too fast fosters poor technique. When taken to extremes, all these adjustments will have a negative impact on your training.

A better method to up intensity is adding weight to your body. Any bodybuilder will tell you "higher resistance equals higher intensity." Adding just ten to fifteen pounds causes a huge increase in intensity on overhanging walls and will yield a leap in finger strength in just a couple weeks. Interestingly, very few climbers are aware of this fact!

- #2.) The exercise must produce muscular failure in much less than one minute. It's universally accepted that strength training must produce muscular failure during the anaerobic phase of exercise. In the weight lifting world, muscular failure in six to twelve reps is considered ideal. This is also valid for our sport, but translates to high-intensity climbing that produces failure in 12 to 24 total hand movements. However, in climbing there's always the lingering question of whether failure resulted from maxxed-out muscles or not being able to do a move.
- #3.) The exercise must be specific to climbing positions and movements. Strength gains resulting from a certain exercise are specific to situations involving similar position and movement. The greater the difference between the exercise and sport use, the less the strength will transfer. Thus, the best strength training exercise for climbing would involve actual climbing movements, whereas an exercise performed while standing or hanging would transfer less.
- #4.) The exercise must focus on a specific grip position for an entire set. In climbing, the rock

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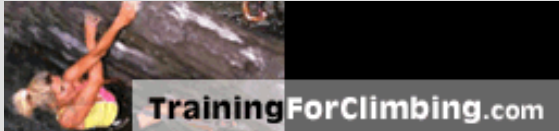
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dictates a random use of many different grip positions. Since strength is specific to each grip position, such cycling of grips allows you to climb much longer than if you use the same grip repeatedly. That's great if you are climbing for performance. However, for the purpose of training grip strength it stinks! That's why a full season of climbing will build endurance, but leave you with the same finger strength as last year.

Effective finger strength training must hammer a specific grip until failure. Due to the limited transfer of strength from one grip to another, you'll need to train all the basic grip positions in this same manner. The six I suggest are: open hand, crimp, pinch, and the three two-finger pocket "teams." Isolate and strengthen these grips, and there will be enough near transfer to cover just about any novel grip position you encounter on the rock.

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The One-Arm Lock-Off

The standard pull-up has long been the staple exercise for climbers. Several sets of pull-ups performed three or four days a week will provide most climbers with the necessary "pull-muscle" strength to progress into the mid-grades in the course of a few months to a year.

Unfortunately, the standard pull-up may not provide the more specialized types of pull-muscle strength needed for more difficult routes. We all know climbers who can knock off a decent number of pull-ups (greater than 15 or 20) but cannot regularly knock off 5.10s or 5.11s! Although, poor technique may be a problem for some, many lack the important skill of being able to fully lock-off on a hold with one hand while making the reach to the next finger hold or good jam with the other.

This lock-off skill is especially critical as the distance between holds and the angle of the rock increase. For these reasons, intermediate and advanced climbers would be well served to add the one-arm lock-off exercise to their training "menu." In fact, connoisseurs of overhanging rock may want to make the one-arm lock-off one of their new staple exercises.

DOING THEM!

As a general rule, you should not train the one-arm lock-off exercise unless your "one-set-max" number of pull-ups is at least 15. Until then, continue to work four to eight sets of pull-ups (palms away) per workout (two- to four-minute rest between sets) until you reach this criteria.

For the able and ready, let me first make two important points:

- One-arm lock-offs are a high-intensity exercise that requires a sharp focus and reasonably fresh muscles, and
- This exercise is quite stressful and could result in injury if overtrained or done improperly.

Perform the lock-offs early in your workout while the mind and body are fresh. Also, a thorough upper-body warm-up is mandatory.

For your warm-up begin with some stretches for the arms, shoulders, and back, as well as several sets of standard pull-ups. A few minutes of sportsmassage performed on the upper arms and back is beneficial.

Begin with a regular chin-up (palms toward you). Lock off completely at the top on one arm, and let go with the other. Hold the lock-off with your chin above the bar as long as you can, all the while focusing on pulling the bar "under your armpit." When you begin to lose the lock, either grab back on with the other hand, or lower slowly (harder)--don't let yourself down fast! Jump down and gather yourself briefly, then do the other arm. Perform three to five sets for each side with a few minutes of rest between sets.

If you can't hold these at first, do them by holding on with one finger of the other hand or by standing in a loop of bungee cord. In a short time you'll be holding a true one-arm lock-off for ten or twenty seconds!

ADVANCED LOCK-OFFS

There are two harder "variations" you can begin to work when you are able to perform five sets of 20-second lock-offs.

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Variation 1:

The same lock-off exercise except with your palms facing away (pull-up position). This is a bit harder because you receive less help from the bicep, but it is more sport specific and thus more useful! Do two sets of lock-offs the regular way, then do three more sets in this new position. Again, try to build up to 20 seconds per set.

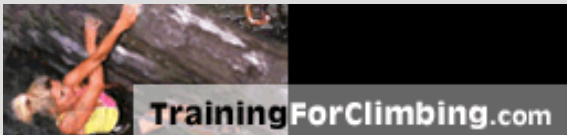
Variation 2:

"Variation 2" involves performing the lock-offs below the bar at "arm-angles" of 45, 90, and 120 degrees. Pull up with two arms until you reach the desired angle. Let go with one hand and hold static as long as possible. These are very hard, and should be done only when you can successfully do "Variation 1."

ONE-ARM LOCK-OFF TIPS

- 1. Focus on pulling the bar toward your armpit.
- 2. Lift your knees to waist height while in the lock-off.
- 3. Try to keep breathing while holding a lock-off.
- 4. If at first you have difficulty holding the lock-off, stand in a loop of bungee cord or use one finger of the other hand.
- 5. Do not work this exercise on a fingerboard.

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The "HIT Workout" For Maximum Finger Strength

Maybe the most often asked question in the history of this sport is "how can I strengthen my fingers?" A common observation of many climbers is that while finger/forearm endurance improves during the course of a season, maximum grip strength--your ability to hang on tiny holds, shallow pockets, slopers and pinches--does not. Sadly enough, it is usually gains in max finger strength, along with technique and the head games, which open up the next level of difficulty. Tony Yaniro points out the importance of training maximum strength over endurance with his comment "if you cannot pull a single hard move, you have nothing to endure." And Tony should know, he's been climbing 5.13 longer than anyone else on this planet!



OK, so what is the best exercise for training maximum finger strength? The leading contenders are high-intensity bouldering, fingerboard training, heavy-weight finger rolls and campus training. Certainly each of these methods are somewhat effective given the right program, however, it's my opinion that they all fall short of being the best. On this website, I'll introduce you to a new and somewhat misunderstood method of finger strength training I develop--it's the HIT Workout!

"If you cannot pull a single hard move, you have nothing to endure!"

Follow the links below to read a primer on my theory of finger training and the HIT Workout program. You will also learn about my specially designed HIT Strips (manufactured by NICROS, Inc. 1-800-699-1975) which serve as the ideal platform for this new type of training; though, you can also perform HIT workouts on any steep wall equipped with a range of finger-friendly pockets, edges, slopers and pinches. .



(Pix: EH on his home wall and in Buoux, France. Photogs: Bruce Stick and Michael McGill, respectively.)

Unsolicited Feedback on HIT Workouts . . .

- "From my first workout on the HIT Strips, I was convinced that they were an excellent finger training tool." -- Chris
- "I've been on the HIT Strips for two training cycles now and I've doubled my finger strength!" -- Dick
- "I've logging great gains in strength already and found a new enthusiasm for training. Thanks for your new training ideas." -- Paul
- "I'm impressed with your HIT concept, your quality advice and your willingness to debunk myths about

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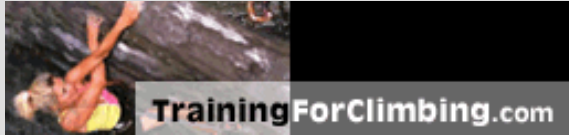
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what makes climbers stronger. After completing just the first training cycle, I climb with more poise and confidence." --Alistair

[HIT Home](#) | [Finger Training Theory](#) | [HIT Workout](#) | [Set-up](#) | [FAQ](#) | [HIT Strips](#)

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Relationship Between Skill and Fitness

For a beginning climber in the Cognitive Stage of Motor Learning, a low level of fitness can pose problems. A certain level of strength is necessary in order to do enough climbing just to begin practice and to develop skill. On the other hand, too much strength allows the beginner to get by with inefficient, wasteful moves which will prevent the development of good technique (unless the strong person makes good technique a goal instead of just getting up the route).

The problem is further enhanced by the fact that people tend to develop their talents disproportionately. Strong people most likely lift weights. Flexible people probably stretch and skillful people undoubtedly climb a lot. For most, the drudgery of working on weak points tends to be discouraging.

In fact, much of what may seem to be strength gains in beginners may well represent learning. Even in weightlifting, the amount of weight that can be lifted goes up dramatically in the first week or two. During this period, no measurable change occurs in the muscles used. Familiarity with the exercise, increases in efficiency, and the neurological organization of the movement produce the apparent gains in "strength."

Elite climbers, though, have relatively little to gain from practicing familiar forms of climbing. For those few expert climbers way out on the practice curve near their ultimate skill potential, fitness becomes the crucial factor in performance. Hence, the common phenomenon of articles by highly accomplished climbers describing seemingly lethal or disastrously stressful fitness regimes that are sure to plunge the ordinary climber into despair, the doctor's office, or self-defeating over-reliance on fitness as the key to improvement.

For the ordinary climber, it becomes obvious that practicing to improve skill is more important and productive than training for fitness. I think the fact that grades that used to be the realm of the fit elite (e.g., 5.11) are now achieved by Elvis-legged bumblebees on a wall in the corner of the local health spa, confirms this! Of course, some of the overall elevation of standards is due to better shoes, gear, etc. However, most of it is due to better learning methods (hangdogging, redpoint, etc.) and the availability of indoor climbing walls (now found in almost every city and in the homes of most serious climbers). More time practicing climbing technique is the key to getting good (fast!), and indoor walls were the breakthrough that allowed most urban climbers to climb more frequently.

Focused fitness training is important after a layoff, a fact that leads many people to believe it is more important than it is. The rapid loss of strength that occurs when heavy workouts are stopped also helps build this belief. Despite this, the most long-term and significant improvements are undoubtedly the result of practice until late in the average climbing career, when sport-specific strength truly becomes a limitation.

The permanence of skill and rapid variability of fitness is good news to people who must take time off to resolve an injury or for some other reason (Figure 2...in book).

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Down-climbing Routes

Every time you lower off the top of a climb you miss out on one of the most effective training exercises: down-climbing. That's right, if you really want to get better in this sport, and fast, then re-chalk at the top of a route and begin climbing back down.

Down-climbing improves many skills including footwork, sense of body positioning, speed of movement, hold recognition and sequence memory, to name a few. It's also great fitness training since you're increasing the length of your "burn" and performing eccentric muscle movements. All totaled, this makes down-climbing a hands-down must on all but performance days.

Clearly, top rope setups facilitate more carefree, go-for-it attempts at down-climbing a route. Whether at the gym or a crag find a good belayer who can pay out rope at just the right rate-- you don't want to get hung-up by the rope while reversing the crux sequence! Continue down-climbing until muscular failure or you botch a sequence and fall. Whether you get back on and continue or lower to the ground (on a steep route you may have no choice) is up to you. Do be careful not to go overboard on this training method. If you fall more than a few times down-climbing, then call it quits and move on to the next (up) climb.

I cautiously advise down-climbing of lead routes. Overhanging sport routes are the best choice here; in fact, down-climbing is a nice alternative to untying and threading anchors. However, a veteran belayer is mandatory, especially as you enter the ground-out zone near the last (lower) two bolts.

TIP: Down-climbing routes is a powerful skill-training exercise. Don't overlook this method of training the triad of skill, fitness and mental abilities. On practice days, down-climb (as far as possible) every route you send.

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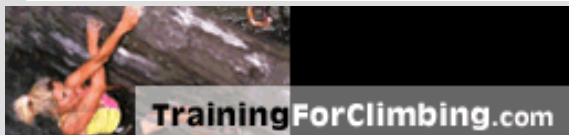
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The Left-Right Rule

Reach, stability, and control--three things you can never have too much of while climbing. Although the location and size of the holds and angle of the rock are contributing factors, it's ultimately your use of the holds and ability to spot the best sequence that determines each of the factors named above. The left/right rule is a fundamental climbing technique you can use to maximize reach, stability and control. What's more, on steep rock it can make the "impossible," "possible!"

Whether you're cross-country skiing, climbing a ladder or climbing rock, the pairing of left-hand movements with right-foot movements (and vice versa) maximizes stability. In climbing it also adds inches to your reach, provided you can spot a sequence of holds to use in a left/right configuration.

There are several different hand and foot positions with which you will want to become accustomed. Practice regularly the ones described below. Without these moves you'll never become a technically skilled climber.

SIDE PULLS / UNDERCLINGS

The left/right rule is essential for performing side-pull and undercling moves effectively. These handhold positions, when paired with an outside-edged foothold, make for long, stable reaches on vertical rock.

Remember that according to the left/right rule, you must use the outside edge of the foot opposite to the handhold you are beginning to pull on, which allows the hip opposite the pulling hand to turn against the wall. Such a twisting motion may feel awkward at first, but it's essential for placing the most weight possible over the outside edge of the pushing foot. This preserves upperbody strength and maximizes reach.

BACKSTEP / DROPKNEE

These foot moves are the legacy of sport/indoor climbing and are undoubtedly the most important position for difficult moves on steep terrain. When used in the left/right hand/foot combination, they allow for seemingly effortless movement through the steep, impossible-looking moves.

The essence of this movement is a hip turn to the wall with a chimney-like positioning of the feet. The hip to the wall should be opposite to the pulling hand, with the inside leg in the backstep position. Again, the twisting movement resulting from the left/right combination pulls the body towards the wall reducing weight on the hands and increasing reach.

Interestingly, the backstep can also improve your purchase on handholds--a definite help when faced with sloping holds on a steep wall! To maximize this effect, drop your inside knee toward the ground (dropknee) and hip toward the wall, while pressuring your feet in the chimney-like position. This creates a tension throughout your body thus changing the pulling force vector of your hands perpendicular to the sloping hold instead of straight toward the ground as usual. This makes "marginal" holds "usable" and oftentimes enables you to deadpoint off an otherwise useless hold.

PERFECT PRACTICE, PERFECT SCHEMA

As with any new climbing skill, you must proceed through the three stages of motor learning (see Chapter 1) before you will be able to use the move quickly and efficiently. The backstep

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and dropknee often feel unnatural and difficult for first-time users, especially those accustomed to more straight-forward vertical climbing movements. Convince yourself that straight-on (neutral) climbing positions are inefficient on overhanging routes. So if you want to excel on the steep routes of the '90s, you must make these new techniques a part of you.

Establish solid schema by practicing the new moves on as many different sequences and holds as possible. Artificial walls are ideal! Vary the orientation and position of the holds as well as the angle of the wall, if possible.

At first, you may want to exaggerate the body movements involved in doing these moves. This helps code the "feel" of the movement more quickly. However, be sure you always do the move correctly. A common mistake for beginners is turning the wrong hip and/or dropping the wrong knee--because you can also encode the "feel" of bad positioning. Remember, the hip turn, backstep and dropknee are almost always performed opposite the pulling hand (as per left/right rule).

PUTTING THEM TO WORK FOR YOU

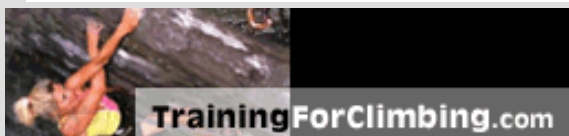
Before you can put these moves to work on a route, you must be able to recognize where and when they will be effective. Unfortunately, in crux or other high-pressure situations your thinking can get clouded by adrenaline, and you may try to force a bad sequence. Interestingly, if you've practiced these moves a lot and developed solid schema, a kind-of sixth sense often surfaces to steer you to the correct positions and movements with little or no conscious effort.

However, this may not always be the case. If a move begins to feel "barn-doorish" or if you are coming up short on what appears to be an obvious reach, then you may be missing the correct left/right solution. Look for chalk on the side of pockets and edges and on the underside of overlaps, small roofs and buckets. These are good tip offs to what the proper sequence might be--it likely includes a side pull or undercling in the left/right configuration.

Same goes for steep routes. Except here you will also want to keep on the lookout for protruding knobs or pebbles, tiny aretes or corners, angling edges or buckets, or anything you can use to stick a backstep or dropknee. Look for rubber marks left by previous backsteppers--this is a key sign, so don't get too focused on all the white holds.

Finally, I should point out that one good side pull and backstep often leads immediately into another. Of course, it would be performed with the other hand pulling and opposite hip turning, resulting in a full 180-degree change in orientation. With practice, multiple backstep combinations will come naturally and with a minimum of effort. The movement also feels great, which makes it one of the most enjoyable techniques to perform!

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De-Pump With The G-TOX (Speeding Short-Term Recovery)

Muscular fatigue is a well-known companion of climbers whether training in the gym or cranking at the crags. It's also a common limiting factor in attempting to increase your level of performance while training or climbing. Consequently, it would be wise to do whatever is possible to limit fatigue in the first place and then to speed recovery once you have become fatigued. The focus of this article is on the latter idea of speeding recovery.

Speed of recovery is important to climbers in three basic time frames:

- 1. between days of climbing/training
- 2. between climbs/parts of a workout
- 3. while resting on a climb or between training exercises.

Although there are many things you can do--or not do--that will speed your recovery in the first two cases, there is very little you can do to speed recovery while hanging out at a marginal rest on a route.

The common method of attempting to detox (recover from a pump) in this situation is to shake your arm by your side. A few seconds, or better yet a few minutes, of using this technique results in noticeable recovery. [Clearly, a lot of skill and experience are involved in knowing just how long you can hangout and detox at a rest without wasting energy and hurting your performance.] Unfortunately, if you are climbing near your limit, the length of time you can hangout and detox on a route can be disturbingly brief! If only there were a way to speed recovery while shaking out on a climb. . .

Enter the G-tox--a variation of the standard detox (discussed above)--with which I've experimented for the last four years. I named it the "G-tox" because it uses gravity as an ally to speed recovery while hanging out at those marginal rests! First I'll tell you how to do it, then why it works.

How to G-tox

The G-tox involves simply alternating the position of your resting arm between the "normal" position at your side and above your head in a raised-hand position. Gently shake your arm for five to ten seconds in each position beginning with your hand at your side. If your forearm muscles feel "cramped" you may open and close your hand a few times; however, focus on relaxing the muscles of the arm as much as possible. Continue alternating shaking positions as long as possible without entering the zone of diminishing returns (wasting more energy trying to rest than you are re-gaining).

Why It Works

The discomfort and pump that develops in your forearms while climbing is a result of an ever-decreasing amount of oxygen and an increasing amount of lactic acid in the muscle. The blood flow tries to keep up with the task of supplying oxygen and removing waste; however, contractions of more than 20 percent maximum begin to slow blood flow and hamper it's efforts.

While climbing, your contractions are often greater than 20 percent maximum; in fact, they are probably near maximum on the crux moves thus occluding (closing off) blood flow. This results in rapid fatigue and a major pump.

When you arrive at a rest, if you use the standard detox method of shaking your arm, only

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down, you'll notice a bloating of the blood vessels (the vascular look bodybuilders pump-up to achieve) in the forearm. The job of these vessels is to return blood toward your heart, but the positioning of your arm at your side (below the heart) makes this task more difficult due to gravity's pull! This explains why the "sickest" pump sets in after you stop climbing and drop your arm to your side.

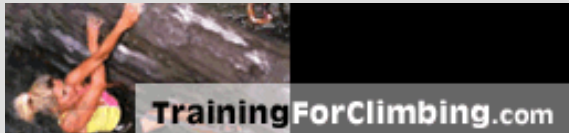
So why not put gravity to work helping get blood (and lactic acid) out of the muscle? That's what the G-tox achieves--increased venous return (blood flow toward the heart)! Blood flow into the arm isn't significantly affected by gravity, which makes the "raised-hand" position optimal for aiding blood flow and hastening recovery.

Through use of the G-tox you'll recover a bit more quickly than with the standard "detox." Better yet, you will reach a specific degree of recovery faster than with the old method (see diagram on page 5). Ultimately, it's difficult to say exactly how much the G-tox speeds recovery; however, it is definitely a noticeable amount. Even a modest ten percent increase in speed of recovery is invaluable when climbing near your limit!

One final note: the "raised-arm" position requires minimal contraction of the muscles in the upper arm and shoulder. This fortunately does not affect blood flow into the forearm, but it can become a source of some muscular tension--hence, the sequence of alternating between the two arm positions.

Experiment with and experience the G-tox at the gym (yeah, people will think you are waving at them!) and on the crags.

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Managing Your Energy Levels

Just when you thought you had it all figured out--complex carbohydrates before climbing for lasting energy, simple carbs after exercises for rapid recovery--nature throws a twist in our attempts to simplify and understand the subject. New research in the metabolism of carbohydrates has shown dramatic differences in the energy provided by seemingly similar carbohydrate food stuffs.

Clearly, the ability to control your energy levels is critical to athletic performance. Consequently, you will want to know how different foods affect your energy and moods and this is finally possible through use of the Glycemic Index.

SIMPLE AND COMPLEX CARBOHYDRATES - AN ANTIQUATED CLASSIFICATION?

Up to this point, nutritionists have classified carbohydrate-containing foods into two groups:

- 1. simple carbohydrates--sugars commonly contained in candy, fruit juices, jam, honey, etc.
- 2. complex carbohydrates--starchy foods including breads, cereals, all grain products, legumes, potatoes, and other root vegetables.

We have based much of our dietary recommendations on the theory that starches are more slowly absorbed than sugars. The consequent insulin response is smaller allowing for a gradual, moderate rise in blood sugar. This process makes starches the best source of energy prior to your workout because its energy release is slow and long-lasting.

Oppositely, dietary sugars are absorbed quickly resulting in a rapid rise in blood sugar. This elicits a large insulin response to return blood-sugar levels to a more moderate level. Unfortunately, this spike in blood glucose plays havoc with your energy levels, and will often result in a feeling of tiredness or weakness--definitely not what you want before climbing or working out!

Although this concept holds true in general, recent studies are finding that there is a large variability in the rise in blood sugar following the ingestion of various foods from both the sugars and starches groups. In fact, some starchy foods such as potatoes cause a greater rise in blood sugar than certain sugars such as sucrose.

THE GYLCEMIC INDEX

To investigate and more accurately classify the metabolism of carbohydrates, researchers developed the Glycemic Index (GI). This new index determines how the ingestion of a particular food affects blood-sugar levels in comparison to the ingestion of straight glucose.

Foods with a low Glycemic Index cause the smallest change in blood sugar. Conversely, foods with a high GI result in a sharp spike in blood-sugar levels.

Thus far studies have not been able to determine exactly what causes the different Glycemic Index values. In particular it's difficult to say exactly why some sugars have less of an effect on blood-sugar levels than some starches--a fact that contradicts our old understanding of simple and complex carbohydrates.

Here are a few theories on what determines a food's Glycemic Index (and consequent effect on your energy levels). Use these as guidelines when planning your meals.

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- 1. Degree of processing--highly processed foods (e.g. instant foods and those processed under a high temperature or pressure) tend to elicit a higher glycemic response than the same food in a less processed state. For example, instant rolled oats have a higher GI than regular rolled oats, and cooked vegetables have a higher GI than raw.
- 2. Food form--powdered or ground foods tend to have a higher GI than their whole counterparts. For example, rice flour has a higher GI than rice in its whole form. Also, foods consumed in a liquid form tend to have a higher GI than foods in a solid form.
- 3. Fiber content--soluble fibers such as guar and pectin have been found to reduce the Glycemic Index while insoluble fiber, such as that found in wheat and brown rice, seems to have little effect on the GI.
- 4. Rate of food ingestion--slowly ingested foods tend to result in a lower GI than the same foods when rapidly ingested.
- 5. Starch/protein and starch/fat interactions--The presence of protein or fat appears to reduce the glycemic response of certain carbohydrates.
- 6. Sodium--adding salt to a food can increase its glycemic response.
- 7. Level of stress while eating--Carbohydrate metabolism is affected by your emotional state. Stressful situations slow blood flow to your gastro-intestinal tract, thus hindering digestion and motility. This can result in an erratic glycemic response.

USING THE GLYCEMIC INDEX

To increase your energy and improve your performance, memorize (or make a copy of the GI Table) the indexes of foods you eat on a regular basis. Apply this knowledge to determine which food is best eaten before, during, and after climbing or a workout.

Choose foods with a low GI, such as oatmeal, an apple or orange, or yogurt, as a pre-climbing snack. The longer the time before exercising, the lower the GI should be of the food you choose.

After your workout, go for foods with a high GI like glucose-containing sports drinks, potatoes, bread or white rice. Such high GI foods will immediately begin to replace muscle glycogen stores (the main source of energy for climbers) thus speeding recovery.

EXPERIMENT TO FIND WHAT WORKS BEST FOR YOU

Interestingly, there is some individual variability in carbohydrate metabolism. For instance, bananas may cause a blood-sugar spike for some individuals while others receive sustained energy from them. Experiment with various foods and listen to your body to determine what works best for you under different conditions. Remember, emotions common to climbing--excitement, fear, and stress--will affect your digestion. You can minimize these effects by eating slowly and listening to relaxing music and sitting still while you eat.

PLANNING YOUR EATING FOR SUCCESS

If possible, plan your meals a day at a time. This is important because eating foods with a low GI at one meal can lower the glycemic response to foods eaten at the next. If you're planning an afternoon workout or climb, then include some low GI foods at breakfast as well. This will slow down the use of the carbo's you eat at lunch and help provide longer-lasting energy during the afternoon.

EXTRA THOUGHT, EXTRA ENERGY

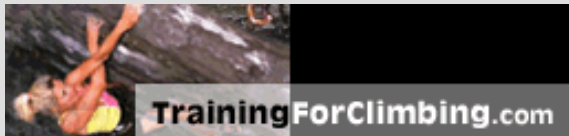
Yes, using the Glycemic Index to prepare the perfect meal does require a little extra thought. However, so does developing the perfect workout or the perfect sequence on a route. So if more power and endurance is what you're looking for, begin paying as much attention to what you do in the kitchen as to what you do while you're at the gym or on the rock!

COMMON FOODS AND THEIR GLYCEMIC INDEX

Peanuts	10	
Soya beans	15	
Barley	22	
Fructose		25
Lentils	29	

Beans (dry)	31	
Yogurt	32	
Milk	34	
Ice Cream		35
Apples	39	
Beans (canned)		40
Oranges/O.J.	42	
Grapes	44	
Porridge oats	48	
Pastas	45 - 50	
Sucrose	50	
Peas (frozen)	53	
Mars Bar		60
Bananas	62	
Raisins	64	
Shredded Wheat	65	
White bread	69	
Rice	70	
Corn Flakes	80	
Honey	85	
Carrots	92	
Potato (baked)	98	
Glucose		100

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Nine Absolutes of Climbing Performance

1. The best training for climbing skill (technique and tactics) is climbing.
2. Climbing skills are specific to the rock type, angle and frictional properties.
3. Skills practice yields a greater return-on-investment than fitness training, for all but elite climbers.
4. General conditioning is the most effective type of fitness training for beginner-level climbers.
5. Sport-specific conditioning is the most effective fitness training for advanced climbers.
6. Strength training builds endurance, but endurance training does not build maximum strength.
7. Wasted energy and time are lost forever.
8. Your body cannot go where the mind has not gone first.
9. Training and climbing provide stimulus for, but no actual, muscular growth. Recomposition and strengthening occur only during sleep and rest days.

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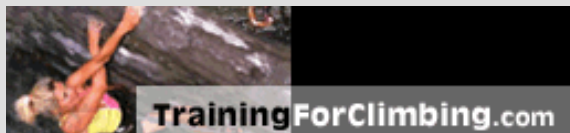
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