

"HIT" for Climbers Holy Grail of Finger Training

by Eric J. Horst - source: www.trainingforclimbing.com

The "HIT Workout™" - Finger Training Theory

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

#1.) 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 55 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, many climbers are unaware of this fact!

#2.) 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 three to, at most, twelve reps is considered ideal. This is also valid for our sport, but translates to high-intensity climbing that produces failure in 6 to 24 total hand movements. However, in actual climbing there's always the lingering question of whether failure resulted from maxed-out muscles or not being able to do a move (technically).

#3.) 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 involve actual climbing movements, whereas an exercise performed while standing or hanging transfer less.

#4.) Exclusive use of a single grip position for an entire set.

In climbing, the rock 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 should be enough near transfer to cover just about any novel grip position you encounter on the rock.

Now, let's analyze four popular methods for strengthening the fingers plus a new exercise and protocol I've developed. How well each exercise method meets the fundamental training elements (discussed above) will determine its effectiveness (See Summary Box at bottom of this page).

- **BOULDERING:** The common belief that bouldering is the best finger strength exercise, I now feel is wrong for two reasons. Failure may result from inability to do a move before you reach absolute muscular failure. Also, bouldering inevitably involves a variety of grip positions. This "cycling" of grips is great for training endurance or anaerobic endurance, but misses the mark for building maximum strength.
- **FINGERBOARD:** Proper fingerboard training will develop some strength gains. A one-minute set of brief, repetitive, high-intensity hangs (add weight) on a single grip position meets three of the four requirements. However, specificity to climbing movement is not satisfied due to the straight-arms and dangling legs. This downfall limits transfer to the rock--but, it's better than no finger training at all.
- **HEAVY-WEIGHT FINGER ROLLS:** Finger rolls performed with very heavy barbell weights (e.g. 100% - 150% of bodyweight) will produce impressive strength gains and quite noticeable hypertrophy. At 160 pounds bodyweight, I must use over 225 lbs on a free weight barbell to produce the high-intensity element. (Unless you belong to a gym with free weights, it's unlikely you'll have access to enough weights to make this exercise work. Finger rolls with "light" dumbbells are basically worthless). Still, this exercise is hardly specific, and it seems to enhance mainly open-hand strength. Use of heavy-finger rolls as a complement to high-intensity bouldering may be a good thing. By itself it misses the mark (as does the next exercise...)
- **CAMPUS TRAINING:** Campus training was the rage of elite climbers a few years back. Its high-intensity jumps and drops between holds maximally stimulate the neuromuscular system developing upper-body power and increasing contact strength--that's good. However, like the fingerboard and heavy finger rolls it lacks specificity to body use on rock--that's not good. What's more, campus training focuses on the open-hand grip while neglecting others. The growing consensus among high-end climbers is that campus training gains do not transfer to rock as much as once thought. Again, campus training is best used as a complement to some type of specific climbing routine. I've been experimenting with pairing campus training with the next exercise (HIT), and the results have been impressive. (More on this later...)

Hypergravity Isolation Training A "H.I.T." Breakthrough

Climbers have long experimented with weighted training--the results have been mixed and enthusiasm so-so. Hypergravity Isolation Training (HIT) is a very refined, new and exciting method of weighted climbing which I developed over the last few years. HIT workouts possess all four elements required for a true maximum grip strength workout and, hence, produce almost immediate, quite noticeable gains in finger strength! HIT involves high-intensity (adding weight simulates "hypergravity") climbing on identical HIT Strips™ (photo) mounted on a 50-degree overhanging wall. The early returns on its effectiveness have been enthusiastic thumbs up.

Just as exciting is the fact that HIT workouts (unlike Campus Training) can be performed by all but beginner, injured and severely out-of-shape climbers. Still, you must proceed carefully. This training method simulates hypergravity--greater than gravity's normal resistance to climbing--and, thus, is more stressful than normal climbing. HIT workouts are just part of a great overall training program and are best performed during Phase 2 of the ten-week training cycle.

SUMMARY BOX: Finger Training Methods--How Do They Stack Up?				
Elements (right)	High Intensity?	Rapid Failure?	Specific Movement?	Isolate Grips?
BOULDERING	yes	maybe	yes	no
FINGERBOARD	yes	yes	no	yes
HEAVY ROLLS	yes	yes	no	no
CAMPUS TRAINING	yes	yes	no	just one
H.I.T. WORKOUT™	yes	yes	yes	yes

Setup

Use an overhanging bouldering wall of 3/4 inch plywood at an angle of 45 to 55 degrees past vertical. HIT workouts on a 55-degree (past vert) wall are significantly harder than the common 45-degree wall. If you are building a wall for HIT Workouts, I advise a compromised angle of 50 degrees (I have optimized the HIT Strip design for use on 50-degree walls). Wall angles overhanging less than 45 degrees are not suitable for HIT workouts, as they require excessive (and dangerous) amounts of added weight to produce timely failure. Walls beyond 55 degrees should not be used for HIT workouts.

Sitting on the floor under the wall, mount the first HIT Strip at top-of-head height. Mount four more strips at approximately 18-inch intervals above the first strip. Now mount two pinch holds between each HIT Strip at roughly shoulder width. Carefully position the pinch holds so the top of each is turned inward about 10 degrees--this will make the pinch grip feel most natural.



The H.I.T. strips and pinches

Scatter a variety of small- to medium-sized foot holds in a region extending at least two feet to each side of the HIT Strips. Fill-up your wall with a wide range of other modular holds for performing

regular bouldering workouts. Note that I have been able to install a standard HIT Strip set-up on my pre-existing home wall (located in my townhouse with standard height ceilings). Some of the best bouldering in PA...

The Training

Begin with a 30-minute warm up consisting of stretching, self massage of your fingers/forearms and bouldering. Gradually increase the intensity of the bouldering during the warm-up period. Take a five to ten minute rest before beginning the HIT workout (See WORKOUT BOX for "Novice" and "Expert" Programs).

Six hand positions will be trained: crimp grip, pinch grip, the three "teams" of two-finger grips and the open-hand grip. Perform three sets for the crimp grip, and two sets of the others. Start with the crimp grip, then proceed with the other grips from weakest to strongest. Always use a stopwatch to time your sets and rests.

Sitting below the first HIT Strip™, place one hand (say right) on the right hand crimp edge on the strip. Start the stop watch, then pull with your right hand and grab the left crimp edge of the second HIT Strip. Continue climbing toward the fifth strip--right hand on third, left on fourth, right on fifth, then left hand on fifth. Begin descending immediately with the right grabbing fourth, left on third, right on second, left on first, then right on first. That's eleven total hand movements, but keep going and continue using only the crimp grip! Move your left hand up to the second strip, right to third, and continue on in the same fashion until the grip fails. Now that's how you fry a grip position in a very sport-specific way and increase its maximum strength!

If you do more than 24 reps, you must then add weight for all future sets working that grip. If you failed at just over 24 reps, add two or four pounds (a little weight makes a big difference). If you sent 30 or more reps, then add ten pounds for your next set. Although you can add weights to a climbing harness, I suggest adding two-pound diver's weights into a fanny pack or diver's belt (see your local dive shop). This makes adding or subtracting two-pound weights quite easy_important, since you'll likely be using different amounts of weight for every grip position.

After your three-minute rest, proceed immediately with a second crimp-grip set, again, climbing to failure. This should take place in under 24 reps; if not, add more weight. Rest exactly three minutes, crank out the final crimp set and take another three minute rest before moving on to the pinch-grip position.

Perform the two pinch grip sets (my weakest) in the exact manner described above, except only perform two sets. Also, since pinch grip positions are more difficult, don't be surprised if initially you do not need to add any weight in order to force failure by 24 reps.

The two-finger pocket "teams" are next. Do two sets of each beginning with the "third team". This is the weakest grip comprised of the pinky and ring finger. As with the pinch grip, beginners often need not add any weight at first. But this will change in just a few weeks--you will not believe how fast this often ignored grip will strengthen!

Next is the "second team" two-finger combo of the index and middle finger. Do two sets of these, then two sets with the strongman "first team" of middle fingers. Rests between all sets remain three minutes, exactly.

Conclude your HIT workout by hammering the open-hand grip with one or sets to failure. (I have recently eliminated the open-hand sets from my personal routine, as the weights need to produce failure are becoming extreme. Further, the high weights I'm now using for the early sets leave me

plenty fried by the end of the two-finger team sets. The extra sets of open hand likely add no training benefit and would only dig a deeper hole from which to recover.) Do no further climbing except for ten minutes of light cool-down bouldering, and, as always, finish you workout with three sets of reverse wrist curls (use a 10 or 15 lb dumbbell). Now all you need is two to three days of quality rest and a few good meals, and your grip strength will rebound far stronger than ever before!

WORKOUT BOX: "Novice" and "Expert" HIT Workouts			
Grip Trained	Weight Added NOVICE	Weight Added EXPERT	Reps & Rest Interval
Crimp (set 1)	5 kg	20 kg	<24 reps & 3 mins.
Crimp (set 2)	5 kg	20 kg	<24 reps & 3 mins.
Crimp (set 3)	5 kg	20 kg	<24 reps & 3 mins.
pinch (set 1)	none	10 kg	<24 reps & 3 mins.
pinch (set 2)	none	10 kg	<24 reps & 3 mins.
2-F "3rd team" (set 1)	none	10 kg	<24 reps & 3 mins.
2-F "3rd team" (set 2)	none	10 kg	<24 reps & 3 mins.
2-F "2nd team" (set 1)	3 kg	20 kg	<24 reps & 3 mins.
2-F "2nd team" (set 2)	3 kg	20 kg	<24 reps & 3 mins.
2-F "1st team" (set 1)	4 kg	20 kg	<24 reps & 3 mins.
2-F "1st team" (set 2)	4 kg	20 kg	<24 reps & 3 mins.
open hand (optional)	5 kg	25 kg	<24 reps & 3 mins.
* Weights are approximations for a 75 kg climber. Use similar percentages of your bodyweight if much different.			

HIT Workout Tips:

- 1.) Each set must be maximum intensity and produce failure in 24 total hand movements or less (12 reps pre hand). Add weight if you achieve more than 24 reps on any hold or set. Lower weight or stop training at the first sign of tendon or joint pain.
- 2.) No stopping or chalking during a set. Climb briskly and without hesitation. If necessary get a spotter, but keep moving until the grip being trained fails. Time yourself with a stop watch--no set should ever take more than 60 seconds to cause failure.
- 3.) Climb the sets with as normal foot movements and body turns as possible. Small (not tiny) to medium-sized footholds are best as too much thought on footwork will slow you down.
- 4.) Keep a training log where you record each set, weight added and reps performed. This way you'll always know what you need for a given set and you can easily track your gains (weight and rep increases) from workout to workout.
- 5.) Rest breaks between sets must be exactly three minutes. Use a stopwatch and stick to the planned order and schedule of exercises. This way, at long last, you can quantify and track your finger strength! However, if you are sloppy on the length of the rests the numbers you record will be meaningless.

- 6.) Always do your HIT workout in the same order and never increase the number of sets! There will be no added stimuli, and you'll only dig a deeper hole from which to recover.
- 7.) Train with a partner for added energy and discipline. He/she can do their set during your three minute rest interval, then yell at you to "crank one more rep" during your set.
- 8.) Tape your fingers. This is imperative when added weight exceeds 10% of bodyweight. Use the "x" method to protect all skin contacting the holds and you reinforce the tendon pulleys. (If you have a home gym, you may want to sand the texture down a bit to reduce skin wear. The "new" texture on the HIT Strips is intended for commercial gyms.)
- 9.) HIT workouts are intense. Always perform a gradual warm-up and cool-down. Do no other serious climbing on HIT days; however, you may want to do some exercises for the large muscles in your arms and back (like lock-offs, heavy pulldowns, weighted chin-ups, etc.). Consider soaking your hands in ice water upon completion of the session. To speed recovery, consume sports drink and whey protein immediately afterwards.
- 10.) Follow the "4-3-2-1 Training Schedule" detailed in my book How To Climb 5.12. This highly effective schedule dictates only three weeks of maximum strength training per ten week cycle. I suggest six total HIT Workouts during this three week period.

The "HIT Workout" - Frequently Asked Questions

Q: *A Climbing Magazine review of "System Training" mentioned that you can not train underclings on your HIT Strips. Is there a supplemental undercling exercise I should be doing in addition to my HIT Workout?*

A: For the article you mentioned, CLIMBING magazine clearly hired a "reviewer" who does not understand the fundamental concepts of training for climbing. Before I answer your question, let me straighten out two misconceptions that exist (partially as a result of CLIMBING's review).

- **Misconception #1: *HIT Workouts are the same as System Training.* **WRONG!****
Although the wall set-up may seem similar, the training protocol is much different. HIT is unique in many ways, but the two most fundamental differences are the progressive adding of weight to your body over the training period AND the pin-point isolation of five key grip positions that are worked to failure! The HIT Strips offer the idea platform for HIT Workouts as they enable you to repeatedly grab holds of the exact same size and configuration. Isolating exact grip positions and climbing to failure on that single position is the skeleton key to unlocking higher levels of finger strength.
- **Misconception #2: *Underclings are a grip position.* **WRONG!****
Underclings are an arm position that can be performed with any of the key grip positions trained with the HIT Workout. Thus, to say that HIT Workouts don't train underclings is to miss the point that the sole focus of HIT Workouts is to train maximum grip strength. Max strength training of the larger muscles of the arms, shoulders and back should be done separate from maximum strength training of the fingers. Again, isolation and specificity are key.

Now back to your original question... The best way to train the muscles used in the undercling arm position is to do a traverse or boulder problem that includes several underclings back-to-back. Using an indoor wall is best as you can do 10- to 20-move traverses exclusively with underclings. Do a few sets,

each with your under cling using a different arm angle. For example, do a set (10 to 20-move lap) with low underclings near your thigh, then a set with waist-high underclings and finish with a set of high underclings near your face.

Q: *Can I do HIT Workouts using modular holds instead of your HIT Strips?*

A: Yes, if you have 10 identical two finger pocket holds, 10 identical crimp holds and 10 identical pinch holds that are all "usable" on a 50-degree overhanging wall. Of course, if you don't have these holds it will cost you as much or more than the HIT Strips and HIT Pinches to buy them. Even more important, using HIT Strips keeps you focused on the goal of only using the specific grip being trained-there's no cheating. Whereas using modular holds encourages you to "break" the sequence (and thus the effectiveness) when you get pumped and start grabbing holds other than the grip being trained. Finally, the HIT Strips are optimized for use of the proper angle wall and possess safe, ergonomic radius of curvature to lower the pain factor when climbing with weight.

Q: *How much weight do you use for your HIT Workouts?*

A: I've been experimenting with the HIT concept for several years. I began using weights in the 5 to 15 pound range, but I found the incredible effectiveness of this routine had me doubling the weights in a matter of months. I've done about six, three-week HIT cycles per year for the last two years. With the current generation of HIT Strips (this 3rd generation has slightly deeper holds than the earlier versions), I'm using about 60 lbs for my strongest grip positions (crimp, and 1st and 2nd team two finger) and about 30 pound for the 3rd team two finger and pinch. At 160 lbs body weight, that has me training my most important grips at a body weight of 220lbs. Now that's hypergravity! After a while, climbing at regular body weight starts to feel like walking after you've taken off a heavy backpack or ski boots. Ever feel that?

I must stress that it took me over three years to gradually increase my weights up to that level. Also, I've been climbing over 20 years, so my tendons have had decades to slowly increase their strength. If you're going to do HIT Workouts, you need to be mature and follow the protocol exactly! That means, limited workouts and frequency, proper rest and nutrition, a slow warm-up and preventative taping. By the way, the strength gains DO transfer onto the rock. It's unmistakable! Interestingly, I'm so enamored of training (always have) and working to much (old age), that I haven't been putting the strength to use often enough. But that will change when I escape PA for more fertile lands for climbing...

Q: *I've been using your HIT Workout and the results are impressive! However, after a HIT Workout it seems that while my forearms are blown, the muscles in my upper arms and back are not. Can I do any other training exercises on my HIT Workout day?*

A: While further finger training will be of no benefit, I do encourage you to do a brief pull-muscle workout to complete the "blowout!" I suggest a few sets of one-arm lock-offs or a few sets of heavy lat pulldowns or weighted pull-ups. Or what I do sometimes (as part of my cool down) is a few "lock-off laps" on the largest holds on my overhanging wall. For instance, I might do five separate 10 to 20 move "laps" where each move employs a lock-off and long reach to the next large hand hold. This serves as the perfect coup de grace.
