M-A-S-S With H.I.T.

How High-Intensity Training Can Get You Bigger Than Ever

by Jerry Robinson
Photography by Michael Neveux

The gym is hot, humid. Your shoulders stick to the bench as you struggle through a hard third set. Sweat drips into your ears. Your pecs burn. Then, your concentration breaks, and fatigue flows into your arms like sand....

Just then your partner leans over and yells, "Push!" Your mind snaps to attention, and you crank out two more clean reps.

If one concept embodies the essence of bodybuilding success, it's *intensity*. High-intensity training, or HIT, is essential if you want maximum results in minimum time. Let's look at the specific differences high-intensity training makes and how anything less is basically a waste of time.

Model: Joe DeAngelis

All or None

Each muscle fiber in the body is stimulated by a nerve. When the nerve fires, the fiber contracts completely; there's no such thing as a partially contracted fiber. Physiologists refer to this as the All or None Law. Obviously, not all jobs require the same degree of force. The same muscles that play the piano or perform surgery sometimes are asked to move refrigerators or do 500-pound deadlifts. To make that possible, your central nervous system regulates the activation of muscle fibers, triggering only as many as are needed.

Heavier jobs employ more fibers; lighter jobs, fewer fibers.

Training, though, is a special case. The quest for gains demands maximum fiber involvement—a goal that can only be achieved through a deliberate mental effort. You've seen your strength suddenly increase when your partner shouts, "Push it!" That sort of cue helps you to focus. You can almost always lift, press or push more than you think.

Especially for the advanced lifter, only an all-out mental effort is sufficient to engage this strength reserve and provide the stimulus necessary for continued growth.

A muscle fiber contracts completely; there's no such thing as a partially contracted fiber.

Model: David Yeung

High-intensity training can raise the central nervous system–imposed limit on your peak performance.

Extending Your Limit

High-intensity training also affects your progress in a second way. Located in the tendons of each muscle, there are a number of tiny sensory mechanisms called Golgi tendon organs. They keep the nervous system informed about contractions of the muscle as a whole. When the overall tension level equals or exceeds the central nervous system's "memory" of the level at which that muscle failed the last time it was pushed, the CNS tells the muscle to shut down.

In other words, if you don't really go for it, your muscles fail at a level below their peak. As a result, your CNS is reprogrammed to think that the lower level *is* your peak. Repeated high-intensity training can push back the level at which the Golgi tendon organs send their warning messages, raising the CNS-imposed limit on your peak performance.

Model: Peter Putman

Submaximal Loads

HIT can also improve your performance on submaximal loads—such as doing sets of six to eight reps while lifting moderately heavy weights. The limiting factor here is not the Golgi threshold but the accumulation within the muscle cells of waste products—chiefly lactic acid, which causes the familiar burn. (For the record, there is some dispute whether it's actually lactic acid or some other by-product of the muscular energy production process that interferes with continued muscle metabolism.)

When you push on through the pain, ultimately you enhance your performance in two ways: You improve your body's ability to get rid of the by-products of muscle metabolism quickly, and you train the muscles to continue past the point at which those by-products used to make them fail.

Not-So-Small Differences

But is it really necessary to go all out? How about still pushing hard but backing off just a little? To put

HIT can help you push past waste-product thresholds for better muscle stimulation.

Model: Jose Raymond

those questions in more technical terms, how much of a difference in muscle electrical activity does a slight decrease in workout intensity make?

Muscle electrical activity refers to the electrical processes occurring in a muscle during a contraction. As mentioned before, muscle fibers are given the signal to contract by electrical impulses from nerves.

With training, nerves stimulate a greater number of muscle fibers, resulting in greater muscular power. (That effect is more pronounced in beginning lifters and is the reason beginners realize greater gains early on.)

The amount of stimulation can be measured with an electromyograph, or EMG, a machine that measures electrical activity in muscles. Amount of electrical activity is related to muscular power and to workout intensity.

In a study reported in the *European Journal of Applied Physiology*, 13 elite male weightlifters, all with five to nine years' experience, were followed through one year of training. All subjects were Finnish champions and/or national-record holders in various weight categories.

The one-year experiment was divided into three four-month periods. The subjects followed individualized programs designed by their own coaches and trained an average of five times per week. Training included standard Olympic and power lifts, as well as supplementary bodybuilding exercises, including squats.

The subjects trained at an average intensity of 79 percent of one-rep max for the first four-month period, at a slightly lower intensity (averaging 7 percent of one-rep max) for the second four-month period and then returned to the initial intensity (79 percent of one-rep max) for the final four-month period.

At zero, four, eight and 12 months researchers measured maximum strength and EMG response for a number of muscle groups. From the first to the second four-month period, when intensity dropped an average of 2 percent, electrical activity in leg muscle dropped a whopping 16 percent. From the second to the third four-month period, when the intensity increased by the same 2 percent, electrical activity in leg muscle increased by the same 16 percent.

Individual changes in workout intensity were paralleled by statistically significant changes in muscular strength. That strongly supports the hypothesis that training intensity plays an important role in determining the nervous system's ability to stimulate muscle.

The bottom line: Small differences in training intensity can translate into big differences in muscle fiber stimulation, strength and gains!

Model: Kyoichiro Morinaga

Just the Facts

To review, repeated high-intensity training does the following:

- Triggers as many muscle fibers as possible, leading to overall greater development.
- Pushes back the level at which the Golgi tendon organs send warning messages to the central nervous system and the central nervous system sends inhibitory signals to the muscle.
- Increases the efficiency with which your body gets rid of lactic acid and other by-products of muscle metabolism.
- Enables your muscles to tolerate higher levels of lactic acid and other by-products of muscle metabolism before failing.
- Gurantees maximum strength and the fastest gains.

Note: For the ultimate intensity method of mass building, see page 221.

Editor's note: Jerry Robinson is the founder of Health For Life, a research and publishing company, and is the co-author of *The 7-Minute Rotator Cuff Solution*, available for $29.95 plus shipping and handling from Home Gym Warehouse, (800) 447-0008 or visit www.Home-Gym.com. **IM**

Model: David Dorsey