



Curling iron.
Using a wrap causes more oxygen-rich blood to pool in the muscles.

Tank: RUFSKIN
Pants: ADIDAS
Sneakers: ANDROID HOMME
Want it? See page 154.

THE SCIENCE OF SQUEEZE

■ BFR has been used in rehab settings for decades, but it is now catching on with athletes and body-builders as a way to both heal faster and grow muscle mass. (Olympic skiing medalist Bode Miller reportedly used it to recover from a back injury last year.)

The process of using blood-flow restriction with weight training is simple: For upper-body exercise, an elastic knee wrap or cuff is placed around the top of each arm; for the lower body, it's wrapped around the top of the thighs. By applying a gentle squeeze to the muscles, the wraps cut down the amount of blood that can run into the extremities, which limits blood being returned to the heart.

Sounds scary, right? Like your limbs will turn blue and you'll die?

But that's not so, says Jeremy Loenneke, Ph.D., assistant professor of exercise science at the University of Mississippi. "The BFR stimulus is very [short-term]—minutes, not hours. When we compare it to traditional resistance training, it appears just as safe, if not safer." (Though, of course, if you have a vascular disease or disorder, you should probably skip BFR.)

A study in the *Scandinavian Journal of Medicine and Science in Sports* this year found that subjects who followed a BFR lifting protocol for six weeks had muscle gains similar to a control group

doing traditional lifting—but they also had even better strength gains: a 10% increase, versus just 7% for the control.

The exact mechanisms BFR training uses to produce results isn't clear, but Loenneke believes increased mechanical tension in the muscle is a factor, as well as the fact that BFR promotes "cell swelling"—the skin-stretching muscle pump you get from doing multiple, intense sets. In addition, a buildup of metabolites (organic compounds that contribute to chemical reactions) in the muscle cells may play a role.

WRAP IT UP

■ Perform BFR training with the bicep curl, leg curl, leg extension, bench press, leg press, and squat; these are the exercises it has been researched with the most at this time.

To start, tie the wraps (pick some up at elitefts.net) on just

under the shoulder or under the crease of the hips—depending on which area of the body you're training. (Note: Don't try to train both your upper and lower body at once.) Wrap the limbs up firmly, but don't go overboard—think "tight" but not "strangulation." Now choose a very light load, about 30% of the most weight you could lift once. Do 30 reps the first set, then three sets of 15. Rest 30 seconds between all the sets.

These rep numbers are your goal, says Loenneke, "but you may not always reach it." If you're falling way short, however, the weight is too heavy or the wraps are too tight.

Do you have to use wraps? No. Using light weights and taking sets to the point at which you can't complete another rep can net a similar effect, Loenneke says.

But, incredibly, with BFR you may not have to lift at all to see gains.

"There's evidence that applying BFR and walking slowly may result in small but meaningful increases in muscle size and strength," says Loenneke. "I think there may be something unique to pooling blood into the muscle. So while going to failure with low loads may replicate one aspect of BFR, it may not replicate the entire stimulus."

Because BFR training doesn't require heavy weights, it may be ideal for older trainees or those coming back from injuries who can't train heavy. If you're a meathead who just needs a break from maxing out his bench press, BFR sets could provide some variety in your training and still move you toward your strength goals.

For the regular gym-going crowd, Loenneke suggests that BFR training can be used at the end of a normal workout, after more conventional training is done.

HARD FACTS

OUR TRAINING DIRECTOR, SEAN HYSON, SOLVES YOUR WORKOUT CONUNDRUMS



"I'm making great progress and don't want to change my workouts, but I have some injuries..."

JAMES T., EL SEGUNDO, CA

■ Stop right there. You're making one of the easiest and most costly mistakes a young lifter can make: trying to push through pain. Believe me, I've been there. You bench 225 one week, and the next week, though your shoulder is killing you, you want to try for 230. Don't do it. Instead, switch to another exercise, lighten the load, and wait until you feel better. Continuing to push yourself, especially while injured, will

make matters worse and eventually derail progress entirely.

You just have to accept that, beyond your first few months of training, gains don't come every week. So that's when it's time to add more variety to your workouts, listen to your body when it tells you something hurts, and think of setting new PRs on a more long-term basis.

Lift smarter, not harder, and you'll lift forever.

Sean Hyson, C.S.C.S., is the Men's Fitness training director and author of 101 Best Workouts of All Time, available at 101bestworkouts.com.