Cool Tech for Your Workouts

John Mauldin | December 9, 2013

I know that what you'll encounter in today's *Outside the Box* is not macroeconomics. But we all have to live in the real world, and our health is as real as it gets. So this is just one guy telling his friends about something he found that has helped make his world a lot better.

My friend and colleague Pat Cox is always finding something new and different. When Pat first introduced me to this idea, I thought he was being a little over the top. But I happened to be in Palo Alto the following week and met with the scientists Pat mentioned and saw their results. Then I got a beta unit and used it for the first time on my last birthday last year.

I am in reasonable shape for my 64 years. I can do 50 pushups relatively easily and then go on to other parts of the gym, but I could never get past 40 for the second set and then even less if I attempted a third set. I would hit maybe 8 machines and exercises as part of one full upper-body set. The first time I used the AVAcore device you're going to read about, I did three sets of everything, including 3x50 pushups over about 75 minutes, then went home and told the kids – who expressed a certain amount of skepticism. I immediately dropped and did another 39. All in less than two hours. It was a good birthday.

And I was not sore the next day, which was even stranger. But let Pat explain the science. It all makes sense. I have talked with and seen interviews with lots of real athletes who swear by this. This is for real, but as Pat emphasizes, it is not Miracle-Grow. It will do nothing for you if you don't work out, and baby workouts won't cut it, either. But if you train seriously – and you should –this is the coolest thing ever (pardon the pun). It will increase your stamina and workout effectiveness.

This is really the first time the device has been offered to a general public audience. And yes, in one year it will be a different and better model and likely cost less. That's the way of the world. So you can keep your current workout if you like, or you can do much better workouts, starting today. And you'll amaze your friends. This is a rather cool thing to take to the gym.

Your keeping cool and pounding reps analyst,

John Mauldin, Editor
Outside the Box

Cool Tech for Your Workouts

By Patrick Cox

Two Stanford University biologists have discovered a way to dramatically increase the benefits of exercise. I've used this technology for the last year and, like many other early users, have seen remarkable improvements in strength, endurance, and muscle mass. In fact, my results are better than they were thirty years ago when I was in my thirties.

I understand, by the way, that this sounds like the claims made in spam e-mails. Fortunately, you don't have to take my word for it. Multiple third-party studies from important academic institutions have verified that the device, about the size of a coffee maker, delivers benefits that are superior to those associated with moderate doses of anabolic steroids – with none of the negative side effects.

Moreover, use of this biotechnology is spreading rapidly through the world of professional athletics. Though these organizations are not quick to publicize competitive advantages, we know that the San Francisco 49ers, the Seattle Seahawks, and some US Olympic training facilities use it. Internationally, at least one major soccer team is employing the device, but they haven't said so publicly. The same is true in professional MMA and basketball.

If I have to convince you that exercise should be a priority in your life, you're probably not the person I want to talk to. Nevertheless, I'll point out that research has shown that cardiovascular and strength training can increase your life expectancy by preventing or reversing many serious health risks. These include arthritis, osteoporosis, obesity, loss of muscle mass (sarcopenia), age-related loss of function, diabetes, and cardiovascular and other chronic diseases. Exercise improves sleep, mood, metabolism, appearance, and creativity. Investors who do not recognize the economic value of their own health and longevity are not truly serious investors.

I understand, however, that it can be hard to find time for fitness. It can also be frustrating when results are slow in coming and the aftermath of exercise includes joint pain and muscle soreness. This is particularly true for those of us who are older, and the older you are the more true it becomes.

Until I started using the device a year ago, I felt I was only slowing my descent into age-related frailty. It was a fight I took seriously, but slow failure is not fun. Since integrating this technology into my workouts, however, I've put on serious muscle mass while increasing flexibility, strength, and endurance.

You're not going to see me on stage in a bikini bottom any time soon, but now I'm having serious fun and feeling better than I have in many, many years. I look forward to every workout and start planning the next one as soon I've finished the last. In the interest of full disclosure, I'm also engaged in a program of nutritional supplementation that includes clinically validated but little-known products. I don't have the space to get into that area today, however.

So, please allow me to give you the big scientific picture so you understand how this device radically improves the results of exercise. I should emphasize that I'm not speaking for the inventors of this technology. Some of what I say about cellular processes probably falls into the realm of speculation, but it is my best attempt to explain why this technology is so important and why it works as well as it does.

Cool Science

The story begins with two esteemed Stanford biologists, Drs. Craig Heller and Dennis Grahn, the world's leading authorities in the field of mammalian thermoregulation. Thermoregulation, the ability to moderate body temperature, is the key to steroid-like exercise gains, as I'll explain shortly.

Grahn and Heller are not minor actors in the area of biological research. Grahn is a senior research scientist in the Biological Sciences Department at Stanford University who has authored numerous important papers. Heller is past chairman of the Biological Sciences Department at Stanford and former chairman of the Defense Advanced Research Projects Agency (DARPA). He has coauthored a leading biology text and numerous research papers. I could go on, but I need to get to thermoregulation.

Heller and Grahn have studied hibernating mammals for decades, puzzling out the means by which animals maintain core body temperatures in both freezing cold and intense heat. Using modern electronics, including remote sensors and infrared photography, they solved a medical mystery that goes back to the time when researchers began dissecting corpses in ancient Egypt and Greece.

Specifically, I'm referring to the masses of densely packed veins found in the palms of your hands as well as the soles of your feet and cheeks. These veins are capable of expanding many times to carry large quantities of blood.

These are the *retia venosa*, and they present an evolutionary puzzle. Why, after all, would we have veins that bleed so profusely, if cut, near the surface of the skin, located where we are most likely to be injured? Ask any chef who has sliced a palm on a mandoline or a swimmer who has lacerated the arch of the foot on a sharp seashell.

Heller and Grahn solved the puzzle by observing bears and other well-insulated hibernating animals. Infrared photography of bears, who are covered in layers of fat and thick fur, revealed heat being vented from the pads in their paws as well as their noses. Humans are not furred animals, but we share the same characteristic of heat dissipation through our extremities.

Further research revealed that all mammals, including humans, have an alternative circulatory system that kicks in when core body temperature rises. Arterial blood is rerouted away from the normal capillary system that handles oxygen and nutrition delivery. Instead, blood moves into the arteriovenous anastomoses (AVA).

Seriously, this is so cool. When your body heats up, blood is routed away from the other tissues in your limbs and into the specialized AVA, where it travels directly to the retia venosa in your extremities. The veins of the retia venosa swell to many times their normal size to enable venting of excess heat. As you radiate heat, cooled blood then flows directly back to the heart and is used to protect the vulnerable brain, heart, and other organs of your core from overheating.

Meet the Wall

This is a marvelous system, of course. Unfortunately, this cooling system has its limits. Vigorous exercise can overwhelm your thermoregulatory system. When this happens, very bad things can happen, starting with heat stroke. However, your body, has several defense mechanisms to stop the overproduction of heat that can cause permanent damage to your brain and other organs.

One safety mechanism resides right in the brain, which tells you to stop exerting yourself. Exertion becomes extremely unpleasant. You may try to exert yourself at maximum force, but your brain won't send the signals needed to do it. You can still move your muscles, but with much less force.

On the cellular level, important changes are also taking place in muscle cells. As blood is routed away from limbs to protect the core, the normal flow of nutrients and oxygen is cut off. Heat and waste materials, such as lactic acid, build up. The mitochondria that convert food into usable biological energy (adenosine triphosphate) stop functioning, so cells run out of power.

While all these responses to overheating may seem dire, they are actually extremely important safety mechanisms. If you work out seriously, you've undoubtedly "hit the wall." The wall is your body's way of stopping the heat production that could seriously damage the organs of your core.

What's good for your core, however, can be hard on muscle and connective tissues, which are second-class citizens in the hierarchy of your body's priorities. While critical organs are being protected, muscle and connective tissues "slow cook" until core temperature and normal circulation are restored.

Delayed-onset muscle soreness is one result of this heat buildup, but it's by no means the most serious. Exercise provokes adaptation and strengthening, of course, but too much can create enough heat to cause serious cellular damage. If you hit the wall often and hard enough, overtraining can erase the health benefits of working out. Serious overtraining can cripple the immune system and lead to illness and death.

As a result, we have to walk the line between too little and too much exercise. One way to shift the balance toward muscle growth is through the use of anabolic steroids, which promote protein synthesis and recovery. Steroids, however, entail risks.

A better solution would be to rapidly cool the core during and after exercise. Normal circulation would then be restored to muscle and connective tissues. Excess heat would be cleared out within minutes and mitochondrial energy production would resume.

Cellular repair and adaptive strengthening would therefore be accelerated. The flow of oxygen and nutrients would return to muscle and connective tissues while waste gases and other products would be cleared. In short, adaptive strengthening would be maximized while the damage done by exercise, as well as the associated pain, would be minimized. The capacity to exercise would go up and recovery would be much more rapid. The gains from exercise would therefore be significantly greater.

This is not just theory; it is clinically validated reality. The story of how it came to pass is, in my opinion, fascinating.

Beat the Wall with AVAcore CoreControl

Once Heller and Grahn understood how the body deals with excess heat, they began to wonder if they could give it a hand. And they succeeded.

First, they figured out that they could drain heat and accelerate core cooling using cold moving water. Construction workers, by the way, already knew this. If overcome by heat, some know to put their palms under cold running tap water until they feel better.

Heller and Grahn, through exhaustive research, learned that they could do this optimally by putting the palm of one hand in contact with cold water at precisely the right temperature range. For convenience sake, they learned to move the cold water through a kind of soft plastic network of tubes called a perfusion pad. The big breakthrough, though, was discovering that a slight vacuum caused the veins in the retia venosa to expand and give up heat much, much faster.

Initially, they concentrated on the many medical uses that their technology opened up. By accident, however, they discovered that post-exercise recovery was radically improved, making workouts far more productive. So, while continuing to work on medical applications, they decided to make their technology available to people interested in maximizing the outcome of physical exercise.

The device has two parts. One contains ice water, a pump, and the microchip that controls water temperature and vacuum. The other portion is a kind of vacuum glove that seals around one hand. In it, water at the optimal temperature passes through the perfusion pad in contact with the palm.

This device, called AVAcore CoreControl, can restore core temperature in just a few minutes for individuals who are heated due to exercise. Typically, it can take hours after intense exercise for normal temperature to be restored.

In practical terms, this means that the cellular damage done by exercise is minimized while recovery is accelerated dramatically. This applies both to resistance and cardiovascular training. Results of resistance training, according to various studies, are comparable to the use of 600 mg of testosterone enanthate weekly, which is significant.

Unlike with steroids, however, the benefits of thermoregulatory augmentation accrue to aerobic and endurance training as well as strength training. Though it's not practical to run with the device at this time, it can be used on a treadmill, elliptical, or other stationary cardio machine.

Moreover, gains that come with use of the device can be maintained through normal exercise even if you stop using it. Personally, I think that the advantages of this device are particularly important for older people, because thermoregulatory abilities decline with age. As I said earlier, my current progress is better than it was when I was half my current age of 62.

Though studies have not been done yet to prove it, I believe the most important benefit to older people will be proven to be that the device protects and allows the strengthening of connective tissues. I'm doing exercises now that I couldn't do a year ago because of joint problems.

I feel like I should share some of what I've learned about optimizing the use of this technology after a year of regular usage, but this article is already long. Maybe I'll discuss supersets and other techniques on my own website, TransTechDigest.com, for those who do buy the AVAcore CoreControl.

I could easily go on for another ten thousand words, as I'm completely obsessed with this breakthrough and enormously grateful to Heller and Grahn. I believe thermoregulatory augmentation is the most important advancement in fitness technology since the ancient Greeks pioneered progressive training.

I'm also enthusiastic because this entirely unexpected breakthrough demonstrates a central premise of my work, that the most important impact of computer technology is its ability to unlock and exploit the secrets of a much older and more sophisticated system: human biology.

Regardless, I ought to make it clear that this is a relatively new technology and the device is, in a sense, at the beta testing stage. It's a little bit kludgey right now and will undoubtedly be improved in years to come, shrinking in size and improving in ease of use. I would not wait, however, if you want to improve your level of fitness.

If you are already serious about exercise, the AVAcore CoreControl device could help you recover quicker from your workouts and derive more impressive gains from your current fitness routine.

AVAcore's CoreControl device sells for $995. If you are interested in obtaining a CoreControl device for yourself or a family member, you may learn more and place your order here. If you want the device delivered in time for the upcoming holiday, you should place your order by noon on Thursday, December 19, and be sure to select the 3-day shipping option.

In the interest of full disclosure, you should know that Mauldin Economics will receive a referral fee if you purchase a CoreControl device. But as I mentioned earlier, I use the CoreControl device myself to aid in workout recovery. John uses the device as well and has reported gains similar to those I described. We are both serious about fitness and love AVAcore's technology.

I reiterate, however, that CoreControl is meant for you only if you already have a rigorous exercise routine in place. If you are more casual about exercise, this is probably not for you. But if you are serious, this product could help you reach the next level of health and fitness.

Here's the link to the company's website.

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