



## [How to Make Lifting Weights a Maximum Anti-Aging Workout](#)

[A recent study](#) found that high-intensity interval training (HIIT) robustly increased both aerobic capacity and mitochondrial function in both old and young people. The older people saw a greater increase in mitochondrial function, because they had a lower baseline function. This study has been making the rounds, calling HIIT [“the best anti-aging exercise”](#). Here we’ll see how to turn lifting weights into a maximum anti-aging workout.

Decline in mitochondrial function is strongly linked to age and aging. In young people (and other young organisms), mitochondria, the powerhouses of the cell, function perfectly and with high efficiency, but with aging comes a falling off of that function. As mitochondria generate power, the decline literally means a decline in overall energy, the energy you feel. It probably explains a lot about why children have seemingly limitless energy, and why exercise improves the amount of energy you actually feel in everyday life.

Increasing mitochondrial function in older people improves their physiology and makes them much more like a young person.

# HIIT vs resistance training

One little hitch for us weightlifters:

Here we report that 12 weeks of high-intensity aerobic interval (HIIT), resistance (RT), and combined exercise training enhanced insulin sensitivity and lean mass, but **only HIIT and combined training improved aerobic capacity and skeletal muscle mitochondrial respiration.**

The researchers reported no effect of resistance training (weightlifting) on better aerobic capacity and mitochondrial function.

Similarly, HIIT, but not continuous aerobic training, [led to increases in PGC-1 \$\alpha\$](#) , the molecule that upregulates mitochondrial biogenesis, i.e. signals cells to make more mitochondria to enhance energy generation.

Does all this mean that strength training does not improve health, or that we must perform HIIT to improve mitochondrial function and reverse aging?

Not at all.

We know that [strength training increases V02max](#), the measure of aerobic capacity. While V02max is a general measure of function, including heart rate, circulation, hemoglobin, and lung function, it also includes mitochondrial function, the ability of the cells to use oxygen to make energy. For a good review, see [Resistance Training to Momentary Muscular Failure Improves Cardiovascular Fitness in Humans: A Review of Acute Physiological Responses and Chronic Physiological Adaptations](#).

So, why didn't the people who did resistance training in the new study see any improvement in mitochondrial function and aerobic capacity?

Most likely because of the way they trained.

I can speak from experience that most people who train with weights are hardly even trying. How so? They

- do the traditional 3 sets of 10 reps, and rest between each set
- they don't lift until failure, but stop at a given number of reps
- their between-set breaks are far too long
- they spend a good deal of their gym time socializing or looking at their phones
- they do isolation, not compound, exercises

This isn't meant to be boasting on my part, just simple observation; in contrast, I

- perform one set of each exercise to failure
- move quickly to the next set
- do compound lifts

- rarely socialize and don't even own a phone, much less take it to the gym

I frequently have to stop after a set to catch my breath, and this is especially obvious when I do big compound exercises, such as squats, deadlifts, T-bar rows, weighted dips, and the like. But I can't even say when I've ever seen another weightlifter in my gym stop to catch his breath. I don't know, maybe I'm not looking hard enough, but it's striking.

When the new study put their trainees in resistance training, it's highly unlikely that they did [a high-intensity routine](#). They most likely did a standard 3 set per exercise protocol, with plenty of rest between sets, 3 days a week, etc.

Most people aren't psychologically cut out to do high-intensity weightlifting. It's too demanding. Which explains the general lack of progress seen in most gym-goers.

If your heart and lungs are not working intensely, at least some of the anti-aging benefits of strength training are lost to you.

## **How to increase mitochondrial function and V02max with weightlifting**

1. Here's a good example of high-intensity strength training: Shawn Baker, M.D., deadlifting 405 pounds for 20 reps. Note that toward the end he pauses, and it looks to me like he does this not so much for his muscles, but to catch his breath.

Trying to do this x 4 years- now on [#zerocarb](#) 405lb DL x 20 reps

50 years old-NO drugs, hormones, supplements, carbs or belt

Objectivity!! [pic.twitter.com/84aoKjoCq7](https://pic.twitter.com/84aoKjoCq7)

– Shawn Baker MD (@SBakerMD) [March 23, 2017](#)

Dr. Baker is 50-years-old, eats zero carb, and is a world-record holder in his age group for 1000 meter rowing.

Compound exercises, like deadlifts, squats, dips, bench, overhead, maximize the use of heart, lungs, and circulation, and will robustly increase mitochondrial function. Isolation exercises like biceps curls and triceps pulldowns are much less effective for this.

Note, this is not Crossfit, which carries a high risk of injury. All exercises must be done with good form and attention to safety.

2. Move quickly to the next set. "Quickly" is subjective of course, but don't wait minutes or until you feel all rested and ready. Attack your workout.

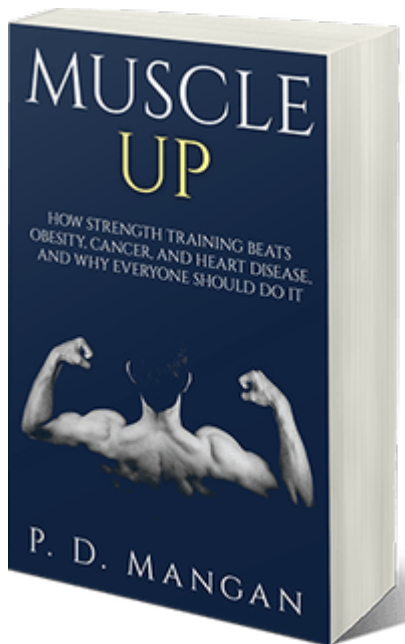
3. Do an adequate number of repetitions. Lifting at your max weight for low reps (1RM) does little to improve cardiovascular conditioning.

4. Finally, you can always add a set or two of actual HIIT at the end of your strength training. For example, a 20-second all-out bout on the stationary cycle at the end of my workout leaves me gasping for breath. Sometimes I do a set or two of jump rope.

## Conclusion

Weightlifting robustly increases V02max and mitochondrial function, but it must be done right. Since the extent to which strength training improves V02max depends on initial state of conditioning, someone who is already highly trained but wants to improve V02max even more should add some HIIT to his strength training.

**PS: For more on why strength training is the best anti-aging exercise, you know you want my book, [Muscle Up](#).**



**PPS: [Check out my Supplements Buying Guide for Men.](#)**