



Workout Recovery: Partner to Overloading

Ok, you have overloaded yourself by taking a long hike, doing a hard workout or having a play date with your grandchildren. Now you need to recover. Where the overload principle is straightforward, recovery is complex and nuanced. So, let's jump in.

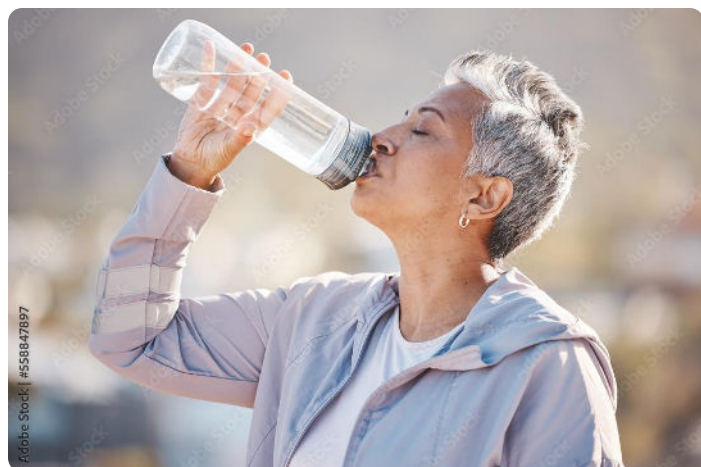
What does overloading do to your body? During overloading you use water for energy production and temperature regulation, and you burn carbohydrates for energy. Also during heavy exercise, you break down muscle cells that will have to be repaired. That's where protein consumption is important. Water, carbohydrates and proteins will all have to be replaced during recovery.

Those overloaded muscles will likely become sore after 24-72 hours. That is delayed onset muscle soreness or DOMS. We want to manage the soreness in the near term and promote muscle recovery over the longer term.

It may be best to think about workout recovery in phases.

Phase 1 - Early Workout Recovery (Day 1):

Hydration: During your workout your body has consumed lots of **water** through sweat and energy production. Dehydration adversely impacts physical and mental performance and is a health risk. So, in the first hour after the workout, make sure you rehydrate by drinking water or other liquids with lots of water in them. (1, 2)



A workout does not have to be very strenuous to require hydration. Professional golfers, for example, drink small amounts of water throughout their round of 18 holes that might take 5 hours. But if you are having a demanding workout, such as a long hike, you will need to drink water. It is best to start drinking before you get thirsty. The more you exercise the more water you will need. The standard advice is to start drinking before you exercise and continue to drink during exercise. Because the

body has a limited capacity to process water in temperature regulation and energy production, it is better to take in water in smaller amounts over time rather than drinking a whole bottle of water all at once. (2)

Carbohydrates and Proteins: Once you have caught your breath and had something to drink, you should consume some **carbohydrates** to replace those used to power your muscles (3).

There is a huge amount of market messaging and social influencing trying to sell you bars and drinks to quickly replenish your carbohydrates. A large body of evidence and experience (4) indicate that these specialized products have marginal benefits for the vast majority of exercisers. For most of us, a balanced diet, with lots of fruits and vegetables, is all we need to replenish our carbohydrates. I eat an apple while playing golf or after a workout and that works for me. You can discover what sources of carbs work best for you. Processed carbohydrates, such as those in energy bars, are much more expensive than carbohydrates in natural food sources and may include other additives such as preservatives (5). So by eating natural foods you will be healthier and save money too.



In Phase 1 you should also begin eating **proteins** in order to provide your body what it needs to repair and build stronger muscles. Protein comes in many forms. The best sources of protein include salmon, tuna, chicken, many types of nuts (e.g. almonds, pistachios, peanuts), dairy products (e.g. milk, eggs, cottage cheese, yogurt), and beans (e.g. chickpeas, lentils, soy) (6). There has been a persistent narrative that there is an “anabolic window” (also “golden window”) during which protein metabolism is elevated and that is the ideal time to consume some protein to potentially accelerate muscle recovery. However, there is little evidence that such a “window” actually exists. So, eating protein at your regular mealtime still works well.

There is some evidence that people over 65 need more protein for muscle recovery than younger people following intense exercise (7). If you are interested in learning how much protein you need, try this diet calculator created by the US Department of Agriculture (3).

Phase 2 - Rest and Rebuilding (Days 1-3): All experts agree that **sleep** is essential for recovery after exercise and for overall health. Smart watches are good at tracking

how many hours you sleep and interruptions in your sleep, but not very good at tracking your stages of sleep.

Protein synthesis, a key part of muscle rebuilding, occurs around the clock. But slow wave (deep) sleep is a time when there is an increase in human growth hormone release and muscle protein synthesis (8). So getting enough deep sleep is especially important for those who exercise.

Our understanding of how much sleep we need is still emerging. Most experts agree that 7 hours of sleep is a minimum for most people but there is recognition that some people need more, others less. However, the evidence is clear that you need more sleep after exercise regardless of age.

There is more good news! Naps after a workout are good for you! They help you recover from intense exercise and boost performance (9).



Phase 3 - Getting Ready (2-5 days): During Phase 3 continue with a good diet and a generous amount of sleep. This continues your recovery from your last workout and prepares you for your next workout.

By Phase 3 you may be experiencing delayed onset muscle soreness (DOMS). This is a common result of intense exercise. I have reviewed several scientific articles, expert opinions from the Cleveland Clinic, UVA Medical, Harvard and other credible sources as well as physical therapists and other specialists. They covered many potential therapies for the treatment of DOMS including ice packs, ice baths, heating pads, saunas, massage, foam rollers, yoga, stretching, dynamic stretching and light exercise. My conclusion is that all of these treatments have some potential to ease discomfort while you are using them and for a short period after. However, none of these treatments have proven to be effective in significantly accelerating recovery from DOMS or improving athletic performance.

The good news is that active recovery methods such as gentle walking, swimming, biking, yoga and other gentle movements show promise for reducing DOMS and promoting muscle recovery. A team of investigators from leading Spanish research institutions demonstrated that such gentle movements increase blood flow and waste removal from muscles (10). They conclude:

“Active recovery protocols showed several advantages and benefits over rest with the main improvements observed on the magnitude of soreness. Muscle isolated contractions, jogging, running, aqua exercise, and yoga all seem to

offer limited management of DOMS after EIMD (Exercise Induced Muscle Damage).”



I have found that light exercise is helpful in reducing DOMS even after moderate activities such as golf and bowling. Take some time to explore what gentle movements/exercises work best for you when you have muscle soreness. With all of that said, it is important to be patient with yourself because workout recovery takes longer as we get older (11).

Summary: Rest, including sleep, and a healthy diet and hydration appear to be the most effective, proven methods for workout recovery. Active recovery between workouts can help you get ready for your next workout.

Bottom Line: Good health habits are good workout recovery habits.

Let's Get Moving!

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Fun Fact: PBJs and the NBA



Fun Fact: The Boston Celtics won the 2008 NBA Finals with a 24 point comeback in game 6 against the LA Lakers. Great teamwork and coaching helped of course. But the most important factor was the peanut butter and jelly sandwiches they ate before game time. Kevin Garnett is credited with bringing PBJs to the Celtics and the team used them to overpower the Lakers. And so they should. PBJs are filled with carbohydrates (bread and jelly/jam) and proteins (peanut butter).

As Celtics players moved to other teams they brought the PBJ culture with them. Now most NBA teams use PBJs to fuel their competitive edge. I am guessing they will soon be using them as recovery snacks.

Personal Note: Swing Recovery



Golf isn't a demanding exercise experience if you ride in a cart as I do. But, nearly every time I play I end up with pain in my lower back. I am not alone. Nearly 30% of golfers experience lower back pain after every round of golf. That is usually due to poor swing mechanics and reduced mobility of the hips and torso.

I am on a mission to improve my swing to reduce the stress imposed on my lumbar vertebrae and strengthen the muscles that are not pulling their share of the load.

In the meantime, I will put a pain patch above my hip, prepare a 19th hole treat and watch professional golfers do things I only dream of. Aah, life is good!

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