Recovery: A multi-faceted consideration for strength athletes

Recovery doesn't get the love and attention it deserves. It's like the foundation of a mansion. No one ever comments on how nice a mansion's foundation is, but people always notice the structure or design. A similar thing happens when it comes to performance athletes. People may notice an athlete's performance abilities, but usually do not notice a foundational aspect of the athlete's performance: their ability to recover from high stressors. If you want to get strong or build more muscle, improving recovery should be a priority.

Recovery is a multi-facet system that has many factors. In short, it's your ability to tolerate stressors, adapt to the stressor, and return to or above baseline performance. Han Seyle introduced the General Adaptation System (GAS) as a model of the body's ability to handle short term and long term stressors. More recently, sports science used the Stimulus- Recovery- Adaptation (SRA) curve, which is just the sport science version of GAS.

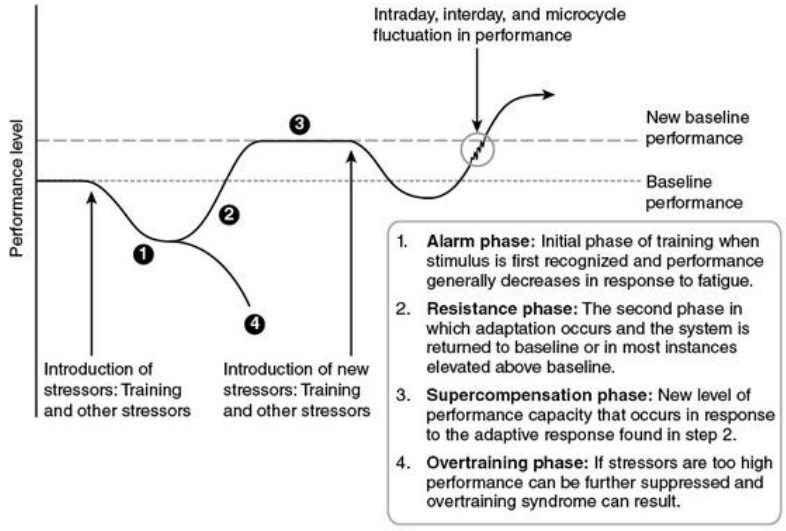

FIGURE 11.1 The general adaptive syndrome and its application to periodization.
Adapted from Fry et al. (36), Stone et al. (73), and Stone, Stone, and Sands (80).

Athletic performance starts at baseline, which should be thought of as your maximal performance at fully recovery. As you present a new stimuli (new training load, volume etc), baseline curve drops and returns back to or above (super compensation phase) baseline performance if your body has the ability to handle the stressor, recovery. Recovery can be looked at from a session to session basis, or even within a single training session.

What factors affect recovery?

Work Capacity

Work Capacity is the amount of work you can handle, properly recovery, and make adaptations while seeing positive performance increases. This can be measured in a single session or week, etc. Work capacity is going to govern how much training (volume) you can handle for each session within your program and how well your performance will be at that volume. Recent research shows that training volume dictates the magnitude of training response (considering you can recover from it).If you didn't know, now you do! Work capacity is your friend and you should care about it. This is especially true as you age; according to the SAID principal, as your training age increases, work capacity is going to have to go up also. Specific Adaptations to Impose Demands: if demands do not increase, then training effect decreases and plateaus or loss of performance. Before we dive into how to increase your work capacity, let's take a look at some systems that can help increase your work capacity.

Energy Systems

It's no secret: strength training is anaerobically dominant and requires a lot of high rate and maximal force production compared to aerobic exercise. Additionally, plenty of research has shown that aerobic training might negate strength training effects, which has lead a lot of strength athletes to avoid aerobic based training. I see a few issues with avoiding or omitting aerobic based training.

If we go back to training volume discussed in work capacity, the magnitude of response is usually related to total volume. Additionally, frequency, intensity, and in this case, timing of aerobic training actually play larger roles in its effect on strength sports. This is probably best reserved for a later article, but in short, as long as you're not training high volume bouts of aerobic work at high frequency and directly following training sessions, you're probably going to be okay. If that sparks some interest to you, I'd suggest looking into the Hybrid Athlete by Alex Viada. He's composed an excellent system of managing both high levels of strength and aerobic training. Alright, to get back on track- secondly, substrate utilization (fats, carbs, lactate, etc.) and bioenergetics (production of energy) is important to understand if you want to maximize your physiological performance for any sport.

ATP is the holy grail of energy production; a must for muscular functions to occur. We can produce ATP aerobically (in the presence of oxygen) or anaerobically (without the presence of oxygen). Anaerobic energy production is much faster via the ATP-PC system which utilizes Phosphocreatine to resynthesize ATP. This is very short lived, as short as 8-10 seconds (1.). Thankfully, the ATP-PC system has a brother known as the Glycolytic System, where ATP is formed from the breakdown of Glucose and Glycogen (carbs are your friend), lasting up to two minutes (1). The aerobic energy production is much slower

consisting of the Oxidative System. The Oxidative System breaks down around 70% fats and 30% of carbohydrates to make ATP (1). Unlike the Glycolytic & ATP-PC systems, the Oxidative System is able to produce energy for hours. I know, I know… whatever, right? You're a strength athlete and you only exercise for short bouts at a time. Which is slightly true, however, if you are like most strength athletes, training sessions can take hours. Researchers found that after repeat bouts of 30 second exercise, the reliance on the Oxidative system increased (2). Similar research as founded by other researchers looking more directly into recovery, they also found that as exercise went on and rest interval went on the reliance of the aerobic system becomes more important (3).

Okay, so where am I going with this? Remember that anaerobic energy is short lived, but can also be restored quickly. However, at high costs and the effects appear to diminish over repeat bouts and duration of time. Increasing your aerobic base via low-intensity mobility, cycling, sled pushes, etc., looks to have a good carryover to increase your work capacity and recovery. If you find yourself extremely winded between sets (unless it's cardio sets) and performance drastically decreases after one or two top sets, spending more time improving your aerobic base may benefit your training performance.

Work capacity has to go up over time, and if you're a strength athlete, your work capacity should be applicable to what you're doing (SAID principal, duh). For powerlifters, using the SAID principal could simply be adding one set per week or bi-weekly, etc. Another multi-faceted approach I have used with athletes that need better recovery is density training. Set a time limit, around 10 minutes (typically), prescribe an RPE or % of intensity, then ask them to perform as many sets and reps in that time frame. It may not directly increase your work capacity as well as adding sets, reps and load, but will improve your movement economy (utilization of oxygen).

Additional recovery methods

Outside of having a high work capacity, a select few other facets can contribute to increasing training recovery for athletes. Train more frequently is one option. Especially if you're a powerlifter, training big 3 movements at higher frequency (competition lifts and variations) has been shown to increase strength gains over time and reduce overall soreness.

Secondly, incorporate active recovery days. Active recovery has been shown to restore muscle force production quicker than just rest and passive recovery (1.). Active recovery training sessions can be another way to increase training frequency on a specific lift that needs more volume. For example, when looking at the Daily Undulating Periodization (DUP) model, it is structured from hypertrophy, power and strength. An example is the back squat: squat three times per week: three sets of nine, three sets of three, three sets of five. The power day (three sets of three) could be a moderate percentage day that is light enough but heavy enough to produce small adaptations and still facilitate recovery. Another way to program active recovery is using GPP days. Focus on low-moderate volume on weak muscle groups, incorporate core work and mobility work to increase blood flow to active tissues for greater recovery.

Utilizing passive recovery is another method to improve overall recovery. If you are interested in this method, I have included the link to an article by Mike Tuchscherer below.

Finally, nutritional interventions can make small yet meaningful contributions to recovery. If you are repeating training sessions back to back, or even in 12 hours, consuming a large bolus of protein and carbohydrates post workout will increase the rate of glycogen resynthesize (1.).

Conclusion

If you're an athlete looking to optimize your performance, make sure you are prioritizing your training around proper recovery as well. Neglecting aerobic work may be hindering your ability to perform per session, as well as your long term goals. Have training cycles which focus on increasing work capacity relative to your needs. This will allow you to achieve greater and more consistent strength gains over time. As a disclaimer, do not get carried away with either volume work or aerobic work; they should be tools used as needed. Heavy resistance training and anaerobic work should still make up a greater amount of your training. If you have any questions, email me at Jasonralya@gmail.com.

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Mike T- http://forum.reactivetrainingsystems.com/content.php?183-Passive-Recovery-By-Mike-Tuchscherer