



# PROGRAM DESIGN SERIES

## Part 2: Sets, Reps and Time Under Tension

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“Going through the motions” is a phrase that can be associated with many inexperienced athletes in the gym environment. Often we will see athletes aimlessly performing gym programs that lack structure and purpose for their desired sporting performance. They train regularly, expecting results from a program with no method or routine that leads to frustration, added stress and a general lack of motivation to continue.

One of the first training characteristics that I look to break in most endurance athletes is their insistence to perform high-rep sets and volume, with little rest. More often than not, I have found that

endurance athletes are ‘wired’ in a certain way. They replicate their ‘non-stop’ aerobic training habits and pump thoughtlessly through the reps, often bouncing from one exercise to another. They’ll continue to pump away with their three sets of ten reps until they inevitably plateau and as a result remove themselves from the gym for the next couple of months. After a few months, the ‘gym-bug’ is back and they start up again with the same exercises, the same 3-x 12-rep scheme and achieve the same results.

What we must realise is that performing exercises at these intensities (3/4 x 10/15 reps) only maintains the condition of the muscle and never creates

the training stimulus required to elicit greater physiological adaptations in the target muscle groups. Improved performance occurs when we target and train the weak areas within an athlete via strength, power and explosiveness.

However, before you think “but I’ve seen your programs promote this rep range” yes they do, and this is not incorrect. This rep range is found in beginner training programs where 10-15 repetitions is a common range for the majority of exercises. When you are a beginner to strength training, it is very important that your body learns the correct technique for each new exercise, as your neurological system will be unfamiliar with these specific new

movement patterns. Therefore performing slow and controlled actions for a high number of reps at the beginning phase of your weight training is vital as your nervous system is being trained more than your muscles.

Once your nervous system is able to recruit the muscle groups properly, it is then time to increase the weight and move on to the next phase. This usually takes around a month of regular training for your body to neurologically adapt. The problems come when an athlete continues to use these rep ranges long after they become ineffective.

We categorise our athletes by their ‘Training Age’, which we formulate using a

number of factors: strength training/gym experience, level of sport specific training, level of sporting performance and lifestyle. Once we take these into consideration we can then have them training at the correct intensity. As a general rule of thumb, I would always start an athlete out in the conditioning rep range (10-15) with any new exercise or training program to establish competency and recovery.

Progression from this phase will see that the athlete’s nervous system has adapted fully to the new movement patterns (exercises). The athlete is now ready to train at heavier loads as their muscles now have a greater ability to

recruit more muscle fibers during exercise. When progressing onto intermediate and advanced repetition ranges, numbers can range dependent on the type of training model, with variations from 3- 5 sets of 2-8 reps. By working at these new ranges and increased load (discussed in the next installment) we now have the ability to develop strength and power that will transfer across to our swim, bike and run performance.

From this point forward it will be the way that you or your trainer/coach organises your training with regards to volume, intensity, frequency and time that will see you get the best results and prevent injury.



percentile of the training population don't pay much attention to this, taking anything between 30 seconds to five minutes, often defined by what they are doing on their phone or whom they are talking too! The fact is that the amount of time we rest is very important if we want to maximise the effects of our training, much like a swim, bike or run set. If your rest periods aren't in line with your training goals and if you aren't monitoring them, you won't see the same results as if you were going by the clock.

For instance when training to increase maximal strength a lifter will perform 5 x 2 reps @ 95% of their 1RM (1 rep max) in the squat, but instead of waiting the minimum of 2 - 3 minutes, they impatiently jump straight back in after 60 seconds. What happens here is instead of executing a strong and effective double lift, they struggle through two exhausting repetitions that not only forces poor technique but also increases their chance of injury. This is all due to them not allowing their body to recover both metabolically and neurologically.

This works the other way too. If a beginner athlete who's looking to improve their overall strength and composition takes too long between sets, they will effectively destroy any training stimulus that they have generated.



**NO CHATTING:** Rest between sets is a neglected variable. It's an important part of the rep. So if you loose focus, you are not maximising the effort.

The right interval length depends on the intensity of your efforts, as well as the type of exercise performed (i.e. you will recover faster from a set of cable pull throughs than from a set of squats). We ask our beginner strength athletes to rest between 60 - 90 seconds between the sets, to guarantee that they fully recover and are able to perform with consistent and safe technique.

**Stay tuned for Part 3 in the Program Design Series: Intensity, Load & Recovery**

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Seeing the need for better athlete education and understanding with regards to Strength & Conditioning for the Endurance Athlete. Kriss works with a variety of athletes from Age Groupers to Professionals developing specialized programs that support and heighten their endurance performance. Kriss is based in Byron Bay with his wife (professional triathlete) Polly Hendy. He has large client base that use his distance (online) coaching.

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**'TIME UNDER TENSION' IS WHERE WE CHANGE THE SPEED AT WHICH WE MOVE THE WEIGHT WHEN PERFORMING AN EXERCISE**

**TIME UNDER TENSION**

'Time under tension' is a key training variable that we can use to manipulate and improve our current and long-term training goals. As we have already highlighted, you will see people in the gym "repping away" on the leg press or squat, often quite happy just counting their reps, following a same tempo, 1 rep every 2 seconds and never focusing on the main purpose of training. Our main purpose should be to elicit change in the muscle group that we are targeting. If you don't hit a minimum level of muscle tension (where muscles remain semi-contracted for an extended period of time) and exceed it, you won't be providing the neuromuscular system with adequate stimulus and you definitely won't see the results you desire.

Simply put, 'time under tension' is where we change the speed at which we move the weight when performing an exercise and in doing so provoke a level of activity within a muscle, forcing it to adapt

and get stronger. The weight isn't always the priority when we train. By slowing the movement down (5 - 10 second duration) we are working to improve selective muscle recruitment, stability and control, as the slower a weight is moved, the more tension can be produced. Creating this time under tension can be achieved through a number of variations, which are dependent on the individual training goals of the athlete. For instance, if you are new to strength training then we would recommend a slow controlled motion which might see you perform one repetition of a squat with a 3-second lowering phase and then a 2-second upward phase of the barbell. Further

down the road to increase intensity to your training and to break through any 'plateau', you might add a 1-second pause at the bottom of the first phase, which could be a stationary hold at the bottom of a squat.

Below is a table with a few examples that'll help you better understand TUT and they should give you a better idea of how you can manipulate it to reach your goals.

**REST BETWEEN EXERCISES**

Our final discussion point is one of the easiest and most neglected variables that we can use to generate intensity in our training programs, the time we take to rest between sets and exercises. A large

TABLE 1:

TIME UNDER TENSION	GOAL
1 - 4 seconds	Speed/Power/Max Strength
3 - 7 seconds	Max Strength
5 - 10 seconds	Stability/Control

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