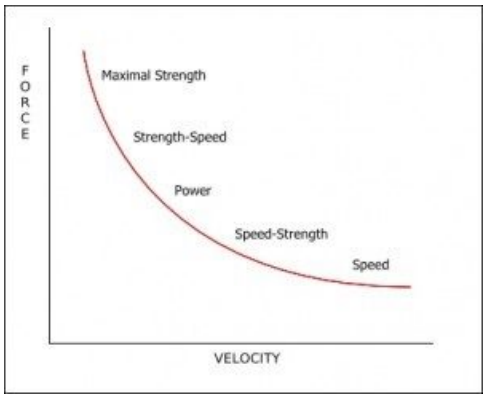
Strength Training For Sport

Article by Leighton Bradgate

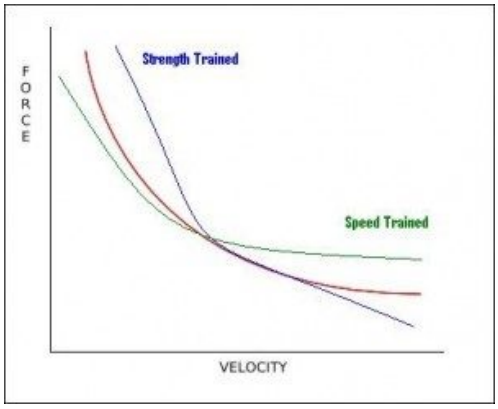
The merits of doing strength training to improve sports performance are well documented and something that recreation athletes to professionals alike tend to engage in. Most of us would have engaged in some form of strength training to help with performance but are we really training in the best way to achieve the most optimal performance outcomes? This article discusses the effects of different types of training and the best way to set your program up for the desired outcome.

Understanding the Force Velocity Curve

The body's response to different forms of training is quite specific. If we only do heavy strength training, then strength tends to improve but often speed can deteriorate. Conversely if we only do speed training, then our max strength will tend to suffer. This is illustrated well on the force velocity curve below, which shows the inverse relationship between force and velocity. The heavier the weight you lift (force), the slower you lift it (velocity); conversely, the lighter a weight, the faster you lift it.

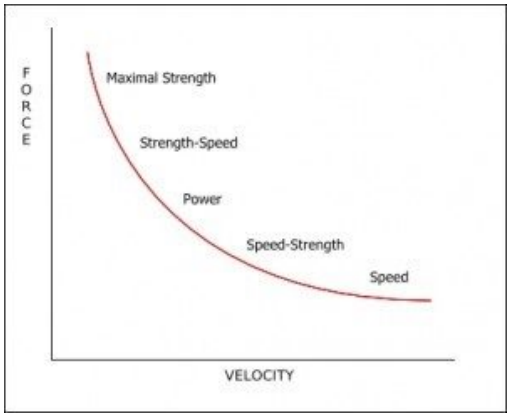


The graph below shows what happens to the force velocity-curve after strength training (blue line) and speed training (green line). If you train at one end of the force velocity curve, you will improve that part of the curve, but the other will decrease.



E: admin@ibphysio.com.au | T: 02 9976 3540 | F: 02 9976 3290 | Suite 14, Level 2, 22 Darley Road, Manly, NSW 2095 Australia

As speed tends to be a major component of most sports, an ideal outcome of training is to shift the whole force velocity curve to the right, improving the speed at which max strength and power can be delivered, such as in figure 3 below. Simple I hear you say, I just need to make sure that I train all parts of the curve at all times to maximize each component, performing a range of training from max strength to max speed? The problem is that adaptions to training are quite specific in nature and your body can only adapt to so much at any one time. If you train all parts of the curve at once, you won't adapt optimally. This brings us to the concept of periodisation.



Periodisation is a strategy for organising strength and conditioning programs (Turner, 2011), where training at different parts of the force velocity curve are undertaken at different parts of the season. One of the principles of periodisation is to move from general training to more specific training. Strength training for most sports tends to be more general, whereas training for power and speed should involve exercises and movements more specific to the nature of the sport that you are training for.

https://www.youtube.com/watch?v=RKmvD3Uje5g

Example of strength exercise

https://www.youtube.com/watch?v=1MgTHZHguvY

Example of speed strength exercise

Your periodisation plan should travel from left to right down the force-velocity curve starting with slower, heavier weights and progressing to faster, more explosive plyometric work as the event that you are training for approaches or the season progresses. Every strength training program should involve a period of training on each part of the force-velocity curve, but how long they spend on each component depends on four things;

- Training age: A beginner will need to spend more time working on max strength than an experienced athlete.
- Sport: Different sports require different strength/speed qualities. A rugby player will require more strength work than a tennis player, but that still doesn't mean that a tennis player shouldn't work on improving max strength for a better serve.
- Position: Different positions within the same sport have different performance requirements, a rugby prop will need to have more max strength than a winger.
- Time of year/season: As discussed, earlier in the preparatory period, stronger emphasis should be on max strength, as the season progresses, a more sports specific approach should be taken with a greater emphasis on speed.

E: admin@ibphysio.com.au | T: 02 9976 3540 | F: 02 9976 3290 | Suite 14, Level 2, 22 Darley Road, Manly, NSW 2095 Australia

https://www.youtube.com/watch?v=wK33qVHM7Qc

Example of strength exercise

https://www.youtube.com/watch?v=Dfwphl_cl9I

Example of speed strength exercise

Strength Training Parameters

OK, so now we have looked at the type of exercise that you should be doing at different parts of the season, but what about the way we structure our sets and reps of each exercise and rest breaks in between, should these always be the same? I think that most of us who have undertaken strength training in the gym would agree that most of us tend to stick to 3 sets of 10 for all of our resistance exercises but is this really the smartest approach? There is a large volume of research to show that the best results for training different aspects of performance are achieved with different parameters in terms of the weight, reps and speeds used.

%RM is the percentage of repetition maximum, so a 85% of 5RM (rep max) is a weight that is 85% of the maximum that you could perform for that exercise 5 times.Recovery = time spent resting between sets

	%RM	Sets	Reps	Recovery
Max Strength/Power	85% 5 RM	5	5	3-5 mins
Speed	85% 5 RM	5	5	3-5 mins
Hypertrophy	95% 12 RM	3	8-12	1 min

E: admin@ibphysio.com.au | T: 02 9976 3540 | F: 02 9976 3290 | Suite 14, Level 2, 22 Darley Road, Manly, NSW 2095 Australia