

## **Resistance Training and Rugby**

By  
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The importance of resistance training in Rugby Union cannot be over-emphasised. We just have to look at the size, strength and power of the modern elite player to realise the impact of resistance training on the game.

But what is resistance training? It can be broken into many components, of which strength, power and muscular endurance will be the focus of this article. Strength is defined as the maximum amount of force a muscle or group of muscles can produce and it is vital as part of injury prevention. It helps increase the magnitude of pull-force which the musculotendinous unit can absorb, helping to prevent muscle-pull injuries. It also helps increase force production, allowing greater instantaneous power production and repeated stretch shortening cycle activities, helping increase performance in the explosive aspects of the game.

Muscular power can be defined as the ability to use strength quickly to produce an explosive effort. This helps in areas of the game where acceleration, change of direction and contact is made (I might hazard the guess that muscular power development is the difference between the good player and elite player in terms of physical fitness). You then have muscular endurance, which is the muscles' ability to keep contracting for an extended period, vital if a player is going to keep producing high intensity efforts over the length of a game.

If we look at elite players' training programmes, much of their strength training is achieved in the gym. Programmes are based around five main lifts (plus their derivatives), which are power clean, power snatch, squat, dead lift and bench press. Obviously, programmes are individualised and adapted and will often contain many other exercises to suit an individual player's requirements.

However, I question how practical this type of programme is to most amateur players. These types of exercise require time, facilities and expert guidance; many of the lifts are very technical to perform and, if they are done incorrectly, can lead to the possibility of injury.

When we look at power development in elite players, a number of strategies are used. One popular exercise is plyometrics, which involves a series of repetitive maximal jumps. It is a very effective training modality, but has a high injury risk potential attached to it because of the amount of force generated by the musculotendinous unit. One drop jump can produce the equivalent of over 500kg of force in the space of less than 200ms (microseconds); if we then multiply that by the 50 jumps in a training session, the muscles involved have produced over 25,000kg of force.

For these reasons many authors have indicated that you should have a substantial strength base before starting a plyometric programme (one of them is being able to squat at least double your body weight). I again question how practical and safe these sorts of exercises are for the majority of amateur players.

So how can we help amateur players' performance through resistance training? I think the first place to look at is what the requirements of the game actually are. Strength/power in rugby performance has to have a multidirectional emphasis, particularly in terms of the torque applied to the torso in contact areas of the game. I feel this is an area that many top-class players miss out. Traditional programmes can be very linear (based on the maximal strength and power programmes from athletics) and, though this can be very important, there needs to be a bridge between what track athletes and rugby players actually require in their respective sports.

To produce an actual increase in strength levels, there is one overriding priority - '*overload*'. The muscle, or group of muscles, must be taken to a point that it is not used to, in order for there to be a physiological change in the musculotendinous unit and the nervous system which controls it. Generally, if you wish to increase muscular strength, maximum repetitions are required (85%+ of 1 rep max) or less than 5 reps at a very high intensity. For muscular endurance, 12+ reps to a point of overload would be required. Basically, as the reps increase the strength gains will diminish and muscular endurance gains will increase. In terms of power training the load is somewhat less than for strength (30-70% of 1 rep max), but exercises are done at maximum speed. Once the movement starts to slow down then you are no longer training for power.

Is it possible, however, that changes in player strength, power and muscular endurance be accomplished without resorting to weight training? I think they can.

Here is a case study that may highlight what I mean. When I was playing first-class rugby (back in the dim and distance past of the early 1990s), two players spring to mind. The first was a prop who lived in the weights room, looked like an Adonis and had to wear a specially enlarged shirt to fit his immense frame. Though a reasonable player, he was slow, not particularly strong and technically poor. Why? Well, his resistance training was really just body-building, so he looked the part but was not fulfilling his potential, because his programme was not designed to increase rugby performance. The other player that springs to mind was probably the strongest player I ever came across. He was a hooker and, compared to our prop, quite small. He had never been in a weights room in his life and thought anyone who had was a bit strange. However, he was a farm labourer and had been scrummaging at the top level for over ten years. When one looked at the resistance work he did, it was very specific. He was throwing straw bales around, carrying sacks of corn and doing some sort of scrummaging at rugby sessions and matches at least three times a week.

I feel the overload necessary for amateur players can be achieved in a fairly specific way by using loads, which are readily available.

**Here is an example of a circuit that I have found useful.**

- Station 1: **Press ups** with feet on partner's back.
- Station 2: **Tackle bag throws.** Overhead throw as far as possible and partner throws back
- Station 3: **Scrummaging** 1 v 1
- Station 4: **Up and downs.**  
Repeated tackles on tackle bag and partner picks up and replaces.
- Station 5: **Piggy-back squats.**
- Station 6: **Forearm hits** into a tackle shield.
- Station 7: **Rotation throws** with tackle bag.
- Station 8: **Lunges** with tackle bag.

This circuit is more suited to muscular endurance and power production, but will get some strength gains. The work/rest intervals can be adjusted, depending on what is required.

- To achieve more muscular and aerobic endurance, go for 30 seconds on each station, with a 20m sprint followed by a 20m jog between each station.
- To address more strength and power, increase the rest *and* increase the intensity of the exercise. Cut out the sprints between exercise stations.

To address true strength gains, I use a range of harder exercise, including:

- 1 v 2 scrummaging.
- Isometric scrummaging against a scrum machine or the posts.
- A range of exercise based on Greco-Roman wrestling. These include putting a player on all fours with an opponent trying to turn him over and laying a player on his back then trying to get up with an opponent trying to pin him down.

The idea of these exercises is to work the legs, upper body and core in a co-ordinated fashion and it is designed to have a greater relevance to the game itself. The exercises shown are only examples of what you could do. If you keep the principles of training outlined in this article in mind, you can come up with exercise(s) which will suit the standard of player you are dealing with.

Undoubtedly, you would get greater maximal strength gains from a heavy weight-lifting programme, but how many players have the time, resources and knowledge to do this safely and effectively?

## References

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