

# **Part 1: Strength Training Specific to Rugby League and Rugby Union**

Prepared by

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## **Introduction**

Rugby league is a highly physical team sport played by teams of 17 players, with a maximum of 13 players per team on the field and four interchangeable reserves. Rugby Union differs to league in that there are 15 players on the field at any one time and has seven replacement or interchange players. The games are based on offence (running with the ball) with aim of scoring a try and, defence (tackling) aims to prevent the scoring of points. Rugby union has an unlimited tackle law unlike league which allows each team to have six tackles before a kick or handover must take place. Both games are played over 2 x 40 minute halves which are separated by a rest interval (half time), of approximately 10 minutes in length.

Both games involve all aspects of physical fitness including but not restricted to, balance, coordination, flexibility, aerobic and anaerobic endurance, speed, strength and power (Gabbett, 2002) and (Meir, et al 2001). All of these physical components play a major role in the success of a rugby league or union player's performance along with game specific skills such as passing, tackling, decision making skills and ability in the ruck and maul and lineout.

As a strength and conditioning coach for rugby league or union it is essential to ensure all of the above aspects of each player's physical preparation are thoroughly planned with both team and individual goals in mind in relation to each phase of their training program. It is also essential to have a thorough understanding of each physical component and how it relates to each training session and phase of training, with the optimal goal of improved on field performance both for the individual and therefore the team.

The following program identifies to the strength and conditioning coach, how to plan strength training and programs and gain a more thorough understanding of periodisation and physical performance in relation to the sport involved, by providing the coach with phase by phase hints and objectives along with sample training programs for all the components of the physical fitness. The exercises used throughout the program aim to show progression based on leading strength and conditioning coaches Mike Boyle and Vern Gambetta from one cycle to another based on each athletes level of function and are aimed at intermediate and experienced level athletes. It is important that during each stage or cycle, the players undergo ancillary exercises outside core lifts shown here in the program. These exercises should focus on ensuring each player possesses adequate stability and muscle control in all planes of motion. This will help to enhance each progressive cycle or phase and lead to greater athleticism. Part II of this program will outline the other physical fitness components essential in power sports like rugby league and union such as speed, plyometrics and metabolic conditioning.

## Periodisation for Strength Training

Put simply, periodisation is the forward planning and evaluation of future training sessions and the phase in which they are made up. In general training phases are divided in **Preparatory Phase** (off season) **Pre competitive** (Pre season) and **Competitive Phase (In season)**. These phases are further sub divided in microcycles based on physical component needs of each team and or players.

The microcycles for strength training team sports are

1. Anatomical Adaptation (Prep)
2. Hypertrophy (Prep)
3. Maximal Strength (Prep)
4. Power / Conversion (Pre Comp)
5. Maintenance (Competitive)

### **Anatomical Adaptation (AA)**

During this phase the player's will undergo a process known as general adaptation syndrome (GAS) according to Bompa and Carrera, (2005). The anatomical adaptation cycle should consist of lower intensity activities and aims to progressively prepare each player for future cycles and the stresses associated with training. It is essential the strength and conditioning coach works with other medical professionals such as physical therapists prior to the commencement of the AA cycle to ensure any potential for injury is identified. A simple but extremely effective and informative assessment tool is the use of leading physical therapist and strength coach Gray Cook's Functional Movement Screen (FMS) as seen in his book, Athletic Body in Balance (See reference 4). The FMS should be used throughout the training program to continually reassess and evaluate each players functioning consultation with other medical staff.

The main concerns from an injury prevention perspective in relation to both codes should be movement quality along with correcting any deficiencies seen in the FMS that may have or will lead to compensatory movement patterns and consequently injury. The program should emphasise exercises enhance the athletes the ability to stabilize the spine and lower limbs and provide mobility at the hip and shoulder girdle to minimize common injuries to ankles, knee's and shoulder's. This should occur through ensuring the athlete possesses similar strength levels in both horizontal (Push up and Inverted Row) and vertical pushing and pulling actions (Shoulder Press and Chin ups). Similarly the athlete must possess similar control and activation in knee (Squatting) and hip dominant actions (deadlifting). The length of this cycle may differ dependent on the level and movement quality of the players and generally lasts 2-4 weeks and may contain 3-4 sessions per week. Sessions should be performed on alternate days, such as Monday, Wednesday and Friday.

Strength training sessions should involve a number of different exercises, multi planar in nature, based on assessment results and may involve a number of bodyweight type exercises such as push up, chin ups, and lunging with minimal emphasis on sport specific strength but more on general athleticism. Sets and Repetitions should range from 3-4 sets of 10-20 at an intensity of 50-65% 1RM.

#### Sample Strength Training Program

	Rest	Week 1	Week 2	Week 3
1. Push ups with Elevated Feet	60s	3 x Max	4 x Max	5 x Max
2. Prone Bridge	30s	5 x 30s	6 x 40s	7 x 50s

3. SL Supported Split Squat with DB	60s	3 x 8	3 x 10	3 x 12
4. Inverted Row with Feet	60s	3 x Max	4 x Max	5 x Max
5. Floor Crunches Supported	60s	3 x 15	4 x 15	5 x 15
6. BB Free Arm Front Squat	60s	3 x 8	3 x 10	3 x 12
7. Internal and Ext Shoulder Rotation – Resistance Band	60s	3 x 10	3 x 15	3 x 20
8. Lateral Bridge – Each Side	30s	3 x 20s	4 x 20s	5 x 20s
9. Underhand Grip Chin ups	60s	3 x Max	4 x Max	5 x Max
10. Cook Hip Lift	60s	3 x 8x 3s	3 x 10x 3s	3 x 12x 3s
11. Military Press*	60s	3 x 8	3 x 10	3 x 12
12. Good Mornings	60s	3 x 8	3 x 10	3 x 12
13. Dips	60s	3 x Max	4 x Max	5 x Max
14. Supine Lying Leg Lifts	30s	3 x 10	3 x 15	3 x 20

*\* If no shoulder issues are present. No Overhead lift until corrected*

## ***Hypertrophy***

Due to the level of physicality and sheer forces involved in the games of rugby league and union, a certain level of muscle mass is essential to be successful. Hypertrophy training is based on the theory of increasing the cross sectional area (CSI) of the players muscles. Muscular strength is proportional to CSI and therefore, the aim of the hypertrophy cycle is to increase the player's lean muscle mass and in effect produce greater force during the later stages of the training program.

This cycle should focus predominately on multi joint exercises such as Cleans, Snatches, Bench Press, Squats and Deadlifts but in some instances isolation exercise can be used (Chest Flyes, Tricep Extensions). Again the focus along with muscle gain should be on maintaining or correcting muscle imbalances and ensuring the player's are lifting through full ranges of motion (ROM) and using multi directional actions. A critical factor in hypertrophy training seems to be "time under tension". Referring to the time each set takes to perform. Ideally each rep should take in excess of five seconds, ie 4:1: X (Eccentric, Isometric and Concentric contractions) to induce maximum muscle growth. The volume and intensity during this period should be slightly greater than during the AA cycle with sets and reps ranging from 3-4 sets per exercise of 8-12 Reps at 65-80% of 1RM. The cycle should last between 6 and 8 weeks and the players should lift 3-5 times per week. The weekly schedule may be performed as follows, Monday (Day1) Tuesday (Day 2) Wednesday (Off) Thursday (Day 3) and Friday (Day 4 or repeat Day 1 or 2).

### Sample Basic Strength Training Program - Day 1

	Rest	Week 1	Week 2	Week 3
1. Hang Cleans	60s-90s	3 x 10	3 x 10,8,8	3 x 8
2. Lunges	60s-90s	3 x 10	3 x 10,8,8	3 x 8
3. Squats	60s-90s	3 x 10	3 x 10,8,8	3 x 8
4. Bench Press	60s-90s	3 x 10	3 x 10,8,8	3 x 8
5. Incline Bench Press	60s-90s	3 x 10	3 x 10,8,8	3 x 8
6. SB Crunches	60-90s	3 x 10	3 x 15	3 x 20

### Sample Basic Strength Training Program - Day 2

	Rest	Week 1	Week 2	Week 3
1. Hang Snatch	60s-90s	3 x 10	3 x 10,8,8	3 x 8
2. Deadlifts	60s-90s	3 x 10	3 x 10,8,8	3 x 8
3. SL Deadlift	60s-90s	3 x 10	3 x 10,8,8	3 x 8
4. Weighted Chin ups	60s-90s	3 x 10	3 x 10,8,8	3 x 8
5. DB Row	60s-90s	3 x 10	3 x 10,8,8	3 x 8
6. Diagonal Plate Chops	60s-90s	3 x 8	3 x 10	3 x 12

### Sample Basic Strength Training Program - Day 3

	Rest	Week 1	Week 2	Week 3
1. DB Shoulder Press	60s-90s	3 x 10	3 x 10,8,8	3 x 8
2. Upright Row	60s-90s	3 x 10	3 x 10,8,8	3 x 8
3. Rear Delt Raises	60s-90s	3 x 10	3 x 10,8,8	3 x 8
4. Weighted Dips	60s-90s	3 x 10	3 x 10,8,8	3 x 8
5. Lying Tricep Extensions	60s-90s	3 x 10	3 x 10,8,8	3 x 8
6. Bridging Circuit	45-60s	3 x 20s	3 x 25s	3 x 30s

## ***Max Strength***

Maximal Strength is the ability to produce the most amount of force and against an external resistance. As already mentioned both games involve fierce body contact at regular intervals combined with explosive force generation due to the sheer size and body mass of each player as well as an increased knowledge of, and greater training focus on spinal stability and core strength which in turn leads to greater body control, awareness, balance and muscular endurance (Meir, 2001).

Strength is therefore the single most important facet of the game and is a major ingredient for the production of power (speed strength). Maximising a player's strength level will help to overcome the loads and forces associated with the game. Strength levels are maximized through performance of multi joint lifts, such as bench press, squats, deadlifts, Olympic lifts along with various other tools, i.e. sleds and odd shaped heavy implements used in strongman type training as these replicate the action of tackling and the maul in rugby union. Sets and Reps should range from 3-6 sets of 2-6 Reps at 80-95% 1RM. Due to the fatigue and neural stress associated with heavy lifting rest period should be 2-4 mins in length. The strength cycle should last 4-8 weeks dependent on level of athlete and training age. Ideally 3 sessions per week are to be performed each week and alternate days are ideal, such as Monday (Heavy), Wednesday (Light) and Friday (Moderate).

### **Sample Basic Strength Training Program - Day 1 (Heavy)**

	Rest	Week 1	Week 2	Week 3
1. Hang Cleans	2-3mins	4 x 5	5 x 5	5 x 5,5
2. DB Lunges – Multi directional	2-3mins	4 x 5	5 x 5	5 x 5,5,4
3. Suitcase Deadlift	2-3mins	4 x 5	5 x 5	5 x 5,5,4,3,2
4. DB Bench Press on SB	2-3mins	4 x 5	5 x 5	5 x 5,5,4,3,2
5. Cable Pull in Lunge Position	2-3mins	4 x 5	5 x 5	5 x 5,5,4,3,2
6. Farmers Walk	2-3mins	4 x 5	5 x 5	5 x 5,5,4,3,2
7. BB Rollouts	60s	3 x 8	3 x 10	3 x 12

### **Sample Basic Strength Training Program - Day 2 (Moderate)**

	Rest	Week 1	Week 2	Week 3
1. Hang snatch	2-3mins	4 x 5	5 x 5	5 x 5,5,4,3,2
2. One Leg Box Squats	2-3mins	4 x 5	5 x 5	5 x 5,5,4,3,2
3. Cook Hip Lift on MB	2-3mins	4 x 5	5 x 5	5 x 5,5,4,3,2
4. Double Leg Stability Ball Hip Extension	2-3mins	4 x 5	5 x 5	5 x 5,5,4,3,

5. Sternum ups (weighted if pos)	2-3mins	4 x 5	5 x 5	5 x 5,5,4,3,2
6. Fireman Carry	2-3mins	4 x 5	5 x 5	5 x 5,5,4,3,2
7. Standing Bodyblade	60-90s	2 x 10s	2 x 15s	3 x 15s

## Conversion

The Conversion phase aims to “convert” the mass or hypertrophy and strength gains from preceding cycles into sport specific performance through power based training. Power is *speed x strength* or the ability to produce maximal force in the least amount of time. It is during this period in the training cycle that volume is low to (3-4 sets of 2-6 reps), but intensity and effort should be near maximal. Unlike the previous cycles the load lifted are generally light ranging from around 40-70% 1RM but the emphasis is on the speed of contraction and hence the players must focus on lifting as fast and forceful as possible. It is during this phase, a greater emphasis is placed on position specific training. In general for most playing positions, the majority of force produced is horizontally distributed and therefore training should focus on this aspect (Forwards and Inside Backs). Outside backs such as wingers and fullbacks must also be trained to produce explosive force vertically to replicate taking a bomb or cross field kick.

It is a common method during power or speed strength phases for strength coaches to use complex training methods, with great results. Complex or combination training involves performing a maximal lift such as front squats, followed by a plyometric exercise such as jump squats, sixty seconds later. Rest periods for this cycle should be lengthy, 4-5mins; this will ensure adequate muscle recovery and neural regeneration between efforts. The power / conversion cycle should last 4-6 weeks in length and consist of 2-3 strength sessions per week. Preferably during this cycle the session should be performed on alternate days such as Monday, Wednesday and Friday to maximise recovery, similar to the strength cycle.

### Sample Basic Strength Training Program - Day 1

	Rest	Week 1	Week 2	Week 3
1a. Power Clean	4-5mins	4 x 5	4 x 4	4 x 4,3,3,2
b. Reverse MB OH Throws		4 x 4	4 x 5	4 x 6
2a. OH Supported Split Squats	4-5mins	4 x 5	4 x 4	4 x 4,3,3,2
b. Box Jumps		4 x 5	4 x 6	4 x 7
3a. Bench Press	4-5mins	4 x 5	4 x 4	4 x 4,3,3,2
b. Smith Machine Bench Throws		4 x 5	4 x 6	4 x 7

## Sample Basic Strength Training Program - Day 2

	Rest	Week 1	Week 2	Week 3
1. Power Snatch	4-5mins	4 x 5	4 x 4	4 x 4,3,3,2
2a. Alt Jammer Slammer	4-5mins	4 x 5	4 x 4	4 x 4,3,3,2
b. Plyo Push ups		4 x 5	4 x 6	4 x 7
3a. Walking Lunges	4-5mins	4 x 5	4 x 4	4 x 4,3,3,2
b. Split Squat Jumps		4 x 5	4 x 6	4 x 7

### ***Maintenance***

In season it's imperative for the players to maintain their level of physical condition, built up over the preparation and preseason period. Training sessions during in season should focus on high intensity strength training workouts emphasizing maximal strength and power and to a lower extent, muscular endurance. Teams should perform 2-3 sessions per week in season to ensure this maintenance occurs and sets and reps should range from 3-4 sets of 2-6 Reps at 80-95% 1RM. Training days during this period are influenced by the day of the game, an example may be a Saturday game followed by a Friday game the next week. This would mean strength training should be performed Monday and Wednesday.

## Sample Basic Strength Training Program - Day 1 (Heavy)

	Rest	Week 1	Week 2	Week 3
1. Hang Cleans	3-4mins	3 x 5	3 x 5,5,4	3 x 4
2a. SL Squats	3-4mins	3 x 5	3 x 5,5,4	3 x 4
b. SL Hurdle hops				
2. Single Leg Deadlifts	3-4mins	3 x 5	3 x 5,5,4	3 x 4
3a. DB Bench Press on SB	3-4mins	3 x 5	3 x 5,5,4	3 x 4
b. Spine Lying MB Throws		3 x 5	3 x 6	3 x 8
4. Turkish Get ups	60-90s	2 x 5-8	2 x 8-10	3 x 8

### **Summary**

Rugby league and union players at all levels, whether it be NRL or super 14 or even under 18's level, must endure enormous amounts of physical contact or force and therefore must be able to resist and overcome these forces to be successful. This is why it is essential for all player's to possess a sufficient level of strength, stability and explosive power. From the training program provided, the aim was to empower the reader with the knowledge and the skills to plan and administer strength training programs with confidence for all players of both codes in any phase or cycle of their training preparation.



## Definitions

**BB Free Arm Front Squat** - Begin with arms extended out in front of the body with the hands at shoulder height. A bar is then placed across the anterior deltoids, finishing close to the throat. From here squat down by bending at the knees until thighs are parallel to the floor. Then rise to start position.

**Cook Hip Lift** - Perform by lying on back with feet flat on the floor (knee's bent). Then place a tennis ball on the ribs and pull the knee to the chest hard enough to hold the ball in place. From here push down through the foot on the ground and extend the hip while keeping the tennis ball tight against the ribs.

**Bridging Circuit** - Perform a prone bridge on the toes with elbow at 90° angle, underneath the shoulders, drawing in the abdominals towards the spine. Hold for set time. From this position rotate body to the left, on to the left arm and the left side of the foot with feet stacked and elbow and shoulders at 90° angles. Ensure elbow is placed under the line of the shoulder. Hold for set time. Repeat on the right, in the same position as on left. Repeat with minimal recovery between positions.

**Inverted Row with Supported Feet** – Perform by placing an Olympic bar in a power rack or smith machine placed at waist height. A bench is placed approx  $\frac{3}{4}$  of the athlete's body length away, where the feet are placed. Place the hands on the bar and hold the torso perfectly straight. Toes are pointed up and the feet together. From here the athlete pulls the chest to the bar, and finally the athlete returns to starting position still maintaining a straight torso.

**SL Supported Split squat with DB** - Standing perpendicular with DB's in hand in front of a box or bench. Place one foot behind on the bench. Ensure Shoulder and hip stay square. Proceed in to a squat position, lowering until thigh is parallel to the floor, hold and return to start position. Perform on opposite leg once desired repetitions are met.

**Supine Lying Leg Lifts** – Lying in a supine position with arms by their sides, the athlete then flexes hip and knees, both to 90 degrees with the toes pointing up. From this position, lower one leg at a time placing the foot momentarily flat on the floor and return to hip flexed position. Alternate leg. Ensure spinal movement occurs and a neutral spine is maintained.

**Suitcase Deadlift** – Start in a conventional deadlift position, with a dumbbell placed on the floor to one side of the athlete. While maintaining a front on posture and the shoulder out over the line of pull, grasp the DB and stand, focusing on hip and knee extension. Lower the DB slowly back to the floor and repeat. Then perform on opposite side.

**Cable Pull in SL Squat Position** – Using a cable column setup, with the pulley placed as close to bottom as possible. The athletes grasp the handle in one hand with the hand internally rotated (thumb down) and proceeds' to set up in a lunge or split leg squat position. From here the athlete pulls towards to body while aiming to maintain a front on or square body position. As the arm pulls the arm will rotate externally and finish in a supine position (thumbs up).

**Farmers Walk** – Standing tall, grasp two heavy implements, such DB's or sandbags, one in each hand. Walk forward for set distance or time.

**One Legged Box Squats** – Standing on a box holding a pair of five pound (2-3kg) dumbbells and attempt to squat down until the loaded thigh is parallel to the floor. Ensure the weight is kept on the heel. As the squat begins, raise the dumbbells to shoulder height to facilitate the sitting back on the heels. It is critical to begin by bending at the knee and not the ankle.

**Cook Hip Lift on Medicine Ball** – Progression from the Cook hip lift. The foot is elevated on a MB.

**Double Leg Stability Ball Hip Extension** – The athlete start in a supine position with arms at the sides, from there the soles of the feet are placed on the stability with hips and knees flexed to 90 degrees. Raise the hips up until there is a straight line from the shoulders to the knees.

**Sternum ups** – Using a reverse or supinated hand position, grasp the chin up bar and pull the body vertically until the sternum is in line with the bar not just to the chin. Focus on drawing the scapulae back and don't allow the body to swing or generate momentum.

**Fireman Carry** – With the use of a partner, squat down and place the partner diagonally across one shoulder and walk forward for set distance or time. Focus on drawing in the umbilicus towards the spine to stabilize the spine. Ensure a tall posture is maintained. Once distance is covered repeat on other shoulder.

**Split Squat Jumps** – Start in a lunge position with tall posture and the rear leg approx 15cm (6 inches) off the floor. The Front hip should be flexed at 90 degrees and the knee should be flexed at 90 degrees or greater. The rear hip should be in extension and the rear knee should be flexed at roughly 90 degrees. Explode upward into a vertical leap, swinging the arms first backward and then forward to help propel the body upward. Reset and jump again, repeating for desired number of repetitions. Reverse your Leg position and perform the same movement on the other side.

**Standing Body blade** – Stand tall with bodyblade extended in front (vertically), arms should be at sternum height and hands interlocked around the centre of the blade. Maintain this position, while vigorously shaking the bodyblade. Ensure the body stays as still as possible. Efforts are generally based on time rather than reps.

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