

PROGRAMS

FOR

RUGBY

LEAGUE

Programs for Rugby League

Strength Training

Programming is essential as it is the compilation of a group of exercises to a set plan in order to achieve a maximal result in the most efficient manner possible. The major factors are volume, intensity of load, frequency of training, type of exercise, variability and specificity.

"Fail to plan is a plan to fail".

Modern strength training concepts are built on a principle of periodisation. This means the volume and intensity and type are grouped into cycles. It is difficult in Rugby League to peak for, as unlike most sports where there is a comparatively small number of maximal performances per year, Rugby League has a peak, ie. the game every week. To further complicate this process of periodisation, the game has many physical aspects - strength - power - skill - agility - speed and endurance to be integrated in the overall plan. Furthermore a high degree of anaerobic endurance, the ability to make repeated short sprints with minimal recovery and a good aerobic capacity, the ability to move up and down the field of play at a steady pace with minimum fatigue are prerequisites for successful football. However what adds even more to the complexity of the situation is that large quantities of anaerobic/aerobic training are counter productive to maximal strength and power development.

Periodisation for Rugby League

Periodisation can be broken down into 3 periods or cycles over a calendar year - off season - pre season - competition season. The off-season usually commences in September and continues until January at elite levels and possibly a little longer at lesser levels. Pre-season ranges from January/February to March/April and then it is competition right through until August/September.

Pre-season training usually involves intensive aerobic/anaerobic activities at least 3-4 times per week, together with some trial games towards the end of this period. Training usually consists of endurance runs, 400 m interval running, short and long sprints, activity drills, circuit training emphasising both strength and fitness, together with a certain amount of skills practice.

Competition phase or cycle. Once the competitive phase commences there is a series of weekly peaks where players have to perform to expectations or face the likelihood of relegation. This weekly peaking usually takes the form of a pyramid (see over) with each training session virtually a micro-cycle. In addition to the pyramid of weekly team training activities at elite levels, the players are expected to engage in a certain amount of individual training (maintenance strength training).

Strength - Power Training for Rugby League

One inescapable conclusion about strength training for Rugby League is that due to the complex activities involved in preparation for and playing Rugby League, the period that is most conducive to maximising strength and power is the off-season. This limited time ranges from 12-15 weeks without the workload of large volumes of aerobic-anaerobic training. That is not to say that in the pre-season it is impossible to improve strength and power, however, as a general rule progress will be minimal, particularly with less genetically endowed players.

It is important that during the pre-season and particularly the competition season strength training remains a continuous part of the overall yearly plan. However, because of the volume of work required in other parts during these cycles, the overall volume of strength training must be diminished. Three times per week in pre-season would diminish off to two sessions in competition, and this will also be determined by the player's external work commitments - professional players. Most players and coaches include some strength training in the off and pre-season periods (often misguided) however, apathy seems to prevail in regard to maintenance strength training during competition. What is overlooked is that strength training is similar to fitness training. It should be specific and ongoing. In other words cessation brings about rapid diminishment. If a player abandons strength training in the competition period, his strength level will begin to deteriorate after about 10 days and by 4 weeks to 6 weeks a major portion of the off season gains will be lost.

In fact towards the end of the competition (the crucial part) this loss of strength could become critical in winning or losing. A player can maintain reasonable strength levels with as little as two 45 minute sessions per week.

Programing and the Individual Player

Various genetic factors play a substantial part in effort put out for return. Some individuals are more fortunate than others in strength and power. Physical requisites also vary greatly with players. It is important that a player assesses his needs, his weaknesses and adjusts his overall program. There are broadly 3 categories:-

1. Those players who wish to increase strength and power without increased lean muscle mass of any significance.
2. Those who wish to increase strength and power but also increase lean muscle mass.
3. The players who because of their body type, have a tendency to increase body fat in the off-season, particularly if their nutritional habits are a bit wayward. For this group, while strength and power is important, a considerable time should be spent on aerobic/anaerobic activities in the off-season.

Structure of a Program

The Set System A repetition (R) means the execution of a movement once. It is designated as 1R - 1RM means the maximum amount that can be used in a particular exercise for one repetition. A collection of repetitions is called a set. It is often written as 1 x 10 ie. 1 set - 10 reps or 4 x 10 - 4 sets of 10 reps. In most instances there is a rest interval between sets from 1 - 3 minutes. The exception to this is circuit training where it is of a continuous nature. The three systems of sets and reps used for Rugby League training are - the plateau - step and pyramid system.

The Plateau System This simply means a sequence of sets are performed up to a specific intensity in an escalating fashion, then continued at the same intensity eg. 30 kg x 5 R - 40kg x 5 R - 50 kg x 5 R x 5 R - total number of sets is 5. Another example using 7 sets and 3 repetitions would be 30 kg x 3 R- 40 kg x 3 R - 50 kg x 3 R - 55 kg x 3 R x 3 R x 3 R x 3 R.

The Step System is similar to the plateau system except that there is a continual escalation of resistance until a maximum is reached eg. 30 kg x 5 R - 40 kg x 5 R - 50 kg x 5 R - 60 kg x 5 R - 65 kg x 5 R.

The Pyramid System is an escalating system of reps and sets. However at the lower end of the scale of resistance the repetitions are of greater magnitude (as against the same reps right across the board in previous systems). As the resistance increases the reps decrease, eg. 30 kg x 10 R - 40 kg x 7 R - 45 kg x 5 R - 50 kg x 3 R - 55 kg x 1-2 R.

A more advanced method of this system is to include 1 or 2 "drop back sets" e.g. after the set on 55 kg for 1-2 R has been done the weight is reduced to 45 kg for a R for 2 sets before finally reducing to 35 kg for a further 7 R. This would increase the fatigue/volume factor with the addition of extra sets. Variations of the pyramid system are generally favoured where both increase in strength and muscle size are to be developed in parallel.

Conclusions

- Strength and power are best developed with lesser repetitions and using greater resistance. Speed is also a factor in power. Speed of execution is important.
- Hypertrophy of fast twitch fibres is best achieved in the 5-8 R range. This also has a positive effect on strength.
- Hypertrophy of slow twitch muscles usually takes place in higher numbers of reps with diminishing effects on strength.

For Strength and Power Development

This is best developed in the range of reps as little as 1 - 2 up to 5 - 6. There would be minimal hypertrophy of muscle unless multiple sets of 5 - 6 reps were performed. In which case some muscle gain could be expected if coupled with appropriate nutrition. The likelihood of hypertrophy under these conditions would be greater in mesomorphic body types.

Examples Using Various Systems

Step System	40 kg x 3 - 50 kg x 3 - 55 kg x 3 - 60 kg x 3 - 62.5 kg x 3
Plateau System	40 kg x 3 - 50 kg x 3 - 55 kg x 3 x 3 x 3 x 3 x 3 OR 40 kg x 5 - 45 kg x 5 - 50 kg x 5 x 5 x 5 x 5
Pyramid System	40 kg x 6 - 45 kg x 5 - 50 kg x 3 - 57 kg x 2 - 62.5 kg x 1 - 55 kg x 2 - 50 kg x 4

Resistance would range from 55-60% of 1RM with initial sets up to as much as 90% 1RM depending upon the reps.

It should be remembered that when performing the exercises the accent should be on speed of movement without sacrificing technique. The eccentric part of the exercise should be carried out in a slow purposeful manner.

Combination - Hypertrophy - Strength - Power

Taking into consideration that muscle hypertrophy in power sports such as Rugby League should be aimed at fast twitch muscle fibres. The repetition range would be from 8 - 10 with less resistance, descending to 2 - 3 for heavier sets. eg.

Pyramid System - 35 kg x 10 - 40 kg x 8 - 45 kg x 6 - 50 kg x 3 x 3 - 40 kg x 7.

Combination Step - Pyramid System - 35 kg x 10 - 40 kg x 8 x 8 - 45 kg x 6 x 6 x 6.

With the above system power, exercises such as power cleans and snatches have little effect on muscle hypertrophy and so maximum reps for these movements would be 5. The exception would be in circuit training where higher reps could be used to induce both muscular and cardio/respiratory failure.

Progressively Overloading

The way the body (muscular system) adapts to a particular stress and elicits a change in strength and composition is generally referred to as the progressive overload system. This means that for any improvement to be gained the training stress (volume-intensity) must be of a continuously increasing magnitude, ie. when the body adapts to a particular workload the volume and/or intensity must be increased.

Train to Failure? This means, should we train to failure or "train heavy every session"? There is no doubt that training to maximum or failure at each workout will produce results over a short period of time - **however** - even in the most gifted/dedicated the ultimate reaction to this type of training is physiological and psychological fatigue with a consequential plateauing, and in some cases retardation.

Over an extended period of time the answer is to vary the training intensity and volume of work using various forms of cycling.

Cycling of Intensity Varying of cycles can be simple, eg. heavy, medium and light workout. Even training heavy to fatigue once a week can be fatiguing. A simple system is to alternate heavy and light weeks - an excellent method for beginners.

What is considered a more efficient method for experienced exercisers is to group together a series of weeks of varying levels of volume and intensity of workload ie. light, medium and heavy weeks in a wave like escalating fashion.

A 10 week program would be ideal for the player training for strength/power with minimum concern for muscle hypertrophy. Weeks 1 - 5 would involve sets of 5 reps followed by weeks 6 - 10 using sets of 3 reps. On the lower intensity weeks 65 -80%, the plateau system would be appropriate. With the higher intensity weeks 85 - 95%, the step system would be appropriate.

Weeks 1 - 10 using the Power Clean

1RM = 100 KG

Week 1	50 kg x 5 - 60 kg x 5 - 70 kg x 5 x 5 x 5 x 5
Week 2	50 kg x 5 - 60 kg x 5 - 70 kg x 5 - 75 kg x 5 x 5 x 5
Week 3	50 kg x 5 - 60 kg x 5 - 70 kg x 5 - 80 kg x 5 x 5 x 5
Week 4	50 kg x 5 - 60 kg x 5 - 65 kg x 5 x 5 x 5 x 5
Week 5	50 kg x 5 - 60 kg x 5 - 70 kg x 5 - 80 kg x 5 - 85 kg x 5
Week 6	50 kg x 3 - 60 kg x 3 - 70 kg x 3 - 75 kg x 3 x 3 x 3 x 3
Week 7	50 kg x 3 - 60 kg x 3 - 70 kg x 3 - 80 kg x 3 - 85 kg x 3 x 3 x 3
Week 8	50 kg x 3 - 60 kg x 3 - 70 kg x 3 - 80 kg x 3 - 85 kg x 3 - 90 kg x 3 x 3
Week 9	50 kg x 3 - 60 kg x 3 - 70 kg x 3 x 3 x 3 x 3 x 3
Week 10	60 kg x 3 - 70 kg x 3 - 80 kg x 3 - 90 kg x 3 - 95 kg x 3 x 3 - 85 kg x 3

This 10 week program could be followed by a week phase using double and single reps with intensities of 85-97-80-105% with a target in week 4 of new personal best - 105%+.

The "block system" on high intensity weeks 85% +. That intensity is only used twice a week, training 3 times per week.

The block system should only be used in conjunction with multiple joint/multi muscle group movements such as squat - power clean and power snatch - together with major pressing exercises such as bench pressing and press/push overhead.

For other movements variations of heavy, medium and light are more suitable.

Prior to commencing the block system, the exerciser should ascertain his 1RM. This is necessary to quantify percentages.

Arranging a Program

The first and foremost on all programs should be total body movements (core exercises). Relative to Rugby League, they are power clean, power snatches and back squats.

Following total body movements the muscle groups of the upper and lower body are exercised in the following order - shoulders, upper back, chest, arms, neck, stomach, lower back, calves. Shoulders, chest and upper back are always exercised before the arms.

When performing compound exercises for these large muscle groups, the arms are a connecting link and if previously fatigued will be unable to handle sufficient resistance to adequately stress the muscle group for which the exercises were primarily designed, eg. if biceps curls are performed before chinning the bar, the fact that the arm flexors are pre-exhausted will limit the number of chins that can be performed. Conversely, chinning prior to arm curls does not greatly effect the amount of resistance for arm flexor movements. Broadly speaking, in upper body compound exercises, the arm flexors are the connecting link for pulling movements, the triceps for pushing movements. Another factor when planning, is that the arms are adequately exercised by all compound upper body exercises (as well as power cleans/snatches), therefore direct arm exercises could be omitted. In the same vein, squats and power cleans involve many smaller muscle groups such as mid-torso-calves etc.

Training Frequency

As a broad rule for Rugby League, where in most instances some other form of training is carried out in conjunction with strength training, it should be carried out in the off-season 3 - 4 times per week on alternate days. During the pre-season and competition, training frequency will vary.

Some sample Programs

Schedule A

- power clean
- squat
- press behind neck
- bar bell or dumbbell rowing
- bench press
- barbell curl
- sit-ups
- partner neck resist
- leg curls
- calf raises
- back raises

Schedule B

- power clean
- squat
- overhead dumbbell press
- upright rowing
- lat machine pull downs
- incline bench press
- dumbbell curls
- triceps press- lat machine
- neck - head strap
- good mornings
- reverse trunk twist

Schedules A and B cover a wide cross section of exercise. A disadvantage of this is that in excess of 3 sets with perhaps 4 in core exercises would be inappropriate due to time and energy constraints. Both schedules would be suitable for beginners (a preparatory phase), performing 2 - 3 sets per exercise.

Schedule A could be used for 6 weeks followed by Schedule B for 6 weeks. Schedule A would involve 8 - 10 reps for all exercises using training poundage intensities based on heavy, medium, light weeks. The exception would be power cleans, where 5 reps would be more appropriate. For the beginner, Schedule A would consist of 2 sets of 10 in the first 3 weeks using an intensity load of approx. 3 reps short of failure in each set.

Schedule B would consist of 3 sets of 8 reps for all exercises except squat and power clean which would be 4 sets of 5 reps. Intensity in this schedule would be based on heavy and light weeks. Some exercises may need to be changed. This will depend upon equipment available.

Schedule C

- power clean
- squat
- dumbbell press
- chins or dumbbell rowing
- bench press
- neck with strap
- twisting sit ups

Schedule D

- leg press with calf ext.
- power clean
- dumbbell press
- barbell rowing
- bar dips
- barbell curl
- sit ups - crunches
- back raises

Schedule E

- bench step ups with dumbbells
- power snatch
- press behind neck
- upright rowing
- lat machine pull downs
- reverse trunk twists
- bar dips

Options

Week 1	day 1 c	day 2 d	day 3 c
Week 2	day 1 d	day 2 c	day 3 d

Option 2 Substitute E for D in above.

The common factor, apart from balance of Schedules C, D and E is their shortness compared to A and B. The advantage - it allows the exerciser to perform 5 - 7 sets on each movement and still keep within the constraints of time and energy.

Schedules C, D and E are for players who have completed several off season periods on A and B OR who have had previous weight training experience. Schedule C is the base workout. It can be adopted to either strength and power or strength, power and muscle hypertrophy.

This would depend upon sets, reps and intensity while C is effective on its own. D and E are more support programs.

A third and slightly more advanced option is to train every alternate day. In other words, 7 workouts per fortnight rather than 6, 3 times a week.

A good combination off season training program for an experienced player in weight training would be a 2 - 3 week preparatory phase using Schedule A or B followed by 6 weeks on C and a further 6 weeks on either Option 1 or 2.

Further Advanced Schedules

Up to this stage programs have been based on alternate day training 3 times a week or 7 times a fortnight. However, to increase training load because overall progress has ceased or an increase in current rate of improvement is desired, a more advanced Schedule may be attempted. This type of training should not be necessary in the first 2 - 3 years where alternate day training would suffice. Indeed many players may never need to work out (strength training) more frequently than 3 times a week.

On the basis of 4 sessions a week, training days can be Monday, Tuesday,, Thursday, Saturday or Monday, Wednesday, Friday, Saturday or Monday, Tuesday, Thursday and Friday.

Four days a week Training Schedule - F

Substitution of exercises may be necessary depending on equipment available.

Day 1

- power clean
- back squat
- dumbbell press
- upright rowing
- bar dips
- dumbbell curl
- neck

Day 2

- power snatch
- leg press
- bench press
- lat machine
- leg curls
- rev. trunk twist
- back raises

Day 3

- power clean
- back squat
- dumbbell press

Day 4

- leg press
- lat. machine
- bench press

- forward rowing
- bar dips
- dumbbell curl
- neck
- leg curls
- upright rowing
- back raises

An ideal off-season program involving Schedule F would be a 3 week preparatory phase on either Schedule A or B followed by 6 weeks on Schedule C and finally 6 weeks on Schedule F. On this combined program (in order to provide variety) the press behind the neck could be substituted for dumbbell press in Schedule F. Load intensity, sets (type), reps etc. would adhere to principles discussed earlier.

Maintenance - In season - Training

If time permits in season Schedule C once a week and alternation of Schedule D and E for the other weekly session would be effective. 4 - 5 sets would suffice while loading could be based on alternate heavy and light weeks. Where time is really a premium a short schedule of power clean, squat and dumbbell overhead press for 5 sets of 5 - 8 reps could be completed in about 40 minutes, or even less if performed as a weight circuit.

In the competition season, power exercises effecting the legs such as squats, power cleans, snatches, leg presses etc. should be confined to 3 - 5 repetitions. This will help in preventing excessive fatigue in the legs due to the demands of playing and training.