CISM INTERNATIONAL SYMPOSIUM
PRETORIA - SOUTH AFRICA
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OFF-SEASON STRENGTH CONDITIONING

FOR POWER ATHLETES

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INTRODUCTION

Before we discuss training for power sports, we must consider exactly what is a power sport and power training.

The understanding of power capacity and how it can be created is one of the keys to optimizing athletic performance. Power should not be confused wit strength. Power is the capacity to do a given amount of work as rapidly as possibly. Power includes the elements of strength and speed. It is dynamic strength coupled with movement speed. Speed is the ability to apply force rapidly, for example when doing a clean and jerk, jumping, throwing and sprinting.

One of the major advantages of being physically powerful is the ability to accelerate. An athlete who is powerful can get up to full speed faster than an athlete who is just strong. To be able to accelerate is not the same as simply being fast. Acceleration refers to the ability to change velocity quickly. Velocity is speed in a given direction. Therefore there is a big difference between lifting very heavy weights slowly and lifting them quickly.

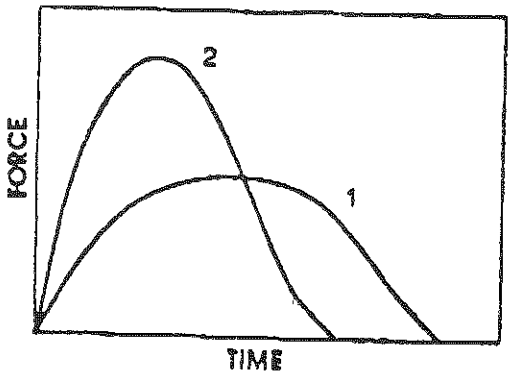

Figure 1 1. Beginner - little power, much time
2. Advanced - great power, shorter time

Power and explosiveness can only be developed by means of athletic type strength training.
Athletic type strength is the ability to apply optimal muscular force through a full range of multiple joint movement with speed for a set distance or time as required to execute a specific athletic movement. It offers the greatest training transfer value biomechanically, physiologically and psychologically to a sport, especially if it is a power dominated sport.

The intrinsic value of athletic type strength training is its capacity to duplicate the large muscular and explosive force required when sprinting, jumping, throwing, striking or tackling.

One of the purposes of athletic type training, if not the main one, is to train and condition the sportsman to generate maximum muscular force at higher and higher movement speed. In competitive sport, when all other factors are equal, power is the deciding factor between wining an losing.

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The working relationship between strength and speed is illustrated by the force-velocity curve, also known as the power-velocity curve.

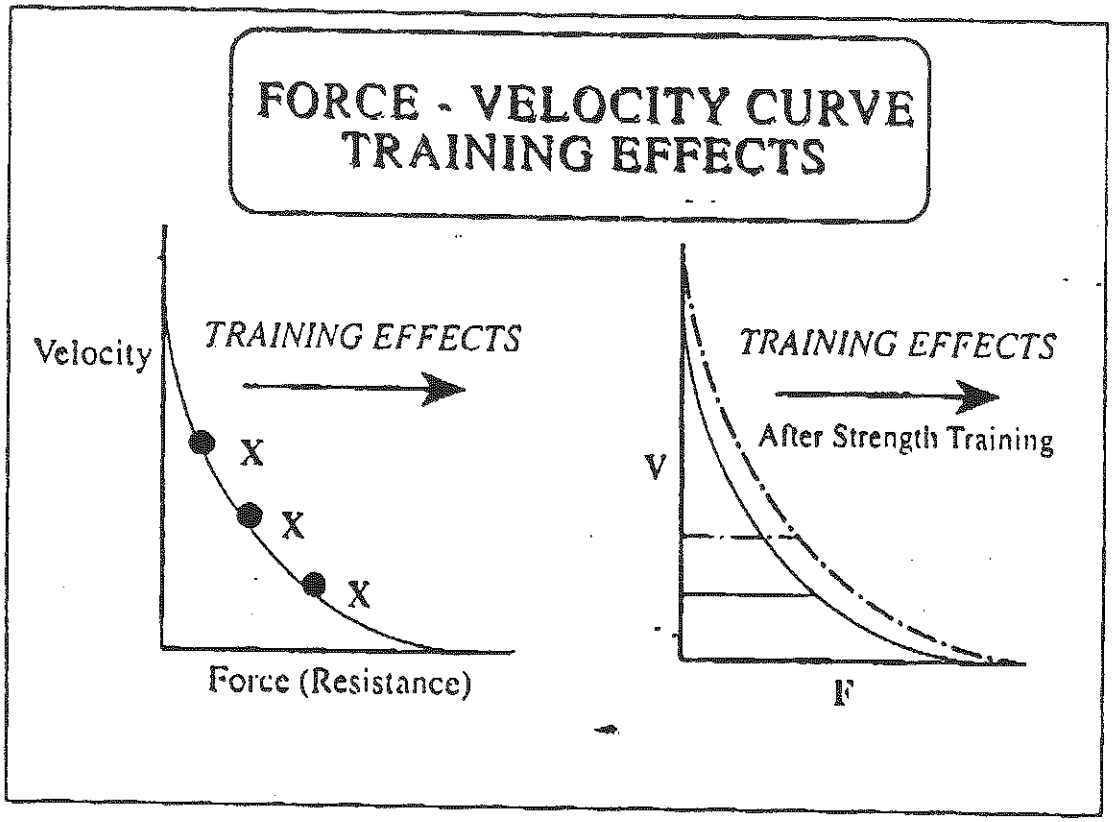

Figure 2 The Force-Velocity Curve Training Effects

To become a power athlete, your training must focus on shifting the middle portion of the curve to the right by either increasing strength or speed or both.

Athletic type strength training develops neurophysiological and neuropsychological systems to a degree that is impossible to achieve through general body building or machine training.

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ATHLETIC WEIGHT TRAINING

The Greatest Transfer of Training for Athletics

Results from Lifts Which Allow

POWER

To Manifest Itself to the Greatest Degree

OLYMPIC LIFTING

ATHLETIC-TYPE LIFTS WHICH IN

THEIR EXECUTION REQUIRE:

1. Use of all major muscle groups
2. Full range multiple joint movement in multiple directions
3. A strong ballistic impulse
   (maximum recruitment of fast twitch fibres)
4. Acceleration & Speed
5. Technique-Balance-Timing
6. Maximum Neuromuscular Conditioning
7. The athlete to think in terms of

STRENGTH * SPEED * TECHNIQUE
& HIGH VELOCITY POWER

Athletic type lifts (power snatch, power cleans, high pulls and squats) are free standing muscle groups lifts. These exercises are also called Core Exercises and develop the "Power Zone" of the body.

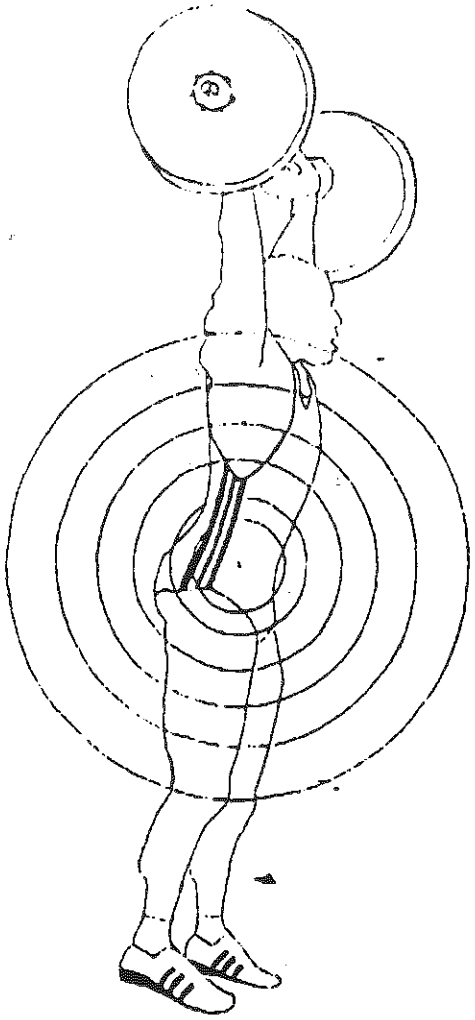

Figure 3 The body's "Power Zone" concentric circles radiate out from the body's largest and strongest muscle groups to the smaller weaker groups.

These exercises are full range multiple joint ballistic movements which generate strong hip and torso rotational forces in multiple directions.

In the execution of these movements, you are forced to think in terms of strength, speed and technique.

The primary goal of athletic type strength training is to maximize the development of true genetic potential for strength , speed and power. These three elements must be worked on simultaneously and progressively while maintaining a balance with technical development.

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THE OFF SEASON PROGRAMME

Many factors may affect athletic performance, luck is not one of them. Any world class athlete can tell that luck is 5% inspiration and 95% perspiration. The off-season phase in an athlete's year programme is a very important phase. During the off-season it is important to establish a good physical base (foundation). Although the technical demands of each sport are not the same, the physical demands are quite similar in terms of explosive strength, speed and power.

Periodization serves the framework around which a strength and conditioning programme is constructed. Periodization provides for maximum control of the variables of strength training, the intensity, volume, frequency, variation and rest.

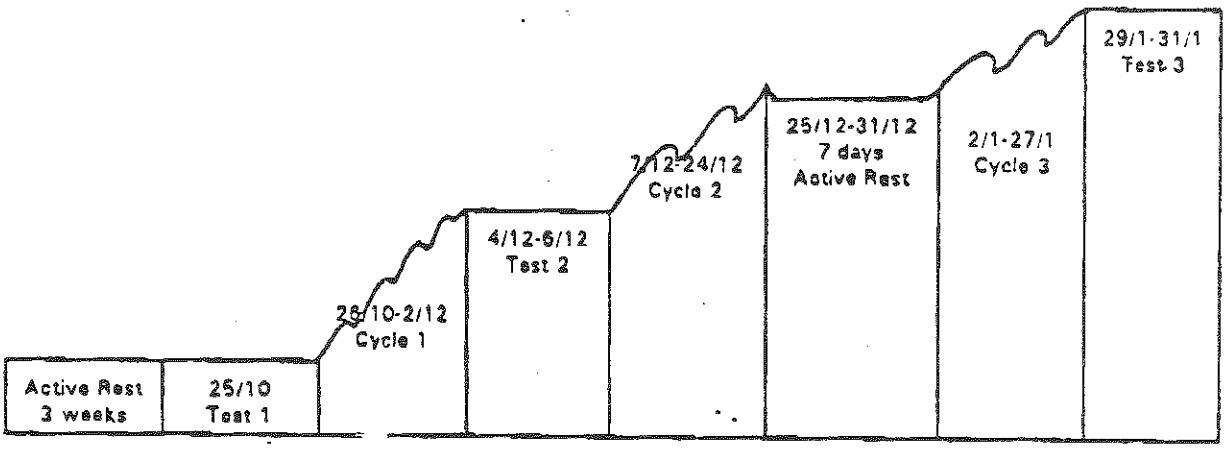

Figure 4 Example of periodization during the off-season of a provincial rugby training programme.

The off-season consists of three phases starting with the Active Rest or Transition Phase.

Active rest is very important following a peaking or competitive period or season. During the period, it is important not to lay off completely of physical activities. The athlete should participate in another sport or recreational activities at a low to moderate intensity. The purpose of active rest is to help the athlete regenerate physically and emotionally and to rebuilt his/her motivational level before starting with the off-season programme.

The off-season training period consist of cycle 1 (preparation/conditioning phase) and cycle 2 (basic strength and power phase). The purpose of cycle 1 is to prepare the body to engage in future physically intensive athletic type strength and power training. During the second cycle of the off-season programme, gains in broad base strength proved the required foundation for further high intensity training. Strength,especially in the large muscle of the legs, hips, abdominal and lower back, increases sharply. This is the so called power zone that is the most important aspect for the power athlete.

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OFF SEASON PROGRAMME
CYCLE I (Basic Conditioning)

Duration : 6 weeks

Low intensity high volume work

Intensity : 70 - 80% of 1 ORM for 10 reps, 4 sets

Major aims

- Synchronize the mind and body back into rhythm of a regular workout schedule.
- Develop broad base physical conditioning strength, endurance, flexibility and agility.
- Reduce body fat.
- Prepare for future heavy training cycles.
- Work to improve lifting mechanics in the power snatch and power clean.

Weight training emphasis

- Athletic-type lifting.
- General bodybuilding.
- Optional: Interval weight training. A 2-week micro cycle between Cycles 1 and 2.

General conditioning activities

Cycling, running , swimming, in-line skating, cross-country, soccer, squash.

Technical work

Sports specific skill training to develop technically superior performance.

Total training

15 -18 hours week. Does not include sports specific technical work.

Monday (heavy day)	Tuesday (light day)	Wed & Sat (endurance day)	Thursday (light day)	Friday (heavy day)
Warm-up * Stationary bike or Stair master * Stretching *Core lifts* * Power clean * Squat (hi-bar) *Auxiliary lifts* * Good mornings (bent legs) * Abdominal crunch *Aerobic cool down* * Stationary bike or Stair master, 20 min. *Technical work* Sport specific	*Warm-up* * Same as Monday *Core lifts* * Incline press *Auxiliary lifts* * High pulls (snatch grip) * Hanging leg lifts * Parallel bar dips * Front dumb bell raise *Aerobic cool down* * Same as Monday	60-90 of one or two of the following activities: * Cycling * Hill running * Soccer * In-line skating * Cross-country skiing * Basketball * Raquetball, etc. *Technical work* * Sports specific	*Warm-up* * Same as Monday *Core lifts* * Power clean * Front squat * Bench press *Auxiliary lifts* * Good mornings (bent legs) * General body-building , 30 min. *Aerobic Cool down* * Same as Monday	*Warm-up* * Same as Monday *Core lifts* * Power snatch * Push press from rack *Auxiliary lifts* * High pulls (clean grip) * Front dumbb-bell raise *Aerobic cool down* * Same as Monday

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OFF SEASON PROGRAMME

CYCLE 2 (Basic Strength)

Duration : 4 weeks. take one week rest before starting with Cycle 3.

High intensity, moderate volume.

Intensity : 70-80% of 5RM for 5 reps, 3-4 sets following the progressive overload system.

Major aims

Broaden base strength, especially in the power zone.

Weight training emphasis

* Same as Cycle 1.
* Learn the Olympic full squat snatch of Functional Isometrics between Cycles 2 and 3. (Functionals can be of special importance to athletes with several years of lifting experience).

General conditioning activities

* Same as for Cycle 1.

* Shift emphasis from endurance conditioning to more sports specific explosive-type, for example, speed/quickness drills and sprint cycling or running.

Technical work

Same as for Cycle 1

Total training time

12 hours per week. Does not include sports specific technical work.

Monday (heavy day)	Tuesday (light day)	Wednesday	Thursday (light day)	Friday (heavy day)
Warm-up * Stationary bike or Stairmaster * Stretching *Core lifts* * Power clean (floor and hang) * Squat (hi-bar) *Auxiliary lifts* * Block high pulls (snatch grip) * Good morn-ings (bent legs) *Aerobic cool down* * 10-5 min Stationary bike or Stairmaster *Technical work* Sports specific	*Warm-up* * Same as Mon day *Core lifts* * Push press * Incline press *Auxiliary lifts* * Learn and practice full squat snatch *Aerobic cool down* * Same as Monday	*Warm up* * 10 min jogging and stretching * Speed/quickness drills * Technical drills, sports specific *Technical work* * Sports specific **Saturday** * Running-Interval work & hurdling *Technical work* * Sports specific	*Warm up* * Same as Monday *Core lifts* * Power clean * Incline dumbbell press *Auxiliary lifts* * Good mornings (bent legs) * Lean & practice full squat clean *Aerobic cool* * Same as Monday	*Warm-up* * Same as Monday *Core lifts* * Power snatch (floor & hang) * Bench press *Auxiliary lifts* * Block high pulls (clean grip) *Aerobic cool down* * Same as Monday

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OFF SEASON PROGRAMME

CYCLE 3 - The cycle of pain (Strength and Power)

Duration : 4 weeks. Take one week rest before starting with Cycle 4.

Very high intensity, low volume

Intensity : 80-90% of 3RM for 3 reps, 2-3 sets following the progressive overload system.

Major aims

* Facilitate maximum neuromuscular conditioning and full-range body power.
* Optimize the relationship between strength speed-power for peak throwing performance.

Weight training emphasis

Athletic-type lifts with greater utilization of full squat snatch and squat clean.

General conditioning activities

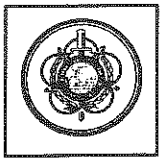
Sports specific acceleration, speed, and plyometric drills (i.e. sprinting, bounding, jumping).

Technical work

Strive to maintain a balance between increasing strength and sports specific skill technique.

Total training time

12 plus hours per week. Does not include sports specific technical work.



Monday (heavy day)	Tuesday (light day)	Wed & Sat	Thursday (light day)	Friday (heavy day)
Warm-up *Stationary bike or Stairmaster 5 min *Stretching *Core lifts* *Power clean and push press or *Squat clean *Squat (low-bar) *Auxiliary lifts* *High pulls *Good mornings *Aerobic cool down* *10 min Stationary bike or Stairmaster *Technical work* Light	*Warm up* Same as Monday *Core lifts* *Incline press or *Incline dumbbell press *Auxiliary lifts* *Power snatch plus squat *Aerobic cool down* *Same as Monday *Technical work* *Sports specific	Technical drills (Sports specific) Speed/quickness acceleration. Plyometric: *Hurdle jumps *Horizontal jumps *Hops *Rebounds & depth jumps	*Warm up* *Same as Mon day *Core lifts* *Hang power clean *Front squat plus push press *Auxiliary lifts* *Power clean *Technical work squat clean *Good mornings *Aerobic cool down* *Same as Mon day	*Warm-up* *Same as Monday *Core lifts* *Power squat snatch (floor & hang) *Auxiliary lifts* *High pulls from blocks *Aerobic cool down* *Same as Monday *Technical work* *Sports specific

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