Sport Specific Training

The University of California 9-Week Pre-season Rugby Training
(Michael Barnes, C.S.C.S. Athletics, Strength and Conditioning University of California at Berkley)

The University of California at Berkley has won the National Collegiate Rugby Championship 10 of the last 13 years. Much of that success has been due to the physical conditioning of the team. The physical demands of rugby vary, depending on the control of play, the athlete's position, environmental conditions and other unforeseen variables. Therefore, taking a methodical and scientific approach to conditioning is vital. At the University of California at Berkley the training program is a joint effort between the rugby team coaching staff and the strength and conditioning staff that has resulted in a comprehensive model for year-round training. The nine-week pre-season training program that was implemented before the in-season spring semester is described below.

The training program is based on the concept of perdiodization, which manipulates frequency, duration, intensity, volume, and specificity (3). Definitions of terms are as follows: Duration -length of an individual training session (1); Intensity-relates to the amount of weight lifted as compared to a single repetition max (i.e. 85 percent, 90 percent), the rest interval between repetitions in the conditioning program (i.e. 30 second rest between sprints) and the percentage of maximal sprinting speed; Volume-number of repetitions performed during a specific time period (1); Specificity-*biomechanical*, performing exercises involving movements similar to those used in the sport (speed of movement, joint angle, forces incurred); *bioenergetic*, training the same energy systems (aerobic, anaerobic) specific to the objective.

Periodization can be used both to peak and to avoid over training. The nine-week training pre-season training program can be divided into three sections: weight training, plyometrics, and conditioning. The objective was to design a program that combines these three components and improve the total athleticism of the team.

Weight Training

The benefits of weight training have been documented repeatedly. Some of these benefits included increased joint stability/injury prevention, enhanced speed, coordination, power and self-confidence. The primary emphasis of weight training for the upper extremities (shoulders, chest, back, and arms) is protection from injury by increasing strength and size. The emphasis on the torso increases strength and spine stability. For the legs and hips, the goal is to develop explosive strength for the hip flexors and extensors, and maintain or acquire balance between the quadriceps and hamstring muscle groups.

The weight training routine was adjusted to elicit five to 10 percent increases in strength, although greater gains can be achieved. The core exercises are executed on a percentage scale to avoid over training and prevent staleness. Athletes did not use percentages for the clean and snatch exercises because most of them were learning them for the first time. The percentages depicted on the weight training routine are based on testing done prior to the nine weeks. It should be also noted that the sets and reps are only work sets. A logical warm-up progression should be completed before attempting any heavy work sets. The complete weight training routine is detailed in Tables 1 and 2, which is broken down for the two rugby positions, forwards and backs.

Plyometrics

Plyometrics are defined as exercises that are characterized by powerful muscular contractions in response to rapid, dynamic loading or stretching of the involved muscles (3). Examples of plyometric movements are jumping for a rebound in basketball, a tumbling pose in gymnastics and a spring board dive. Plyometrics can be done for the upper body as well as the torso. The degree of sprinting at maximal speeds can be defined as a plyometric exercise. Rugby, which is a game of speed, power and explosion. Descriptions of each of the plyometric exercises are listed in Table 3.

Conditioning

The approach to the conditioning segment of the training is threefold: 1) sprint training, 2) run specific training for rugby and 3) long, slow distance running. The condition segments of the routine are to be done

three days per week, preferably day one on Monday: day two on Thursday, and day three on either Saturday or Sunday. Justification for each of the conditioning days are as follows: *Day1*- sprint training. Specifically conditions the anaerobic pathway. Also included on this day is stadium running, which is used as a speed enhancement exercise because of the exaggerated hip flexion. The stadium had 50 steps, each 18 inches high. A rugby match may last for 90 minutes and include many short bursts of high intensity. There fore, conditioning for these intervals is essential for developing sprint-speed endurance (Table 4). *Day 2* – run specific training for rugby. This day is used to stimulate rugby play. As previously stated, there is continuous running with short bursts of high intensity sprinting in rugby. Therefore, this day of continuous running with sprint intervals is very specific to a game situation. At the University of California at Berkley athletes were conditioned on the football field for convince (Figure 1). The sprints are to be done at 95 to 100 percent maximal speed, and jogging at 50-60 percent maximal speed. *Day 3* – long distance running. The conditioning focuses at building aerobic endurance. Athletes are encouraged to make the run as enjoyable as possible using trails and cross-country runs through hills and wooded terrain. This ideal for variation in a training routine. Running on uneven surfaces (trails, dirt roads, and grass) is excellent for strengthening the ankles and surrounding muscles.

Conclusion

The University of California rugby team will continue to be in peak physical condition at the beginning of each competitive season. It is vital to keep open the lines of communication between the coach, the strength and conditioning staff, the team medical staff, and the athletes. Keep in mind that there are different circumstances for each setting and it is up to the coaches to utilize the available sources.

References

1. Fleck, S. and W. Kraemer. 1987. Designing Resistance Training Programs, Human Kinetics Book. Champaign, IL.
2. Radcliffe, J. and R. Farentinos. 1985. Plyomterics: Explosive Power Training. 2nd Ed. Human Kinetics Book. Champaign, IL.
3. Stone, M. and H. O'Bryant. 1987. Weight Training: A scientific Approach. 2nd Ed. Bellwethen Press. Minneapolis, MN.

Figure 1. Run-specific training for rugby, weeks 1 to 4

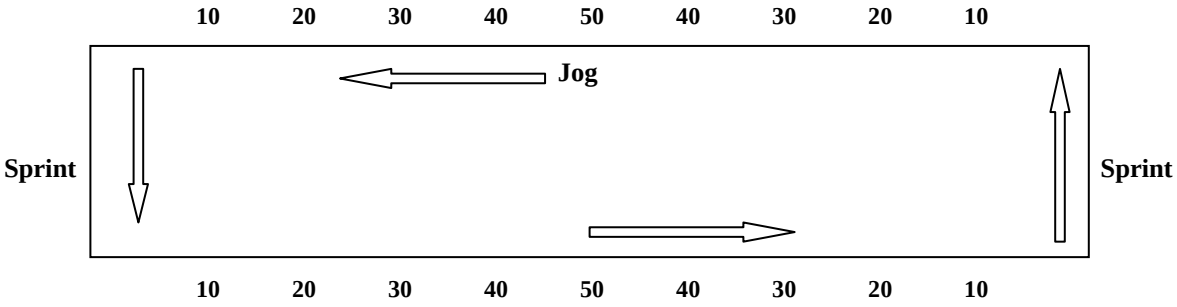

Figure 2. Run-specific training for rugby, weeks 5 to 9

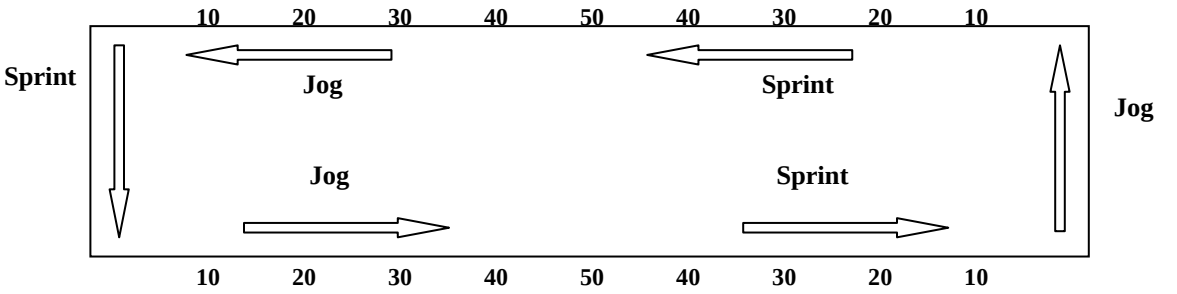

Table 1. Nine-week weight training for rugby

Forwards

Monday	**Week 1**	**Week 2**	**Week 3**	**Week 4**	**Week 5**	**Week 6**	**Week 7**	**Week 8**	**Week 9**
Power cleans	4x5	4x5	4x5	4x3	4x3	4x3	*3max attempts then 3x3	*2max attempts then 2x3	*2max attempts then 3x3
Low pulls	3x8	3x8	3x8	3x6	3x6	3x6	3x3	3x3	3x3
Back Squat	4x8 @80%	4x8 @ 82.5%	4x8 @85-7%	**5x5 @87%	**5x5 @92%	**5x5 @95-7%	*1RM, then 2x5 @80%	*2max attempts then 3x3 @90%	*2max attempts then 3x3 @90%
Leg press	3x10	3x10	3x10	3x6	3x6	3x6	4x6	4x6	4x6
Hamstring curl	4x10	4x10	4x10	4x8	4x8	4x8	4x6	4x6	4x6
Hip Flexion (multi-hip machine)	2x10	2x10	2x10	2x8	2x8	2x8	2x8	2x8	2x8
Abdominal crunches	100reps	100reps	100reps	100reps	100reps	100reps	100reps	100reps	100reps

NOTE - ** start at 80lbs below target weight and make 20lb increases
*based on a pre-test max (1RM = 1 Repetition Max)

Tuesday	**Week 1**	**Week 2**	**Week 3**	**Week 4**	**Week 5**	**Week 6**	**Week 7**	**Week 8**	**Week 9**
Bench Press	4x8 @80%	4x8 @82.5%	4x8 @85-7%	**5x5 @87%	**5x5 @87%	**5x5 @87%	*1RM, then 3x5 @90%	*2max then 5x3 @97.5%	*3max then 5x3 @100%
Incline Bench Press	4x8	4x8	4x8	4x5	4x5	4x5	4x3	4x3	4x3
Pull-ups	6x6 in 6mins	7x6 in 7mins	8x6in 8mins	9x6 in 9mins	10x6 in 10mins	10x6 in 10mins	11x6 in 11mins	12x6 in 12mins	Do 80 total
T-bar row	3x8	3x8	3x8	3x6	3x6	3x6	3x5	3x5	3x5
Behind the neck press	4x8	4x8	4x8	4x5	4x5	4x5	4x3	4x3	4x3
Dips	3x10	3x10	3x10	weighted 4x10	weighted 4x10	weighted 4x10	3max	3max	3max
DB side raise	4x8	4x8	4x8	3x8	3x8	3x8	3x6	3x6	3x6

NOTE - ** start at 80lbs below target weight and make 20lb increases
*based on a pre-test max (1RM = 1 Repetition Max)

Thursday	**Week 1**	**Week 2**	**Week 3**	**Week 4**	**Week 5**	**Week 6**	**Week 7**	**Week 8**	**Week 9**
Power cleans	4x5	4x5	4x5	4x3	4x3	4x3	4x3	4x3	4x3
Shrugs	3x8	3x8	3x8	3x6	3x6	3x6	3x5	3x5	3x5
Front Squat	3x6	3x6	3x6	3x5	3x5	3x5	3x3	3x3	3x3
Lunges	3x6	3x6	3x6	3x5	3x5	3x5	3x3	3x3	3x3
Hamstring curl	4x10	4x10	4x10	3x8	3x8	3x8	2x8, 2x6	2x8, 2x6	2x8, 2x6
Hanging leg raise	3x10	3x10	3x10	3x12	3x12	3x12	3x12	3x12	3x12

NOTE - ** start at 80lbs below target weight and make 20lb increases
*based on a pre-test max (1RM = 1 Repetition Max)

Friday	**Week 1**	**Week 2**	**Week 3**	**Week 4**	**Week 5**	**Week 6**	**Week 7**	**Week 8**	**Week 9**
Bench Press	5x8 @70%	5x8 @70%	5x8 @70%	5x5 @80%	5x5 @80%	5x5 @80%	5x3 @85%	5x3 @85%	5x3 @85%
DB Incline	3x8	3x8	3x8	3x6	3x6	3x6	3x5	3x5	3x5

Fly's	3x8	3x8	3x8	3x6	3x6	3x6	3x5	3x5	3x5
Pull-ups	4x8	4x10	5x10	4x8	4x8	4x8	3x10	3x10	3x10
DB rows	3x8	3x8	3x8	3x6	3x6	3x6	3x5	3x5	3x5

NOTE - ** start at 80lbs below target weight and make 20lb increases
*based on a pre-test max (1RM = 1 Repetition Max)

Table 2. Nine-week weight training for rugby

Backs

Monday	**Week 1**	**Week 2**	**Week 3**	**Week 4**	**Week 5**	**Week 6**	**Week 7**	**Week 8**	**Week 9**
Power snatch	3x5	3x5	3x5	3x3	3x3	3x3	3x2	3x2	3x2
Power cleans	3x5	3x5	3x5	3x3	3x3	3x3	3x2	3x2	3x2
Back Squat	3x8 @80%	3x8 @82.5%	3x8 @85-7%	3x5 @87%	3x5 @92%	3x5 @95-7%	*1RM, then 2x3 @ 20%less	*2max attempts then 2x3 @90%	*2max attempts then 2x3 @90%
Hamstring curl	4x10	4x10	4x10	4x8	4x8	4x8	4x8	4x8	4x8
Hip Flexor	2x10	2x10	2x10	Flexion 2x8	Flexion 2x8	Flexion 2x8	2x8	2x8	2x8
Abdominal crunches	100reps	100reps	100reps	100reps	100reps	100reps	100reps	100reps	100reps

NOTE - ** start at 80lbs below target weight and make 20lb increases
*based on a pre-test max (1RM = 1 Repetition Max)

Tuesday	**Week 1**	**Week 2**	**Week 3**	**Week 4**	**Week 5**	**Week 6**	**Week 7**	**Week 8**	**Week 9**
Bench Press	4x8 @80%	4x8 @82.5%	4x8 @85-7%	*4x5 @87%	*4x5 @92%	*4x5 @95-7%	*1RM attempts then 2x3 @90%	*2max attempts then 3x3 @97.5%	*3max attempts then 3x3 @100%
Pull-ups	6x6 in 6mins	7x6 in 7mins	8x6 in 8mins	9x6 in 9mins	10x6 in 10mins	10x6 in 10mins	11x6 in 11mins	12x6 in 12mins	Do 80 total
Incline Bench Press	4x8	4x8	4x8	3x5	3x5	3x5	3x3	3x3	3x3
T-bar row	3x8	3x8	3x8	Hammer /t bar 3x6	Hammer /t bar 3x6	Hammer /t bar 3x6	3x5	3x5	3x5
Behind the neck press	4x8	4x8	4x8	Push press 4x5	Push press 4x5	Push press 4x5	Push press 3x3	Push press 3x3	Push press 3x3
Dips	3x15	3x15	3x15	weighted 4x10	weighted 4x10	weighted 4x10	3max	3max	3max
DB side raises	3x8	3x8	3x8	3x8	3x8	3x8	3x6	4x6	3x6

NOTE - ** start at 80lbs below target weight and make 20lb increases
*based on a pre-test max (1RM = 1 Repetition Max)

Thursday	**Week 1**	**Week 2**	**Week 3**	**Week 4**	**Week 5**	**Week 6**	**Week 7**	**Week 8**	**Week 9**
Power snatch	4x5	4x5	4x5	4x3	4x3	4x3	4x2	4x2	4x2
1-legged press	3x8	3x8	3x8	3x5	3x5	3x5	3x4	3x4	3x4
Hip Flexion (multi-hip machine)	2x8	2x8	2x8	2x8	2x8	2x8	2x8	2x8	2x8
Hanging leg raise	2x12	2x12	2x12	2x12	2x12	2x12	2x12	2x12	2x12

NOTE - ** start at 80lbs below target weight and make 20lb increases
*based on a pre-test max (1RM = 1 Repetition Max)

Friday	Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7	Week 8	Week 9
Bench Press	5x8 @70%	5x8 @70%	5x8 @70%	3x5 @80%	3x5 @80%	3x5 @80%	4x3 @85%	3x5 @85%	3x5 @85%
DB incline	3x8	3x8	3x8	3x6	3x6	3x6	3x6	3x6	3x6
Pull-ups	3x8	3x8	3x8	4x8	4x8	4x8	4x8	4x8	4x8
DB rows	3x8	3x8	3x8	3x6	3x6	3x6	3x6	3x6	3x6
Abdominal crunches	-	-	-	100reps	100reps	100reps	100reps	100reps	100reps

NOTE - ** start at 80lbs below target weight and make 20lb increases
*based on a pre-test max (1RM = 1 Repetition Max)

Table 3. Rugby Plyometric Training

Conditioning Day	Power Hops	Squat Jumps	Bounding	Power Skips
Monday	3x10	3x10	2x10 or 2x12	3x10 or 3x13
Thursday	3x10	3x10	2x10 or 2x12	3x10 or 3x13

**Plyometric training should be done twice a week, before conditioning on Monday and Thursday
**Definitions:

-Power Hops (hands are placed behind the head and explosive double leg hops are done in place)
-Squat jumps (Use a double arm action, jumping approximately one meter horizontally with maximum height)
-Bounding (Using a running action exaggerate height and distance for 20 to 25 meters)
-Power Skip (Start with slow skip, then increase both the height and distance)

Table 4. Rugby Conditioning

Day	Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7	Week 8	Week 9
Monday	4x400 2min. rest 4x200 1min rest 2 stadiums	4x400 2min. rest 4x200 1min rest 2 stadiums	6x400 2 min rest 3x200 1min rest 3 stadiums	6x400 2 min rest 3x200 1min rest 3 stadiums	6x400 2min rest 3x200 45sec rest 4 (1/2 stadiums)	6x400 2min rest 3x200 45sec rest 4 (1/2 stadiums)	3x400 2min rest 4x200 45sec rest 6x110 30sec rest 6 (1/2 stadiums)	3x400 2min rest 4x200 45sec rest 6x110 30sec rest 6 (1/2 stadiums)	2x400 2min rest 4x200 45sec rest 8x110 30 sec rest 6 (1/2 stadiums)
Thursday	25min interval running*	25min interval running*	25min interval running*	25min interval running*	30min interval running*	30min interval running**	40min interval running**	40min interval running**	45min interval running**
Saturday	2-3 mile run	2-3 mile run	3-4 mile run	3-4 mile run	4 mile run	4 mile run	4-5 mile run	4-5 mile run	4-5 mile run

NOTE - *refer to Figure 1
**refer to Figure 2