Wrestling:

Strength and conditioning for wrestling

John Stucky
Gerard A. Palmieri, C.S.C.S.
Strength & Conditioning Coaches
Oklahoma State University

Many factors are involved in the development of champion wrestlers. In addition to skill, ability, and knowledge of the sport, one must be strong and well-conditioned. When two highly talented young men compete for a crown, strength and conditioning are often the variables that determine the difference. At Oklahoma State University, our goal is to help each athlete be stronger and in better shape than any opponent they will face. The accomplishment of such a task will develop more physical and more confident individuals, which will subsequently yield wrestling champions.

Collegiate wrestling is an anaerobic sport which taxes both the ATP-PC and lactic acid energy systems (Fox, 1979; Kraemer, 1984). Today's wrestler must be powerful as he attempts to takedown, throw or turn an opponent, while having the anaerobic endurance to compete for seven minutes. A successful strength program must develop both characteristics in the wrestler.

At Oklahoma State, the wrestler's year round strength program is divided into four phases. Each phase has its own specific goal and weight resistance routine designed to attain that goal. The four phases, off-season, pre-season, lactic acid, tournament, and the conditioning program will be fully discussed individually following a brief analysis of the sport's basic movements.

Basic movement analysis

Kinesiological analysis of the sport's movements demonstrate the involvement of the hip rotators and the hip and knee extensors in the lower body area (Jacobsen, 1983). Therefore, emphasis is placed upon the power clean, clean pull, squat, and lunge exercises. The lunge in particular simulates the mechanics of various takedowns and throws. Upper body analysis reveals great amounts of pulling movements (Jacobsen, 1983). The weighted pull-up, dumbbell row, arm curl, and hand gripper stress the body's pulling movers. It is believed that the weighted pull-ups are similar to the intense muscular endurance often encountered in a match, while the dumbbell row movement is common to the many pulling activities of the sport. Even though this analysis identifies the major muscle groups involved in wrestling, the total body must be developed to maintain muscular balance.

The off-season program

The wrestler's off-season during the academic year extends from the end of August to mid-October. During this time the athlete's goal is to produce strength and power. High priority is given to the powerful structural movements. See Chart 1 for the specific program.

The squat exercise is cycled for six weeks following the sets and repetitions of periodization (Stone, O'Bryant, Garhammer, McMillan, & Rozeneck, 1982). Chart 2 displays the volume and intensity levels for each week. Since the goal is to develop strength and power, rest between sets is from two to three minutes in length.

The pre-season program

During the pre-season, that time from mid-October to January, the wrestler's mat time and tournament activity is greatly increased. The goal in this phase is to maintain the strength and power developed during the off-season. Weight training is reduced to only two days per week. The same exercises are performed during both training sessions (see Chart 3).

The lactic acid program

The lactic acid phase begins in early January and continues to the middle of February. The bulk of the team's dual competition is encountered during this phase. The goal of the weight program is to continue to develop power in the hips, while acclimating the athletes' muscles to the high concentration of lactic acid. Lactic acid is the fatigue substance that is present in the muscle during intense activities such as wrestling (Kraemer, 1984).

The first two exercises of this program, clean pull and squat, are performed explosively to continue the development of hip and quadricep power. Following the completion of the power lifts, the circuit is begun. Most of these exercises are pre-exhaustive in nature and include "burn-out" sets. The athlete moves from the first exercise at a station immediately to the second. Repetitions are in the vicinity of 10. It is believed that this procedure will stress the lactic acid energy system. A rest period of one to two minutes is permitted prior to performing the next set of both exercises.

Due to the heavy schedule of matches during this phase of the season, the team lifts twice a week. Chart 4 displays the lactic acid routine.

Chart 1 - Off-season

M & F	W
Station No:	Station No:
1. Power Cleans - 5 x 5	1. Push Press - 5 x 5
2. Clean Pulls - 4 x 5	2. Inclined Flies - 4 x 10
3. Weighted Chins - 3 x 10 Bench Press - 2 x 10	3. Lunge - 3 x 12 Leg Extension - 2 x 10
4. Squats (Heavy-M)-5 x cycle (Light-F)	4. Lat Pulls - 2 x 10 Upright Rows - 2 x 10
5. D.B. Rows - 3 x 10 Shoulder Press - 3 x 10	5. Stiff Leg Deadlifts - 2 x 10 Abdominal Pushdowns - 2 x Burn-out
6. Hyperextensions - 2 x 15 Crunchers - 2 x Burn-out	6. Close Grip Bench - 2 x 10 D.B. Curls - 2 x 10
7. Arm Curls - 3 x 10 Gripper - 2 x 10	7. Gripper - 2 x 10 Weight Dips - 3 x 10
8. Neck (Partner) - 1 x 8 Leg Curls - 3 x 10	

Chart 2 - Squat Cycle

Week	Heavy	Light
1.	55%/10, 4 x 65%/10	50%/10, 55%/10, 3 x 60%/10
2.	60%/10, 4 x 70%/10	50%/10, 55%/10, 3 x 60%/10
3.	70%/5, 3 x 80%/5, 70%/10	65%/5, 3 x 70%/5, 70%/10
4.	75%/5, 3 x 85%/5, 70%/10	65%/5, 3 x 70%/5, 70%/10
5.	80%/3, 3 x 90%/3, 75%/10	70%/3, 3 x 75%/3, 70%/10
6.	80%/3, 3 x 95%/3, 75%/10	70%/3, 3 x 80%/3, 70%/10

Tournament

The tournament phase is the final phase of training from mid-February to mid-March. The Big 8 and NCAA Championships occur during this phase, so the goal is to physically peak the wrestlers in muscular strength, endurance, and conditioning. This task is obtained through a high intensity circuit program following the squat and clean pull. The routine includes 11 exercises which the athletes execute as many times as possible for 45 seconds (approximately 15 reps.). Fifteen seconds are allotted for changing to and setting up the next exercise, followed by 45 seconds of work.

After completion of one set of the circuit (all 11 exercises), the wrestlers move to the indoor track to run approximately one mile of interval training, e.g. 2 x 880, or 1 x 880, or 2 x 440, or 4 x 440. Following the running, the team returns to the weight room to complete another set of the circuit. After the second set, the athletes manually work their necks together as a team. See Chart 5 for the tournament routine.

Conditioning

While muscular strength and endurance are of extreme importance, the wrestler must also possess cardiovascular endurance. It is estimated that 90% of the energy needed to wrestle a match is derived from the ATP-PC and lactic acid energy systems (Fox, 1979). Fox (1979) has reported that interval training is an effective method for conditioning these two systems. Interval training includes repeated bouts of intense runs separated by adequate rest periods. The philosophy is to allow just enough recovery to run the distance at a high level of physical stress.

The distance covered per training session, as a combination of the running protocol, ranges from one and one-half to two miles. The distances and their work/rest ratio are listed below:

1. 880 yards (1:1) - A work/rest ratio of 1:1 means that the athletes rest the same amount of time as it takes to run the distance.
2. 3-minute fartleks - The athletes jog 20 seconds, sprint 10 seconds, jog 20 seconds, sprint 10 seconds for a total time of three minutes.

Chart 3 - Pre-season

Station No:
1. Power Clean - 5 x 5
2. Weighted Chins - 3 x 10
   Incline Flies - 2 x 8
3. Squats - 5 x 10-5
4. Lat Pulls - 3 x 10
   Arm Curls - 3 x 10
   Upright Rows - 3 x 10
5. Lunges - 3 x 12
   Leg Curls - 2 x 10
6. Tricep Extensions - 3 x 10
   Hyperextensions - 2 x 15
   Abdominals - 3 x burn-out

Each fartlek is separated by one minute of rest.
3. 440 yards (1:2)
4. 220 yards (1:3)

Conclusion

The Oklahoma State wrestling strength and conditioning program is designed to produce athletes who can compete at high intensity for a full seven minute match. Strength and conditioning are not the only variables involved in developing champions, but the weaker, out-of-shape athlete rarely succeeds. At O.S.U., our wrestlers may not win every match, but our goal is not to let strength and conditioning be the determining factor of defeat. ●

References

Fox, E.L. (1979) ***Sports Physiology.*** Philadelphia: Saunders College.

Jacobson, B. (1983) Wrestling: the single leg takedown. ***National Strength and Conditioning Association Journal,*** 5, 6-9, 71.

Kraemer, W.J. (1984) Wrestling: Physiological Aspects for Conditioning. ***National Strength and Conditioning Association Journal,*** 6, 40, 66, 67.

Stone, M.H., O'Bryant, H., Garhammer, J., McMillan, J., & Rozenek, R. (1982) A theoretical model of strength training. ***National Strength and Conditioning Association Journal,*** 4, 36-39.

Chart 4 - Lactic Acid

Clean Pulls - 4 x 5

Squats - 4 x 6

Circuit
1. D.B. Flies
   To 2 x Burn-out
   D.B. Bench
2. Lat Pulls
   To 2 x Burn-out
   Pull-ups (angle)
3. Leg Curls - 2 x 10
   To
   Lunges - 2 x 12
4. D.B. Shoulder Raise
   To 2 x Burn-out
   Shoulder Press
5. Bicep Curls
   To 3 x Burn-out
   Pull-Ups (under handed)
6. Hyperextensions - 2 x 15
   Abdominals - 2 x Burn-out
   Neck - 1 x 8
7. Tricep Extensions
   To 3 x Burn-out
   Close Grip Bench

Chart 5 - Tournament

Clean Pulls - 4 x 5

Squats - 4 x 6

Circuit
1. Inclined Flies
2. Lunges
3. Lat Pulls
4. D.B. Shoulder Raise to Press
5. Bicep Curls
6. Tricep Pushdowns
7. Leg Curls
8. Pull-Ups
9. Abdominal Crunchers
10. Dips
11. Back Hyperextensions

Neck - 1 x 8