The Development of a Strength Training Program for Collegiate Basketball Players Based on a Survey Study of Colleges with Prestigious Basketball Programs

by

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UNIVERSITY OF WISCONSIN-LA CROSSE

COLLEGE OF EDUCATION

Candidate: Rod Popp

I recommend acceptance of this seminar paper in partial fulfillment of this candidate's requirements for the degree Master of Education in Professional Development.

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This seminar paper is approved for the College of Education.

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ABSTRACT

Popp, R., The development of a strength training program for collegiate basketball players based on a survey study of colleges with prestigious basketball programs (unpublished manuscript): University of Wisconsin-La Crosse, 1981.

This study developed a strength training program for collegiate basketball players. The study was based on the hypothesis that coaches of prestigious collegiate basketball teams and a review of the literature would advocate that strength training be incorporated into the conditioning of basketball players.

A questionnaire addressing issues specifically related to the strength training of basketball players was formulated. This survey was sent to the universities whose basketball teams ranked highest in the nation during the 1980-1981 season according to the final Associated Press poll.

Findings and conclusions indicated that a strength training program should be incorporated into the conditioning of basketball players. A systematized program was developed to insure efficiency and effectiveness.

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I am greatly indebted to Coach Mike Sanders for sharing his expertise and advice with me. Also, I wish to thank the head basketball coaches and strength training coaches from the following institutions for their response to the survey: University of Arkansas, Brigham Young University, UCLA, De Paul University, University of Illinois, University of Iowa, University of Kentucky, Louisiana State University, University of Louisville, University of Maryland, University of North Carolina, University of Notre Dame, Oregon State University, University of Tennessee, Wake Forest University, and the University of Wyoming.

Finally, I wish to extend my deepest appreciation to my wife and family for their patience, inspiration, and continual encouragement.

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CHAPTER I

INTRODUCTION

Background

A player capable of actively participating in competitive intercollegiate sports is a highly skilled athlete. She or he has typically spent a great deal of time developing and perfecting the skills of his or her sport. It is the function and challenge of the athletic coach to maximize the skills of each performer so that the full potential of each athlete and, consequently, the entire team is reached.

As a men's basketball coach who trains athletes at the collegiate level, this writer felt a need to address the issue of how to improve upon the performance level of each highly skilled athlete. The author holds the belief that a stronger athlete is a better athlete. Also, the author believes that in order for an athlete to reach his full potential, his strength must be commensurate with his skills. Many basketball players have not been exposed to strength training regimens; consequently, they are not as strong players as they have the potential to be.

The fact that some colleges do not implement a strength training program in their conditioning programs suggests that there is controversy, lack of awareness, or some other factor influencing this area of athletic development. This author

hypothesized that the results of the survey would demonstrate that the majority of prestigious basketball teams have strength training programs. It was necessary to glean from the literature truths which apply to the formation of a complete and effective program. A good program should be based on substantiated facts regarding cause and effect relationships.

Statement of the problem

In order to prepare the athletes most effectively, there is a need to develop a comprehensive and efficient strength training regimen for college basketball players. This writer's intent was to review the strength training programs presently used by the colleges or universities in this nation who have prestigious basketball programs.

The Associated Press national ranking for the top twenty collegiate NCAA Division I basketball teams for the 1980-1981 season determined which schools had prestigious programs. The exercises and equipment most consistently used by experienced strength coaches from these nationally recognized basketball programs were identified. Specific responses made by major college coaches regarding the effectiveness of strength training in the conditioning of basketball players was evaluated. A comparative study of various programs provided a nucleus for developing a comprehensive strength training program for these athletes. Access to a complete strength training program designed to meet the specific needs of basketball players and the implementation of such a program are essential to the development of a team that is aspiring to reach its full potential.

CHAPTER II

REVIEW OF THE LITERATURE

The amount of literature available on strength training is extensive; however, literature specifically addressing strength training for basketball players is limited. The majority of the literature reviewed consisted of the authoritative opinions of strength training experts. Many of the opinions were based upon the personal experiences of these authorities. This review of the literature resulted in the following observations.

Increased muscle strength results in increased athletic ability. Strength training improves the physical capacity of the body which in turn improves the ability to play a sport. (Parker and Marsh, 1974) According to Riley (1977), too few athletes possess a level of strength that equals their skill level; therefore, good athletes could be even more successful by increasing the strength of the muscles involved in their sport. This attempt to develop as much strength as possible would give the good athlete an advantage over the "average" athlete with whom he/she is competing. Strength training not only would increase strength but it would also create the reserve of extra strength that is necessary in highly competitive physical sports. (Hoffman, 1961) Strength training provides a way to overload muscles systematically to optimize strength improvement. (Berger, 1973)

Peterson (1975) performed a study at West Point to determine the consequences of a short-term, high-intensity strength training program. He used twenty-one subjects in his study. The subjects trained three times per week for eight weeks. The five main muscle groups were exercised with pre- and post-tests. The findings showed that strength training had a positive effect in six weeks. Strength training significantly improved cardiovascular condition and increased the level of flexibility.

A good athlete has an intuitive sense of timing. Practicing the skills of the sport and rehearsing the movements will not substantially improve reaction time; however, by increasing the athlete's strength, reaction time is automatically increased. Strength training shortens the reaction period enabling the athlete to have a superior sense of timing. (Hoffman, 1961)

Description of a strength training program

Muscle performance is improved by carefully selected warm-up activities. A brief relaxed warm-up prior to lifting will increase muscle flexibility, decrease viscosity of muscles and prevent tears. (Bjornara, 1975) Jogging is a suggested warm-up activity, as well as a selection of various stretching and flexibility exercises.

Spotters or workout partners should be used to lessen the risk of injury. These persons could also assist the lifter by recording pertinent workout data.

Free weights and weight machines such as the Universal and Nautilus machines are the most common types of weight training equipment. Because of their versatility and practicality,

free weight equipment is the most commonly used. The Universal machine and the Nautilus are both expensive and cumbersome in that they are not easily moved. The needs of a strength training program can be met by all three apparatuses. If all are available, personal preferences of the coaches and/or athletes would determine the equipment used.

According to Riley (1974) an efficient strength training program should be organized with emphasis placed on seven training variables. The following list identifies these variables:

1. Exercises to be performed
2. Order of exercises
3. Number of repetitions
4. Number of sets
5. Amount of weight to use for each exercise
6. Time interval between exercises
7. Frequency of workouts

The athlete spends many hours learning and practicing the skills of his particular sport. He could not afford to use his time wastefully in the weight room. Skillful management of the seven variables will insure a very productive strength training period. A review of the literature discussing these seven variables provided a great deal of insight into the formation of a quality strength training program.

1. Exercises to be performed. An efficient strength training program consists of high intensity resistive exercises. (e.g. Darden, 1975; Jones, 1975; Riley, 1977) These exercises should focus on muscle groups used in the particular sport for which one is conditioning. Exercises which focus on any particular muscle group are numerous. ~~The literature indicates that~~ four specific exercises are recognized for their effectiveness

in increasing overall strength. They are the squat, the bench press, the power clean and the incline press.

It is necessary to consider the equipment and facilities available when selecting a set of exercises. The number of exercises selected for a set regimen should be limited as the quality, not the quantity, of exercises enhances the program's effectiveness.

2. Order of exercises. Some degree of flexibility exists in the order that exercises should be performed. (Riley, 1974; Allman, 1976; and Darden, 1977) Parker and Marsh (1974) gave strong arguments for dividing the body into five segments with the largest and strongest muscles exercised first while progressing to the smaller and weaker muscles. The legs and hips should be exercised first because of their potential for developing strength and muscle mass. The torso should be exercised next and both pulling and pressed movements should be performed for fullest development. The arm muscles would be exercised after the legs and torso. Abdominal exercises should be performed after completing exercises for the legs, torso, and arms. The neck muscles which support the head should be exercised last. The rationale for this order was that fatigue will affect the smaller and weaker muscle groups if exercised first. The attempts to move to the larger muscles next would provide very little benefit. The following order of body segments should be considered when designing an exercise routine: legs, torso, arms, abdomen, and neck.

3. Number of repetitions. A repetition is defined as the number of times a lift is performed. Repetition alone will not improve strength. Progressive maximum intensity resistance, the addition of more weight as the lifter becomes stronger, must accompany the repetition to produce rapid increase in strength. The muscle is stimulated only if the body has to call on a reserve ability to perform the workload. (e.g., Bjornara, 1975 and O'Shea, 1976)

According to the literature, techniques of the repetition are of utmost importance. The movement through the repetition should be slow and smooth with consideration given to as complete a range of movement as possible. Breathing techniques should be synchronized with the exercise. Riley (1974) and Bjornara (1975) stated ~~that~~ the most common method is to inhale whenever resistance is being lowered or pulled to the body and to exhale when resistance moves away.

There is no consensus of opinion as to the precise number of repetitions to be performed. The number of repetitions suggested by the authorities in the field ranged from four to fifteen. However, one could conclude from the literature that as the number of repetitions made decreases, the amount of resistance should increase.

4. Number of sets. Sets are the number of times repetitions are performed for each exercise. The specialists indicated that two to three sets should be performed and that it is imperative that these sets be properly performed with intensity and maximum effort.

5. Amount of weight used. Initially determining the amount of weight a lifter should use is done by trial and error. The initial weight used should be an amount that can be handled through the assigned sets and repetitions. Bjornara (1975) suggested that some trial and error could be eliminated when determining initial resistance levels by having the trainer perform a one-time maximum-amount repetition. Sixty-five per cent of this amount would constitute the initial poundage to be used. Each succeeding week the weight should be increased by five to ten pounds. The addition of more weight as the athlete becomes stronger is known as progressive weight training. Progressive weight training was advocated by strength training specialists.

6. Time interval between exercises. The amount of time which elapses between exercises should be very brief, approximately one minute. (Riley, 1974) There should be no rest between sets and the athlete should move rapidly from one exercise to another. (Bjornara, 1975) Minimal rests between exercises enhance cardiovascular fitness.

7. Frequency of workouts. The literature was very conclusive as to the frequency with which workouts should be conducted. The opinion of strength training specialists was that there should be a minimum of forty-eight hours and a maximum of ninety-six hours between workouts. Muscles will increase strength most rapidly if forced to work harder during each successive workout and given adequate time to recover. (Riley, 1974 and Darden, 1977) Workout sessions can vary from fifteen minutes to one hour in length during in-season training and from one to two hours during the

off-season training. (Bjornara, 1975) The opinions stated in the literature consistently recommended three workouts per week during the off season and two workouts each week in season. It is imperative that workouts be properly conducted and well supervised.

Conclusion

The authorities agreed that there are no short cuts to success. Strength can only be developed through sound training methods. This development takes time, effort, patience and discipline applied to an efficient, systematized, progressive strength training program.

CHAPTER III

METHOD

The advantages of strength training in athletics were discussed in the previous chapter. This raises the question of what kind of strength training program would be best for a collegiate basketball program.

To answer this question, a survey was conducted of schools which had the highest ranked collegiate basketball teams in the nation from the 1980-1981 season according to the final Associated Press poll. The results should help to determine the common elements among strength training programs used by successful basketball teams.

A questionnaire was formulated which addressed the issues specifically related to the strength training of basketball players. Mike Sanders, strength coach at the University of Wisconsin-La Crosse, was consulted in preparing this questionnaire. The resulting questionnaire, provided in Appendix C, was sent to twenty colleges and universities.

The twenty institutions selected for the survey are listed in Appendix A. The questionnaire and a cover letter (see Appendix B) explaining the purpose of the survey were sent to each of these institutions. In addition to completing the questionnaire, the personnel contacted were also requested to submit a printed copy

of the current strength training program in their institution if one existed. Sixteen of the twenty institutions contacted responded to the survey.

Once the questionnaires were received, the results were tabulated. Every response to each question was included in the final tabulation, which is presented in Appendix D. The questionnaire allowed for additional comments to be made by the recipients at their discretion.

It was this writer's intention to design a strength program based upon the information gained from the tabulated data of the survey.

CHAPTER IV

RESULTS

Completed questionnaires were received from sixteen of the twenty institutions surveyed. The tabulated data from these questionnaires is recorded in Appendix D. Fifteen of these sixteen programs engage in a resistive strength training program during the off season. All but one of the basketball programs which engage in a strength training program during the off season continue such a program in season. Data referenced in the remaining sections of this chapter is based on the responses made by the fifteen programs which routinely engage in a strength training regimen throughout the year.

The equipment utilized in the strength training programs varied. Fourteen of the fifteen basketball programs surveyed utilize free weights and twelve of the programs utilize Nautilus machines. These two apparatuses were the most commonly used. Five or fewer of the programs used other equipment such as the Universal, Hydra-gym, Leaper and others.

Specific exercises utilizing these various types of equipment were identified. The most widely used exercises involving free weights included the squat, the bench press, the power clean, and the incline press. Data from this survey supports the consensus of the authorities that these lifts are the more

important for improving overall strength. Thirteen additional exercises were listed as being used by four or fewer of the programs. The most popular exercises employing the Nautilus machines included leg extensions and leg curls.

It is apparent that no specific type of repetition and set regimen is consistently used. No regimen identified was employed by more than four of the fourteen programs. In the majority of the programs the repetition and set regimen did not vary with the experience of the lifters.

The athletes in twelve of the fourteen programs utilizing in-season strength training engaged in such a program after regular basketball practices two days per week. During the off season, training was conducted three days a week. Strength training sessions were not conducted on consecutive days.

Eleven institutions indicated that they periodically perform evaluations to assess the progress of their athletes. Five of the programs perform maximal tests three times per year. A maximal test consists of one repetition in which the maximal amount of weight a lifter can lift is used. Four programs test before and after off-season and in-season training periods. One of the programs tests every two weeks while another conducts performance related tests. In order to assess any strength training program, it is imperative that periodic evaluations are made of the athletes' abilities as indicated by the fact that eleven of the fifteen schools surveyed made such evaluations.

Persons completing the questionnaires were given an opportunity for personal comments. The few comments verified the

fact that there is a need to develop a sound strength training program for basketball players. Some coaches indicated that they were confused as to why and how such a program should be implemented. Some strength coaches suggested that they would like to convince the basketball coaches of a need for a systematized strength training program in the conditioning of players. Comments from coaches who have implemented a relatively systematic program were favorable.

CHAPTER V

CONCLUSIONS AND RECOMMENDATIONS

Conclusions

The intention of this study was to develop a quality strength training program specifically designed for male college basketball players. The writer intended to do this by combining those exercises considered by major college basketball teams as top priorities, evaluating responses to specific questions regarding strength training and its effectiveness in the conditioning of a men's basketball team, and using personal insight gained from reviewing literature on the subject of strength training.

A quality training program must be efficient, effective, practical and adaptable. A basketball player spends many hours practicing the skills of his sport and cannot afford to waste time in the weight room; therefore, the time he spends lifting weights must be spent efficiently. An efficient program will allow for maximal effectiveness in the least amount of time. An effective program will measurably increase the strength of specific muscles used in the sport of basketball as well as increase the reaction time, stamina and flexibility of the athlete.

Recommendations

Although the ideal setting for implementing any weight or strength program may exist, it is necessary to consider the

practicality of the program. The most efficient program will not be effective if it is not implemented. Today, implementation requires careful consideration of budgets and facilities. The strength training program must fit a reasonable budget and be adaptable to a variety of settings and facilities. Following is the strength training program the writer recommends.

Orientation Program

The strength training program will be initiated by an orientation regimen which will be implemented two weeks prior to the basic weight lifting program. None of the schools surveyed reported using such an orientation program. Upon the suggestion of Mike Sanders, the strength coach with whom the author conferred throughout this project, the author decided to develop such a regimen. The purpose of this program is to acclimate the lifters to the strength training program. After five to ten minutes of warm-up exercises consisting of stretching exercises, the following repertoire of exercises would be implemented:

Exercises	Sets	Repetitions
Parallel squats	2	10
Leg curls	2	10
Bench press	2	10
Upright rows	2	10
Military press	2	10

Basic Program Design

The author referred to Riley's (1974) seven training variables when designing this strength training program. Those exercises suggested by the literature as the most effective for

strengthening the four major muscle groups used by basketball players were incorporated into this program. These same exercises were also the most popular among the schools surveyed. It is apparent that they are widely recognized and accepted for their importance and effectiveness. Following is a description of the exercises used in the program. For an outline of the program, see Appendix E.

Exercises

The exercises performed are not the key to strength gains; more important is how the athlete performs the exercise. This exercise selection was based on the need to develop overall strength and to place an emphasis on each major muscle group.

1. The squat. The muscles used for this exercise are the major muscles of the legs and buttocks. The starting position is with feet approximately shoulder width apart with the barbell resting on the shoulders just below the neck. Lower the buttocks until the thighs are parallel to the floor, pause and return to starting position. Inhale when lowering to the squatting position and exhale on the return. For explosive power in your legs, return to an upright position with as much speed as possible. Be under complete control and do not bounce.

2. The bench press. The muscles used for this exercise are the pectorals, deltoids and triceps. This exercise is performed laying flat on an exercise bench with the knees bent and the feet flat on the floor. The barbell is in the arms extended

position. Lower the barbell to the highest point of the chest, pause, and return to starting position. Inhale when lowering the weight and exhale when returning to starting position. Do not bounce the bar and always be under control.

3. The power clean. The power clean is an exercise that involves every basic muscle group. This exercise is performed by taking a shoulders width grip on the barbell, knees flexed, back flat and head up. The barbell should be pulled upward to your chest; thrusting your elbows forward and resting the bar on your chest, pause and lower barbell to starting position. Inhale while raising the weight and exhale when returning to the starting position.

4. The incline press. The incline press is an exercise that uses the pectorals, deltoids and triceps. This exercise is important because of increased range of motion over the bench press. The starting position for this exercise is lying on the back on an incline bench with a barbell in arms extended position. Lower the weight to the top of the rib cage, pause, and return to the arms extended position. Inhale when lowering the bar and exhale when returning to arms extended position.

5. The leg curl. The leg curl is an exercise that must be used to maintain proper muscle balance between quadriceps and hamstrings. This exercise is performed lying face down on an exercise bench that has a leg curl attachment. The heels are hooked under the pads, the knee caps should be just off the edge of the pad for comfort. Flex the lower legs until they are at

least perpendicular to the floor, pause, and return to the starting position. Inhale when raising the weight and exhale when lowering the weight.

The number of repetitions and sets

To determine the optimal number of repetitions for development of muscular strength/power and endurance, the author employed the median as a measure of central tendency. From tabulated data of the surveys, the calculated median was three sets of ten repetitions for in-season workouts and three sets of eight repetitions for off-season workouts.

Amount of weight used

The amount of weight used for each exercise is based on the amount of weight the athlete can handle for three sets of the assigned repetitions. There would be some trial and error involved until a definite weight was established. The athlete would strive to increase the poundage from week to week.

The time interval between exercises

The amount of recovery time would be only as much time as is needed to move to the next exercise. Generally, sixty seconds would be a sufficient amount of rest between each exercise.

The frequency of workouts

During the off season there should be three workouts per week on alternating days. (Example: Monday - Wednesday - Friday) During the season the athlete should train twice a week after practice. The workouts would be scheduled the day after competition and forty-eight to ninety-six hours before the next competition.

Order of exercises

All workouts will begin with the largest muscle groups and proceed down to the smallest. The potentially larger muscles of the hips, lower back and legs would be exercised first, followed by the torso and arms.

Points of Emphasis for the Program

All the exercises require a full range of motion. Allow the muscles to raise the weight (do not bounce). The positive part of the exercise should take approximately two seconds and the negative portion should take four seconds. The athletes should be paired off so that every repetition of each exercise is supervised to guarantee proper execution. The spotter also has the responsibility to record all workout data on a workout data card (Appendix F). He should also encourage the lifter to give an all-out effort on each exercise. A five-minute warm-up period consisting of flexibility and stretching exercises must be completed prior to any lifting.

The goal of a coach is to help each athlete reach his full potential. The design of this strength program was intended to make each athlete stronger. The increase in strength that the athlete gains from this program will have a positive effect on his performance, which will make him a better athlete.

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APPENDIX A

COLLEGE BASKETBALL TEAMS CONTACTED

IN THE SURVEY

A Listing of the 1981 Top Twenty
College Basketball Teams (AP)

1. DePaul University
2. Oregon State University
*3. Arizona State University
4. Louisiana State University
*5. University of Virginia
6. University of North Carolina
7. University of Notre Dame
8. University of Kentucky
*9. Indiana University
10. University of California at Los Angeles
11. Wake Forest University
12. University of Louisville
13. University of Iowa
*14. University of Utah
15. University of Tennessee
16. Brigham Young University
17. University of Wyoming
18. University of Maryland
19. University of Illinois
20. University of Arkansas

*Did not respond

APPENDIX B

COVER LETTER FOR THE STRENGTH TRAINING SURVEY

University of Wisconsin - La Crosse

La Crosse, Wisconsin 54601

DEPARTMENT OF ATHLETICS

October 1, 1981

Dear Coach

The basketball staff along with the weight training department of the University of Wisconsin-La Crosse is conducting a survey of the top twenty 1981 collegiate basketball teams. The purpose of this survey is to gather data for the development of a comprehensive year round strength training program for basketball players.

The traditional success of your basketball program leads us to inquire about the nature of your strength training program. We would greatly appreciate your assistance in filling out the enclosed survey. If your strength and weight training program is administered by a strength coach, please pass this survey onto him.

The inclusion of a printed copy of your present weight training program with the return of the questionnaire is requested. Please respond to this request by October 19, 1981. Your cooperation is sincerely appreciated. A copy of the summary of the compiled data received from the surveys will be forwarded to you.

Sincerely,

Rod Popp
Assistant Basketball Coach

Mike Sanders
Strength Coach

RP/MS:jh

Encl.

APPENDIX C

STRENGTH PROGRAM SURVEY

University of Wisconsin - La Crosse

La Crosse, Wisconsin 54601

UNIVERSITY OF WISCONSIN-LA CROSSE
STRENGTH PROGRAM SURVEY

INSTITUTION _____

NAME _____

TITLE _____

1. Does your team engage in a resistive weight training program?

Off season	____ Yes	____ No
In season	____ Yes	____ No

2. What type of equipment do you utilize?

____ Free weights	____ Nautilus
____ Universal	____ Other (list)
____ Hydra-gym	_____
____ Leaper	_____

3. What specific exercises do you perform?

a) Free weights

____ squat	____ upright rows
____ bench	____ others (list)
____ power clean	_____
____ dead weight lift	_____

b) Machines

Universal (list exercises)	Leaper
_____	_____
_____	_____
_____	_____

Hydra-gym	Nautilus
_____	_____
_____	_____
_____	_____

b) Machines (continued)

Other

_____ _____

_____ _____

_____ _____

4. Generally, what type of repetition and set regimen do you follow for:

a) Off season

b) In season

5. Do beginning lifters use the same type of repetition and set regimen?

____ Yes ____ No (explain)

6. Do you perform your weight training program before or after practice?

____ Before ____ After

7. How many days per week do you perform your program?

Off season = _____ days In season = _____ days

8. What specific days do you weight lift?

Off season ____ S ____ M ____ T ____ W ____ TH ____ F ____ S

In season ____ S ____ M ____ T ____ W ____ TH ____ F ____ S

9. Do you periodically perform maximal tests to gage the progress of your athletes:

____ Yes ____ No How often?_____

10. Additional comments:

Please complete by October 19, 1981, and return in the enclosed self-addressed stamped envelope. Thank you.

Rod Popp
Assistant Basketball Coach
Department of Athletics
University of Wisconsin-La Crosse
La Crosse, WI 54601

Mike Sanders
Strength Coach
Department of Athletics
University of Wisconsin-La Crosse
La Crosse, WI 54601

APPENDIX D

TABULATED RESULTS OF SURVEY

1. Does your team engage in a resistive weight training program?

Off season	15	yes	1	no
In season	14	yes	2	no

2. What type of equipment do you utilize?

14 Free weights
5 Universal
3 Hydra-gym
4 Leaper
12 Nautilus
3 Other (list)
Dumbbells
Mini-gym
Jumper
DLC calf machine

3. What specific exercises do you perform?

a. Free weights
10 Squat
12 Bench press
8 Power clean
3 Dead weight lift
4 Upright rows
5 Others (list)
1 Jerk
3 Tricep extensions
1 Dumbbell extensions
6 Incline Press
1 Lateral flys
1 Single leg sidesquats
1 Lateral raise
3 Step ups
1 Curl
2 Wrist curl
2 Seated military press
2 Dips

b. Machines
Universal (list exercises)
4 Lateral pulls
1 Leg extension
1 Bench press
1 Tricep extension
1 Toe raises

b. Machines (continued)

Leaper
- 1 ¼ Thrusters
- 1 Isokinetic jumper
- 1 Squat
- 1 Speed work

Hydra-gym
- 2 Ab-ad
- 1 Squat

Nautilus
- 2 All
- 2 Tricep extension
- 3 Leg extension
- 7 Leg curl
- 3 Pullover
- 1 Hip low/back
- 3 Double shoulder
- 2 Double chest

Other machines
- 2 Calf machine
- 1 Mini-gym (speed work)

4. Generally, what type of repetition and set regimen do you follow

a. Off season
- 1 3 to 5 sets of 5 to 8 repetitions
- 1 Pyramids 10 + 8 + 6
  For power, warm up with 3 sets of 5 at 85%; maximum of 4 sets of 6 at 80-85%
- 4 8 to 12 repetitions - 1 set upper body
  12 to 15 repetitions - 1 set lower body
- 1 5 sets of 5 repetitions
- 1 3 to 5 sets of 4 to 8 repetitions
- 1 6 to 8 sets of 1 to 8 repetitions
- 3 3 sets of 8 repetitions
- 2 3 sets of 6 to 15 repetitions

b. In season
- 1 4 sets of 10 repetitions
- 2 3 sets of 8 repetitions
- 2 3 sets of 6 to 15 repetitions
- 4 1 set of 8 to 12 repetitions
- 1 3 to 5 sets of 10 to 15 repetitions
- 1 3 to 4 sets of 5 repetitions
- 1 1 set of 10 to 15 repetitions
- 1 2 to 3 sets of 8 to 12 repetitions
- 1 1 set of 10 to 15 repetitions (lower body)

5. Do beginning lifters use the same type of repetition and set regimen?

10 yes *5 no

*Explanation: Less weight, emphasis on proper form.

6. Do you perform your weight training program before or after practice?

2 Before
12 After

7. How many days per week do you perform your program?

Off season 3 days
In season 2 days

8. What specific days do you weight lift?

Off season

S 15 M T 15 W Th 15 F S

In season

7 S 3 M 7 T 3 W 4 Th F S

9. Do you periodically perform maximal tests to gauge the progress of your athletes?

11 yes
4 no

How often?

5 Three times per year
1 Every two weeks in different stations
4 Before and after training period
1 Performance-related tests

APPENDIX E

OUTLINE OF BASIC STRENGTH TRAINING PROGRAM

Off season strength training program

Days per week: M - W - F

Warm-up: 5 to 10 minutes of stretching and flexibility exercises

Exercise	Sets	Repetitions
1. Squat	3	8
2. Bench press	3	8
3. Power clean	3	8
4. Incline press	3	8
5. Leg curl	3	8

*1 hour workout

In season strength training program

Days per week: assigned days (2 per week)

Warm-up: 5 to 10 minutes of stretching and flexibility exercises.

Exercise	Sets	Repetitions
1. Squat	3	10
2. Bench press	3	10
3. Power clean	3	10
4. Incline press	3	10
5. Leg curl	3	10

*1/2 to 3/4 hour workout following practice

APPENDIX F

WORKOUT DATA CARD

Front of Card

WORKOUT DATA CARD

Name _____ Spotter _____

"There are no short cuts to success. Winning is hard work, losing is easy."

Equipment: Free weights

Repetitions and Sets: In Season - 3 sets of 10 repetitions
Off Season - 3 sets of 8 repetitions

Time Interval: Between sets - move through as rapidly as possible.

Between exercises - 1 minute

Frequency of Workout: Off Season M - W - F
In Season Assigned days (2/week)

*Use proper techniques and form

Back of Card

EXERCISES	Dates of Workouts										
1. Squat	W S R										
2. Bench Press	W S R										
3. Power Clean	W S R										
4. Incline Press	W S R										
5. Leg Curls	W S R										

W = weight S = sets R = repetitions