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TRAINING & CONDITIONING

**SPECIAL
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FOCUS ON ABILITY

A Look at Training Athletes with Disabilities

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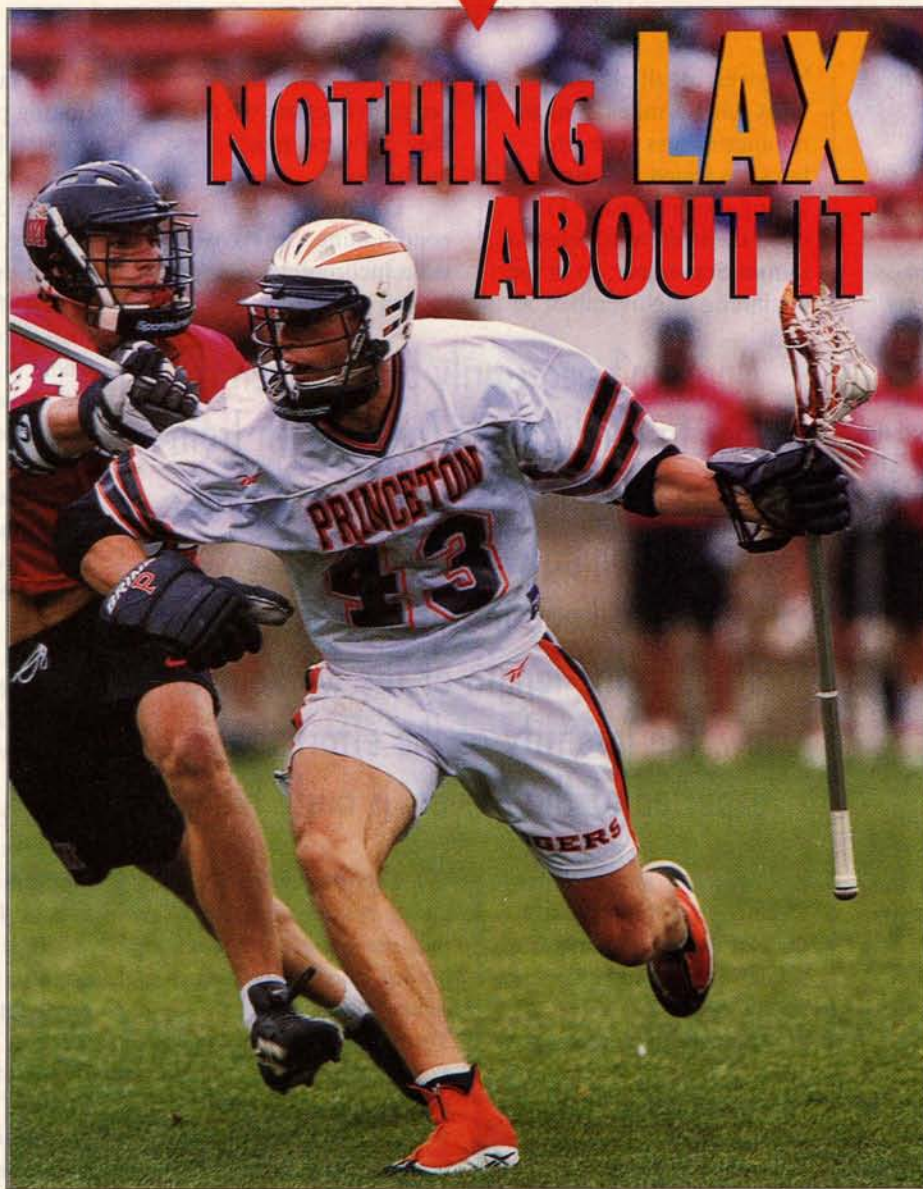


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With five national championships in seven years, the Princeton University men's lacrosse team has been the most successful college program of the 1990s. An important part of that success is the team's emphasis on conditioning. Strength and conditioning work will take various forms throughout the year, but it is always an integral part of the team's training.

"Our schedule is highly competitive every year,"

Princeton men's lacrosse takes strength and conditioning very seriously. With a deceptively simple program, they've dominated the game in the '90s.

says Head Coach Bill Tierney. "Our strength and conditioning program is a key element in our preparation. When all other skills are equal, the stronger and more-conditioned athletes will win."

Long-time assistant coach David Metzbower—who is responsible for the strength and conditioning program—states, "The main purpose of our strength-training program is to increase a player's per-

formance potential and to prevent injury." It's felt that increasing an athlete's strength will allow him to tolerate stresses that might otherwise cause an injury.

"Strength training won't automatically make an athlete into a better player," Metzbower continues, "but it will improve his potential to be a better player. An athlete must still learn how to

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BY MATT BRZYCKI

apply his strength on the lacrosse field."

At Princeton University, as in all academic settings, a high priority is placed on academics, which demand a tremendous amount of an athlete's time. As such, the design and application of the strength and conditioning program can be summed up in one word: efficiency. The most efficient program is one that produces the maximum possible results in the minimum amount of time.

The bulk of the lacrosse team's strength and conditioning training is done in the preseason. During the competitive season, the training is similar to the preseason program, but with lower volume and frequency. Each athlete is also given a comprehensive manual for the off-season to guide the training through the summer months. Following is a detailed run-down of each of these training periods.

PRESEASON TRAINING

Preseason training starts when players return to campus in the middle of September and ends on January 31. This 4.5-month period is critical for developing each athlete's physical preparedness.

CONDITIONING

In order for athletes to play lacrosse at their full potential, it is important for them to be as highly conditioned as possible. At Princeton University, the lacrosse coaching staff assesses the readiness of its players with a simple conditioning test: Regardless of position or

bodyweight, all players must run 1.5 miles in nine minutes or less. The athletes are tested four times during the preseason: 1) upon their return for classes in mid-September; 2) in the beginning of November; 3)

part of the conditioning program because we feel they place too much stress on the body.

During its preseason conditioning, the lacrosse team incorporates the following guidelines:

More isn't necessarily better when it comes to conditioning (or strength training, for that matter). Excluding a warm-up, conditioning workouts do not exceed 30 minutes. Keep in mind, however, that although the length of the workout is low, the intensity of the effort that is expected of the players is quite high.

just before or just after the December holidays; and 4) the last day in January (which is the day before the season begins).

Because lacrosse is a sport in which the players must run, most of the conditioning work is accomplished by running. However, heavier players are encouraged to do at least some of their conditioning with low-impact, non-weightbearing activities—such as pedaling stationary bicycles—to reduce the potential for orthopedic problems that can result from the higher impact forces of running.

During the preseason, the players also practice their lacrosse skills and do position-specific agility drills. (During the fall, they are permitted 12 team practices as well as individual sessions with coaches.) Plyometric drills are not

Frequency. The players do conditioning workouts three times per week on non-consecutive days (usually on Tuesday, Thursday, and Saturday). For the first two months of the preseason, the three weekly conditioning workouts consist of long-distance running. After completing a long-distance run, the players occasionally do a series of sprints up the stadium steps.

In the middle of November, the frequency of the long-distance running is reduced to twice a week (Tuesday and Thursday) and an interval workout is added (on Saturday). Each interval workout starts with an easy one-mile jog. Then, the players run a designated number of intervals using a 1:1 work:rest ratio (e.g., two minutes of intense work merits two minutes of rest).

Progression. In gener-

al, the purpose of the conditioning program is to progressively overload the energy systems that are specific to the sport of lacrosse. Like the 1.5-mile conditioning test, the application of progressive overload is surprisingly simple. There are three ways that the players can progress from one conditioning workout to the next: 1) complete the distance at a faster pace (i.e., in a shorter amount of time); 2) cover a longer distance at the same pace; or 3) increase both the distance and the pace.

In the beginning of the preseason, for example, the players run for either 20 minutes or 3.0 miles; by the end of the preseason, they progress to the point where they run for either 30 minutes or 4.8 miles.

The interval workouts are also progressively more challenging. For instance, the first workout calls for five work intervals of two-minutes' duration (a total of 10 minutes of work) with a rest interval of two minutes between each effort. The goal is to run 600 meters in each of the five two-minute work intervals—a total of 3,000 meters for the workout. By the end of the preseason, the last workout calls for 10 work intervals of 90-seconds' duration (a total of 15 minutes of work) with a rest interval of 90 seconds between each effort. The goal is to run 500 meters in each of the 10 90-second work intervals—a total of 5,000 meters for the workout.

Duration. More isn't necessarily better when it



comes to conditioning (or strength training, for that matter). Excluding a warm-up, conditioning workouts—whether they be long-distance or intervals—do not exceed 30 minutes. In fact, some conditioning workouts are completed in as little as 18 to 20 minutes. Keep in mind, however, that although the length of the workout is low, the intensity of the effort that is expected of the players is quite high.

STRENGTH TRAINING

Another vital component in preparing the players for the physical demands of the game is strength training. Athletes are encouraged to use whatever equipment they prefer—

In the weight room, the athletes are asked to perform each exercise to the point of muscular fatigue. To increase the intensity of the exercise, athletes sometimes do three to four post-fatigue repetitions—either forced repetitions or breakdowns—immediately after reaching muscular fatigue.

barbells, dumbbells, machines, or manual resistance. Exercises are intended for strength training only. Athletes are not expected to mimic lacrosse skills in the weight room with weights or weighted objects.

Athletes are asked to chart their performance in the weight room on workout cards, but are not tested on their strength. Coach

Metzbower periodically reviews the cards to monitor the progress of each athlete.

The lacrosse team incorporates the following guidelines during its pre-season strength training:

Intensity. In the weight room, the athletes are asked to perform each exercise to the point of muscular fatigue—when they've fatigued their muscles to the

point that they can't perform additional repetitions in good form. To increase the intensity of the exercise, athletes sometimes do three to four post-fatigue repetitions—either forced repetitions or breakdowns—immediately after reaching muscular fatigue.

Progression. The application of progressive overload employed by the lacrosse team is much simpler, more practical, and less restrictive than that of an approach using periodization. In the weight room, athletes can progress from one workout to the next in two ways: 1) Whenever they achieve the maximum number of prescribed repetitions, they increase the resistance; or

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2) if they cannot do the maximum number of prescribed repetitions, they use the same resistance and try to perform a greater number of repetitions. After increasing the resistance in a subsequent workout—usually by about five percent—athletes start at the lower end of their repetition ranges and increase the repetitions until they attain the maximum number again.

Sets. A staggering amount of scientific and anecdotal evidence shows that there are no significant differences in strength improvement when comparing single sets to multiple sets of an exercise—provided that the single set is done at a high level of intensity. In seeking the most time-efficient methods possible, athletes are encouraged to perform one set of each exercise to the point of muscular fatigue. This is true regardless of the training season.

Repetitions. In general, the athletes attempt to reach muscular fatigue within the following repetition ranges: 18 to 20 for hips, 13 to 15 for legs, and 10 to 12 for the upper body. Anyone who reaches a plateau with these ranges is prescribed slightly lower repetitions.

Technique. "How the weight is lifted is more important than how much weight is lifted," says Metzbower. The players do not lift weights explosively. Rather, they are expected to raise and lower the weight with a deliberate, controlled speed of movement. Furthermore, the

athletes exercise throughout the greatest possible range of motion that safety allows.

Frequency. During the preseason, the players do two to three total-body workouts on non-consecu-

Recent data from the NCAA Injury Surveillance System indicate that three body parts account for 45 percent of all injuries in men's lacrosse: the knee (17 percent), upper leg (17 percent), and ankle (11 percent). Accordingly, most of the exercises target the major muscles that affect these body parts.

tive days. Athletes also have the option of performing a split routine. In this case, they train upper body on Monday, Wednesday, and Friday and lower body on Tuesday and Thursday.

Volume. During the preseason, athletes limit the number of exercises to 19 or less in a total-body workout. Recent data from the NCAA Injury Surveillance System indicate that three body parts account for 45 percent of all injuries in men's lacrosse: the knee (17 percent), upper leg (17 percent), and ankle (11 percent). Accordingly, most of the exercises target the major muscles that affect these body parts; namely, the hips and legs, as well as the upper torso.

Duration. Athletes are encouraged to complete their workouts in 70 min-

utes or less. It is felt that spending any more than 90 minutes in the weight room is an indication that the level of intensity is too low.

IN-SEASON TRAINING
The lacrosse team begins its

season on February 1—the first permissible practice date allowed by the NCAA—and can end it as late as Memorial Day weekend. The in-season training is very similar to the preseason training, with the main difference being a reduction in the volume and frequency of strength and conditioning activities.

CONDITIONING
Once the season begins, most of the team's conditioning work is done during practice. Sometimes, this includes different sprint drills covering various distances during and at the end of practice.

STRENGTH TRAINING
Lacrosse athletes lift twice a week during the season, usually Sunday and Tuesday. Athletes who feel that they need more recovery after a Saturday game can lift on

Monday and Wednesday.

During the season, the strength-training routine consists of six exercises that address the following areas: hips (1), chest (2), upper back (2), and shoulders (1).

OFF-SEASON TRAINING

The off-season program—essentially, the summer months—is basically the same as the preseason program. Each player receives a summer strength and conditioning manual developed by Coach Metzbower. The comprehensive, 50-page manual contains sections on strength training, conditioning, flexibility, skill work, and nutrition. In addition, the manual has monthly calendars that detail specific instructions on what players should do on a daily basis in terms of strength training and conditioning. The manual also contains a conditioning diary for recording results from each running workout along with several strength-training cards to chart performance in the weight room. Finally, the manual has three appendices that feature exercise options for free weights, machines, and manual resistance.

EFFORT = SUCCESS
The lacrosse team's approach to strength and conditioning is summed up best by Coach Metzbower: "Successful seasons are not built on occasions of hard work or moments of brilliance. Success comes from the consistency of effort at high intensity." ♦