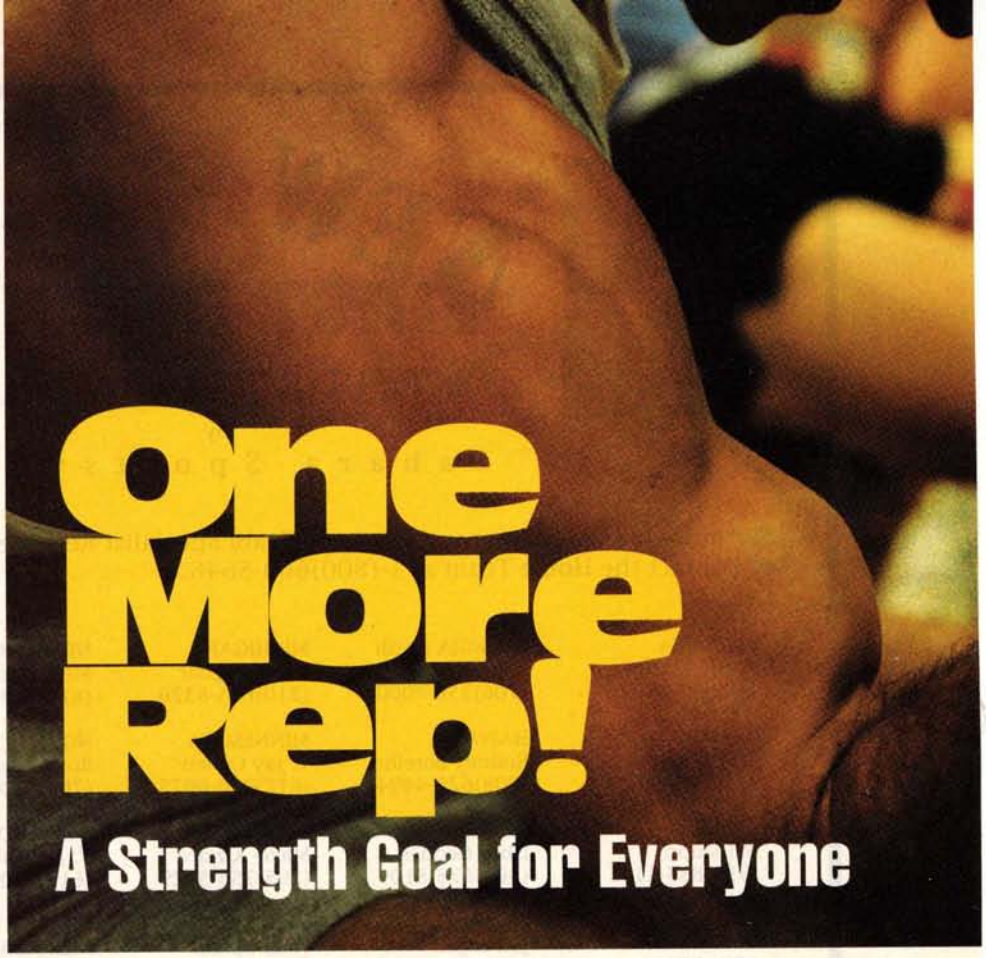

One More Rep!

A Strength Goal for Everyone

PHOTO BY BRIAN DRAKE/SPORTSCHROME EAST/WEST

THOUGH STRENGTH CAN BE enhanced through a variety of training methods and equipment, scientific research has never been able to pinpoint a pre-eminent program or a significant difference in productivity between free weights and machines.

The message is plain: Since just about any type of program or equipment will yield favorable results, it is up to the coach to decide what is most practical for his athletes, based upon safety, time, space, and budget.

Every significant training module is based upon the concept of progressive resistance exercise devised by Dr. Thomas L. DeLorme. Dr. DeLorme started lifting weights at the age of 16 in 1932. Scorning the traditional principles of "weightlifting," DeLorme developed a system of progressive resistance that he went on to validate in his rehabilitation work with large numbers of wounded soldiers in World War II.

Although the principles of progressive resistance exercise have been clearly established, many athletes are still performing the same number of repetitions with the same amount of weight over and over in workout after workout.

Obviously, anyone who does a set of leg curls for 10 reps with 110 pounds month after month isn't going to show any significant increases in strength. If, on the other hand, he begins adding extra weight and extra reps so that by the end of a few weeks he is doing 11 reps with 120 pounds, you have a pretty good situation: a 10% increase in reps that is producing 20% more weight. That's excellent progress.

PROGRESSIVE OVERLOAD

The pivotal factor in improved muscular function and structure is the continued use of the overload principle, namely: In order to increase in size and strength, a muscle must be stressed, or "overloaded," beyond its present capacity.

The intensity of the effort must produce enough muscular fatigue to trigger an adaptive response. In short, a muscle that is properly nourished and adequately rested between workouts will adapt to the demands upon it by increasing in size and strength.

The extent to which this "compensatory adaptation" occurs becomes a function of the athlete's inherited characteristics (i.e., predominant fiber type, muscle-to-tendon ration, etc.)

If, therefore, a muscle is to continually increase in size and strength, it must be forced to do progressively harder work steadily and systematically throughout the course of the strength-training program.

PRACTICAL APPLICATIONS

In order to overload muscles, the athlete must attempt to increase either his workload or his reps every time he works out. This can be viewed as a "double progressive" technique—resistance and repetitions. Challenging the muscles in this manner will stimulate compensatory adaptation.

Each time the maximum number of repetitions are attained, the resistance must be increased for the next workout. Progressions need not be in Herculean leaps and bounds but the weight must always be challenging and one with which the athlete is comfortable.

Fortunately, this may be accomplished systematically. The muscles will respond better if the progressions in resistance are 5% or less. Coaching point: The resistance must always be challenging.

If the athlete is just beginning a strength-training program or is being asked to change the exercises in his routine, it may take several workouts before a challenging weight is found. That's okay; the athlete should simply continue to make progressions in the resistance as needed.

It's also important to understand that the athlete's strength gains will be minimal during the season, especially as the practices become more intense. Although this isn't necessarily cause for alarm, the workout frequency and the

by Matt Brzycki
Coordinator, Health Fitness & Strength Programs
Princeton University

total number of exercises performed in the weight room may have to be reduced to allow for adequate recovery.

In any event, the added activity in practices, games, and sometimes even traveling will make strength gains difficult to accomplish during the season.

Though the athletes won't be able to improve in every exercise from one workout to the next, they should achieve gradual strength gains in all the exercises over the course of four or five workouts.

When an athlete fails to show progress in an exercise (in resistance or in reps) by this time, the coach can accept it as a signal to change some aspect of the routine.

ADEQUATE RECOVERY

The athlete will begin adapting to the stress of lifting during the recovery process. In other words, the muscles do not get stronger during the workout, but during the *recovery* from the workout. The lifting breaks down the tissue, while the recovery process gives the muscle time to rebuild.

The athlete may think of this as allowing a wound to heal. If he had a scab and picked at it every day, he would delay the healing process. If he left it alone, he would give the damaged tissue time to heal.

Everyone has different levels of tolerance for exercise. However, a period of about 48-72 hours is usually necessary for muscle tissue to recover sufficiently from a strength workout.

How does a coach know when an athlete has had sufficient recovery time? Answer: By the gradual progression in the amount of weight and/or the number of reps that the athlete is able to do over the course of several weeks. If he does not show progress, he is probably not getting enough of a recovery between workouts.

WORKOUT CARD

The importance of accurate record-keeping cannot be overemphasized. The workout record card should log what each athlete accomplishes during each and every exercise of each and every session.

The card thus offers an extremely valuable tool with which to monitor progress and make the workouts more meaningful. The card should record the athlete's weight, date of each workout, weight used for each exercise, number of reps performed in each exercise, order in which the exercises were completed, and any necessary seat adjustments.

FINAL CONSIDERATIONS

Since every athlete has a different genetic potential for developing muscular size and strength, coaches should disregard the players' relative lifting abilities. They should focus on how each athlete is lifting day after day.

In other words, they should not compare one athlete with another, but just make sure each athlete is getting as strong as he can be and constantly urge him to do that extra rep every day! ■

(Matt Brzycki is the Coordinator of Health Fitness, Strength and Conditioning Programs at Princeton University. His book, A Practical Approach to Strength Training, is currently in its third edition.)