



The New Jersey Police Chief

The Official Publication of the New Jersey State Association of Chiefs of Police

Vol. 20, No. 10 • November 2014

POLICE EXECUTIVE INSTITUTE
14th SESSION
April 13-17, 2015

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The Foundation of Strength Training

By Matt Brzycki, Assistant Director of Campus Recreation, Fitness, Princeton University

When lifting weights, most people pay little or no attention to how they do their reps. Yet, the rep is the most foundational component of strength training. Think about it: A program is comprised of workouts. Workouts are comprised of sets. And sets are comprised of reps.

So regardless of the type of strength training that you perform, a productive program begins with a productive rep. If your reps aren't productive, then your sets won't be productive; if your sets aren't productive, then your workouts won't be productive; and if your workouts aren't productive, then your program won't be productive.

What's a productive rep? Well, a rep has four checkpoints: the positive (or raising) phase, the mid range position, the negative (or lowering) phase and the range of motion. Let's take a more detailed look at each.

The Positive Phase: A rep starts with raising the weight. To minimize the use of momentum, you should raise the weight in a smooth, controlled manner without any explosive or jerking movements. Raising a weight with high speeds isn't recommended for two main reasons. First, high-speed reps are less productive than low-speed reps. Second, high-speed reps carry a greater risk of injury than low-speed reps.

The Mid-Range Position: After raising the weight, you should pause briefly in the mid-range position where the muscle is fully contracted. The mid-range position of a rep is the endpoint of the positive phase. For example, when performing a leg extension, the mid-range position is where your legs are completely straight (extended); when performing a leg curl, the mid-range position is where your legs are completely bent (flexed). Pausing momentarily in the mid-range position allows you to focus your attention on your muscles when they're fully contracted. Furthermore, a brief pause in the mid-range position permits a smooth transition between the raising and lowering of the weight and helps to decrease the influence of momentum.

The Negative Phase: A rep ends with lowering the weight. The importance of emphasizing the negative phase of a rep can't be overstated. Reps that involve both raising and lowering the weight produce greater increases in strength (and size) than those that involve just raising the weight. Remember, the same muscles that you use to raise a weight are also used to lower it. In a bicep curl, for instance, your biceps are used to raise and lower the weight. The only difference is that when you raise the weight, your biceps are *shortening* against the load and when you lower the weight, your biceps are *lengthening* against the load. Also of note is that your eccentric strength is always greater than your concentric strength. This means that it takes less effort to lower a weight than it does to raise a weight; indeed, walking down stairs is much easier than walking up stairs. It makes sense, then, that lowering the weight should take more time to complete than raising the weight.

The Range of Motion (ROM): A rep should be done throughout the greatest possible ROM that safety allows, from a full stretch to a full contraction and back to a full stretch. Performing reps throughout a full ROM allows you to maintain—or perhaps increase—your flexibility. Moreover, it ensures that you're stimulating your entire muscle—not just a portion of it—thereby making the reps more productive. In other words, full-range exercise is necessary for a full-range effect.

Bottom line: Strength training will be safer and more productive when reps are done with proper technique.

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