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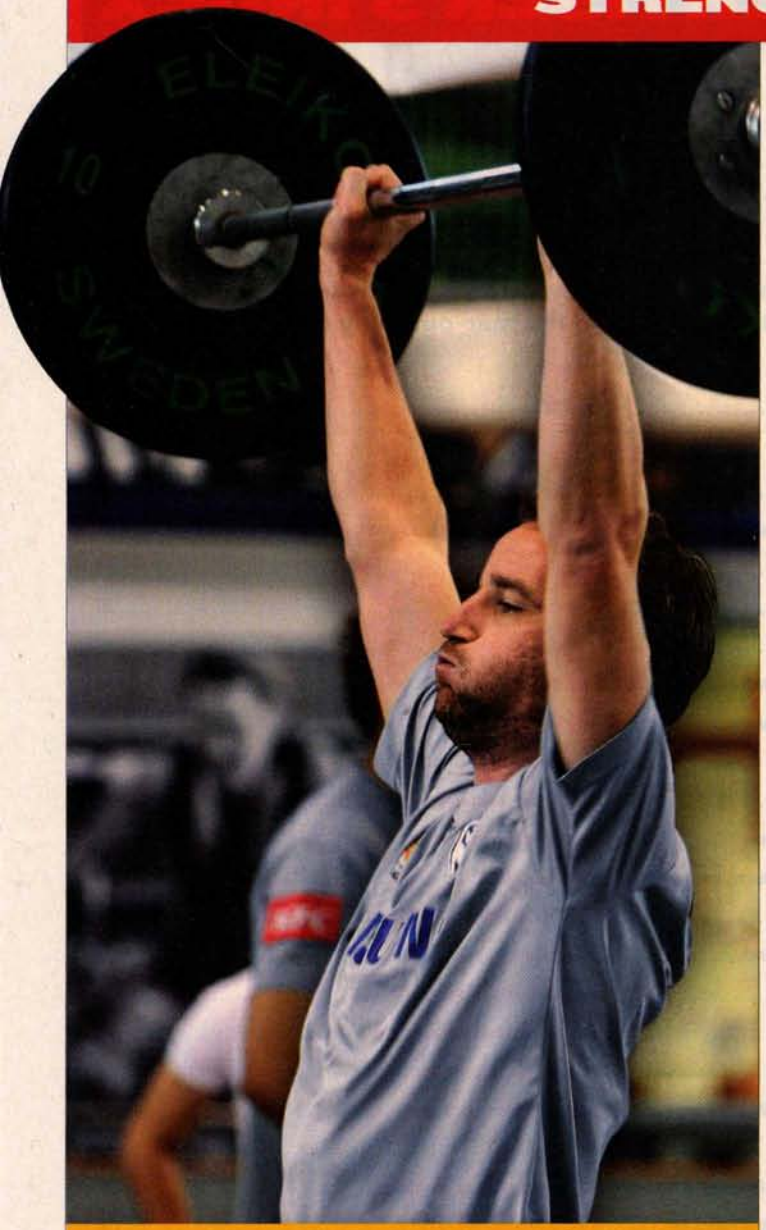

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The Seven Deadly Sins in Exercise Technique

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

A quality program consists of quality workouts. Quality workouts consist of quality sets. And quality sets consist of quality reps. The point here is that the foundation of a quality program is built on quality reps.

A quality rep is one that's safe and productive. These two characteristics can be satisfied by using good technique.

Yet, many athletes aren't aware of their exercise technique. They think that as long as the weight goes up and down, they're getting something out of the exercise. But there's much more to it than that.

Let's take a look at seven common mistakes or "sins" in exercise technique that can be deadly to a quality program.

1. LIFTING THE WEIGHT TOO QUICKLY.

Perhaps the most common mistake in exercise technique is performing reps so fast that an excessive amount of momentum is used to lift the weight. Momentum is desirable when competing on the athletic field. But momentum is undesirable when lifting in the weight room.

By definition, momentum is mass in motion. As soon as a lifter moves a weight (mass), momentum is produced. So, the involvement of momentum is really inescapable. The goal, then, is to minimize its role. Why?

Using an excessive amount of momentum makes an exercise less productive. When too much momentum is used to lift a weight, the muscles produce tension during the first part of the rep—but not for the last part. At this point, the weight is essentially moving by itself. In effect, the load on the muscles is eliminated and so are the potential gains in muscular strength.

To illustrate this phenomenon, imagine raising the weight so quickly on a leg-extension machine that the pad leaves the lower legs partway through the rep. Think about it; if the pad is no longer in contact with the lower legs, there's no load on the muscles. If there's no load on the muscles, there's no stimulus or reason for them to adapt.

Sure, some benefit will be obtained when the muscles are loaded during the first part of the rep (when the pad is against the lower legs). However, no benefit will be obtained when the muscles are *unloaded* during the last part of the rep (when the pad isn't against the lower legs).

Your athletes should understand that it isn't a race to see how quickly they can do their reps. To make each rep as productive as possible, weights should be lifted in a controlled and deliberate manner.

2. USING PERIPHERAL (OR SECONDARY) MUSCLES.

Another ubiquitous mistake in exercise technique is using muscles other than those being targeted. Doug Scott, the Strength Coach at The Pingry School in Martinsville, NJ,

Paul Kane/Getty Images

refers to these unwanted actions as the use of excessive "body English." This mistake rears its ugly head in a variety of exercises. In all instances, it's done to lift more weight or do more reps. Here are some examples of exercises in which this happens most frequently:

During the bench press with a barbell, lifters raise and lower their hips. This increases the risk of injury to their lower back. In this exercise, movement should only occur at their shoulder and elbow joints.

During the pec fly and pullover with a machine, lifters bend back and forth at their waist. This engages their abdominal muscles. In these exercises, movement should only occur at their shoulder joint.

During the chin-up or pull-up, athletes swing, kick, "kip" and/or "bicycle" their legs. This engages a number of peripheral muscles. In these exercises, movement should only occur at their shoulder and elbow joints.

During the seated row and lat pulldown, lifters bend back and forth at their waist. This engages their low-back muscles. In these exercises, movement should only occur at their shoulder and elbow joints.

During the bent-over row with a dumbbell, lifters rotate their torso. This engages their low-back muscles and obliques. In this exercise, movement should only occur at their shoulder and elbow joints.

Granted, it's natural for a little unwanted movement to occur when these exercises (and others) are performed no matter how strict the technique. But the use of peripheral muscles should be kept to a minimum. Remember, the more work that's done by secondary muscles, the less work that's done by primary muscles.

3. USING TOO MUCH WEIGHT OR NOT ENOUGH.

One of the key tenets in improving strength is that the muscles must be exposed to a meaningful and appropriate workload. Specifically, the weight used in any given exercise must be challenging enough to reach or approach muscular fatigue within a designated range of reps (or window of time). If the weight is too heavy, it invites poor technique and possible injury; if the weight is too light, it hinders improvements.

Left to their own devices, many lifters will arbitrarily select any old weight on just about all of their exercises. One mother told me that her 15-year-old son watches the strongest guy in the weight room at his school and uses half of whatever weight that person is lifting. Selecting a weight doesn't get much more unscientific than that.

This discussion underscores the importance of having your athletes record their data on a workout card (most importantly, their weights and reps for each exercise). Maintaining records is an extremely valuable tool for your athletes to make their workouts more productive and for you to monitor their progress.

Show me an athlete who says that he doesn't need to use a workout card because he can remember his weights and reps and I'll show you an athlete who's been using the same weights and doing the same reps for so long that the information has become firmly entrenched in his long-term memory.

4. PERFORMING PARTIAL REPS.

In the bench press, do your athletes lower the bar all the way down to their chest or do they stop halfway? In the chin-up or pull-up, do your athletes lower their body all the way down to a "dead hang" or do they stop before their arms are completely straight?

Unfortunately, many lifters don't do their reps throughout a full range of motion in these and other exercises. This often happens because they're using too much weight and must limit their range of motion in order to achieve a certain number of reps. In other cases, their range of motion decreases with each successive rep as they become more fatigued. And sometimes, lifters simply do partial reps.

The fact of the matter is that each rep should be performed throughout the greatest possible range of motion that safety allows. In general, reps should be done from a full stretch to a full muscular contraction and back to a full stretch. **There are two main reasons why this should be done.**

1. Doing reps throughout a full range of motion allows ath-

letes to maintain (or perhaps increase) their flexibility. After a while, doing partial reps will almost certainly render them less flexible.

2. Doing reps throughout a full range of motion ensures that the entire muscle is being stimulated, not just a portion of it. Numerous studies have shown that increases in strength are specific to the joint angle being worked *plus or minus a few degrees.* So, limited-range reps will produce limited-range effects. It becomes crystal clear, then, that performing full-range reps is a requirement for obtaining full-range effects.

A potential outcome of partial reps is a higher risk of injury. Mike Shibinski, the Strength Coach at Princeton High School in Cincinnati, OH, says, "Over time, doing partial reps can lead to weaknesses in muscles and connective tissues such as ligaments and tendons. And when doing aggressive movements like jumping or sprinting, weak support structures are more susceptible to breaking down or tearing." He adds, "Athletes are only as strong as the weakest part of their muscles and connective tissues."

5. USING INCORRECT APPLICATIONS OF FORCE.

In order for an exercise to be as productive as possible, the resistance must oppose the force that's generated by the lifter by 180 degrees. In other words, the resistance must be exactly opposite the direction of the applied force. If the resistance is from the south, the lifter must pull north; if the resistance is from the east, the lifter must pull west.

Gravity is a force that always pulls straight down. Because of the effects of gravity, the force that's applied to free weights (barbells and dumbbells) must be in a vertical plane (straight up and down). When a lifter pushes or pulls a barbell or dumbbell straight up while gravity acts straight down, the application of force is absolutely perfect.

Consider the shoulder shrug with a barbell. In this exercise, the lifter pulls straight up and the resistance is straight down. Here, the application of force is correct. But force is misapplied when lifters "roll" their shoulders at the top of the movement. Now, the lifter pulls straight back but the resistance is still straight down. So, pulling the shoulders back in this exercise is an incorrect and ineffective application of force.

Another exercise in which force is often misapplied is the rotary torso with a wooden stick or similar object. Many lifters sit on a bench, place the object across their shoulders and rotate their torso from side to side. Again, doing this is an incorrect application of force. No matter how much the object weighs, the resistance is always straight down. But here, the lifter needs resistance that's parallel to the floor, not perpendicular to it.

6. BOUNCING THE WEIGHT.

At one time or another, just about everyone has been asked "How much can you lift?" Some lifters, though, should be asked, "How much can you bounce?"

In the leg press, for example, lifters often bounce the weight off the rubber bumpers that are attached to the frame of the machine. Another exercise in which lifters often bounce the weight is the bench press with a barbell.

"Bouncing the bar off the chest when doing the bench press is probably the one mistake in technique that I see most frequently," says Rick Rignell, the Strength Coach at Anoka (MN) High School, "and it's one of the toughest habits to break."

In these exercises (and others), bouncing the weight gives the lifter a great deal of assistance from the rebound. Getting this "boost" means that less work is being done by the muscles. In other words, the demands on the muscles are reduced. And reduced demands on the muscles equate to reduced results.

What's the solution? Coach Rignell offers this simple but sage advice: "Bouncing can be eliminated by reminding lifters to slow down when they perform the negative [lowering] phase of an exercise."

7. HOLDING THE BREATH.

It's important for lifters to breathe properly when they do strenuous activities such as strength training, especially during intense efforts. Holding the breath during exertion creates an elevated pressure in the abdominal and thoracic cavities which is referred to as the "Valsalva maneuver." The elevated pressure interferes with the return of blood to the heart. This may deprive the brain of blood and can trigger a loss of consciousness.

Should lifters breathe in when raising a weight and out when lowering it or do the opposite? Well, it doesn't seem to matter too much whether they inhale or exhale as the weight is raised. As it turns out, inhaling and exhaling naturally usually results in correct breathing. This is fortunate since it may be difficult for some individuals to maintain a set pattern of breathing when they lift weights.

THE LAST REP

Poor technique can wreak havoc on any program. Weights shouldn't be bounced, flung, heaved, hoisted, launched, thrown, or yanked. Athletes must make a determined effort to perform their reps with good technique. Doing otherwise is a sin! ■

Matt Brzycki is the Assistant Director of Campus Recreation, Fitness at Princeton University in Princeton, New Jersey). He has authored, co-authored and edited 17 books on strength and fitness including *Youth Fitness: An Action Plan for Shaping America's Kids*.