

# ACE STUDY REVEALS BEST BICEPS EXERCISES

*Exclusive ACE research evaluates  
8 popular biceps exercises to find  
which is the most effective.*

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**A**s a personal trainer at the local gym, Scott Young worked the desk a lot, which gave him a unique vantage point. From the desk he could see it all, including which lifts and exercises the members did most often. It should come as no surprise that at Scott's gym—and most others across the nation—the biceps brachii (the biceps muscle) is one of the most coveted, sought after and overly trained muscles in the human body.

Goad a man into “showing his muscles” and undoubtedly he’ll give you the good ol’ double biceps pose. “Where’s the gun show?” “It’s thatta way!”

We asked Young what he thought were the most popular biceps exercise at his gym: “I would say the standing dumbbell and barbell curls and the preacher curls seem to be really popular because people can turn and look at their left or right arm while they’re doing it,” says Young. “And in their head they’re thinking, ‘I’m getting bigger, I’m getting stronger’—that type of thing.” With so much time and attention given to the glorious biceps, it’s surprising that there has been no real conclusive research to determine which is the most effective exercise for targeting the biceps.

So the American Council on Exercise, America’s Workout Watchdog, commissioned the exercise scientists at the University of Wisconsin–LaCrosse and its Clinical Exercise Physiology program to find an answer. Young, now a graduate student at UWLAX, would help shepherd the study along under the guidance of department head John Porcari, Ph.D.

## THE STUDY

To determine which exercise is the most beneficial for activating the biceps brachii, researchers compiled a list of the eight most commonly used exercises for targeting the biceps:

- Cable curl
- Barbell curl
- Concentration curl
- Chin-up
- EZ Curl (with both wide and narrow grip)



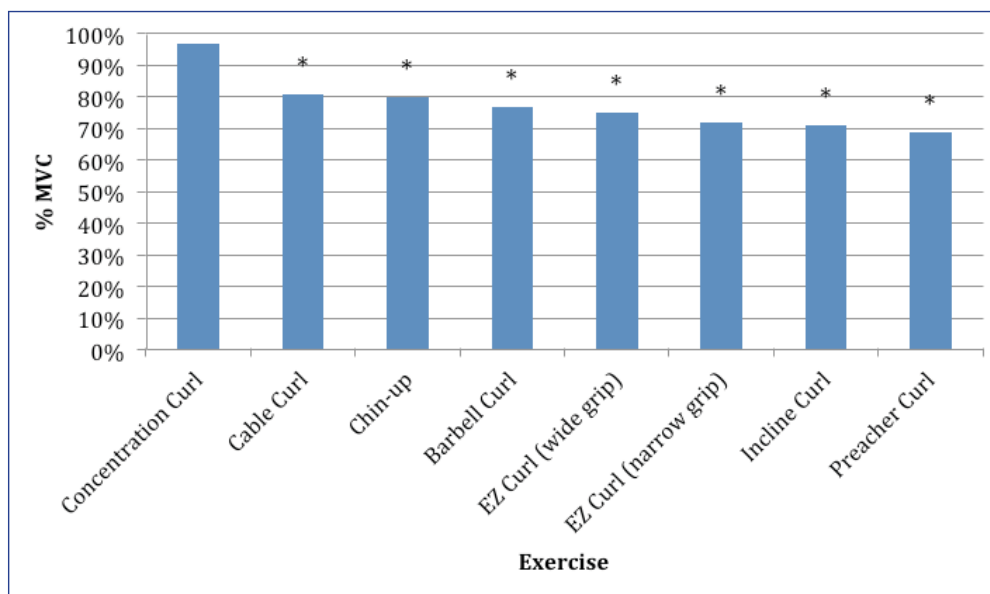
- Incline curl
- Preacher curl

Next, the researchers recruited 16 healthy, female and male volunteers (eight men and eight women) between the ages of 18 and 24. All of the subjects had some form of weightlifting experience to ensure that during testing the exercises would be performed correctly.

Prior to the actual study, each subject attended one practice session in which researchers made sure that the subjects understood how to perform each of the exercises and were acquainted with the testing procedures. To establish a baseline of fitness, the subjects also completed a one-repetition maximum (1-RM) for each of the eight exercises.

On the first day of testing, researchers affixed electrodes on the biceps brachii (BB), anterior deltoid (AD) and the brachioradialis (BR) of each subject to measure total muscle activity via a wireless electromyography (EMG) machine. Next, subjects began by completing a maximum voluntary contraction (MVC) for the biceps by performing an isometric one-arm cable curl. Following that, researchers randomly assigned four more biceps exercises for the subject to complete. For those lifts that did not use body weight, the subjects used 70 percent of their 1-RM as resistance. A rest period of two minutes was given between each exercise to ensure that subjects were not too tired to complete the required reps. On the second day of testing, subjects were hooked up to the EMG machine again, began with a MVC and then completed each of the four remaining biceps exercises.

**Figure 1**  
Muscle activation of the biceps brachii



\* Significantly different than concentration curl ( $p < 0.05$ ).





## THE RESULTS

Immediately following both testing sessions, researchers crunched the numbers. When compared to the other seven exercises, the concentration curl came out on top, eliciting significantly higher muscle activation of the biceps than any other exercise tested (Figure 1).

According to Porcari, it's important to note, that when training the biceps, other muscles, such as the AD and BR, can become involved in the lift, effectively taking a portion of the load away from the biceps, and thus reducing the relative effectiveness of that lift. With that in mind, researchers found that for the AD, the incline curl, concentration curl and the chin-up had significantly less muscle activation than the barbell curl. The incline curl and preacher curl elicited significantly lower muscle activation of the BR compared to the EZ curl (narrow grip).

## THE BOTTOM LINE

"When you look at it, the concentration curl was significantly better than anything else. And I think the reason is that you're really isolating the biceps muscle more so than in any of the other exercises," explains Porcari. "Some of the other exercises called into play the anterior deltoid or the front of your shoulder more, and for a lot of those, it's almost natural to just swing your whole arm or shoulder forward to stabilize before you lift."

Not only did the current study show that the concentration curl had the greatest biceps activation, but that the activation of the AD was significantly less than most of the other exercises. This may be because during a concentration curl, the humerus is pressed against the leg and does not



allow the upper arm to sway, which isolates the biceps.

According to Young, there may also be something mental going on with the concentration curl (it may be aptly named, after all) to make it markedly more effective. "Motivation-wise, it always helps when you can see results," notes Young. "So when you look down and can see the muscle working it helps with your focus. Whether it's subconscious encouragement or whatever, I think that helps."

That said, Porcari puts the relative effectiveness of the concentration curl into perfect context with this comment: "The upside of doing a concentration curl is that you pretty much totally isolate the biceps. The downside of the concentration curl is that you pretty much isolate the biceps."

So if you're bodybuilder, or a lover of the mirror, and you want to really work your biceps, then there's one clear choice: the concentration curl. But if you want to strengthen your biceps and other muscles of the arm for functional fitness, to make yourself better at the everyday movements we encounter in daily life, then you have more options. For sure, every arm workout should include the concentration curl, but the best way to ensure that you activate other key muscles of the arms is to sprinkle a couple of the other seven biceps exercises into your routine as well.

"Definitely don't skip the concentration curl if you want to get stronger biceps," says Young. "But variety is the spice of life. And you should mix it up and choose from any of the other exercises we tested because they're all pretty much just as good one another." ◆

## SUPER CHARGE THE BICEPS CURL

If you want stronger biceps, you don't want to skip doing concentration curls, as shown in this ACE-sponsored study. But if you're short on time or want to work more muscles, you should check out this [super-charged biceps routine](#), which adds some lower-body work, changes in arm positions and a little cardio power for a fun and efficient workout.

