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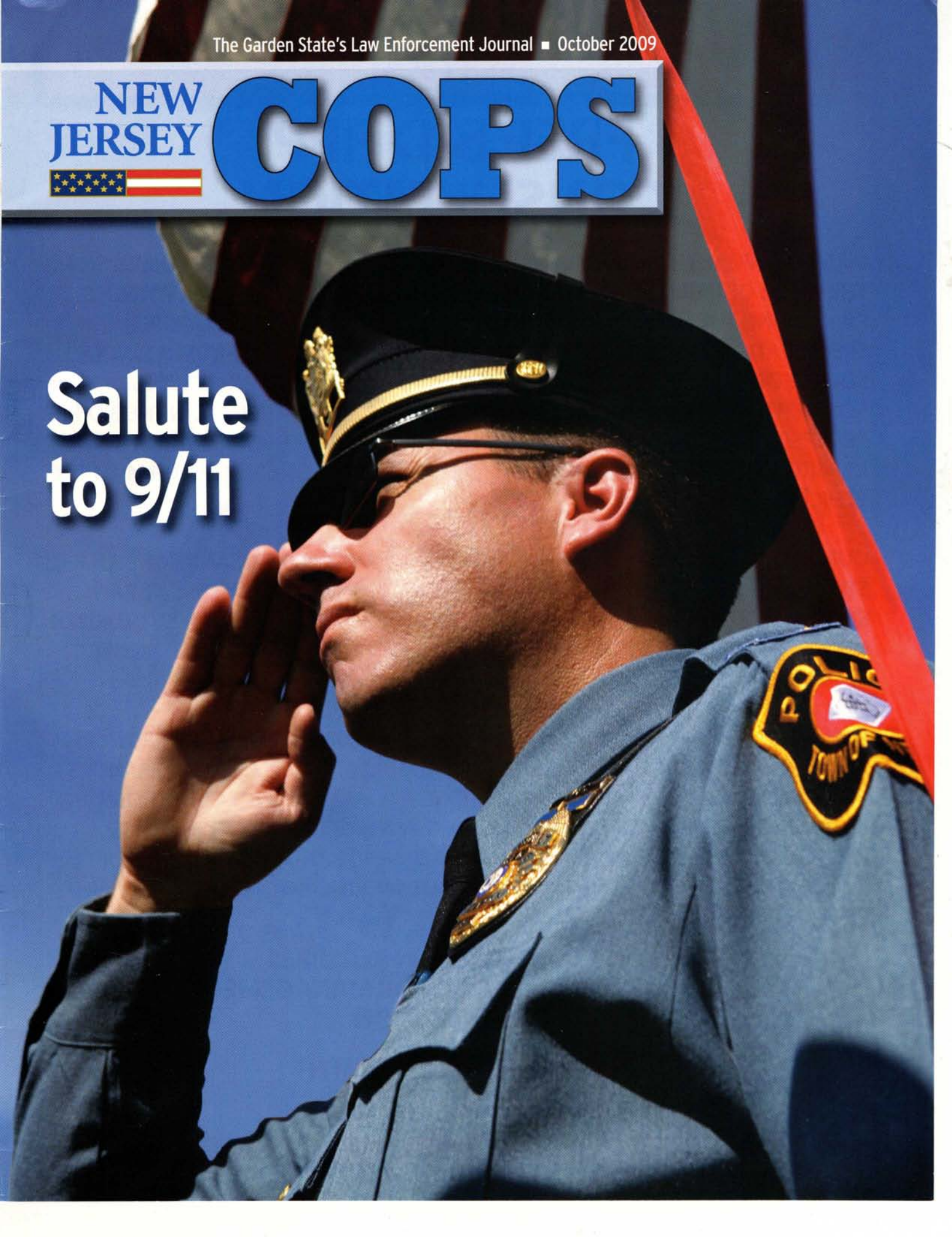
NEW JERSEY COPS



Salute to 9/11

Single limb training

Matt Brzycki

BY MATT BRZYCKI

As a police officer, it's likely that you've gotten your share of bumps and bruises in the performance of your job or other physical activities. Maybe you sprained an ankle during a foot pursuit. Maybe you dislocated your shoulder during a tactical operation. Maybe you hurt your elbow during a workout in the gym. Or maybe you tweaked your hamstring during a recreational softball game.

Quite often, only one side of the body is injured. And that's a good thing when it comes to training and rehabilitation. Let's see why.

WHAT THE RESEARCH SAYS

Many studies have shown that training a muscle on one side of the body has some effect on the contralateral muscle (that is, the same muscle that's on the opposite side of the body). This phenomenon – which first came to light way back in 1894 – has been referred to by several different names including "bilateral transfer," "cross education" and "cross transfer." Although the effect is small, the fact of the matter is that the effect is real.

In a recent study, Canadian researchers randomly assigned 30 subjects to two treatment groups. In both groups, the subjects had their non-dominant wrist, thumb and hand immobilized in a fiberglass cast for a period of 21 days. The difference was that over the course of the 21 days, one group trained their dominant (non-casted) arm five days per week and the other group did not. (A third group served as a control and received no treatment.)

The group that didn't train their non-casted arm showed a 14.7 percent decrease in the strength of their casted arm. Meanwhile, the group that trained their non-casted arm showed a 2.2 percent increase in the strength of their casted arm (as well as a 23.8 percent increase in the strength of their non-casted arm).

In addition, the group that didn't train their non-casted arm had a 4.3 percent decrease in the size of their casted arm. Meanwhile, the group that trained their non-casted arm had a 1.1 percent decrease in the size of their casted arm (as well as a 2.9 percent increase in the size of their non-casted arm).

In summary, those who trained their non-casted arm experienced an increase in strength in their casted (untrained) arm and a smaller decrease in size in their non-casted arm in comparison to those who didn't train their non-casted arm.

Also of note is that there appears to be a strong association between the level of effort and the magnitude of the bilateral transfer. In other words, as the intensity of the effort increases so does the amount of transfer.

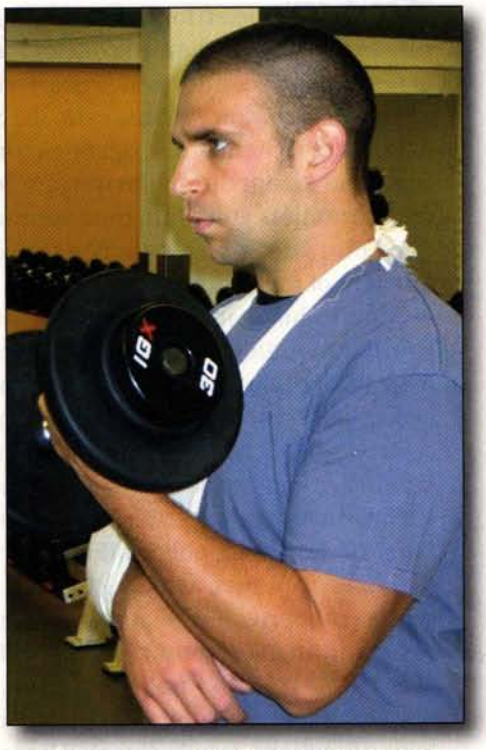
Why does training one side of the body have an effect on the opposite side of the body? Well, the increase in strength in the untrained limb has been attributed to neural adaptation. Support for this theory comes from studies that have found a significant increase in muscular strength without a significant increase in muscular size. It has also been theorized that while the muscles that are being trained perform dynamic contractions the muscles that aren't being trained experience isometric contractions.

Incidentally, several studies have also found that doing a skill with one limb produces an improvement in performance in the other (untrained) limb. Interestingly, this bilateral transfer of skill occurs from hand to foot as well as from hand to hand. The greatest transfer, though, is between the same muscles that are on opposite sides of the body.

The moral of the story is that if you sustain an injury to one limb, you can still train your unaffected limb and receive some benefits on your injured side.

PRACTICAL APPLICATIONS

You can apply this information in your training and rehabilitation in a variety of ways. Here's one example: Suppose that you had shoulder surgery and, as a result, your left arm was placed in a sling. Obviously, the sling wouldn't allow you to perform any exercises that involved any range of motion whatsoever for the left side of your torso. Even so, you could do exercises with the right side of your torso and obtain some improvements in strength on your left (injured) side.



Numerous machines are equipped with independent movement arms that allow you to train your limbs separately. If such machines aren't available, single-limb training can be done in many exercises with dumbbells, resistance bands and manual (partner) resistance.

THE BOTTOM LINE

Regardless of why a bilateral transfer of strength occurs, the important thing to remember is that it occurs. And this neuromuscular fact can be applied to your training and rehabilitation.

Matt Brzycki is the Assistant Director of Campus Recreation, Fitness at Princeton University. A former Marine Drill Instructor, he has authored, co-authored or edited 16 books on strength and fitness, including SWAT Fitness (which is available at www.optacinternational.com).