

# Athletic



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# Strengthening the Neck: Reducing Risk of Cervical Injury

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Suppose that someone were to ask you to "make a muscle." In response to this challenge, very few people would open up their shirt collars and flex their necks. Because the neck is not a "show" muscle like the biceps and triceps, neck exercises are typically deemphasized or neglected altogether. Yet, a strong, thickly muscled neck is extremely important in protecting the cervical area from traumatic injury in contact sports such as football, wrestling, boxing, rugby, soccer and judo.

Injuries primarily occur when an outside force acting upon a joint momentarily exceeds the structural integrity of that joint such that the muscle has been forcefully stretched or extended beyond its existing range of movement. Therefore, in order to reduce the potential for injury, coaches should strengthen the musculature and increase the joints' range of movement (flexibility).

The primary muscles of the neck are the sternocleidomastoideus and the trapezius. The functions of the neck muscles are: flexion of the head forward; extension of the head backward; lateral flexion of the head to the left and right; rotation of the head to the left and right; and elevation of the shoulders. In order to strengthen the neck properly, exercises should be prescribed for as many of the various functions as possible.

## Guidelines for Training the Neck

The following guidelines apply when training the neck musculature:

1. Perform one set of 8-12 repetitions for each prescribed neck exercise to the point of momentary muscular failure. Momentary

muscular failure can best be defined as that instant when it is literally impossible to execute another repetition in good form—not when you think you cannot do another repetition.

2. Good form or technique is raising the weight without momentum, pausing distinctly in the contracted position and lowering the weight at the same speed it was lifted or slower. This applies to all modes of training—Nautilus, Universal, free weights, manual resistance and others. This will ensure that (a) the muscles are raising the weight (rather than momentum) and (b) the chances of incurring an injury while strength training are minimized.

3. Always perform each neck exercise through its full range of movement. Done properly, this will increase flexibility, again reducing the risk of sustaining an injury.

4. Train the neck twice per week during the season (no sooner than 72 hours before a game and the day after the game) and three times per week in the pre-season and post-season (every other day). Never do strength exercises for the neck before a practice session or a game. A fatigued muscle is more prone to injury.

## Neck Exercises

The excuse of not strengthening the neck due to lack of equipment is no longer valid. Manual resistance is a type of exercise in which the resistance is supplied by a training partner/spotter. It was popularized by Dan Riley (current Washington Redskins strength coach) at West Point during the mid-1970s and at Penn State during the late 1970s.

At Princeton University, the wrestling team trains their necks almost exclusively with manual resistance. When performed properly, the neck can be strengthened as effectively with manual resistance as it can with any device available on the market. One Princeton linebacker has demonstrated an increase of approximately 1.25 inches in neck circumference (from 16.5 inches to 17.5 inches) in just two minutes by performing a set of neck flexion and a set of neck extension manually (Photos 1 and 2).

These two exercises (flexion and exten-

Photos 1 and 2: Pete Maruca, Princeton linebacker, before and after performing neck exercises.





Photo 3: Neck flexion (start).



Photo 4: Neck flexion (mid-range).

sion) along with lateral flexion left and right, a shoulder shrug and an upright row constitute a complete neck strengthening program. The six exercises should be performed as follows:

**Neck Flexion:** The lifter should lie supine on a bench so that his head hangs over one end. The spotter should place his dominant hand on the lifter's chin and his other hand on the lifter's forehead (Photo 3). To begin the movement, the lifter should pull his chin to his chest, while the spotter offers resistance evenly throughout the full range of movement. The lifter should now pause briefly in the contracted position (Photo 4) before returning slowly to the starting position against the spotter's resistance.

**Neck Extension:** The lifter should lie prone on a bench so that his head hangs over one end. The spotter should place his dominant hand on the back of the lifter's head and his other hand on the lifter's upper back (Photo 5). To begin the movement, the lifter should pull his head up while the spotter provides resistance evenly throughout the full range of

movement. The lifter should now pause briefly in the contracted position (Photo 6) before returning slowly to the starting position against the spotter's resistance.

**Lateral Flexion Right:** Lateral flexion is best performed manually by the lifter himself. The lifter should stand erect with the left side of his head near his left shoulder and his right hand against the right side of his head (Photo 7). To begin the movement, the lifter should raise his head laterally to the right until it is perpendicular to the ground while offering resistance evenly throughout the full range of movement with his right hand. He should now pause briefly in the contracted position (Photo 8) before returning slowly to the starting position against his own resistance. Reverse the movement for lateral flexion left.

The final two exercises, a shoulder shrug and upright row, can also be performed manually, although it is difficult to spot effectively. For this reason, the exercises will be described using free weights.

**Shoulder Shrug:** The lifter should stand  
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Photo 5: Neck extension (start).



Photo 6: Neck extension (mid-range).



# Neck Strength

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erect with his feet approximately shoulder width apart and hold a dumbbell in each hand at his sides. Without bending his arms, he should raise his shoulders to his ears, pause briefly in the contracted position and return slowly to the starting position. This exercise can be performed with a barbell or on the bench press station of a Universal machine. It can also be done seated on a Nautilus Shoulder Shrug machine.

*Upright Row:* The lifter should stand erect with his feet about shoulder width apart and

hold a barbell in front of him at arm's length. His hands should be approximately 4-6 inches apart with his palms facing him. Without moving his hips or lower back, he pulls the bar directly underneath his chin (keeping his elbows high), pauses briefly in the contracted position and returns slowly to the starting position. An upright row can be performed on the bicep station of a Universal machine, on a Nautilus Multi-Exercise machine or with dumbbells.

In order to get the most out of these last two exercises, the lifter should perform a set of shoulder shrugs followed quickly by a set of upright rows. The shoulder shrug is a primary exercise which will isolate (or pre-exhaust)

the trapezius muscle. The upright row, on the other hand, is a compound exercise which will enlist the biceps to enable the already fatigued trapezius muscle to work even harder. It is important to move from the shoulder shrug to the upright row as fast as possible since the trapezius will recover much of its resting strength within a few seconds.

## Summary

We, as coaches, can take preventive measures against our athletes' risk of sustaining a cervical injury through total body conditioning. Each individual athlete should be as strong, as flexible and as skilled as possible within their own genetic limitations. Cervical injuries could never be avoided altogether, but we can certainly reduce their frequency and severity. □

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Photo 7: Lateral flexion right (start).



Photo 8: Lateral flexion right (mid-range)