

[Protect the Neck](#)

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Prior to joining the football sports performance staff at Stanford University, I was the head strength and conditioning coach at both Columbia University and the University of Memphis. The year before I came to Columbia, the team had nineteen concussions, the second highest in the Ivy League (that year, the highest was twenty). In less than one year, we were able to reduce the team's concussions by 73 percent and had the fewest in the Ivy League at five. The second year, we were the lowest in the Ivy League yet again with five. In addition to these numbers, out of those athletes who sustained a concussion, we previously identified 73 percent of them as at risk for a concussion utilizing our cervical screen protocol. We also had zero concussions during both spring ball and training camp.

At the University of Memphis, we saw similar results, where concussions decreased 50 percent from the previous year, and we were able to identify 75 percent of all players who had a head injury as a risk factor.

This article will give an overview of our cervical screen protocol, the types of neck exercises and volumes used, and my thoughts on how you should be training your athlete's necks to reduce the chance of a concussion.

The Cervical Screen

My primary objective when it comes to reducing head injuries is to eliminate those athletes who we have identified as a risk factor for a concussion. While there are several things out of my control as it relates to head injuries in football, as a strength coach, I can control (and what the research literature has supported to reduce head injury risks) how strong the athlete's neck is, how big it is, and how much range of motion the athlete has. I've developed an objective testing system that measures those three areas and it's tested throughout the year with our team.

We do two different cervical strength tests for the anterior flexors (front of your neck/forward flexion). I only test the anterior flexors because most concussions occur from a direct hit to the front of a face mask, so if we're only testing one area of the neck, the front will give us the best information. A proper

warm-up is essential prior to any neck work or testing. We use a good warm-up consisting of heart rate elevation, neck mobility, and neck activation exercises.

The first neck strength test is easy and anyone with a blood pressure cuff can utilize it. Simply pump the cuff up to 20 mmHg, have the athlete lay on a bench with his hands overhead and his chin tucked, and have him push against the cuff as hard as he can for three seconds. This is essentially a max strength test for the neck. If someone is below our minimum standard, I consider them a strength concern.

The second test we do is a static strength endurance test where we have a dumbbell strap system. For this test, the athlete lays in the exact same position as the blood pressure cuff test and holds his head in neutral with his chin tucked and his hands overhead. If the athlete can maintain the starting head position for thirty seconds, the test is over and he passes. If he falls out of a safe position, the test is stopped and he fails. Simply put, athletes with strength concerns must do extra neck strength work. When we **measure neck size**, it isn't just how big the neck is but how proportionate it is to both neck length (Inion to T1) and head circumference. When I measure neck circumference, I put a box against the wall and have the athlete put his glutes, shoulders, and head against the wall, measuring at a slight angle down below the Adam's apple. It's important to note that I pull the tape "semi-tight" when measuring to ensure that I'm getting a true muscular measure and that I'm getting through that layer of subcutaneous fat in the neck. We then calculate a head-to-neck ratio and a neck-to-length ratio, where the lower the score, the better. If an athlete is below our minimum standards, he must do extra neck size work.

Neck range of motion is done in six measures: forward flexion (>45), extension (>55), right/left lateral flexion (>45), and right/left rotation (>70). If the athlete is below the clinical ranges of motion, we consider them a range of motion concern and extra range of motion work is needed.

Training Methods

We spend a lot of time when it comes to programming neck exercises for our athletes. When I think about neck training, there are several things that should always be present in your weekly program. All six motions need to be trained (with emphasis on rotations) as well as perturbations, isometrics, manual eccentrics, upper trap, and range of motion. With any training program, there needs to be a gradual increase in loading and difficulty of exercises. If you're doing two days of neck training per week, I suggest adding a third day for 8–12 weeks. Every day that we are lifting, we do some form of neck work. But remember, there must always be a balance in workloads, so heavy or high RPE work shouldn't be done every day.

While mainly slow twitch muscles, the cervical muscles need different forms of activation just like any other body part, so exercises should be rotated every four weeks. We use several different neck resistances with our athletes: manual resistance, stability balls, weighted resistance, a six-way neck machine, a four-way neck rack attachment machine, band resistance, sleds, combo methods, and bridging. Neck exercises can be put just about anywhere in your program: before the lift, in the lifting warm-up, during the lift, as an accessory, post-lift, during the running warm-up, conditioning rest periods, post-run, post-practice, or on off days.

Sample Off-Season Training Program					
Day	Exercise	Resistance	Sets	Reps/Time	Tempo (E-1-C)
Monday	Forward/backward neck bridge	Stability ball	2	15 seconds	1-15-1
	Four-way manual neck	Manual	2	20 seconds	4-1-2
Tuesday	Three-way moving neck perturbations	Manual	2	15 seconds each	4-1-4
	Supine cable shrugs	Machine	2	20	2-1-2
Thursday	Combo method neck	Manual + band	2	20 seconds	4-1-2
Friday	Three-way rotations and perturbations	Band + manual	2	20 seconds	4-1-4
	Standing shrug and extension	Dumbbell	3	15	2-1-2

Sample In-season Training Program					
Day	Exercise	Resistance	Sets	Reps/Time	Tempo (E-1-C)
Sunday	Four-way manual neck	Manual	1	30 seconds each	2-1-2
Tuesday	Seated neck rotations	Manual/band	2	15 seconds each	4-1-2
Thursday	Football stance perturbations	Manual	3	20 seconds	1-20-1

Sample Extra Post-practice Work for Concern Players					
Day	Exercise	Issue	Sets	Reps/Time	Tempo (E-1-C)
T, TH	Six-way neck machine	Size concern	2	X 8-12 each	4-1-2
T, TH	Four-way neck rack attachment machine	Strength concern	2	X 3-6 each	4-1-2