

active
living for
all ages

In Motion

A PUBLICATION OF THE AMERICAN ORTHOPAEDIC SOCIETY FOR SPORTS MEDICINE

FALL 2011

Provided in Conjunction with St. Helena Sports Medicine & Orthopaedics



Prevent a Football Burner: Wear a Collar

By Robert A. Gallo, MD

The violent collisions associated with tackling are a fundamental component of football. With each of these collisions, athletes are susceptible to temporary or permanent spinal cord and nerve injury. Fortunately, permanent spinal cord injury sustained during football competition is relatively rare. However, a burner, or stinger as it's sometimes called, is a temporary alteration in sensation and/or strength from the neck and/or shoulder to the arms, and is a common injury among football players. According to one report, up to 65 percent of college football players will experience a burner during their career. Furthermore, the vast majority (85 percent) report at least one recurrence of the injury.

Several different football collars have been developed and widely employed in an attempt to decrease the incidence of burners. The design of these collars is based upon the mechanism by which these injuries occur. Burners are thought to be caused by an abrupt stretch of the nerves as they exit the spine and travel to the shoulder. While most catastrophic spinal cord injuries are caused by forcefully bending the neck forward or applying a force straight down on the head (e.g., landing on one's head), burners result from violent and extreme bending of the neck backwards or to the side. Therefore, all collars function by limiting the potential neck range of motion and, thus, protecting against excessive stretch.

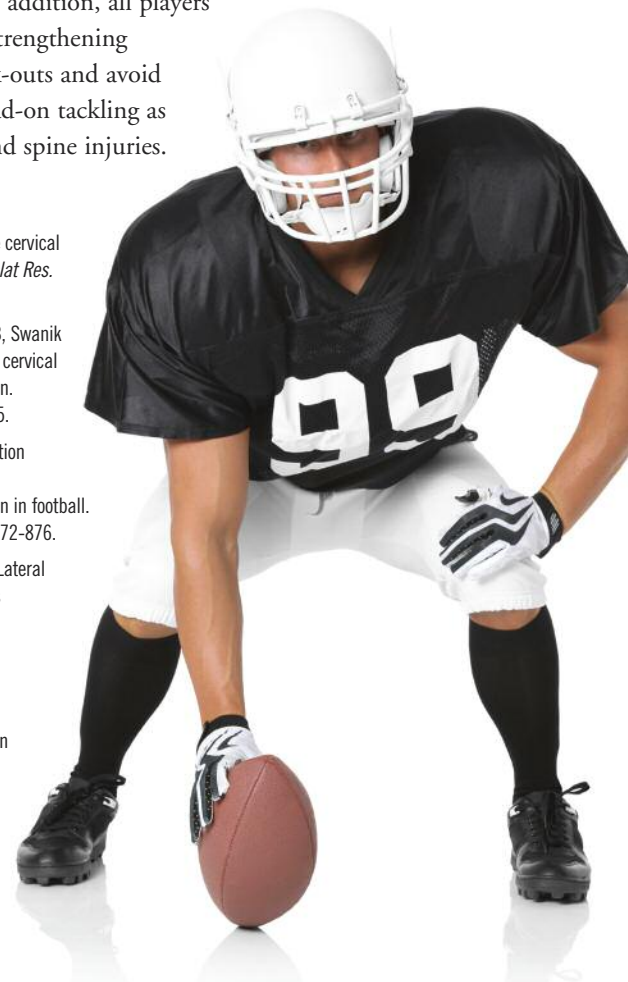
Collars are generally U-shaped to prevent excessive hyperextending and side-bending of the neck. The collars vary in configuration and height and the method of attachment, from attaching directly to shoulder pads to an entirely separate vest. Biomechanical studies in both humans and crash test dummies have consistently shown that most available collars are more effective at limiting

over-extending the neck backwards than preventing over-bending of the neck sideways. These studies have also demonstrated that shoulder pads alone provide little protection against these motions.

The decision to use a football collar should be based on careful consideration of the risk of injury versus amount of motion required to play effectively. For example, those who are subjected to frequent violent collisions such as defensive players or lineman may benefit more from a collar than a quarterback or wide receiver who require more neck motion. In addition, all players should include neck strengthening exercises in their work-outs and avoid spear tackling and head-on tackling as a way to limit neck and spine injuries.

References

- Funk FF, Wells RE. Injuries of the cervical spine in football. *Clin Orthop Relat Res.* 1975;109:50-8.
- Gorden JA, Straub SJ, Swanik CB, Swanik KA. Effects of football collars on cervical hyperextension and lateral flexion. *J Athl Training.* 2003;38:209-215.
- Hovis WD, Limbird TJ. An evaluation of cervical orthoses in limiting hyperextension and lateral flexion in football. *Med Sci Sports Exerc.* 1994;26:872-876.
- Rowson S, McNeely D, Duma S. Lateral bending biomechanical analysis of neck protection devices used in football. *Biomed Sci Instrum.* 2007;43:200-205.
- Sallis RE, Jones K, Knopp W. Burners: offensive strategy for an underreported injury. *Physician Sportsmed.* 1992;20:47-55.





Picking Appropriate Cleats Might Help Prevent Injury

By Brian Wolf, MD

There are several sports where using cleats are beneficial for traction. Deciding on what type of cleat to use is tied very closely to the sport being played and the surface that is used. There are subtle differences between cleats that are designed for American football, soccer, and baseball. Soccer cleats often have a different toe box design due to the need for frequent kicking.

There are two basic designs for cleats, molded and screw in types. Molded cleats are the most common and cannot be changed or modified on the shoe. Most molded cleats are a standard length and do well on most turf grass surfaces and natural grass surfaces. These are most common for the average athlete and league. Screw in cleats are designed so that the athlete can exchange the cleats on the bottom of the shoe and potentially put in longer or shorter cleats. This design is more common for upper echelon players and leagues.

Longer cleats are often more helpful in wet conditions and on soft or soggy playing fields. Shorter cleats are preferred for harder and firmer playing surfaces. Cleats are generally not used for indoor competitions unless modern turf grass is used, as cleats can tear up the surfaces. When the surface is a very short turf, then a sneaker-like turf shoe with a rubber sole that has small nubs, is often the preferable shoe.

Picking the right cleat for the right surface may help improve performance and lessen the chances for injury.



Picking the right cleat for the right surface may help improve performance and lessen the chances for injury.



Getting a Pre-Participation Physical Spots Issues Early

By Kenneth Fine, MD

The pre-participation physical evaluation (PPE) is a screening examination that is administered to athletes prior to the beginning of a sports season. Objectives of the pre-participation evaluation include:

- Screening for life-threatening or permanent conditions, such as heart conditions or asthma
- Screening for treatable or avoidable injuries, such as muscle injuries
- Interacting with a physician or healthcare provider.

Although the PPE is not meant as a thorough medical exam, it may be the only opportunity for many athletes to interact with a physician on a regular basis. A simple conversation might bring up an issue that could easily be solved and prevent future issues.

Most schools, colleges, professional, national, and international sports organizations require PPEs. Exact requirements, including the frequency of subsequent PPEs, (yearly, every two years, or only before the first year of competition) vary among schools, states, and organizations.

The PPE may be performed by the athlete's primary care physician or by a coordinated medical team with "stations" for different parts of the exam.

How does an athlete get cleared to play?

The majority of athletes are cleared for full participation after the PPE. Some athletes, however, will need further testing or evaluation by other specialists prior to



clearance. In rare cases where participation is restricted, efforts should be made to find an alternative sport at which the athlete can participate. Sports may be categorized by degree of strenuousness and degree of contact. Certain conditions will allow participation for certain categories of sport. For example, a n athlete with a spine injury would not be cleared for tackle football but may be allowed to swim or run track.

What conditions may lead to disqualification?

Although rare, there are many conditions that may result in disqualification from some or all sports, including cardiac, neurological, musculoskeletal, infectious,

dermatologic, and pulmonary issues. Other general conditions that may warrant consideration regarding participation include sickle cell trait, diabetes, loss of a paired organ, eating disorders, and epilepsy. Cardiac issues are especially important because they are the most likely to lead to sudden death in athletes. A general principle is that any athlete who has had any cardiac symptoms such as chest pain, shortness of breath, light-headedness, syncope (passing out), or palpitations (irregular heart beat) should have a thorough medical work-up before being cleared for sports.

What other screening tests might be performed?

Besides the PPE, there are no agreed-upon screening tests for sports participation. There have been controversial recommendations for pre-participation EKGs, echocardiograms, blood tests, including sickle cell trait, ferritin and hemoglobin (for anemia), and urinalysis. Of course, if a potential issue is raised during the PPE, certain tests will then be indicated.

The PPE assesses the safety of athletes to participate in their chosen sport. Although pre-participation screening is important, much research is needed to improve our ability to accurately detect potentially dangerous conditions in athletes. A standardized PPE is a possibility in the future.



To get more information on the PPEs, please visit ppesportsevaluation.org.



About AOSSM and *In Motion*

As a world leader in sports medicine education, the American Orthopaedic Society for Sports Medicine (AOSSM), we have designed the publication to highlight relevant information for multiple age groups from exercise and rehabilitation to nutrition and psychology.

This important educational tool is published quarterly and distributed electronically.

AOSSM members can add their practice name and logo to *In Motion*. Personalizing *In Motion* is an easy way to get pertinent, patient-friendly sports medicine information to your patients with just a click of a mouse. For more information, please e-mail Lisa Weisenberger at lisa@aossm.org or contact the Society at 847/292-4900.

Executive Editor
Bruce Reider, MD

Managing Editor
Lisa Weisenberger

Contributors
Robert Gallo, MD, Kenneth Fine, MD,
John D. Kelly, IV, MD, Brian R. Wolf, MD



Vitamin D Critical to Maintaining Bone Health

By John D. Kelly, IV, MD

Bone health is essential for our well being. Osteoporosis, or loss of bone mass, is an age related phenomenon which may be modified with nutritional supplementation. Both calcium and vitamin D are essential to maintain bone integrity. Each nutritional element is dependent upon the other in order to preserve bone mass. In other words, taking calcium alone may not have any single significant benefit. In fact, a recent report indicated that calcium supplements by themselves may actually increase a person's risk of heart attack and stroke. Calcium stores are best replenished naturally, through food and sun exposure.

The aversion to dairy products coupled with increased soft drink consumption has created a country of calcium starved citizens. Soft drinks may contain phosphoric acid which binds free calcium. Extra calcium is especially important to adolescents undergoing their growth spurt. This is a time of large calcium requirements and where bone mass is accrued rapidly. Lactating women also require extraordinary amounts of calcium, on the order of 1500 mgs daily. Recall that a single glass of skim milk contains 300 mgs of calcium. The need for increased dairy consumption is obvious.

Vitamin D has become the new “wonder vitamin” with benefits not only to bone health reported but also to immune function and possible prevention of heart disease, depression, diabetes, and cancer. Sadly, it is estimated that approximately 90 percent of Americans are vitamin D deficient. Our chief source of vitamin D is sunlight, which converts cholesterol to vitamin D in our skin. However, Americans living in the Northern half of the continent essentially generate no vitamin D from sun exposure between October and April. Furthermore the use of sunscreens has greatly diminished vitamin reserves in many individuals. Thus the need for supplementation is apparent. The recommended daily dose for vitamin D has been increased to 800IU. Some will require more than this to reach adequate levels. You can increase your vitamin D stores by eating low fat dairy products, fortified cereals, and/or supplementation. Be sure to speak with your physician before taking any supplements.

Stay ahead of the game by ensuring you get adequate calcium and vitamin D. Each dietary deposit will help build a strong skeleton — one meant to last a lifetime.

