

Ch.6: Protective sports equipment

The proper selection and fit of sport equipment are essential in the prevention of many sports injuries.

This protection is particularly important in direct contact and collision sports such as football, hockey, and lacrosse, but it can also be important in indirect contact sports as basketball, and soccer.

Currently, there are serious concerns about the standards for protective sports equipment, particularly material durability standards- concerns that include who should set these standards, mass production of equipment, equipment testing methods, and requirements for wearing protective equipment. Some people are concerned that a piece of equipment that protects one athlete may be used as a weapon against another athlete.

Equipment Regulatory Agencies

The following is a list of protective sports equipment regulatory organizations:

- Athletic Equipment Manager Association (AEMA)
- National Association of Intercollegiate Athletics (NAIA)
- National Collegiate Athletic Association (NCAA)
- American National Standards Institute (ANSI)
- United States Olympic Committee (USOC)

Legal Concerns

Manufacturers and purchasers of equipment must foresee all possible uses and misuses of the equipment and must warn the user of any potential risks inherent in the use or misuse of that equipment.

To decrease the possibilities of sports injuries and litigation stemming from equipment, the practitioner should do the following:

- Buy sport equipment from reputable manufacturers
- Buy the safest equipment that resources will permit
- Make sure that all equipment is assembled correctly. The person who assembles equipment must be competent to do so and must follow the manufacturers guidelines.
- Use equipment only for the purpose for which it is designed
- Warn athletes who use the equipment about all possible risk that using the equipment could entail
- Use great caution in the construction or customizing of any piece of equipment
- Use no defective equipment. All equipment must routinely be inspected for defects, and all defective equipment must be rendered unusable.

Head Protection

- Direct collision sports like football, and hockey require special protective equipment, especially for the head
- Also sports like softball and baseball require helmets for batting

The National Operating Committee on Standards for Athletic Equipment (NOCSAE) has developed standards for football helmet certification

An approved helmet must protect against concussive forces that may injure the brain

ALL HELMETS MUST HAVE A NOCSAE CERTIFICATION, which includes a warning that is placed on all football helmets:

WARNING: Do not strike an opponent with any part of this helmet or facemask. This is a violation of football rules and may cause you to suffer severe brain or neck injury: including paralysis or death. Severe brain or neck injury may also occur accidentally while playing football. NO HELMET CAN PREVENT YOU SUCH INJURIES. USE THIS HELMET AT YOUR OWN RISK.

Athletes must also sign a waiver saying that they have read and understood this warning.

Proper Football Helmet Fit

To properly fit a football helmet:

- The helmet should fit snugly around all parts of the player's head and there should be no gaps between the pads and the head or face
- It should cover the base of the skull. The pads placed at the back of the neck should be snug but not to the extent of discomfort
- It should not come down over the eyes. It should sit $\frac{3}{4}$ inches above the player's eyebrows
- The ear holes should match
- It should not shift when manual pressure is applied
- It should not recoil on impact
- The chin strap should be an equal distance from the center of the helmet
- Straps must keep the helmet from moving up and down or side to side
- The cheek pads should fit snugly against the sides of the face
- The facemask should be attached securely to the helmet, allowing a complete field of vision.

FACE PROTECTION

In sports, the face may be protected by:

- Face guards
- Mouth guards
- Ear guards
- Eye protection devices

FACE GUARDS

Face guards are used in a variety of sports to protect the face from carried or flying objects during collision with another player

Since the adoption of face guards and mouth guards for use in football, mouth injuries have been reduced more than 50%, but the incidence of neck injuries has increased significantly

Particularly, football, lacrosse, hockey, and baseball catchers need to be protected from facial injuries

A great variety of facemasks and bars are available to the players depending on the position played and the protection needed

Laryngotracheal protection (throat)

A Laryngotracheal injury, though uncommon, can be fatal. Baseball catchers, lacrosse goalies, and hockey goalies are most at risk. Throat protection should be mandatory in these sports

MOUTH PROTECTION

The majority of dental traumas can be prevented if the athlete wears customized mouth guards

In addition to protecting the teeth, the mouth guard absorbs the shock of chin blows and helps cerebral concussions. Mouth guards also prevent lacerations to the lips and cheeks and fractures to the lower jaw.

Mouth guards should give the athlete a proper and tight fit, comfort, unrestricted breathing, and unimpeded speech during competition

The athlete's air passages should not be obstructed in any way by the mouthpiece.

Many high schools and colleges require that mouth guards be worn at all times during competition and must be visible to the officials,. Generally, mouth guards are bright colors

The NCAA mandates that a time out be charged to a team if a player fails to wear the mouth guard

EAR GUARD

With the exception of boxing and wrestling, most contact sports do not make a special practice of protecting the ears

Boxing and wrestling can cause irritation of the ears to the point that permanent deformity can result (cauliflower ear)

EYE PROTECTION DEVICES

The national society to prevent blindness estimates that the highest percentages of eye injuries are sport related

Eye protective devices must be sports specific

It is essential that athletes take special precautions to protect their eyes, especially in sports that use fast-moving projectiles and implements

Glasses

- Glasses are a blessing and a nuisance
- Glasses slip off when wet with sweat, get bent when hit, fog from perspiration, detract from peripheral vision, and are difficult to wear with protective head gear

Contact lenses

- Contact lenses come in two types: the corneal type, a hard plastic lens that covers just the iris of the eye and the scleral type, a soft plastic lens that covers the entire front of the eye
- Contact lenses can be tinted to prevent glares. Yellow lenses for ice glare and blue lenses for snow glares.

HAND, WRIST, AND ELBOW PROTECTION

- The hand is perhaps one of the most neglected areas in terms of protection
- The hand should be protected in sports encountering high speed projectiles
- The elbow and wrist often need compression and support for protection

TRUNK AND THORAX PROTECTION

Of particular concern are the exposed bony protuberances of the body that have insufficient soft tissue for protection, such as shoulder, ribs, and spine

****Make sure equipment is not used as a weapon against the opponent. It is for safety****

THORAX

- Rib protectors are often used to protect the thorax

Football shoulder pads

There are two types of shoulder pads: flat and cantilevered. The players, who use their shoulders a great deal for blocking and tackling use the bulky, cantilevered pads. Where a quarterback and a receiver use the flat top.

The following are rules for proper shoulder pad fitting:

- The width of the shoulder is measured to determine the proper size of the pad
- The inside shoulder pad should cover the tip of the shoulder in a direct line with the lateral aspect of the shoulder
- The epaulets and cups should cover the deltoid muscle and allow movement required by specific positions
- The neck opening must allow the athlete to raise the arm over the head without placing undue pressure on the neck yet must not allow the pad to slide back and forth

- Straps underneath the arm must hold the pads firmly in place, but not so they constrict soft tissue. A collar and drop down pads may be added to provide additional protection

BREAST SUPPORT

In the past the primary concern for female breast protection had focused on preventing contusions or bruising

Sports bras are essential. There are two types of sports bras: compressive and supportive

Not wearing bras and/or supportive sports bras while being active may result in damage to the Cooper's ligament. Damage to this ligament causes premature sagging

Understand, some sports, like ice hockey, require women wear chest protectors

HIP AND BUTTOCKS

- Pads in the region of the hips and buttocks are often needed by athletes in collision and high velocity sports such as hockey and football

GROIN AND GENITALIA

- Sports involving high velocity projectiles (hockey, lacrosse, and baseball) require cup protection for male participants
- The cup comes as a stock item that fits place in a jockstrap, or athletic supporter

LIMB PROTECTION

- Limbs are exposed to a great deal to sports injuries and can require protection, or where there is weakness, support
- Compression and mild soft tissue support can be provided by neoprene sleeves, and hard bony areas can be provided by commercial pads

FOOTWEAR

- Footwear can mean the difference between success, failure, and injury in competition

SOCKS

- Poorly fitted socks can cause abnormal stresses on the foot
- For example, socks that are too short crowd the toes socks that are too long can cause skin irritation because of wrinkles. All athletic socks should be clean, dry, and without holes to avoid irritation
- A combination of materials such as cotton and polyester is less bulky and dries faster

SHOES

- Chronic abnormal pressure to the foot can cause permanent structural deformities as well as calluses and blisters
- Also improperly fitted shoes can result in mechanical disturbances that affect the body's total postural balance and may eventually lead to injuries to muscles or joints

Shoe Compression

- All sports shoes should have the following parts: a sole, uppers, heel counter, and toe box

- The sole, or bottom of a shoe is divided into an outer, middle, and inner section, each of which must be sturdy and flexible and must provide a degree of cushioning, depending on the specific sport requirements
- A heel counter should support and cushion the heel and the toe box should protect without crowding
- The uppers must give the foot support and freedom to withstand a high degree of stress
- The toe box, the area between the toes and the front of the shoe, provides room for the toe in the shoe. Most experts recommended that $\frac{1}{2}$ inch to $\frac{3}{4}$ inches should be the distance between the toes and the tip of the shoe

Shoe Fitting

- Understand that generally one foot is larger than the other. Therefore both feet should be measured before trying on a shoe
- It is also desirable to fit the athlete's shoes at the end of the day to accommodate the gradual increase in size that occurs from the time of awakening
- Biomechanics abnormalities should also be addressed (Flat feet = pronation or High Arches = supination)

COMMERCIAL ANKLE SUPPORTS

- Ankle braces can be worn for support and protection in sport
- A plus to ankle braces is unlike ankle taping, ankle braces do not loosen up
- A combination of ankle taping and ankle braces are the best situation for protection

SHIN AND LOWER LEG

- The shin is often neglected in contact and collision sports
- However, shin guards are often worn and required by sports like soccer

KNEE SUPPORTS AND DEVICES

- Devices most frequently used in sports are sleeves, pads and braces
- Elastic knee pads or guards are extremely valuable in sports in which the athlete falls or receives a direct blow to the anterior aspect of the knee