



USE OF PROTECTIVE EQUIPMENT IN RUGBY – PRACTICAL GUIDELINES

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Providing coaches, referees, players, and administrators with the knowledge, skills, and leadership abilities to ensure that safety and best practice principles are incorporated into all aspects of contact rugby.

INTRODUCTION

Rugby attracts large numbers of players of all ages and competency levels. The growth of the sport and the physical nature of the game expose the players to a vast array of injuries. Some of these injuries have the potential to be life-threatening and life-changing.

Several commercial companies are involved in the design and production of a variety of protective equipment and clothing specific to the sport of rugby. Most of these items are available in local sports stores. Despite numerous scientific studies on the effectiveness of the equipment, much controversy remains. To manage and control the protective wear industry, the International Rugby Board (IRB) has issued directives and specifications pertaining to the wearing of protective equipment by players. These are contained in Schedule 1 (regulation 12), dated 2007, entitled “Specifications relating to players’ dress” and Appendix 2 – Law 4.3, entitled “Safety aspects of rugby boot sole design. General Design Guidance”. This comprehensive document is available on the internet at www.irb.com and covers items such as shin guards, fingerless mitts, shoulder pads, head-gear, chest pads for women, studs, and banned items of clothing.

The use of protective wear by the players is increasing, but the information on how to use the equipment in a proper and practical way is lacking.

The aim of this document therefore is to consolidate the available information and provide players, coaches and officials with practical guidelines on using protective equipment.

MOUTH GUARDS

Manufacturers’ claims about mouth guards

- Provide 30 % more protection for teeth and jaws ^[5].
- Reduces injuries to orofacial structures ^[5].
- Minimal interference with breathing and speech ^[5].
- Available in do-it-yourself application / boil and bite ^[14].
- Contribute to protection against concussion ^[31].
- Protects the temporo-mandibular joint (TMJ) against dislocation and related injuries ^[31].
- Protects against internal oral lacerations ^[31].

- Absorbs and reflects damaging impacts ^[31].
- Integrated jaw pads and lateral stabilisers protects against side and bottom jaw impacts ^[31].

Evidence for / against injury prevention

There is some evidence suggesting that custom-made mouth guards are superior to the normal boil-and-bite models ^[10]. Another study ^[34] however, found no difference between the two types of mouth guards.

Most of the scientific studies done ^[3, 11, 21, 28, 30] concluded that players wearing any type of mouth guard had a reduced incidence of fractured teeth and head acceleration, compared to players not using mouth guards. The risk of sustaining orofacial injuries is approximately 1.6 – 1.9 times higher when players do not wear mouth guards. ^[21]

None of the studies however could positively conclude that mouth guards would be effective in preventing concussion.

Advantages

- Reduces the risk of sustaining orofacial injuries.
- Relatively cheap and widely available in all local sports stores.

Disadvantages

- May not be effective in preventing concussions.
- Mouth guards deteriorate structurally over time and with use, and need to be replaced regularly.
- Improperly fitted mouth guards may not be effective. Mouth guards worn by younger players specifically need to be replaced regularly.
- Disease transmission may take place if hygienic practices are insufficient.
- Players' attitudes may change when wearing mouth guards, making them more self-confident and aggressive and thus more prone to possible injury.
- May be uncomfortable to wear, making players nauseous while also impeding speech and breathing.

Practical guidelines

- Mouth guards should be worn during both practice sessions and matches.
- Mouth guards should be inspected regularly for any signs of wear and tear (splits and loss of resilience) and replaced if necessary.
- Adult players should replace their mouth guards at least every 2 years and growing children at least every 6 months.
- To decrease mouth dryness, a light coating of petroleum jelly can be applied to the lips and mouth guard before use and combined with taking frequent sips of water.
- Mouth guards should be stored in a rigid container, washed in cool or lukewarm soapy water and rinsed after cleaning.
- Players should not chew excessively when under stress during a match as this will lead to a quicker deterioration of the mouth guard.

Suppliers and equipment available

Gilbert Rugby:

Offers simple “boil and bite” models, available in three different types: Plain, Flavoured and Razor. All are available in senior and junior sizes, in a variety of different colours and flavours. There are also “International” models available.

Canterbury of New Zealand:

Offers a “boil and bite” and custom-made AirGard as worn by players in 2007 Super 14.

Colour is clear only and available in senior and junior sizes.

Shock Doctor:

Offers “boil and bite” versions only. Several different models available.

Different colours and an Anti-Microbial Mouth Guard case are available.

DynaSport (BSN Medical (Pty) Ltd):

Have a range of “boil and bite” versions available in different sizes.

PROTECTIVE PADDING (E.G. SHOULDER PADS)

Claims

Gilbert Rugby states that all their products meet the technical specifications as set out by the International Rugby Board and are approved for match play.

Gilbert claim that their products:

- Offer superior all-over protection.
- Do not restrict players' movement.
- Have a re-designed padding section for extra protection for the kidneys, biceps, sternum and back.
- Transport moisture away from the body to keep the player cool.
- Have a triflex shoulder padding system that offers superior protection and performance.
- Have cavity shoulder padding.

Canterbury of New Zealand claim that their products:

- Include unique honeycomb shoulder pads.
- Allow free movement, improved breathability and protection.

Medac Pty Ltd (www.medac.co.za / www.medac.org):

- Products are made of Breath-O-Prene® fabric that breathes, thus reducing moisture and perspiration.
- Materials are Latex-free, which ensures less skin irritation.
- Fabrics have an open-cell construction that allows for stretching whilst retaining durability.
- All fabrics are manufactured in a temperature controlled environment, thus ensuring consistent high quality standards in the strength and durability characteristics of the fabric.

Evidence for / against injury prevention

Players use shoulder pads primarily to help absorb and disperse force from direct impact contact. There is still no consensus however as to the effectiveness of shoulder pads in preventing more serious damage to the shoulder joints, as the mechanism of these injuries also involve rotational forces for which the shoulder pads are not designed for. ^[13]

Advantages

May be effective in preventing direct impact contact injuries and reducing minor soft-tissue bruising.

Disadvantages

- May not be effective in preventing serious joint or other major organ damage.
- May give players a false sense of security that they will not get injured, thus changing the way in which they perceive and play the game.
- Fairly expensive.

Practical guidelines

- Should be worn during practices and matches.
- Should fit well (snugly) and not be too big.
- Wash regularly with cool or lukewarm water and rinse properly.
- Should not be tumble dried.

Suppliers and equipment available

Gilbert Rugby:

Have different models available in sizes ranging from extra small to extra, extra large.

Different models have slightly different features.

Canterbury of New Zealand:

Have 4 different models available in all sizes with slightly different features.

Medac (Pty) Ltd:

Have a shoulder brace single cuff and protective shoulder brace available. Both products come in different sizes, ranging from small to XXL in various colours. The single cuff brace may be ordered for a specific shoulder (left or right).

HEAD-GEAR

Claims

Gilbert Rugby states that all their products meet the technical specifications as set out by the International Rugby Board and is approved for match play.

Gilbert claim that their products:

- Have a 3-dimensional fit and are fully flexible for a superior fit.
- Have strategic air vents to improve airflow and thus prevent overheating.
- Have cut-out ear sections to improve communication.
- Have Xact padding for extra protection.

Canterbury of New Zealand claim that their products:

- Have a honeycomb construction providing extra comfort and protection.
- Have high-density cell foam padding, laminated construction and antimicrobial treatment for comfort and durability.
- New mesh ventilator style, specially designed for warmer climates.

Evidence for / against injury prevention

The general consensus of all the studies performed on head-gear is that the use of head-gear should be encouraged for all players at all levels, as it does provide a measure of protection against lacerations and abrasions ^[19, 24, 33].

Most of the studies however also cautioned that although wearing head-gear may provide a measure of protection, its efficiency in preventing concussion has not been conclusively proven ^[20, 33].

Advantages

Head gear provides a measure of protection against minor soft tissue injuries such as bruises and lacerations.

Disadvantages

- May not be adequate protection against concussion.
- Fairly expensive.
- May be uncomfortable (hot, impedes hearing, weight) to wear for some players.
- May alter a player's perception of his own vulnerability and change the way he approaches the game (may become more aggressive).

Practical guidelines

- Head-gear should be worn during both training sessions and matches.
- Head gear should fit properly (different sizes are available).
- Head-gear should be properly fastened using the chin straps.
- If head-gear becomes damaged in any way (torn), it should be replaced.
- Head-gear should be regularly washed with cool or lukewarm water and properly rinsed. This holds true especially after any blood injury!

Suppliers and equipment available

Gilbert Rugby and Canterbury of New Zealand:

Have several different models available in several different colours (white, grey, blue, black).

Sizes available range from small to extra large.

RUGBY BOOT

Claims

Gilbert Rugby states that their boots are:

Lightweight, with durable performance, stable and provide support for all level of players.

Canterbury of New Zealand:

Do not make any specific claims pertaining to safety aspects of their wide range of boots.

Adidas (adidas.com):

Do not make any specific claims regarding the safety aspects of their boots.

Evidence for / against injury prevention

Most of the available studies focus on soccer, tennis and running shoes and not on rugby boots. There is very little information available on the mechanical properties of natural surfaces and the interrelationships between these surfaces, footwear design and injury prevention. Due to the variability of underfoot conditions experienced by rugby players, individual player load differences, footfall patterns and positional differences, it is difficult to make any specific recommendations regarding a desirable rugby boot to suit all players. ^[26]

Advantages

- May protect players against soft tissue bruising of the foot.
- The presence of studs and specific stud configuration may provide players with extra traction and more stability.
- The mid- and high-cut boots may provide players more ankle support and protection against ankle knocks.

Disadvantages

- The studs are a potential source of injury to other players, especially if they are worn down and exposing rough metal edges.
- Studs not properly fastened or worn away may cause problems (falls and ankle sprains) to the player.
- Boots are expensive.

Practical guidelines

- All boot studs worn should conform to IRB specifications (Regulation 12), must not be longer than 21 mm and must not have any burring or sharp edges. A single stud at the toe of the boot is prohibited. The guidelines also contain further detailed information as to the design (materials, construction), shape, dimensions and performance of rugby studs / cleats ^[16].

- Boots should always be worn during both training and matches.
- Boots should fit well and be replaced if too small / large or damaged (torn) in any way.
- If possible, boots should be bought with two sets of studs, one long and one short. Long studs will be used for additional grip in soft underfoot and wet conditions and the shorter studs will be used for harder, drier playing surfaces.
- Players must ensure they have a spare set of laces and studs available.
- Boots should be dried if wet (no direct heat) and polished to preserve the leather.
- If inner soles are removable, these should be frequently washed with a gentle soap to ensure good hygiene.

Suppliers and equipment available

Gilbert Rugby:

Have a wide variety of models available, such as low cut, mid and high cut boots. Some boots are specifically designated as “junior boots”. Two new models were introduced in 2007: Vision Back and Vanguard Forward. The company also produces and sells accessories such as laces, wondertape, aluminium studs and aluminium tipped studs.

Canterbury of New Zealand:

Have a wide variety of boots available. Boots are advertised according to the player profile, such as for the “faster player requiring excellent fit” and with a slim foot type, for the bigger player with a medium foot width and volume, heavier player with a wider and deeper foot type, etc. Design features are specified: internal non-stretch panel support system, TPR heel counter, hydrophobic mesh lining etc.

Adidas:

Have four different boots available. Product information is available on website (www.adidas.com) for each boot. Different studs are also available (Tunit studs).

COMPRESSION GARMENTS

Claims

Canterbury of New Zealand:

Advertise that their garments have a “Canterbury Body Temperature Control System” that is guaranteed to keep the player cool or warm depending on the conditions. The garments have an inbuilt “moisture transport system”, are skin-tight and prevent excessive muscle oscillation, which can waste energy. The compression system is designed to protect the muscles and reduce the buildup of lactic acid.

Peak Performance Fitness (Rockets Compression Garments):

State that their garments are exclusively designed to improve performance by speeding up recovery rate. Scientific studies are quoted to substantiate this statement (http://www.ppfitness.co.za/rr_research.asp).

Medac:

Products are manufactured with a special Breath-O-Prene® material that reduces moisture and perspiration. They are also Latex-free to reduce the risk of skin irritation.

The garments provide support, compression and pain relief and insulate specific body parts, e.g. groin, hamstring, quadriceps and lower back.

It has a two-way stretch, allowing for normal movement whilst giving maximal support.

Injury prevention

Some studies [8, 22] found that fewer than 15 % of players wear protective wear other than mouth guards. Most of the studies done on compression garments indicate that this type of garment may in actual fact be useful in injury reduction, with regard to sprains and strains, and prevent the recurrence of hamstring injuries [3, 9, 23, 32]. Impact forces may be reduced, skin temperature increased and muscle oscillation decreased. [9]

Advantages

- May be useful in injury reduction, with regard to sprains and strains and recurrence of hamstring injuries.
- Warms up muscles quicker and keeps the muscles warm.
- May affect performance parameters positively.

Disadvantages

- May affect performance parameters negatively on less well-conditioned players and if incorrectly fitted.
- Fairly expensive.

Practical guidelines

- Garments should be properly fitted.
- Torn garments should be replaced.
- Garments should not be exposed to high temperatures (ironed) or tumble dried.
- Garments should be washed in cool or lukewarm water and properly rinsed.
- Must be worn under other sport clothes.

Suppliers and equipment available

Gilbert Rugby:

Have a wide variety of different models and sizes available.

Canterbury of New Zealand:

Have a wide variety of different models and sizes available.

Peak Performance Fitness (Rockets) (www.ppfitness.co.za):

Have one model (RCG) long leggings and top available.

Medac:

Have one model (Thermal Thigh/Hamstring Support Shorts) currently available.

STRAPPING AND TAPING

Claims

Leuko:

The various tape products provide even compression, support and consistent control to maintain stability in injured joints or ligaments. Strapping plays an important role in supporting muscles, especially during

aggressive sports activities. It also prevents excessive joint movement, which may cause injuries, such as ankle sprains.

LP support:

Wraps gives heavy-duty support to joints. The elastic and transverse nylon fibres provide extra strength with a loop for controlled compression.

Evidence for / against injury prevention

The areas generally taped are the ankle, knee and hand, and mostly to protect a current or recent injury. A study found that taping of various joints comprised about 24 % of player-weeks over the course of a season [22]. One study found no difference in the incidence of ankle sprains between two groups using either braces or taping [25]. In order for an external device to be effective in supporting a ligament, it should exceed the strength of that particular ligament. As such, taping has a limited effectiveness and its effect may be more psychological in nature. Taping deteriorates rapidly due to the loss of custom fit because of the vigorous movement experienced, while sweating may render taping useless within a few minutes [12]. Support from taping is reduced by 30 – 50 % after 10 minutes of exercise and by 57 % after 30 minutes of exercise [29].

Advantages

May protect a current or recent injury.

The tape can be moulded to fit a particular area that a brace may not be able to cover.

Disadvantages

- Taping is not effective in preventing injuries and if poorly or incorrectly applied may hamper rather than improve performance.
- The effectiveness of taping deteriorates within a few minutes due to excessive movement and moisture (sweating).
- It is time consuming to tape joints, especially in a team sport where one person may have to tape several players – braces are quicker to fit.
- Taping is expensive and cannot be re-used.

Practical guidelines

- An untrained person should not apply taping Do not tape prior to having the injury assessed professionally.
- Ensure the player receives proper rehabilitation instead of just strapping as a matter of course.
- Do not strap in the presence of poor blood circulation. Check circulation frequently.
- Check for abnormal skin reactions (allergies) such as burning or itching. If present – remove taping immediately.
- Shave the area to be strapped (preferably 8 hours before),
- Clean and dry the area prior to strapping
- Do not strap over open wounds.

Suppliers and equipment available

Leuko:

Have a comprehensive range of strong adhesive support bandaging, adhesive non-stretch strapping bandage, aggressively adhesive rigid tape and strong non-adhesive support bandaging.

LP support:

Have a range of protective wrist and ankle wraps.

Elastoplast:

Have a wide range of different adhesive tapes and strapping.

BRACES

Claims

LP support braces:

The support brace provides added stability to prevent displacement of joints and minimises chances of future injuries. It retains body heat to warm the joint and increases blood circulation. Helps relieve pain from tendonitis and arthritis.

Medac:

Provides maximum support in body contact sports.

May be used as protection after injury and prophylaxis in sport.

Evidence for / against injury prevention

The effectiveness of braces depends on the type of material used, the players' joint stability and previous injury history ^[15]. Studies have indicated that off-the-shelf braces have the ability to provide up to 20 – 30 % more resistance to lateral blows to the knee, with custom-fitted braces providing even better protection ^[27]. However, another study also indicated that braces may affect some performance parameters adversely, depending on the type of brace and the experience and strength of the individual player ^[1]. Bracing seems to be used more as a means of protecting current and recent injuries and less as a means of preventing injuries.

Advantages

- It is a cost- and time-effective method of providing support to ligaments and joints.
- May provide a degree of protection to lateral blows to the knee.
- Quick and easy to put on.
- Fairly comfortable to wear.

Disadvantages

- May adversely affect some performance parameters, especially in more inexperienced and less well-conditioned players.

Practical guidelines

- Only braces that conform to the guidelines as set out by the IRB (Regulation 12) may be worn.
- Should be well fitted and worn in preference to taping if allowed.
- Should be worn during both practice sessions and match play.
- Players with a history of ankle or joint instability should undergo proprioception and appropriate strength training in addition to wearing the brace.
- Instructions on the fitting (sizing) and care of braces appear on the manufacturer's products.

Suppliers and equipment available

LP support:

- Mostly made of neoprene. Instructions regarding care sizing are on the box. Different sizes available.
- Have different models for knees: closed patella, open patella, hinged knee support.
- Have different models for ankles: plain, plain with Velcro.
- Have wrist wraps and support-only models for wrists.
- Elbow support neoprene braces also available.

Nike:

Have a range of knee, elbow and ankle sleeves available. No instructions on the box regarding fitting or care.

Dischem Sportmate:

Have their own branded range of elbow, knee and ankle support braces available.

Medac:

Have a wide range of braces available for knees (closed patella, patella/cartilage knee brace and hinged knee braces).

Also have ankle and calf/shin padded sleeves available in a variety of sizes.

Have elbow sleeves, wrist locks and thumb/wrist locks available.

AUTHORS' BIOGRAPHY

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