

HELMET EDUCATION



“Head gear and helmets show reduction in biomechanical forces but have not translated to a reduction in concussion incidence.”

*- 3rd International Conference on Concussion in Sport,
Consensus Statement on Concussion in Sport*

CONTENTS:

CONCUSSIONS 101

HECC 101

HELMETS 101

Reebok

CONCUSSIONS 101



WHAT IS A CONCUSSION?

A concussion is a common form of brain injury, and can be caused by a direct or indirect hit to the head or body (for example, a car crash, fall or sport injury). This causes a change in brain function, which results in a variety of symptoms. With a concussion there is no visible injury to the structure of the brain, meaning that tests like MRI or CT scans usually appear normal.

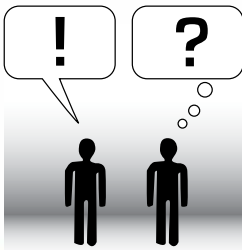
WHAT ACTUALLY HAPPENS?

The brain shifts inside the skull knocking against the inner bony surface. This may be enough to cause microscopic shearing of nerve fibres and probably sets off a process of swelling and a series of chemical reactions; this not only affects the way the brain works (e.g. thinking and co-ordination) but makes the brain susceptible to further injury during the period of recovery.



MYTHS & FACTS:

MYTH - You need to lose consciousness or memory to be diagnosed with concussion.
FACT - Only about 8% of cases of concussion involve loss of consciousness (Oliaro et al, 2001); Concussion may present in many different ways depending on the area of the brain most affected; these may be obvious signs such as blacking out, vomiting or confusion, or more subtle symptoms such as poor concentration or personality changes.
MYTH - Wearing a mouth guard reduces the chance of sustaining a concussion.
FACT - A review of scientific studies shows there is no scientific evidence that wearing a mouth guard reduces either the frequency or severity of concussions. (MTBIFacts.com).



VIENNA CONCUSSION CONFERENCE: RETURN TO PLAY RECOMMENDATIONS.

Athletes should complete the following step-wise process prior to return to play following concussion.

1. Removal from contest following and signs/symptoms of concussion.
2. No return to play in current game
3. Medical evaluation following injury
 - a. Rule out more serious intracranial pathology
 - b. Neuropsychological Testing considered "cornerstone" or proper post-injury assessment
4. Stepwise return to play
 - a. No activity and rest until asymptomatic
 - b. Light aerobic exercise
 - c. Sport-specific training
 - d. Non-contact drills
 - e. Full-contact drills
 - f. Game play



Reebok

WHO IS HECC?

All helmets sold in the United States must comply with the Hockey Equipment Certification Council (HECC) program. HECC is an independent, volunteer, not for profit corporation with its own constitution and by-laws. The HECC Executive Committee is made up of between 9-15 members and is comprised of consumers, hockey equipment manufacturers/retailers, and general interest groups.



HECC'S PURPOSE IS:

1. To seek out and select standards and testing procedures for hockey equipment for the purpose of certification.
2. To develop and establish the criteria and procedures for certification.
3. To design and determine the method of identifying the certified equipment (registered logo).
4. To promote the use of certified products.
5. To monitor the program to ascertain its effectiveness on the sport of hockey.
6. To promote and sponsor research pertaining to the prevention of reduction of injuries in hockey.

WHICH TESTS DOES HECC MANDATE?

Most helmet standards are designed to primarily reduce the risk of a catastrophic injury to the head such as skull fractures. Helmet standards are based on research performed on cadavers and a fundamental understanding of the forces present in ice hockey. The standard presently used to obtain HECC certification for helmets consists of test procedures that ensure:

1. The helmet covers sufficient area of the player's head.
2. The helmet is sufficiently able to stay in place on the player's head (retention).
3. The helmet's effectiveness in absorbing impact.



IMAGE 1

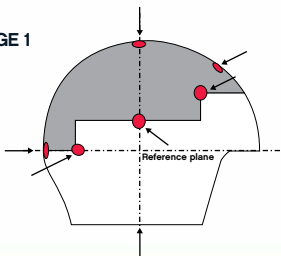
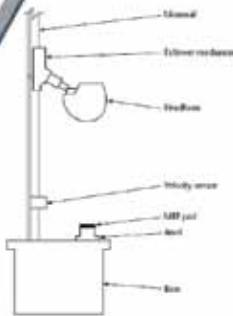


IMAGE 2



THE SPECIFICS FOR EACH ELEMENT OF THE CERTIFICATION TESTING PROCEDURE ARE AS FOLLOWS

- Impact absorption performance test:

- Test apparatus – Monorail Drop (image 2)
- Impact speed – 4.5 m/s
- Impact locations – 6 prescribed & 2 random (anywhere in the shaded test area) (image 1)
- Impacts – 3 per location, 60 seconds apart
- Conditions – Ambient (20°C) / Cold (-25°C) / Elevated (30°C)

- Retention test:

- Elongation – retention system shall not stretch more than 25 mm up to a load of 110 N.
- Release – retention system shall release anywhere between 110 and 500 N.

- Blade penetration test:

- Test blade shall not contact the headform anywhere in the protected area.

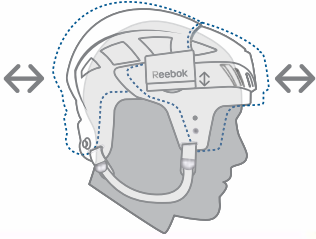
BEST BEFORE DATE - WHAT IT MEANS, WHY IT EXISTS

Standards are reviewed periodically, usually every 5 years, to assure they are up-to-date with any new developments. The rationale for the HECC label expiry, 6.5 years from the date of manufacture, is to keep certification in alignment with the standards.

Please recognize that this date in no way indicates a product's shelf-life or likely life-time use. This date only provides the expiration of the product's HECC certification.



“Head gear and helmets show reduction in biomechanical forces but have not translated to a reduction in concussion incidence.” - 3rd International Conference on Concussion in Sport, Consensus Statement on Concussion in Sport



PURPOSE: TO REDUCE THE RISK OF INJURY TO THE HEAD

To serve this purpose helmets must:

1. Fit properly and snugly.
2. Remain securely positioned on the head.
3. Absorb and dissipate as wide of a range of impact energies.

HELMET FIT

Fit is an extremely important component of safety. To ensure that a helmet is properly fitted the helmet should be adjusted so that it sits approximately a half inch above the eyebrows. The chin strap should also be adjusted so that it touches the underside of the chin. Players should carefully read the instruction manual that accompanies the helmet to ensure that their product performs at the highest level.

HELMET DESIGN

The Shell

The shell of the helmet dissipates the energy from impacts by spreading the energy over a wide area and away from the head. To achieve this, helmets are designed with geometry, such as ridges and bumpers that minimize the flat areas in order to better deflect and disperse impact energy.

The Liner

The liner of the helmet absorbs the energy from impacts to minimize the energy transferred to the head. Generally, softer foams are more effective in absorbing low impact energies while harder foams are more effective in absorbing high impact energies.



THERE ARE DIFFERENT TYPES OF LINERS CURRENTLY USED IN HOCKEY HELMETS:

EPP:

Expanded polypropylene (EPP) is a moldable engineered plastic foam material that was originally developed for motor vehicle and aerospace applications. Its molecular structure makes it lightweight with a very high strength to weight ratio, giving it the ability to withstand multiple impacts without significant damage. EPP is excellent for impact protection and is used extensively in protective helmets, car bumpers, and aircraft cockpits.

VN:

Vinyl nitrile (VN) foams are closed cell products that are available in a wide variety of densities. VN foams are excellent products for cushioning, vibration dampening, and shock absorption. Usually produced in full sheets, VN is die-cut by manufacturers according to their specific needs.

REFERENCES

There is a lot of information concerning helmet standards and concussion prevention and treatment. For more information visit the following websites:

HECC – www.hecc.net

Think First – www.thinkfirst.ca

Sports Concussion South Africa – www.sportsconcussion.co.za

Sport Concussion Institute - www.concussiontreatment.com



Reebok