



**Reducing
direct linear
impacts to
the head by
up to 85%**



Hedkayse



**An introduction
for coaches,
parents and
players**



Hedkayse



Innovate

Using science and technology to develop world-leading protective materials

Educate

Working with globally-renowned experts in concussion recognition, prevention and recovery

Protect

To better protect players and the long term future of rugby in the UK and beyond



Hedkayse

Who we are

Hedkayse origins

- A foam company specialising in head protection
- World's safest repeatable (non-sacrificial) cycle helmets
- Foam tech, **Enkayse®**, being licensed into multiple sports - think 'GORE-TEX' for head safety.

Rugby Division

- George - The brains, 'Q Branch', with a passion for safety & protection - created **Enkayse®**
- Tim Stimpson - Brand Ambassador - Coach @ Market Harborough RFC & Leicester Grammar School - Leicester Tigers, England, British & Irish Lions.
- Ben - Head of Delivery
Teaching & military background, former player & coach, Physiology & Exercise Physiology Lecturer on MSc degree.

Rugby Story

Tim met George at a trade event
Nov 2022.

Impressed by **Enkayse®** he asked
*"Can you make a rugby
headguard to protect my
children?"*

George said "Well, let's try!"

January 2023 we started the
journey to make the world's safest
headguard.

The issue - 'concussions & sub-concussions'

Concussions and brain injuries

- Big, scary topic in the media on an almost daily basis.
- Scares people away from the game and prevents people starting.
- Horrible experience for players resulting in time out from the game and potentially reducing careers.
- Needs contextualising and explaining.

3 key issues from head impacts

- 1 Skull fractures
- 2 mTBI (a.k.a. concussion)
- 3 CTE - Chronic Traumatic Encephalopathy

Total lifetime head injury debt

Cumulative number of total concussive and sub-concussive injuries sustained by an individual - think 'compound interest'

Minimising total lifetime debt is the cornerstone of potential CTE mitigation

Anything that can be done to lower head impacts to a level below sub-concussive threshold is to be applauded.

Are headguards needed?

Independent research from BCOM
176 parents & 131 coaches

What do parents
of youth level
players think?

79%

OF PARENTS

expressed concerns that
their child may could suffer a
potential brain injury from
playing rugby

36%

OF PARENTS

believed traditional scrum
caps protected the brain
from concussion

Designed to look like they protect from impacts



Limitations of Traditional Headgear in Concussion Prevention

TRADITIONAL HEADGEAR PURPOSE

Scrum caps, or headguards, don't protect the brain. They use soft foam to protect against cauliflower ear and cuts & abrasions, they are not designed to reduce head impacts.

WORLD RUGBY PROHIBITS PROTECTIVE HEADGUARDS

According to World Rugby's Law 4 Regulation 12:

- Headgear compliant with this specification is only intended to protect against cuts and abrasions.
- Testing, as per Section 4.3 procedures, mandates that the peak acceleration of impacts to test locations must not be less than 200g.

THE SCIENCE

An Australian study on sports-related concussion (SRC) from 1985-2023, published 19th May 2023 (Inclusive of Rugby, Aussie rules and Soccer) reported that **headguards do not prevent SRC.**

*6,311 players at 173,383 exposure hours showed **0% SRC reduction** per 1,000 hours of exposure in the experimental group compared with the control group.*

Understanding the impact in 'g'

95-100g is the accepted start of concussion

WORLD RUGBY REGULATIONS

According to World Rugby's Law 4 Regulation 12:

"When tested in accordance with the procedures specified in Section 4.3, the peak acceleration of impacts delivered to test locations shall not be less than 200g."

IMPLICATIONS

- Current headguards are restricted by this regulation, they are not allowed to offer protection that reduces impact to below 200g.
- This is above the accepted level for concussion, which starts at 95g.
- Ideally, head and brain protection should extend below 90g and as low as possible, aiming to mitigate the potential of brain injuries associated with impact.

Evolution of World Rugby's Perspective on Head Protection

SHIFT IN FOCUS

World Rugby's emphasis is transitioning towards enhanced head protection.

Initial concerns included preventing the weaponisation of the head and the "Superman syndrome."

CURRENT INITIATIVES

Emphasis on player safety through various measures:

- Sanctions for head contact
- Tackle height changes
- Head Injury Assessment (HIA) / Return to play protocols
- Educational programs fostering understanding
- Instrumented mouth guards for data collection
- Encouragement of advancements in headguard technology, as seen in the 2022 Concussion In Sport Group (CISG)
- Law 4 Headgear Trial

World Rugby's Law 4 Headgear Trial & Hedkayse Compliance

WORLD RUGBY LAW 4 TRIAL

Initiative to field-test new headgear materials.

Requires medical registration for trial participation.

"In an effort to allow manufacturers to 'field-test' new materials which may be of assistance in reducing or helping to prevent head injuries, World Rugby has created a global law trial for headgear (the 'Global Law Trial')"

HEDKAYSE HEADGUARDS COMPLIANCE

FDA Class 1 Medical Device classification

Recognised as a PPE Category I CE & UKCA certifications (Category II pending)

TRIAL APPROVAL STATUS

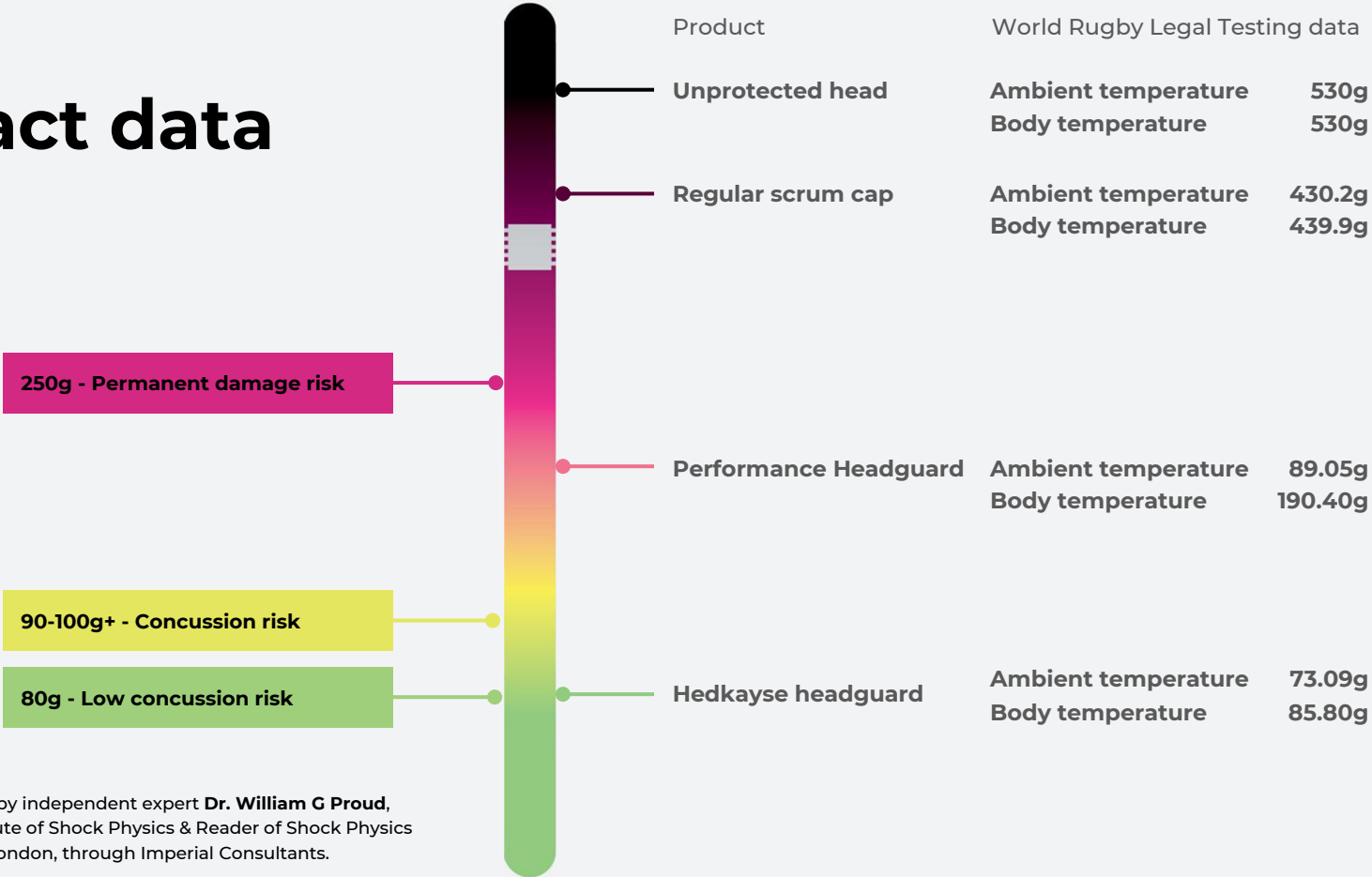
Currently, Hedkayse headguard is permitted for training

(at least 20% of all concussions occur in training)



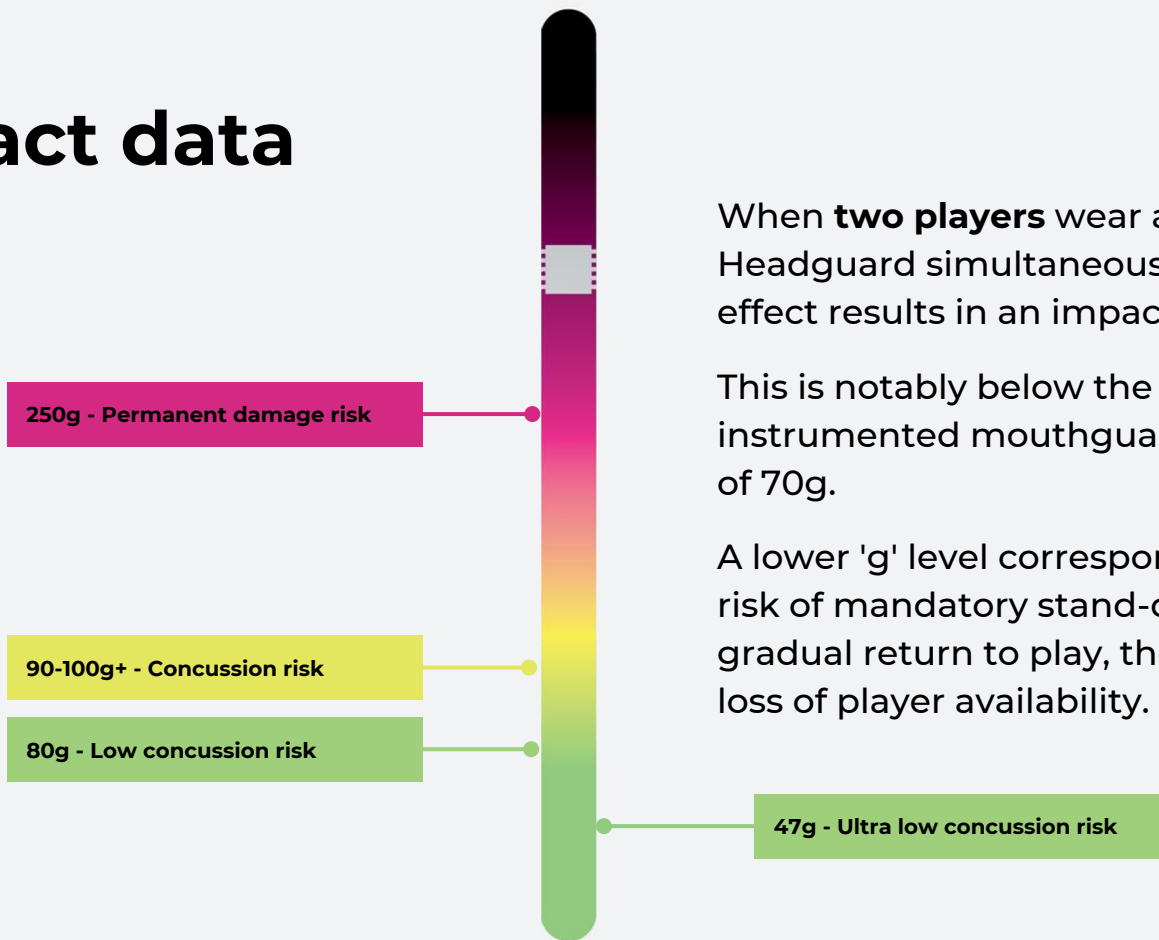
Expected Jan' 24

Impact data



Impact data verified by independent expert **Dr. William G Proud**,
Director of the Institute of Shock Physics & Reader of Shock Physics
at Imperial College London, through Imperial Consultants.

Impact data



When **two players** wear a Hedkayse Headguard simultaneously, the combined effect results in an impact recorded at **47g**.

This is notably below the World Rugby instrumented mouthguard intervention level of 70g.

A lower 'g' level corresponds to a decreased risk of mandatory stand-down and a more gradual return to play, thereby reducing the loss of player availability.

Enkayse®

OUR REVOLUTIONARY MATERIAL

After 4 years and 6,000 tests and iterations, we formulated our revolutionary **Enkayse®** material.

Scientifically and independently proven to offer an unparalleled performance, providing users the best possible protection against head injuries.

Enkayse® has a unique ability to load spread - diffusing the force and mitigating the impact to the skull and brain. **Specifically this material has optimal performance at body temperature.**



Design may look good, but there is nowhere for the impact force to go.



The Design Process

The Design Authority Concept

- Individuals invited to help design the concept
- 'If we could design a protective headguard from scratch, what would it look like?'
- What are the key issues / concepts / feature / benefits?

The Design Authority Council

- Former & current players
- Coaches
- Referees
- Drs & Surgeons
- Designers
- Engineers

All independent and not paid

Key issues

Ideally we wanted 3 key features:

1. A revolutionary impact foam which can load spread.
2. This foam must work at body temperature.
3. There must be as much surface area as possible to provide optimal performance

Answer = 3 large pieces of **Enkayse®** rather than multiple nodes and bumps which are unable to diffuse or load spread force.

Enkayse®



Hedkayse has been designed to never expose an area of the head more than 10mm.

This is achieved by having 3 large pieces of **Enkayse®** foam which provides excellent protection over the whole head.

This, along with the unique properties of **Enkayse®**, especially at body temperature, is the reason for the excellent load spread and force diffusion - which is unparalleled in a headguard.

Key features:

- Machine washable
- Anti-microbial
- 3 year life span

Excellent
situational
awareness

Zero reduction
in hearing

CRITT Sport audiology report



Customisable
design

Superior
ventilation

No lacing, no
weak spots

Occipital lobe
coverage



Not a silver bullet

Hedkayse headguard is not **THE** solution to head impact concerns. It is, however, **PART** of the solution...along with education, tackle technique, neck strength and recovery protocols.

We cannot claim to prevent all concussions

Our aim is to mitigate against multiple sub-concussive impacts.

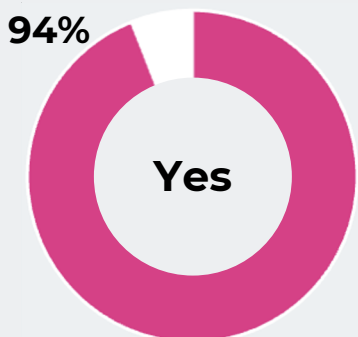
Reducing impacts to 90g and below mitigates the potential of brain injuries.



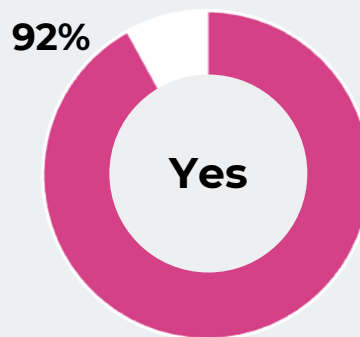
Are headguards wanted?

Independent research from BCOM
176 parents & 131 coaches

Would you recommend your child wears a headguard if it were proven to mitigate the risk of brain injury?



Would you recommend your players wear a headguard if it were proven to mitigate the risk of brain injury?





Innovate Educate Protect



Hedkayse