Snell Standards and Research for Better Protection

January 24, 2021

Rider Choices Zoom Meeting

By Hong Zhang

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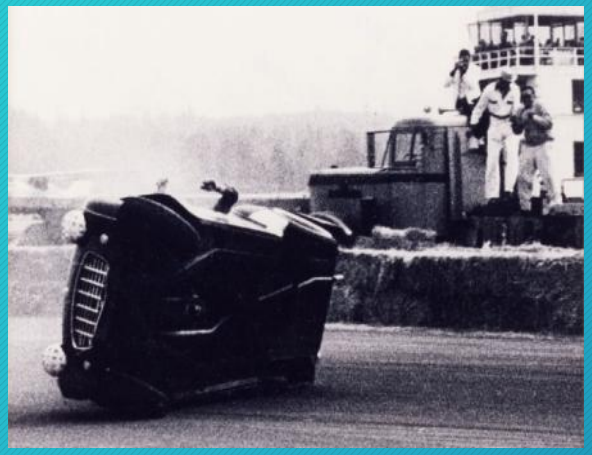
Beginnings

- Amateur Racer William “Pete” Snell
- Rollover Crash in Arcata, California,
  - August 6, 1956
- Pete died of head injuries
  - Sustained in a then state-of-the-art helmet



Helmet in 1950s

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How to Choose Rider Coaches? Which Motorcycle Helmets?

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Snell Motorcycle Helmet Standards

Effectiveness of Standards

- Standards = Documents

- Effectiveness of standards depend on
  - * Strict and independent certification
  - * Enforceable compliance
  - * Experience and competence

- Testing and More Testing

Oldest Snell Testing Photo

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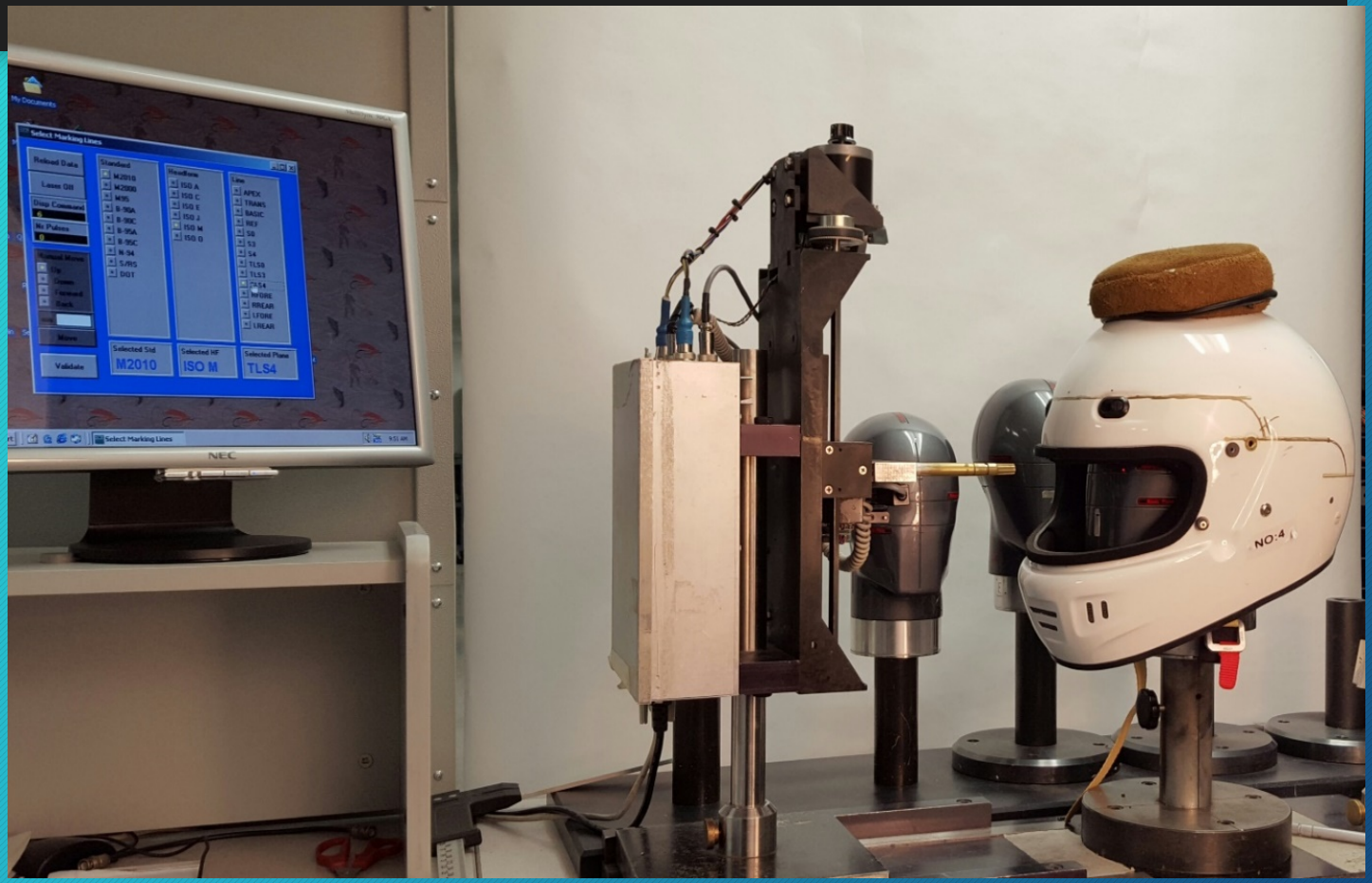
Old Oscilloscope Early 1960s

Snell Test Lab Today



Snell Impact Test

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Snell Penetration Test

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Roll-off Test

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Snell Face Shield Test

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Some fail tests.

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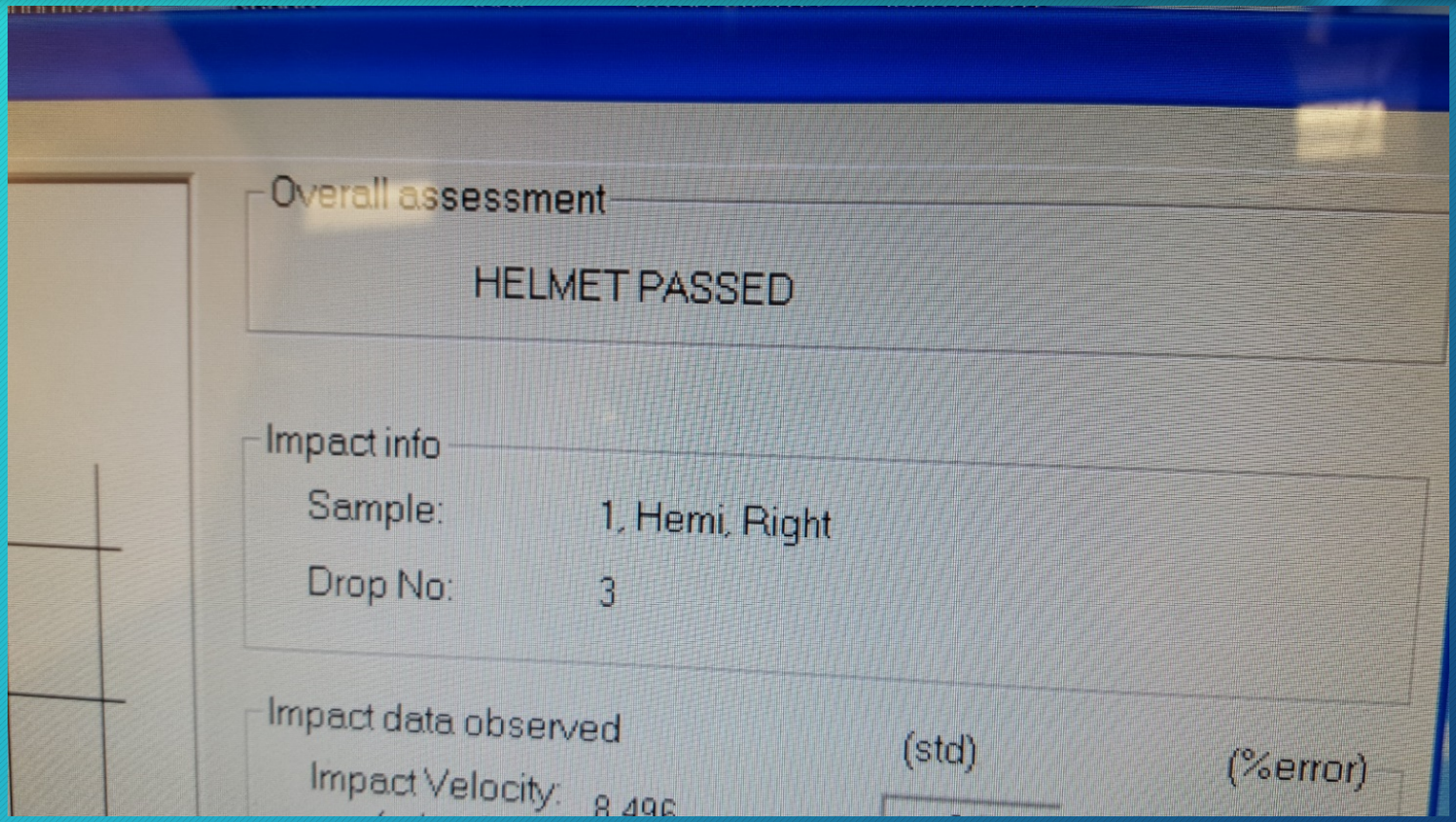
Some pass tests.



Scientifically Valid and Repeatable Test

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Experience and Expertise

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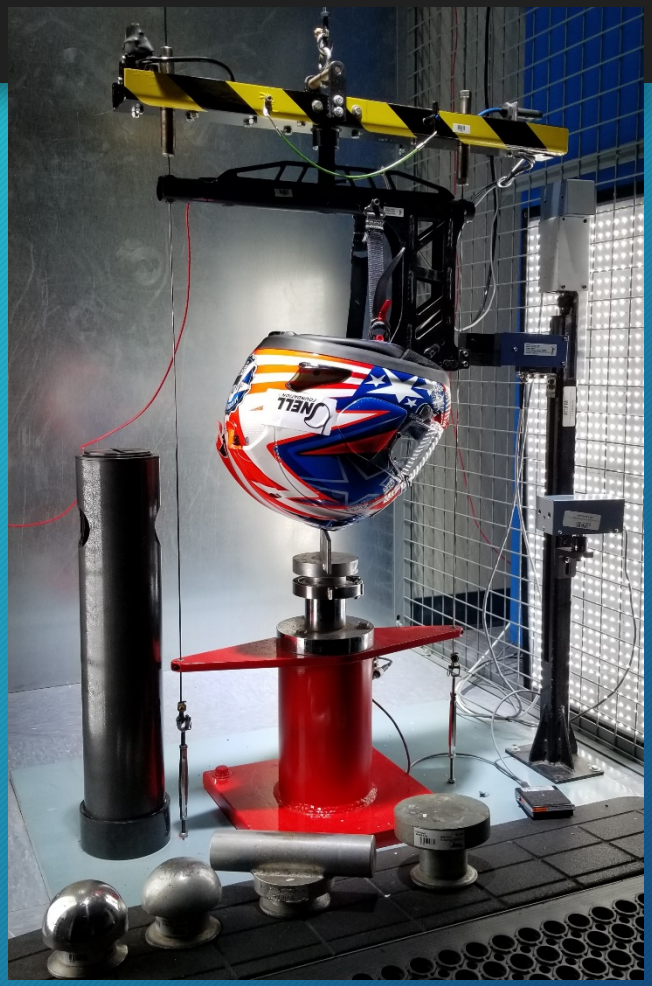
Snell Certification Program

- Tough Standard Requirements
  - To ensure best protection available
- Certification
  - To determine worthy Helmets
- Random Sample Testing
  - To assure compliance of helmets in markets

Snell Certification/RST Testing



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Snell Updates Standards Every 5 Years
M2020 Standard Effective Oct. 1, 2019

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Newer Helmets and Greater Protection

- The effectiveness of helmet has increased from 29% between 1982-1987 to 37% between 1993-2002.(NHTSA reports)
- Tougher Snell Standards
- DOT Standard Unchanged
- Better Designs and Materials

Shell Spreads the Load.
Liner Foam = More Braking Time

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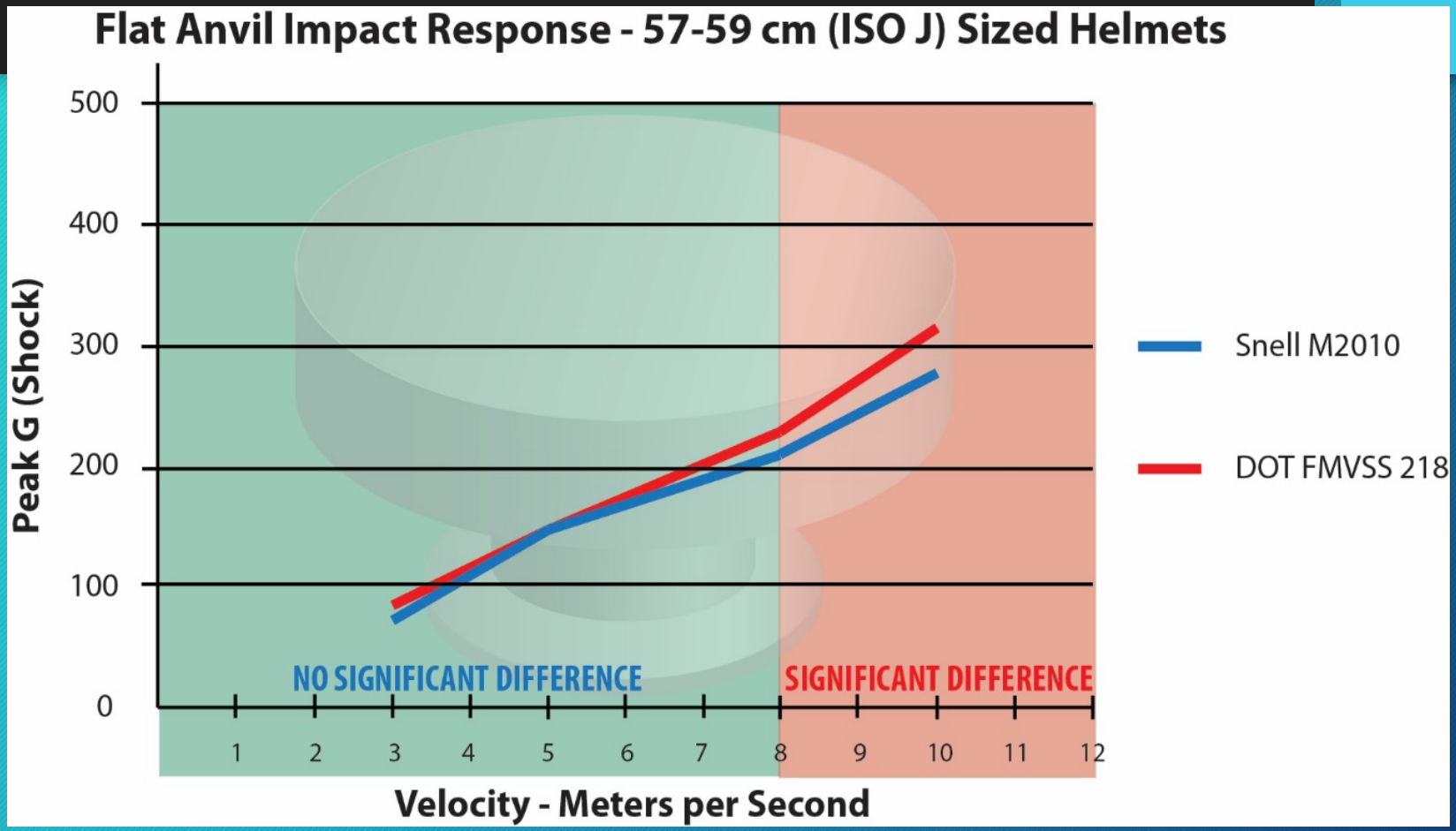
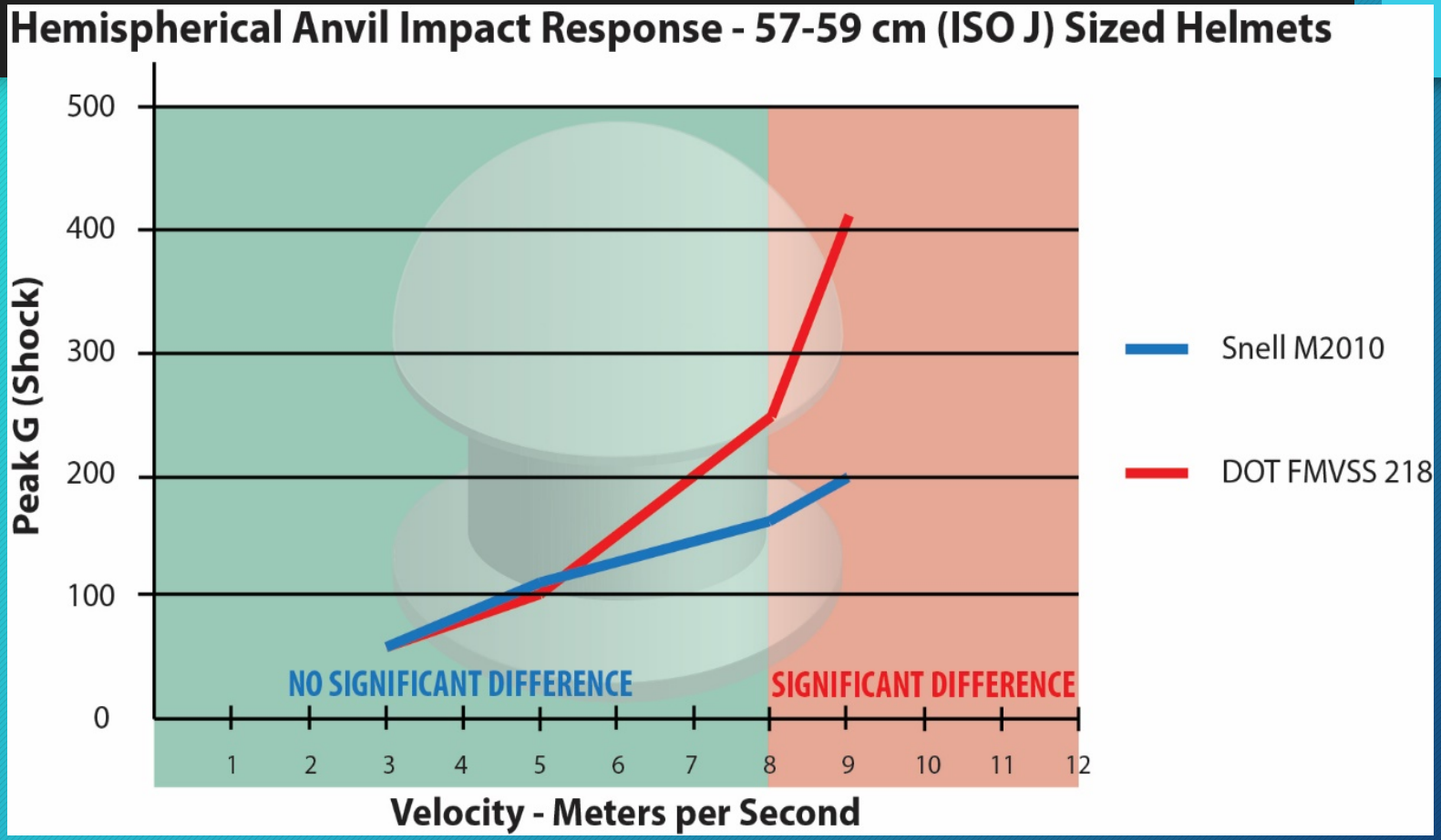
Research Snell vs DOT



Snell Protects/DOT Bottoms Out



Fact Check

- Misinformation that Snell helmets are only for racers.
- DOT is NOT all you need.
- Snell helmets are NOT too hard.
    - Snell and DOT protect the same in minor impacts.
    - Snell continues to protect at higher level impacts long after DOT protection fails.

International Conference of Biomechanics Research (IRCOBI)

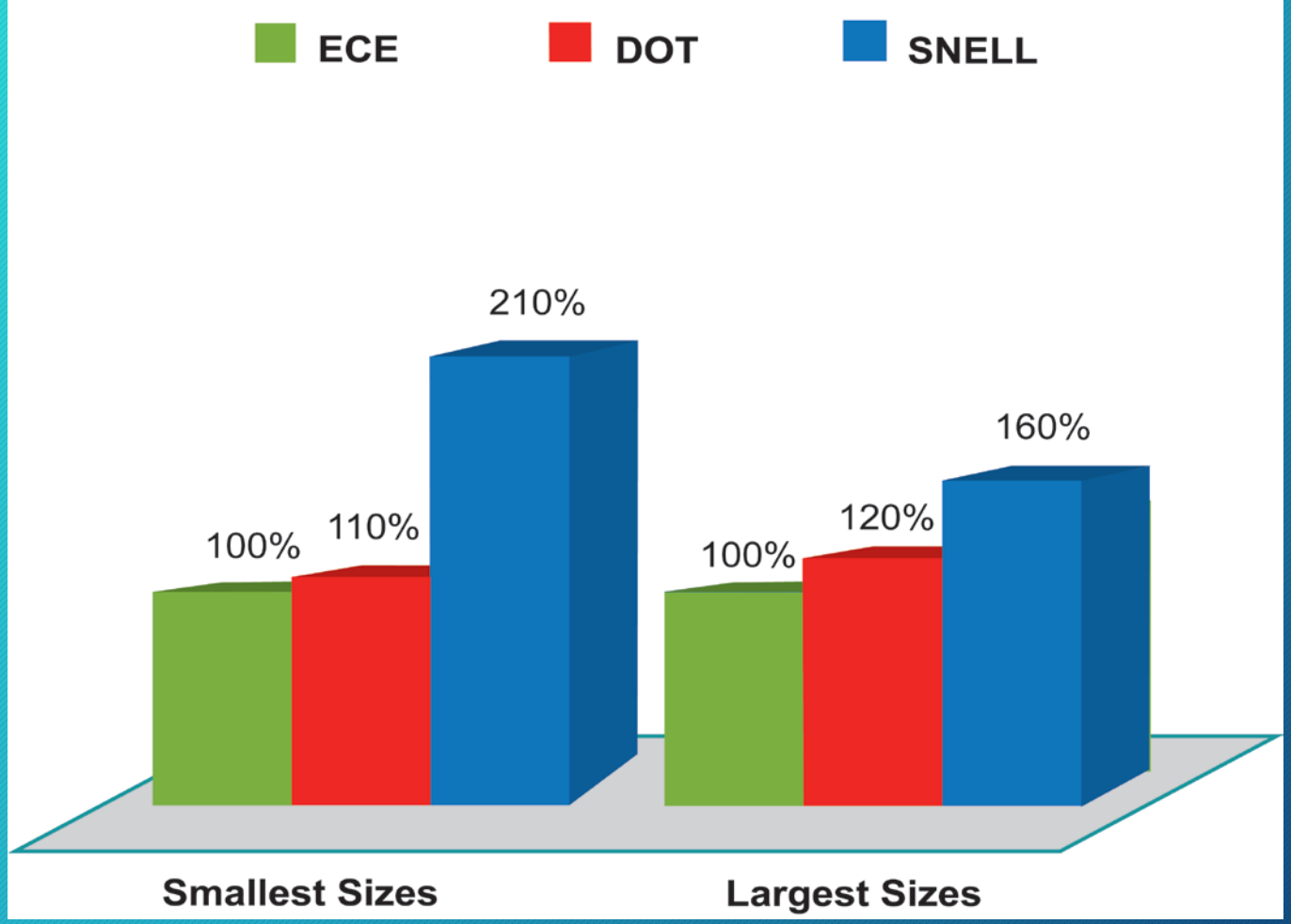
- September 2015 in Lyon, France
- Snell Presents Peer Reviewed Research Paper
- Low Energy Impact Comparison Study
- Snell and NOCSAE Sponsor a Seminar on Test Method for Angular Acceleration

Three Helmet Standards (US)

- ECE and DOT (FMVSS 218)
  - Mandatory – minimum impact protection requirement
  - DOT Self-certified /ECE Not as protective
    - Manufacturers arrange “reasonable” testing
    - Claim DOT certification for their own products
- Snell M2015
  - Voluntary – premium impact protection capability
  - Snell certified
    - Snell does pre-market and in-market testing
    - Manufacturers are bound by contract

Impact Energy Management

as a percentage of ECE demands



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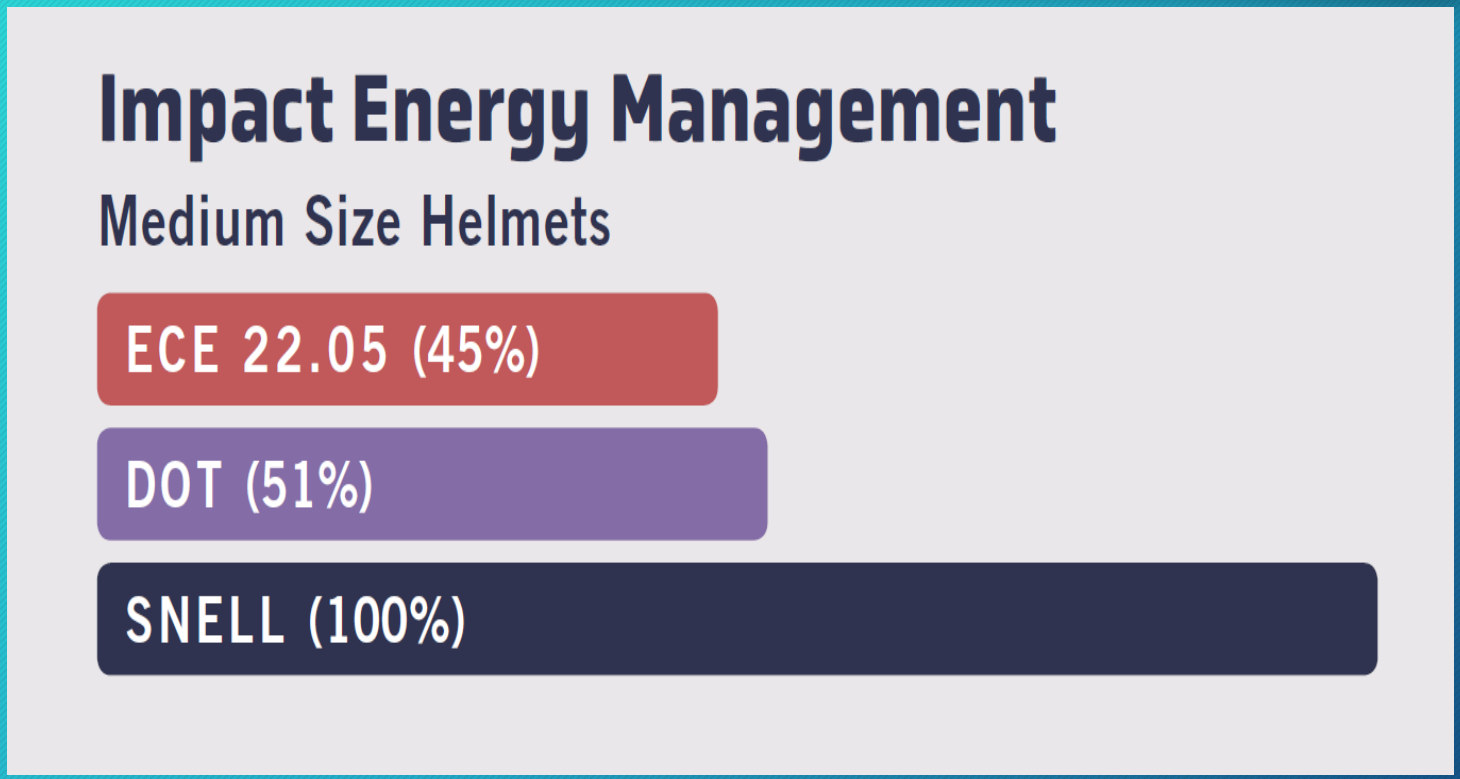
Snell Means Premium Protection.
DOT and ECE are Minimum Requirement.



Motorcycle Helmet Effectiveness

- NHTSA estimates that helmet usage leads to:
- 37% reduction of crash fatality
- 67% prevention of brain injuries

Helmet Fit Research

- Well-fitted helmets protect better.
- Dr. Amy McIntosh reported in 2012 that children with help fitting a helmet had concussions reduced by 41%.

How Helmets Work

- Space
- Time
- Cartoon Videos on YouTube.com

Wireless Head Form for Rotational Impact Test

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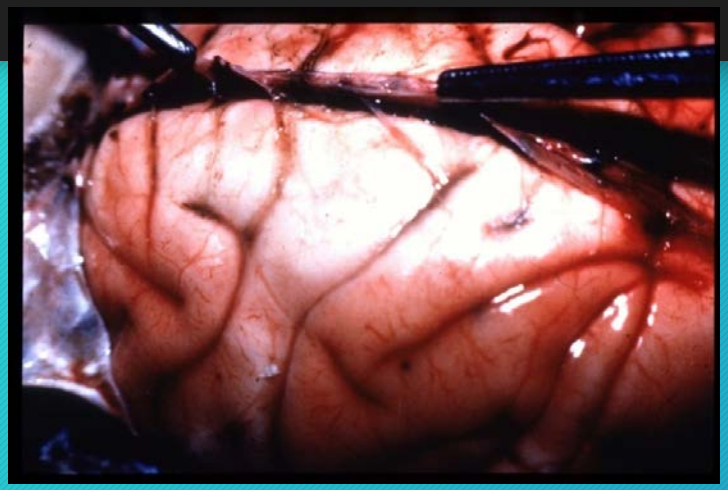
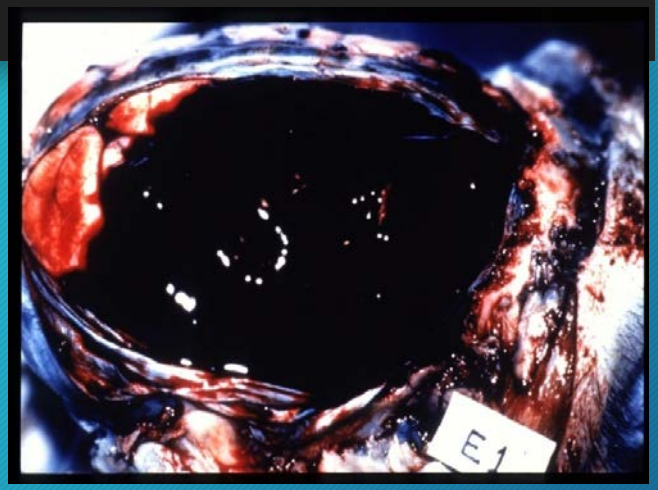
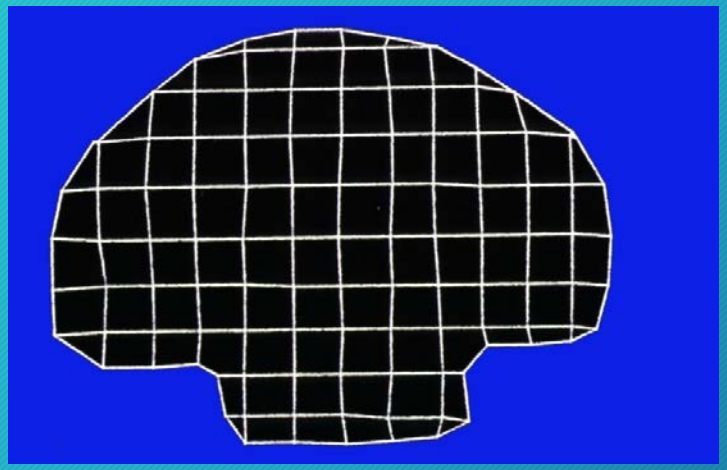
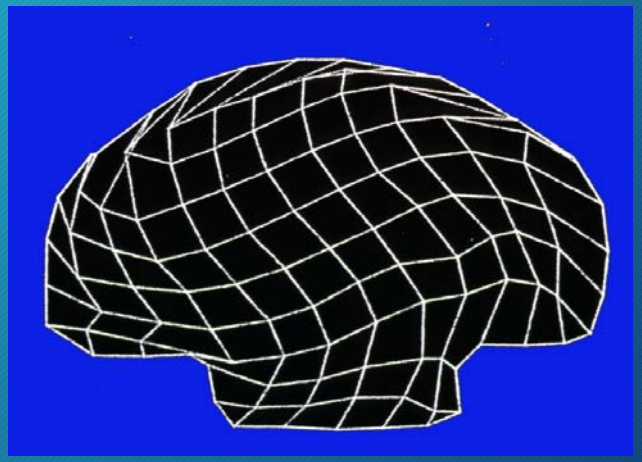
Bridging Vein Rupture









Shell Spreads the Load.
Liner Foam = More Braking Time

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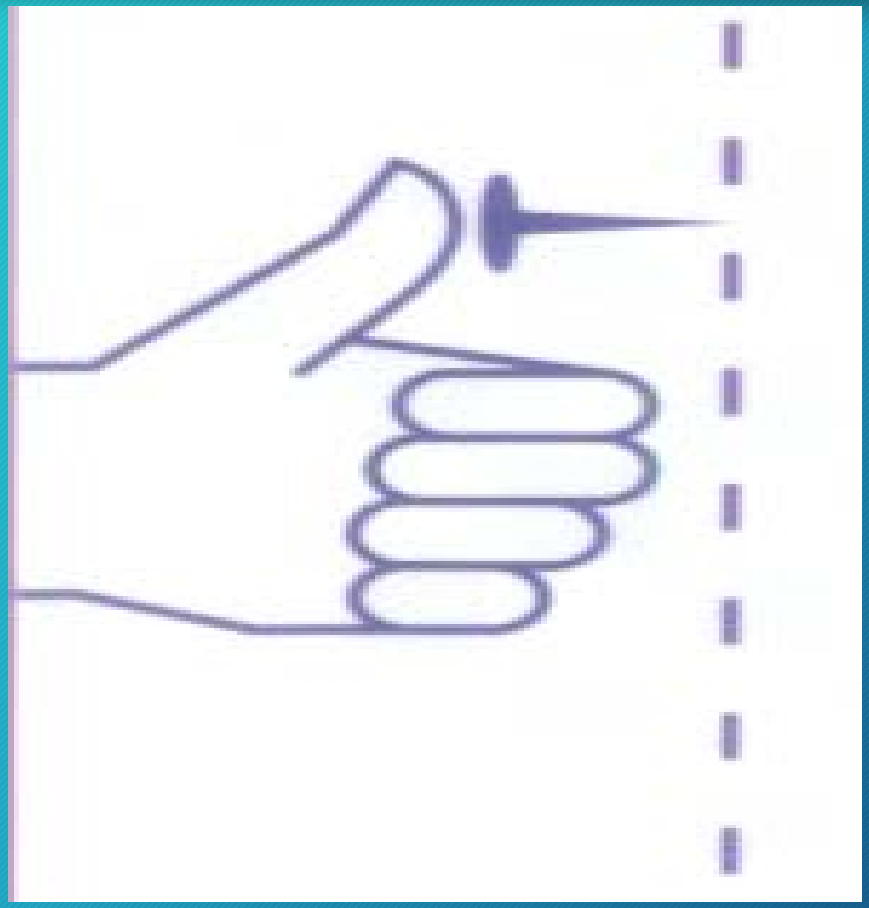
Physics in a Thumb Tack



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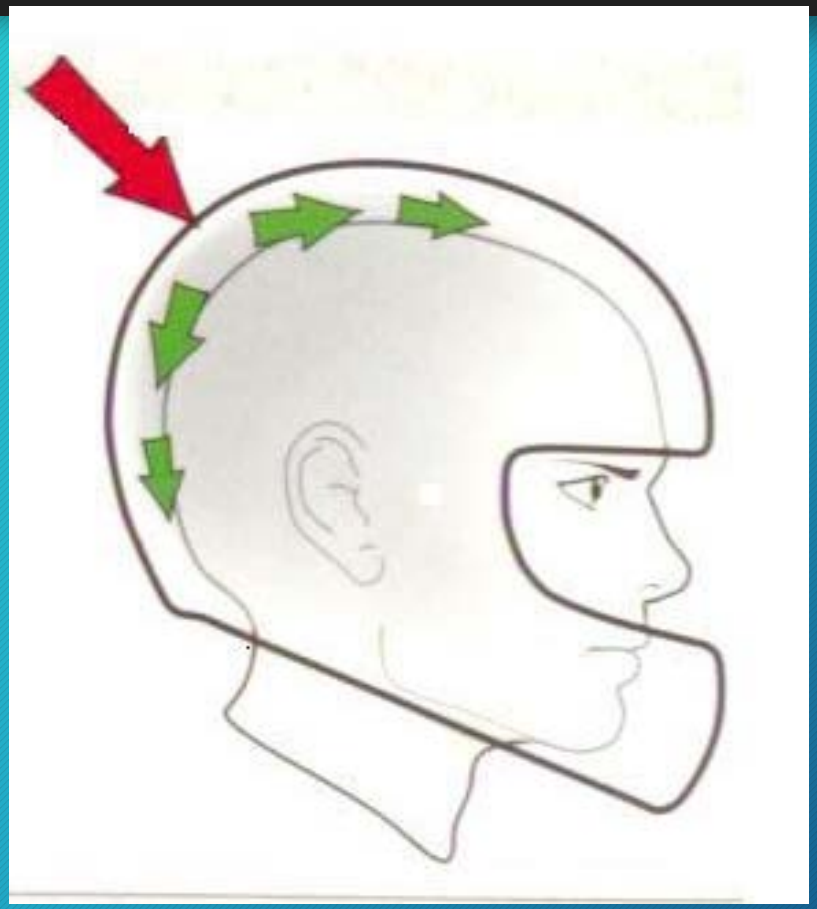
Hard Shell /Spread the Force



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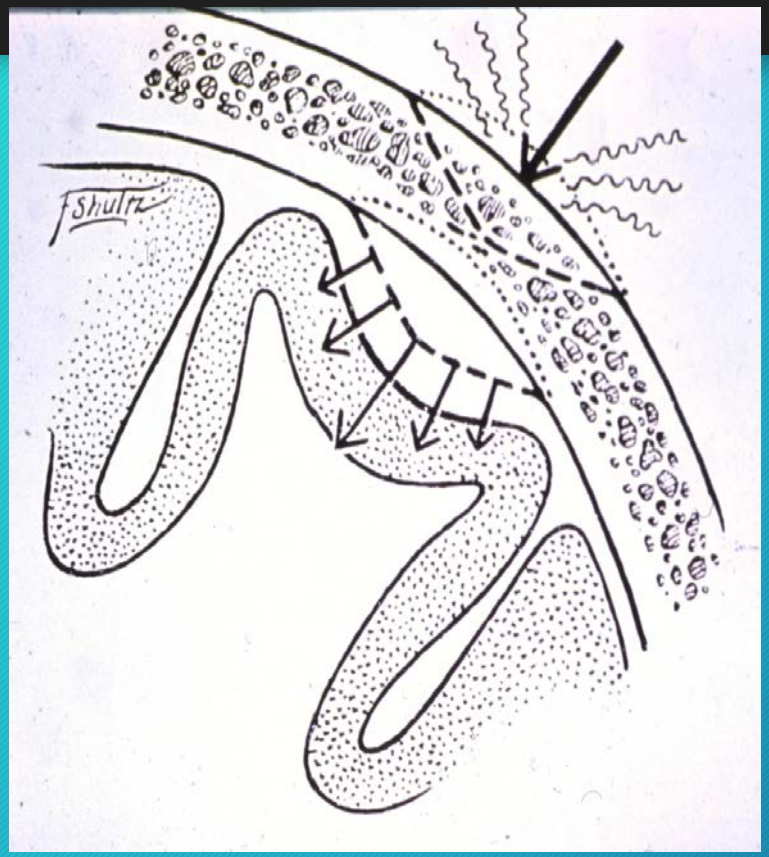
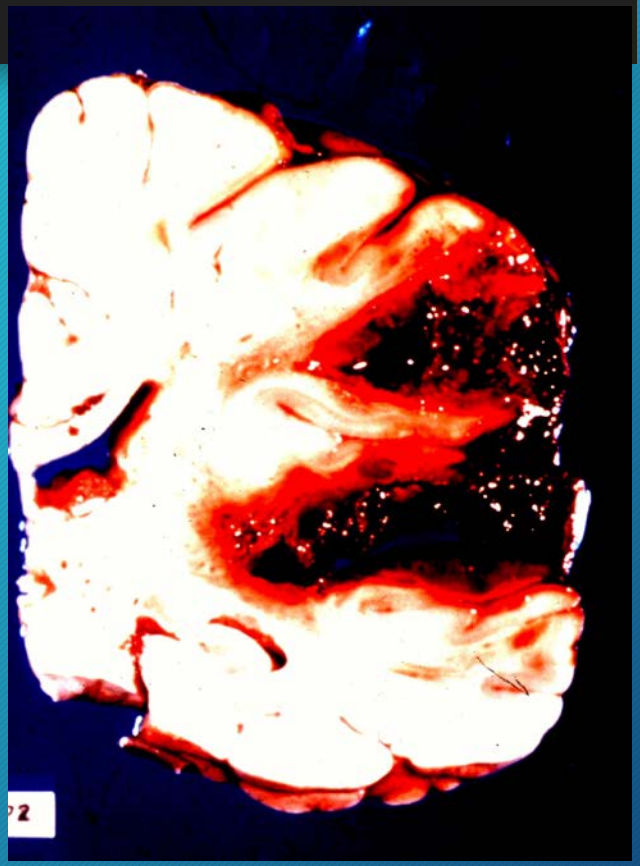
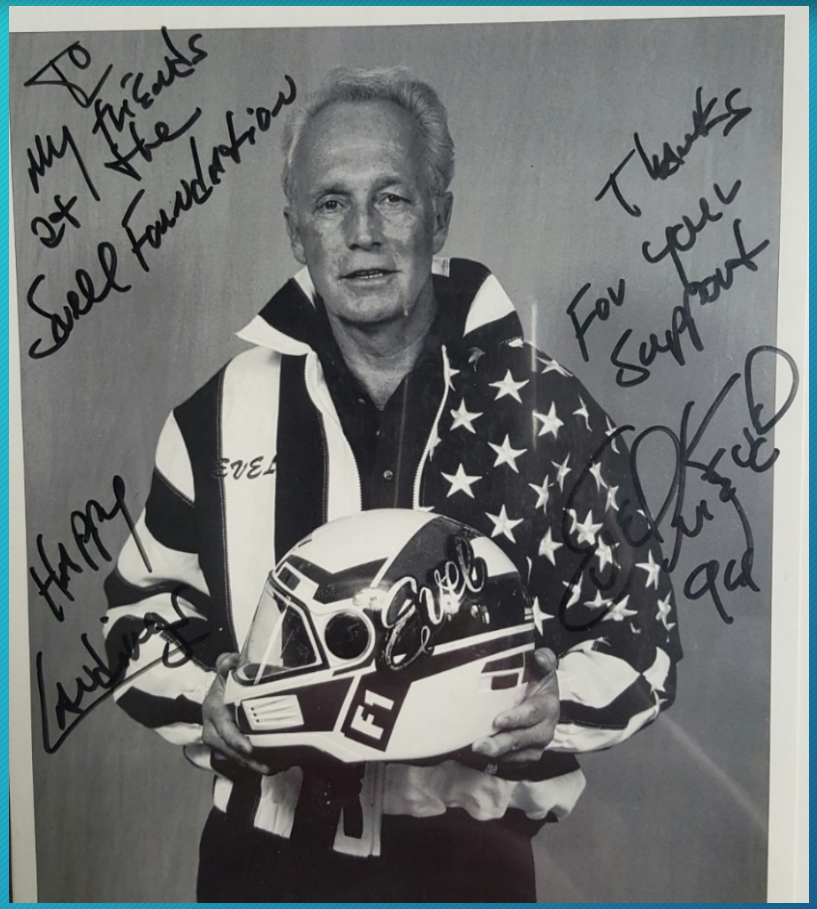
Skull Fracture and Hemorrhage





Snell Helmets Save Lives.



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Snell Tests For Public Safety

- Snell Web Site Helmet List
- Updates Each Day
- Certified Helmets by Name and Size
- Decertified Helmets Noted

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Snell's Mission

- Evidence based Helmet Standards
- Premium Protective Helmets
- Injury Prevention Education

SCCA National Hall of Fame 2015

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Helmet Dos and Don’ts

- Replace every 5 years.
- Fasten chin strap.
- Clean with only soap and water.
- Do not cut or alter the helmet liner.
- Do not put helmet near hot muffler or engine.
- Do not place helmet atop mirror or handle bar.

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We Don't Make Helmet.
We Make helmets Safer.

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More Information

- Videos in Snell Youtube Channel
  - How Helmet Works to Protect the Brain
  - Why Helmet Standards Matter
  - Snell Lab Tour
  - Snell Facebook/Twitter
  - Call Snell Lab and Office: 916-331-5073

Last Words

- Riders have no direct indicators of helmet protective capability.
- Riders can look for indirect indicators.

  (e.g.:a serialized Snell sticker)
- There are reasonably foreseeable crashes that will exceed a helmet's protective capabilities.
- In serious crashes riders need all the impact management capability a helmet can offer.
- www.smf.org 916-331-5073 for more info