



Occupant norm in vehicle safety

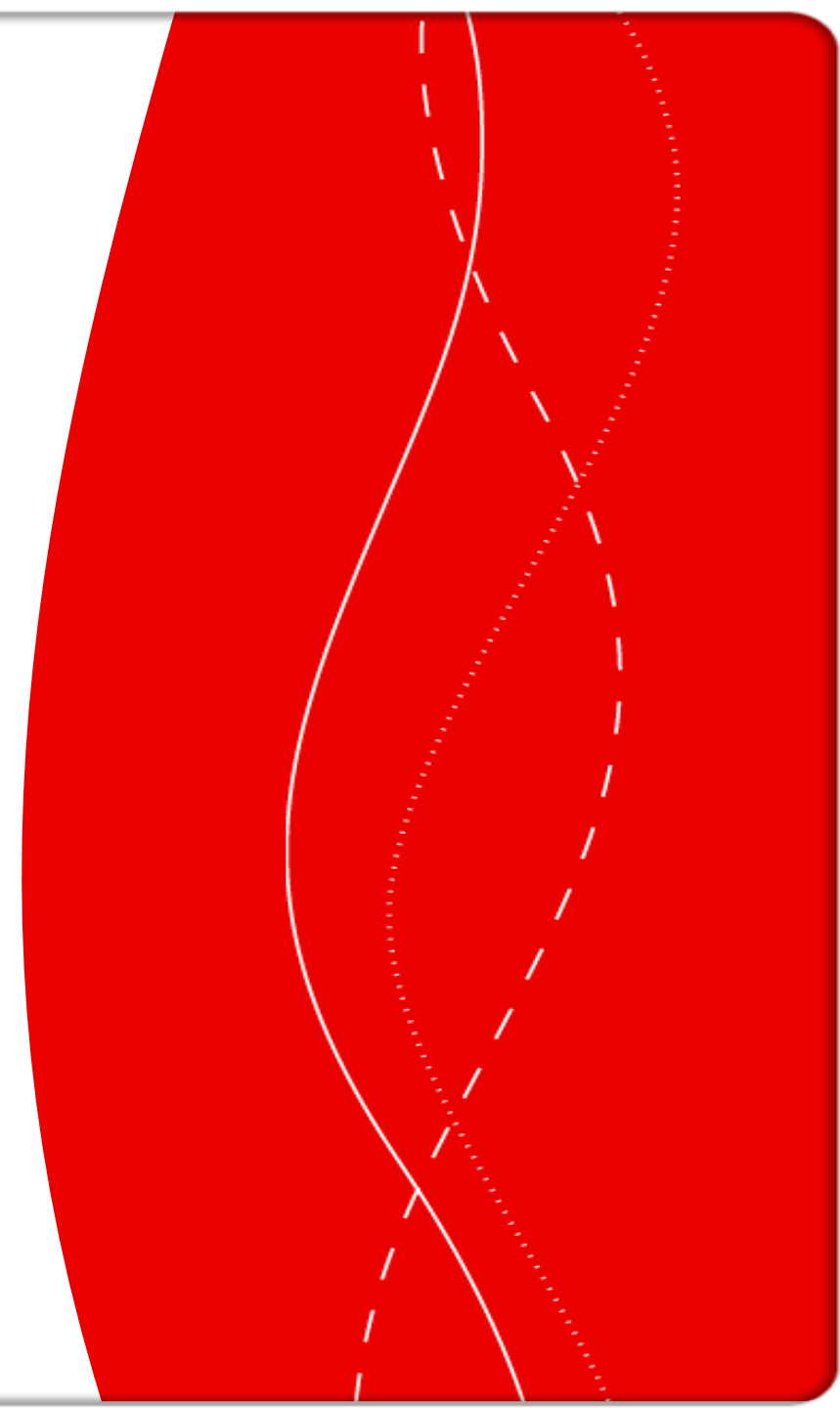
Astrid Linder, PhD

Associated Professor

Research Director, Traffic Safety

Swedish National Road and Transport Research Institute

Gender Summit 6 Asia Pacific 2015, August 26-28, Seoul





vti

BioRID: Biofidelic Rear Impact Dummy



VOLVO



vti

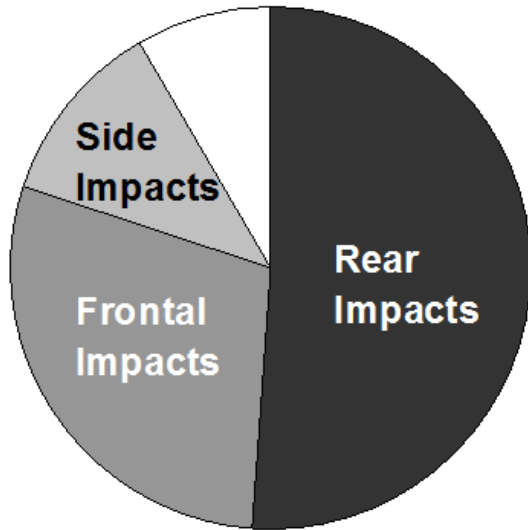
Whiplash Injuries

- App. **70% of the costs** of all injuries leading to permanent medical impairment for the insurance companies
- Europe: **800 000** injuries annually, **40 000** result in long term suffering
- **Costs: > 10 billion €** in Europe

Whiplash Injuries

Most common in rear impacts

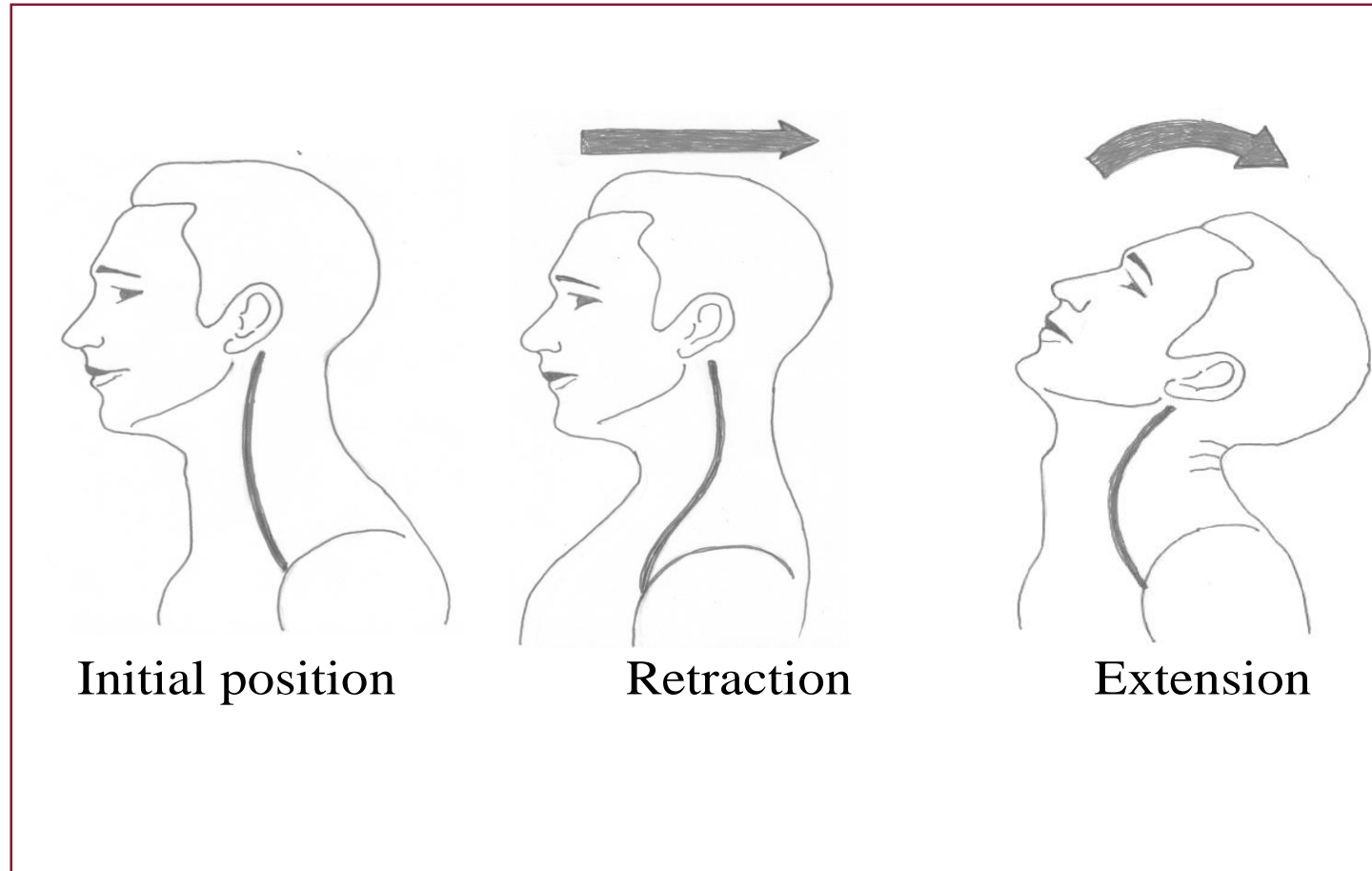
Different level of protection in different car models and seat designs



Based on Krafft (1998)

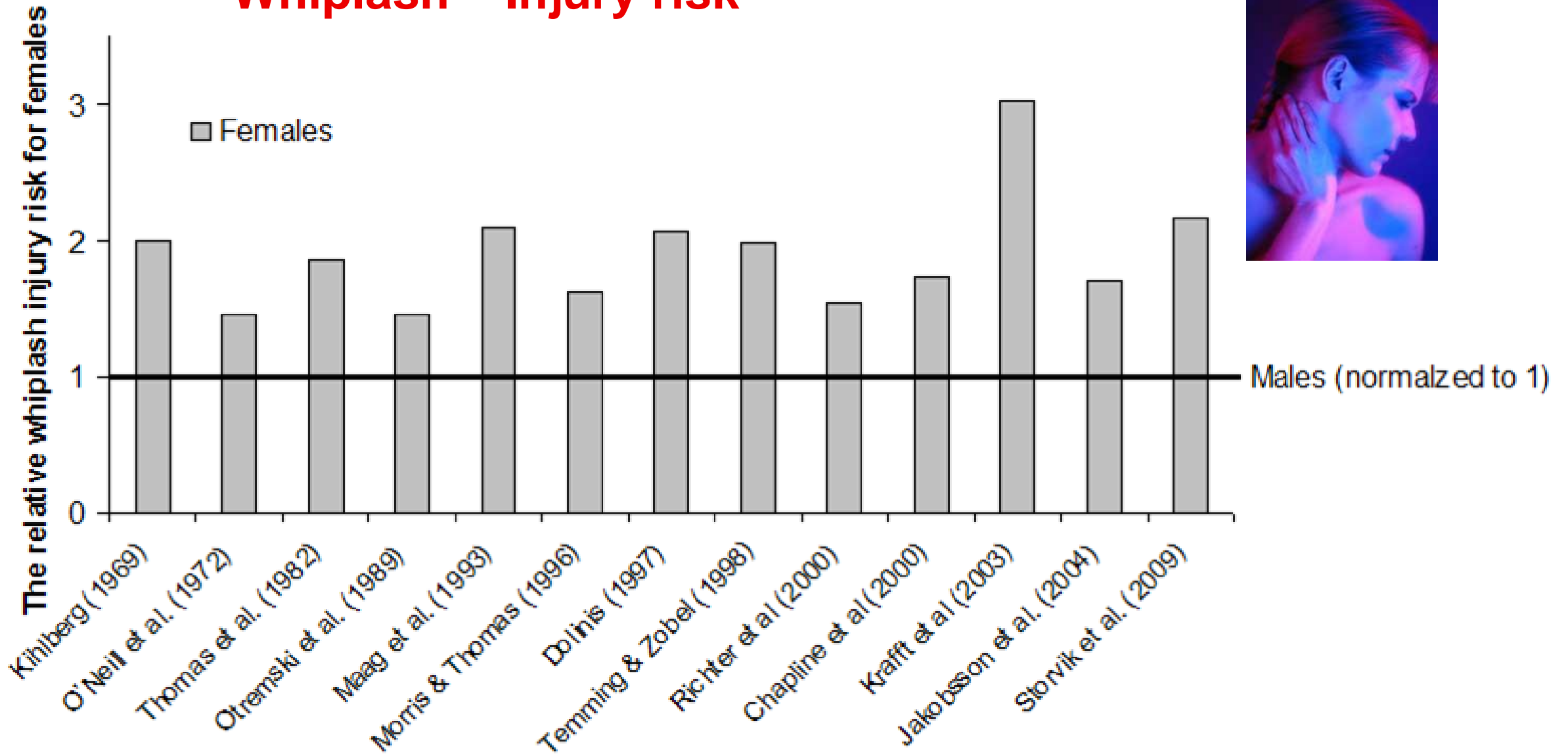


Neck motion during a rear impact



The hypothesises of injury mechanisms: In the retraction motion

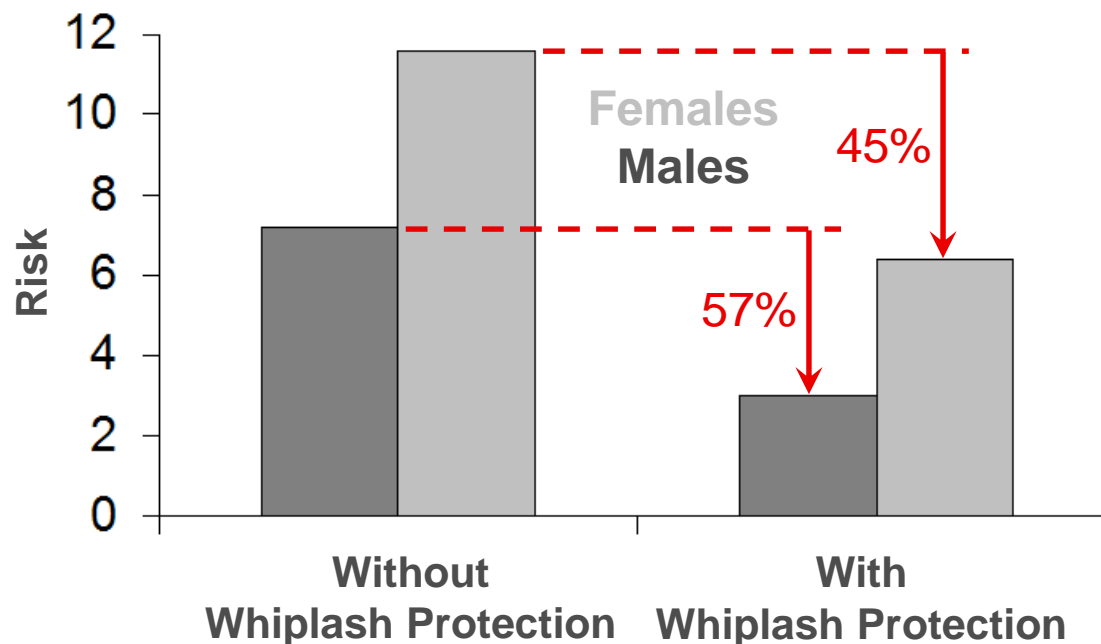
Whiplash – Injury risk



Whiplash protection systems

Injury Statistics – Folksam (Kullgren & Krafft 2010)

Whiplash protection systems less effective for females than for males



Data based on:

- permanent medical impairments
- all whiplash protection systems

ADSEAT the project



Aims

- Reduce the risk of whiplash injuries by enhanced understanding of injury criteria and development of seat evaluation tools.
- Develop a finite element dummy model of an average female, named EvaRID (Eva – female/RID – Rear Impact Dummy).
- Budget: 3.45 million Euros, 2.5 million Euros from the European Commission, FP7.
- 12 partner
- Duration: 42 months, 2009-2013



EvaRID

Platform for implementing research findings ADSEAT

Real World Data
- Size selection



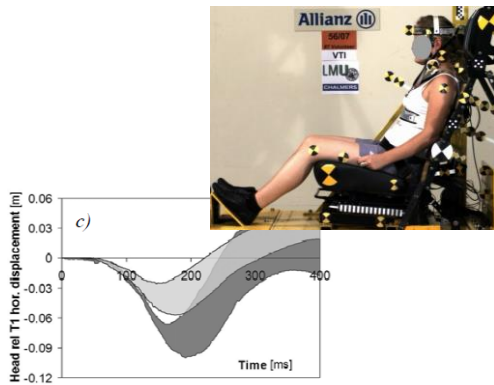
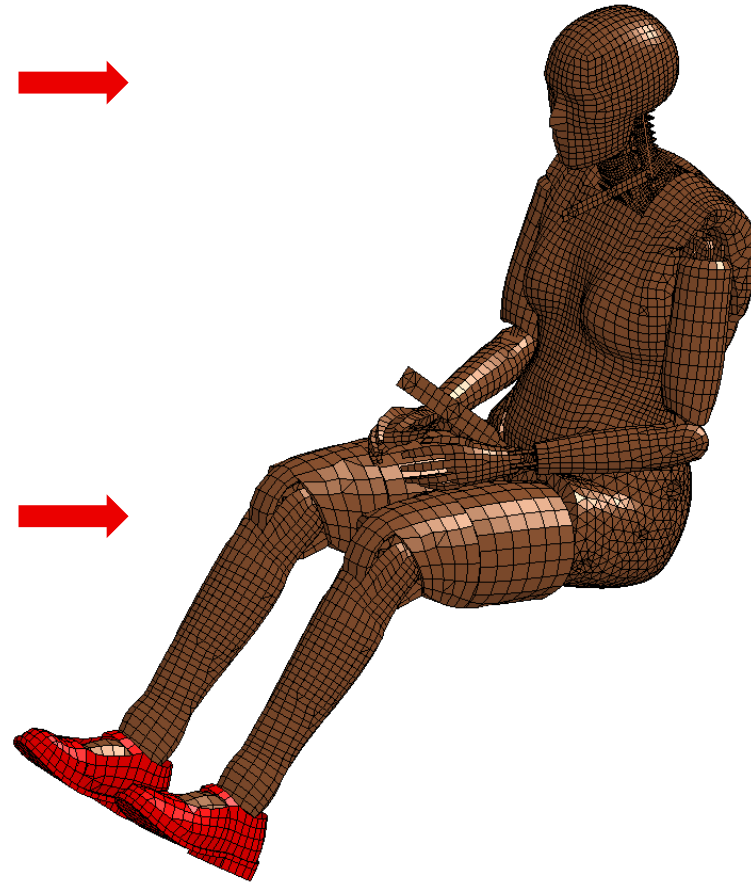
Assessment Criteria & Thresholds
-Threshold values



Biological Tests
- Anthropometry
- Response corridors



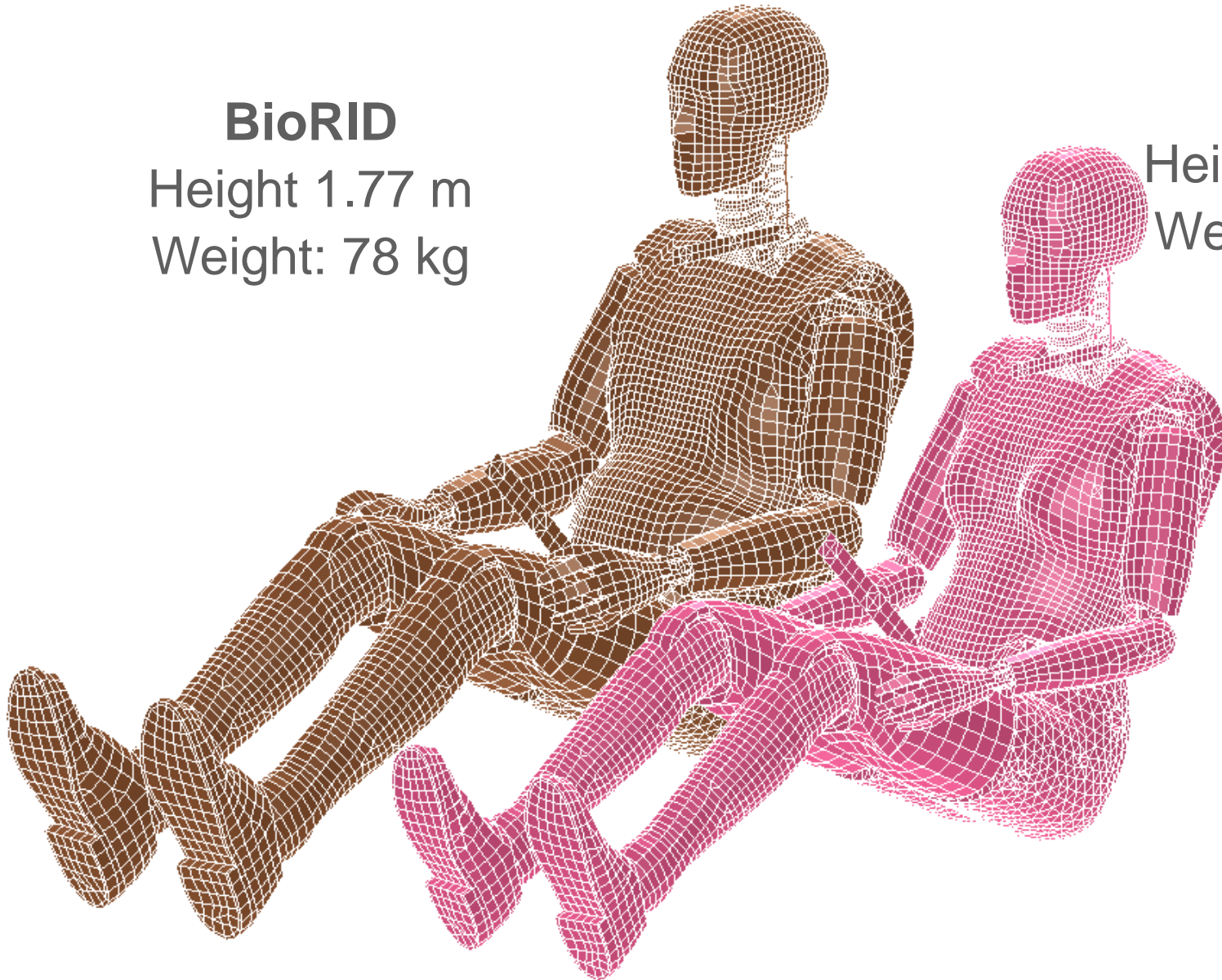
Seat design
-Use model in evaluation studies



BioRID

Height 1.77 m

Weight: 78 kg



EvaRID

Height: 1.66 m

Weight: 62 kg

Illustrator and Seat Evaluation



The screenshot shows the ADSEAT website homepage. At the top, there is a navigation bar with links for Home, Sitemap, and Contact, along with a search bar. Below the navigation bar, the main content area is divided into several sections: SEAT ADJUSTMENT GUIDELINES, GENERAL INFORMATION, INTERACTIVE SEAT CONFIGURATOR, SEAT EVALUATION GUIDELINES, and FURTHER INFORMATION. To the right of these sections is a 'PARTNERS' section featuring logos for vti, LMU, HUMANETICS, Loughborough University, Folksam, faurecia, AGU Zürich, CHALMERS, UNIVERSITÉ DE STRASBOURG, TU Graz, and cidaut. At the bottom of the page, there is contact information for vti, including phone, email, postal address, and visiting address, along with logos for the European Union and vti.

ADSEAT

Start Project Overview Work Packages Guidelines Illustrator Consortium News Events Links Downloads

Home Sitemap Contact

Search

SEAT ADJUSTMENT GUIDELINES

Select your Language.
English - German - Spanish - French - Dutch

This is the place for adjustment guidelines.

GENERAL INFORMATION

This is a general introduction to the term "whiplash injuries" and a brief description of its causation.

Read more..

INTERACTIVE SEAT CONFIGURATOR

The Interactive Seat Configurator application allows the user to evaluate different seat configurations for male and female occupants. The user will also be advised which setting provides the best protection in a rear impact at risk of causing "whiplash injuries".

Try out..

SEAT EVALUATION GUIDELINES

These guidelines highlight recent findings of the ADSEAT project, beneficial to vehicle users. The guidelines illustrate how different seat adjustments and occupant characteristics influence the protective performances of the seat.

Download the complete Document (english only)

FURTHER INFORMATION

For further information on whiplash testing and recent tested cars please visit Euro NCAP.

Contact: Phone: +46 31 750 2603
E-mail: astrid.linder@vti.se

Postal address: Box 8072
SE-402 78 Göteborg
Sweden

Visiting address: Regnbågsgatan 1
SE-417 55 Lindholmen
Map

vti

AGU Zürich

LMU

CHALMERS

HUMANETICS

UNIVERSITÉ DE STRASBOURG

Loughborough University

TU Graz

Folksam

cidaut

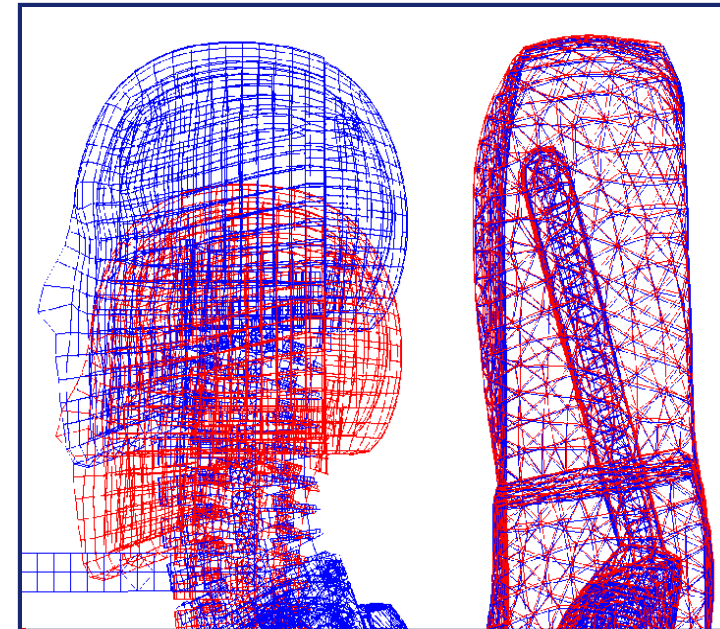
faurecia

VOELVO

EUROPEAN UNION

vti

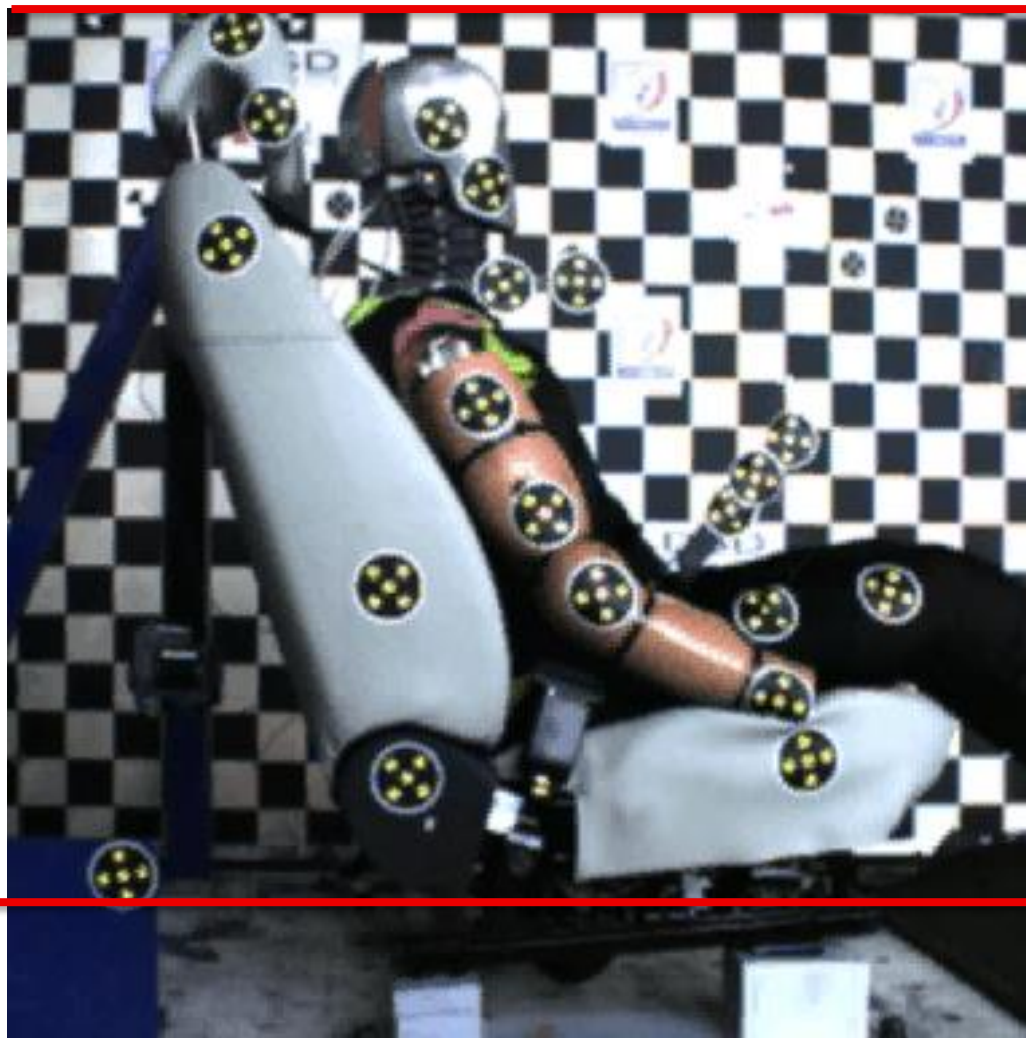
FINDING A BETTER WAY



www.adseat.eu

vti

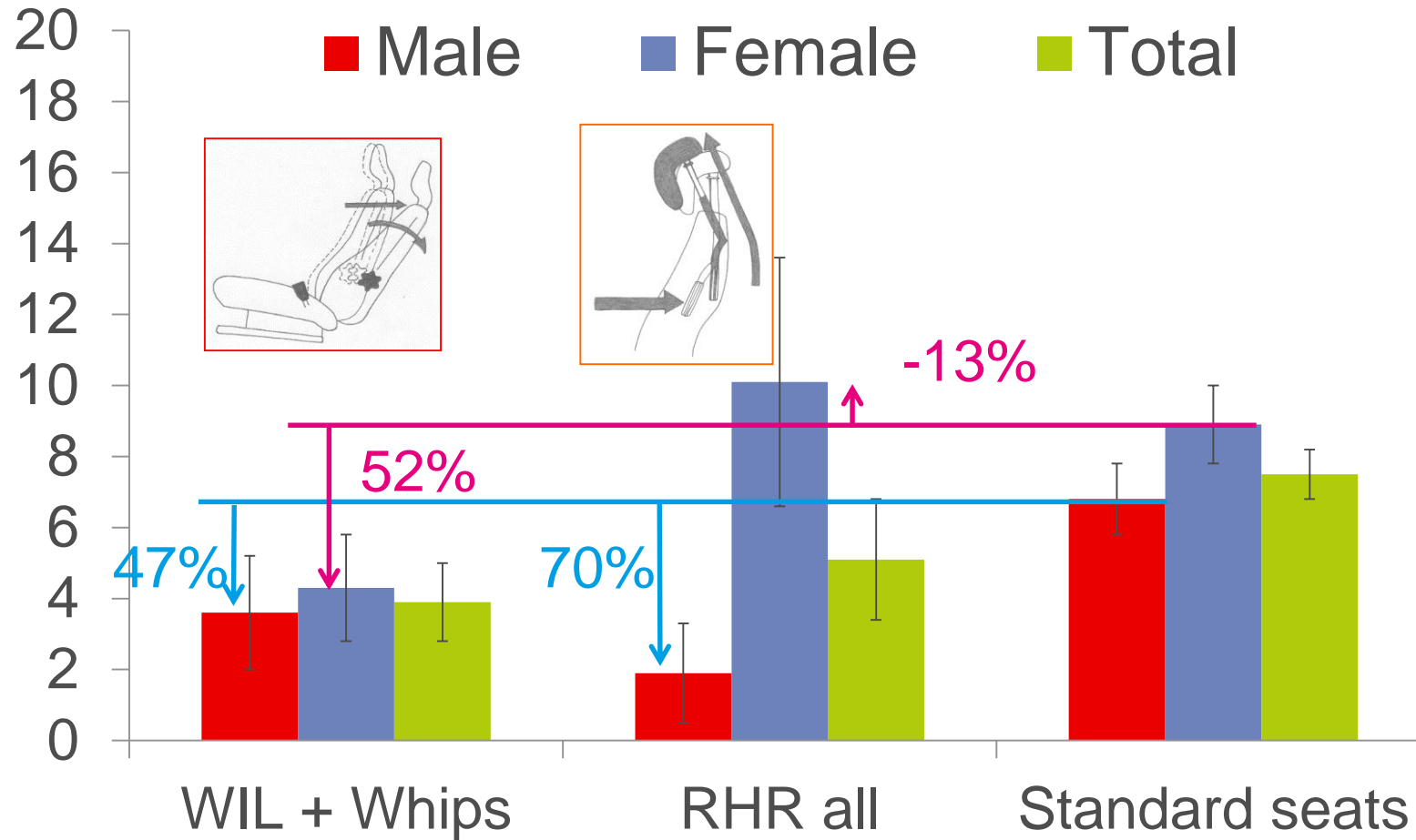
BioRID 50F



BioRID II



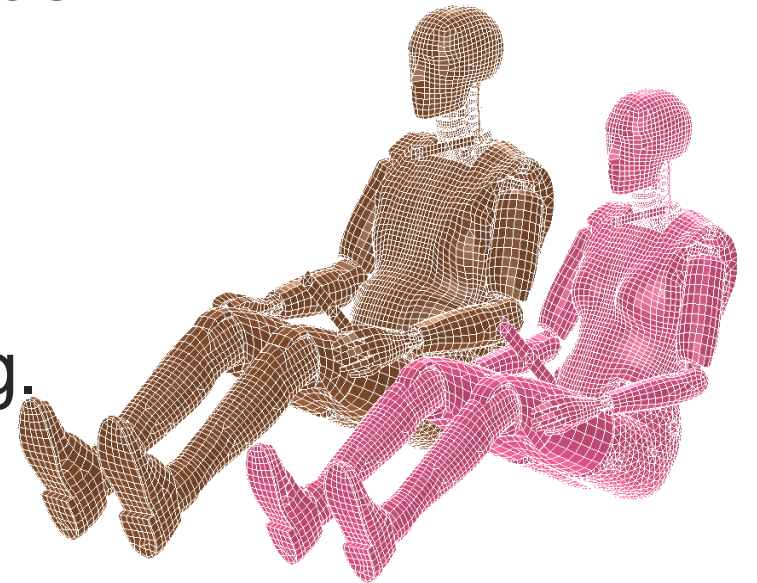
Whiplash concepts, risk for pmi



Kullgren et al. (2013) Development of Whiplash Associated Disorders for Male and Female Car Occupants in Cars Launched Since the 80s in Different Impact Directions, IRCOBI Conference

Summary

- Improved evaluation of safety performances in order to identify and promote best designed systems in consumer testing programmes, such as NCAP.
- Occupant diversity should be addressed in the area of crash testing.



A photograph of a duck swimming in water during sunset. The water is dark blue with many small, shimmering ripples that catch the golden light of the setting sun. The duck is in the upper left quadrant, moving towards the right. The text is centered in the middle of the image.

Thank you for your attention!
astrid.linder@vti.se