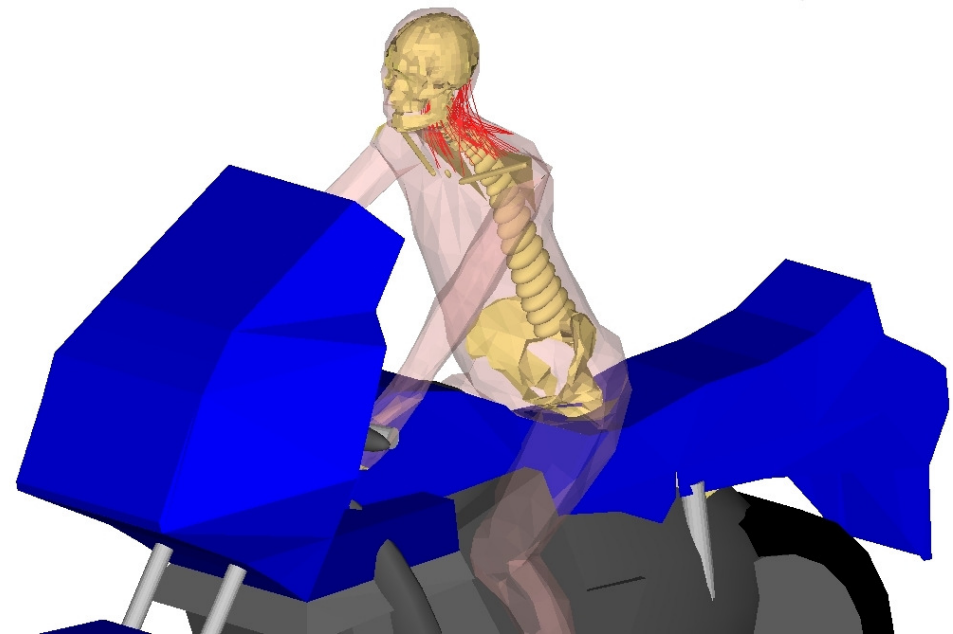




*MYMOSA workshop
Eindhoven, February 4th 2010*

MYMOSA WP4 – Biomechanics





Contents

- Introduction (15 min)
Lex van Rooij (TNO - WP leader)

- 3 Technical presentations (15 min each)
Nicolás Nemirovsky (TNO - ESR 17)
Ioannis Symeonidis (LMU - ESR 10)
Bernhard Fiedler (TNO - ESR 18)

Need for WP4 Biomechanics

- In 2006 at least 6200 motorcycle riders were killed in EU
 - This equals 16% of all road fatalities, while they represent only 2% of all road users
 - Motorcycle riders are 18 times more likely to die in a road accident than car occupants
 - The majority is caused by human error
- Improved understanding of human behaviour prior to and during the crash is required to develop systems that help mitigate crashes, injuries and fatalities

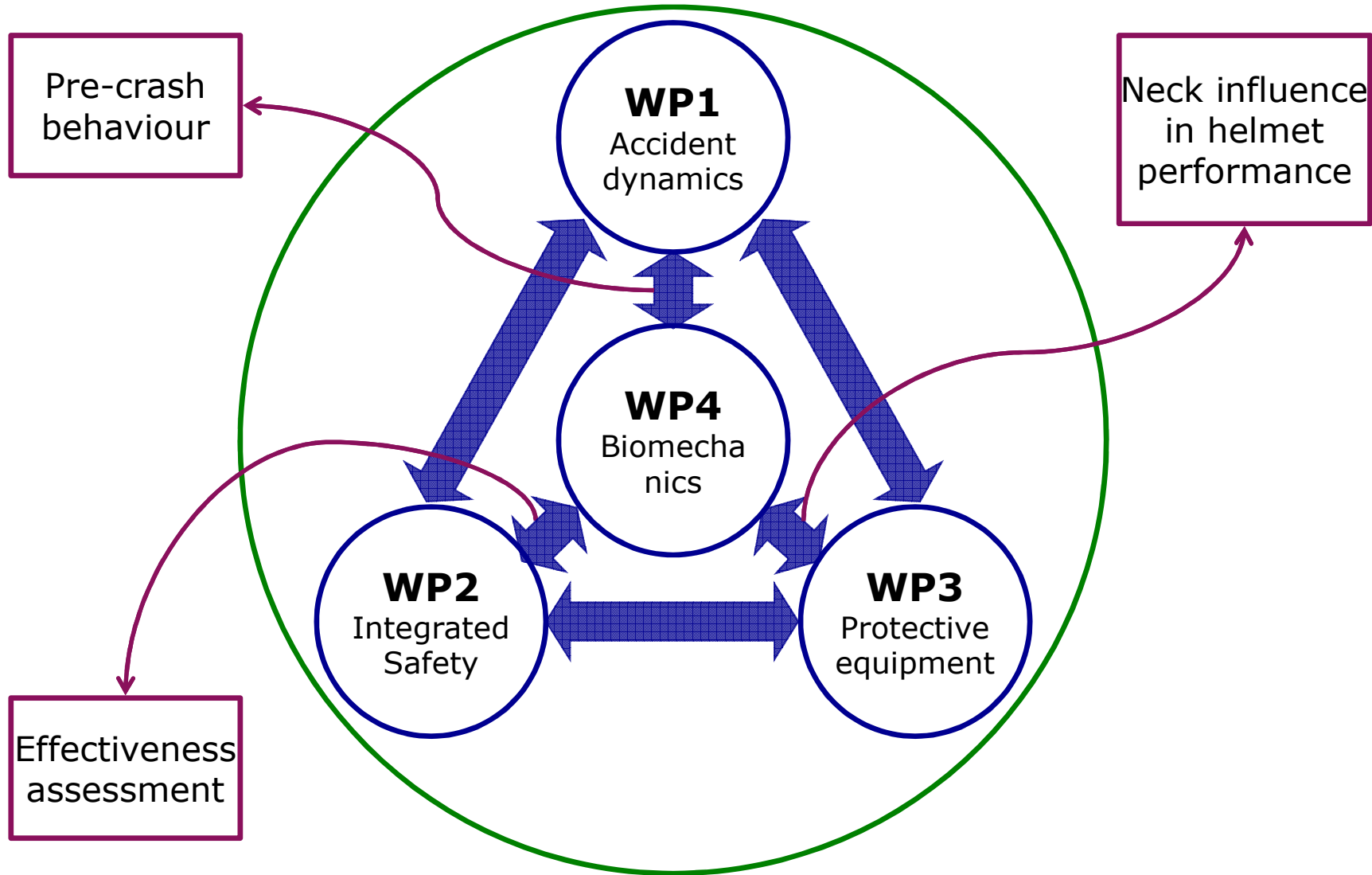
Objectives of WP4 Biomechanics

Goal: *to develop new biomechanical knowledge specifically for motorcyclists based on the current knowledge of car occupants and pedestrians. Focus is on head and neck and in view of protection offered by motorcycle helmets*

Approach: *numerical human modelling and validation with emphasis on active neck response, in order to provide:*

- *tools for the design of innovative protective devices*
- *tools to assess the implications of IS systems on the driver*

Role of WP4 Biomechanics





Timeline of WP4 Biomechanics

Year 1

Ioannis Symeonidis
Volunteer testing

Year 2

Filipe Fraga
Head/neck control

Year 3

Luis Matos
Detailed muscle model

Year 4

now

Nicolás Nemirovsky
Head/neck control

Bernhard Fiedler
Neck muscle model



Presentations of WP4 Biomechanics

- Numerical modelling of motorcyclist active behaviour

Nicolás Nemirovsky (ESR 17)

- Experimental testing of motorcyclist kinematic behaviour for model validation

Ioannis Symeonidis (ESR 10)

- Detailed neck muscle modelling for injury prediction

Bernhard Fiedler (ESR 18)

Expected results of WP4 Biomechanics

- Insight in motorcyclist kinematic behaviour in interaction with a motorcycle during various avoidance manouvres including active braking systems
- A numerical model with realistic human stabilising behaviour in motorcycle emergency conditions for safety system design
- Detailed muscle models for implementation in FE human models for prediction of injury
- Applications demonstrating benefit of understanding human behaviour in motorcycle riding
- Dissemination of results back towards broader automotive field



Thank you

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