



Never Stand Still

Transport and Road Safety (TARS) Research | School of Aviation

Head injury patterns in Australian rollover fatalities from the National Coronial Information System



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Introduction

- Dynamic Rollover Occupant Protection Project
 - Assess vehicle safety in a rollover
 - Test protocol
 - ATD and appropriate injury measures

Introduction

- Dynamic Rollover Occupant Protection Project
 - Single-event rollover
 - Appropriate occupant
 - 16 years or older
 - Seatbelt
 - Not ejected
 - Serious Head Injuries

Introduction

- Serious Head Injuries
 - 21% of all serious injuries

Methods

- NCIS
 - Police Accident Reports
 - Coroner's Findings
 - Autopsy Report
 - Toxicology Report

Methods

- NCIS query
 - From 2000-2011
 - Blunt force, transport injury event
 - Occupant (≥ 16 years) in single vehicle event
 - NSW, NT, QLD, TAS, VIC

NCIS
initial
output

No fixed
object
collision

Sufficient
crash info

Relevant
rollover
occupant

Pure
Rollover

Final
Check

• n=4171

• 1201

• 939

• 351

• 190

• 83

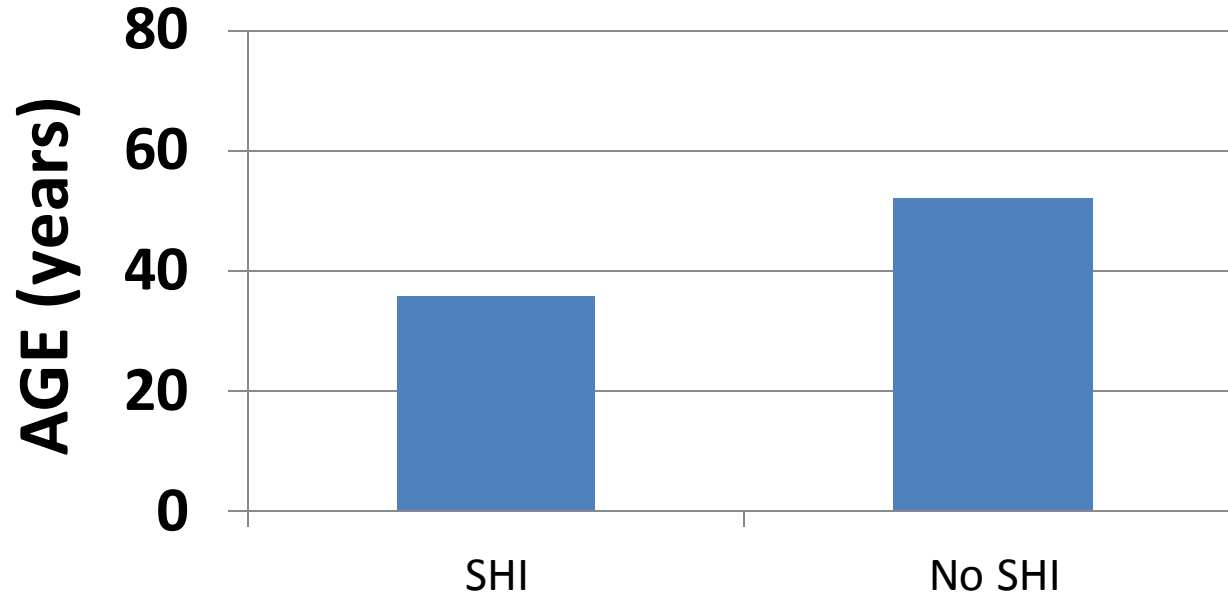
Methods

- 83 appropriate cases
 - Injuries coded using AIS (1990)
 - Vehicle/crash characteristics
 - Occupant/injury characteristics

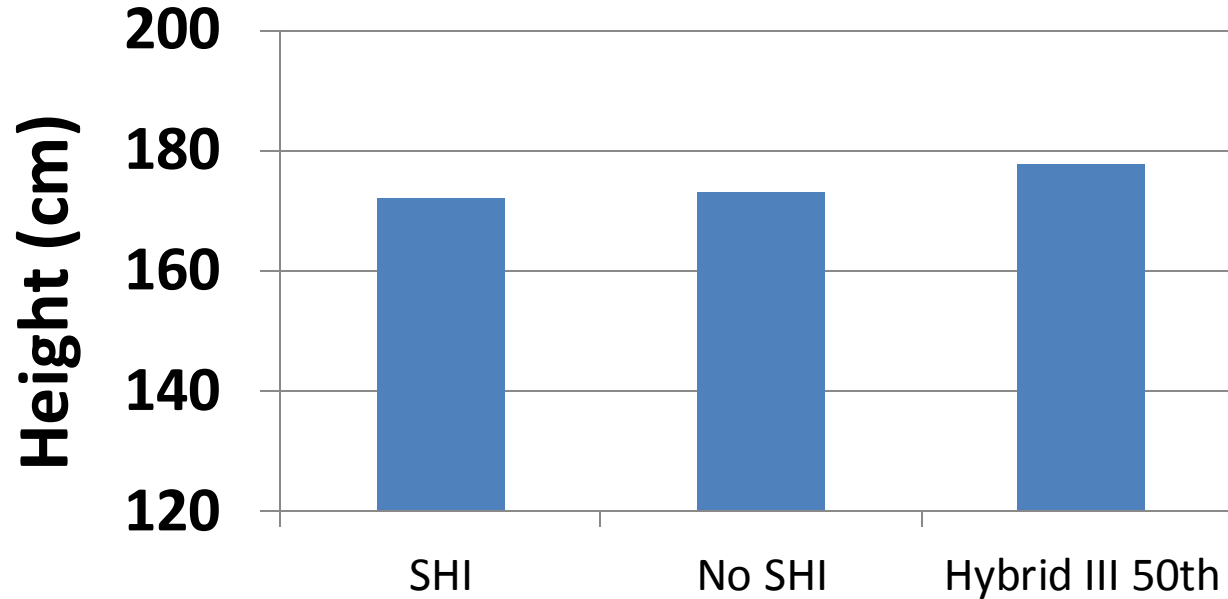
Results

- 83 appropriate cases
 - 56 (67%) with Serious Head Injury (SHI)
 - 27 (33%) with no SHI

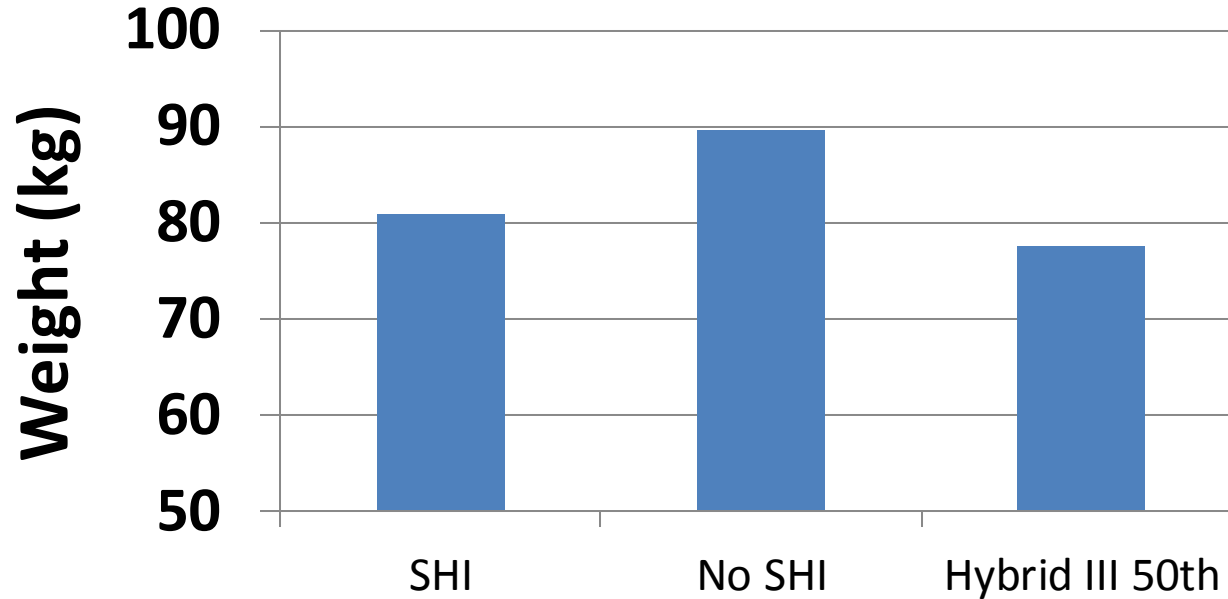
Results – Average age



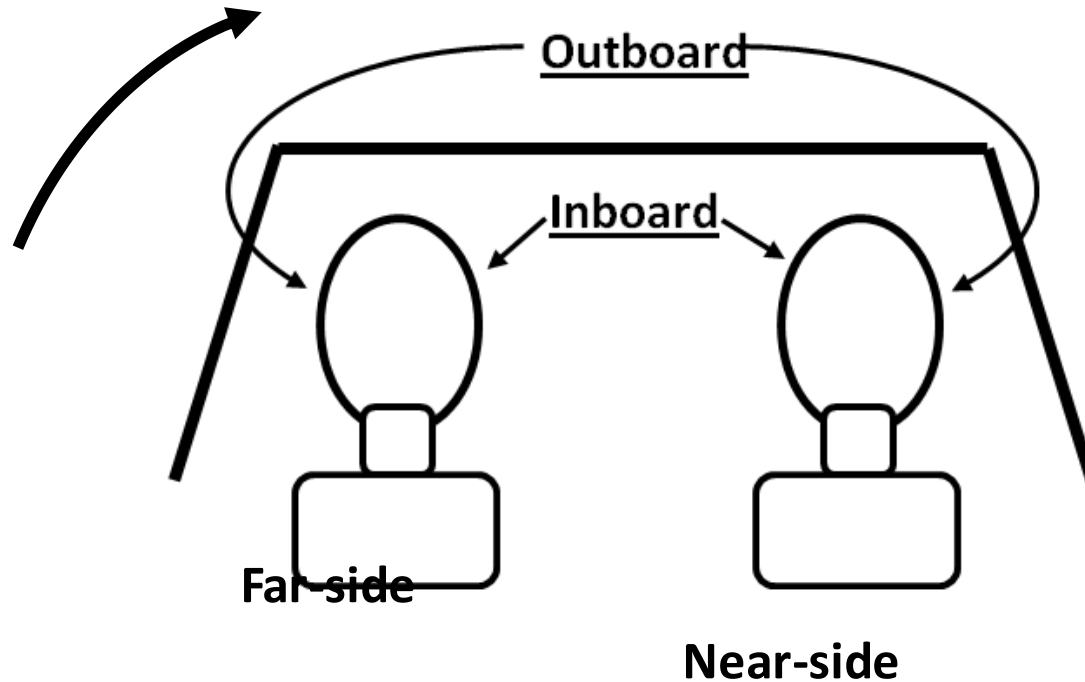
Results – Average height



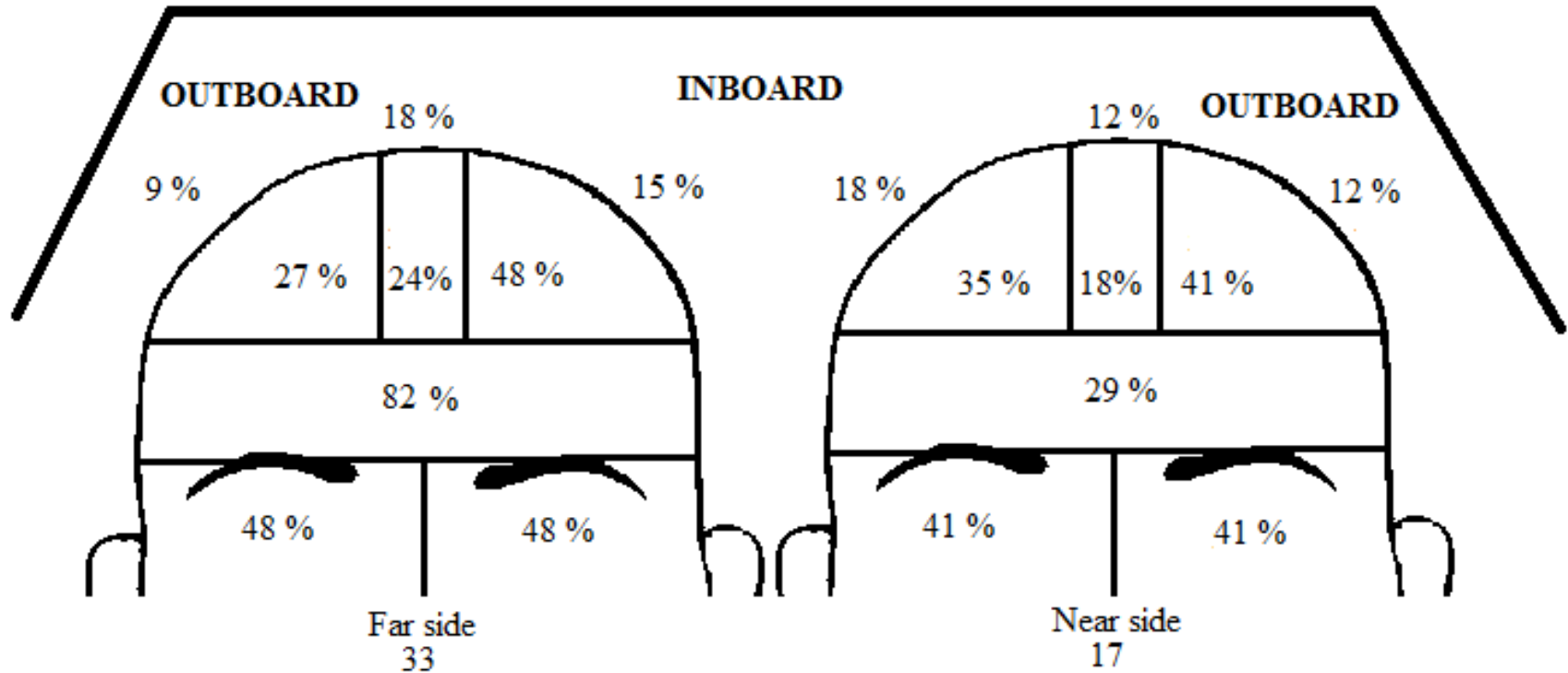
Results – Average weight



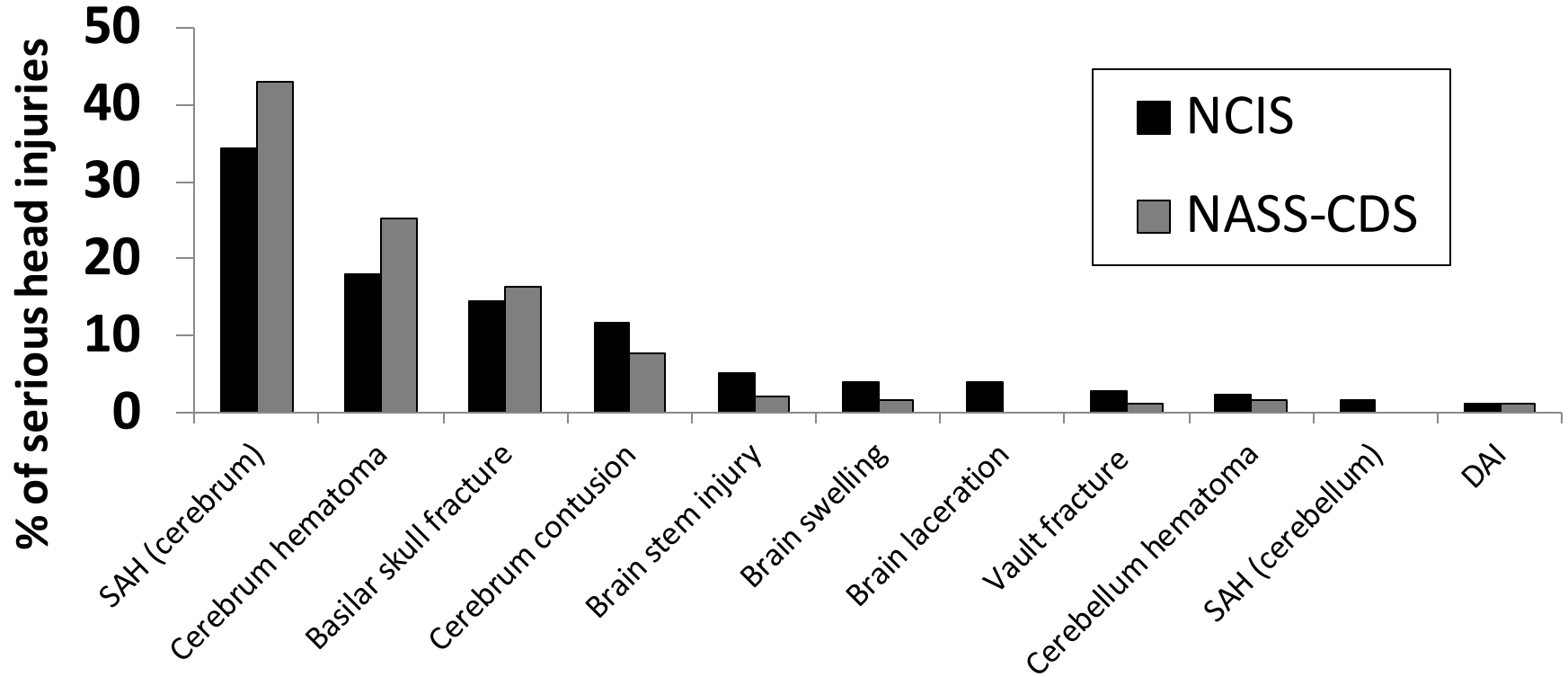
Results – Head contact location



Results – Head contact location



Results – Brain injury



Results – Post crash response?

- 10 cases of position asphyxia
- Roof deformation an obstruction in extrication

Conclusions – Supporting previous work

- More head injuries for far-side
- Fatal cases are more severe
- Head injury pattern depends on seat position

Conclusions – Injury characteristics

- Lateral head impact
 - Most frequent scenario
 - Resulted in higher severity SAH
- Head and Spine injuries
 - Few concomitant
 - Different injury modes

Conclusions – Dynamic test protocol

- Current ATD size is representative
- Head contact location is known
- Injury severity is known

Limitations and Future Work

- SHI was rarely observed to occur with both serious Thorax and Spine injuries

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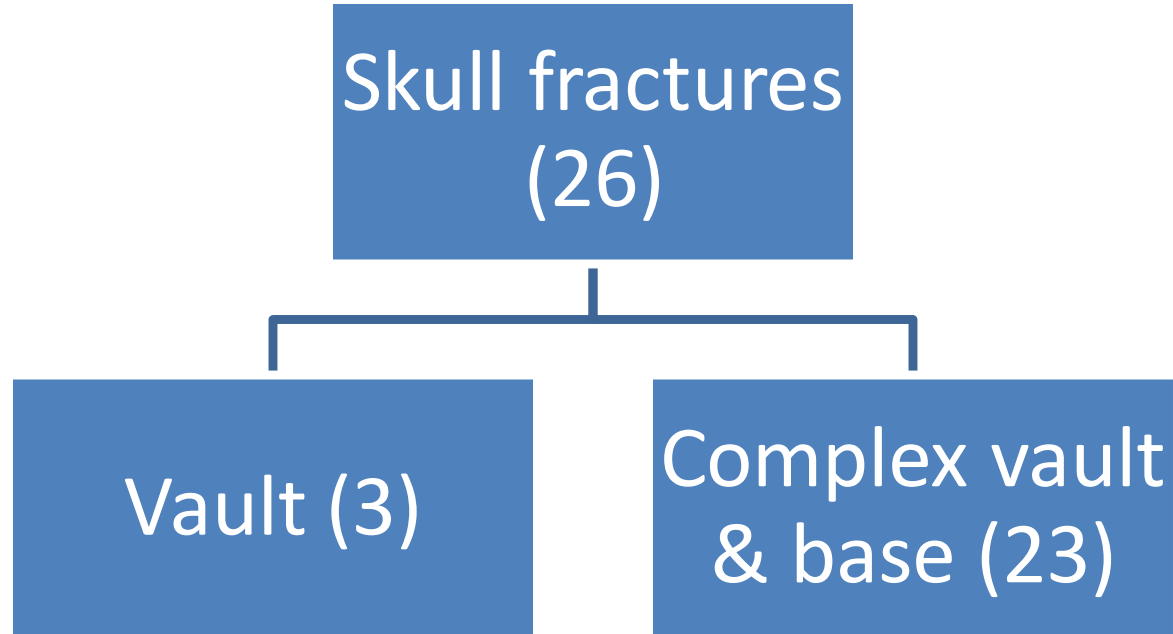
Questions?

Acknowledgements

Questions?

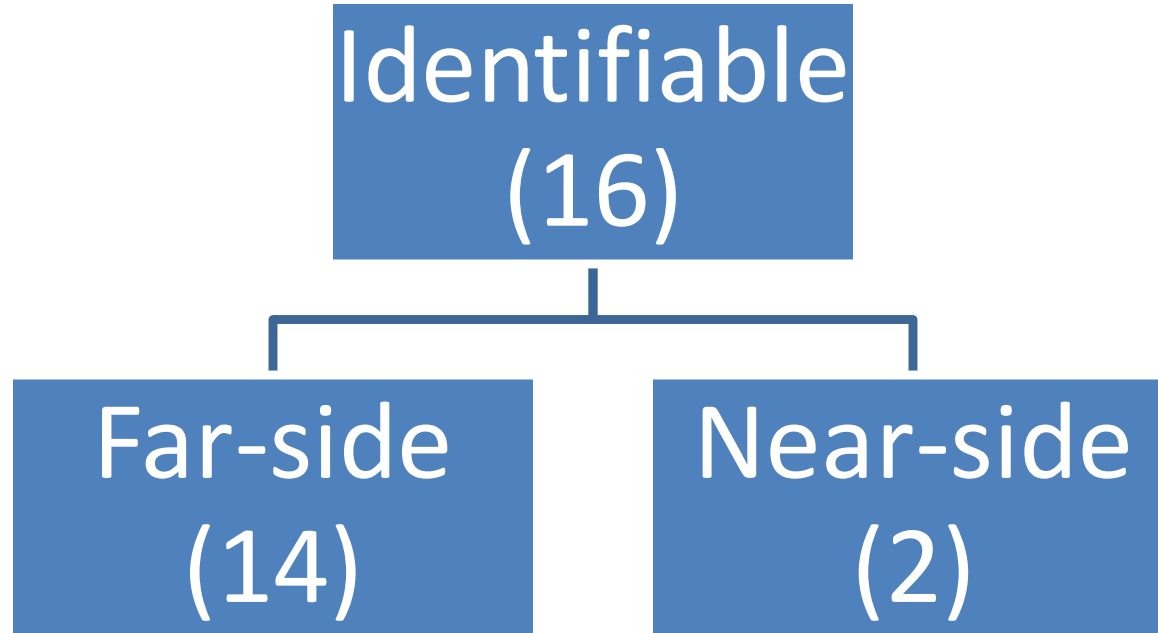
Results – Skull fracture

- Type of skull fracture



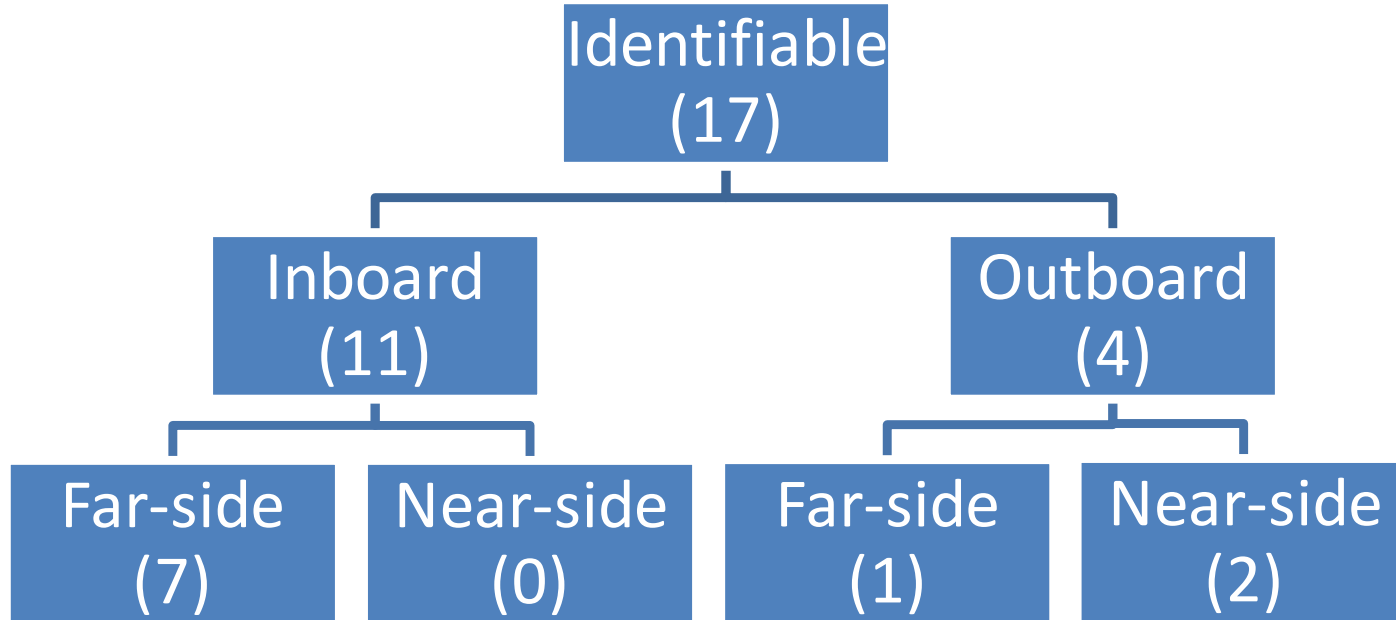
Results – Skull fracture

- Direction of roll



Results – Skull fracture

- Location of fracture



Results

