Evaluation of Crash Types Associated with Test Protocols
Test Protocols

- Offset Deformable Barrier (ODB)
- Moving Deformable Barrier (MDB)
- Fixed Rigid Barrier (FRB)
NASS Variables

- Object contacted
- GAD of other vehicles
- Specific horizontal location (SHL)
- Direct damage width
- Heading angles
- GAD of the other vehicle in combination with heading angles
Offset Deformable Barrier

ODB Test
ODB type crash with left offset
ODB type crash for a left offset, with an oblique angle.
Moving Deformable Barrier

MDB Test at Oblique Angle
MDB type crash with a right oblique right offset configuration
MDB type front-to-rear crash configuration
Fixed Rigid Barrier

FRB Test
Front-to-rear FRB type crash
FRB type crash configuration for a full-frontal, nearly full-engagement, head-on crash.
ODB Type Crash
Hyundai Elantra, Offset Frontal With Corolla
ODB Type Crash
Toyota Corolla, Offset With Elantra
MDB Type Crash
Toyota Avalon, Oblique With Chevrolet Suburban
MDB Type Crash
Toyota Avalon (Continued)
MDB Type Crash
Chevrolet Suburban, Oblique With Avalon
MDB Type Crash
Buick Century, Oblique With Explorer Partner
Buick Century Interior
Explorer Partner Not Categorized
FRB Type Crash
VW Jetta Full Frontal, With S10 Partner
FRB Type Crash
Chevrolet S-10 Pickup, Full Frontal With Jetta Partner
ODB & MDB
Chevrolet Malibu And Ford Taurus, Right Offset
## Frontal Crashes Represented by Crash Type

**NASS 1995-2001**

(Accident exposure by crash type and air bag availability)

<table>
<thead>
<tr>
<th>Crash Type</th>
<th>Airbag</th>
<th>Non Airbag</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>ODB</td>
<td>0.5086</td>
<td>0.5814</td>
<td>1.09</td>
</tr>
<tr>
<td>MDB</td>
<td>1.196</td>
<td>1.2291</td>
<td>2.42</td>
</tr>
<tr>
<td>FRB</td>
<td>0.6874</td>
<td>0.663</td>
<td>1.35</td>
</tr>
</tbody>
</table>

### Graphical Representation

- **ODB**, **MDB**, **FRB**
- **Airbag**, **Non Airbag**, **Total**
- Bar graph showing number of crashes (millions) for different crash types and airbag availability.
MAIS 2-6 Driver Injuries by Crash Type
NASS 1995-2001
(Injury distribution by crash type and air bag availability)
**AIS 2-6 Driver Injuries by Body Region in Airbag Vehicles**

**NASS 1995-2001**

*(Distribution of driver injuries by body region for air bag-equipped vehicles)*

<table>
<thead>
<tr>
<th>Body Region</th>
<th>ODB (Thousands)</th>
<th>MDB (Thousands)</th>
<th>FRB (Thousands)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Head</td>
<td>19.716</td>
<td>12.294</td>
<td>13.720</td>
</tr>
<tr>
<td>Thorax</td>
<td>11.322</td>
<td>6.832</td>
<td>3.458</td>
</tr>
<tr>
<td>Upp Ext.</td>
<td>5.641</td>
<td>3.417</td>
<td>1.178</td>
</tr>
<tr>
<td>Lower Ext.</td>
<td>4.747</td>
<td>3.417</td>
<td>1.178</td>
</tr>
</tbody>
</table>

**Number of Injuries (Thousands)**

- **ODB**: Light gray
- **MDB**: Red
- **FRB**: Green

**Legend**

- **Head**:_head_1
- **Thorax**:_thorax_1
- **Upp Ext.**:_upper_extremity_1
- **Lower Ext.**:_lower_extremity_1
Conclusion

**MDB Type Crash**

- Most frequent frontal crash
- Predominant cause of overall injuries and injuries to the lower extremities
- Intrusion rather than inertial loading is the predominant cause of injuries to the lower extremities
Inertial loading is the predominant injury mechanism for the lower extremities in ODB and FRB type crashes.

There are nearly 2 times more lower leg injuries in FRB type crashes, than in ODB type crashes.
Questions