Selection of Size of Child Restraints

Craig Newland
3rd Meeting of GRSP Informal Group on CRS
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Consumer Knowledge

• Consumers must select and use the appropriate size of restraint for their child

• Information to consumers often presented in terms of mass

• Potential for consumer confusion:
  – Mass of child may not be known
  – Mass range for child restraint may not be known or understood
Study on Feasibility of Age-Based Criteria for Child Restraint Selection

• Conducted by
  Robert Anderson and Paul Hutchinson
  Centre for Automotive Safety Research
  The University of Adelaide, Australia

• Reported at 20th ESV Conference, Lyon, France, 2007

THE FEASIBILITY OF AGE-BASED CRITERIA FOR CHILD RESTRAINT SELECTION
RWG Anderson, TP Hutchinson
Paper number 07-0220
Group I (9-18kg)

Group II (15-25kg)

Transition weight range

Transition age range

AGE (years)

WEIGHT (kg)

WEIGHT (lb)
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Group I (9-18kg)

Group II (15-25kg)

Transition age

Outgrown Group I before transition age

Too small for Group II at transition age
Trade-Off

- For a given set of mass specifications (mass ranges) for child restraint groups, selection of a transition age determines the number of children that are too small or will have outgrown the restraint at the transition age.
- The above technique can be applied to the transition between each of the restraint groups.
- The following graph looks at the trade-off for transition age selection for children moving from Group I to Group II restraints.
Age based transitions from FFCR (Group I) to Booster (Group II).
Number too large for a FFCR v. number too small for a booster by transition age.
Rates of correct restraint specification using aged-based transitions

<table>
<thead>
<tr>
<th>Standard</th>
<th>Transition ages</th>
<th>Percentages correctly classified</th>
<th>Percentage of children under 8</th>
</tr>
</thead>
<tbody>
<tr>
<td>AS1754: 2004</td>
<td>6 m, 4 y, 8 y</td>
<td>99.0 93.5 85.4 89.8</td>
<td>89.8</td>
</tr>
<tr>
<td>UN ECE R44.04</td>
<td>12 m, 4 y, 8 y</td>
<td>90.4 95.4 93.2 93.7</td>
<td>93.7</td>
</tr>
<tr>
<td>FMVSS 213</td>
<td>12 m, 5 y, 8 y</td>
<td>90.4 80.1 84.8 83.7</td>
<td>83.7</td>
</tr>
</tbody>
</table>
Discussion

• This technique can be applied to variables other than mass – for example, height of children versus age could also be considered in this way.
• It is feasible to specify the age of children for the transition between restraint types. Mass ranges may need to be suitably adjusted to minimise trade-off.
• Age based specification may be easier for consumers to grasp and remember.
Alternative Approach

• Draft changes to AS/NZS 1754 (the Australian Standard for child restraints for use in motor vehicles) propose the use of height as the method to determine child restraint selection.
• The marking of maximum and minimum shoulder height lines on the child restraint has been proposed.
• Growth chart data can be used to minimise difficulties in accommodating the mass variation in children of a given height.
Proposed Changes to Australian Requirements for Child Restraints

- Deletion of mass-based categories
- Shoulder height marking on child restraint - mock-up examples (illustrative only; revisions to standard not finalised; may be subject to further amendment)