

# Child Restraint Rating

## *Research and NCAP Testing*

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# Outline

- Background
- Child Seat Ratings Around the World
- U.S. Crash Data
- NCAP approach to CRS Safety Rating
- Near-term Tasks

# Background

- In October 2000, under “TREAD” ACT, Congress mandated that NHTSA establish the feasibility of including child restraints in every NCAP crash tests
- Congress also mandated that NHTSA issue a notice to establish a Child Seat safety rating by Nov 2001 with the program beginning by October 2002

# Child Seat Rating Programs Around the World

# Euro NCAP CRS Rating

- Three factors used to rate the CRS and vehicle, however, no score given.
  1. Dynamic performance during full-scale 40% offset and side impact testing
  2. Clarity of warning label for children and airbags
  3. Simplicity of installation instructions
- Plans to penalize vehicle manufacturers if labeling and CRS performance is unacceptable

# Australian NCAP CRS Rating

- Three factors used to rate the CRS
  1. Vehicle compatibility (each seat placed in a category of vehicle to determine ease of fit)
  2. Ease of correct installation of child and of child seat
  3. Dynamic performance during numerous sled tests (forward, rearward, sideways, and rollover)
- Child seat rated *preferred buy* or *standards approved*

# USA- Consumers Union

- Three factors used to rate the CRS
  1. Dynamic performance during sled test
  2. Ease of correct installation of child seat in three different vehicles.
  3. Stroller score if applicable
- Child seats given an overall score

# Canadian Insurance Organization

- Ease of fit rating
- Rate child seats in 6 different categories
- Each category has a score of Good, Average  
Bad
- No overall rating given



# Japan NCAP Rating

- Have not started child seat rating program
- Plan to start a CRS rating program in the future, but no date or plan was given

# Real World Crash Data

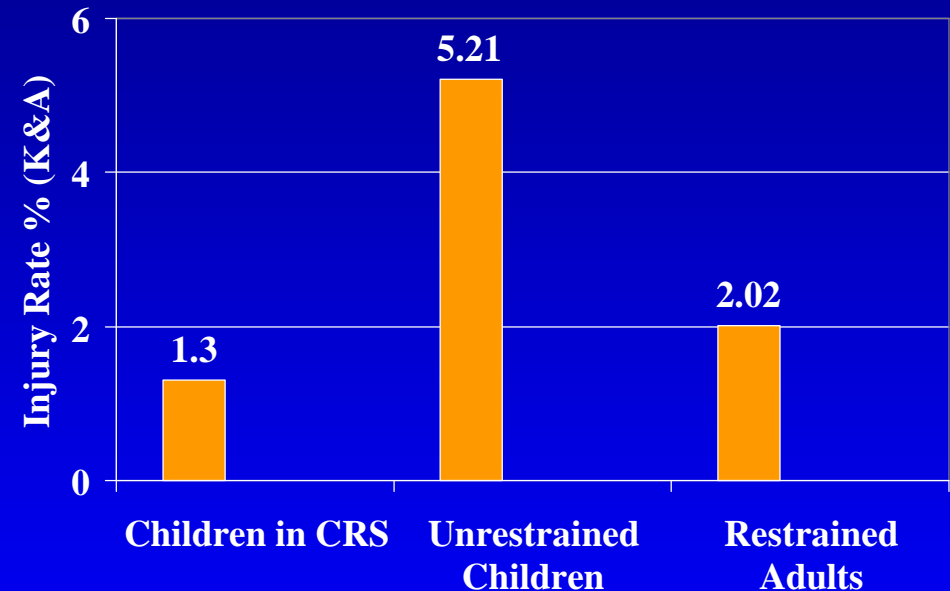
# Real World Crash Data

- NASS GES is a statistical sample of police reported crashes and uses the KABCO scale  
~45,000 cases
- NASS CDS is a more detailed investigation of police reported crashes and identifies the severity of injury using the Abbreviated Injury Scale (AIS) ~ 4,500 cases
- FARS is a census of fatal crashes taken within the USA

# Preliminary-K&A Injury Rates

Age [4 YO in rear seats, Frontal & Non-rollover, Age 15 YO adults

- Small children in CRS are safe.
- Unrestrained children are four times as likely to be injured as small children in CRS.
- For child fatalities 0-6, roughly speaking, 46% are in CRS, 35% are unrestrained and 19% are using adult belts.

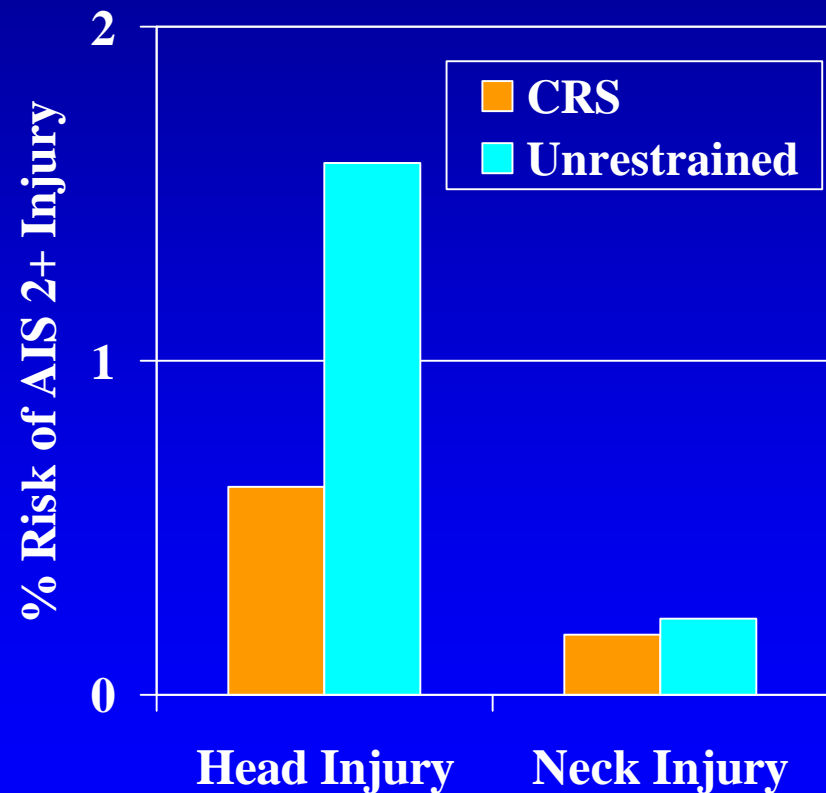


Compiled from 1991-1999 GES and FARS

# Preliminary-NASS/CDS

Age [4 YO in rear seats, Frontal & Non-rollover

- Unrestrained small children are about 2.6 times as likely to be traumatized in the head as small children in CRS.
- Generally speaking, few children, either unrestrained or restrained, suffered neck trauma.



# U.S.A. NCAP and a Child Seat Safety Rating

# Child Restraint Safety Rating

- **Interest:** Give a child restraint safety rating that is useful to consumers
- **Options:** Generate a variety of possibilities before deciding what to do
- **Criteria:** Insist that the result be based on some objective standard

# Child Restraint Safety Rating

Possible options for a safety rating

Crash Tests

1. Full scale NCAP tests
2. Dynamic Sled tests

Ease of Use

3. Child seats and vehicle seats are rated

Combination of Crash Tests and Ease of Use



# Option 1 - NCAP Vehicle Tests

# Option 1: Full-scale NCAP tests

## -Observations

1. Low cost
2. Can rate many CRS
3. Compatibility issue could be addressed
4. Harmonization with Europe

1. Real world crash data says CRS's are safe in vehicles.
2. Methodology may be unfair
  - Some CRS's will be in the more severe subcompact car and some will be in large car
3. Preliminary testing has shown, that a vehicle crash pulse is less severe than the 213 pulse.
4. Results delayed until end of NCAP testing

# Option 2 - Dynamic Sled Tests

# Option 2: Sled Tests

## -Observations

1. Low cost
  2. Can rate 40 CRS
  3. Methodology is fair
    - The CRS will be exposed to same impulse loading.
  4. Completed early in Model Year
1. Real world crash data says CRS's are safe
  2. The NCAP dynamic crash will be less severe than the 213 pulse.
  3. NCAP sled buck different from the 213.
  4. Doesn't address CRS/vehicle compatibility

# Option 3 - Ease of Fit

# Option 3: Ease of Fit – Rate Vehicle

## -Observations

1. Low cost
  2. Can rate 40 CRS
  3. Methodology is fair
  4. Completed early in Model Year
  5. Recognizes what real world crash data says about CRS.
  6. Postpones decisions until 213 is resolved.
  7. Encourages correct use and may lead to reduced real world trauma.
1. Have to develop a reasonable procedure
  2. The safety community will have difficulty developing an objective and consistent criteria

# Near-Term Tasks

- In mid May – July of 2001, a series of sled testing, 3 YO in different configurations, is scheduled.
- We are studying incompatibility and easy of fit.
- We plan to test CRS in side NCAP in MY 2002
- Notice of CRS NCAP methodology is due in Nov 2001

Thank You

End of Presentation