

RESTRAINT SYSTEMS FOR CHILDREN



Rimini - Il nuovo Grand Hotel

C Mercier-Guyon, CERMT, Annecy, France



Restraint Systems for Children (RSC)

- Children and road accidents
- The effects of the laws
- The regulations in USA and Europe
- The effectiveness of the use of RSC
- The role of prevention actions




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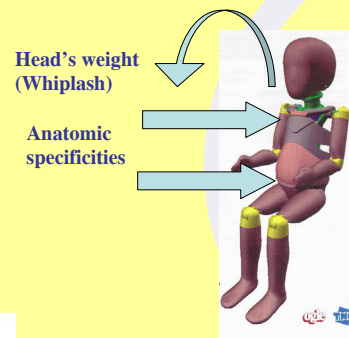
The specific risks

- Risk of being ejected X 6 or 7 if non fastened (generally side windows)
- Risk of crash against the front window
- At 50 km/h, weight X 30
- A child of 30 kg become a 900 kg's bullet (= fall from 3 floors)




The specificity of accidents

- 40 % of fatal accidents involving children happen on distances less than 3 km
- 30 - 50 % of children are not fastened on short distances

Head's weight (Whiplash)

Anatomic specificities



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Study ONISR 1995, France accidents involving kids 0-14 years old

	Fatalities	Injuries
Passengers	206	6626
Pedestrians	91	5819
Cyclists	60	1847
Motorcycles	18	1171
Total	375	15463



Study ONISR, France accidents involving kids 0-14 years old

Year	Fatalities	Serious Injuries	Other injuries
1988	520	4049	14307
1992* Law 01 01 1992	384	2946	11196
1995	375	2885	13042



Swedish Insurance Companies Study, 1989

- 2763 accidents involving children:
- Non fastened: 15,6% injured
- Fastened: 6,9% injured



The laws implementing mandatory seat belt use and Restraint systems

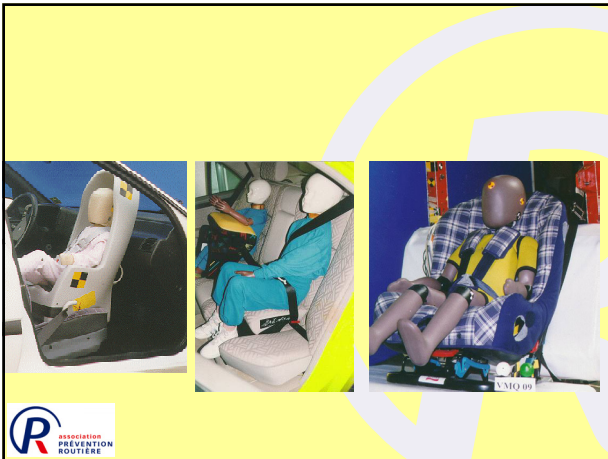
- Sweeden: 2/3 less fatalities since the law of 1986
- France: 659 children killed in road accidents in 1982, 375 in 1995 (law in 1992)



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NHTSA recommendations

Proper Child Safety Seat Use Chart

	INFANTS	TODDLER	YOUNG CHILDREN
Weight	Birth to 1 year at least 20-22 lbs.	Over 1 year and Over 20 lbs.-40 lbs.	Over 40 lbs. Ages 4-8, unless 4'9"
Seat Type:	Infant only or rear-facing convertible	Convertible / Forward-facing	Belt positioning booster seat
Position	Rear-facing only	Forward-facing	Forward-facing
Always Make Sure:	Children to one year and at least 20 lbs. in rear-facing seats. Harness straps at or below shoulder level.	Harness straps should be at or above shoulders. Most seats require top slot for forward-facing.	Belt positioning booster seats must be used with both lap and shoulder belt. Make sure the lap belt fits low and tight across the lap/upper thigh area and the shoulder belt fits snug crossing the chest and shoulder to avoid abdominal injuries.

- ## EC Directive 91/671
3. Child restraints fall into five "mass groups":
- (a) Group 0 for children of a mass less than 10 kg;
 - (b) Group 0+ for children of a mass less than 13 kg;
 - (c) Group I for children of a mass from 9 kg to 18 kg;
 - (d) Group II for children of mass from 15 kg to 25 kg;
 - (e) Group III for children of mass from 22 kg to 36 kg.
4. Child restraint systems may be of two classes:
- (a) an integral class comprising a combination of straps or flexible components with a securing buckle, adjusting device, attachments, and in some cases a supplementary chair and/or impact shield, capable of being anchored by means of its own integral strap or straps;
 - (b) a non-integral class that may comprise a partial restraint, which, when used in conjunction with an adult belt, which passes around the body of the child or restrains the device in

EC Directive 91/671

Type of restraint	Approx. age range	Approx. weight range
Infant carrier or baby seat	birth to 9 months	up to 10 kg
Child or toddlers seat	6 to 4 years	9-18 kg
Booster seat	6 months to 6 years	9-25 kg
Booster cushion	4 years to 11 years	15-36 kg

- ## Derogations
- Taxis
 - Rental cars (but often equipment available)

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ONISR France 1992

- 31 % non correctly fastened
- 25 % Restraint System not used for short distances



Use of safety belts and restraint systems

Member State + year of observation	Usage rates in percentages
Austria (1994)	Front safety belts – 56%; front child system – 21%; rear safety belts – 31%; rear child system – 31%
Denmark (1993)	0-7 years – 70%; 8-15 years – 55%
Finland	Rear seats, child system : 0-5 years – 82%; 6-14 years – 60%
France (1992)	0-5 months – 75%; 6 months to 2 years – 87%; 3-9 years – 65%
Germany (1995)	built-up areas, child systems : 0-5 years – 80% 6-11 years – 23%
Greece (1995)	0-6 years – 15%
Netherlands (1994)	Front 0-12 years – 54%; rear 0-12 years – 32%
Sweden (1994)	rear seats safety belts + child systems : 0-15 years – 87%
UK (1995)	rear seats safety belts + child systems : 0-4 years – 85%; 5-13 years – 72%

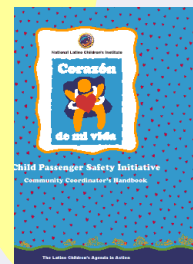


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Importance of Prevention and Information Campaigns



References

- nhtsa.dot.gov
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Thank you
for
your attention

