Driving towards Safety:
Strategies for Protecting 7–10-Year-olds in Vehicles

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March 13, 2024

Disclosures

I have no relevant financial relationships with the manufacturer(s) of any commercial product(s) and/or provider(s) of commercial services discussed in this CME activity.

I do not intend to discuss an unapproved/investigative use of a commercial product/device in my presentation.

Learning Objectives

1. Understand the basic principles of child passenger safety, including:
   - Epidemiology
   - Physics
   - Crash dynamics
2. Discuss best practice recommendations for appropriate child passenger restraint
3. Identify and access resources in your community, including for children with special health care needs

Why is this important in pediatrics?

Every year, we drive 282.4 million vehicles

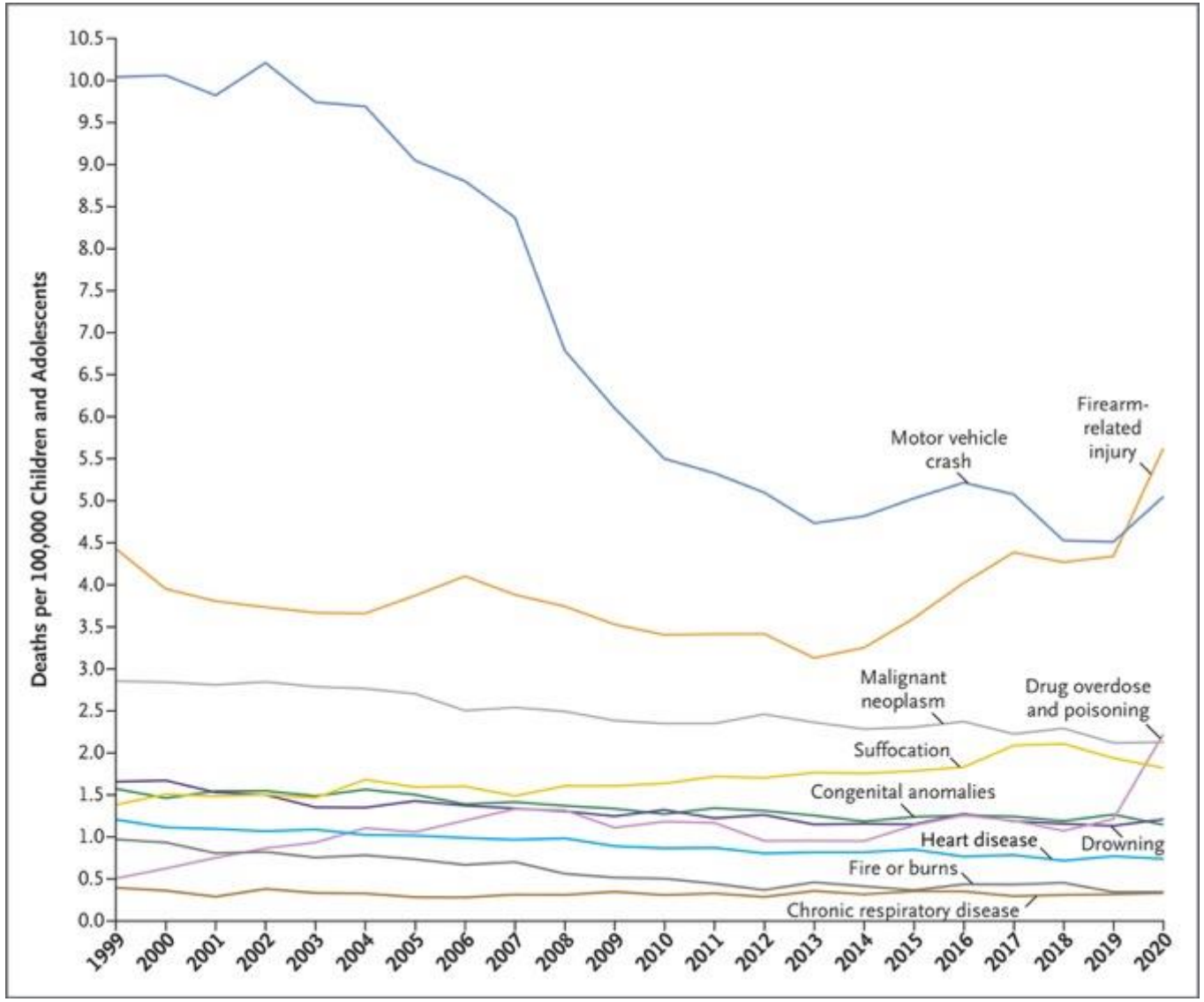
2021 NHTSA Traffic Safety Facts

For a total of 3.14 TRILLION miles per year

Take a moment to reflect...

Motor vehicle crashes are one of the leading causes of death in children and adolescents

Leading Causes of Death among Children and Adolescents in the United States, 1999 through 2020



Goldstick et al. *NEJM*. 2022

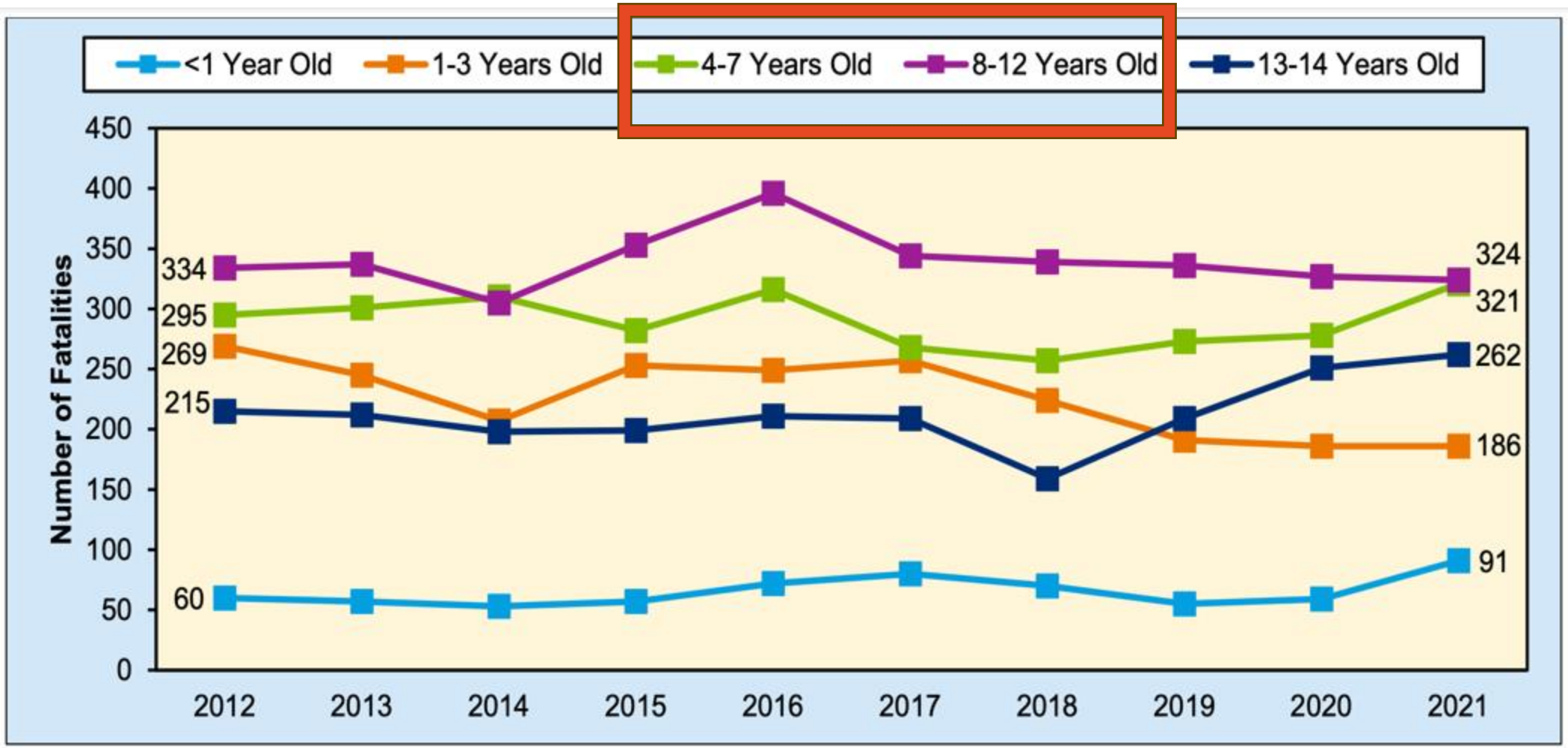
In the United States

445 children are injured, and 3 children die due to car crashes every day

2021 NHTSA Traffic Safety Facts

Child Traffic Fatalities, by Age Group, 2012-2021

2021 NHTSA Traffic Safety Facts



Source: FARS 2012–2020 Final File, 2021 ARF

“If a disease were killing our children at the rate unintentional injuries are, the public would be outraged and demand that this killer be stopped.”

Former US Surgeon General, C. Everett Koop

Car Seats Through the Ages

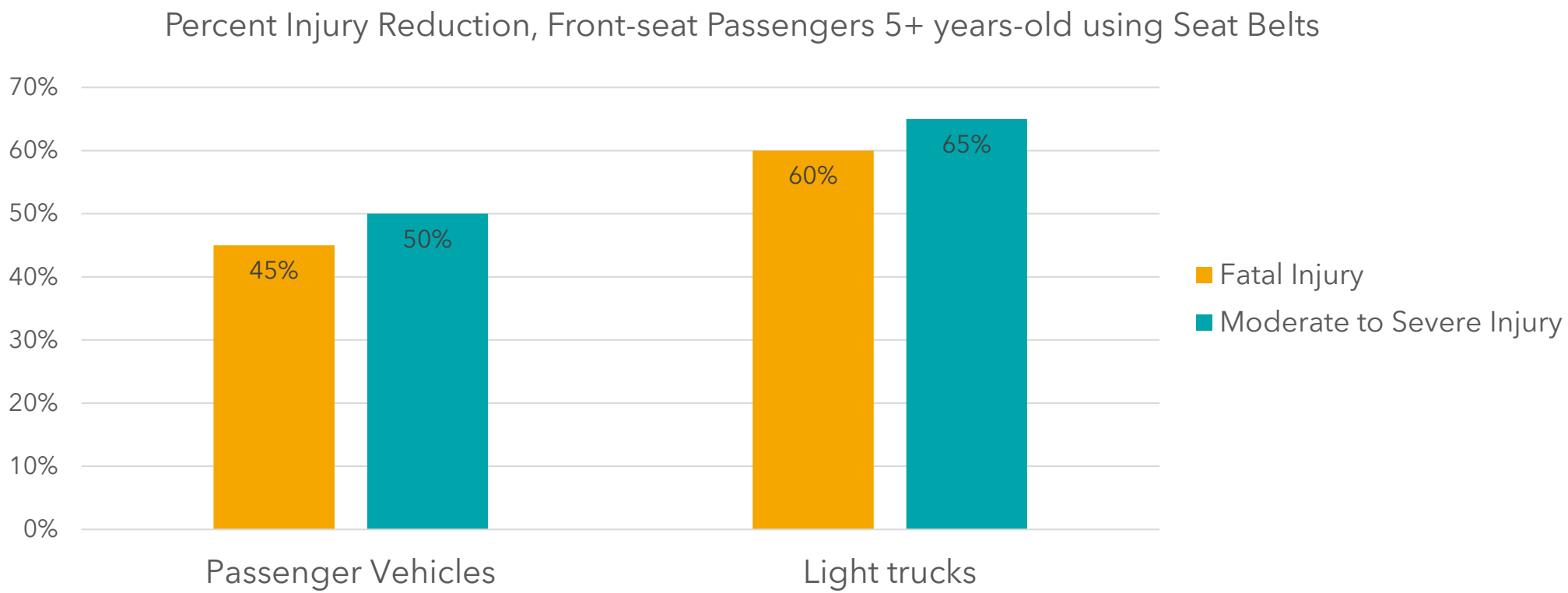
Images courtesy of The Henry Ford

Use of Restraints Saves Lives

From 1975 to 2017, an estimated
11,606 lives were saved
by child restraints for children <4

Image courtesy of Volvo Cars

Use of Restraints Saves Lives

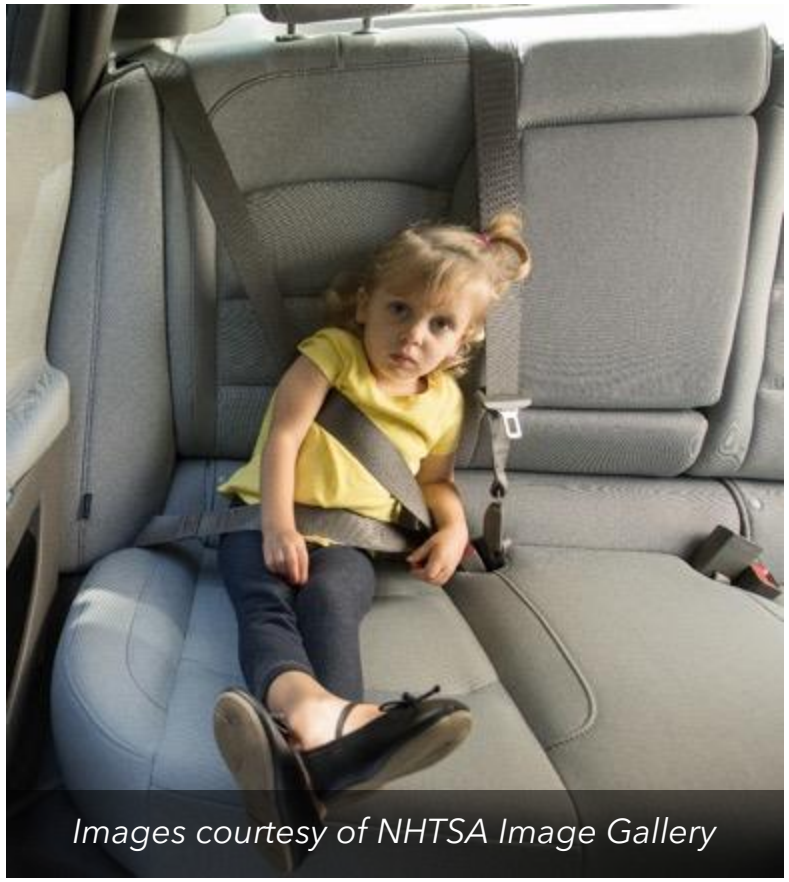


NHTSA 2021 Traffic Safety Facts


Who has installed
a car seat before?

Misuse

An estimated **<u>52-90%</u>** of child restraints are misused



Images courtesy of NHTSA Image Gallery

Common Types of Misuse

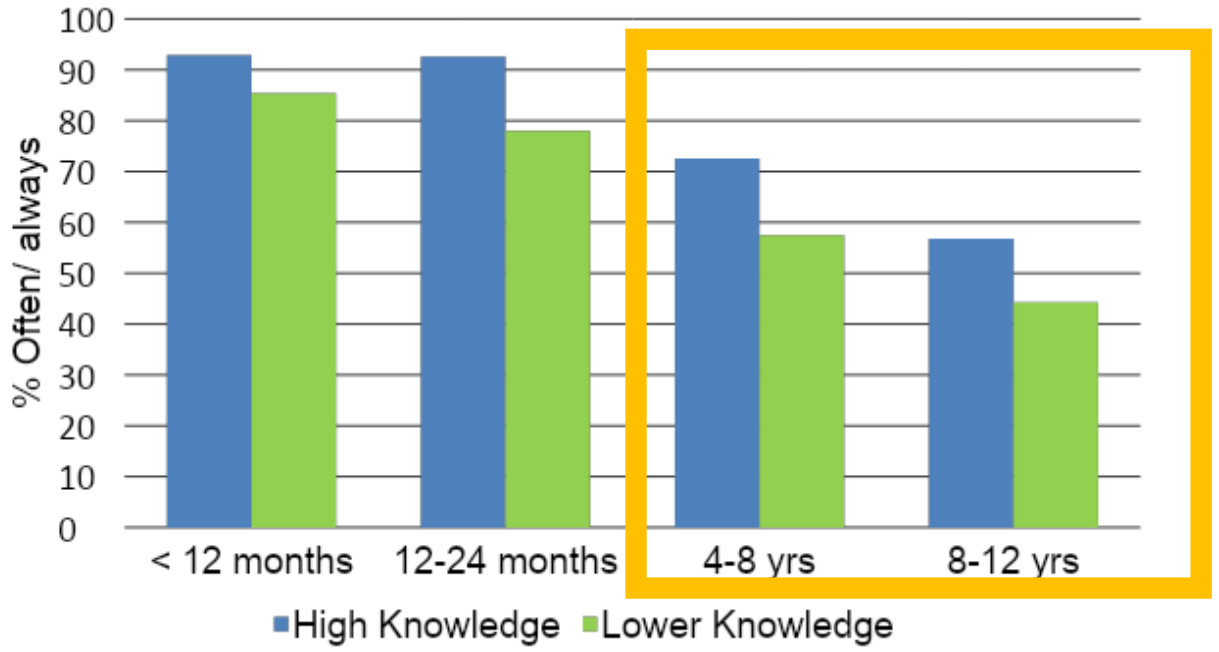
- Wrong seat type for the child's age and weight
- Seat belt is not holding the seat tightly to the seat or is not locked
- Harness straps are not snug to child
- Harness straps are not routed correctly
- Chest clip is not at the level of the axilla
- Car seat has been recalled

How much time did you spend learning about child passenger safety in your training?

Knowledge Impacts Practice

Pediatricians who have more knowledge about child passenger safety are more likely to provide counseling to families.

Frequency of Counseling by Pediatricians
(all comparisons statistically significant at <0.01)



Zonfrillo et al. J Peds. 2014


Best Practice

AAP Recommendations

- Children should ride in a **rear-facing car safety seat** as long as possible, up to the limits of their car safety seat. This will include virtually all children under 2 years of age and most children up to age 4.
- Once they have been turned around, children should remain in a **forward-facing car safety seat** up to that seat's weight and length limits. Most seats can accommodate children up to 60 pounds or more.
- When they exceed these limits, child passengers should ride in a **belt-positioning booster** seat until they can use a seat belt that fits correctly.
- Once they exceed the booster limits and are large enough to use the vehicle seat belt alone, they should always use a **lap and shoulder belt**.
- All children younger than 13 years should be restrained in the **rear seats** of vehicles for optimal protection.

The “Laws”

When talking about car seats,
there is a difference between:

the laws of physics

and

the laws of the land

Laws of the Land

Federal laws regulate car and seat manufacturers

State laws regulate car seat use

Laws of the Land: South Carolina

SECTION 56-5-6410. Child passenger restraint systems; age and weight as basis for required restraining system; standards.

(A) Every driver of a motor vehicle (passenger car, pickup truck, van, or recreational vehicle) operated on the highways and streets of this State when transporting a child under eight years of age upon the public streets and highways of the State must properly secure the child in the vehicle as follows:

(1) An infant or child under two years of age must be properly secured in a rear-facing child passenger restraint system in a rear passenger seat of the vehicle until the child exceeds the height or weight limit allowed by the manufacturer of the child passenger restraint system being used.

(2) A child at least two years of age or a child under two years of age who has outgrown his rear-facing child passenger restraint system must be secured in a forward-facing child passenger restraint system with a harness in a rear passenger seat of the vehicle until the child exceeds the highest height or weight requirements of the forward-facing child passenger restraint system.

(3) A child at least four years of age who has outgrown his forward-facing child passenger restraint system must be secured by a belt-positioning booster seat in a rear seat of the vehicle until he can meet the height and fit requirements for an adult safety seat belt as described in item (4). The belt-positioning booster seat must be used with both lap and shoulder belts. A booster seat must not be used with a lap belt alone.

(4) A child at least eight years of age or at least fifty-seven inches tall may be restrained by an adult safety seat belt if the child can be secured properly by an adult safety seat belt. A child is properly secured by an adult safety seat belt if:

(a) the lap belt fits across the child's thighs and hips and not across the abdomen;
(b) the shoulder belt crosses the center of the child's chest and not the neck; and
(c) the child is able to sit with his back straight against the vehicle seat back cushion with his knees bent over the vehicle's seat edge without slouching.

(5) For medical reasons that are substantiated with written documentation from the child's physician, advanced nurse practitioner, or physician assistant, a child who is unable to be transported in a standard child passenger safety restraint system may be transported in a standard child passenger safety restraint system designed for his medical needs.

Any child restraint system of a type sufficient to meet the physical standards prescribed by the National Highway Traffic Safety Administration at the time of its manufacture is sufficient to meet the requirements of this article.

SC Code of Laws

Laws of Physics: Crash Dynamics

Three stages of a crash:

1. Vehicle crash
2. Human crash
3. Internal crash

Laws of Physics

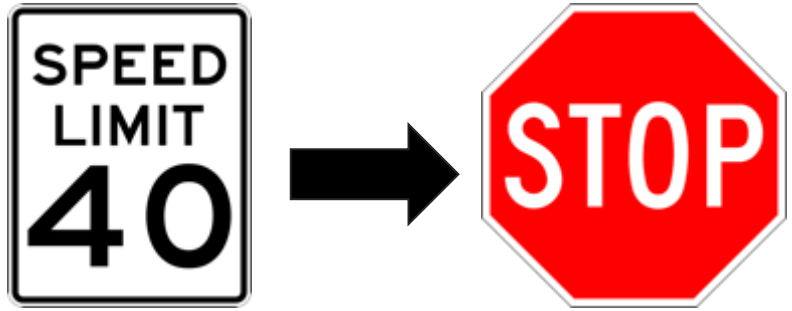
Force = Mass x Acceleration

Laws of Physics

Force = Mass x Acceleration

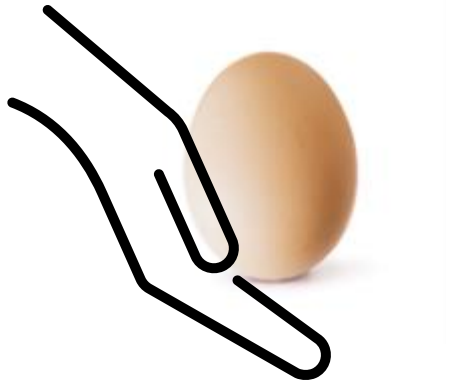
⇧ Force = ⇧ Injury

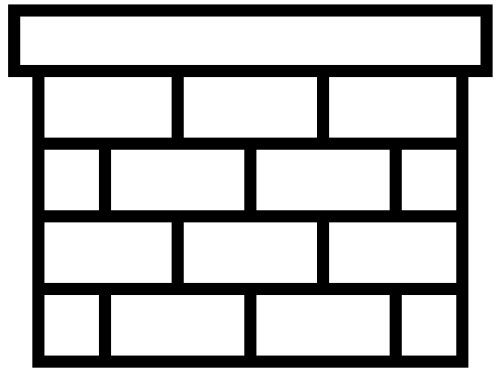
$$\text{Acceleration} = \frac{\Delta\ \text{Velocity}}{\text{Time}}$$

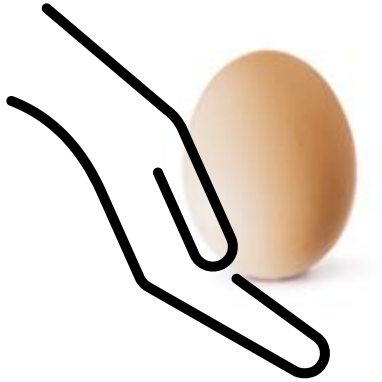


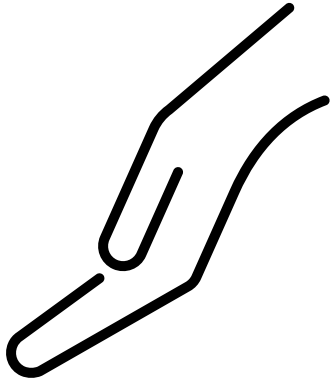
Laws of Physics: Egg toss

$$\text{Acceleration} = \frac{\Delta\ \text{Velocity}}{\text{Time}}$$





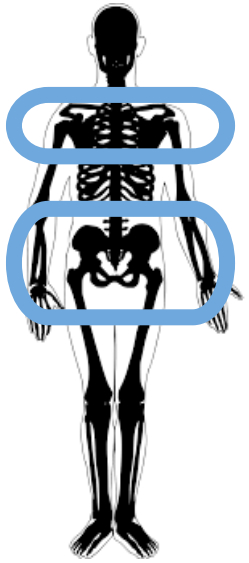




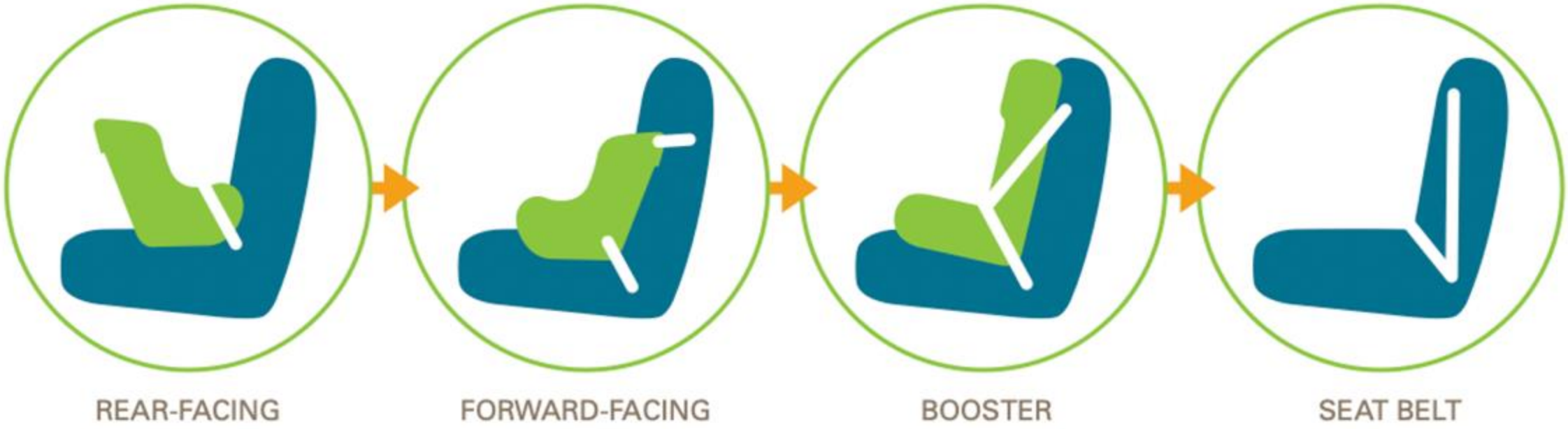
⇧ Time to stop ⇢ ⇩ Acceleration ⇢ ⇩ Force

How Car Seats Work

1. Prevent ejection
2. Direct forces to the strongest parts of the body (shoulders and hips)
3. Spread forces over a wide area
4. Protect the head, neck, brain and spinal cord
5. Allow the body to “ride down” with the vehicle

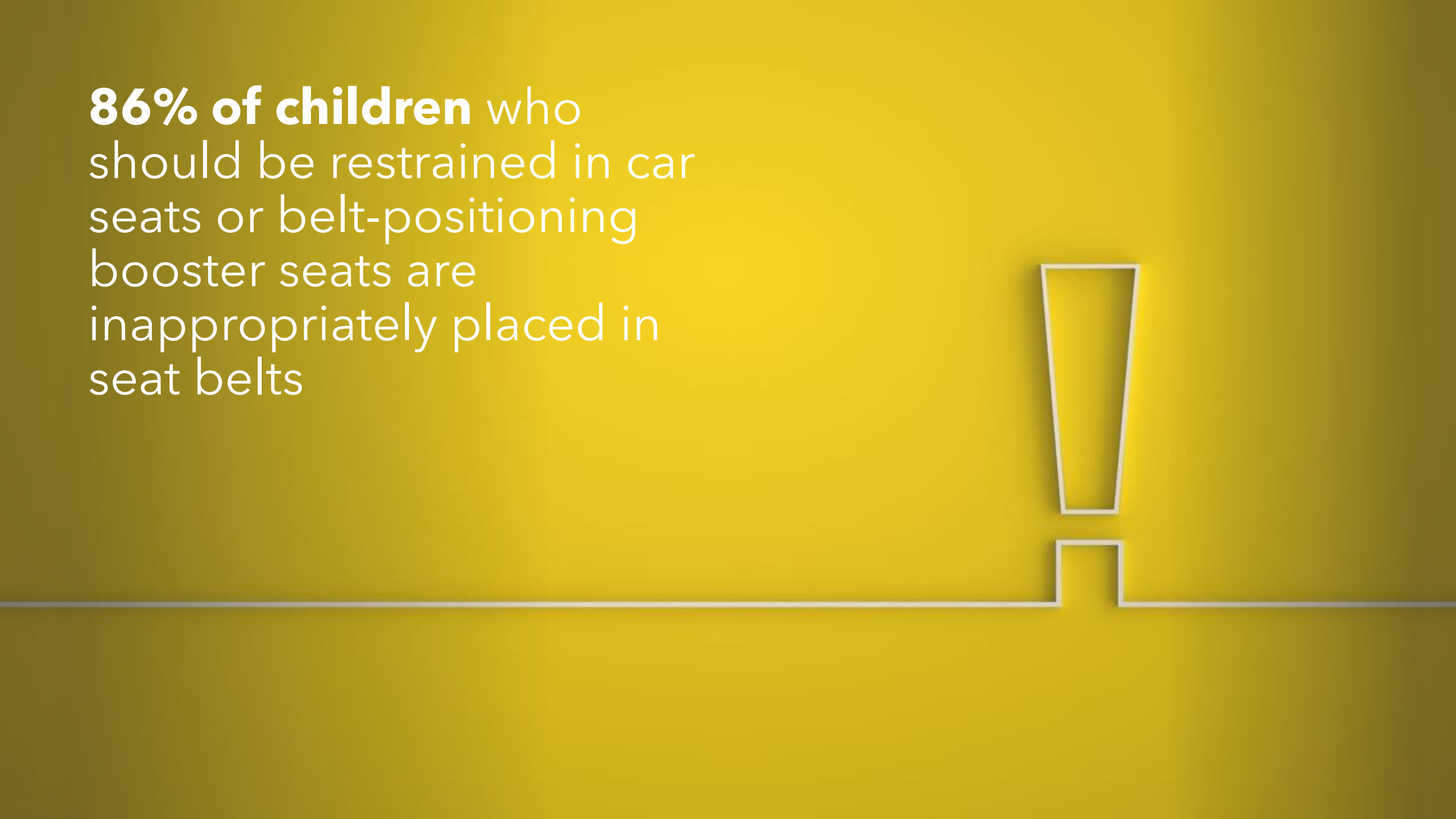


Types of Car Seats

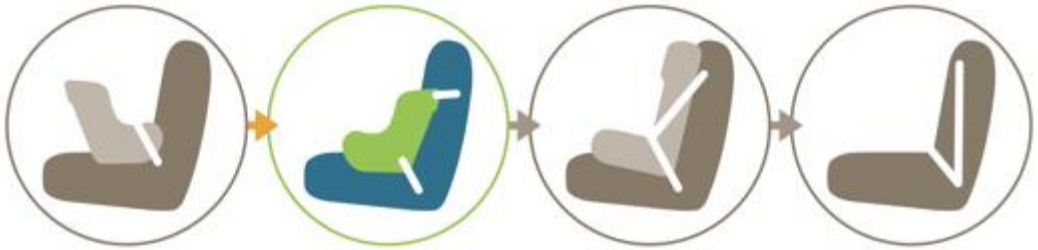



A 7-10-year-old can probably use a seat belt, right?

86% of children who should be restrained in car seats or belt-positioning booster seats are inappropriately placed in seat belts



Forward-facing Seats



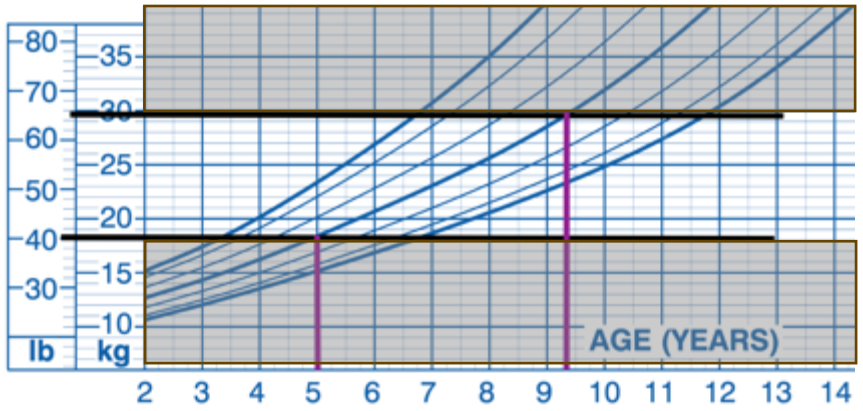
Seat Type	Direction	Max Weight Limit	Max Height Limit
Convertible	Rear → Front	40-65 lbs	40-54 in
Combination	Front → booster	40-65 lbs	48-54 in
All-in-one	Rear→ Front→ Booster	40-65 lbs	43-57 in

NOTE:
Most of these seats have a MINIMUM weight of 22 lbs, which the average child doesn't reach until AFTER 1 year old

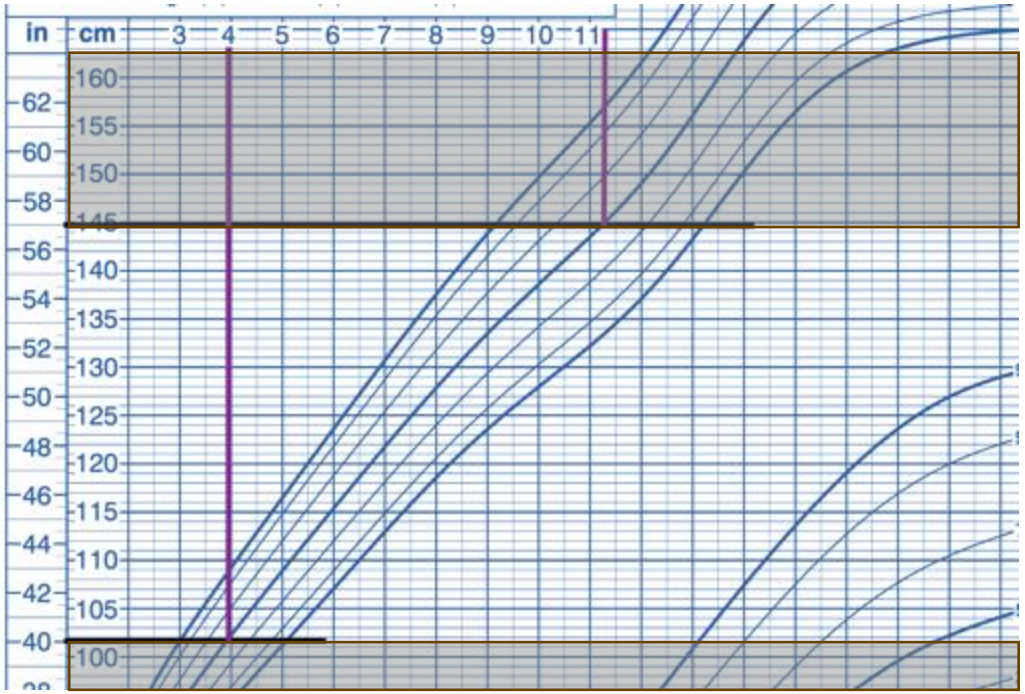
2023 AAP Car Safety Seat Product List

Average Fit in Forward-facing Seats

Max Weight Limit: 40– 65 lbs

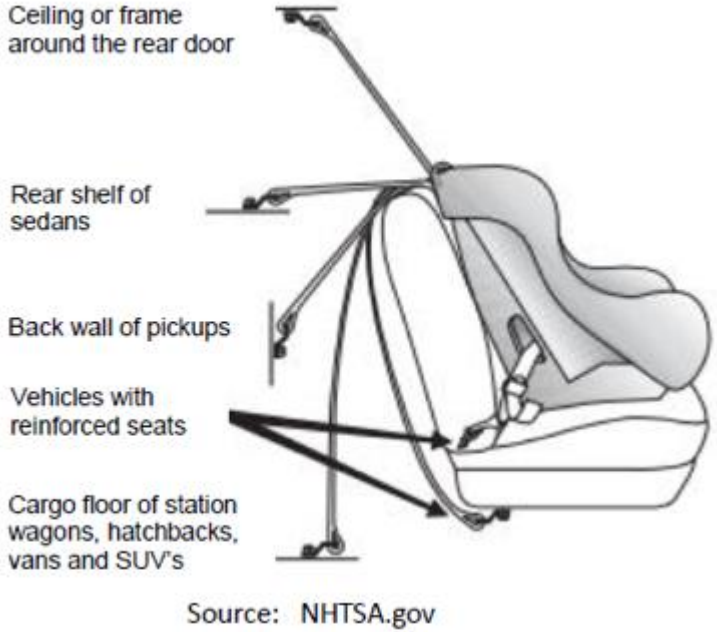


Maximum Height Limit: 40-57 in



Proper Fit in Forward-facing Seats

Top Tethers

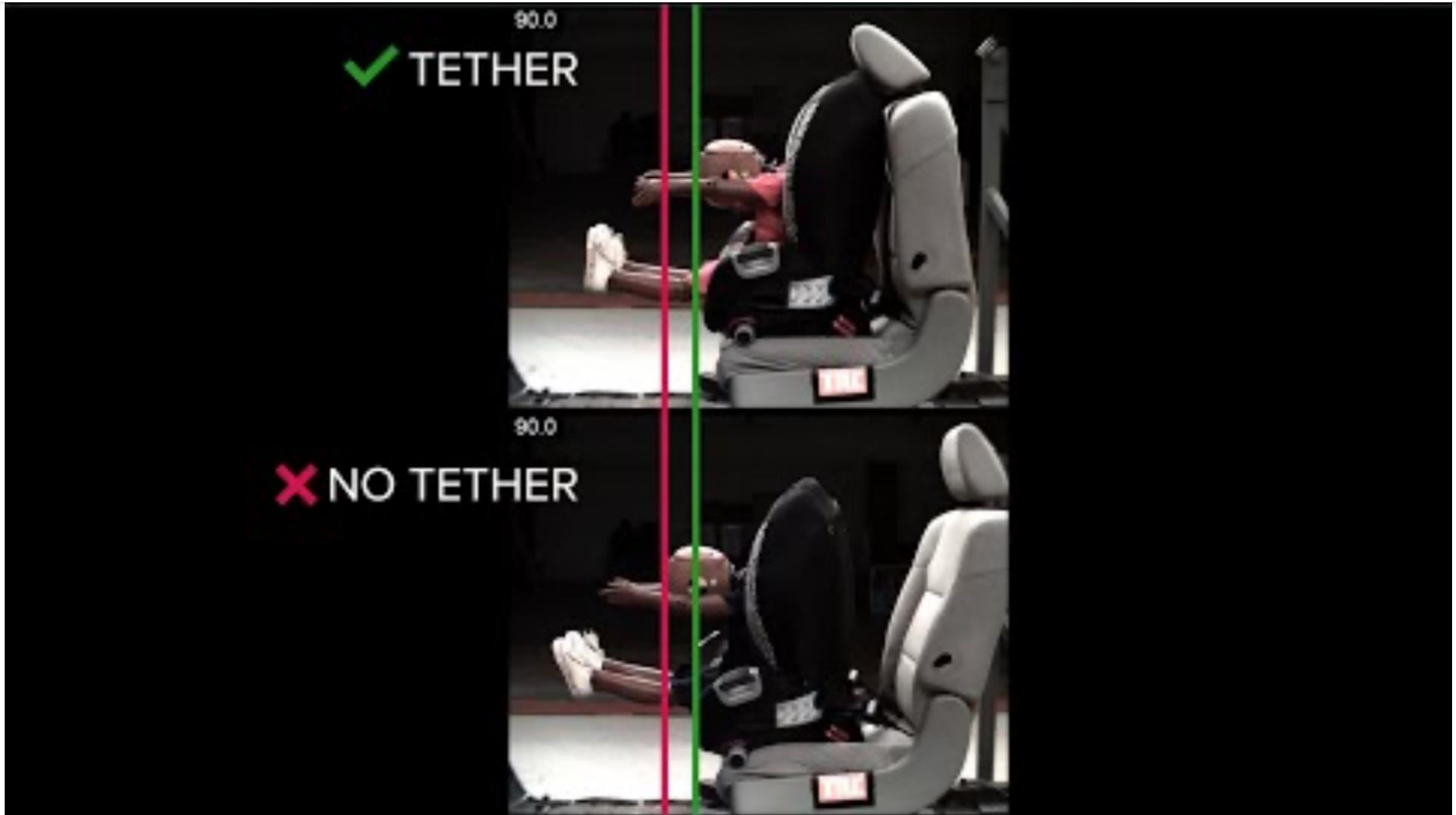


Source: NHTSA.gov

Image courtesy of University of Michigan

Top Tether Reduces Head Excursion

Video courtesy of The Ohio State University: Buckle up with Brutus



Bottom Line

Best practice:

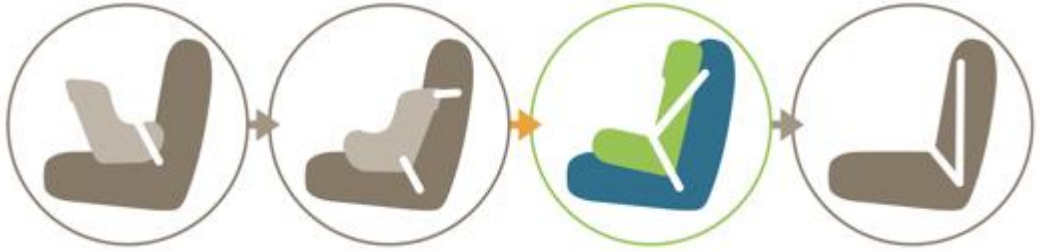
Forward-facing with a harness for as long as possible,
up to the limit of the seat (minimum 4-8 years)

Always use the tether

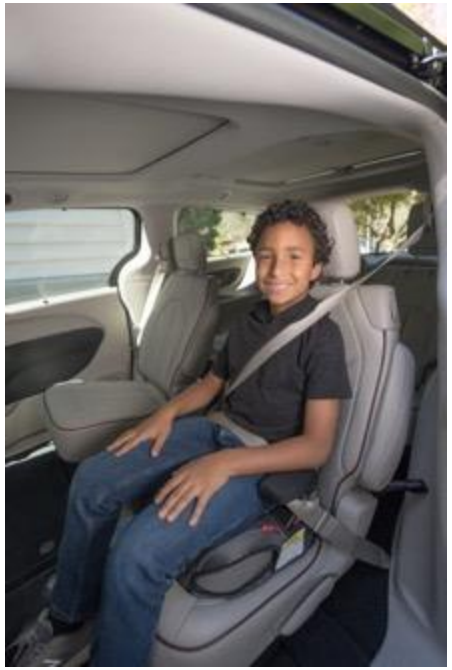
Key Time Points:

4-10 years

Booster Seats



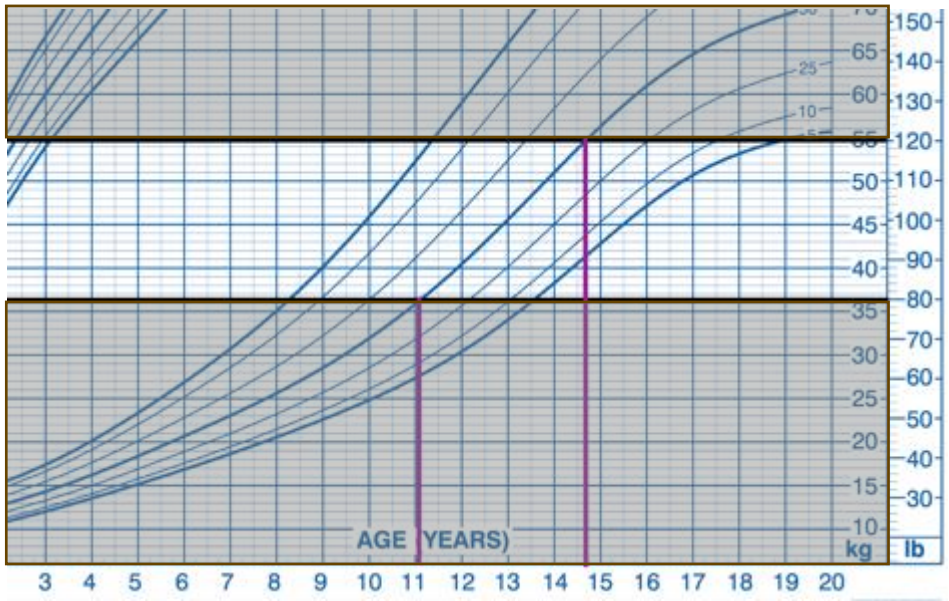
Seat Type	Lower wt limit	Max Weight Limit	Max Height Limit
Combo (Front → booster)	40 lbs	100-120 lbs	52-63 in
All-in-one (rear, front, booster)	40 lbs	80-120 lbs	52-63 in
Booster (high-back or backless)	40 lbs	100-120 lbs	57-63 in



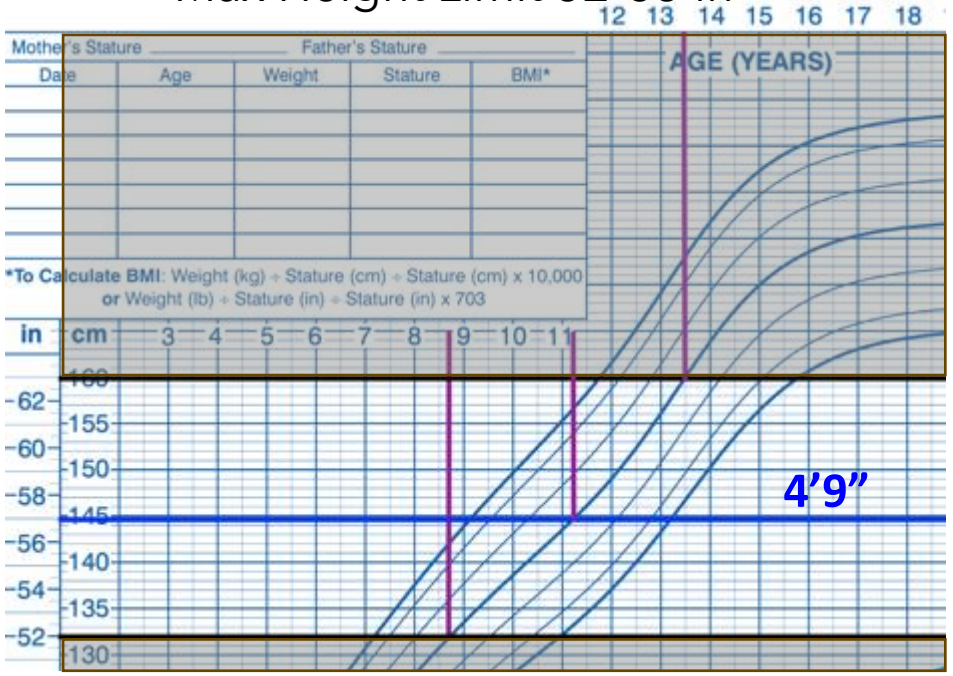
2023 AAP Car Safety Seat Product List

Average Fit in Booster Seats

Max Weight Limit 80-120 lbs



Max Height Limit 52-63 in



The average child does not reach 4'9" until just after **11 years old**

Proper Fit in Booster Seats

How Boosters Work

4 year-old pelvis

15 year-old pelvis

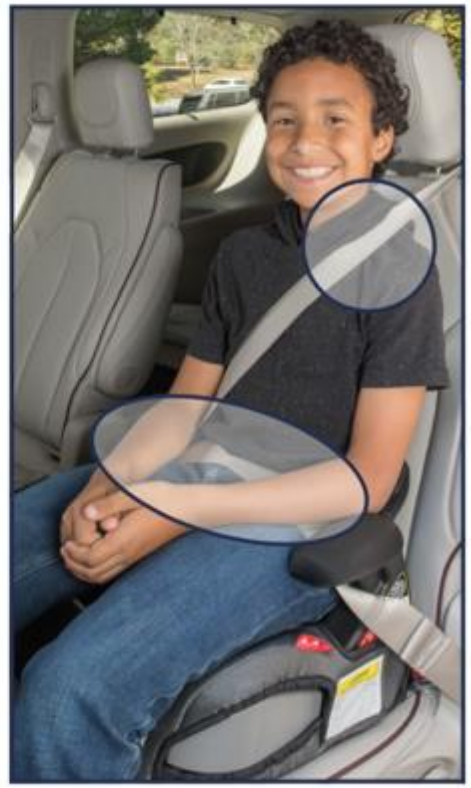
Boosters Provide the ASIS

Submarining

How Boosters Work

Seat belt doesn't fit correctly.

- Slouching down until knees bend.
- Lap belt sitting too high.
- Shoulder belt rubbing on neck.



Booster seat raises child so seat belt fits correctly.

- Knees bending comfortably.
- Lap belt on hip area.
- Shoulder belt crossing mid-shoulder.

Source: BuckleupNC.org

High vs. Low-back Boosters

- No significant difference in injuries
- High-back booster is only **necessary** when there is not a headrest present that reaches the top of the ears

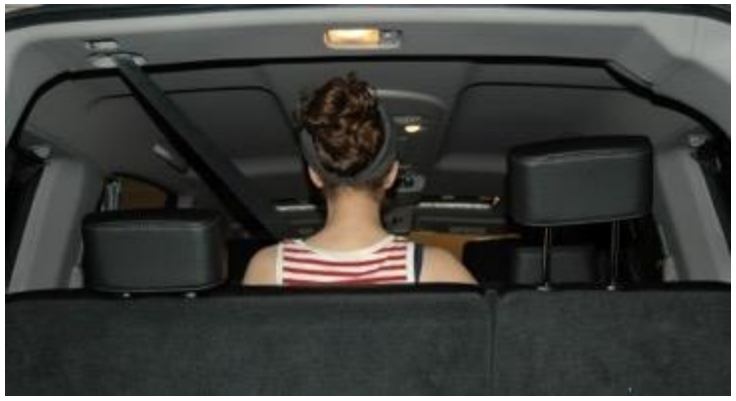
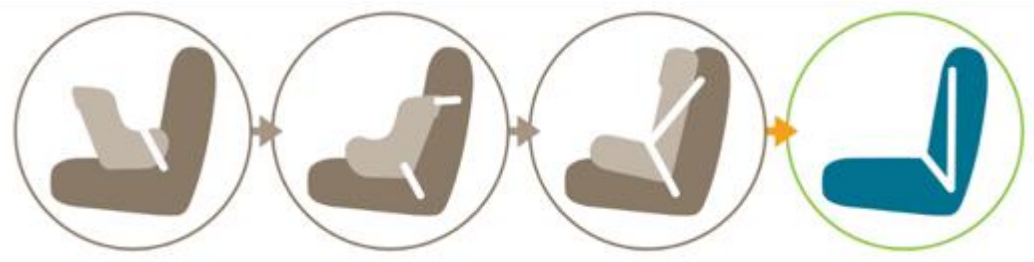


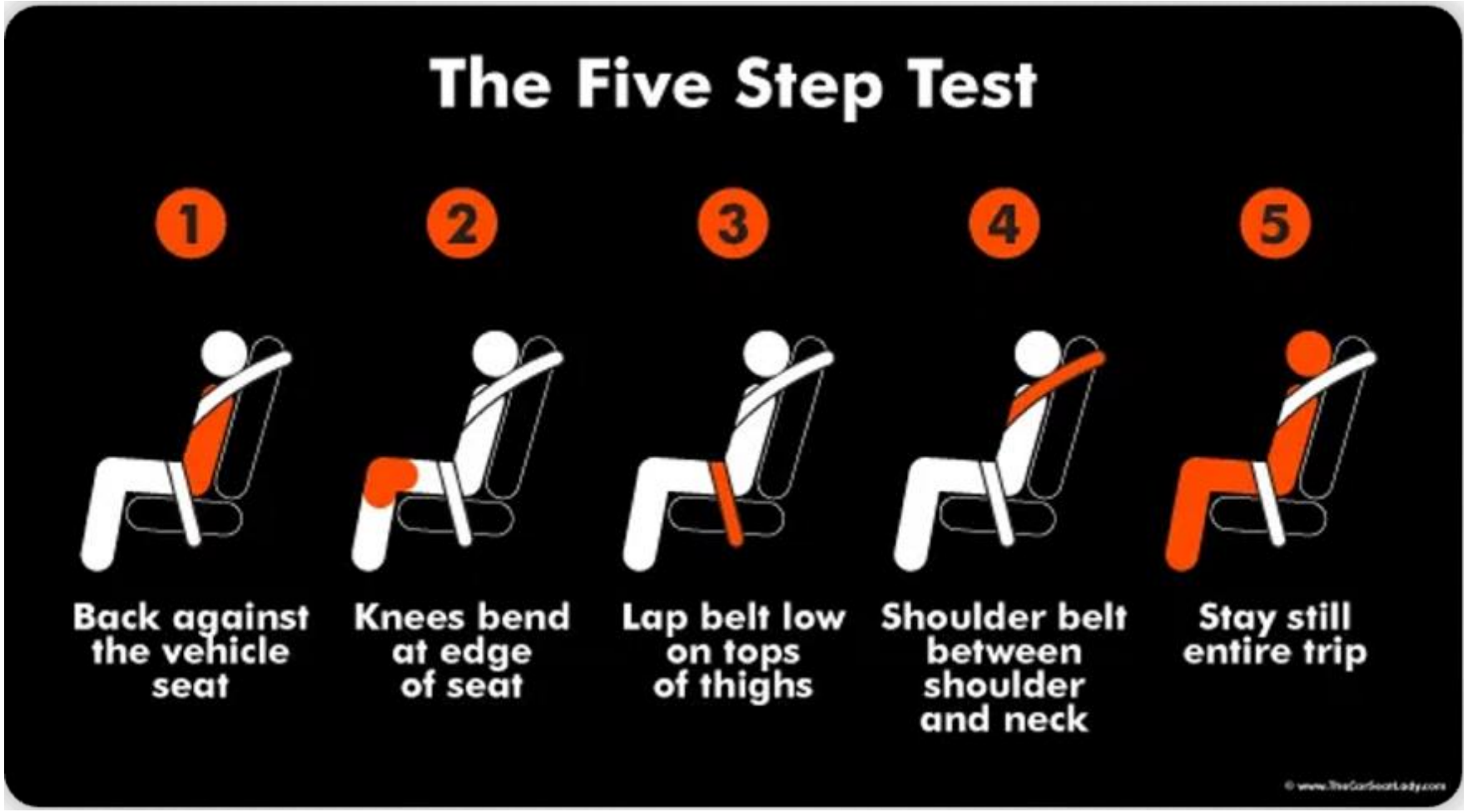
Image courtesy of The Car Seat Lady

Image courtesy of Smithsonian Institute

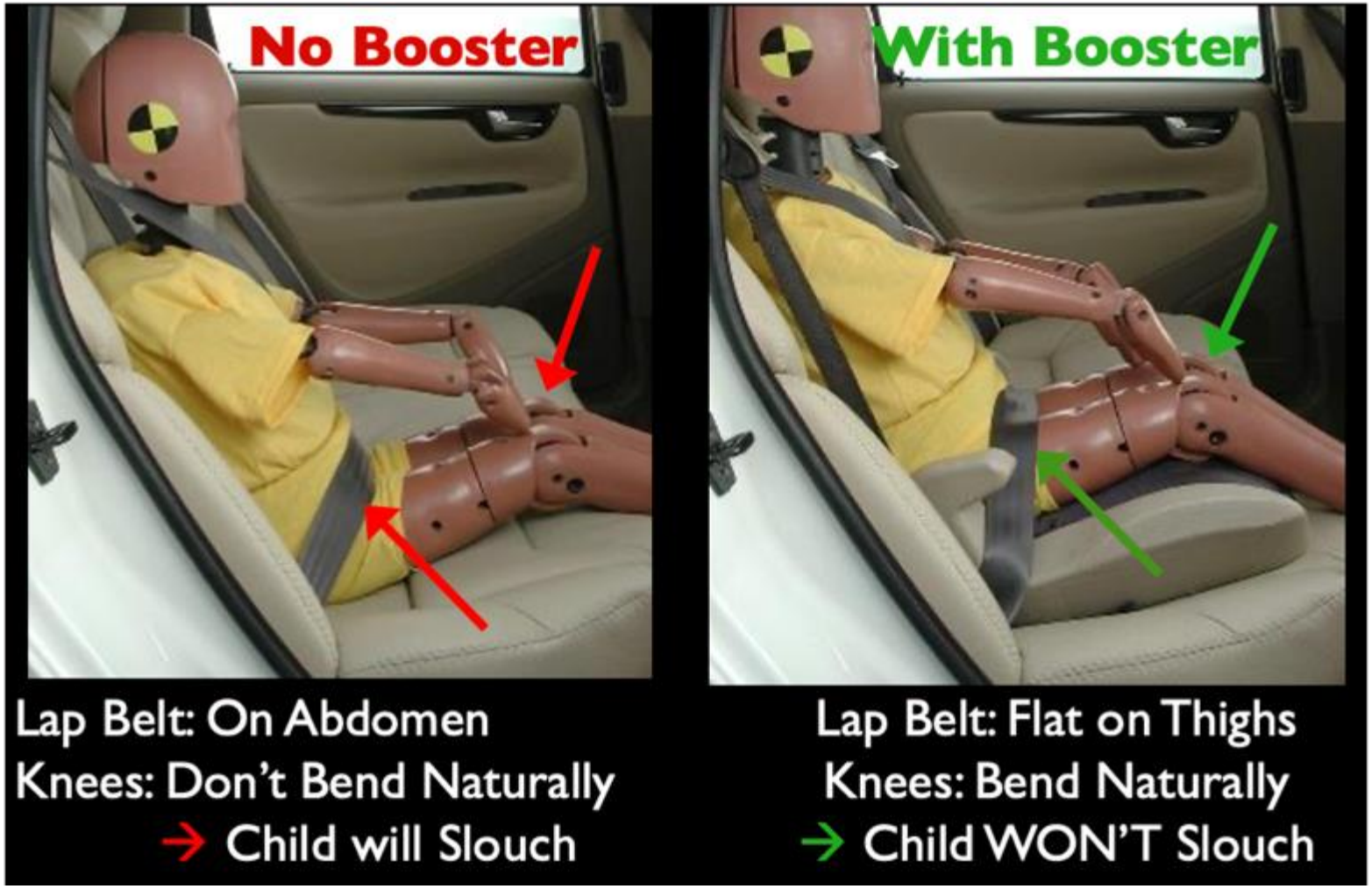
Arbogast KB, et al. Pediatrics 2009

Seat Belts




The Five Step Test
1
2
3
4
5
Back against the vehicle seat
Knees bend at edge of seat
Lap belt low on tops of thighs
Shoulder belt between shoulder and neck
Stay still entire trip

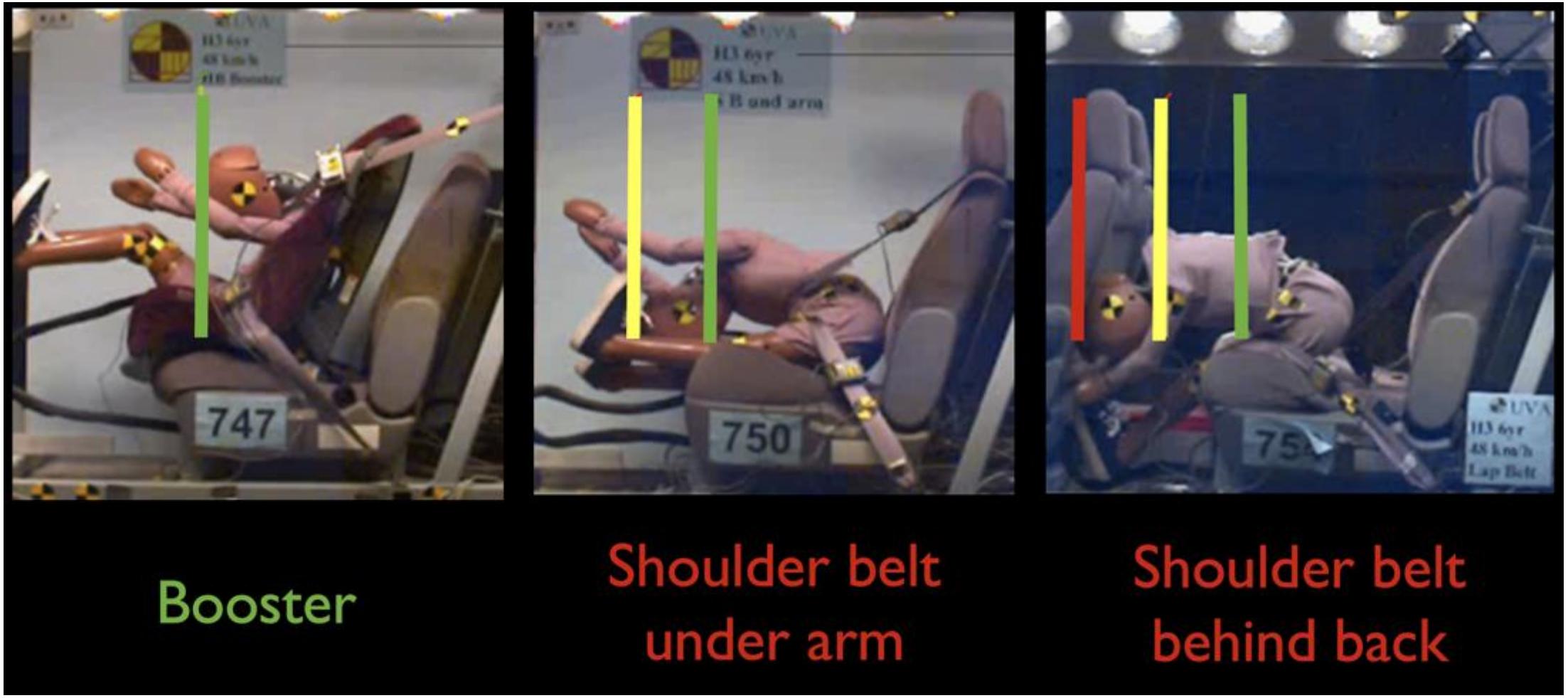
Poorly-Fitting Seat Belt vs. Booster



When the Belt Does Not Fit

Source: Amazon

When the Belt Does Not Fit



Seat Belt Syndrome

Source: BuckleupNC.org

Source: Al-Ozaibi L, et. al. (2016) International Journal of Surgery Case Reports

Non-approved Products

Where to Sit in the Vehicle?

Where to sit?

- 40-70% elevated risk of injury in the front-seat compared to back
- Front-seat passengers suffered more severe injuries
- The beneficial effects of rear-seat were no longer seen at 13 years-old

> J Pediatr Surg. 2006 Nov;41(11):1854-8. doi: 10.1016/j.jpedsurg.2006.06.012.

Factors influencing pediatric Injury Severity Score and Glasgow Coma Scale in pediatric automobile crashes: results from the Crash Injury Research Engineering Network

Peter F Ehrlich [1], J Kristine Brown, Mark R Sochor, Stewart C Wang, Martin E Eichelberger

> Pediatrics. 2005 Mar;115(3):e305-9. doi: 10.1542/peds.2004-1522.

Effects of seating position and appropriate restraint use on the risk of injury to children in motor vehicle crashes

Dennis R Durbin [1], Irene Chen, Rebecca Smith, Michael R Elliott, Flaura K Winston

> Annu Proc Assoc Adv Automot Med. 2001:45:61-72.

The effect of seating position on risk of injury for children in side impact collisions

D R Durbin [1], M Elliott, K B Arbogast, R L Anderko, F K Winston

Where to sit?

- Possible benefit to center rear seat
  - Lund found a similar risk of injury (any police reported injury) in rear-center vs. outboard seats
  - Kallan et al found injury risk (fracture and internal injury) 43% lower in rear-centerthan outboard seats.

> Pediatrics. 2008 May;121(5):e1342-7. doi: 10.1542/peds.2007-1512.

Seating patterns and corresponding risk of injury among 0- to 3-year-old children in child safety seats

Michael J Kallan [1], Dennis R Durbin, Kristy B Arbogast

> Accid Anal Prev. 2005 May;37(3):435-9. doi: 10.1016/j.aap.2004.12.004.

The effect of seating location on the injury of properly restrained children in child safety seats

Ulric J Lund [1]

Bottom Line

Best practices:

Booster until the seat belt fits correctly

(Minimum: 8-12 years or 4’9”)

Buckle up every ride

Back seat <13 years

Key Time Points:

6 + years

Transporting Children with Special Health Care Needs

Slides adapted from “Adaptive Transportation In-Service for OTs, PTs and Hospital Personnel” - Safe Kids Worldwide and Automotive Safety Program.

Images courtesy of Automotive Safety Program

Types of Adaptive Restraints

National Center for the Safe Transportation of Children with Special Health Care Needs

Angel Ride
Weight: Less than 9 pounds
Height: Less than 21.5 inches
For infants who must travel lying down in a car bed. *(Merritt Car Seat, 317-409-0148, merrittcarseat.com)*

Dream Ride SE
Weight: 5-20 pounds
Height: 26 inches or less
For infants who must travel lying down in a car bed. *(Dorel Juvenile Group, 800-544-1108, na.dorelJuvenile.com)*

Hope Car Bed
Weight: 4.5-35 pounds
Height: Up to 29 inches (longer if legs permitted to bend)
For infants who must travel lying down in a car bed. Restraint bags or 3-point harness-both with cummerbund. Additional Accessories include: side-facing restraint bag, leveling straps, and wedge. Spica cut-out available. *(Merritt Car Seat, 317-409-0148, merrittcarseat.com)*

Jefferson
Weight: 7.5-40 pounds
Height: 19-37 inches
For children with an omphalocele or children that need yoke harness routing around abdomen. Rear-facing only. *(Merritt Car Seat, 317-409-0148, merrittcarseat.com)*

Wallenberg
Weight: 5-40 pounds RF, 25-80 pounds FF
Height: Head 1-inch from top RF, Up to 60 inches
For children in leg, hip, or arm casts. Convertible car seat. Hammock, wedge, and buckle riser for positioning. *(Merritt Car Seat, 317-409-0148, merrittcarseat.com)*

503 Lay Down Vest
Ages: 1 year and older
Weight: 22-106 pounds
Height: Must fit lengthwise on vehicle bench seat. For children who must travel lying down. Vehicle seat belts route through vest for occupant protection. *(EZ-ON Products, 800-323-6598, ezonpro.com)*

IPS Car Seat
Weight: 20-102 pounds
Height: Up to 60 inches
Additional Accessories include: Abductor, lateral pads, extensor thrust wedge, anti-escape options. Tether required. FAA approved. *(Inspired by Drive, 800-454-6612, inspiredbydrive.com)*

Roosevelt
Weight: 35-115 pounds
Height: 33.5-62 inches
Additional Accessories include: EZ-Up headrest system, stay-put pommel, incontinent cover, scoliosis harness, anti-escape options. Tether/EZ-Tether required. FAA approved.
(Merritt Car Seat, 317-409-0148, merrittcarseat.com)

Special Tomato MPS Car Seat
Small: Weight: 20-80 pounds Height 28-52 inches
Large: Weight: 80-130 pounds Height 45 inches-adult
Additional Accessories include: Head rest/back cushion/seat cushion options, 30 degree hip-flex adjustment. Tether required. FAA approved.
(Special Tomato, 866-529-8407, specialtomato.com)

Spirit Plus/Spirit/Spirit Spica
Weight: 25-130 pounds
Height: Up to 66 inches
Additional Accessories include: Incontinence cover, anti-escape options, extensor thrust wedge. Spirit plus includes swing away hip and trunk supports, abductor, and seat depth extender. Tether required.
(Inspired by Drive, 800-454-6612, inspiredbydrive.com)

Defender Reha
Harness: Weight: 22-65 pounds Height: 27-57 inches
Booster: Weight: 30-110 pounds Height: 34-57 inches
Combination car seat. Additional Accessories include: Footrest, seat wedge, table/tray, abduction block, crotch pad. Swivel base available in booster mode. Lap-and-shoulder belt required for occupant protection. FAA approved in harness mode.
(Thomashilfen, 866-870-2122, thomashilfen.us)

Convaid Carrot 3 Child Restraint
Weight: 30-108 pounds
Height: 37-60 inches
Lap-and-shoulder belt required for occupant protection. Additional Accessories include: tether strap, support tray, wedge, footrest, seat length & backrest extensions, lateral supports, incontinence cover,FAA approved fixing strap. More accessories on order form. Lower anchors required. Tether highly recommended. *(Etac, 844-876-6245, etac.com)*

Recaro Monza Nova 2 Reha
Weight: 33.1-110.2 pounds
Height: 37-59 inches
Lap-and-shoulder belt required for occupant protection. Additional Accessories include: swivel base, footrest, seat depth extension, seat wedge, table/tray, abduction block, soft harness strap. chest clip. Lower anchors required.
(Thomashilfen, 866-870-2122, thomashilfen.us)

Hercules Prime
Weight: 40-176.4 pounds
Height: 51.1-70.9 inches
Lap-and-shoulder belt required for occupant protection. Additional Accessories include: swivel base (passenger side only), footrest, leveling cushion, lateral trunk supports, abduction block, seat wedge, table/tray, soft harness strap. More accessories on order form. Lower anchors required.
(Thomashilfen, 866-870-2122, thomashilfen.us)

Convaid Carrot 3 Booster Seat
Weight: 79-165 pounds
Height: 55-69 inches
Lap-and-shoulder belt required for occupant protection. Additional Accessories include tether strap, support tray, wedge, 3D body balance pads, backrest extension, large crotch belt. Lower anchors required. Tether highly recommended. FAA approved with fixing strap.
(Etac, 844-876-6245, etac.com)

Special Tomato Soft Touch Booster Seat
Small: Weight: 51-90 pounds Height: 40-56 inches
Large: Weight: 81-130 pounds Height: 50-65 inches
Lap-and-shoulder belt required for occupant protection. Lower anchors required. FAA approved.
(Special Tomato, 866-529-8407, specialtomato.com)

Churchill with Positioning Vest
Churchill with Postioning Harness
Weight: 44-175 pounds
Height: 44-72 inches
Lap-and-shoulder belt required for occupant protection. Additional Accessories include: EZ-Up headrest, hip inflection wedge, hip inflection comfort pommel, stay-put pommel, anti-escape options. LATCH required. *(Merritt Car Seat, 317-409-0148, merrittcarseat.com)*

Chamberlain Vehicle Positioning Vest
Weight: 81-225 pounds
Height: 48 inches until top of ears exceed top of vehicle seat back or headrest
Lap-and-shoulder belt required for occupant protection. Additional Accessories include: EZ-Up headrest, leg straps. LATCH required.
(Merritt Car Seat, 317-409-0148, merrittcarseat.com)

Moore Support Vest
Weight: 65 pounds and up
Waist size: 30-36, 38-44 inches
Lap-and-shoulder belt required for occupant protection. Tether required. *(Besi Inc, 800-543-8222, besi-inc.com)*

MAX PV Vest
Ages: 2 years and older
Weight: 31-168 pounds
Lap-and-shoulder belt required for occupant protection. Rear Zipper closure. MAX PV mount required & included. Additional Accessories include: Neck pads, wrist straps upper arm straps, ankle straps.Tether required.
(EZ-ON Products, 800-323-6598, ezonpro.com)

303Z Vest **403PB Vest**
Ages: 2 years and older
Weight: 31-168 pounds
Lap-and-shoulder belt required for occupant protection with required tether mount. Floor mount available 31-168 pounds. Rear zipper or Front push button closure. Additional Accessories include: Neck pads, wrist straps upper arm straps, ankle straps, zipper lock, wheelchair mount. *(EZ-ON Products, 800-323-6598, ezonpro.com)*

800-755-0912 preventinjury.pediatrics.iu.edu
This poster does not imply product endorsement and may not be all inclusiv

Adaptive Restraints

Designed for children who:

- Are unable to use conventional harness system
- Have outgrown conventional car seat and require additional postural support
- Must lie down
- Demonstrate severe behavioral challenges/escaping/unbuckling

Child with diagnosis of sensory processing disorder in large medical seat

Source: Automotive Safety Program

Adaptive Restraints

- Not readily available
- More expensive than conventional seats
- Often require a therapist evaluation and Letter of Medical Necessity
- Ordered through local durable medical equipment (DME) providers or directly from the manufacturer
- May be available through hospital loan, purchase, or give-away programs

- **Always start with conventional car seats**

Child with diagnosis of autism in large medical seat

Source: Automotive Safety Program

Large Medical Seats

- Forward-facing only
  - Lower weight range: 20-35 pounds
  - Upper weight range: 102-130 pounds
  - Height range: 33.5-66 inches
- 5-point harness for crash protection
- May be useful for children with:
  - Neuromuscular conditions
  - Scoliosis
  - Behavioral challenges
  - Obesity

Large medical seat
Source: Merritt Manufacturing

Large Medical Seats

- Standard and optional accessories:
  - Abductor wedges
  - Seat extenders
  - Head supports
  - Anti-escape features available on specific large medical seats
- Often require therapist evaluation
- Order through DME company
- Could take months for insurance approval

Occupational therapist working with family
Source: Automotive Safety Program

Adaptive Booster Seats and Vests

- **Require lap-and-shoulder belt over child** for crash protection
- Positioning harness or positioning vest for *postural support only*

Adaptive booster
Source: Merritt Manufacturing

EZ-ON Vest
Source: Automotive Safety Program

Chamberlain adaptive vest
Source: Merritt Manufacturing

Medical Equipment

- Keep equipment as low as possible to not become a projectile
- Secure by:
  - Placing on floor of vehicle
  - Wedging with pillows, foam, or blankets
  - Buckling into adjacent, unoccupied seat belt
- Check vehicle manual about placing items under vehicle seat
  - Some newer vehicles have airbag sensors that can be affected
- No specific product available for securement of equipment in a vehicle

Apnea monitor being wedged under vehicle seat

Source: Automotive Safety Program

Wheelchair Transportation

- **Child is safest if transferred from the wheelchair to a conventional or adaptive restraint.**
- If a child is staying in wheelchair during transportation:
  - WC must be attached to an appropriate tie-down system at securement points
  - **Must use** vehicle lap-and-shoulder belt

NOTE:
No postural harness supports, and very few pelvic belts are crash tested.

Dynaform postural harness support
Source: AEL

Postural pelvic belt
Source: AEL

Bottom Line

Best Practice:

Conventional restraint when possible

Keep medical equipment secured so it does not become a projectile

Always use a seatbelt with a wheelchair

What to Check in the Clinic

- Stickers
  - Weight/Height Limits
  - Expiration Date
  - Counterfeit seat
- Check for aftermarket parts
- Loose/twisted straps
- Strap location
- Coats/Blankets
- After a crash

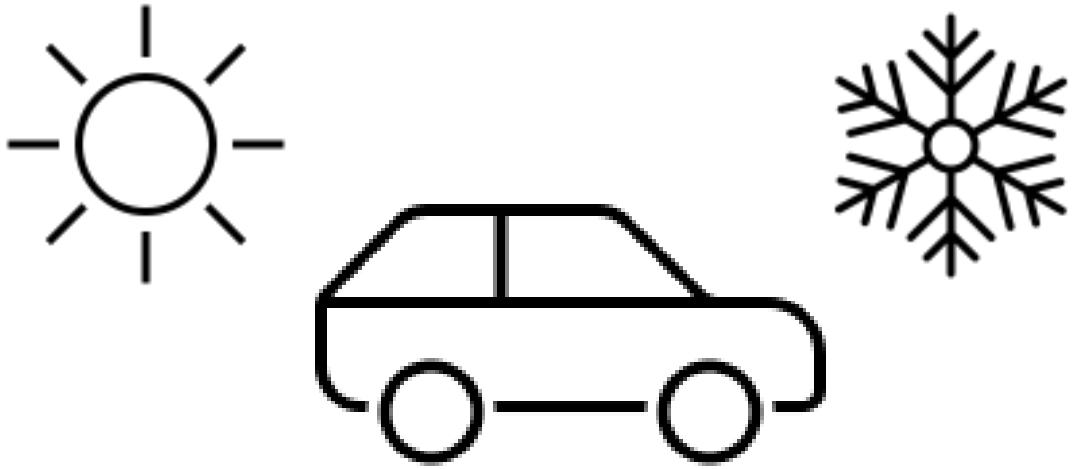
Counterfeit and Fake Car Seats

Image courtesy of The Car Seat Lady

Crash Test of an Illegal Car Seat

Expiration Dates

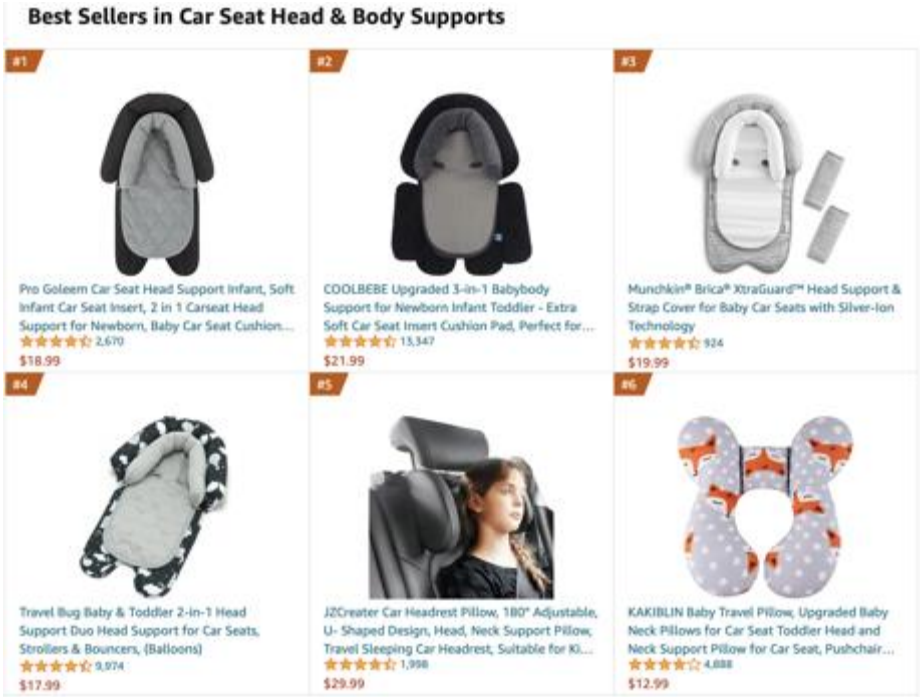
- Deterioration or breakdown of the plastic shell or other parts
- Updated performance standards or labeling requirements



Source: Safe Ride 4 Kids

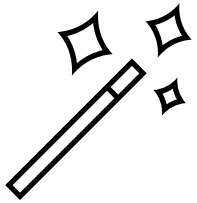
Dangers of Aftermarket Products

- Push head forward → airway compromise
- Interfere with proper fit
- Can be a projectile



Twisted Straps

1. Fold the strap over on itself so the ends are at 90°, making a triangle or "4" shape
2. Slide buckle over folded section
3. Straighten strap
4. Buckle!



Source: Consumer Reports

Staying Warm in the Seat

Car Seat Use After a Crash

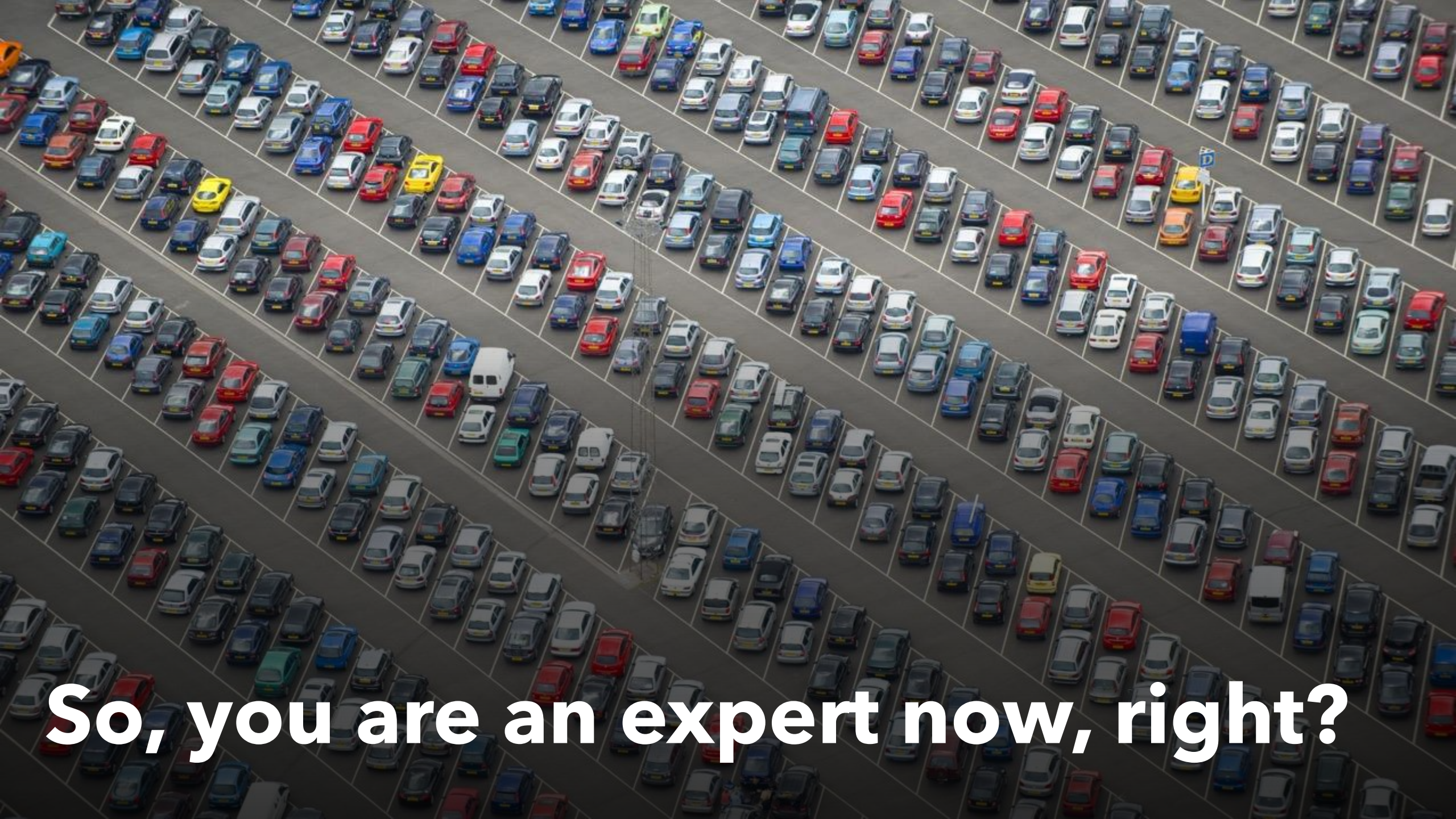
NHTSA recommends that car seats be replaced following a moderate or severe crash in order to ensure a continued high level of crash protection for child passengers. Car seats do not automatically need to be replaced following a minor crash.

What defines a minor crash?

A minor crash is one in which ALL of the following apply:

- The vehicle was able to be driven away from the crash site.
- The vehicle door nearest the car seat was not damaged.
- None of the passengers in the vehicle sustained any injuries in the crash.
- If the vehicle has air bags, the air bags did not deploy during the crash; and
- There is no visible damage to the car seat.

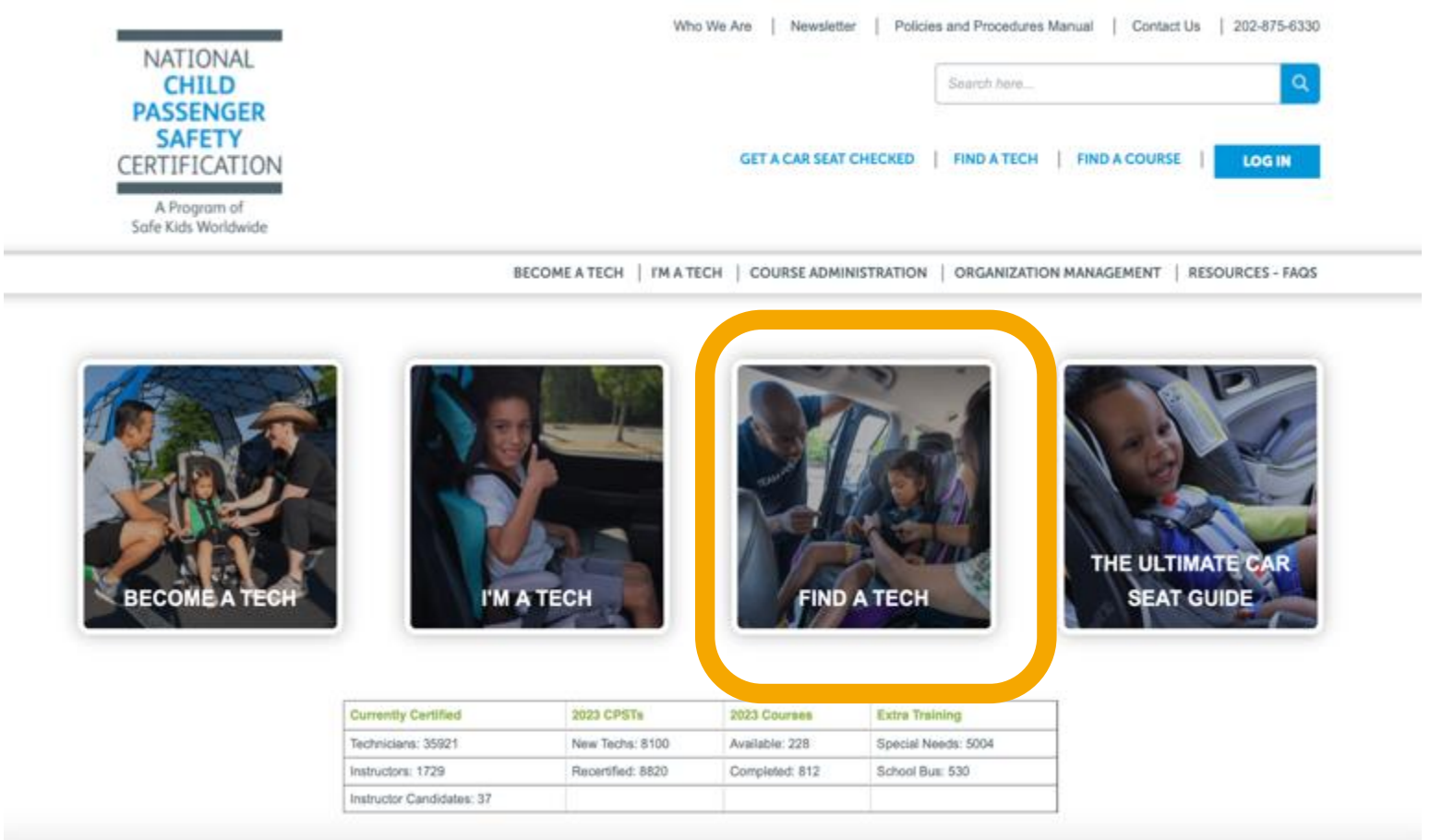
NEVER use a car seat that has been involved in a moderate to severe crash. Always follow manufacturer's instructions.



So, you are an expert now, right?

Phone a Friend: How to Get Help

cert.safekids.org



AAP Car Safety Seat Product Listing

Wonderful resource for families!

Best way to compare what fits budget, child size and other needs

https://www.healthychildren.org/English/safety-prevention/on-the-go/Pages/Car-Safety-Seats-Information-for-Families.aspx

American Academy of Pediatrics
DEDICATED TO THE HEALTH OF ALL CHILDREN™

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Powered by pediatricians. Trusted by parents.
from the American Academy of Pediatrics

2024 Car Safety Seat Product Listing

When looking for a car seat for your child, you may be uncertain which features to look for based on your child's age, size and other needs. This list can help you sort through all the choices.

Notes:

*Weight is in pounds [lbs.] and height is in inches ["]

**Load legs and anti-rebound bars are features that can help absorb the energy of a crash. Load legs reduce forward rotation in the initial phase of a crash, and anti-rebound bars protect the child during the second phase of a crash from rearward rotation.

Rear-facing only seats

(Used rear-facing. All seats have a 5-point harness.)

Name	Rear-Facing Weight Limits*	Height Limits*	Load Leg or Anti-Rebound Bar**	Price
Baby Jogger City Go 2	4-35 lbs.	Up to 32"	Anti-Rebound Bar	$349.99
Britax Willow (only sold as part of a travel system)	4-30 lbs.	Up to 32"	None	
Britax Willow S	4-30 lbs.	Up to 32"	ReboundReduce Stability Bar	$249.99
Britax Willow SC	4-30 lbs.	Up to 32"	ReboundReduce Stability Bar	$299.99
Baby Trend Ally 35	4-35 lbs.	Up to 32"	None	$69.99
Baby Trend EZ Flex-Loc	4-30 lbs.	Up to 30"	None	$109.99
Baby Trend EZ Flex-Loc Plus	4-30 lbs.	Up to 30"	None	$109.99
Baby Trend EZ-Lift 35 Plus	4-35 lbs.	Up to 32"	Anti-Rebound Bar	$89.99
Baby Trend Secure Snap Gear 35	4-35 lbs.	Up to 32"	None	$149.99
Century Carry On 35 Infant Car Seat	4-35 lbs.	Up to 32"	None	$109.99
Century Carry On 35 LX Infant Car Seat	4-35 lbs.	Up to 32"	None	$159.99

Take Home Messages

- All car seats, *independent of cost*, meet the same safety standards
- The best car seat:
  - Fits the child well
  - Fits the car well
  - Can be used correctly every trip

With regards to car seats: **<u>push it to the limit</u>**

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