INJURY PREVENTION

Child Passenger Safety Guide for Pediatric Clinicians







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University of Vermont Health | Golisano Children's Hospital

Introduction

Motor vehicle crashes are a leading cause of death and injury for children aged eighteen and under (2nd leading cause of death for children 0-4, and top cause for children 5 and up). According to the National Highway Traffic Safety Administration (NHTSA), of the 23,959 passenger vehicle occupants killed in 2023 in traffic crashes, 700 (3%) were children. Restraint use (car seats, boosters, and seat belts) was known for 620 of these children, and 264 (43%) of them were unrestrained. Children 13 to 14 years old had the highest percentages out of the child age groups of being unrestrained and dying - 73 (61%) were unrestrained.

In their 2018 news publication, Child Passenger Safety Policy [1], the American Academy of Pediatrics (APP), states, "using the correct car safety seat or booster seat can help decrease the risk of death or serious injury by over 70%, and parents look to their pediatricians as a trusted source of guidance."

Car seats, booster seats, and seat belts help prevent injuries or reduce their severity because they:

- Keep occupants in the vehicle—ejection is a significant predictor of mortality and severe trauma.
- Spread crash forces to the strongest parts of the body—the hips and shoulders.
- Distribute crash forces over a wide area of the body.
- Protect the brain and spinal cord by keeping the head and upper body away from interior surfaces of the vehicle.
- Extend the time it takes for the occupant to slow down, reducing the crash forces on the body.

Unfortunately, child restraints (child safety seats) can be complicated to use. A National Child Restraint Use Special Study published by NHTSA in 2015 estimated overall car seat and booster seat misuse was 46%. In that same study, however, most caregivers said they were confident that their child's seat was installed and used correctly. The past 8 years of data from a U.S. seat check system showed overall misuse of child restraints was 67% (sample size 191,000). These data do not include a caregiver's level of confidence.

This toolkit provides pediatric clinicians with evidence-based child passenger safety recommendations from the AAP and other sources. Additional resources, including information for parents and other caregivers, are offered at the end of the document.

Disclaimer: Unless otherwise identified, photographs are from the NHTSA photo galleries or the National Child Passenger Safety Board, Child Passenger Safety Technician Certification Training, National Safety Council (2024 or prior versions). Images are intended to serve as educational examples and are not an endorsement or promotion of a specific product, service, individual, or organization.

Table of Contents

Stages of Child Passenger Safety 1

Summary of Guidance for Clinicians 2

Child Passenger Safety Laws 3

What is a Child Passenger Safety Technician? 4

Stage 1: Rear-facing Car Seats 5

Stage 2: Forward-facing Car Seats 8

Stage 3: Belt-positioning Booster Seats 11

Stage 4: Seat Belts 13

Crashes, Used Seats, and Non-Compliant Child Restraints 15

Winter Coats and Car Seat Safety 16

Pediatric Vehicular Heatstroke (PVH) 17

Escaping Behaviors 18

Transportation of Children with Special Healthcare Needs 19

Child Passenger Safety in Other Modes of Transportation 20

No/Low-Cost Child Safety Seat Options 23

Addressing Caregiver Questions and Concerns 23

Appendices — Flyers for Waiting Areas and Exam Rooms 27

References 33

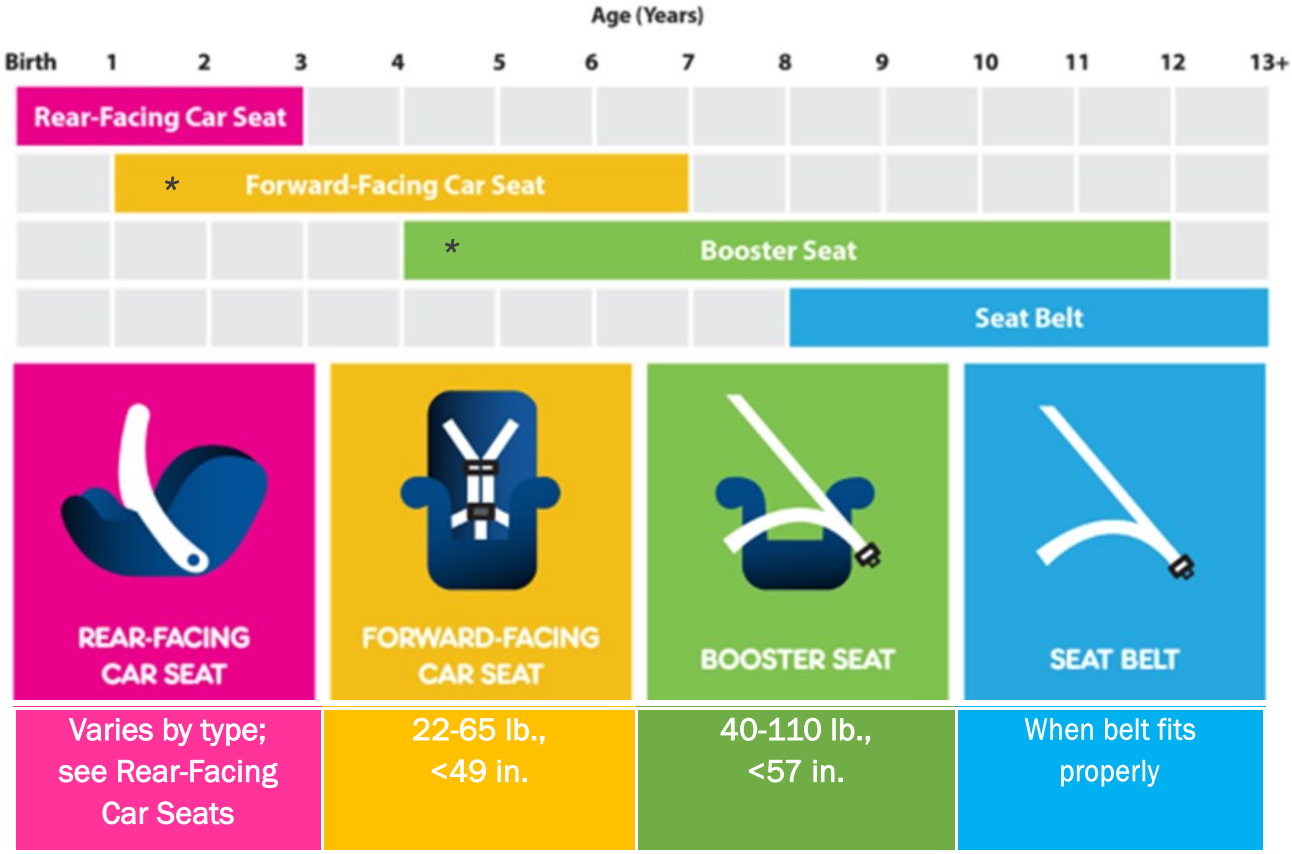


Stages of Child Passenger Safety

There are Four Stages of Child Passenger Safety (CPS).

It's helpful if healthcare providers avoid words like "milestones," which may inadvertently encourage caregivers to move their child to the next stage prematurely. Details on each stage are available in subsequent sections of this document, including AAP best practice recommendations for children at each stage. Although this tool kit is focused on Child Passenger Safety, buckling up is also the best thing an adult can do to protect themselves in a crash. NOTE: For pregnant people, NHTSA offers suggestions for wearing a seat belt and other safety tips during pregnancy [2].

"I know that most parents and caregivers think that moving from rear-facing to forward-facing and from forward-facing to booster is a good thing. While moving from one stage to the next is usually seen as a good thing for most aspects of child growth and development, child passenger safety is the exact opposite. Helping them understand that delaying transitions is the safest thing for their child is one of the most important things we can do to protect kids." — ***Benjamin Hoffman, MD, FAAP, AAP 2024 president, and author of several of the CPS resources linked in this guide.***



Ranges are approximate. Some child restraints have different minimums or maximums.
** See Summary of Guidance for Clinicians and Child Passenger Safety Laws (page 2)*

Summary of Guidance for Clinicians

The AAP Child Passenger Safety Policy Statement [3] and the more in-depth AAP Child Passenger Safety Technical report [4] offer evidence-based best practice recommendations to optimize safety in passenger vehicles for children from birth through adolescence. The Policy includes a decision algorithm to help practitioners provide the safest guidance to families. The recommendations call for the following:

- Children should ride in a rear-facing car seat as long as possible, up to the limits of their car seat. {**Note:** a rear-facing seat should never be placed in front of an airbag. Airbags are dangerous for children [5], especially those who are rear-facing].
- Once they have been turned around, children should remain in a forward-facing car seat up to that seat's limits.
- 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 should be restrained in the rear seats of vehicles for optimal protection.

Check out"Car Seat Safety 101: Choosing the Right Car Seat for Every Stage"[6] to listen to a 2026 podcast with Drs. Ben Hoffman and Edith Bracho-Sanchez. This is intended for caregivers (it is on the family-facing AAP website) but contains good information for pediatric clinicians as well.

Note: A seat is outgrown whenever one limit - weight, height, or other parameters set by the manufacturer - is met.

Child Passenger Safety Laws

All fifty states have some form of Child Passenger Safety law. Clinicians should encourage caregivers to consider those laws as bare minimums. For example, many states still allow a child to be forward-facing at age one. This is not only misaligned with current AAP recommendations, it is out of date with the previous AAP recommendation of rear-facing to at least two years old.

These are the current Child Passenger Safety laws for Vermont and New York. If a caregiver is transporting their child in another state or country, they should investigate that entity's laws.

Vermont

A child under age two must ride rear-facing and not in a front seat with an airbag. A child under age five must ride in a harnessed car seat. A child under age eight must in a booster if they are not riding in a harnessed car seat. A child under 13 must, if practical, ride in the back seat. A child under age 18 must use a seat belt if they are not using a child restraint.

Vermont law bans possessing a lighted tobacco product or using electronic cigarettes or other electronic or battery-powered devices that deliver nicotine or other substances through the inhalation of vapor in a motor vehicle occupied by a child under age eight.

New York

A child under age two must be rear-facing. A child under age four must ride in a car seat. Children must ride in a child restraint system until their eighth birthday. A child under age 16 must wear a seat belt. New York does not prohibit a rear-facing child to ride in a front seat with an airbag, but acknowledges that it is dangerous.

What is a Child Passenger Safety Technician?

A Child Passenger Safety Technician (CPST) has been trained and certified in child safety seat installation and use, motor vehicle safety principles, child passenger safety best practices, and effective communication skills. CPST's educate caregivers on the selection and use of child safety seats and the stages of child passenger safety through one-on-one appointments, car seat events, group presentations, and informal interactions.

Note that while many CPSTs work in health care, law enforcement, or other emergency response fields, many hospitals, police agencies, fire departments, or rescue squads do not have a CPST on staff.

Finding a CPST

- Vermont Health Department Be Seat Smart [7]
- New York's Governor's Traffic Safety Committee Child Passenger Safety [8]
- Safe Kids Worldwide U.S. National Child Passenger Safety Certification Training Program [9] (For more results, use fewer fields. Includes the option to find techs who do virtual appointments)
- Many car seat manufacturers offer virtual checks—see their websites
- The National Safety Council also offers virtual appointments [10]

Find out if any CPST's are employed by your medical facility. Having a CPST on staff or organizing seat check events for your practice are great ways to support your patients and their families. The National Child Passenger Safety Certification Training Program [9] also has information how to become a tech, including classes by state. Classes are generally 3-4 days long and include a car seat check event. There is usually a nominal fee. In Vermont, you can use the Be Seat Smart website to request a seat check event or a Child Passenger Safety display table at an open house or other event being held at your practice.

An experienced CPST can become an instructor (CPSTI), which allows them to teach the CPST certification class. CPS technicians and instructors maintain their certification through a variety of continuing education opportunities and hands-on skills reviews.

Dr. Ben Hoffman, mentioned on prior pages, is a CPSTI with more than 30 years of dedication to child passenger safety. He is also a nationally recognized expert in other aspects of child injury prevention and education.





Stage 1: Rear-facing Car Seats

AAP recommendation: All children should ride in a rear-facing car seat as long as possible, up to the car seat manufacturer's stated limits. This will include almost all children under two years of age and most children up to age four.

"Evidence continues to show the relative superiority of rear-facing."
— AAP

Rear-facing Car Seats



There are three types of rear-facing car seats. Many families select an infant car seat (see photo, left) for their newborn. These seats typically have a base and a removable seat with a carry handle. While there is a variety of minimums and maximums for weight and height, these seats usually fit newborns very well, and they are convenient and portable.

The other two types of rear-facing seat are convertibles (such as the one pictured on the previous page) and all-in-one seats. These seats are not meant to be portable. They can be rear-facing, generally to 40 or 50 lbs., and forward-facing, generally to 65 lbs. All-in-one seats also have a booster mode. While many can be used from birth, some convertibles and all-in-one seats may not fit newborns well.

Why Rear-facing?

Young children have a large, heavy head in proportion to the rest of their body. Their neck muscles are also less developed than those of an older child. When riding in a rear-facing car seat, the head, neck, and spine move together and are cradled by the shell of the seat.

This screen capture from a video [11] produced by The Ohio State University "Buckle Up with Brutus" program shows the difference in the forces to the spinal column in a rear vs. forward-facing car seat.





Rear-facing Car Seats (continued)

Since a clinician might observe a baby in an infant car seat during an appointment, here are a few items to consider discussing with caregivers.

Harnessing Basics:



Other points to review with caregivers include:

- Aftermarket (non-regulated) products are usually not allowed by car seat manufacturers and may create safety concerns for harness fit or child positioning. Placing receiving blankets along the sides of a very small infant to assist with positioning is acceptable if allowed by the car seat manufacturer (most do), but the blankets should not go above the child's ears or around their head (see photo, right).
- Limit the time your child spends in their seat. This can prevent causing or exacerbating certain health concerns, including flat head, respiratory issues, torticollis, and motor delays.
- Practice safe sleep [12] (AAP Policy Statement). When you reach your destination, move baby from their car seat to a safe sleep space for naps and at night.
- Avoid placing a car seat - or a baby carrier - on a shopping cart [13] (AAP publication), countertop, or other elevated surface.
- No puffy jackets, snowsuits, or bulky clothes. See Winter Coats and Car Seat Safety (page 15).

See Addressing Caregiver Questions and Concerns - Harnessed Car Seats (page 22) for more information. Please consider putting Car Seat Safety Checklist flyers in your waiting areas and exam rooms (page 31).



Stage 2: Forward-facing Car Seats

AAP recommendation: Once they have been turned around, children should remain in a forward-facing car seat up to that seat's weight and length limits.

All forward-facing harnessed car seats currently sold allow use until at least 40 lbs. Most seats have an upper weight limit of 65 lbs.

Forward-facing Car Seats

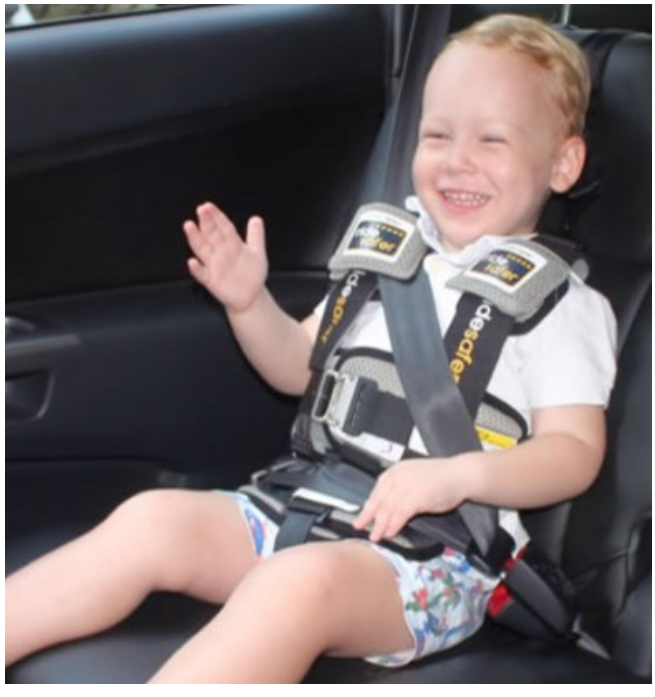
There are several types of forward-facing seats. The most common are a convertible, an all-in-one seat, and a combination car seat. Combination seats, which only forward face, may be referred to as “harnessed boosters” because they can be used in either harnessed or booster mode. Most of these seats have forward-facing limits of 65 lbs. and 49 inches.

Caregivers may choose a combination car seat for an older child so they can pass a convertible or all-in-one seat on to a younger child. Combination seats are often less expensive than convertibles or all-in-ones, and sometimes make better boosters due to their less bulky size, lower sides, and overall shape. There is no safety difference between using a convertible or all-in-one seat forward-facing with the harness and using a combination seat with the harness, provided the child meets the weight and height requirements of the seat.

A RideSafer® Travel Vest (RSTV) [14] is a forward-facing child restraint that has met the same federally mandated crash testing requirements as a forward-facing harnessed car seat. An RSTV is useful for travel. It is helpful when a smaller vehicle back seat needs to fit three occupants or for children whose weight has exceeded that allowed by harnessed forward-facing seats. While it is marketed for children as young as two, it allows more freedom of movement than a harnessed car seat does. It is also easier for a child to reach and unbuckle the seat belt. Caregivers should be judicious in selecting it for a younger child.



Combination car seat (sometimes called “harnessed booster”)

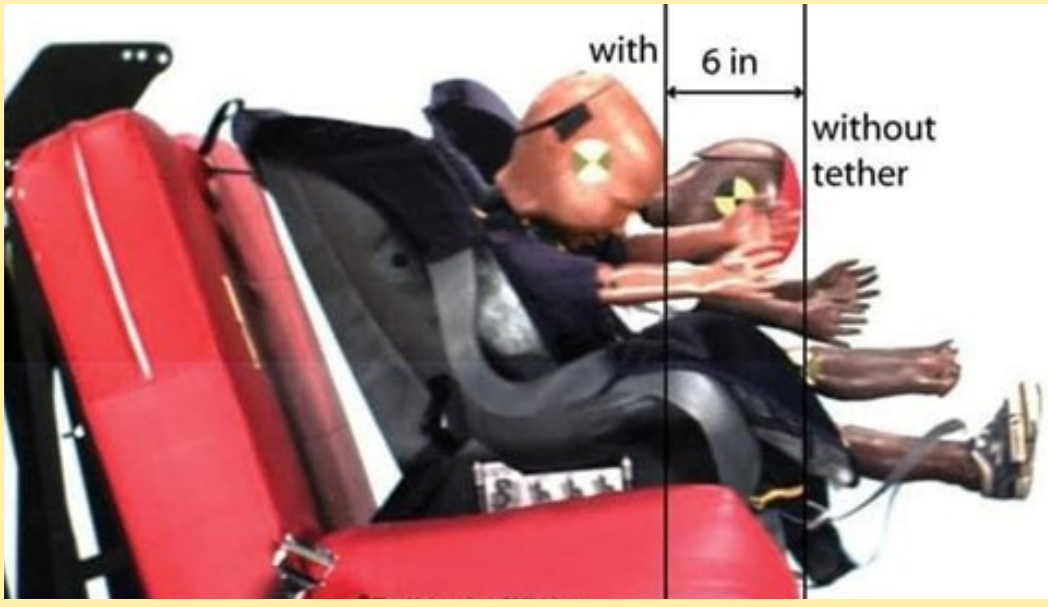


RSTV

Forward-facing Car Seats (continued)

There is a very important feature to forward-facing seats that bears mentioning. That is the tether (sometimes called a “top tether”). The tether attaches to a tether anchor in the vehicle. Tethers can mitigate neck injuries by reducing head acceleration and neck loading. Decreasing forward head excursion also lessens the chances that the occupant’s head will strike a vehicle surface.

The image below shows why tethering is so critical. Using a tether for forward facing seats is mandatory in Canada.



Source: *Cited by the* ***Automotive Safety Program, Indiana University School of Medicine.*** [15] *Original from the University of Michigan, as noted in the illustration.*

Another relevant, and often a new point for caregivers with older, heavier children, is that lower anchors (a way of installing most car seats) have weight limits. Car seat manufacturers have identified the maximum weight of a child for safe installation using lower anchors. This information is in the instruction manual and labels on the seat. The child can continue to use the car seat up to the weight (or height) limit of the seat, but the installation method must switch to a seat belt.

This Clinician’s guide is not intended to cover details about car seat installation, but tether use and lower anchor weight limits are often overlooked by caregivers. Please consider putting flyers on Tethering (see reference number 39, page 37) and Lower Anchor Weight Limits (page 34 flyers in your waiting areas and exam rooms.



Stage 3: Belt-positioning Booster Seats

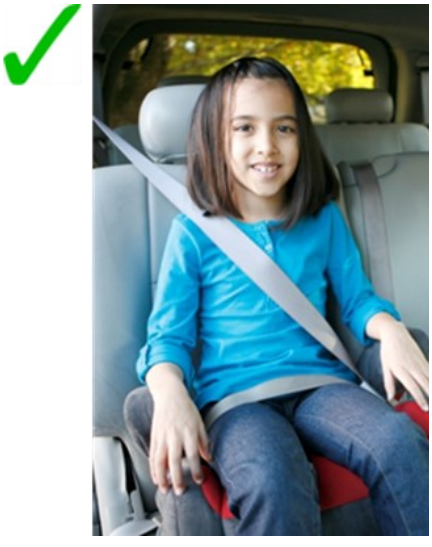
AAP recommendation: Children whose weight or height is above the forward-facing limit for their car seat should use a belt-positioning booster seat until the vehicle lap and shoulder seat belt fits properly.

Research shows boosters reduce the risk of nonfatal injury among four to eight year-olds by 45% compared with seat belts alone. AAP

Belt-positioning Booster Seats

Belt-positioning booster seats position the child, or the seat belt, so that the belt fits properly: lap portion low across the hips and pelvis, and the shoulder portion across the middle of the shoulder and chest. Boosters help prevent "seat belt syndrome" [16], an injury pattern that occurs when sudden deceleration forces and compression of the lap belt around the abdomen causes abdominal wall bruising, intra-abdominal injuries, and spinal fractures.





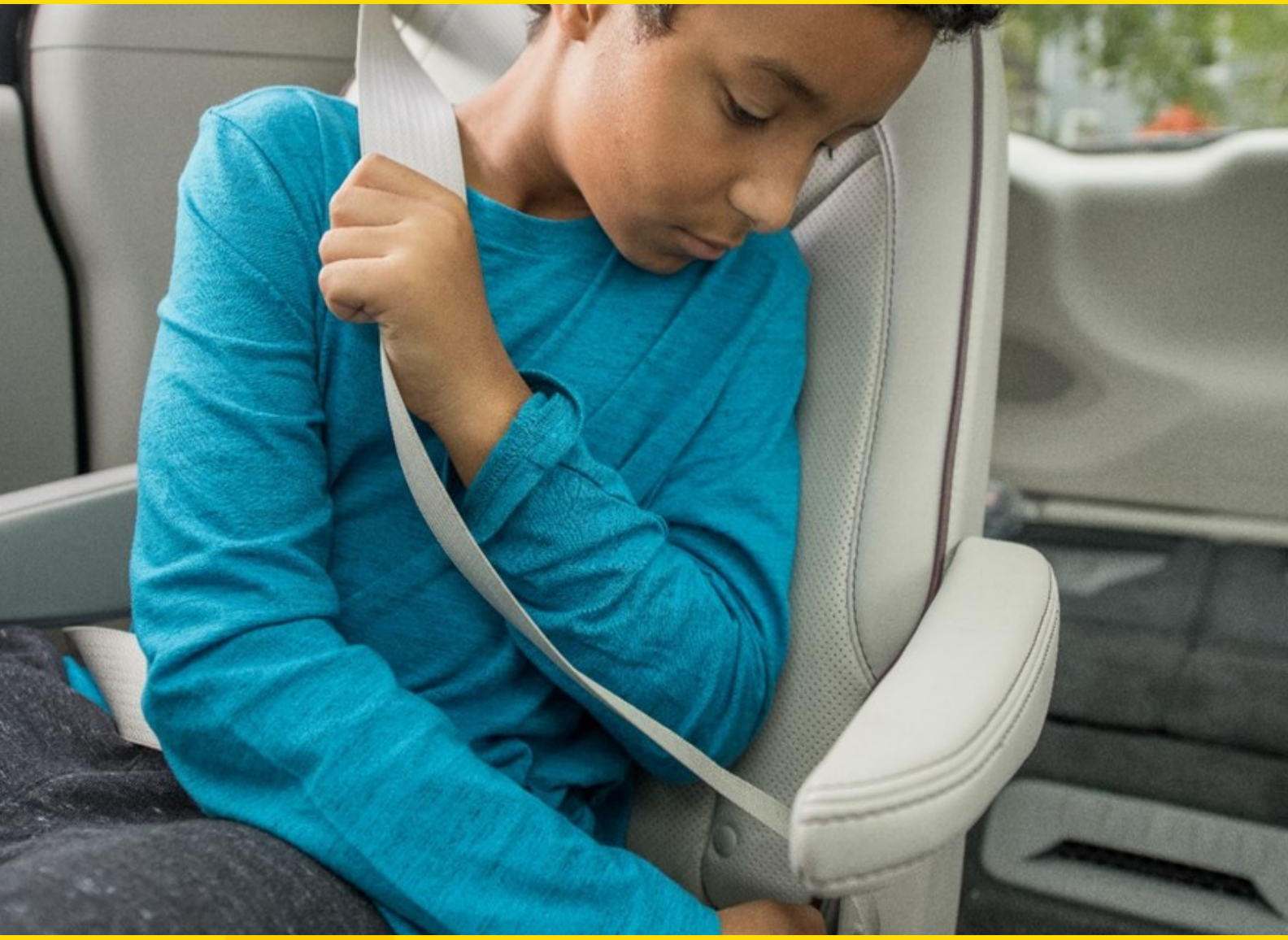
Boosters fall into two general types: high back and backless. The child on the previous page is in a high back booster. The child in the photos on the right is using a backless booster.

A high back booster is good for a new booster rider. The back and sides remind them to sit properly and offer a place to lean their heads. High back boosters are needed in vehicles without headrests or with low seat backs.

Backless boosters are convenient, inexpensive, and portable. They are a good option for experienced booster riders provided the vehicle seat back or head rest supports the child at least to the top of their ears.

Boosters require the use of a lap and shoulder belt; never a lap belt only. All boosters currently sold have a weight minimum of 40 lbs. per the manufacturer's instructions. Height minimums vary.

While most booster manufacturers allow use by a child at four years of age, provided they meet weight and height requirements, maturity plays a large role in a child's readiness for a booster. In a recent study, "Variations in booster seat use by child characteristics" [17], 50 mother-child (aged four to eight) dyads were observed with harnessed car seats or boosters in a driving simulator. Across the age groups, children in harnessed seats had no observed errors during simulated trips. When children were observed in booster seats, the four year-olds spent on average 67% (Median = 76%) of the drive inappropriately restrained. The children aged five to eight spent less than 28% of the drive inappropriately restrained. This behavioral difference is one of the reasons that Child Passenger Safety experts and pediatricians advocated for the law in Vermont (page 2) to require harnessing until at least five years old, unless outgrown.



Stage 4: Seat Belts

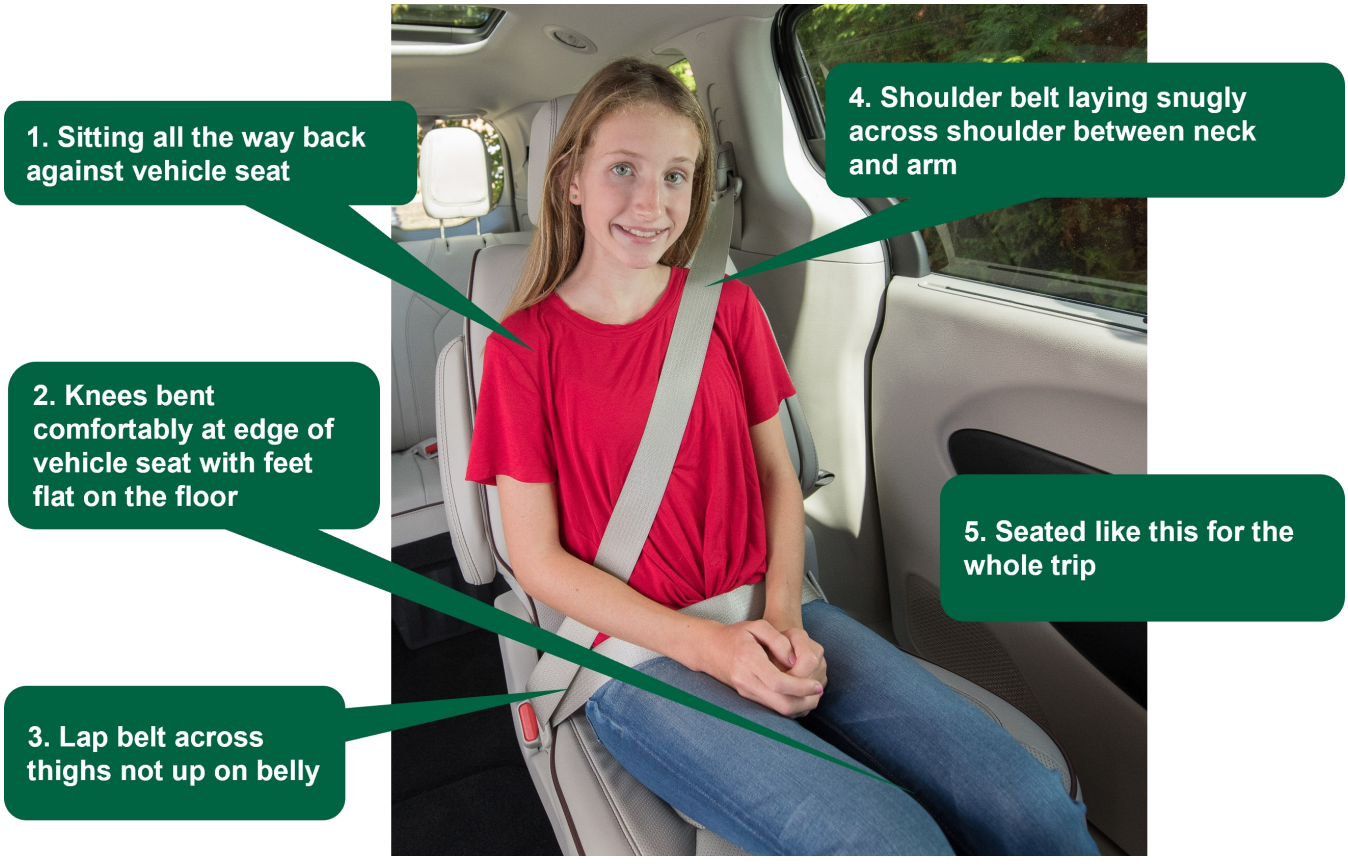
AAP recommendation: When children are old enough and large enough to use the vehicle seat belt alone, they should always use lap and shoulder seat belts for optimal protection.

"Most children will not fit in most vehicle seat belts without a booster until 10 to 12 years of age." AAP "Car Seats: Information for Families"

Seat Belts

Most people understand the lifesaving value of seat belts. According to NHTSA, the national seat belt use rate was at 91.6% in 2023 (most recent data available). New York state's rate was 94.1%. Vermont is below the national rate (91.9%), with the most recent use rate of 88.9%.

These **five steps** determine if a child is large enough to ride safely without a booster seat:



Since vehicle seat geometry varies, this five-step test should be performed in any vehicle and seating positions in which the child rides.

Reminder: All children less than 13 years of age should be restrained in the back seats of vehicles for the best protection.

Seat Belts Save Lives! Clinicians can also encourage caregivers to set the example. They're teaching their child, and future driver, good safety habits.

Please consider putting up a Five Step flyer (page 35) in your waiting areas and exam rooms.

Crashes

Most child restraint manufacturers require their seats to be replaced after any crash. A few companies, however, allow their seats to be reused after a minor crash. NHTSA defines a minor crash as one in which ALL 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 occupants 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.

Caregivers should read the seat's manual for more information and contact the manufacturer if they have any questions. The replacement requirements include booster seats.

Non-compliant Child Restraints

There has been a disturbing increase in the sale of non-compliant child restraints to U.S. consumers in recent years. Some of these seats comply with the regulations of another country or region, but it is not legal for caregivers to use them in the U.S. Some devices are counterfeit [18]. They are made of materials that lack the strength and integrity of the real thing and do not meet any safety standards. These are a serious safety risk in addition to not being legal. Here are indicators that a seat may be non-compliant:

- Brand not found on the AAP Car Safety Seat Product Listing [19]
- No manufacturer's address/contact information
- No manual or registration card
- Spelling/grammatical errors in product literature
- No chest clip (while federal motor vehicle safety standards do not require a chest clip, almost every harnessed car seat on the market includes a chest clip)
- A deal "too good to be true"

Used Seats

It's important that if a caregiver is considering a second-hand car seat or booster, they know its history. Was it ever in a crash? How was it cared for and cleaned? Is it expired or recalled? (Recalls are why caregivers should register their seat with the manufacturer). A used seat from a close friend or family member is very different from a used seat purchased at a garage sale or from an on-line seller – the history of the seat is available, and the seat is from a trusted source, and expiry and recall information can be investigated.

Clinicians can refer caregivers to the No/Low-Cost Child Safety Seat Options (page 23) if there are financial constraints involved.

Winter Coats and Car Seat Safety

AAP recommendation: Puffy coats [20] should not be worn in car seats.

In a car crash, fluffy padding compresses from the force, leaving extra space under the harness. A child can then slip through the straps and be thrown from the seat. Even older children and adults should avoid wearing a puffy coat in the car, to allow the seat belt to perform optimally without space created by a winter jacket.



Here's how you can describe to a caregiver how to test to see if their child can wear their coat safely in the car seat:

- Place your child in the car seat with their coat on. Snug up the harness and perform the pinch test - using your thumb and forefinger, you should not be able to pinch any of the harness webbing at the child's shoulders.
- After unbuckling, remove the child from the seat **without loosening the harness.**
- Take the child's coat off and buckle the child in the car seat.
- **Without adjusting the tightness,** can you pinch any harness webbing? If yes, then the coat is not safe to wear in the car seat because a collision could cause the coat to flatten out and leave a similarly loose harness fit.

Other ways to keep a child warm include dressing them in thin layers and adding hats, mittens, and socks or booties. Place a blanket over the harness straps or seat belt or put the child's winter coat on backwards after they are buckled up.

Please consider putting up a seasonal flyer (page 32) in your waiting areas and exam rooms.

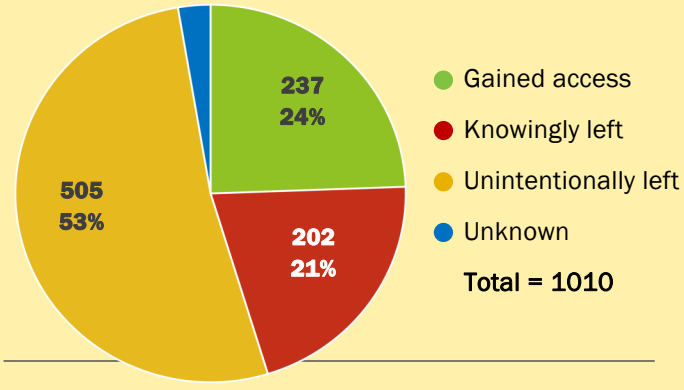
Pediatric Vehicular Heatstroke (PVH)

PVH is the leading cause of non-crash-related auto fatalities for children ages 14 and younger, according to national data. Because their bodies heat up quickly, three to five times faster than adults, children left in cars can die of heatstroke in minutes [20]. PVH can occur if a child gains access to a vehicle or is knowingly or unintentionally left behind by a caregiver. While relatively rare compared with other mechanisms of injury, PVH remains a worldwide public health matter.

The good news is that these tragedies are preventable. Clinicians can provide caregivers with these messages

- There's no safe amount of time to leave a child (or pet or vulnerable adult) alone in a vehicle. A car can heat up to dangerous levels in a short time, even with the windows open or when parked in the shade. For example, on an 80-degree day, the temperature in a vehicle can be over 100 degrees after just 15 minutes.
- Lock parked vehicles and keep key fobs out of reach of children.
- Loving and capable parents and other caregivers can make a mistake, especially when tired, distracted, or out of their routine. Create habits and reminders, such as putting your cell phone in the back seat or your child's diaper bag in the front seat. Look before you lock. Ask your childcare provider to call you if your child doesn't arrive as expected. Check in with another caregiver to confirm daycare drop off.

PVH Fatalities in the U.S.—1998 through 2024



37	27 months	31%	58%
Average number of fatalities per year	Average age	Less than 1 year old	1-4 years old

A quarter of "Unintentionally Left" deaths occurred in a workplace parking lot

Source: Jan Null, CCM Department of Meteorology and Climate Science San Jose State University January 2025

- If you see a child alone in a car, call 911. Fast action can save a life. If a child is missing, check the bodies of water first, then the car, including the trunk.

You can also put PVH information in your office parking lot and educate your employees about PVH. The National PVH Stakeholders Workgroup Subcommittee of the National Safety Council has developed an Employer Toolkit [22], which includes customizable emails, posters, infographics and window cling templates to help build awareness in the workplace. These toolkit files are shared via a cloud-based server. If you have difficulty accessing the files, contact **hotcars@nsc.org**.

Please consider putting up a seasonal flyer (page 33) on this topic in your waiting areas and exam rooms.

Escaping Behaviors

It is not uncommon for young children to try to unbuckle or get out of their car seat. They are becoming more independent and like to try new things. Caregivers often want to make the harness even snugger, but this usually increases the child's desire to "escape." Here are ideas to suggest to parents who are concerned about their little escape artist.

- Check the harness fit. Remember, for rear-facing, harnesses should be at or below the shoulders (unless otherwise instructed by the car seat manual) and pass the pinch test but not tighter.
- Experiment with recline angles if the seat allows more than one recline setting. By this age, a child (barring medical concerns) can ride more upright. Seeing more things out the window may decrease the urge to elope.
- Provide positive reinforcement for staying buckled, such as a sticker or a special treat.
- A soft toy or book can provide a distraction for busy hands.
- A social story with simple pictures and sentences emphasizing safety may be a great tool.
- Give the child the role of "car monitor." They get to make sure everyone stays buckled up.



- If you are going on a fun outing, turn around and go home if the child unbuckles.

If a booster rider is trying to elope from a seat belt, they should return to a harnessed seat. If they have outgrown all conventional harnessed car seat and behavior change strategies are not working, it is likely that an adaptive car seat is needed.

Transportation of Children with Special Healthcare Needs

Conventional child restraints may be used for many children with health-related transportation needs and are preferable when possible. They are easier to find and use, and less expensive than specialized restraints. Often, conventional restraints have options that can help children with medical conditions. For example, many car seats allow for extended harness use (rear-facing to 50 lbs. and forward-facing to 65 lb., with appropriate heights) or have adjustments that assist in positioning.

If a conventional restraint cannot be used, adaptive seats, boosters, and vests are available. These devices are ordered from durable medical equipment providers or directly from a manufacturer. The process to obtain an adaptive restraint can be complicated, lengthy, and expensive, and should involve the child's family and clinical team.

For **preterm and low birth weight infants** who cannot maintain cardiorespiratory stability when semi-reclined in a conventional car seat, a car bed should be used. Car beds accommodate an infant in a fully reclined position (usually supine). AAP's publication Safe Transportation of Preterm and Low Birth Weight Infants at Hospital Discharge [23] provides additional details.

Other health conditions that may require an adaptive restraint include casts or braces, hypotonia, omphalocele, scoliosis, behaviors such as impulsiveness, distractibility, and short attention span, and obesity, if the child's age or developmental level precludes moving to another stage of Child Passenger Safety.

Some CPST's have received additional training in Safe Travel for All Children. (STAC). This course introduces participants to medical conditions that can impact how to safely transport a child in a motor vehicle. Many of these CPST's are not medical professionals and will need support from clinicians when helping a family and the child's healthcare team with restraint selection and use. Important information to share includes whether there are any airway concerns, the child's ability to sit upright unassisted, any medical equipment that is used in the vehicle, the type of child restraint currently in use, and the future medical needs pertaining to safe transport.

CPST's who have taken the STAC course are identified on the National Child Passenger Safety Certification Training Program [8] website. The Indiana University School of Medicine's Adaptive Transportation [24] is a comprehensive resource for clinicians and caregivers.

The AAP Policy Statement Transporting Children With Special Health Care Needs [25] includes general guidance and information on certain specific medical conditions.

Child Passenger Safety in Other Modes of Transportation

Air Travel

Airlines currently allow children under the age of two to fly free as lap children. The Federal Aviation Administration (FAA) "strongly urges" caregivers to use a car seat on an airplane (Flying With Children [26]). The AAP recommendation [27] is that children less than 40 pounds be securely fastened in child restraints when flying. A study, "In-Flight Injuries Involving Children on Commercial Airline Flights"[28], published in the journal "Pediatric Emergency Care" states, "Unrestrained lap children are prone to in-flight injuries, particularly during meal service (burns were the most commonly identified mechanism of injury) or turbulence."

U.S.-based airlines must allow a child to use an FAA-approved car seat when a parent or guardian purchases a seat for the child, a parent or guardian accompanies the child, and the child is within the limits for the car seat. There must be a label on the seat stating, "This restraint is certified for use in motor vehicles and aircraft." Most harnessed car seats are FAA-approved.



Before planning to use a car seat on an international flight on a non-US carrier, caregivers should check that airline's policies. Unfortunately, some non-US carriers do not allow the use of car seats or require car seats to face forward.

A child less than two should be rear-facing in their car seat. Note that any car seat , rear-facing or forward-facing, must be installed on a forward-facing airplane seat. Sometimes, caregivers or airline staff misinterpret this and think that a car seat cannot face the rear of the aircraft.

The FAA has also approved one harness-type device for children weighing between 22 to 44 lbs. This device is not approved for use in motor vehicles and there is only a small window where it fits children well. An airplane seat belt begins to fit at about 40 lbs. Still, if a car seat is needed at the destination, even if the child is over 40 lbs., it's best to use on the flight to avoid loss or damage. Even gate-checking a car seat is no guarantee that it will arrive on the same flight as the child who needs it, or that it will be undamaged.

Boosters are not FAA-approved, but should be brought on board and stowed for flight. The RideSafer® Travel Vest [14] (see Forward-Facing Car Seats, page 8) is also not FAA-approved.

Child Passenger Safety in Other Modes of Transportation (continued)

Recreational Vehicles

Many people are surprised to learn that motorized Recreational Vehicle (RV) cabins are exempt from federal seat belt requirements for rear occupants and are not required to be crash tested. Also, an RV is full of equipment and storage materials that can become projectiles during a collision.

The best way for a family to travel with children and an RV is to choose a non-motorized, towable camper. This way, children can be properly restrained in the vehicle that is pulling the RV. Another option is to drive children in a separate vehicle.

The Car Seat Lady is a reputable resource run by a pediatrician and CPST. Their website has an article covering risks to children and other rear passengers in RV's. [29]

Alternative Vehicles

Car seats are designed for vehicles meeting federal motor vehicle safety standard definitions of passenger car and multipurpose passenger vehicle. While alternative vehicles may meet some federal motor vehicle safety standards, they are not the same standards as passenger cars or multipurpose passenger vehicles, and therefore, car seats may not perform as designed when used in those vehicle types. Most car seat manufacturers prohibit use of car seats in these types of vehicles.

The AAP Recommendations for the Prevention of Pediatric ATV-Related Deaths and Injuries [30] document states that no child younger than sixteen years of age should operate or ride as a passenger on an ATV. Tips to Keep Children Warm and Safe Outdoors in Winter [31] includes the AAP recommendation that that children under age 16 not operate snowmobiles and that children under age 6 never ride on snowmobiles. The AAP notes that golf cart injuries are more common in kids than adults.[32]

Manufacturers of side-by-sides, also called Recreational Off-Highway Vehicles (ROVs) or Utility Terrain Vehicles (UTVs), often suggest a minimum age of 12 for riders. The AAP states that as more research is completed, they will develop a policy statement with recommendations for side-by-sides.

Child Passenger Safety in Other Modes of Transportation (continued)

School Buses

Large school buses are designed to be highly visible and protect occupants by closely-spaced seats with energy-absorbing seat backs (called compartmentalization). While NHTSA [33] does not require seat belts on large buses, some states, including New York, do. If a child rides on a large bus that is equipped with seat belts, best practice is to use them. Some buses are also equipped with harnesses. These are specifically designed for buses and meet federal motor vehicle safety standards (see photo).

Small school buses that are of similar size and weight to passenger cars and trucks. They must be equipped with seat belts to provide protection for all occupants.

The AAP Policy Statement on School Transportation Safety [34] provides pediatricians with information, studies, regulations, and recommendations related to the safe transportation of children to and from school and school-related activities. As the policy states, “Pediatricians can play an important role at the patient/family, community, state, and national levels as child advocates and consultants to schools and early education programs about transportation safety.”



No/Low-Cost Child Safety Seat Options

The Vermont Be Seat Smart WIC voucher program [6] allows for distribution of free car seats to WIC (Women, Infants and Children Special Supplemental Nutrition Program) recipients after completing a child passenger safety seat inspection appointment. Families receiving Reach Up assistance or Dr. Dynasaur, and foster children may be eligible if in need. Receiving a new seat is not automatic. The CPST will determine if a child needs a seat and provide caregivers with education and instruction on installation and harnessing.

New York does not have a statewide program, but caregivers can check with the car seat inspection/fitting stations in their area to see if they have free or reduced-cost seats available.

Car seats are also available at many price points. A caregiver should not feel that if they purchase a lower cost seat, they are compromising their child's safety. All child restraints that are legally allowed to be sold in the United States pass rigorous safety standards and are safe when used properly. The AAP Car Safety Seat Product Listing [19] includes price information.

A reminder that acquiring a used car seat (page 14) might seem cost-effective for a caregiver, but may not be a safe solution, depending on the source of the seat.

Addressing Caregiver Questions and Concerns

In their Child Passenger Safety Policy [1], the APP recommends that "**clinicians provide child passenger safety advice to families at every health maintenance visit.**" A practitioner might treat a child after a motor vehicle crash. Here are key messages to provide to caregivers during appointments:

- Make your vehicle smoke free.
- Read the manual for your car seat and vehicle – changes are needed as your child grows.
- Get a seat check by a Child Passenger Safety Technician (page 3).
- Avoid aftermarket (non-regulated) products.
- No puffy coats.
- Prevent vehicular heatstroke – "Look before you lock."
- Consider your child's safety in any mode of transportation.
- Set the example – your child is a future driver!

The following three pages contain common caregiver questions and possible responses. Clinicians can also refer caregivers to the AAP Healthy Children website "Car Seats: Information for Families" [35] for more information about Child Passenger Safety.

General

Q: I'm not sure my child safety seat is correct. What should I do?

A: You can set up an appointment with a CPST at a car seat station or attend an event where CPST's are doing seat checks.

Q: I need a car seat for my child and cannot afford one. What should I do?

A: Vermont's Be Seat Smart program [6] offers income-eligible Vermonters free car seats if a child needs one. New York does not have a state program, but you can check with the car seat inspection/fitting stations in your area to see if they provide free or reduced-cost seats.

Q: Does my child's car seat need to be replaced after a motor vehicle crash?

A: Check your car seat manual to see what the manufacturer of the seat requires. If you have any questions about what the manual says about replacement after a crash, contact the manufacturer.

Q: My child is unbuckling themselves at the wrong time. How do I address this?

A: This is not uncommon. Young children are becoming more independent and like to try new things. Sometimes children try to get out of their seat because it's uncomfortable. A CPST can look at your child in the seat and suggest any adjustments that may help your child be more comfortable and less likely to unbuckle. If your child is doing this in a booster and they still fit in a harnessed car seat (most have a maximum of 65 lbs. and 49 inches), consider putting them back into a harness. [Clinicians can review ideas in Escaping Behaviors (page 17) that are appropriate for the child and their family].



Harnessed Car Seats

Q: I'm concerned that my child slumps forward when the you are in their car seat. Should I buy a head cushion or wrap a blanket around their head? [This should also be addressed if a clinician observes aftermarket products or something around the child's head at an appointment].

A: After-market products such as head cushions are not recommended. They are usually prohibited by car seat manufacturers. Anything added to the seat may affect the harness fit or cause your child to be positioned incorrectly. Here are ways to help keep your child riding comfortably and safely:

- Check that your car seat is at the correct recline angle. For newborns (or older children with a medical condition affecting head and neck control), riding as reclined as allowed per the manual helps protect your child's airway by avoiding a "chin to chest" posture. Turning their head to the side, or "ear to shoulder" is airway-protective.
- Make the harness snug so that you cannot pinch any harness fabric (webbing) at your child's shoulders. This helps their position in the seat and provides the best protection in a crash.
- Check your car seat manual for proper harness height and harness buckle placement.
- A child with good head and neck control will move if they are uncomfortable.

Q: My rear-facing child's legs seem cramped. Should I be concerned?

A: Children are very flexible and can easily find a comfortable position when rear-facing. Leg injuries are very rare when rear-facing.

Q: Is my child getting too big for their rear-facing seat? [This may be another way of asking about leg room but also may be driven by another concern about fit.]

A: If your child has reached any of the limits set by the seat's manufacturer, they have outgrown the seat (or that mode of the seat, if it's a convertible or all-in-one). Once infants outgrow their infant seat, move them to a convertible or all-in-one seat and keep them rear-facing to the maximum weight or height of that seat.

Q: Is it okay for me to leave my child in their car seat for naps?

A: Children should not be left to sleep in a car seat. Place your child in a crib or other safe sleep space for naps and at night.

Q: My rear-facing child gets car sick. Should I turn them forward-facing?

A: Forward-facing often doesn't help and might even exacerbate motion sickness. What other steps have you taken to combat this situation?

Note: The Car Seat Lady is a resource run by pediatrician and CPST Alisa Baer, and other child passenger safety experts. Their Motion Sickness webpage [36] is geared toward non-medical persons but contains good refresher information for health care professionals and may help you guide parents dealing with a child who is experiencing motion sickness.

Harnessed Car Seats (continued)

Q: Since I shouldn't dress my child in a winter coat, how should I keep them warm?

A: Dress your child in thin layers, starting with tights or leggings and a long-sleeved bodysuit or "onesie." Add pants and a warmer top, like a sweater or thermal-knit shirt. Your child can wear a thin, well-fitting fleece jacket that stops at the waist over the other layers. Don't forget hats and mittens. Once you have snugly harnessed your child, cover them with a blanket or put their coat on backwards with their arms in the sleeves and the coat itself covering them.

Booster Seats and Seat Belts

Q: When can my child use a booster seat?

A: Keep your child harnessed until they reach the maximum weight or height allowed by their seat and meet the minimum weight and height requirements for a booster. It's best to wait until they are at least five years old and will wear the seat belt properly all the time in a booster. Vermont law requires children to be in a harnessed car seat until age five unless outgrown.

Q: Does the "no puffy coats" message apply to children when they're not in car seats?

A: Yes. Everyone should avoid wearing a puffy or bulky coat in the car, even adults. A heavy coat adds space between the body and the seat belt.

Q: I've tried all the methods to prevent my child from unbuckling the seat belt . What is the next step?

A: The next step is an adaptive transportation seat or vest. Some CPST's have extra training in working with children with special healthcare needs. Find a technician one at the Safe Kids Worldwide National Child Passenger Safety Certification Training Program [8] to get recommendations for the best options. Your child's healthcare team can help navigate the process to try to get an adaptive restraint covered by insurance. You may also want to look at this this short **"Special Needs" video** [37], a collaboration of Cincinnati Children's Hospital and Toyota.

Q: When can my child stop using a booster?

A: New York and Vermont law require the use a child restraint until a child is at least eight years old. After they are eight, they should continue to use a booster for their safety until you can answer "yes" to these five steps (page 13):

- Does the child sit all the way back against the vehicle seat?
- When seated with their back against the vehicle seat, are their knees bent comfortably at the edge of the vehicle seat with their feet flat on the floor?
- Is the lap portion of the seat belt as low as possible, touching their thighs?
- Does the shoulder belt lay snugly on their shoulder between their neck and arm?
- Can they remain seated like this for the whole trip?

Q: When can my child ride in the front seat?

A: The back seat is the safest place for all children less than age 13. If you have a circumstance where a child must ride in a vehicle without a back seat or your back seat is full with other children, consult a CPST to see what the best set-up will be.

Appendices — Flyers for Waiting Areas and Exam Rooms

These links contain printable PDF documents from reputable outside sources:

- Safe Kids Worldwide car seat safety tips [38]
- Safe Kids Worldwide tether infographic [39]
- Seat belts while pregnant [2]
- Recreational vehicles and child passengers [40]

There are several Golisano Children's Hospital branded flyers available on the following pages:

- Child Passenger Safety Checklist
- Winter coats and Car Seats
- Children in Hot Cars
- Lower Anchor weight limits
- 5-Steps

Or contact the UVM Medical Center Child Passenger Safety program at 802-847-1215 or injuryprevention@uvmhealth.org for our trifold brochure. We'd also be happy to work with your office to develop customized flyers

Child Passenger Safety Checklist

☑ Is it the right seat for my child?

- Read labels and the manual to confirm your child meets the weight and height limits of the seat and the seat has not expired.
- Keep children in a rear-facing seat until they reach the top weight or height allowed by their car seat manufacturer. Vermont and New York law requires children to rear-face until age 2.
- Keep children in a harnessed seat until they are at least 4 years old and 40 pounds. It's best to wait until at least age 5 before moving to a booster seat (and it's the law in Vermont).
- Keep children in a car seat or booster until at least 8 years old (Vermont and New York law).

☑ Is the seat correct in my vehicle?

- Use the seat belt OR lower anchors, not both.
- Check car seats for less than 1 inch of movement at the belt path.
- Always use the tether for a forward-facing seat.
- Keep children in the back seat until they are age 13. Never place a rear-facing seat in front of an active airbag (Vermont law). Always use a lap and shoulder belt with a booster.

☑ Is the fit correct?

- Generally, for rear-facing, the harness straps should be at or below the child's shoulders and for forward-facing, the straps should be at or above the shoulders (read the car seat manual to confirm).
- The harness should be snug so you cannot pinch the webbing at the child's shoulder.
- In a booster, the seat belt should be snug across the shoulder and chest and the lap belt should be snug and low across the hips.
- No puffy coats, winter jackets, or snow suits. Cover the child with blankets or a coat on backwards after harnessing or buckling.

☑ Am I sure?

- Read the car seat and vehicle manuals.
- Register the seat with the manufacturer and check for recalls (nhtsa.gov).
- Get a seat check in your vehicle with a Child Passenger Safety Technician (CPST). Find a Vermont CPST at beseatsmart.org. Go to trafficsafety.ny.gov/child-passenger-safety to find a CPST in New York.







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Injury Prevention
UVMHealth.org/carseats

Winter Coats and Car Seats

Winter Coat + Car Seat = Danger

Why? In a crash, a puffy winter coat or snowsuit can flatten out or compress, causing the car seat harness to be too loose to protect a child properly. Even older children and adults should avoid wearing a bulky coat because it can cause space between the body and the seat belt.

See if a jacket is "car seat safe"

1. Place your child in the car seat with their coat on. Tighten the harness until you are unable to pinch any of the harness between your thumb and forefinger ("pinch test").
2. Unbuckle the child from the car seat without loosening the harness straps.
3. Take the child's coat off and buckle them in the car seat again.
4. Does the harness still pass the pinch test? If not, the coat is not safe for the car seat. A crash could cause the coat to compress and the harness would be too loose.

Keep your child warm and safe

Dress them in thin layers. Start with tights or leggings and a long-sleeved bodysuit or "onesie." Add pants and a warmer top. Well-fitting fleece or sweaters keep children warm without adding bulk.

Cover the child with a blanket or a coat on backwards. Remove it as the car warms up so your child does not overheat.



Remember, never use a sleeping bag, blanket, or add anything underneath a child in the car seat. Like bulky coats, these items can compress during a crash and cause slack in the harness straps.

Children and Hot Cars



THE DANGER OF HEATSTROKE

Pediatric Vehicular Heatstroke (PVH) can occur if a child gains access to, or is knowingly or unknowingly left in a vehicle. A young child is especially vulnerable because their body heats up three to five times faster than an adult's.

The good news is PVH is preventable. Here are some key points to remember.

- **Lock up.** Lock your vehicle when it's parked. Keep key fobs out of the reach of children.
- **Talk to your kids.** Teach them that a car is not a play area.
- **Never leave a child alone in a car.** Even on a cooler day, in the shade, or with the windows open, a vehicle can heat up to dangerous temperatures rapidly.
- **Look Before you Lock.** Get into the habit of checking the back seat. Most newer vehicles have a "check back seat" message—if your vehicle has this technology, do not disable it.
- **Create Reminders.** Loving and capable caregivers can make a mistake, especially when tired, distracted, or out of their routine. Put your purse, cell phone, work badge, etc. the back seat. Or place your child's diaper bag or one of their stuffed animals in the front seat where you can see it easily.
- **Develop a Plan.** Ask your babysitter or childcare provider to call you if the child doesn't show up for care as expected.
- **Check in.** When another caregiver is dropping your child off at daycare or a babysitter, do a quick check in to confirm. Ask another caregiver to do the same for you.
- **Act Fast to Save a Life.** If you see a child alone in a vehicle, call 911. If a child is missing, check any nearby bodies of water first, then vehicles, including trunks.

Car Seat Safety

Did You Know? Lower Anchors Have a Weight Limit!



Why? A vehicle's lower anchors are rated for a maximum of 65 lbs. This is the weight of the car seat plus the weight of the child. Car seat manufacturers have done the math for you by identifying the maximum weight of a child for installing their seat with lower anchors.

Find this information in the car seat manual and labels on the seat. You can continue to use the car seat up to the limit of the seat, but you must switch from installing with lower anchors to a seat belt installation.

Frequently Asked Questions:

Q: Are lower anchors safer than a seat belt?

A: No. Either method is safe when a car seat is installed according to the manufacturer's instructions. Seat belts safely restrain large adults!

Q: Do infant car seats have lower anchor weight limits?
A: No, because your child will have outgrown the seat before the combined weight reaches 65 lbs.

Q: Do I still use the tether when installing a seat with a seat belt?
A: Yes! The tether is an important safety feature for forward-facing car seats. A few car seats require the tether for rear-facing installations. Read your manual for more information.

Q: Why does my child's booster seat allow using lower anchors when my child weighs over 65 lbs.?
A: When allowed by the car seat manufacturer and the vehicle manufacturer, you can use the lower anchors to keep the booster in place when it's unoccupied. Since the seat belt restrains the child, lower anchors only restrain that empty booster. The child's weight doesn't apply and you do not need less than one inch of movement. If you are not using lower anchors or LATCH (never use the tether alone), buckle the booster in when it is not occupied, so it does not become a projectile.

Q: What if I still have questions?
A: Contact a Child Passenger Safety Technician (CPST). Find a Vermont CPST at beseatsmart.org. In New York, go to trafficsafety.ny.gov/child-passenger-safety to find a CPST.

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When can a child ride without a booster seat?

ANSWER: WHEN THEY PASS THIS "FIVE STEP" TEST!



Reminders:

- Since vehicle seats vary, test in any vehicle and seating positions where the child rides.
- All children under age 13 should ride in the back seat for the best protection.
- Set the example. You are teaching your child, and future driver, good safety habits!

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INJURY PREVENTION
UVMHealth.org/carseats

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