What to do if the conventional car seat does not work...

What are the options?

Anthony McGovern, MS OTR, CPST

Occupational Therapist Riley Children's Health at Indiana University Health Automotive Safety Program National Center for the Safe Transportation of Children with Special Health Care Needs





Purpose



 Provide CPSTs and medical professionals with potential options for vehicle passengers with more complex needs (infants to adults).





Learning Objectives

- Identify conventional restraints that may benefit children and adults with complex needs
- Identify adaptive restraints that may benefit children and adults with complex needs
- Identify helpful local and national resources
 available





Today is an Introduction to Adaptive Restraints

- To learn more and get hands-on with the adaptive restraints: Please take the Safe Travel for All Children: Transporting Children with Special Health Care Needs Course
- MUST be a CPST to take course
- Enrichment course on adaptive transportation developed by the National Center
- Two-day in-person course hosted nationwide
- Hybrid course online modules with one day in-person (Indiana only currently - going national later in 2024)







Why not a conventional car seat?

- Have outgrown conventional restraints and still require postural support to improve positioning
- Need additional postural support to improve positioning
- Must lie down during transportation
- Have been casted and do not fit into their own conventional option
- Demonstrate severe behavioral challenges or is escaping/eloping





Basic Child Passenger Safety Guidelines





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Basic Guidelines

- Avoid use of non-compliant/nonapproved/after-market/un-regulated products
- Never modify structure unless crash tested with modification to meet FMVSS 213 and approved by manufacturer
 - Seemingly minor modifications can compromise performance of the restraint



Infant using non-approved support pad





Basic Guidelines

- Minimize travel
- Make frequent stops
- Position child in back seat with additional caregiver
- Caregivers must travel with medical care plan, health care providers, and durable medical equipment (DME) providers, if applicable
- Caregivers must have enough power for medical equipment for twice the length of travel
- Caregivers must have enough oxygen for twice the length of travel



Additional caregiver in back seat visually observing child





Basic Guidelines

- Securing medical equipment:
 - Place on floor of vehicle wedged with pillows, foam, or blankets
 - Check vehicle owner's manual about placing items under vehicle seat as many newer air bag sensors may be affected



Apnea monitor being wedged under vehicle seat with towel roll

 Secure in adjacent, unoccupied vehicle seat with vehicle seat belt





Conventional Restraints

- Use conventional restraints whenever possible
 - Easier to find
 - Easier to use
 - Less expensive
- Rear-facing as along as possible
- Use conventional restraint as long as possible up to manufacturer's height limits and weight limits
- Multiple adjustments, harness heights, and buckle strap positions
- Additional accessories infant positioning inserts or additional padding in many conventional restraints





Adaptive Restraints

- More expensive than conventional restraints
- Some adaptive restraints can be purchased online out of pocket
- Most adaptive restraints are ordered through local durable medical equipment (DME) providers
- Third party payers may cover cost with documentation
- May take multiple months to obtain adaptive restraints due to insurance process





Conventional and Adaptive Restraints

NOTE: The restraints presented in these slides may not be all inclusive and do not imply product endorsement.





Transportation Options for Infants Preterm/Premature or Infants with Low Birth Weight to Improve Positioning





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Rear-Facing Only Options

- Conventional RFOs start at 3 pounds
- Select rear-facing car seat with shortest distance from crotch buckle strap to seat back
- Harness straps that can be positioned at or below shoulders
- Multiple harness slots provide more choice



Source: Evenflo

AAP Clinical Report, May 2009, reaffirmed 2019







Source: Merritt Car Seat

Source: Dorel Juvenile

Source: Merritt Car Seat

- For infants and toddlers who must lie down during transportation
- Up to 35 pounds
- Up to 29 inches





Transportation Options for Infants/Toddlers/Children to Improve Positioning





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Rear-Facing As Long As Possible

- Increased padding
- Increased postural support
- Increased recline options
- However, may be too expensive for some families



Source: Graco



Source: Britax



Rotating/Swiveling Conventional Car Seats

- May encourage caregivers to keep child rear-facing longer
- May improve safety of transfers in and out of car seat
- However, may be too expensive for some families



Source: Baby Jogger





Jefferson Adaptive Car Seat

- Rear-Facing Only
- 7.5-40 pounds, 19-37 inches
- Special yoke harness design for omphaloceles
- Buckle position and padding prevents buckle from contacting omphalocele
- Can be used for other diagnoses needing the yoke harness



Source: Merritt Car Seat





Forward-Facing with Recline Options





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Forward-Facing with Recline Options

- Recline options can improve positioning for many children
- Many convertible/all-in-one have multiple recline options in forward-facing
- May be helpful for children with decreased trunk control or decreased head control
- Can use gravity to assist with positioning with additional recline options





Soft Cervical Collars

- Recommend replacing rigid neck collars with soft cervical collars during travel
- Crash tests indicate rigid
 collars decrease neck flexion
- MD must be consulted and provide written order to change rigid collar to soft collar – <u>this is not a CPST</u> <u>choice only!!</u>



Child with soft cervical neck collar





Adaptive Restraints for Casts

Convertible adaptive car seat designed for arm casts and leg casts

• Rear-facing 5-40 pounds



Source: Merritt Car Seat

• Forward-facing 25-80 pounds



Source: Merritt Car Seat





Adaptive Restraints for Casts

- Hope Car Bed (if infant must lie down)
- Lay Down EZ-ON Vest (if child must lie down)
- Spirit Spica (forward-facing only)

INDIANA UNIVERSITY

SCHOOL OF MEDICINE



Source: Merritt Car Seat



Source: EZ-ON



Source: Inspired by Drive





Transportation Options for Toddlers/Children to Decrease Escaping





Check the Current Car Seat

- Escaping from looser harness?
- Harness positioned too high or too low from the shoulders?
- Pushing down retainer clip to free arms?
- Unbuckling retainer clip?
- Unbuckling buckle strap?
- Unbuckling vehicle seat belt?





Parents Get Creative











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Non-Compliant Products E







Trial Conventional Options First









GRACO

Source: Graco





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Conventional Car Seats with Adaptive Chest Clip Guard

- Evenflo will allow the use of the Merritt Chest Clip Guard with:
 - Sonus 65, Maestro Sport, SureRide/Titan 65
- Evenflo online Medical Waiver must be completed
 - Search for Merritt on Evenflo website
- Purchase the car seat from Evenflo
- Purchase Chest Clip Guard from Merritt Manufacturing



Source: Evenflo



Source: Merritt Car Seat





Ride Safer Travel Vest

- Positions vehicle seat belt
- Vest may be calming to many children – not a compression vest





Source: ridesafer.net





Roosevelt Car Seat

- 35-115 pounds
- 33.5-62 inches
- Chest Clip Guard
- EZ Guard Buckle Cover
- A-Lok Cover



Source: Merritt Car Seat







Spirit Car Seat

- 25-130 pounds
- Up to 66 inches
- Retainer Clip Guard
- Buckle Guard
 - Medication bottle top







Source: Inspired by Drive





Transportation Options for Children/Tweens/Teens to Improve Positioning





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Large Medical Seats

- Forward-facing only
- Lower weight range 20-35 pounds
- Upper weight range 102-130 pounds
- 5-point harness restraint



Source: Merritt Car Seat

Source: Special Tomato





Large Medical Seats

- Optional accessories to improve positioning:
 - Abductors
 - Seat extenders
 - Lateral supports
 - Head supports



Source: Inspired by Drive





Adaptive Booster Seats

- Forward-facing only
 - Lower weight 20-79
 pounds
 - Upper weight 108-175
 pounds
- Require lap-and-shoulder belt over child for crash protection
- Positioning harness or positioning vest for postural support



Source: etac



Source: Merritt Car Seat





Transportation Options for Children/Tweens/Teens to Decrease Escaping





Churchill Booster Seat with Vest

- Positioning Vest Vehicle seat belt must be used for occupant protection
- 44-175 pounds
- 44-72 inches
- Side-release buckles can be added atop Velcro attachment sites on vest
- Vest may be calming to many not a compression vest



Source: Merritt Car Seat





Churchill Booster Seat with Harness

- Positioning Harness Vehicle seat belt must be used for occupant protection
- 44-175 pounds
- 44-72 inches
- Harness can be ordered with or without Chest Clip Guard and EZ Guard Buckle Cover
- The positioning vest and the positioning harness can be ordered together for use with same booster



Source: Automotive Safety Program





303Z Vest





- Two years and above
- 31-168 pounds
- Rear Zipper closure
- Additional Accessories:
 - Tether mount
 - Lower anchor attachment
 - Zipper lock
 - Neck pads
 - Wrist straps
 - Upper arm straps
 - Ankle straps
 - Floor mount





MAX PV Vest

- 31–168 pounds
- MAX PV Vest and MAX PV Mount sold together
- Vehicle seatbelt must be used for occupant protection routed through the vest hip loops
- Rear zipper closure with a zipper lock
- All connector points are not accessible to the child - increasing difficulty to unbuckle



Source: EZ-ON





Transportation Options for Young Adults/Adults/Older Adults to Improve Positioning





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Adaptive Booster Seats

- Forward-facing only
 - Lower weight 20-79 pounds
 - Upper weight 108-175 pounds
- Require lap-and-shoulder belt for crash protection
- 5-point positioning harness or positioning vest for postural support
- Recline options for some adaptive booster seats







Adaptive Vests

- Forward-facing only
 - Lower weight 31-81
 pounds
 - Upper weight 168-225
 pounds
- Require lap-and-shoulder belt over child for crash protection
- Vest or harness for postural support



Source: Merritt Car Seat

Source: Besi





Transportation Options for Young Adults/Adults/Older Adults to Decrease Escaping





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Churchill Booster Seat with Vest

- Positioning Vest Vehicle seat belt must be used for occupant protection
- 44-175 pounds
- 44-72 inches
- Side-release buckles can be added atop Velcro attachment sites on vest
- Vest may be calming to many not a compression vest



Source: Merritt Car Seat





Churchill Booster Seat with Harness

- Positioning Harness Vehicle seat belt must be used for occupant protection
- 44-175 pounds
- 44-72 inches
- Harness can be ordered with or without Chest Clip Guard and EZ Guard Buckle Cover
- The positioning vest and the positioning harness can be ordered together for use with same booster



Source: Automotive Safety Program





303Z Vest



Source: EZ-ON

- Two years and above
- 31-168 pounds
- Rear Zipper closure
- Additional Accessories:
 - Tether mount
 - Lower anchor attachment
 - Zipper lock
 - Neck pads
 - Wrist straps
 - Upper arm straps
 - Ankle straps
 - Floor mount





MAX PV Vest

- 31–168 pounds
- MAX PV Vest and MAX PV Mount sold together
- Vehicle seatbelt must be used for occupant protection routed through the vest hip loops
- Rear zipper closure with a zipper lock
- All connector points are not accessible to the child - increasing difficulty to unbuckle



Source: EZ-ON





Chamberlain Positioning Vest

- Forward-facing only
- 81-225 pounds
- 48 inches and up
- Require lap-and-shoulder belt over child for crash protection
- Side release buckles can be added atop Velcro attachment sites on vest





Source: Merritt Car Seat





Moore Support Vest

- Zipper in back
- 65 pounds and up
- Size Options:
 - Medium: Waist size 30" to 36"
 - Large: Waist size 38" to 44"
 - Extra Large: Waist size 45" to 51"
- Require lap-and-shoulder belt for crash protection



Source: Besi





Additional Transportation Methods





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Transportation in a Wheelchair

- Best practice is to transfer out of wheelchair into appropriate restraint
- Wheelchair must be secured to
 appropriate wheelchair tie-down
 system
- Passenger must have lap-andshoulder belt in vehicle:
 - Face rider forward
 - Wheelchair tilted/reclined 30 degrees or less



Source: UMTRI





Postural Supports in Wheelchairs

- The majority of wheelchair or adaptive medical stroller lap belts and harnesses are for <u>positioning only</u> – must use vehicle lap-and-shoulder belt
- Postural lap belts and harnesses attached to wheelchairs are <u>NOT</u> strong enough to withstand crash forces
- Check for WC19 labels and contact manufacturer for more information - if there are questions



Source: AEL





Transportation in a School Bus

- Restraint options:
 - Integrated bus seats
 - Conventional restraints
 - Adaptive restraints
 - School bus specific restraints
- Availability of seat belts on bus affects restraint selection
- Some restraints attach to school bus seat without seat belt
- School bus restraint training available through NHTSA
 - CPST version
 - Bus driver version



Adaptive restraints in school bus seat with torso support and integrated bus seat Source: IMMI





Transportation in a Plane



amsafe.com/kidsflysafe-com/

CARES Vest

- <u>Child Aviation REstraint System</u>
- 1 year and older, 22-44 pounds, up to 40 inches
- FAA Exemption needed for older children with special needs 41-56 inches

Special CARES Vest

- Available if child with special needs is close to or over 5 feet tall
- Special CARES vest extends to accommodate a flyer up to
 6 feet tall
- FAA Exemption needed for Special CARES vest
- Exemption could take 6-8 weeks after applying





Resources







Resources

- LATCH Manual
- Adaptive Restraint information by manufacturer
- Safe Ride News
 - Educational Materials for the Child Passenger Safety Field
 - www.saferidenews.com



Source: Safe Ride News





AAP Car Seats: Product Listing for 2024

- Conventional Car Seats English and Spanish
- Rear-Facing Only, Convertible, All-in-One, Combination, Booster
 - Descriptions, Installation, and Safety information
 - Price Ranges
 - Rear-Facing Weight Limits and Height Limits
 - Forward-Facing Weight Limits, Height Limits, and Age Limit
 - Booster Weight Limits, Height Limits, and Age Limits
 - Recline Options in Forward-Facing
 - Travel Vests

www.healthychildren.org/English/safety-prevention/on-the-go/pages/Car-Safety-Seats-Product-Listing.aspx







National Center

- National Center for the Safe Transportation of Children with Special Health Care Needs
- 1-800-543-6227
- preventinjury.medicine.iu.edu
- Resources include Child Restraint Options/Medical Conditions/Upcoming STAC Trainings/News/FAQs
- National database of instructors -Search by state







Find a Tech

- Find a CPST with the adaptive transportation training of Safe Travel for All Children (STAC)
 - Click on 'Find a Tech'
 - Enter location information
 - Check 'Special Needs' in Extra Training





cert.safekids.org





Safe Travel for All Children: Transporting Children with Special Health Care Needs Course

- MUST be a CPST to take course
- Enrichment course on adaptive transportation developed by the National Center
- Two-day in-person course
- Hybrid course online modules with one day inperson (Indiana only now going national later in 2024)
- preventinjury.medicine.iu.edu







Brochures

- Download free at <u>preventinjury.medicine.iu.edu</u>
- Brochures include Car Safety for Your Child with:
 - Autism
 - Cerebral Palsy
 - Down Syndrome
 - Low Birth Weight
 - Osteogenesis Imperfecta
 - Use of Hip Casts



Car Safety for Children with Cerebral Palsy

Children with cerebral palsy may have positioning needs that can affect travel. This brochure answers some questions you may have about safely transporting your child.





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 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)



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)



11, 11 2

Weight: 7.5-40 pounds Height: 19-37 inches

For children with an omphalocele or children that need voke 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)

Roosevelt

Weight: 35-115 pounds Height: 33.5-62 inches

Additional Accessories include: EZ-Up headrest system, stay-put pommel, incontinent cover, scoliosis kit, anti-escape options. Tether/EZ-Tether required, FAA approved, (Merritt Car Seat, 317-409-0148, merrittcarseat.com)

MPS Car Seat

Small: 20-80 pounds, 32.5-50 inches Large: 80-130 pounds, 45 inches-adult (Multi-PositioningSeat) Additional Accessories include: Head rest/back cushion/seat cushion options. Tether required. FAA approved. (Special Tomato, 866-529-8407, specialtomato.com)

Spirit/Spirit Plus/Spirit Spica

Weight: 25-130 pounds Height: Up to 66 inches

Additional Accessories include: Incontinence cover, extensor thrust wedge, anti-escape options. Spirit plus includes swing away hip and trunk supports, abductor, and seat depth extender. Tether required. (Inspired by Drive, 800-454-6612, inspired by drive.com)

Defender Reha

Weight: 22-65 pounds Height: 27-57 inches Booster:30-110 pounds, 34-57 inches

Combination car seat. Additional Accessories include: Footrest, seat wedge, table/tray, abduction block Swivel base in booster mode. Lap-and-shoulder belt required in booster mode. FAA approved in harness mode. (Thomashilfen, 866-870-2122, thomashilfen.us)

Soft Touch Booster Seat

Small: 51-90 pounds, 40-56 inches Large: 81-130 pounds, 50-65 inches Lap-and-shoulder belt required. Lower anchors required. FAA approved. (Special Tomato, 866-529-8407, specialtomato.com)

> 800-543-6227 preventinjury.medicine.iu.edu This poster does not imply product endorsement, and may not be all inclusive



Carrot 3 Child Restraint (Booster) Weight: 30-108 pounds Height: 37-60 inches

Lap-and-shoulder belt required. Additional Accessories include: tether strap, support tray, wedge, footrest, seat & backrest extensions, lateral supports, incontinence cover, FAA approved. More accessories available. Lower anchors required. Tether highly recommended. (Etac, 844-876-6245, etac.com)

Recaro Monza Nova 2 Reha (Booster) Weight: 33.1-110.2 pounds Height: 37-59 inches

Lap-and-shoulder belt required. 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 (Booster) Weight: 40-176.4 pounds

Height: 51.1-70.9 inches

Lap-and-shoulder belt required, Additional Accessories include: swivel base (passenger side only), footrest, leveling cushion, lateral trunk supports, abduction block, seat wedge, soft harness strap. More accessories on order form. Lower anchors required. (Thomashilfen, 866-870-2122, thomashilfen.us)

Carrot 3 Booster Seat

Weight: 79-165 pounds Height: 55-69 inches

Lap-and-shoulder belt required, 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)

Churchill Booster with Positioning Vest Weight: 44-175 pounds Height: 44-72 inches

Lap-and-shoulder belt required, Additional Accessories include: EZ-Up headrest and cap, hip inflection wedge, hip inflection comfort pommel, stay put pommel, side relesae buckles available. LATCH required. (Merritt Car Seat, 317-409-0148, rrittcarseat com)

Churchill Booster with Positioning Harness

Weight: 44-175 pounds Height: 44-72 inches

Lap-and-shoulder belt required. Additional Accessories include: EZ-Up headrest, hip inflection wedge, chest clip guard, buckle guard. LATCH required. (Merritt Car Seat, 317-409-0148, merrittcarseat.com)

403PB Vest

Ages: 2 years and older Weight: 31-168 pounds

Lap-and-shoulder belt required with tether mount. Floor mount available 31-168 pounds. Front push button closure. Additional Accessories include: Neck pads, wheelchair mount. (EZ-ON Products, 800-323-6598, ezonpro.com)

303Z Vest

Ages: 2 years and older Weight: 31-168 pounds

Lap-and-shoulder belt required with tether mount. Floor mount available 31-168 pounds. Rear zipper 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)



Ages: 2 years and older



Weight: 31-168 pounds Lap-and-shoulder belt required. 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)

Chamberlain Vehicle Positioning Vest















National Center Resources



preventinjury.medicine.iu.edu/adaptive-transportation





Questions?





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