Safe Transportation of Children with Special Health Care Needs:

Do you know what you need to know?
Introduction

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Objectives

• Participants will learn the structured approach to addressing transportation practices for children with special health care needs.

• Participants will become familiar with common restraint resources utilized for children with special health care needs.

• Participants will learn how to identify local resources for children who have special transportation needs.
Disclosure statement

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

• We do not intend to discuss an unapproved/investigative use of a commercial product/device in our presentation.

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Definition

“Children with special health care needs are those who have or are at increased risk for a chronic physical, developmental, behavioral, or emotional condition and who require health care and services of a type or amount beyond that required by children generally.”

Merle McPherson, MD
Pediatrics, July 1998
National Survey of Children’s Health – Information on Children with Special Health Care Needs (CSHCN)

- In 2017-2018 – approximately 13.6 million (18.5%) children in the US, 0-17 years had a special health care need
- One in four households (24.8%) in the US had one or more CSHCN
- One in four CSHCN (26.6%) had functional limitations
- One in five CSHCN (19.9%) were consistently and/or significantly impacted by their health condition
Issues Affecting Transportation of Children with Special Health Care Needs (CSHCN)

- Lack of awareness
- Lack of resources
- Limited research and data
Issues Affecting Transportation of Children with Special Health Care Needs (CSHCN)

• Funding
• FMVSS 213
• State law exemptions for CSHCN
• School Bus Transportation

Source: Google Images
The Role of the Child Passenger Safety Technician

- Access appropriate resources
- Provide families with current information
- Develop community-based partnerships
- Solve problems
- Assist families with proper use and installation
- Know your limits
Working with Families

• Person-first terminology
• Recognize family is the constant
• Share complete and unbiased information
• Be aware of the impact of change

Occupational therapist trialing large medical seat with patient and family.
Working with Families

• Be open-minded and non-judgmental
• Be prepared to repeat information
• Consider all people who are significant to child’s care
• Respect choices
Team Approach

- Child
- Parents
- Caregivers
- Family members
- CPSTs
- Nurses
- Physicians
- Therapists
- And many more!

Nurse, mother, occupational therapist, physician, and child
Medical Conditions
Conditions with Challenges for the CPST

- Airway Obstruction
- Orthopedic Procedures and Conditions
- Developmental and Behavioral Challenges
- Neuromuscular Problems
- Gastrointestinal Conditions
Restraint Options for Children with Special Health Care Needs
Restraints Overview

• Considerations for Restraint Selection
• Basic Guidelines
• Conventional Restraints
• Adaptive / Specialized Restraints
Considerations for Restraint Selection

• Child’s size, age, developmental and behavioral characteristics

• Medical condition or procedures

• Optimal safety and positioning
Considerations for Restraint Selection

- **Recommended position during travel:**
  - Does the child need to travel flat? Prone? Supine?
  - Does the child need to travel on his/her side?
  - Does the child have breathing difficulty when sitting?
  - Can the child bend at the hips?
  - Can the child sit unsupported?
Considerations for Restraint Selection

- Availability and/or affordability of restraints
- Vehicle(s)
- Other occupants
- Family choices
Basic Guidelines

• Avoid use of non-approved products

• Never modify structure unless crash tested with modification to meet FMVSS-213

  ➢ Seemingly minor modifications can compromise performance of the restraint
Basic Guidelines

• Minimize travel
• Make frequent stops
• Travel with medical care plan
• For long trips, have list of health care providers and durable medical equipment providers, if applicable
• Position child in back seat with adult supervision
Basic Guidelines

• Securing medical equipment:
  • Place on floor of vehicle wedged with pillows, foam, or blankets
  • Secure with adjacent, unoccupied seat belts
  • Check vehicle owner’s manual about placing items under vehicle seat

• Have enough power for equipment and oxygen supply for double the length of the trip
Conventional Restraints
Conventional Restraints

- Use conventional restraints whenever possible
  - Easier to find
  - Easier to use
  - Less expensive

- Rear-facing as long as possible

- Use restraint with higher-weight harness as long as possible
Conventional Restraints

Features helpful for children with special health care needs:

• Multiple harness slots and buckle strap positions
• Accessories from manufacturer (newborn inserts, extra padding, etc.)
• Rear-facing weight ranges from 3-4 pounds up to 40-50 pounds
Conventional Restraints

- Forward-facing with multiple tilt settings
- Forward-facing harnesses up to 65/85 pounds
- Boosters with weight limits up to 120 pounds and/or adjustability features

➢ Always read and follow instructions for restraint and manual for vehicle
AAP Car Seats: Product Listing for 2021

- American Academy of Pediatrics Car Seat Listing
- Search engine: AAP car seat product list 2021
- Toggles between English and Spanish
- Rear-Facing Only, Convertible, All-in-One, Combination, Booster
  - Price Ranges
  - Rear-Facing Weight Limits and Height Limits
  - Forward-Facing Weight Limits, Height Limits, and Age Limits
  - Booster Weight Limits, Height Limits, and Age Limits
  - Recline Options in Forward-Facing
  - Travel Vests
Conventional Restraints

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

- More supportive
- Installed with recline
- Extra padding and inserts from manufacturer

Infant born preterm positioned in car seat designed with positioning inserts

Infant born prematurely positioned in car seat with blanket rolls
Rear-Facing Only

Many different models:

- Chicco KeyFit
- Cosco Light ‘n Comfy
- Graco SnugRide
- Maxi Cosi Mico
- Safety 1st Onboard 35

Source: Safety 1st
Rear-Facing Only

- The Evenflo LiteMax and Evenflo SafeMax infant car seats have updated weight and height requirements, noted below, to allow their use with small occupants:
  - Weight: 3 – 35 pounds
  - Height: 15.75 – 32 inches
- Approval of your child’s healthcare provider
- This update is a retroactive change to existing Evenflo LiteMax and SafeMax infant car seats.
- Date of manufacture 1/1/2018 or newer – infant insert is OPTIONAL for child fit
- Date of manufacture 12/31/2017 or older – infant insert is REQUIRED for infants who weigh between 3 – 4 lbs and OPTIONAL for infants who weigh over 4 lbs.

Source: Evenflo
Forward-Facing Harness to Higher Weight

- Children who have outgrown convertible or combination seats and cannot sit unassisted or who may have behavior challenges
- Can potentially use towel rolls and/or soft cervical neck collar for positioning
- These can be used as interim solution too
Forward-Facing Harness to Higher Weight

Many different models:

- Britax Boulevard
- Cybex Sirona
- Diono Radian
- Evenflo Titan 65
- Safety 1st Grow and Go

Britax Boulevard
Source: Britax
Forward-Facing Harness to Higher Weight

Maxi-Cosi Pria 85 Max

- 22–85 pounds
- 29–52 inches

Source: Maxi Cosi
Booster Seats

Ten year old with achondroplasia in booster and head support seat with adjustable sides

Six year old, who weighed about 100 pounds, in booster seat
Vests and Harnesses

Five year old with autism in Ride Safer Vest

86Y-Harness with halo

86Y-Harness from EZ-ON

Source: EZ-ON
Adaptive / Specialized Restraints
Adaptive / Specialized Restraints

• Designed for CSHCN who:
  • Have outgrown conventional car seat and still require a five-point harness
  • Require devices or accessories to assist with positioning during transportation
  • Demonstrate severe behavioral challenges
• Usually ordered through local durable medical equipment (DME) provider
• Third party payers may cover cost with documentation
Adaptive / Specialized Restraints

NOTE: The restraints presented in these slides may not be all inclusive and do not imply product endorsement.
Types of Adaptive / Specialized Restraints

• Car Beds
• Restraints for Casts
• Jefferson Rear-Facing Car Seat
• Large Medical Seats
• Adaptive Booster Seats
• Adaptive Vests
Car Beds
Car Beds

- For infants who must lie down
- Preterm/premature birth, low birthweight, apnea, Pierre Robin Sequence, osteogenesis imperfecta

Angel Ride  Dream Ride  Hope Car Bed
Angel Ride Car Bed

- Less than 9 pounds
- Less than 21.5 inches
- Supine
- Right side or prone (only with MD order)
Recall Information: Angel Ride

- Merritt Manufacturing has recalled certain Angel Guard Angel Ride car beds. The restraint harness may not have been properly sewn where the buckle is attached.

- Production Dates: August 8, 2019 - October 24, 2019

- In the event of a crash, the harness may not restrain the bed occupant, increasing their risk of injury.

- Merritt will notify owners, and will provide replacement harnesses, free of charge. The recall began January 15, 2020. Owners may contact Merritt customer service at 317-409-0146 to order free replacement harness.
Dream Ride

• 5-20 pounds
• 26 inches or less
• Supine
• Prone (only with MD order)
Hope Car Bed

- 4.5-35 pounds
- Restraint bags
  - 4.5-10 pounds; 10-35 pounds
    - Supine
    - Prone or right side-lying
      (only with MD order)
- 3-point harness
  - 10-35 pounds
    - Supine
    - Prone (only with MD order)

Source: Merritt Car Seat
Car Seat Tolerance Screening

- Observe infants born < 37 weeks gestation in car seats for apnea, bradycardia, oxygen desaturation

- Observe a minimum of 90-120 minutes or duration of travel (whichever is longest)

- Shorter studies may miss significant events

Car Seat Tolerance Screening

• Significant documented events warrant interventions, such as: additional medical assessment, supplemental oxygen, continued hospitalization, or use of car bed

• If car bed selected, baby should be re-tested in car bed prior to discharge

• Follow-up testing needed before transition to car seat

AAP Clinical Report, May 2009, reaffirmed 2019
Transporting Low Birth Weight and Preterm Infants Training

- Currently LBW curriculum is under revision
- Designed for hospital staff who are responsible for evaluating preterm infants in car seats or CPSTs interested in learning more about issues related to the transport of preterm infants.
  - Selection
  - Positioning
  - Installation Considerations
- Approximately 4-hour training with lecture and hands-on exercises
- Information on training available through the National Center for the Safe Transportation of Children with Special Health Care Needs
Restraints for Casts
Casts

• Immobilize a part of the body to stabilize limbs and trunk after trauma or surgery

• Lower Extremities - Fractures, developmental dysplasia of the hip (DDH), muscle or tendon lengthening procedures

• Upper Extremities - Fractures, dislocations, tendon or ligament lengthening procedures, and nerve issues (i.e., brachial plexus injuries) are all common reasons

• Body casts, hip spica casts, long leg casts, shoulder spica casts, and other orthopedic devices can present challenges
Casts

• If a child can sit up - a conventional car seat could potentially work

• If a child cannot sit up during transportation, a specialized restraint may be necessary:
  • Never transport on a reclined vehicle seat
  • Some children may require professional transport
Hope Car Bed

• Up to 29” long (longer if legs are permitted to bend)

• Contact Merritt Manufacturing regarding potential cutting out of EPS foam and/or car bed shell to accommodate hip spica casts

Source: Merritt Car Seat
Wallenberg

- Convertible seat designed for hip and arm casts
- Rear-facing 5-40 pounds
- Forward-facing 25-80 pounds and 60 inches or less
- Optional hammock
- Lighter, narrower version under development – due out 2021

Source: Merritt Car Seat
Quokka

- Convertible seat for children who have difficulty sitting in conventional seat
- Rear-facing: 5-39.6 pounds and less than 41 inches
- Forward-facing: 22.2-39.6 pounds and less than 41 inches
- Spica cast wedge positioning system

Source: ETAC/Convaid/R82
Spirit Spica

• 25-130 pounds
• Less than 66 inches
• Optional wedge cushions and seat depth extender

Source: inspiredbydrive.com
Wallaroo

- 22.2-106 pounds
- Up to 56 inches
- Hip Spica Kit
  - Cushion, Positioning wedge, 10-inch buckle strap

Source: ETAC/Convaid/R82
Hippo

- Convertible seat for children with hip/lower body casts
- Utilizes optional wedge system to accommodate multiple cast configurations

- Discontinued in 2015 and no longer available
  - May still be around with expiration in 2021
Lay Down EZ-ON Vest

- One year and older
- 22-106 pounds
- Body casts, hip spica casts, braces
- Supine or side-lying on bench seats
Jefferson Rear-Facing Only Car Seat
Jefferson Rear-Facing Only Car Seat

- Designed for children with an omphalocele
- Rear-Facing Only
- 7.5-40 pounds
- 19-37 inches

Source: Merritt Car Seat
Large Medical Seats
Large Medical Seats

- Children who have outgrown conventional restraints
- Children who may need increased and/or specialized positioning support
- Forward-facing restraints
- Five-point harness similar to conventional restraint
- Mandatory tethering systems
Large Medical Seats - Accessories

• Provide child with a more customized fit
• Variety and types differ with manufacturer
• Not interchangeable from one restraint to another
• Check with manufacturer for ordering instructions – online ordering forms
Large Medical Seats - Accessories

- Seat extenders
- Abductors
- Head support systems
- Lateral Supports
Roosevelt

- 35-115 pounds
- 33.5-62 inches
- Scoliosis harness kit
- Extra long harness kit
- Anti-escape options

Seven years old, 48 pounds, with diagnoses of Autism & CP
Roosevelt

- Chest Clip Guard
  - Requires key to lock/unlock

- EZ Guard Buckle Cover

- A-lok Cover (not pictured)
Wallaroo

- 22.2-106 pounds
- Up to 56 inches
- 30-degree tilt wedge
- Support tray
- Spica kit
Inspired by Drive Products

IPS Car Seat

Spirit Car Seat

Spirit Spica

Spirit Plus

Source: inspiredbydrive.com
IPS Car Seat

• 20-102 pounds
• Up to 60 inches tall
• Consider ability of caregiver to transfer since child must be lifted up and over sides
• Speedway Gray - Only Color Now

Head support pad
Abductor wedge
Spirit / Spirit Plus

- 25-130 pounds
- Less than 66 inches
- Adjustable swing-away lateral and hip supports
- Retainer clip guard and buckle guards

Swing away trunk and hip support
Adaptive Booster Seats
Adaptive Booster Seats

- Require lap-and-shoulder belt over child as occupant restraint
- Harnesses or vests used for positioning, not an occupant restraint
- Standard or optional features and accessories to aid positioning
- Some require use of lower anchors and tether
- Some recommend use of lower anchors and/or tether
Carrot 3 Child Restraint

- 30-108 pounds
- 37-60 inches
- “LATCH Equipped”
- Lower anchors attached to restraint and tether strap must be added to order form
- Recline and tilt options
- Requires use of lap-and-shoulder belt
- Footrest, tray

Etac/Convaid/R82
Recaro Monza Nova 2 Reha

- 33.1-110.2 pounds, 37-59 inches
- Requires use of lap-and-shoulder belt
- 5-point positioning harness
- Swivel base, table/tray, footrest
- Integrated speakers in headrest for phone/tablet

Source: Thomashilfen
Pilot

- 40-120 pounds
- 38-63 inches
- Width adjusting seat back
- Requires use of lap-and-shoulder belt
- Positioning vest
  - Discontinued in Fall 2020

Etac/Convaid/R82
Churchill

- 65-175 pounds
- 48-72 inches
- Requires use of lap-and-shoulder belt
- Lower anchors and tether required for installation
- Anti-escape 5-point harness option (same as Roosevelt)
Carrot 3 Booster Seat

- 79-165 pounds
- 55-69 inches
- “LATCH Equipped”
- Lower anchors attached to restraint and tether strap must be added to order
- Utilizes 4-point positioning “H-harness”
- Requires use of lap-and-shoulder belt

Source: Etac/Convaid/R82
Adaptive Vests
EZ-ON Vest

- 31-168 pounds
- 2 years or older
- May be helpful with children with behavioral challenges
- Alternative for children who have outgrown large medical seats or for vehicles with limited space
- Manufacturer recommends replacement after six years
- Standard push button in front or zipper in back
Lay Down EZ-ON Vest

• One year and older
• 22-106 pounds
• Body casts, hip spica casts, braces
• Supine or side-lying on bench seats
Chamberlain

- Positioning vest only
- 81-225 pounds
- Top of child’s ears must not be above top of vehicle seat back
- Requires use of lap-and-shoulder belt
- Leg straps for pelvic positioning
- Lower anchors and tether required for installation

Merritt Manufacturing
Moore Support Vest

- Positioning vest only
- Lap belt or lap-and-shoulder belt required
- Tether required
- 65 pounds and up
- Sizing according to waist size 30-44 inches

Source: Besi
Wheelchairs
Background

• In general, wheelchairs (WC) not designed for transportation purposes in vehicles

• If possible, transfer occupant to appropriate restraint
Background

In some cases, children are transported in wheelchairs

- Transfer difficulties
- No restraint fits
- Independent mobility

Source: Google
Occupant Protection in Wheelchairs

- Secure the wheelchair independent of the rider
- Secure/protect the rider
  - Face rider forward
  - WC tilted 30 degrees or less
  - Upper and lower torso (lap) restraint belts required
  - Lap belt angles between 45-75 degrees to vertical

Source: University of Michigan Transportation Research Institute (UMTRI)
Voluntary Standards

- There is no government regulation to address the safety needs of using a wheelchair as a transportation device. In response to lack of legislation/standards, the Society of Automotive Engineers and Rehabilitation and Engineering Assistive Technology Society of North America (RESNA)
  - WC18-Compliant
    - Wheelchair Tie-Down and Occupant Restraint Systems (WTORS)
  - WC19-Compliant
    - Wheelchairs (frames and seating) used as seats in motor vehicles
  - WC 20-Compliant
    - Seating systems
WC19-Compliant

- Have clearly marked securement points on the frame for tie down attachment
- Must be able to hook using one hand in 10 seconds or less
Rehabilitation Therapist
Rehabilitation Therapist

- Includes occupational therapists and physical therapists
- Assess a child’s physical capabilities and determine ways to improve a child’s interaction with their environment
- Often work with children who have complex positioning needs
- Individualized positioning guidelines if questions arise regarding how to position a child in a car seat
- Most rehab therapists are not CPSTs but important to involve them when working with children with complex positioning needs
Rehabilitation Therapist

• Patient and family interview
• Positioning assessment and intervention
• Recommendations
• Order equipment – DME provider – third party payer
• Deliver equipment
What resources are available to a CPST?
Next Steps

• Identify child passenger safety services in your facility and in the community

• If you work in a hospital or rehab environment - Review your discharge policies and protocols

• Identify additional individuals in your facility to attend the NHTSA CPST training course

• Identify CPSTs who have taken or are interested in taking the Safe Travel for All Children training course
Resources

- LATCH Manual
  - Safe Ride News
  - www.saferidenews.com
- Adaptive / Specialized Restraint information by manufacturer
Become a Tech/Find a Tech/Find a Course

- [cert.safekids.org](https://cert.safekids.org)

- Information about becoming a certified child passenger safety technician and finding technicians in your area

- Check ‘Special Needs’ in Extra Training to find CPSTs that have taken the Safe Travel for All Children training
Special Needs Transport In-Service for Hospital Personnel

- Designed to increase awareness among medical professionals regarding transportation of CSHCN
- Can be taught by any CPST
- Approximately 1 hour
- www.safekids.org/safe-travel-inservice
Hospital Discharge Recommendations

• Comprehensive hospital discharge policy and protocol necessary to ensure safe travel

• Recommendations from Expert Working Group including NHTSA, AAP and NSC

Wheelchairs

- Ride Safe brochure
- Available online
- Spanish and French versions available
- Information for families

www.travelsafer.org
National Center for the Safe Transportation of Children with Special Health Care Needs at IU School of Medicine

- [preventinjury.pediatrics.iu.edu](http://preventinjury.pediatrics.iu.edu)
- Info on adaptive transportation:
  - Medical conditions
  - Restraint options
  - Trainings
  - Research
  - Brochures
- Occupational therapist on staff
- 1-800-755-0912
Safe Travel for All Children: Transporting Children with Special Health Care Needs

- Enrichment course on adaptive / specialized transportation developed by the National Center
- Two-day course
- Course offered throughout US
- MUST be a CPST to take course
- preventinjury.pediatrics.iu.edu
Safe Travel for All Children Instructors

- National database of instructors at preventinjury.pediatrics.iu.edu
National Center Brochure

• Order or download copies free of charge from preventinjury.pediatrics.iu.edu

• Opens into poster of adaptive / specialized restraints

• Great resource for CPSTs, parents, caregivers, families, therapists, etc.
Questions?

Contact Information

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