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continued

## CAR SEATS FOR CHILDREN WITH SPECIAL NEEDS



Ashley Fogle, PT, DPT, CPST  
Danielle Morris, PT, DPT, PCS, CPST

no reprints

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continued

## Disclosure

- Nothing to disclose
- No financial gain
- Examples provided do not represent endorsement of any product
- Please do not reprint or distribute

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continued

## Outcomes

- Identify laws and best practices that apply to the transportation of children with special needs.
- Describe medical, physical, and behavioral conditions and procedures to consider when evaluating transportation systems for children with special needs.
- Compare and contrast conventional and specialized restraints that can meet the transportation needs of children with special needs.
- Describe a plan of action to help children with special needs to access safe transportation in vehicles.

no reprints

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## Travel

- Contributes to mental and physical health
- Allows us to meet our societal needs and obligations:
  - Work, School, Medical Appointments, Church
- Promotes independence
- Fosters social relationships
- Involves choice making:
  - When, Where, Why, How?

no reprints

(Waara, 2001)

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## Travel for Children With Special Needs

- Limited Access and Options
  - Impacts/Influences:
    - Freedom
    - Social Engagement and Participation
    - Choice Making
    - Ability to Meet Obligations and Needs

(Waara, 2001)

no reprints

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## Travel for Individuals Using Wheelchairs in Private Vehicles

- Observational Study
- 20 families exiting a parking garage
  - 18/20 Children with Neurological Disorders
    - Mean Age: 12 years; Weight: 65 pounds
  - **14/20 parents reported limited travel due to challenges**
  - 50% had to have another adult sit next to child
  - 6/20 stopped at least 4 times in one month to attend to the child

(Yonkman, O'Neil, Talty, & Bull, 2010)

no reprints

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## Travel for Individuals Using Wheelchairs in Private Vehicles

- Child factors influencing travel choices:
  - Weight/Size of Child
  - Poor Muscle Control
  - Orthopedic Deformity
  - Difficult Transfers

(Yonkman, O'Neil, Talty, & Bull, 2010)

no reprints

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## Know the Laws and Best Practices!

- Federal Laws
- State Laws
- AAP Recommended Best Practices

no reprints

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## Federal Laws

- Regulate cars, seat belts, and car seats prior to sale
  - Safety during use is dependent on compliance as directed by manufacturer
- NEVER MODIFY a car seat or vehicle seat belt

no reprints

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## Federal Motor Vehicle Safety Standards (FMVSS)

- Developed by the National Highway Traffic Safety Association (NHTSA)
  - Agency of US Department of Transportation
- Provide Minimum Safety Performance for:
  - Vehicles and Components
    - Seat Belts
    - Car Seat

( U . S . D e p a r t m e n t o f T r a n s p o r t a t i o n )

no reprints

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## FMVSS 213 Child Restraint Systems in Vehicles and Aircraft

- Effective 1971/Last Revision 2014
- Addresses:
  - Dynamic Crash Test Performance
    - Integrity of the System
    - Excursion of Occupant/Force Distribution
  - Labels
  - Instructions



(U.S. Department of Transportation, 2014)

no reprints

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## FMVSS 213 Revisions

- August 2005
  - Increased maximum testing criteria to **65 pounds**
    - Resulted from Anton's Law
- February 2014
  - Increased maximum testing criteria to **80 pounds**
  - Added 77 pound, 10 year old Crash Test Dummy

(PUBLIC LAW 107-318—DEC. 4, 2002; U.S. Department of Transportation, 2010)

no reprints

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## FMVSS 213-LATCH

- Lower Anchors and Tethers for Children
- Required on Vehicles manufactured **after September 1, 2002** consists of:
  - Lower Anchors
    - Metal anchors in seat bight
  - Top Tether Anchors
    - Attachment for tether to be connected
- Assists with car seat installation
- Not located in all seat positions
- New labeling requirement in 2014 address weight limits of lower anchors

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## State Laws

- Each state determines laws for **Use** and **Enforcement** for:
  - Car Seats
  - Seat Belts

no reprints

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continued

## Know your State Laws

Insurance Institute for Highway Safety

<http://www.iihs.org/iihs/topics/laws/safetybeltuse>

Governors Highway Safety Association

<https://www.ghsa.org/state-laws>

no reprints

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continued

## Louisiana State Law

### Louisiana Child Passenger Safety Law

Age/Size	Restraint Use
Birth to at least 2 years old	Ride rear facing in an infant or convertible child safety seat
At least 2 years old and has outgrown the rear facing seat by height or weight	Ride in a forward-facing child safety seat with an internal harness
4 years old and has outgrown the forward-facing seat with internal harness by height or weight	Ride restrained in a belt positioning child booster seat using a lap shoulder seat belt
9 years old or has outgrown the booster seat and can pass the 5 Step Test	Ride restrained with a lap shoulder seat belt secured correctly on the vehicle seat
Younger than 13 years old	Ride in the rear seat of a vehicle, when available and properly restrained

A child who can be placed in more than one category shall use the more protective category.

Child safety seats must be used according to the manufacturer's instructions.

*5 Step Test: The seat belt fits correctly when the child sits all the way back against the vehicle seat, the child's knees bend over the edge of the vehicle seat, the belt fits snugly across the child's thighs and lower hips and not the child's abdomen, and when the shoulder strap snugly crosses the center of the child's chest and not the child's neck.*

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Effective 8/1/2019

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(lsp.org)

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continued



## Best Practice-American Academy of Pediatrics (AAP) Policy Statements

- Policy Statement on Child Passenger Safety
- School Bus Transportation of Children with Special Health Care Needs
- Transporting Children with Special Health Care Needs
- Safe Transportation of Preterm and Low Birth Weight Infants at Hospital Discharge

no reprints

(aap.org)

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## State Law vs AAP Best Practice

- Always encourage best practice that goes beyond the State law

no reprints

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## According to the CDC...

- Motor vehicle injuries are the leading cause of death among children in the United States
- Age and size appropriate car seats and booster seats reduce serious and fatal injuries by half
- Distribution and education programs can:
  - Increase restraint use
  - Reduce child motor vehicle deaths

(www.cdc.gov)

no reprints

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## According to the CDC...

- Child safety seats reduce the risk of death in passenger cars by 71% for infants and by 54% for toddlers ages 1 to 4 years.
- Booster seat use reduces the risk for serious injury by 45% for children aged 4–8 years when compared with seat belt use alone.
- For older children and adults, seat belt use reduces the risk for death and serious injury by approximately half.

(www.cdc.gov)

no reprints

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## Survey of Child Passenger Safety Knowledge

- AAP and Board Certified Pediatricians
  - 533 Eligible Respondents
- 6 Child Passenger Safety Knowledge Questions and Scenarios
  - 52.9% answered all correct



(Zonfrillo, Sauber-Schatz, Hoffman, & Durbin, 2014)

no reprints

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## Survey of Knowledge Results

- Knowledge of guidelines decreased with child age
- Frequency of child passenger safety addressed at well visits decreased with age
  - Birth to 12 months: 89.4%
  - 4-8 years: 65 %
  - 8-12 years: 51%

(Zonfrillo et al., 2014)

no reprints

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## Barriers to Providing Knowledge

- Inadequate time: 45.2%
- “Not trained”: 24.1%
- Topic not priority: 19.9%
- Parents not interested: 19.9%
- Inadequate educational resources: 14.5%
- Inadequate understanding of guidelines: 8.1%

(Zonfrillo et al., 2014)

no reprints

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## Conclusions

- High knowledge is associated with:
  - Confidence and frequency of providing knowledge
- Gaps
  - Exist
  - Provide an opportunity for increasing and disseminating knowledge

(Zonfrillo et al., 2014)

no reprints

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## According to the National Highway Safety Commission..

The best way to protect children in cars is to put them:

- In the right SEAT
- At the right TIME
- In the right WAY

([www.nhtsa.gov](http://www.nhtsa.gov))

no reprints

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## Types of Conventional Seats

- Rear Facing
- Convertible
- Combination
- Belt Positioning Booster
  - High Back
  - Backless

no reprints

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## Rear Facing

- Usually called infant carrier
- Always rear facing
- Can range from 4-35 pounds



no reprints

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## Convertible

- Can be used Rear or Forward Facing
- Example:
  - Graco My Ride 65
    - Rear Facing to 40 pounds
    - Forward Facing to 65 pounds



no reprints

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## Combination

- Can be used as a forward facing seat or a booster seat
- Example:
  - Britax Frontier Clicktight
    - 90 pounds with harness
    - 120 pounds as booster

no reprints



(Photo from Britax)

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## High Back Booster

- Middle step between harness and simple seat with lap/shoulder belt
- Provides head and trunk support
- Allows for proper positioning of lap/shoulder belt

no reprints



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## Backless Booster

- Middle step between harness and simple seat with lap/shoulder belt
- Relies on head and back support of vehicle
- Allows for proper positioning of lap/shoulder belt



no reprints

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## Children are NOT little adults

- Consider:
  - Anatomy and Physiology
    - Bony Structure and Position
    - Strength
    - Biomechanics
    - Maturity

(Huelke, 1998; Lustrin, Karakas, Ortiz, Cinnamon, Castillo, Vaheesan, Brown, Diamond, Black, & Singh, 2003)

no reprints

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## Cervical Spine

- 72% spinal injuries in children are in the cervical spine
- Most injuries are at level of occiput to C2-C3
  - Associated with neurological damage and head Injury (20-25%)

(Lustrin et al., 2003)

no reprints

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## Instability of Cervical Spine in Children

- Anatomy
  - Hypermobility
    - Ligamentous Laxity
    - Facet joints (shallow and angled)
    - Spinous processes-underdeveloped
    - Vertebral bodies-anterior wedging
  - Incomplete ossification at odontoid process
  - Weak neck muscles
  - Large head

(Lustrin et al., 2003; Huelke, 1998)

no reprints

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## Abdominal Cavity

- Thoracic walls
  - Thinner
  - More Elastic and Compressible on Organs
- Vital Organs less protected by Pelvis and Rib Cage
  - Bladder
  - Liver
  - Kidney

(Huelke, 1998)

no reprints

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## Seat Belt Syndrome

- Flexion/Distract injury of the thoracolumbar spine
- Rigid thoracic spine hyperflexes at the site of the lap belt that serves as a fulcrum
  - Abdominal Injuries
  - Lumbar spine fracture (Chance fracture)
  - Spinal Cord Injuries
  - Bowel Rupture

(Louman-Gardiner, Mulpuri, Perdios, Tredwell, & Crompton, 2008)

no reprints

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## What is a Child Passenger Safety Technician?

no reprints

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## Child Passenger Safety Technicians

- Complete certification training through NHTSA (National Highway Traffic Safety Administration)
- Complete requirements in order to recertify every 2 years



no reprints

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continued

## Child Passenger Safety Technicians

- Educate caregivers on how to properly select, use, and install car seats and boosters
- Know when to transition children to seat belts once booster seats are outgrown



no reprints

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continued

## Child Passenger Safety Technicians

- Guide parents through reading vehicle and child restraint manuals
- Check for car seat recalls
- Identify unsafe, damaged, and expired seats



no reprints

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continued



## Physical and Occupational Therapists Traditional Roles

- Specializing in assessing the unique positioning needs of children who have special needs
- Providing medically based interventions that support obtaining specialized adaptive equipment for children with special needs

(Automotive Safety Program)

no reprints

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## Physical and Occupational Therapists Expanded Roles

- Help children with special healthcare needs to achieve safe protection during transport
- Develop community partnerships with individuals that have medical and/or technical training in helping children with special health care needs

(Automotive Safety Program)

no reprints

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continued

## Considerations for Seat Selection

- Child's weight and height
- Child's age
- Composition of family (who travels in the car)
- Type of vehicle – Does it fit in their car??
- Financial situation

no reprints

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continued





## Additional Considerations for Seat Selection

- Medical Diagnoses
  - Cerebral Palsy
  - Spina Bifida
  - Spinal Cord Injury
  - Seizure Disorder
  - Traumatic Brain Injury
  - Chromosomal Disorder
  - Neuromuscular Disease
  - Autism



no reprints

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## Considerations for Seat Selection

- Impairments:
  - Range of motion/contractures
  - Strength
  - Tone
  - Muscle Control
    - Head, Trunk, Extremities

no reprints

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## Considerations for Seat Selection

- Medical Equipment
  - Portable Suction
  - Ventilator
  - Oxygen Tank
  - G tube
- Orthotics
  - TLSO
  - Halo
- Casts/Splint
- Sources of Funding

no reprints



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## Considerations for Seat Selection

- Keep rear facing as long as possible
- Low profile sides for transferring
- Higher weight limit
- Adjustability of harness/crotch strap
- Side impact protection head rests
- Ability of seat to recline

no reprints

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## Conventional Car Seats

- Many children with special health care needs can be transported in conventional car seats
- Rear and forward facing seats with higher weight limits
- Seats with low or shallow sides
- Seats that recline



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## Conventional Seats

### Benefits

- Can purchase off the shelf
- Less expensive
- Smaller
- Trend toward higher weight limits

### Challenges

- Access/can be expensive
- Not funded by insurance
- Limited positioning components
- Lower weight limits than medical seats

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continued

## Graco My Ride 65



no reprints

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continued

## Maxi Cosi Pria 85



no reprints

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continued

## Britax Frontier 85



no reprints

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## Specialized Car Seats

- Many children with special health care needs can NOT be transported in conventional seats
- Specialized seats must be considered
  - Forward Facing Large Medical Seats
  - Belt Positioning Boosters
  - Vehicle Positioning Devices
  - Vests
  - Car Beds



no reprints

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## Large Medical Seats

### Forward Facing

- Accommodate larger weights and heights
- Provide Positioning Components
  - Recline
  - Abductors
  - Head/Trunk Supports
  - Scoliosis Harness/Positioning Pads
  - Extended Depth and Height

(Automotive Safety Program)

no reprints

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## NOTE

- The following examples provided are not inclusive
- We do not endorse one product over another
- **Modifications/Updates occur regularly** so please refer to Manufacturer's Instructions prior to use
- You should **always** have a Certified Child Passenger Safety Technician assess compatibility with vehicle and assist with correct installation

no reprints

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continued

## Roosevelt



- One option for a forward facing seat with **high weight/height limits**
- **Weight:** 35-115 pounds
- **Height:** 33.5-62 inches

(Photo from Merritt Manufacturing)

no reprints

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continued

## Roosevelt

- **Features:**
  - Head Rest
  - Tilt Bar
  - EZ-Tether Connector Strap
- **Accessories**
  - Foam Abductor
  - Kit for Children with Scoliosis
  - Seat Depth Extension
    - 3 or 4.5 inches: 15.5, 17.0 inches



no reprints

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continued

**continued**

## Roosevelt Features: EZ-Up Head Rest System

- Velcro Head Rest System
  - Velcro Head Rest
  - Cap
    - Small
    - Medium
    - Large



(Photo from Merritt Manufacturing)

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**continued**

## Roosevelt Anti-Escape Features



**Chest Clip Guard**



**Buckle Guard**

(Photos from Merritt Manufacturing)

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**continued**



continued

Now in 10 colors!



Ocean Blue



Shaded Berry



Total Camo

(Photos from Merritt Manufacturing)

no reprints

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continued

Inspired by Drive Spirit and Spirit Plus

- **Weight:** 25-130 pounds
- **Height:** up to 66 inches
- **Features:**
  - Low profile sides
  - Recline bar
  - Shoulder width-18"
- PLUS (M and L)
  - Swing away trunk and hip supports and hip abductor
- **Accessories**
  - Seat Depth Extender-16"
  - Extensor Thrust Wedge
  - Buckle/Retainer Clip Guard



no reprints

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continued

continued

## Wallaroo by R82

- **Weight:** 22-106 pounds
- **Height:** Less than 56 inches
- **Accessories:**
  - Recline wedge
  - Abductor pommel
  - Support Tray
  - Seat extension (14.5")
  - Trunk positioning pads
  - Spica Insert



no reprints

continued

## Belt Positioning Boosters

- Accommodate higher weights and heights
  - Up to 175 pounds
- Must use lap shoulder belt for restraint
- May require LATCH
- Have positioning components
  - Wedges
  - Hip abductors
  - Head and trunk supports
  - Extended depth

no reprints

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continued

CONTINUED

## Churchill

- One option for a Belt Positioning Booster seat with positioning components and high weight/height limits
- Installs with LATCH system
- **Weight:** 65-175 pounds
- **Height:** 48-72 inches
- Standard: Base and Vest
- Seat base depth: 15" or 18"
- Colors: Blue Sapphire and Camo



(Photo from Merritt Manufacturing)

no reprints

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CONTINUED

## Churchill

- **Features:**
  - Low profile base to transfer child to seat
  - "Anti-Slouching" Leg Straps
- **Accessories:**
  - Hip inflection wedge/comfort pommel
  - Velcro EZ-Up Head Rest
  - Foam Abductor
  - Belt Guides



no reprints

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CONTINUED

continued

## Churchill

- Positioning 5 point Harness Option
- **Must still use lap shoulder belt**
- Escape Proof Products:
  - Chest Clip Guard
  - Buckle Guard



(Photo from Merritt Manufacturing)

no reprints

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continued

## Chamberlain



(Photo from Merritt Manufacturing)

- **Vehicle Positioning Device**
  - Sit on Vehicle Seat
- **Weight:** 81-225 pounds
- **Height:**
  - Minimum: 48 inches
  - Maximum: top of ears below top of seat back/ head rest
- 3 sizes of vests
- EZ-Up Head Rest and Cap (extra)

no reprints

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continued

continued

## Recaro Monza Nova 2 Reha

- **Weight:** 33.1-110.2 pounds
- **Height:** 37-59 inches
- **Features:**
  - 5 point positioning belt
- **Accessories:**
  - Footrest/Swivel Base
  - Seat Depth Extension
  - Seat Wedge inside/outside
  - Table
  - Abduction Block



no reprints

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continued

## Convaid Carrot 3

Belt Positioning Booster

- **Weight:** 30-108 pounds
- **Height:** 37-60 inches
- **Accessories**
  - Footrests
  - Extensions (back and seat)
  - Angle Adjustment Wedge
  - Pommel
  - Tray



no reprints

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continued



## Carrot Booster 3 Seat

Belt Positioning Booster:

- **Weight:** 79-165 pounds
- **Height:** 55-69 inches
- **Features:**
  - Wide seat (16.5 in)
  - 4 point H harness
- **Accessories:**
  - 4 inch back rest extension
  - Tray
  - Lateral Pads



no reprints

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## Positioning Do's and Don'ts

Never add a positioning device to a car seat if it was not crash tested by the manufacturer of the car seat.

**Rigid collar:**  
NOT RECOMMENDED



no reprints

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continued

## Positioning Exception:

You **CAN** use blanket rolls for lateral trunk support



no reprints

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continued

## Positioning Exception:



no reprints



You **CAN** use a soft collar  
\*only -if necessary

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continued

# How Do I Get an Appropriate Seat?

no reprints

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## EVALUATION PROCESS

- Obtain a Prescription:
  - Physical Therapy/Occupational Therapy:  
Evaluate and Provide Adaptive Transportation System
- Complete a Comprehensive Assessment to include:
  - **Trial of seat** in clinic and in vehicle
    - Many hospitals/clinics have adaptive car seat programs

no reprints

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continued

## Trial in Clinic!



no reprints

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continued

## Not all seats work the same



no reprints

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continued

## EVALUATION PROCESS

- Select an appropriate seat
- Complete order form
- Develop a Letter of Medical Necessity (LMN)
- Coordinate with a Durable Medical Equipment (DME) vendor for a request for funding
- Order seat

no reprints

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## FITTING and INSTALLATION

- Assess Position and Safety at clinic or hospital
  - THERAPIST SHOULD ASSESS!
- Install seat (refer to appropriate location)
  - **CHILD PASSENGER SAFETY TECHICIAN SHOULD INSTALL**
- Provide family education
- Follow up as needed

no reprints

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continued

## Roosevelt Example

- Height: 41 inches
- Weight: 53 pounds
- Age: 6 years
- Diagnosis: Cerebral Palsy
- Seat Depth Extension
- Foam Abductor



no reprints

B1

continued

## Roosevelt MISUSE

Before



After



B2

continued

continued

## Churchill Example



no reprints

B3

continued

## Churchill Example



no reprints

B4

continued

## Behavioral Challenges

- We get a lot of referrals for children who don't stay in their car seats!



no reprints



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## Autism Spectrum Disorder (ASD)

- Retrospective Study of Child Passenger Safety Assessments
  - October 2004-July 2009
  - Reviewers: Occupational Therapists
    - Instructors for CPST SN Curriculum
- **82/637 ASD**
  - Mean Age: 5.5 years (range 2-13 years)
  - Mean Weight: 53 pounds, Height 44 inches
- **61/82 "Escaping" (74%)**
  - Unbuckling (chest clip, crotch buckle, seat belt)

(Yonkman, Lawler, Talty, O'Neil, &amp; Bull, 2013)

no reprints

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## Children were “Escaping”

- **Rate**
  - Booster Seats/Seat Belts: 84%
  - 5 point harness: 58%
- **Misuse**
  - 44% by caregiver
    - Installation
    - Use of harness
    - Selection of seat (weight/height)
    - Expiration/Adaptions

(Yonkman et al., 2013)

no reprints

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## Behaviors/Interventions

- 21% kids had disruptive behaviors
  - kicking, attacking, opening doors, rocking, holding breath
- 16 (20%) had education on behavior modification strategies
  - positive reinforcement
  - social stories

(Yonkman et al., 2013)

no reprints

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## Interventions

92% received commercial or adaptive seat

- 29% (24 parents) returned for 2<sup>nd</sup> visit
- 4 parents returned for 3<sup>rd</sup> visit



(Yonkman et al., 2013)

no reprints

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## Pre-Term Infants

- 1970s – AAP recommends infants travel in a car safety seat
- 1980s – Evidence that preterm infants at increased risk of desaturations while in the semi-upright car seat position
  - Medical: Lung immaturity? Breathing immaturity? Low tone?
  - Size: Too small for the standard seat?
- 1990s – AAP recommends “a period of observation for apnea, bradycardia and desaturations” in the car seat prior to discharge for preterm infants → Car Seat Tolerance Test

(Bull & Engle, 2009; Willett, Leuschen, Nelson, & Nelson, 1986; Willett, Leuschen, Nelson, & Nelson, 1989; Salhab, Khattak, Tyson, Crandell, Sumner, Goodman,... & Robinson, 2007)

no reprints

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## Pre-Term Infants

- 2000s – Evidence that longer time in car seat increases risk of desaturations
- 2009 – Current AAP recommendations:
  - A Car Seat Tolerance Test should be performed on:
    - All infants born <37 weeks
    - 90-120 minutes, or length of car ride home, whichever is longer
    - No guidelines for “failure” criteria

(Bull et al., 2009; Willett et al., 1986; Willett et al., 1989; Salhab et al., 2007)

no reprints

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## Low Birth Weight (LBW)

- Low birth weight term infants found to have similar car seat tolerance test failure rates as preterm infants
  - Up to half of NICUs include LBW term infants in their CSTS protocols
- Car Seat Tolerance Screen failure found have an association with in-utero opiate exposure and poor pre-natal care.

(Davis, 2015)

no reprints

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## Suggested Failure Criteria

- Apnea >20 seconds
- Heart Rate <80 beats per minute for >10 seconds
- Saturation <90% for >10 seconds
- Respiratory distress not improved with proper positioning

(Davis, Zenchenko, Lever, & Rhein, 2013)

no reprints

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## Car Beds – Angel Ride

- **Weight:** Less than 9 pounds
- **Length:** Less than 21 ½ inches
- **Position:** primarily in supine, but right sidelying or prone if necessary



no reprints

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continued

## Car Beds – Dream Ride

- **Weight:** 5-20 pounds
- **Height:** Up to 26 inches
- **Position:** supine, prone if medically necessary (if in prone, outgrows at 10-12 pounds)



no reprints

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continued

## Jefferson

- Specifically for Children with Omphalocele
- **Weight:** 7.5-40 pounds
- **Rear Facing Only**
- 2 support cushions to optimally position smaller babies
- Cleanable naugahyde cover



no reprints

(photo from Merritt Manufacturing)

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continued

continued

## Leg Casts – Snugseat Hippo

(no longer available – still using seats not expired)

- Made for Spica Casts
- Fabric easy to clean
- Low profile sides for transferring and offers room for abducted legs
- Has triangular shaped wedges that account for hip extension
- Can be used rear facing (5-33 lbs.) or forward facing (20-65 lbs.)
- Must use casted weight



no reprints

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continued

## Wallenberg



(Photo from Merritt Manufacturing)

- For hip and arm casts
- **Weight:**
  - 5-40 pounds rear
  - 25-80 forward
- **Max Height:** 60 inches
- Two hammock positions
- Rear facing base available
- Removal headrest
- Sanitizeable flat plastic seat with stainless frame
- Replacement foam, cover and harness

no reprints

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continued

continued

## Hippo

A-Frame Cast

Pavlik Harness



no reprints

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continued

## Modified EZ-On Vest

- For kids who need to lie down
- Comes in 2 sizes
  - X-Small: at least 12 months old, 22-75 pounds
  - Small: 40-106 pounds
- Can use loaner program



no reprints

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continued

continued

## Modified EZ-On Vest



- Child must fit across vehicle seat with legs extended
- Can use pillows under head and legs
- Must be installed by a CPST

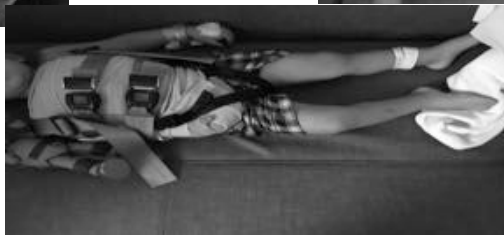


no reprints

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continued

## Not Always an Easy Answer...



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continued

## Upright EZ-On Vest

- Sizes range from 31-168 pounds
- Good for larger kids who have outgrown large medical seats and don't need a lot of support
- Great for escape artists - closure in back
- Children with Halos
- Sometimes may require a heavy duty tether anchor installation in vehicle
- Many different options for vehicle and bus use

no reprints



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continued

## Upright EZ-On Vest



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continued

## Barriers to Safe Transportation

- Lack of Knowledge
- Misuse
- Lack of Access to Proper Equipment
- Lack of Resources
- Funding

(Zonfrillo et al., 2014)

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## Plan of Action

- Start thinking about how your patients are transported to your clinic or hospital
- Try walking them out to their vehicle...you will be surprised!
- You CAN do something about it!
  - But please...not without the proper training
- Befriend a CPST in your area and work together

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## Plan of Action

Find a Technician  
Become a CPST

[www.cert.safekids.org](http://www.cert.safekids.org)

Remember not all CPSTs are trained in special needs

no reprints

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## Team Work



no reprints

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continued

# Resources

National Center for the Safe Transportation of  
Children with Special Healthcare Needs

Riley Children's Hospital

[www.preventinjury.org](http://www.preventinjury.org)

National Highway Traffic Safety Administration

[www.nhtsa.gov](http://www.nhtsa.gov)

no reprints

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continued

- Questions?

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continued

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