Passenger Safety for Children with Special Health Care Needs

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Objectives

• List best practice recommendations for child passenger safety.
• Identify technology options for positioning and safety for children with special needs during transportation.
• Locate online resources for conventional and special needs transportation safety.
• Describe requirements for Child Passenger Safety Technician certification.
• Discuss model for Special Needs Transportation Clinic.

Why Transportation?

Motor vehicle crashes are the leading cause of injury death for children and young adults in the United States.

(National Center for Injury Prevention and Control, 2010)
Why Therapists?

Occupational therapists are **uniquely suited** to evaluate transportation needs.

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Rehab Therapist Knowledge

- Online survey of over 1,000 occupational and physical therapists.
- Therapists reported knowledge and behavior regarding transportation:
  - 53%: little or no knowledge
  - 79%: no formal training
  - 54%: no experience
  - 61%: little or no counseling with families on the subject

[Blake, Sherman, Marks, & Lapidus, 2006]

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Prevention

- Deaths of children younger than 13 years of age has decreased in response to:
  - Using age- and size-appropriate child restraints
  - Seating children in rear seat of vehicle
  - Enforcement of stricter child restraint laws

[CDC, 2014; Durbin, 2011]
Common Misuses

- >70% of child restraints misused in a way that could lead to injury in a crash.
- Common critical misuses:
  - Loose installation
  - Loose harness straps
  - Improper positioning of harness straps
  - Chest clip not used or not positioned correctly
  - Seat belt placement incorrect

(Decina & Lococo, 2005; O’Neil, Yantian, Tahty, & Bull, 2009)

Child Passenger Safety Technicians (CPST)

- Certification program began in 1997.
- 3-4 day training course, written test, competency check-offs, and community car seat-check event.
- Continuing education requirement for biannual recertification.
- http://cert.safekids.org

Role of CPSTs

- Assist families with proper installation and use of child restraints and seat belts.
- Provide resources and current information to families.
- Participate in community car seat checks.
- Provide educational presentations.
- Provide in-hospital consultations or fitting station appointments.
Best Practice

- Recommendations made by American Academy of Pediatrics.
- Meet or exceed all state laws.
- Based on child’s:
  - Height
  - Weight
  - Age
  - Readiness

(Durbin, 2011)

Rear-Facing

- Children and infants up to 2 years old
  or
- Until highest height or weight limits for the child restraint are reached.

Rear-Facing

Infant-only

Convertible

www.evenflo.com

www.coscojuvenile.djgusa.com
Forward-Facing with Harness

• Children over 2 years old, or
• Have outgrown the rear-facing height or weight limit of their child restraint.
• Use until child outgrows the highest height or weight limit.

Forward-Facing with Harness

Convertible
Combination

Belt-Positioning Booster

• Children whose height or weight is above the limits of a forward-facing seat with harness.
• Use until the vehicle lap and shoulder seat belt fits correctly (usually around 4 feet, 9 inches tall [145 cm] and 8-12 years old).
• Child must have maturity and trunk control to sit upright for duration of travel.
Belt-Positioning Booster

High back
Low back

www.toysrus.com
www.walmart.com

Vehicle Seat

• Children who are:
  o Old enough
  o Large enough
  o Mature enough

• Use lap and shoulder seat belt.

• Rear seat under 13 years old.

Vehicle Seat Belt Readiness

1. Sits upright with back/bottom against the vehicle seat.
2. Knees bend over the edge of the vehicle seat.
3. Feet rest flat on the floor.
4. Seat belt fits appropriately [lap belt across pelvis, shoulder belt across torso and shoulder].
5. Maturity to sit in this manner for duration of travel.
Transporting Children with Special Needs

- May require additional problem solving due to:
  - Limited postural control
  - Limited physiologic stability
  - Limited behavioral regulation
- Can often use a traditional child restraint.
- Sometimes require a specialized child restraint.
- Therapists and suppliers are well-positioned to assist families, because of existing relationships.

Use Trained Providers

- Child passenger safety is complex.
- Providers should not exceed the limit of their expertise.
- Do not modify child restraints or use after market products. [NHTSA, 2007]
- Therapists/suppliers not trained in child passenger safety can make referrals to community resources and organizations who can assist them. [Yonkman, Lawler, Talty, O’Neill, & Bull, 2013]
- Therapists/suppliers can pursue CPST training.

Special Needs Training for CPSTs

- Created by the Automotive Safety Program at Riley Hospital for Children, with funding from the National Safety Council.
- Designed to expand the knowledge base of CPSTs in situations involving transporting children with medical conditions and procedures.
- 16 hour training, available to CPSTs.
- www.preventinjury.org
Restraint Use by Families

- Comparison study of recommendations and practice.
- 275 drivers transporting 294 children with special health care needs were observed.
- 82% of drivers had chosen the appropriate type of restraint.
- Only 27% of restraints were being used properly.
- 24% of the seats observed were inappropriately modified.
- 19% of the children could have used additional positioning support during transportation.
- Only 8% of medical equipment was properly secured.

(O'Neill, et al., 2009)

Concerns of Families

- Questionnaire completed by more than 1,000 families in Sweden.
- Findings:
  - Transfers in/out of vehicle are perceived as “risky.”
  - Concerns regarding poor postural sitting positions
  - Concerns regarding lack of information/education.

(Falkmer & Gregersen, 2002)

Specialized Transportation Interventions

- Must meet Federal Motor Vehicle Safety Standards 213. (FMVSS, 2014)
- Instructions of child restraint manufacturer and vehicle manufacturer must be followed.
- Child restraints crash tested in specific configuration. Variance from this can compromise safety.
Considerations

- Child’s age
- Child’s height
- Child’s weight
- Child’s behavioral regulation
- Vehicle (make, model, year, seat belt type, lower anchors, tether anchor, other occupants, other child restraints in use)
- Child’s medical condition
- Medical equipment

Large Medical Seats

- Children with poor postural control (neuromuscular disorders, scoliosis, etc.).
- Height and weight are above limits of commercially available child restraint.
- Children with behavioral challenges that compromise safety of child or vehicle occupants.
- Children with temporary orthopedic conditions (casts)
- 5-point harness.
- Up to 130 lbs. (59 kg) and 66 inches (167 cm).
- Consider large size of car seat, growth of child, ease of transfers, and availability of tether anchor in vehicle.

Roosevelt by Merritt Manufacturing

- Low sides
- EZ Tether
- Scoliosis kit
- EZ-Up Head Rest
- Chest clip guard
- Buckle guard
- Seat depth extender
- Narrow shoulder width

www.eztether.com
Spirit by Columbia Medical

- Swing-away adjustable positioning supports (lateral chest supports, lateral hip supports, medial thigh guide)
- Individually adjustable harness straps (for trunk asymmetry)
- Low sides for easier transfers
- Requires tether anchor or long seat belt path

www.columbiamedical.com

Traveller Plus by Snug Seat

- Recline bar allows a semi-reclined position when forward-facing
- Crotch pad incorporates buckle guard to discourage children with behavioral disorders from unbuckling the seat
- Seat depth extension available

www.snugseat.com

Hippo by Snug Seat

- Designed for children with spica or hip casts
- Optional pillow allows seat fit to be adjusted
- Allows semi-reclined position forward-facing

www.snugseat.com
Jefferson by Merritt Manufacturing

- Designed for omphalocele
- Support cushion for smaller children
- Rebound control bar
- Optional tether
- E-Z Leveling feature
- Rear-facing only

Medical Belt-Positioning Boosters

- Designed for children who need more support than what the seat belt alone can provide.
- Children must have some head/trunk control.
- Offers a more age-appropriate option than a large medical seat for some children (achondroplasia, neuromuscular disorders, etc.).
- Consider behavioral regulation of child.
- Consider availability of tether anchor.

Carrot 3 by Convaid

- Offers free-angle recline
- Adjustable seat depth and back height
- Tray and footrest available
- Requires use of lower anchors, top tether, and seat belt
Churchill by Merritt Manufacturing

- Guides to position seat belt properly on child
- Trunk, head, and lower extremity supports available
- Very low sides for transfers
- Compact and lightweight
- Age-appropriate option for older children
- Requires lower anchors and tether anchors

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**Vests**

- Children who require more support than the seat belt alone.
- Children with behavioral regulation difficulties that have mastered unbuckling the seat belt or child restraint harness.
- Some offer installation without using seat belt.
- Can be an age-appropriate option.
- Require tether anchor.

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E-Z-On Upright Vest by E-Z-On Products

- Zipper on back of vest prevents escape from the child restraint
- Requires top tether and seat belt or top tether and floor mounted lower anchors

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www.eztether.com

www.ezonpro.com
E-Z-On Modified Vest by E-Z-On Products

- Allows child to lay supine in the vehicle seat
- Designed for children in spica or long-leg casts
- Lightweight and easy to transport
- Requires available bench seat in vehicle

Car Beds

- Designed for premature or low birth weight infants or infants who are unable to pass child restraint tolerance testing.
- Common diagnoses: osteogenesis imperfecta, apnea, Pierre Robin sequence, myelomeningocele, omphalocele, hydrocephalus, casts, etc.
- Offers supine, prone, or sidelying positioning options.
- Consider position relative to air bags and other vehicle occupants (some take up 2 seating positions).

Car Beds

- Angel Ride by Angel Guard
- Cosco Dreamride by Dorel Juvenile
- Hope Car Bed by Meeth Manufacturing

www.ezonpro.com
www.eztether.com
www.allegramedical.com
www.angel-guard.com
www.eztether.com
www.allegramedical.com
**Special Needs Transportation Clinic**

- Developed in 2009
- Goal: Provide safe transportation options through family-centered care to improve quality of life.
- Seeks to promote safety and prevent injury during community mobility.
- Strong focus on education.
- Over 250 families served.

**Client Population**

- Any child with a medical diagnosis and transportation concerns.
- Typically over age 3 and weigh more than 35 lbs.
- Common diagnoses:
  - Cerebral palsy
  - Spina bifida
  - Autism
  - Osteogenesis imperfecta
  - Achondroplasia
  - Down syndrome
  - Respiratory conditions
  - Gastro-esophageal reflux
  - Hydrocephalus

**Clinic Structure**

- Physician referral required.
- Usually 2 clinic visits (evaluation and fitting/training).
- Evaluation by occupational or physical therapist:
  - Family concerns
  - Travel habits and routines
  - Position of family members in the vehicle
  - Current child restraints in use
  - Vehicle details
  - Physical assessment (pain, behavior, posture, strength, range of motion, functional mobility)
  - Positioning in and installation of current restraint
  - Needs identification
Evaluation Visit

• Demonstration and trial of options.
  o Allows family to gain hands-on understanding of positioning, installation, and ease of use.
• Family and therapist work together to determine best option.
• Family can practice transfers under guidance of skilled practitioner and receive education on safe techniques.
• Recommendation.

Fitting/Training Visit

• Strong focus on education.
• Therapist provides instruction/assistance in positioning child, adjusting components, and installing in vehicle.
• Therapist provides education on future steps, such as changing harness position, seat orientation, or seat style.
• Caregivers install the seat with coaching by therapist as needed.
• Therapist completes checklist to ensure proper use and installation.

Funding

• Traditional child restraint recommended when possible – funded by family.
• Large medical seats and medical boosters – often funded by medical insurance.
• Vests – funded by family or grant funding.
• Denials after appeals – funded by family or grant funding.
Case Studies

Client One

- 3 year old female
- 36 lbs, 38 in
- Dx: Angelman syndrome
- Travels with oxygen

Considerations:
- Needs education on storage of oxygen/medical equipment.
- Needs long term trunk support.
- Parent wants forward-facing restraint.

Britax Traveler Plus
Client Two

- 8 month old female
- 17 lbs, unknown height
- Dx: Developmental dysplasia of the hip
- Rhino brace

Considerations:
- Brace is temporary.
- Needs to remain rear-facing in vehicle.
- Need seat with low sides to accommodate brace.

Client Two

- 10 year old male
- 75 lbs, 47 in
- Dx: Cerebral Palsy

Considerations:
- Ability of patient to assist with transfer.
- Needs long term trunk/torso support.
- History – has used a large medical seat in the past, caregiver indicates challenge with transfer.
Client Three

- 6 year old male
- 56 lbs, 44 in
- Dx: Down syndrome, autism
- Considerations:
  - Limited behavioral regulation.
  - Single cab pick up truck.
  - Unbuckles and interferes with driver.

Client Four

• 6 year old male
• 56 lbs, 44 in
• Dx: Down syndrome, autism
• Considerations:
  - Limited behavioral regulation.
  - Single cab pick up truck.
  - Unbuckles and interferes with driver.

Client Four

- EZ On 103Z with Floor Mount
Conclusion

Promote Transportation Safety

• Develop a special needs transportation clinic.
• Become familiar with child passenger safety resources nationally and locally.
• Refer families to local CPSTs – list available at http://cert.safekids.org.
• Ask about transportation during every evaluation.

References

References


