Children with special needs demonstrate an equal or greater need for access to services and their communities than other children. However, because of medical, physical, or behavioral problems, these children often require more assistance during transportation than those who are typically developing. It is crucial to raise awareness in the community and within the occupational therapy profession about the unique issues surrounding transporting children with special needs in order to ensure this population is being transported safely and not at an increased risk of injury or death. Occupational therapy practitioners provide a vital role in supporting the safe transportation of all children, including proper use of child restraints, bus transportation, and adapted driving.

When faced with transportation challenges, families may seek the advice of health care professionals, so it is important that these professionals, including occupational therapy practitioners, are aware of resources or restraint options available, and that they have access to information about best practice recommendations to address the safe transportation of children with special needs, or can at least refer families to those who do. As a foundation of practice, occupational therapy practitioners are encouraged to adapt environments to increase independence with functional activities, while of course making sure the adaptations are safe.

When helping children and their families address transportation challenges, for example, even minor changes or modifications to restraint devices can affect how a car seat performs in a crash (see Figure 1 on p. 9).

One model for helping children and their families dealing with these challenges is the National Center for the Safe Transportation of Children with Special Health Care Needs, based at Riley Hospital for Children at the Indiana University School of Medicine, in Indianapolis. Founded in 2004, the National Center serves inpatient and outpatient pediatric clients by providing occupational therapy evaluations to specifically address the unique transportation challenges faced by children with special needs. For those not within the local area, the center also provides referrals for car seat technicians around the country. The National Center employs three occupational therapists who are also certified child passenger safety technicians and have attended a 2-day enrichment course to be qualified to complete transportation evaluations for children with various disabilities. Clients are referred to our program by physicians, rehabilitation therapists, and community programs to evaluate transportation safety and
help families transport their children as safely as possible. Examples of common referrals to our program include children diagnosed with cerebral palsy, Down syndrome, or autism, who may require positioning or behavioral interventions.

EVALUATION PROCESS
During the approximately 1-hour evaluation at the Center, the occupational therapist compiles and evaluates information about the child's current transportation situation and implements interventions based on evaluation findings. Typically, both the evaluation and the adapted restraint are covered by the family's insurance; however, this can vary greatly from state to state. The information gathered from the parent interview and clinical observations of the child that may affect travel are documented on the Child Safety Seat Evaluation & Delivery Report (see Figure 2).

The evaluation form for transporting children with special needs was developed specifically for the National Center and is part of the client's official medical record. Data collected through the evaluation include the type of car seat the child arrives in, whether that seat meets the child's positioning and/or behavioral needs, what vehicle the child rides in, whether the car seat is compatible with that vehicle, whether after-market products or homemade solutions are being used, and whether a conventional (see Table 1 on p. 10) or adaptive (see Table 2 on p. 11) child restraint system is warranted. The occupational therapists' medical background qualifies them to complete thorough evaluations of the child's medical needs during travel, including tone, balance, head control, tubes, and any other medical issue that may affect the fit of a child restraint for transportation.

BEST PRACTICE IN CHILD PASSENGER SAFETY
When determining the optimal restraint for a child, the occupational therapists at the Center consider not only types of restraints but also best practice guide-

lines. As defined by the National Child Passenger Safety Certification Training Program (2007), "Best practice is the gold standard of protection. It is the most acceptable way to transport a child safely on the basis of the child's age, weight, height, and body development" (p. 10). Best practice guidelines for child passenger safety as set forth by the American Academy of Pediatrics include the following:

1. All infants and toddlers should ride in a rear-facing car safety seat (CSS) until they are 2 years of age or until they reach the highest weight or
### Table 1: Types of Conventional Car Seats

#### Basic Types of Conventional Car Seats
Conventional car seats conform to federal motor vehicle safety standard 213, are commercially available, and can be purchased at retail or discount stores. At all possible, children with special health care needs should be restrained in conventional car seats. Conventional car seats are less expensive, easier to use, readily available, and can provide a sense of "normacy" for the client and/or caregiver. Manufacturers' instructions must be read for specific weight and height guidelines and directions for use.

<table>
<thead>
<tr>
<th>Rear-facing only</th>
<th>Convertible</th>
<th>Forward-facing only</th>
<th>Belt-positioning booster</th>
</tr>
</thead>
<tbody>
<tr>
<td>Can only be used rear-facing, semi-reclined in vehicles</td>
<td>Can &quot;convert&quot; from a rear-facing, semi-reclined car seat to an upright, forward-facing car seat</td>
<td>Can only be used forward-facing in vehicles</td>
<td>For children who have outgrown a forward-facing car seat but are too small for an adult seat belt</td>
</tr>
<tr>
<td>May have detachable base and carrying handle</td>
<td>For children rear-facing who weigh as much as 35 or 40 pounds and children forward-facing who weigh as much as 40 or 65 pounds</td>
<td>For children who weigh up to 40 or 65 or 80 pounds</td>
<td>Weight ranges of 40-100 or 120 pounds</td>
</tr>
<tr>
<td>For children who weigh as little as 4 or 5 pounds and as much as 22 or 35 pounds</td>
<td></td>
<td>Lifts the child up so that the adult seat belt fits low on the hips and across the middle of the shoulder and chest</td>
<td></td>
</tr>
</tbody>
</table>

The following case examples illustrate situations in which the therapists at the National Center were able to promote safe transportation practices.

#### REAR FACING LONGER

Louis, an 18-month-old child with Down syndrome weighing 30 pounds, had recently transitioned from rear-facing to forward-facing in a convertible car seat. Louis was referred to a National Center occupational therapist because his parents were concerned that his head fell forward frequently when he was fatigued, compromising his airway. The occupational therapist inspected Louis’ car seat and determined it was still appropriate for him to use. However, the therapist recommended Louis be turned back to the rear-facing position, explaining that not only would rear facing be safer, but also the semi-reclined position of the car seat installed rear-facing would help prevent Louis’ head from falling forward during travel. In addition, children with Down syndrome may demonstrate cervical spine instability and are better protected in a rear-facing car seat in the event of a crash.

![Child positioned rear-facing in a convertible car seat](image)

#### FORWARD-FACING CHILD SAFETY SEAT WITH HARNESS

A family was referred to a National Center occupational therapist for a transportation evaluation of Henry, their 5-year-old boy with autism. Henry weighed 50 pounds and rode in a booster seat. His parents reported that he placed the shoulder portion of the seat belt behind his back during travel because he had tactile sensitivities. He also had a history of unbuckling the seat belt and roaming around the vehicle. His parents reported that Henry did not
have problems with escaping his previous car seat, which had a five-point-harness. However, use of the previous car seat was discontinued because Henry exceeded the harness weight limit of 40 pounds. The occupational therapist recommended that Henry be transitioned back into a car seat with a five-point harness, but one that could accommodate a higher weight. To address Henry's sensory concerns, the occupational therapist advised the family to look for a car seat that was sold with neck pads covering the harness straps and adequate lateral and head support to provide him with more defined boundaries when riding in the car.

Table 2: List of Adaptive Restraints*

<table>
<thead>
<tr>
<th>Name of Seat</th>
<th>Height/Weight Limits</th>
<th>Accessories (check manufacturer instructions for required or optional use)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Traveller Plus EL</td>
<td>22–105 pounds Up to 56 inches</td>
<td>Head pads; foam abductor; seat extender</td>
</tr>
<tr>
<td>The Roosevelt</td>
<td>35–115 pounds 33.5–62 inches</td>
<td>EZ-Up head rest with Velcro cap; foam abductor; seat extender; incontinence cover; Chest Clip Guard; EZ-Guard Buckle Cover; scoliosis harness kit; foam inserts</td>
</tr>
<tr>
<td>Special Tomato</td>
<td>Small: 20–60 pounds 32.5–50 inches Large: 80–150 pounds 50–63 inches</td>
<td>Anti-thrust seat surface; lateral head support; extended seat</td>
</tr>
<tr>
<td>Columbia 2000 &amp; 2500</td>
<td>2000: 20–102 pounds 36–60 inches 2500: 40–130 pounds 54–66 inches</td>
<td>Block style head pads; swing away foam abductor; seat extender; extensor thrust wedge; lateral support pads</td>
</tr>
<tr>
<td>Columbia 2400 Spirit</td>
<td>25–130 pounds Less than 66 inches</td>
<td>Head support; swing away trunk and hip supports; swing away foam abductor; seat extender; extensor thrust wedge; incontinence cover</td>
</tr>
</tbody>
</table>

Adaptive Booster Seats and Vests

These are for older children who need support because of problems sitting upright or who have behavioral issues. They have a harness for positioning (excludes EZ-On Vests) and require the use of a lap/shoulder belt for restraint.

<table>
<thead>
<tr>
<th>Name of Seat</th>
<th>Height/Weight Limits</th>
<th>Accessories (check manufacturer instructions for required or optional use)</th>
</tr>
</thead>
<tbody>
<tr>
<td>The Churchill</td>
<td>65–175 pounds Up to 72 inches</td>
<td>EZ-Up head rest with Velcro cap; hip inflection comfort pommel; foam abductor; Inflection wedge</td>
</tr>
<tr>
<td>Garell 3</td>
<td>30–108 pounds 37–60 inches</td>
<td>Seat and backrest extenders; abductor; tray; footrest</td>
</tr>
<tr>
<td>Snug Seat Pilot</td>
<td>30–120 pounds 38–63 inches</td>
<td>Abductor; seat extender; adjustable lateral pads</td>
</tr>
<tr>
<td>Recaro Monza</td>
<td>33.1–110.2 pounds 37–59 inches</td>
<td>Abductor; seat extender; seat wedge; turning plate; footrest; tray</td>
</tr>
<tr>
<td>Recaro Start 2.0 Plus</td>
<td>30–80 pounds 37–59 inches</td>
<td>Lateral supports; knee pads; abductor; footrest; wedge; tray; turning base</td>
</tr>
<tr>
<td>E-Z-ON vest</td>
<td>Ages 2 and older 20–188 pounds</td>
<td>Vest with rear-zipper that prevents child from escaping restraint—eliminates use of seat belt</td>
</tr>
</tbody>
</table>

*This list may not be all inclusive and does not imply product endorsement.
Sarah's hips on her abdomen, and the shoulder portion was covering part of her face. Her parents reported that Sarah often placed the shoulder belt behind her back because it otherwise obscured her view and irritated her. After the occupational therapist explained the risks of riding in an improperly positioned seat belt, while highlighting the benefits of being able to see out of the window when riding in a booster seat, Sarah and her parents agreed that Sarah would ride in a booster seat.

ADAPTIVE RESTRAINT
Children with neurological deficits associated with such conditions as cerebral palsy are frequently referred to a National Center occupational therapist. The family of Ben, a 7-year-old boy who weighed 70 pounds, was referred because he would fall over in his booster seat during sharp turns and sudden stops. His parents reported that Ben was able to tolerate his previous car seat with a five-point-harness but had some difficulty remaining upright and frequently hung forward on the harness. Due to Ben's hypertonia and resulting extensor tone, his parents stated that they sometimes had difficulty positioning him in the car seat in order to buckle the harness. They discontinued using the car seat with a five-point harness because Ben exceeded the weight limit of 65 pounds. After evaluating the transportation needs of the family, including other children in car seats and vehicle information, the occupational therapist recommended that Ben ride in an adaptive car seat with positioning accessories. An adaptive car seat provided the support of a five-point-harness to a much greater height and weight limit, while providing needed inhibition of tone through the use of accessories, such as an abductor pommel, so he could ride safely and comfortably in the car.

A variety of adaptive restraints are available for children with special needs. For more information, please see Table 2 on page 11.

CONCLUSION
Occupational therapy practitioners are in a position to advance the safe transportation practices of children with special needs. According to the Occupational Therapy Practice Framework: Domain and Process, 2nd Edition, instrumental activities of daily living include community mobility, which is defined as “moving around in the community and using public or private transportation” (p. 631). Child passenger safety is within the profession’s scope of practice, and occupational therapy practitioners offer a unique skill set to address issues of daily living skills and participation in meaningful activities that can be overlooked by other professionals. Through collaboration with the child’s family and medical team, the occupational therapy practitioner can help ensure that these children are as safe and comfortable as possible when riding in vehicles.

Therapists interested in becoming a certified child passenger safety technician can attend a 4-day course.
offered by the National Highway Traffic Safety Administration. Courses are listed at http://cert.safekids.org. After successfully completing the course, therapists are eligible to attend “Safe Travel for All Children,” a 2-day enrichment course that is offered through the National Center for the Safe Transportation of Children With Special Health Care Needs. The course provides an overview of special needs transportation issues for the pediatric client. Occupational therapy practitioners not trained in child passenger safety should not exceed their area of expertise, and they should feel empowered to seek additional training and/or refer families to organizations or health care systems within the community to address transportation challenges for their pediatric clients when they arise.

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