

POWER WHEELCHAIR TRANSPORTATION CONSIDERATIONS

A CASE STUDY

CLIENT HISTORY

John is a 60-year-old male university professor with C5 tetraplegia. He sustained his injury in a water skiing accident. He would like to return to his job, which includes teaching and research. He will purchase a personal vehicle (van or SUV) for travel to and from work, but will also use public transportation when traveling outside of his home city. John currently uses a power wheelchair and lives with his significant other.

CLIENT TRANSPORTATION-RELATED GOALS

John would like to independently drive a personal vehicle and independently use public transportation so he can return to work, do daily errands and socialize with his friends. He understands that he must undergo driver training and earn his certification to drive a van using hand controls and steering aids. Public buses in his city are accessible, equipped with a ramp for wheelchair boarding/alighting and have designated spaces provided for forward-facing securement of wheelchairs using four-point strap type tie-downs. Each wheelchair station is also equipped with vehicle-mounted lap and shoulder belts to restrain the wheelchair user.

CLIENT CLINICAL OVERVIEW

- Motor assessment - C5 ASIA A
- Skin is intact, sensory intact to C5
- Upper extremity passive and active range of motion is within normal limits
- Assistance required for transfers between level surfaces
- Independent pressure relieving maneuvers
- Independent power wheelchair mobility
- Dependent in bowel and bladder care
- Assistance required for upper body dressing
- Dependent in lower body dressing

CLIENT ASSISTIVE TECHNOLOGY AND WHEELCHAIR TRANSPORTATION NEEDS

1. Consultation on a power wheelchair that is appropriate for use during transportation.
2. Consultation on appropriate adaptive vehicle equipped with driving aids, wheelchair securement system, occupant restraints and wheelchair lift or ramp.
3. Consultation on training program for drivers with disabilities.
4. Instruction regarding transportation safety and the proper use of occupant restraints and wheelchair securement in vehicles.
5. Instruction regarding appropriate and safe use of a wheelchair lift or ramp.

ASSISTIVE TECHNOLOGY (AT) TEAM APPROACH

1. Provide the client with power wheelchair options that meet his clinical needs and that are compliant with the RESNA WC-19 Wheelchairs Used as Seats in Motor Vehicles standard. When wheelchair users are unable to transfer to a vehicle seat and do not have adequate postural stability, they must travel seated in the wheelchair. Wheelchairs that are

Bus operator securing wheelchair to the vehicle by attaching tiedown straps to the designated wheelchair securement points. Four tiedown straps are needed to secure the wheelchair and the occupant must be restrained using lap and shoulder belts.



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compliant with WC-19 are safe for use as a motor vehicle seat in personal smaller vehicles, as well as in larger public buses. These wheelchairs have been sled impact tested (crash tested) and are equipped with securement points that interface with four-point strap type tie-down systems and are rated for their ability to accommodate proper lap and shoulder belt fit. A list of RESNA WC-19 certified wheelchairs can be found at: <http://bit.ly/2dbw2Iz>

2. Interface with a National Mobility Equipment Dealers Association (NMEDA)-certified van modifier to identify potential personal vehicles and necessary vehicle adaptations for driving, access to the vehicle (ramp or lift), wheelchair securement and occupant restraint. A list of NMEDA-certified vehicle modifiers can be found at: www.nmeda.com.

3. Assure that the WC-19 power wheelchair has the proper adaptor to interface with the van securement system. While buses are typically equipped with four-point strap type tie-down systems to secure wheelchairs, vans are often equipped with automated docking systems to allow for independent securement. These docking systems must be crash tested in accordance with RESNA WC-18 Wheelchair Tie-downs and Occupant Restraint Systems for Use in Motor Vehicles. It is important to consult the manufacturer of the docking system to assure that the chosen power wheelchair is compatible with the docking system and that an associated wheelchair-mounted interface adaptor is available for the wheelchair. If possible, select a docking system that has been successfully crash tested with the chosen power wheelchair model. Some power wheelchair manufacturers offer their own wheelchair-specific crash-tested docking system. In this case, one should utilize the specially manufactured compatible docking system.

4. Interface with an Association for Driver Rehabilitation Specialist-certified program for drivers with disabilities to arrange for written and behind-the-wheel education. The instructor providing driver education must be a Certified Driver Rehabilitation Specialist. A directory of certified driver rehabilitation specialists can be found at: www.aded.net. Driver training will enable John to try various types of adaptive equipment to determine which equipment best suits his capabilities and preferences.

5. Ensure that the Certified Driver Rehabilitation Specialist interfaces with a National Mobility Equipment Dealers Association (NMEDA)-certified van modifier to identify potential personal vehicles and necessary vehicle adaptations for driving, access to the vehicle (ramp or lift), wheelchair securement and occupant restraint. A list of NMEDA-certified vehicle modifiers can be found at: www.nmeda.com.

6. Ensure that the client is capable of independent use of wheelchair lifts or ramps to enter/exit his van and board/alight a public bus. This will require directed and supervised use of the van and public bus lift or ramp. Research has shown that most wheelchair-related incidents occur when boarding/alighting from buses, not when the vehicle is in motion.¹ Many transit agencies provide opportunities to practice boarding/alighting from buses – contact the local transit agency community liaison for more information.

7. Instruct client on safety related to use of occupant restraints and wheelchair securement system. An excellent resource for providing wheelchair transportation safety education is the Ride Safe brochure, which can be downloaded from <http://bit.ly/2dbw2Iz>

8. Instruct client's significant other regarding proper usage of wheelchair lift or ramp, as well as occupant restraints and wheelchair securement system.

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9. To ensure the client is able to independently access and safely use the public transportation system – including lift/ramp, occupant restraint system and securement system – supervised travel in the community should be conducted. A member of the AT team should ride the bus with John to assure that he is capable of safe boarding/alighting using the lift/ramp and is able to instruct the bus operator if he/she fails to properly use occupant restraints and tie-downs. It is important to note that research has shown bus operators may not always use four tie-downs and may not always use both lap and shoulder belts.² Thus, the AT team must reinforce to wheelchair users that they must take a proactive role when traveling on a bus or paratransit vehicle to ensure their safety.

10. Conduct one-month client follow-up visit to discuss questions and challenges regarding usage of transportation safety equipment in the personal vehicle and during use of public transportation. Ensure that a one-month follow-up is also conducted by the Certified Driver Rehabilitation Specialist to address any challenges or concerns related to driving.

OUTCOME

The AT team introduced John to wheelchair transportation safety using the Ride Safe brochure, which he was able to take home. Together with his AT team, John chose an Invacare Storm power wheelchair (crash tested WC-19 compliant wheelchair) to meet his clinical and transportation needs. John chose a Chrysler Town & Country van that was modified by a NMEDA-certified dealer to include hand controls, a wheelchair ramp and a Q'Straint QLK-150 wheelchair docking system installed in the driver's

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position. Additionally, a special bracket supplied by Q'Straint was mounted on his power wheelchair; this bracket serves as the interface between his wheelchair and the docking system. To be able to drive his van, John enrolled in a driver's program taught by a Certified Driver Rehabilitation Specialist that included in-classroom and behind-the-wheel training. To enable safe use of public transportation, John visited his local transit agency where he practiced supervised boarding and alighting from a public bus, and experienced the wheelchair securement and occupant restraint process, of which he was knowledgeable given his exposure to the Ride Safe brochure (in a public bus setting, John's job is to ensure that bus operators use the designated securement points on his wheelchair when attaching all tie-down straps, and that both lap and shoulder belts be used for restraint). Once John was comfortable with the public bus environment, a member of the AT team then accompanied John on a public bus trip to assure he was capable of safely accessing the bus and managing his wheelchair securement and occupant restraint process.

The comprehensive AT team approach described prepared John for safe and independent transportation using both personal and public transportation. Educating wheelchair users about transportation safety is an often overlooked but critical element in AT service delivery.

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2. FROST K, BERTOCCI G, SALIPUR Z. WHEELCHAIR SECUREMENT AND OCCUPANT RESTRAINT SYSTEM (WTORS) PRACTICES IN PUBLIC TRANSIT BUSES, ASSISTIVE TECHNOLOGY, VOL 25, 16-23, 2013.

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