

Incorporating Wheelchair Transportation Safety into Wheelchair Prescription Practices

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ABSTRACT

Clinicians routinely address issues related to positioning and function during the wheelchair prescription process. For those individuals who plan to remain seated in their wheelchairs while traveling in motor vehicles, issues associated with wheelchair transportation safety should also be addressed during the prescription process. This article provides information on key questions to ask the client, recommendations for prescribing ANSI/RESNA WC19-compliant wheelchairs, common misconceptions, and best practices.

KEY WORDS

Wheelchair transportation safety, WC19, transit option, wheelchair prescription

INTRODUCTION

Many wheelchair users remain seated in their wheelchairs when traveling in motor vehicles. This may occur due to reasons of convenience or independence; or it may be necessary in cases when transfer to vehicle seating is not recommended due to postural, medical or other issues. Those individuals who use their wheelchairs as seating in motor vehicles are at a disadvantage in terms of crash safety. Knowledgeable choices made during the wheelchair prescription process can make motor vehicle travel both easier and safer for these individuals.

There are four basic components needed to provide occupant protection in motor vehicles:

1. Safe vehicle: Federal Motor Vehicle Safety Standards (FMVSS) dictate the minimum safety requirements for motor vehicles.
2. Crashworthy wheelchair: choose a wheelchair that has passed ANSI/RESNA WC19 or ISO 7176-19. [1, 2]
3. Effective wheelchair securement: the wheelchair needs to be effectively secured to the vehicle using a 4-point strap-type tiedown or docking system that complies with SAE J2249 [3] or ISO 10542 [4, 5].
4. Effective occupant restraint: the wheelchair seated occupant needs to use a 3 or 5-point crash-tested occupant restraint [3, 4].

All wheelchairs that comply with ANSI/RESNA WC19 – *Wheelchairs Used as Seats in Motor Vehicles* have several key features that make them suitable for use as seats in motor vehicles. They have demonstrated structural integrity and crashworthiness in 30 mph, 20g frontal impact sled testing. WC19-compliant wheelchairs contain four labeled and easily identified securement points that are crash-tested, located at the proper height, and provide clear paths for tiedowns. WC19-compliant wheelchairs also provide improved wheelchair stability during normal travel, reduce potential injury-producing sharp edges and hard points, and use gel-cell batteries in all power wheelchair models.

Additional benefits include improved ease-of-use and application of wheelchair tiedown and occupant restraint systems (WTORS). In addition, WC19-compliant wheelchairs provide for use of wheelchair-anchored pelvic safety belts, and are rated for accommodation and fit of vehicle-anchored occupant restraints (3 or 5-point seatbelts).

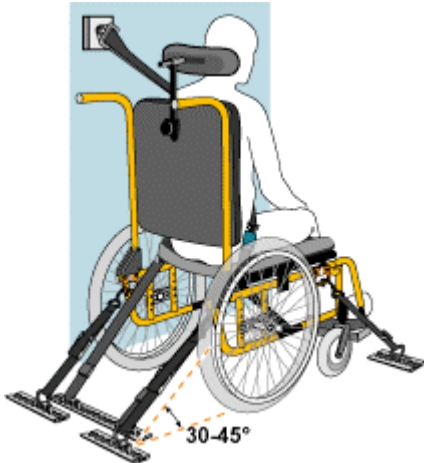


Fig. 1 – Wheelchair tiedown and occupant restraint system (WTORS).

Figure 1 depicts a WC19-compliant wheelchair secured to a vehicle with four tiedowns. The wheelchair-seated occupant is wearing a vehicle-mounted 3-point (i.e., shoulder and lap belt) occupant restraint. Note that the occupant restraint shoulder belt is anchored to the vehicle wall. All other anchor locations are on the vehicle floor. WTORS are best installed by the vehicle manufacturer or, after market, by National Mobility Equipment Dealers Association members (NMEDA) who have successfully completed the NMEDA accreditation program, <http://www.nmeda.org>.

OBJECTIVES

To provide basic information to clinicians on how to discuss wheelchair transportation safety with clients and caregivers, including:

- a) types of questions to include in the dialogue
- b) ANSI/RESNA WC19 wheelchair recommendations
- c) common wheelchair transportation misconceptions
- d) best practices

METHODS

Clinicians can open the dialogue with individuals who use wheeled mobility by asking how they plan to use their wheelchair outside the home. Questions should focus on travel in both private and public vehicles. Some individuals, who may typically transfer to a vehicle seat when traveling in a private vehicle, will instead remain seated in their wheelchairs when traveling on paratransit or public transportation. This is especially true for children who often travel on school vans or buses during the week and then travel in their parents' private vehicles at other times. Questions should cover how the wheelchair will be transported in motor vehicles, where the individual will sit during travel in a motor vehicle, and for individuals who will remain seated in the wheelchair, how WTORS will be used. Additional questions can focus on their current transportation

solutions. A suggested script for this discussion can be found at:

http://www.rercwts.org/RERC_WTS2_KT/RERC_WTS2_KT_Stand/WC19_Docs/Talking4Therapists.html.

When medically appropriate, clinicians should recommend ANSI/RESNA WC19-compliant wheelchair models, or models with a WC19 transit option specified. A current list of WC19-compliant models can be found at: <http://www.rercwts.org/WC19>. This list includes manual, power and stroller-type wheelchair models for both adults and children. Some WC19 wheelchair models include tilt-in-space, recline, and folding frames. Despite a common misconception, WC19-compliant wheelchairs are not necessarily heavier than their non-compliant counterparts; for example, even a lightweight stroller-type wheelchair model has performed consistently well during WC19 sled testing. While payment for the WC19 option is currently determined on a case-by-case basis, suggested phrases to include in letters of justification for medical necessity can be found at: http://www.rercwts.org/RERC_WTS2_KT/RERC_WTS2_KT_Stand/WC19_Docs/Justification_WC19.html.

The authors' experiences communicating with therapists, school bus drivers, individuals who travel seated in their wheelchairs and their parents/caregivers have highlighted some common wheelchair transportation safety misconceptions.

- 1) *I already have a seatbelt on my wheelchair, so I don't need to use another one* – FALSE.

If the individual is using a WC19-compliant wheelchair with a WC19-compliant wheelchair-anchored pelvic safety belt, then the rider need only to attach the shoulder belt to the pin on the pelvic safety belt. However, most pelvic belts used for positioning are NOT crash-tested occupant restraints, and should NOT be relied on for motor-vehicle safety. A 3-point occupant restraint meeting crash safety standards should be used either with or instead of the pelvic positioning belt while traveling in motor vehicles.

- 2) *This child uses a chest harness, so she doesn't need a shoulder belt on the school bus* – FALSE.

The chest harness is a postural support device – not a crash-tested occupant restraint. We recommend continued use of the harness along with a 3-point occupant restraint. The harness can improve the rider's positioning, thereby improving the fit of the occupant restraint.

- 3) *Other passengers are standing on the bus. I see no reason for me to have my wheelchair tied down* – FALSE.

Unlike bus seats, the wheelchair is not anchored to the bus. In case of an accident or evasive driving maneuvers, an unsecured wheelchair can become a moving object, causing danger to the wheelchair user or other passengers. In addition, a secured wheelchair will provide improved seating stability during normal vehicle operation.

General information on best practices for wheelchair transportation safety can be found in the Ride Safe Brochure [6] or at: <http://www.travelsafer.org>. This user-friendly brochure outlines a three-step process for effective wheelchair transportation safety, including

choosing the right equipment, securing the wheelchair, and protecting the wheelchair rider. Additional guidelines for use of secondary postural support devices by wheelchair users during travel in a motor vehicle can be found at: <http://www.rercwts.org/info> [7]. This resource contains two sections. The first reviews the basic principles for wheelchair transportation safety, and the second offers specific recommendations for postural support device use during travel in motor vehicles (e.g., pelvic positioning belts, chest harnesses, headrests, anterior head supports, lateral supports).

RESULTS/DISCUSSION

The use of crash tested wheelchairs with SAE J2249 or ISO 10542 tested WTORS offer the best option for occupant protection for those individuals who travel in motor vehicles while remaining seated in their wheelchairs. The clinician often provides the first line of information for individuals who need wheelchairs to meet their mobility needs. Wheelchair transportation safety can be incorporated into the wheelchair prescription process, without compromising positioning or functional needs. The therapist can resolve transportation misconceptions and provide basic information for safe travel in motor vehicles. All links to websites described in this article and extensive additional information can be found at the Rehabilitation Engineering Research Center on Wheelchair Transportation Safety website: <http://www.rercwts.org>.

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