



Vehicle modification process

Conversations, assessments and considerations for an OT/PT

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Glossary of terms

- **Crash tested** – Passed crash testing in the laboratory to the standards as referred to in this presentation
- **Postural support** – component or length of webbing material used to support a person in a desired seated position, but not intended to provide occupant restraint in a vehicle impact
- **WTORS** – wheelchair-tiedown and occupant-restraint system; complete restraint system for wheelchair-seated occupants comprised of equipment for wheelchair tiedown and a belt-type occupant restraint
- **Occupant restraint** – system or device designed to diminish the risk of injury to its wearer, in the event of collision or abrupt deceleration of a motor vehicle, by limiting the mobility of the wearer's body
- **Anchor points** – (number of origin and insertion points) location on a vehicle interior component to which an anchorage is attached
- **2-point (pelvic belt restraint) occupant restraint** – portion of an occupant restraint which passes across the front of the wearer's pelvic region
- **3-point (pelvic belt and diagonal shoulder belt restraint) occupant restraint** – assembly of hardware and belt webbing comprised of both a pelvic belt restraint and a shoulder belt restraint with three anchor points that connect together near the hip of the user
- **Securement points** – points on the wheelchair to which wheelchair tiedowns are connected
- **4-point strap-type tiedown** – wheelchair tiedown system that uses four strap assemblies to secure the wheelchair in the vehicle, attaching to the wheelchair at four separate securement points and to the vehicle at four separate anchor points
- **Powered docking tiedown device (“dock and lock”)** – docking tiedown device that uses external power to secure and/or release the wheelchair

Evidence-informed practice (EIP)

- This presentation is based on the principles of EIP with references in the next 2 slides
- EIP considers:
 - Best practices
 - Recommended practices
 - Practice based evidence
 - Professional wisdom and values
- “Know your research, but don’t take your eye off the child” –
Dana Brynelsen
- Evidence informed practice is used to design health promoting programs and activities using information about what works. It means using evidence to identify the potential benefits, harms and costs of any intervention and also acknowledging that what works in one context may not be appropriate or feasible in another. Evidence informed practice brings together local experience and expertise with the best available evidence from research –

References

- WA Road Traffic Code 2000 (the law)
- AS/NZS 10542.1-2015
 - Technical systems and aids for people with disability - Wheelchair tiedown and occupant restraint systems
- AS/NZS 6396.19:2009
 - Wheeled mobility devices for use as seats in motor vehicles
- ISO16840-4:2009
 - Wheelchair seating – Part 4: Seating systems for use in motor vehicles
- The “equivalent” standards internationally
 - AS/NZS 10542.1-2015 - ANSI/RESNA WC 18; ISO10542-1:2012
 - AS/NZS 3696.19:2009 - ANSI/RESNA WC 19; ISO 7176-19
- International Best Practice Guidelines 2013
 - Complementing the above standards for therapists
- WA Safe Transport Interagency Group

Clinical process

Vehicle modification

- Therapist
 - Assessment
 - Features required
 - Justification of features
 - What products has the features required; trials; quotes
 - Funding bodies/budget

Wheelchair prescription/Home modification

- Therapist
 - Assessment
 - Features required
 - Justification of features
 - What products has the features required; trials; quotes
 - Funding bodies/budget

Conversations around vehicle modifications

- Client's goals and our considerations
 - “Information is power” for our clients and families
 - As much as necessary, as little as possible
 - Consider safest possible set up first
 - It is only fair that clients and families are aware of their options for safest possible set up
 - Informed choices

Conversations with the families

- Client's goals and our considerations
 - Time versus urgency of access needs versus requirements of the law
 - Your safe transport risk assessment documentation and family's decision
 - Is it more reasonable to have a second hand modified vehicle that
 - Does not meet the all relevant standards for safest possible set up?
 - Fittings that are not damaged and has not been involved in a vehicular accident? – How do you know?
 - Meets the requirement of the law/roadworthy in WA?
 - Use of current non-crash tested wheelchair
 - Is there a crash tested wheelchair that is appropriate for the client to use and can be hired in the meantime?
- Costs and Grants
 - How will this impact on the funding applications in the future when wanting to retrofit the WTORS for the safest possible set up?
 - Criteria of the funding bodies – mileage, age of the vehicle etc.
 - Can the family “meet in the middle” in terms of funding and/or change of vehicles again?

EIP - “Ideal” set up

- Always transfer to a standard vehicle seat if possible
- Use a crash tested wheelchair
- Use a crash tested wheelchair tiedown and occupant restraint system (WTORS)
- Use a crash tested body support system (postural support/seating insert) if required for postural support

Crash tested wheelchair

- Thinking about how the wheelchair is set up in the lab for testing
 - Headrest is always included!
 - Wheelchair failed crash testing (3:03)
 - https://www.youtube.com/watch?v=_2ew9110dvU
- Labelling requirements
 - Presence of securement points and/or the karabiner symbols alone do not guarantee that the wheelchair is crash tested to AS/NZS 10542.1:2015
 - Always get written information from the manufacturer or supplier – “from the horse’s mouth”

Crash tested WTORS

- Human is secured!
 - Occupant restraint 3-point vs 2-point
 - This is the “seatbelt”; not for postural support
 - WA Road Traffic Code 2000
 - Must have a seatbelt just as any other occupants in the car would
- Seat (wheelchair) is secured!
 - The chair is secured just as any other chairs in the car would
 - 4-point
 - Docking (dock and lock)
 - Clamp-type
 - Brakes must be engaged!

Crash tested WTORS

- Again, thinking about how the WTORS is set up in the lab for testing
 - WTOR SYSTEMS
 - Occupant restraint
 - Wheelchair tiedown
 - Tracking/fixed points
 - Clear space requirements
 - Same manufacturer/brand
 - Labelling requirements

3-point vs 2-point occupant restraint

- 3-point
 - Safest possible option
 - As recommended by AS/NZS 10542.1:2015 and Intl BPG 2013
 - Most similar to a standard seatbelt in a vehicle
 - Inclusion consideration – “just like everyone else in the car”
- 2-point
 - When may this be considered?
- Must always, always, always have a “seatbelt” whether 2-point or 3-point
- Is there a safe working load?

Hot topic: 4-point tiedown vs dock and lock

- Pros and cons
 - Think about how the wheelchair is set up to pass crash testing in the lab
 - Did the test use the 4 securement points on the wheelchair or the dock and lock plate or both?
 - Manufacturer or supplier written “ok” for your documentation
 - Location of the securement points on the wheelchair
 - Think about manual handling for the main caregivers
 - Strain
 - Awkward postures
 - Think about controls for the clients and the main caregivers

Hot topic: 4-point tiedown vs dock and lock

- Fixed points, tracking or dock and lock?
 - How many wheelchairs used as a seat in the vehicle?
 - How likely is the wheelchair type or size likely to change in the next 10 years?
 - What should be the location/spacing of the fixed points/tracking/dock and lock?
 - What is the clear space like?
 - What is the safe working load?
 - BSS + wheelchair + anything else they carry
 - Person?
 - What is involved (e.g. cost, time etc.) in transferring the WTORS to another vehicle?

Visuals of lab testings

- Only 2 wheelchair tiedown used; similar to uneven line of pull (0:38)
- 4 point wheelchair tiedown with even line of pull (0:56)
- No occupant restraint, postural support on wheelchair only (1:35)
- 2 point occupant restraint only (2:11)
- Crash tested wheelchair and WTORS all appropriately placed (3:57)
- https://www.youtube.com/watch?v=_2ew9110dvU

Safe transport risk assessment

- Always complete your safe transport risk assessment if going outside of the “ideal” set up
 - Why?
 - How?
 - What?
 - Must always, always, always have a “seatbelt” whether 2-point or 3-point

Other considerations

- Remove and secure anything that is not essential for life
 - Exclude postural support!
 - Potential projectiles in a small space
 - Trays?
- Funding bodies
 - Be creative with the funding sources
 - Criteria, e.g. mileage, age of vehicle, timeframe to the next application etc.

Other considerations

- Always refer to the law, standards, Intl BPG, written info from manufacturers/suppliers
 - **Clinicians, always back your recommendations up!**

Demystifying the clinical process

Vehicle modification

- Therapist
 - Assessment
 - What is the problem? What is not meeting the requirements of the law, relevant standards or needs of the client/family?
 - Features required
 - Referring to the above, what would be your clinical recommendation?
 - Justification of features
 - Why do you need the features required? Because according to the law/standards/needs of family...
 - What products has the features required; trials; quotes
 - Funding bodies/budget
 - Criteria of the funding bodies
 - E.g. trials, quotes, vehicle mileage, age of the vehicle, timeframe to the next application etc.
- Supplier/fitter
 - The “features required” as recommended by the therapist is doable in building/engineering and is roadworthy/passing the “pits” in WA
 - Suggestion of products and alternatives that may meet the features required
 - Build the vehicle and modifications to an expected good standard, roadworthy and according to the requirements of the law
 - Same expectations as per the Australian Consumer law
 - <https://www.commerce.wa.gov.au/consumer-protection/consumer-rights-people-disability>

Clinical rationale

- Please feel free to forward your questions and clinical rationale to the interest group (or me for anonymity) so we can all practice and help
- Next meeting? 😊

Assessment	Features required	Justification of features/Objectives