

Queensland Health

# Child car seats and Disability Specific Restraints

Information from a MASS Webinar  
“Securely Seated in a Vehicle”

Webinar held 23 November 2016 and website document  
updated 11 January 2017

Great state. Great opportunity.



## Child Car Seats and Restraints

- Motor vehicle crashes remain one of the leading causes of injury and deaths in Australian children aged 1-14 years (Neuroscience Research Australia and Kidsafe Australia, 2013; ACCC,2013)
- Serious injuries in motor vehicle crashes have resulted from:
  - Use of a restraint that is not the most appropriate size,
  - Premature graduation to adult seatbelts, or
  - When the restraint is not installed or being used as it was designed to be (Neuroscience Research Australia and Kidsafe Australia, 2013)
- Kidsafe Australia have reported that approved and properly fitted child restraints may reduce the risk of death or serious injury in road crashes by up to 70% (ACCC, 2013).

## Child Restraint Legislation

**The mandatory Australian Safety Standard AS/NZS 1754 Child restraint systems for use in motor vehicles governs the design and performance of child restraints to be used in Australia.**



- The current edition is AS/NZS 1754:2013 which introduced changes to accommodate larger and older children
- AS/NZS 1754 is recognised as the most stringent child restraint standard in the world, due to:
  - Side impact testing
  - Use of top tether strap (Type A, B, D, and boosters over 2kgs)
- Existing restraints (less than 10 years old) are still able to be used provided they comply with the previous standards.



With a tether strap



Without a tether strap

## Child Restraint Legislation

The use of child restraints is regulated via state/territory road traffic authority user requirements (ACCC, 2013).

Use of child car seats and restraints is a legal requirement.

<http://www.qld.gov.au/transport/safety/rules/children/index.html>

“If a child is not in an approved child restraints that is properly fastened and adjusted, you can be fined \$365 and incur 3 demerit points for each child that is not properly restrained.

Double demerit points will apply for second or subsequent child restraint or seatbelt offences committed within 1 year after an earlier offence”

Department of Transport and Main Roads - Last updated 28 July 2016

## Child Restraint Legislation

Australian legislation requirements for appropriate restraint use:

| Age                 | Restraint (Australian Standard approved)   |
|---------------------|--|
| Birth to 6 months   | Rearward facing child restraint  |
| 6 months to 4 years | Either a rearward facing child restraint, or a Forward facing child restraint with inbuilt harness |
| 4 to 7 years        | Either a forward facing child restraint with inbuilt harness, or a booster seat                    |
| 7 years onwards     | Either a booster seat or seatbelt  |

Summary of Australian legislation requirements for seating position:

| Age                 | Seating Position  |
|---------------------|---|
| Birth up to 4 years | Must be in a rear seated position   |
| 4 to 7 years        | Can only be seated in the front seat if all rear seating positions are occupied by younger children |

<http://www.qld.gov.au/transport/safety/rules/children/index.html>

## Types of Child Restraints

| Rearward facing                | Approx. Age         |
|--------------------------------|---------------------|
| Type A1                        | Up to 6 months      |
| Type A2                        | Up to 12 months     |
| Type A4 (new AS/NZS 1754:2013) | Up to 2-3 years     |
| Type D                         | 6 months to 4 years |



| Forward facing                | Approx. Age         |
|-------------------------------|---------------------|
| Type B                        | 6 months to 4 years |
| Type G (new AS/NZS 1754:2013) | 8 years             |



| Booster seat  |  |
|---|--|
| Used in conjunction with a Type C child restraint and a seatbelt, or with a lap sash seatbelt |  |
| Type E  |  |
| Type F (new AS/NZS 1754:2013)   |  |



## Types of Child Car Seats and Restraints

- The appropriate car seat and restraint is one that is best matched to the child's anthropometry and development, and varies with age (Neuroscience Research Australia and Kidsafe Australia, 2013).
- Shoulder height markers (upper and lower seated shoulder height) implemented in AS/NZS 1754:2013 better reflect the adequacy of the size match between a child and a child restraint (Neuroscience Research Australia and Kidsafe Australia, 2013).
- Shoulder height markers will prompt the transition of the child to the next appropriate restraint once their shoulders reach the upper shoulder height marker, and also prevent children from moving to the next level of child restraint if the child's seated shoulder height is below the lower mark on the device.



Upper Shoulder Height Marker

Example of a shoulder height marker on a dedicated rearward facing child restraint



Example of a shoulder height marker forward approved forward facing restraint

## Types of Child Car Seats and Restraints

- It is recommended to keep smaller children in the earlier age type restraint as long as possible.
- Parents/carers are encouraged to exhaust all options for restraints in the child's current or 'recommended' category before transitioning them to the next category of restraint.
- Within a given restraint category, there is considerable variation in the size of children accommodated by specific makes and models of restraints
- When a child exceeds the size limits of one particular model of restraint, there may be other restraints available in that category that accommodate that child's size, which would provide better protection than progressing to the next category of restraint (Neuroscience Research Australian and Kidsafe, 2013).

## Types of Child Car Seats and Restraints

The Queensland Road Rules allow a child who is too large or too small to fit into an age specific child restraint to either be moved into the next level of restraint or remain in the lower level of child restraint for as long as necessary. For example:

- a three year old child that is too big for a child seat can be seated in a booster seat with an adult lap-sash seatbelt or a fastened and adjusted H-Harness
- a six year old that is too big for a booster seat can progress to an adult seatbelt
- a child who has turned four but is too small for a booster seat should remain in a forward facing child restraint with built-in harness
- a child who has turned seven, but is too small for an adult seatbelt should remain in a booster seat.

## Adult Seat Belts: 5 step test

- Although at 7 years of age a child can legally use a vehicle seat with seat belt, it is considered best practice to use a booster seat until a good adult seatbelt fit is achieved.
- Good seatbelt fit in most vehicles is generally not achieved before a child is approximately 145-150cm in height or up 12 years of age.
- The 5 point test is used to determine if optimal fit in an adult seatbelt can be achieved without use of a booster seat. Can the child sit with:



1. Their back against the seat back



2. Knees bent comfortably over front edge of the seat cushion



3. Shoulder belt across the mid shoulder



4. Lap belt low across the top of the thighs, and



5. Maintain this position for the duration of the trip

(Neuroscience Research Australia and Kidsafe Australia, 2013).

## Child Seat and Restraints Accessories

**Child restraint accessories that are not supplied or recommended by the manufacturer or are not certified for use with a specific restraint under AS/NZS 8005:2013 are not recommended.**

- These include items such as: H-harnesses, seat belt positioners, buckle covers, belt tensioners, seatbelt extenders, add on chest clips, and any padding (pillows or cushions, etc).
- A compliant accessory may be recommended or prescribed for safety, postural support, comfort, entertainment, storage, or for installing a child restraint in a motor vehicle.
- **H-harnesses:** not recommended for use and only to be considered when in a seating position with a lap only seat belt or used in conjunction with a booster seat to prevent submarining.
- **Buckle covers:** Behavioural solutions are preferred.



H-harness



Mobility Engineering Seat belt cover (AS/NZS 8005 compliant)

(Neuroscience Research Australia and Kidsafe Australia, 2013).

## Children with Additional Needs

- Parents and carers with typically developing children have access to evidence based support and advice, and easy access to an extensive range of Australian Standards child restraints.
- Difficulties can arise when trying to use these same restraint options with children who have additional needs.
- Children with disability, a medical condition or behavioural challenges, often require special consideration when being transported in a motor vehicle (VicRoads, 2011).
- Children with permanent disability require long term solutions that need to be reassessed as the child grows (VicRoads, 2011)

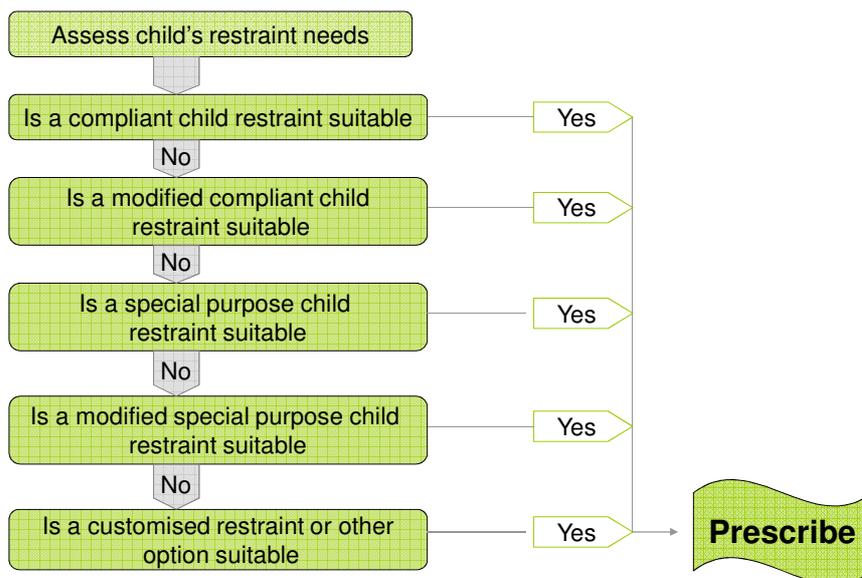
## Children with Additional Needs

Baker and colleagues (2012) surveyed occupational therapists working in Victoria with children from birth to 18yrs found:

- Only half the participants indicated they had an appropriate knowledge of standards approved restraint options, non standards approved options and legal requirements for seating children with additional needs
- The legal and ethical implications for therapists related to the restraint of children in motor vehicles, means that therapists carry a large responsibility when making these decisions

**AS/NZS 4370:2013 Restraint of children with disabilities or medical conditions in motor vehicles. Provides guidelines for the prescription of car restraints for children with additional needs to ensure they are seated safely and in accordance with legal requirements.**

## AS/NZS 4370:2013 Prescriber Flowchart



### Assess child's restraint needs

| Child  | Parent(s)/Carer   | Vehicle   |
|--|---|---|
| <ul style="list-style-type: none"> <li>• Nature of the disability or medical condition</li> <li>• Current restraint used</li> <li>• Age, height and weight</li> <li>• Ancillary equipment required during transport</li> </ul> | <ul style="list-style-type: none"> <li>• Physical ability</li> <li>• Ability to safely transfer child into the restraint</li> <li>• Ability to access additional adult support for the child during travel</li> <li>• Ability to move the restraint to other vehicle(s) the child may regularly travel in</li> <li>• Distance/time of most frequent journeys</li> <li>• Family configuration</li> <li>• Financial constraints</li> <li>• Funding options</li> </ul> | <ul style="list-style-type: none"> <li>• Type of motor vehicle</li> <li>• Size of vehicle</li> <li>• Age of vehicle</li> <li>• Anchorage locations</li> <li>• Access, space and methods for securing ancillary equipment</li> </ul> |

### Is a compliant child restraint suitable?



Safe N Sound Unity Infant Carrier



Britax/Safe N Sound Maxi Rider AHR Easy Adjust



Britax/Safe N Sound Encore 10



Infa Secure Grandeur Treo

### Is a modified compliant child restraint suitable?

- To seat children with additional needs safely, modifications may need to be made to car restraints that comply with Australian Standards AS/NZS 1754.
- This document provides guidance on the prescription of car restraints for children with:
  - Orthopaedic conditions
  - Postural or movement disorders
  - Complex and challenging behaviours
  - Medical conditions

### Children with Orthopaedic Conditions (AS/NZS 4370:2013)

May require **short term management** whilst wearing upper or lower limb trunk plasters or braces, or longer term management for scoliosis

Strategies:

- Is there an option to hire a compliant, special purpose or modified special purpose child restraint?
- Have other forms of suitable transport such as an ambulance may need to be considered?

Modifying a compliant child restraint:

- Short term use of an extended crotch strap to accommodate the extra height of the hip spica
- Short term use of foam to raise the child's hips and move the trunk forward in the restraint. NB minimise transport distance due to the increased risk of spinal injury in a motor vehicle accident

### Children with Postural or Movement Disorders (AS/NZS 4370:2013)

These children may:

- Require additional postural support to maintain head and trunk in an upright position
- Exhibit involuntary movements or reflexes which affect their ability to sit and travel in safety and comfort
- Have epilepsy which also needs to be safely managed in their restraint during motor vehicle travel

Strategies:

- Using additional padding for trunk support or a soft collar for head support
- Increasing the recline of the restraint
- Using a foam wedge positioned under thighs to promote hip flexion
- Providing foot support (e.g. firm foam/bean bag between front and rear seats)
- Using a harness as postural support in conjunction with an adult seatbelt
- Using a 5 or 6 point harness system with a booster seat with upper torso support

### Children with Complex and Challenging Behaviours (AS/NZS 4370: 2013)

Carers of children with an intellectual impairment, autism or behavioural challenges report a range of challenges associated with motor vehicle travel:

- attempting to escape from the vehicle,
- exhibit distracting behaviours,
- engage in physical fighting with other vehicle occupants, and
- may physically interfere with the driver

Strategies: ***Behavioural strategies must be trialled in the first instance***

Modifying a compliant child restraint:

- Accessory buckle cover to restrict access to the child release button
  - Reversing the buckle so the button faces inwards to the body
  - Accessory cross chest strap
- A Survey of 102 OTs in Victoria in 2011 showed that 80% of referrals for a child restraint were for behavioural problems (Baker, et al, 2012).

### **Children with Medical Conditions (AS/NZS 4370: 2013 )**

- Requires assessment of restraint needs including consideration of ancillary equipment which may be required during travel.
- Other forms of suitable transport, such as ambulance, may need to be considered for short term conditions

Modifying a compliant child restraint:

- Size of the child restraint and length harness straps e.g. to accommodate a child's leg position if they are wearing a plaster cast
- Using additional padding to ensure the child is appropriately supported in the child restraint
- Recliner of the restraint may need to be greater than provided with compliant child restraints to support respiratory function

### **Modifying a Child Restraint**

- The integrity of the restraint as supplied by the manufacturer should be maintained:
  - the foam or plastic shell of the child restraint cannot be modified, e.g. do not cut off pieces of foam, armrests or any other part of the restraint
  - the harness or webbing straps cannot be cut or sewn
  - Padding used beneath or behind the occupant should be avoided as it will collapse/compress in a crash causing harness slack.
- If padding is required for a specific positioning then it should:
  - Be firm foam
  - Not exceed 2kgs in total weight
  - Be flame retardant and slow burning, and
  - Be suitably covered and secured, as appropriate, with flame retardant material to prevent access by the occupant to the foam

**Modifying an AS/NZS 1754 child restraint means the child restraint no longer meets the requirements of AS/NZS 1754 (VicRoads, 2011).**

## Modified Child Restraints – Kidsafe QLD

- Kidsafe QLD provide:
  - Restraint hire service for children with fractures and hip spica.
  - A limited number of modified child car seats and restraints to safely accommodate plaster casts or burn splints
- Modifications are completed in consultation with Britax engineers and rehabilitation engineers from RCH.
- Modifications include extended crotch strap and additional padding with firm foam to increase hip angles
- For further details please contact Kidsafe [www.kidsafeqld.com.au](http://www.kidsafeqld.com.au)  
Please note, hire items are not funded through CAEATI and VOSS



### Is a special purpose child restraint suitable?

**MASS is not aware of any disability specific child restraint that complies with AS/NZS 1754 (to date).**

#### **Australian Competition and Consumer Commission (ACCC)**

Consumer Protection Notice No.21 of 2011 *Child restraint systems for use in motor vehicle*

- This notice makes it illegal to sell or hire any child restraint that does not comply with AS/NZS1754. However, since October 2008 this has not applied to child restraints for children with disability
- Instead suppliers were encouraged to meet the voluntary standard AS/NZS 4370, and allows manufacturers of child restraints for children with disability to voluntarily meet the requirement of AS/NZS 17540.
- As this is voluntary, there is no evidence that Australian or overseas manufacturers are following this practice

**Therapeutic Goods Administration (TGA):** Overseas imported child restraints for children with disability are required to comply with the TGA requirements of Class 1 medical devices

## Vic Roads Report: Child restraints for children with a disability (2011)

|  | Columbia | Hippo Spica Cast | Timy | Snug Seat Traveller Plus | Carrot | Lars | R82 Panda Evo | Sonja | Recaro Monza Reha |
|--|----------|------------------|------|--------------------------|--------|------|---------------|-------|-------------------|
| Technical data availability  | ✓        | ✓                | ✓    | ✓                        | ✓      | ✓    | ✓             | ✓     | ✓                 |
| Compliance with one or more of the overseas standards for child restraints                                       | ✓        | ✓                | ✓    | ✓                        | ✓      | ✓    | ✓             | ✓     | ✓                 |
| Top tether anchorage system or an engineer approved alternative system   | ✓        | ✓                | ●    | ✓                        | ✓      | ✓    | ✓             | ●     | +                 |
| Access to the child restraint manual, including guidelines for installation                                      | ✓        | ✓                | ✓    | ✓                        | ✓      | ✓    | ✓             | ✓     | ✓                 |
| Access to a local distributor  | ✓        | ✓                | ✓    | ✓                        | ✓      | ✓    | ✓             | ✓     | ✓                 |
| Child restraint has features to minimise the occupant's motion in the restraint, such as:                        |          |                  |      |                          |        |      |               |       |                   |
| Five or six point harness (as in AS/NZS 1754 Type A, B and D child restraints)                                   | ✓        | ✓                | X**  | ✓                        | ✓**    | ✓**  | ✓**           | ✓**   | ✓**               |
| Side wings or walls to prevent lateral motion of the occupant in a side impact crash                             | ✓        | ✓                | ✓    | ✓                        | ✓      | ✓    | ✓             | ✓     | ✓                 |
| Sash seatbelt guides – to orient the sash seatbelt over the occupant's chest in a booster seat                   | N/A      | N/A              | ✓    | N/A                      | ✓      | ✓    | ✓             | ✓     | ✓                 |
| Lap seatbelt guides – to orient the lap seatbelt over the pelvis area of the occupant and to prevent submarining | N/A      | N/A              | ✓    | N/A                      | ✓      | ✓    | ✓             | ✓     | ✓                 |
| Child restraint design avoids loading of the occupant's genital area   | ✓        | ✓                | ✓    | ✓                        | ✓      | ✓    | ✓             | ✓     | ✓                 |
| Child restraint buckle cannot be released by the occupant  | ✓        | ✓                | ✓    | ✓                        | ✓      | ✓    | ✓             | ✓     | ✓                 |

## CAEATI and VOSS Application Process for Child Car Seats and Disability Specific Restraints

**In instances where modified or disability specific child restraints are required as a compliant solution is not appropriate, MASS is complying with the process set out in AS/NZ4370:2013**

To demonstrate compliance with the process, prescribers will need to, in addition to CAEATI or VOSS (passenger) application, submit:

- Child car seat and disability specific restraint for vehicle transport checklist  
[https://www.health.qld.gov.au/data/assets/pdf\\_file/0030/436476/child\\_carseat\\_vehicle\\_checklist.pdf](https://www.health.qld.gov.au/data/assets/pdf_file/0030/436476/child_carseat_vehicle_checklist.pdf)
- Prescriber certificate issued by a medical practitioner (GP or specialist), occupational therapist, psychologist, physiotherapist or biomedical engineer  
<https://www.qld.gov.au/transport/safety/rules/children/exemptions/>

## References

- Australian Competition and Consumer Commission (2013). Discussion paper: Review of the consumer products safety standard for child restraint systems for use in motor vehicles.  
<http://www.productsafety.gov.au/system/files/Review%20-%20Consumer%20Product%20Safety%20Standard%20for%20child%20restraints%2024%20June%202014.pdf>
- Baker, A., Galvin, J., Vale, L. & Linder, H. (2012). Restraints of children with additional needs in motor vehicles: Knowledge and challenges of paediatric occupational therapists in Victoria. *Australian Occupational Therapy Journal* 59, 17-22.
- Neuroscience Research Australia and Kidsafe Australia (2013). The National guidelines for the safe restraint of children travelling in motor vehicles. [www.neural.edu.au/crs-guidelines](http://www.neural.edu.au/crs-guidelines)

- **AS/NZS 1754:2013** Child restraint systems for use in motor vehicles
- **AS/NZS 8005: 2013.** Accessories for Child Restraints used in Motor Vehicles
- **AS/NZS 4370:2013** Restraint of children with disabilities or medical conditions in motor vehicles

### Useful Resources:

- TOCAN (Transportation of Children with Additional Needs)  
[www.rch.org.au/tocan](http://www.rch.org.au/tocan)
- Martin, J., & Paule, R. (2016). *Transportation of children with disabilities who display behaviours of concern: clinical reasoning guide for occupational therapists*. State of Victoria, Department of Health and Human Services.  
[http://www.dhs.vic.gov.au/\\_data/assets/pdf\\_file/0007/970009/1606031-Transportation-of-children-with-disabilities-who-display-behaviours-of-concern.pdf](http://www.dhs.vic.gov.au/_data/assets/pdf_file/0007/970009/1606031-Transportation-of-children-with-disabilities-who-display-behaviours-of-concern.pdf)