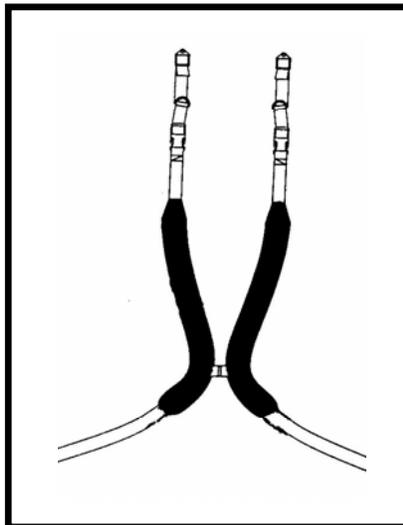


PROMOTING AIRWAY SAFETY WHEN PRESCRIBING HARNESSSES FOR WHEELCHAIRS AND OTHER SEATING DEVICES

Guidelines for Prescribers



Prepared by The Victorian
Harness Safety Industry
Working Group

Supported by
Department of
Human Services

This document has been prepared by the Victorian Harness Safety Industry Working Group, at the request of the Department of Human Services. The group is made up of the following representatives:

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Copies of this document and a Safe Use of A Chest Harness brochure can be accessed at www.scopevic.org.au/harness

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INTRODUCTION

In 1999, the incorrect use of a postural harness attached to a wheelchair resulted in the death of a child in NSW. The coroner found that the harness caused compression of the child's neck. Two therapists who were involved with the child were found to have contributed to the death. An investigation by the relevant health complaints body found that "...lack of adequate communication contributed to the tragic outcome in this case. There was inadequate communication between the two therapists... and between the school occupational therapist and the child's teacher". It was also found that "... the child's parents were not adequately informed or involved in decision making about the seating aids used for their daughter and were unaware of the dangers". (*ausotnews 2002*). Issues relating to the training and accreditation of therapists prescribing seating systems and therapists making straps and seating systems were also identified.

The correct prescription and application of seating supports is vital if prescribers are to ensure that the people who use them are seated for optimum function and utmost safety. If seating supports are not prescribed or applied correctly it is possible that airway safety may be compromised.

This document aims to provide an overview of the issues and safety considerations relating to the safe use of postural harnesses for Victorian therapists and other seating prescribers. The document outlines the risks associated with the use of harnesses and details how to best minimise these risks.

GLOSSARY OF TERMS

Pelvic Strap	A strap prescribed for the purpose of maintaining the pelvis in optimal alignment. This is usually set at a particular angle to hold the pelvis in position. It may have two or four points of attachment.
Postural Harness	A device that is applied to the trunk to assist in supporting a person to remain in an optimal sitting position.
Airways	The pipe that runs from the mouth and nose down the front aspect of the neck/throat to the lungs. It transports air to the lungs and is also known as the windpipe.
Ventilation	The act of getting air in to and out of the lungs.
Therapeutic Goods Administration (TGA)	The TGA carries out a range of assessment and monitoring activities to ensure that therapeutic goods available in Australia are of an acceptable standard.
Postural Supports	Any device that is prescribed to enhance or promote improvement in posture. These can include, but are not limited to, trunk supports, pelvic supports, head supports and foot supports.

HOW DOES A HARNESS CAUSE INJURY OR DEATH?

There are three ways in which a harness can cause mechanical asphyxiation or strangulation.

Strangulation occurs when there is excessive constriction or compression of the airway that interrupts its ability to act as a passage.

Strangulation may result if:

- **The harness rides up** – The point at which the harness joins centrally travels up, blocking the airway and causing strangulation.



- **The person slides down** – The person slips down in the chair, the harness makes contact with the neck, blocking the airway and causing strangulation.



Mechanical asphyxiation occurs when the chest and abdomen becomes so compressed that they cannot expand and the lungs cannot fill with air. The position of the person's body in relation to the surroundings prevents thoracic relaxation and lung aeration.

Mechanical Asphyxiation occurs when:

- **The harness is applied or fits too tightly** – The chest is compressed limiting adequate ventilation.



These three situations result due to one or a combination of the following:

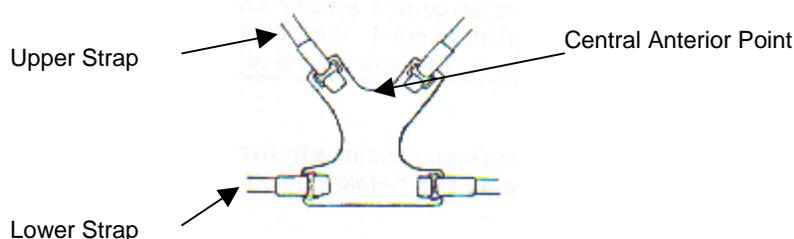
Inappropriate Prescription

The prescribed harness does not work with other prescribed supports to provide suitable postural support. When prescribing a harness it is essential to consider what other postural supports will be used, how the harness will attach to the chair and how tightly the harness might fit.

NB: A small number of people will continually slip down in their wheelchair despite the prescription of a range of postural supports. This may be due to challenging behaviours or physical shape. These people will be at significant risk of injury if a harness is prescribed, alternatives to a chest harness should be considered for these individuals.

Faulty Equipment Design

The design of the harness itself may increase the risk. This is the case for butterfly and vest harnesses where the central anterior point of joining for the harness is high increasing the risk of strangulation if the harness rides up or the person slides down.



Product Wear and Tear

The prescribed harness, other postural supports or their attachments to the chair experience deterioration over time that is not identified and repaired.

Carer Monitoring and Maintenance

The application of the harness or other postural supports is not correct, (eg. the harness is applied upside down or the straps are not correctly tightened.) Or maintenance of the harness and other postural supports does not occur in a timely manner.

NB. This can be a significant issue when the person who uses the harness has a large number of carers or changes in carer/s. **Instruction about how to correctly use the harness and other seating supports is essential.** Reducing the adjustability of the lower harness straps can also assist in preventing incorrect application.

NOTE: The Harness Safety Industry Working Group recommends that therapists and other prescribers do not manufacture harnesses. We recommend that all harnesses used by prescribers are produced by companies who are registered under the Therapeutic Goods Administration.

HARNESSES PRESCRIPTION

Specialist seating requires expert prescription. When seating systems and postural supports are being prescribed it is important that the prescribers are people who have skills, experience and education in the field.

The use of postural harnesses cannot be considered in isolation. The harness should be viewed as part of the overall postural support system along with supports such as lap belts, foot supports, trunk supports, thigh straps, tilt in space and reclining backrests. Effective support of the pelvis, feet, trunk and shoulders and the use of tilt may eliminate the need for harness prescription.

Close consideration should be given to:

- Ensuring the person cannot fall forwards, slide down or lift their pelvis. (note people will still require the ability to relieve pressure by weight shifting)
- The effects of recline, tilt in space or built in fixed tilt as a change in tilt can limit the effectiveness of straps and supports.
- The use of trunk or side supports. If a person has poor lateral trunk control, trunk or side supports will limit sideways movement, which can lead to the harness cutting into the neck.

NOTE: A firm fitting pelvic strap must be prescribed every time a harness is prescribed

NOTE: A harness is not considered an approved safety restraint for travel in a vehicle

TIP: A harness should not be used in addition to a harness system that is already in place on a car seat. If prescription of a harness is required for a car seat the following standards and guidelines should be consulted.

- **Australian standard for restraint of children with disabilities in motor vehicles AS/NZS 4370:1996**
- **Australian standard for child restraint systems for use in motor vehicles AS/NZ 1754:2004**
- **Vic Roads guidelines for restraints and fitting must be observed. Refer to www.vicroads.vic.gov.au**

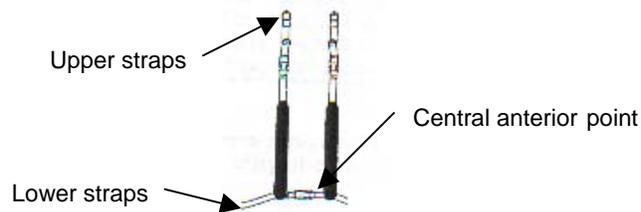
Which Harnesses Are Most Safe?

There are many different designs and styles of harnesses that are available commercially in Victoria. The choice of harness style will be dependent on the needs of each individual and the people who support them.

Features of a Harness that Reduce Risk

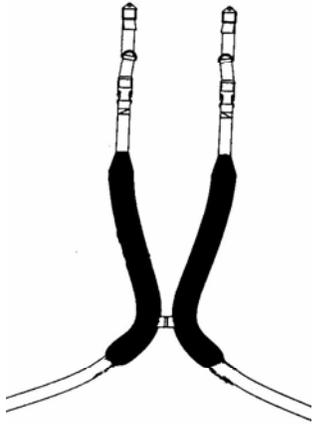
The features of a harness that result in a reduced risk of strangulation or asphyxiation include:

1. Upper straps that join at a central anterior point which is low down (see below). This means that a person has to slip a long way down or a harness has to ride a long way up for injury to occur.

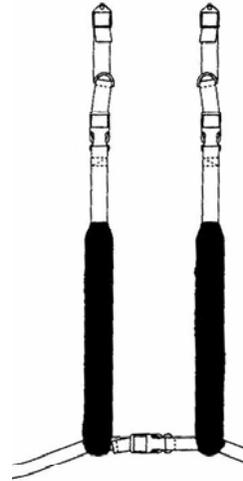


2. The ability to un-clip or un-buckle at a central anterior point. This means that the lower straps of the harness can remain in place whilst the person exits their chair. It also allows the lower straps of the harness to be of fixed length. They may be attached via clips or buckles to the chair frame making them non-adjustable. This reduces the risks associated with incorrect harness application and the risk of the harness riding up. The upper straps can be adjustable for growth. Straps should be secured with buckles in preference to hook and loop (velcro) or D-ring fastening.
3. A horizontal strap that sits lower than the bottom of the rib cage. The horizontal strap stops the upper straps from sliding off the shoulders. It should be secured to the upper straps to prevent it from sliding upwards onto the airways.
4. Harness styles that can not be applied upside down. This can be achieved by the use of different buckles or attachments on the upper and lower straps. Clearly marking the harness top and bottom will also reduce the risk of incorrect application.

Examples of Harnesses with Reduced Risk



Boomerang Harness



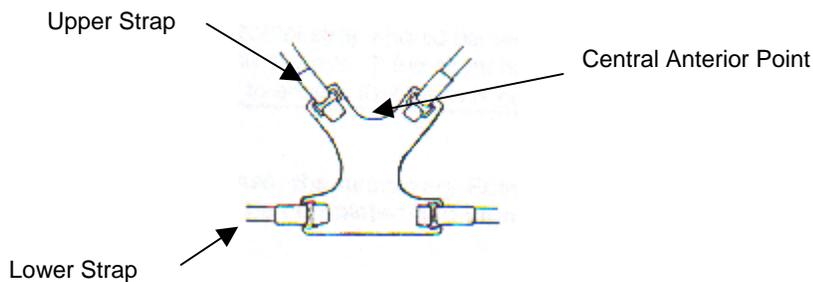
H- Harness

Features of a Harness which May Increase Risk

There may be some instances in which a prescriber/s find that a harness with the features outlined above cannot provide the type of postural support that an individual needs. Alternatively a family or individual may have a strong desire to use another type of harness.

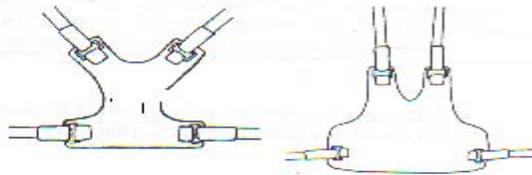
Harness features that pose a greater risk to an individual of strangulation or asphyxiation include:

1. A central anterior point that is higher, thus increasing the risk of asphyxiation if the person slips down in their chair or the harness rides up.



2. An inability to un-fasten at a central point. This means that the lower straps cannot be of a fixed length, increasing the risk of the harness being inappropriately applied (i.e. upside down or placed at the wrong level).
3. The ability of the harness to be applied too tightly, resulting in a greater risk of asphyxiation due to compression of the chest wall.

Examples of Harnesses That Pose an Increased Risk



Butterfly Harness

Vest Harness

If the decision is made to prescribe a harness that poses an increased risk it is important to consider the following:

- Ensure that the decision is a collaborative one involving your peers and the person/family.
- Check that a harness that is less risky is not appropriate (trialing one of these prior to making a final decision is highly recommended).
- Ensure that the decision is based on sound clinical reasoning and **DOCUMENT** this reasoning process.
- Develop and clearly document a plan for ensuring adequate education for all people who might apply and remove the harness.

NOTE: When a harness is fitted to a chair it is important that manufacturers guidelines for fitting are followed

TIP: A harness can be marked using stitching or permanent marker to indicate top and bottom, front and back. The straps may also be marked to indicate the point at which they should be fastened.

INSTRUCTING CARERS IN THE SAFE USE OF HARNESSES

It is important that therapists, and others who prescribe a harness as part of a seating system, ensure that carers receive adequate instruction about how to safely apply, remove and maintain the harness.

People with a disability may have multiple and frequently changing carers and the prescriber may have very little to do with the person between seating reviews.

The following guidelines are recommended:

- The risks associated with harness use should be discussed with the person with a disability and at least one primary carer.
- The person with a disability and the primary carer should be encouraged to share this information in both written and verbal formats with other carers.
- The person with a disability and/or the primary carer should be provided with a copy of the “**Safe Use of a Chest Harness**” brochure. For copies of this brochure go to: www.scopevic.org.au/harness
- If the person lives in supported accommodation or attends other services, they and/or their carers should be encouraged to provide a copy of the brochure to the services.

TIP: The use of photographs that show the person wearing a correctly applied harness can assist in instruction.

DOCUMENTATION

It is essential to ensure that documentation relating to harness prescription is adequate. The clinical reasoning, discussions and collaborations that led to the prescription and the instruction that accompanies the prescription of seating supports must be recorded in the appropriate place.

In particular, it is necessary to document the following:

- A collaborative decision making process
- Adequate instruction of carers
- Time frames and the process for review

If a person with a disability or those that support them choose to make a decision other than that recommended by the prescriber this must be reflected in the documentation.

REVIEW AND EVALUATION

It is strongly recommended that all harnesses, other postural supports and seating systems be regularly reviewed to ensure that they are safe and effective. This may be difficult in situations where a therapist or prescriber does not have regular contact with the harness user, however strategies for ensuring that review occurs must be considered.

NOTE: Discussion regarding the process for reviewing the harness should occur at the time of prescription.

NOTE: The Victorian Aids and Equipment Program guidelines recommend regular follow up and review for equipment See www.dhs.vic.gov.au/disability for more information.

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