



Practitioner Manual for Wheelchairs & Scooters



**A Manual devised by the SWEP Clinical Advisory
Team to assist SWEP registered AT Practitioners**



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Updated May 2021

Images in this manual have been used to demonstrate the range and breadth of features available within this AT category. However images provided should not be considered an endorsement of a particular product; nor should they be considered an exhaustive list of all products or features available. As a practitioner you need to use due diligence to ensure that the item and supplier you recommend is best suited to your consumer, their wishes and needs. SWEP will not be held liable for any mismatch of consumer and AT interface that has resulted from the use of Images or information in this manual.

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Background

This manual aims to support and enhance the prescription capability among practitioners.

The State Wide Equipment Program (SWEP) Clinical Advisors have developed this resource manual to provide:

- Useful information for practitioners
- Links to evidence based practices
- Recommended assessments to assist with prescribing continence products
- Outlines potential risks related to consumer, support person and the environment
- Description of products and links to a range of product types

Guidelines

The Department of Health and Human Services - Victoria provides a range of mobility equipment through SWEP to support people with **a permanent or long-term** disability to enhance their independence. Access to the guidelines for the Victorian Aids and equipment program are located on our website here:

<https://swep.bhs.org.au/other-relevant-documents.php>

Application and Prescription Form

An application for a consumer to receive items within this prescription category needs to be submitted through the portal available at this link:

<https://swep.service-now.com/csm>

Definitions of Wheelchairs and Scooters

Wheelchairs

Manual wheelchair:

A wheelchair that is propelled by self or pushed by another person. SWEP have identified that there are two broad categories of manual wheelchairs

- a more durable high frequency use wheelchair and
- a lower frequency use wheelchair

More durable high frequency use wheelchair

This category of manual wheelchair is most appropriate when a consumer

- uses the wheelchair on a daily basis
- requires more adjustment in the wheelchair to give precise postural support due to the time spent in the chair
- needs a more robust manual wheelchair due to regular or 'heavy' use, or to hold additional postural supports such as backrests, harnesses etc.

Lower frequency use wheelchair

This category of manual wheelchair is most appropriate when a consumer

- does not use the wheelchair on a daily basis and may be able to use other methods for some mobility
- can manage if the wheelchair frame or postural supports are not as customised or robust due to reduced frequency of use. Consumer may need a lighter weight wheelchair to assist support people to lift the equipment in and out of a vehicle boot etc. (please check weight specifications for each product).

Types of Frames

Rigid frame: Generally, a rigid frame wheelchair will consist of a welded frame on which the seating system is attached.

Folding Frame: A folding frame wheelchair is a wheelchair whose frame is usually collapsible sideways by the use of an X mechanism in the frame. This mechanism is and the wheelchair folds on release of two locking levers on the chair. Some wheelchairs may fold by folding the backrest down onto the seat but still have a rigid base frame providing stability.

Powered Wheelchair:

A powered wheelchair is a wheelchair in which the motor is derived from electrical power. It can be user or carer operated. It can be front wheel, rear wheel or mid wheel drive.

Other methods of powering a wheelchair include:

1. Power pack: an external electrical device that can be fitted to a manual wheelchair to assist with propulsion and steering of the chair. These can be fixed to the front or the rear of the wheelchair and may be operated the wheelchair user or their support person, depending on the type of the power pack

2. Powered wheels. These are wheels, generally the large rear wheels, that have an inbuilt power source within the wheels and these can once again be operated by the wheelchair user or their support person.

Click on the link below to see an outline of how drive wheel configuration can affect the way a chair moves.

<https://www.aci.health.nsw.gov.au/networks/spinal-cord-injury/spinal-seating/module-10>

Scooter

A scooter is an electrically powered wheelchair with a manual tiller to control the steering. Scooters are designed for outdoor use and must have a maximum capable speed of 10 km/hr and are required to use the footpath wherever possible. There is no standardized format or legislation governing the requirements for assessment of a powered mobility scooter. A scooter is usually prescribed for someone who has difficulty accessing their community however is able to mobilize in their home environment. As scooters are designed for community access, they are not designed to have modified seating and pressure care products. Therefore, this needs to be considered with any scooter prescription.

Scooters are funded under the Aids & Equipment program for up to \$4,000

Products Supplied (summary)

The types of products supplied in this category are power wheelchairs, manual wheelchairs and scooters.

Recommended Assessments/Measures and Requirements

The list of measures and assessments that appear here is not exhaustive, but represent valid and useful measures that will assist in the prescription of your item.

These measures relate to;

1. Consumer Characteristics – physical
2. Consumer Characteristics – functional
3. Support person characteristics
4. Satisfaction and goals
5. Environment assessment

Consumer Characteristics

Physical

The physical assessment includes an understanding of the past and current medical history and the disease/disability potential for progression/change.

Physical Assessment will include a MAT (Mechanical Assessment Tool). This will assess factors including:

1. Range of Movement
2. Spasticity (Ashworth or Tardieu)
3. Muscle strength
4. Balance – sitting, and if relevant standing balance
5. Body anthropometrics (weight, height, limb length, body segment measures,
6. Pressure care and skin integrity – including existing pressure issues and risks for skin integrity

This is a thorough hands on physical assessment, which is ideally a joint assessment between the OT and PT, yet may require input from other disciplines including Prosthetist and Orthotist, Medical Doctor, Continence nurse, and Speech Pathologist.

Wheelchair prescription can be greatly affected by involvement of other specialists. These specialists may include a rehabilitation consultant for Spasticity management or an Orthopaedic surgeon for management of bony and muscle issues. Surgery can be planned up to 1-2 years in advance so it is essential that any future medical plans are known and allowed for as required.

As a result of the MAT assessment, it may be apparent that referral for spasticity or orthopaedic management is required and this can be via the public or private system.

Other factors to be assessed include

1. pain
2. bowel and bladder function
3. sensation
4. upper Limb function and risk factors for injury – if not covered in the MAT
5. presence of reflexes (e.g. ATNR)
6. hand dominance
7. please see the following link to “Management of Cerebral Palsy in Children: A Guide for Allied Health Professionals” NSW Government Health. This includes outlines of assessments commonly used and further references

https://www1.health.nsw.gov.au/pds/ActivePDSDocuments/GL2018_006.pdf

Please see the further link below for seating considerations for bariatric consumers:
<https://mobilitymgmt.com/articles/2010/06/01/anatomy-of-bariatric-mobility.aspx>

Functional

One important aspect of wheelchair prescription is to enable the person to participate in everyday activities and maximize their potential and participation. It is necessary to consider all issues that may impact on obtaining the correct wheelchair prescription for the consumer.

These may include:

- Home Environment, key issues to consider are access, door width, circulation space access to the bedroom, bathroom and toilet. An assessment of the home environment and trial in the home environment is essential if a wheelchair has not been previously used, or if there are significant changes to their wheelchair prescription. This is especially relevant in the cases of children undergoing major growth changes.
- Transfers (seat to floor height, equipment used, degree of independence of user)
- Continence (accessing a urinary bottle, changing requirements)
- Ongoing Reflex activity such as the ATNR (impact on ability/appropriate modifications to drive a power wheelchair safely)
- Cognition (planning, insight, perception, behavioral issues)
- Communication (ability to express pain or discomfort. Is this open to interpretation or clear? Access to an AAC)
- Medical status of user i.e. need for oxygen, naso-gastric feeding, etc.
- Vision: There is no set vision standard for operating a powered wheelchair or scooter. However, it is necessary to assess visual acuity and visual fields. The standard requirement for visual acuity for driving a vehicle is: A person’s vision needs to be equal or better than 6/12 with both eyes together
- Activities that will be undertaken in a wheelchair e.g. mealtimes, school activities, sports
- Transport: How the wheelchair will be transported, if it fits into the car, if it is

able to be taken apart and lifted in in sections, if the person will be seated in the wheelchair for transportation

Support Person Characteristics

Safety, abilities and needs of family members and support workers require consideration in the wheelchair prescription process. Risks to these need to be identified and assessed and may include:

- Sustained or repetitive postures
- Awkward postures
- Consumer behaviours
- Carer/family's physical and cognitive status

Satisfaction and Goals

Satisfaction incorporates aspects of satisfaction with current chair which need to be included in the new prescription and then satisfaction with the end product. Opinions of consumer, carers, family and involved institutions need to be considered.

- Passive function (ease of care)
- Impairment (range of motion)
- Pain
- Environment the device is the be used in
- Carers needs and feedback

Environment assessment

Consideration of the physical, social, cultural and institutional environment will involve factors such as:

- Working space
- Type of surface, e.g. smooth flooring, carpet, gravel, grass
- Gradients of areas likely to be accessed e.g. driveway, access ramps, local terrain etc.

Outcome measures

Wheelchair Outcome measure (WhOM):

<https://millerresearch.osot.ubc.ca/tools/mobility-outcome-tools-2/the-wheelchair-outcome-measure-whom/>

Wheelchair mobility assessments:

<http://millerresearch.osot.ubc.ca/tools/mobility-outcome-tools-2/>

<http://ijmsc.org/doi/pdf/10.7224/1537-2073-7.3.111>

Wheelchair skills program WSP (including wheelchair skills test, WST)

<http://www.wheelchairskillsprogram.ca/eng/4.1/WSTPManual4.1.35.pdf>



Considerations for Practitioners/Equipment

Rigid frame: when wheelchair does not need to be collapsible, or when the wheelchair will be subject to frequent and heavy usage

Folding frame: when wheelchair is required to fold to fit into a vehicle, etc.

Tilt in Space: may be required for pressure or pain relief, if the consumer has decreased head control, to assist with hoist transfers,

Folding frame and tilt in space: care is required when prescribing this combination for a larger/heavier consumer as a folding frame offers less stability than a rigid frame.

Mulholland Growth Guidance System (GGS) as pictured below may be considered for children with high extensor tone. Due to the high-end cost and extreme postural support provided to the child, consider other options before prescribing this wheelchair.



Recline: when consumer requires change in position. E.g. for pain relief

Vertical lift: Will raise and lower the user in their seated position, without changing the seat angles. A seat elevator may elevate from a standard seat height or may lower the user closer to the floor.

Sit to stand: enables user to move between sitting and standing by changing the position of the wheelchair seat between vertical and horizontal. This feature of the chair reduces the need for physical assistance by consumer and/or carer. Care needs to be taken when prescribing this type of wheelchair as postural supports in the sitting position will not necessarily be correct for the standing position.

Rigidiser: for use with cushions on slung upholstery to provide a stable seating base

Tension adjustable upholstery: to allow for fluctuating tone, pressure relief, and to accommodate for growth.



Items that may assist with....

In addition to the references and tools provided at the end of this manual, a short reference guide to commonly encountered situations and equipment features that may assist is provided below.

Items that may assist with transfers in and out of the wheelchair:

- Anterior tilt – standing transfers
- Tilt in Space – position person back in chair
- Seat to floor height – standing transfers
- Removable / folding footplates – step transfers
- Removable arms supports – side transfers, sling in and out
- Swing away laterals
- Removable thigh laterals – increase ease of sling attachment



Items that may assist with bariatric consumers

- Allowance for gluteal shelf in considering backrest type and position
- Use of fabrics in cushion covers that breathe, wick moisture and /or conduct heat away from the skin surface
- Use of scrotal support for males at risk of impingement when seated
- Be aware of manufacturers weight limits
- Chair set up where centre of mass and centre of gravity will be different to a standard set up

Items that may assist with pressure care

- Tilt in Space
- Recline
- Combination of tilt and recline
- Adjustable cushions – pelvic obliquity, hip flexion contractures
- Moulded seating systems
- Before using pelvic obliquity build-ups check if postural asymmetries are fixed or flexible using a MAT evaluation
- Thigh laterals – improve lower limb and foot position
- Orthotics made in conjunction with the WC prescription
- Thoracic laterals
- Hip blocks
- Pelvic positioning belts – consider design and placement



Items that may assist with positioning

- Tilt in Space
- Adjustable cushions – pelvic obliquity, hip flexion contractures
- Moulded seating systems
- Thigh laterals
- Thoracic laterals
- Positioning belts



Items that may assist with wheelchair performance

- Yearly chair service
- Battery size
- Tyre style and tread width
- Cushions
 - Supply clear washing and drying instructions
 - Note use of creams that may degrade the cushion and cover
 - Correct cushion size to allow for inserts when used.
 - Chair set up
 - Centre of mass
 - Timely replacement of covers and cushions
- Centre of gravity



Items that may assist with accessing the environment

- Suspension
- Frog legs
- Battery size
- Training
- Rigid frame
- Low seat to floor height with reduced seat depth - for leg propulsion
- Arm rest design



Items that may be added to assist with health and daily activities

- Ventilator transport mounting
- Oxygen transport mounting
- Suction transport mounting
- PEG poles
- Canopies
- Lifestyle accessories (bag hooks, cup holders, etc.)



Items that may assist with storage and maintenance

- Annual service
- Location of power points for charging
- Powered door access to storage location



Items that may assist with moving the chair

- Attendant control
 - Consider RWD for ease of operation
- Power pack
 - Consider weight limits, proposed terrain
- Push rims
- Power assist wheels
- One arm control wheels
- One arm drive
- Height adjustable or stroller push handles
- Wheel size, tyre width and type
- Extended brake handles and location of brakes
- General set up as above



Items that may assist with continence management and personal care

- Continence cover
- Consider impact on skin integrity
- Two covers
- Chair height
- Vertical lift
- Cut out in mid anterior foam (replaceable) for bottle use
- Recline
- Impact of TIS and recline on catheter drainage

Items that may assist with transportation

- Tie downs
- Head rests
- Seat belt
- Folding frame
- Transportation aides such as frames, hoists and trailers
- Manual handling
- Overall all weight and use of removable backrests and cushions
- Weight of individual parts such as backrest and hardware

Items to consider when prescribing a replacement wheelchair

- Why is a replacement required
- What are the “negatives” of the current wheelchair – discuss with support workers/family members
- What are the “positives” of the current wheelchair – discuss with support workers/family members
- What repairs/modifications have been required for the current wheelchair (may indicate ongoing unresolved issues)
- Are there any likely changes that are known to be occurring in the near future e.g. place of living, home environment, medical/surgical management, support person changes

Considerations when choosing a scooter

1. Three-wheeled versus four-wheeled scooters: Four-wheeled scooters often feel more stable for consumers on uneven terrain. However, three-wheeled scooters have a smaller turning circle and are easier to manoeuvre and have more leg room.
2. Suspension: Can differ greatly on scooters so if the consumer has a history of back pain a scooter with good suspension is required.
3. Environment where the scooter will be used. In a hilly environment a consumer may require a scooter with a stronger/larger motor.

Recommendations when assessing capacity to use a scooter

Obtaining medical clearance: signed clearance from GP to state the consumer has no medical conditions which impact on their capacity to operate a scooter.




Vision: As per wheelchairs there are no set standards. However, for a driver's license a person must have a visual acuity of 6/12. If you have any concerns re a consumer's vision, this should be referred for an assessment by an optometrist. Visual fields should be assessed.

Cognition: Attention, visual and verbal memory and relearning capacity are important to consider.



Trial and follow up training: A trial should be completed around the home environment and local area.

Storage: SWEP requires the consumer to have an accessible and appropriate storage and a power point to recharge scooters prior to the scooter being funded.

Wheelchair Componentry

Component	Description	Picture
Recline	A recline feature changes seat to back angle orientation while maintaining a constant seat angle in respect to the ground	
Tilt-in-Space	A tilt-in-space feature changes the seat angle orientation in relation to the ground while maintaining seat to back and seat to leg angles. Anterior tilt can be used to assist sit to stand transfers	
Head rest	There are many different types of headrests available that perform a variety of functions from being a safety precaution during travel to providing postural assistance in all directions using differing additional pads and straps as required. Headrests may also be required to have provision for head control switches to control powered wheelchairs	
Back Rest	Backrests may be slung backrests, which offer basic support and allow the wheelchair to be folded easily or rigid	

	<p>which gives greater stability and enables more componentry to be fitted to meet individual consumer's needs.</p>	
<p>Moulded Back rest</p>	<p>A moulded backrest provides some trunk postural stability when extra supports such as trunk thoracics would be too excessive. They come in differing sizes and shapes, which should be fully assessed during wheelchair prescription.</p>	
<p>Customised Backrests</p>	<p>These backrests are individually made according to the consumers' needs, such as when there are significant deformities or muscle tone issues</p>	
<p>Trunk Thoracics (or trunk laterals)</p>	<p>Trunk thoracics or laterals are used to provide postural support to the consumer's trunk. They come in a variety of sizes, shapes and the pads may be curved to differing degrees. Laterals may be used asymmetrically if required. . The brackets for the attachment of these can also allow the laterals to be placed at angles to assist in accommodating trunk deformities</p>	

<p>Shoulder Stabilizers</p>	<p>Shoulder stabilisers are used when a high degree of assistance is required to maintain an upright trunk posture.</p>	
<p>Pelvic Stabilisers</p>	<p>Used to help maintain a correct seated pelvic position, especially when there is marked increased tone. They are a common component of the Mulholland GGS wheelchair</p>	
<p>Harness</p>	<p>There is a wide variety of harnesses available to allow for differing needs. Particular care should be taken when considering the harness positioning so the safety of the consumer is ensured.</p>	
<p>Lap Belt</p>	<p>A lap belt can assist in providing some safety and seating stability. It is generally accepted that all wheelchairs should have some type of lap belt or pelvic restraint.</p>	

<p>4 point Lap belt</p>	<p>A 4 point belt provides additional pelvic stability when seated in a wheelchair, compared with a standard lap belt, by utilising two angles of pull to maintain correct seated pelvic posture</p>	
<p>Thigh Guides</p>	<p>Thigh guides or pads help prevent excessive hip abduction. This will help to maintain a stable sitting position.</p>	
<p>Pommel</p>	<p>A pommel is used to help control excessive hip adduction. Small pommels may be a component of the cushion rather than an actual part of the wheelchair</p>	
<p>Elevating leg rests</p>	<p>Elevating leg rests allow individuals to change the angle of the orientation of the legs and or footrests relative to the seat. They can be used to help manage oedema, pain and as a form of pressure relief</p>	

<p>Calf strap</p>	<p>A calf strap is used to help maintain a stable foot position on the footplates.</p>	
<p>Ankle Straps</p>	<p>Ankle straps (sometimes known as “ankle huggers”) will provide some further assistance to maintain correct foot placement on the footplates while still allowing some capacity for minimal movement</p>	
<p>Foot Cups</p>	<p>Foot cups (sometimes known as “taddy cups”) may be used when extra assistance is required to maintain a stable foot position. They are attached to the footplates and should be able to be adjusted in multiple directions according to the consumer’s needs.</p>	 

Contract / tender details

After a rigorous and robust evaluation process, SWEP has contracted suppliers for a wide range of Assistive Technology. This has ensured that the equipment selected has been certified under the relevant Australian Standards, meets the specifications required by our consumer group and has been secured at the best value for money. SWEP have a Contracted Item catalogue on our website, which contains all items listed by category, with a product brochure link, specification and relevant information. You can access the catalogue here:

<https://swep.bhs.org.au/picklists-catalogue.php>

Summary of evidence

Wheelchair prescription must be evidence based with best practice guidelines being applied to individual clinical needs. Included in this manual is a non-exhaustive list of research and evidence pertaining to wheelchair prescription.

References, Further Readings and Resource Links

New resources for Provider of Wheelchairs and Seating Systems

The following standards have been published by the International Standards Organisation (ISO) pertaining to wheelchairs

<https://www.iso.org/committee/53792/x/catalogue/>

A Clinical Application Guide to Standardized Wheelchair Seating Measures of the Body and Seating Support Surfaces, Revised Edition

This guide aims to translate the content of the Standard into a resource manual as Standards are complex documents and expensive to purchase.

In this resource manual defining over 130 measurement terms, the authors present a complex ISO standard in a format and language that is easy to understand and practical to use. It includes the correct terminology for angular and linear measurements of the seated person's body and the seating support system. For each term, the guide explains the purpose of the measure and it's clinical relevance, with an accurate definition, a sample measurement procedure, and 1 to 2 illustrations helping to clarify each measure.

<https://www.ncart.us/uploads/userfiles/files/GuidetoSeatingMeasuresRevisedEdition.November2013.pdf>

Glossary of Wheelchair Terms and Definitions, Version 1.0

This glossary includes a searchable list of 550+ defined terms related to wheelchairs, wheelchair seating, and wheelchair seated posture. The terms are organized (2) Wheelchair Components and Features, (3) Seating Support System and (4) Angular and Linear Dimensions. Reference sources are included for each term and definition, and historical terms are linked to the preferred term in a comprehensive index.

<https://www.ncart.us/uploads/userfiles/files/glossary-of-wheelchair-terms.pdf>

Useful websites for scooter users and therapists

A guide for choosing and using motorised mobility devices: Mobility devices and electric wheelchairs (Victoria)

Consumer Resource

<https://www.vicroads.vic.gov.au/safety-and-road-rules/pedestrian-safety/motorised-mobility-devices>

Practitioner Resource

<https://otaus.com.au/practice-support/areas-of-practice/motorised-mobility-devices>

How scooters work: For more information on components of scooter and mechanics
<https://www.scootersaus.com.au/>

The EWC/scooter trial form at this link maybe a useful guide for therapists

<http://www.dva.gov.au/dvaforms/Documents/D1325.pdf>

Public Transport Victoria. This includes information on using mobility aids on public transport.

<https://www.ptv.vic.gov.au/more/travelling-on-the-network/accessibility/wheelchair-access-and-mobility-requirements/>

Refer to SWEP and Independent Living Centre websites for updates on current equipment

<http://swep.bhs.org.au>

www.ilcaustralia.org.au

Scope is one of the largest providers of services to people with a disability in Victoria. For information on prescribing and safely using harnesses, please refer to this link: <http://www.scopevic.org.au/index.php/site/resources/harnesssafety>