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Powered Mobility
Empowering Participation

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## Contents

1.0 Introduction, Philosophy ................................................................. 9  
   1.1 Introduction ................................................................................ 9  
   1.2 Powered mobility - philosophy .................................................. 9  
   1.3 Frequently asked questions (FAQs) ............................................. 10  

2.0 Evaluation Process and Tools ......................................................... 13  
   2.1 The evaluation process explained .............................................. 13  
   2.2 Initial needs survey ................................................................. 14  
   2.3 Powered mobility mat evaluation .............................................. 15  
   2.4 INS - support network ........................................................... 16  
   2.5 INS - implications of PM for the family .................................... 17  

3.0 Practical Evaluation ..................................................................... 19  
   3.1 Practical evaluation for new users of PM .................................. 19  
      3.1.1 Selecting the appropriate input device/method .................. 19  
      3.1.2 Guide for session for new users of PM ......................... 20  
      3.1.3 Progression of mobility development ............................. 21  
   3.2 Instructions for use of powered mobility trial - record sheet ......... 22  
   3.3 Practical evaluation for existing powered wheelchair users ......... 23  

4.0 Setting Up To Go ...................................................................... 24  
   4.1 Seating tips and tool kit ........................................................... 24  
   4.2 PM trials - the set-up procedure ............................................. 25  
   4.3 Basic electronic set-up of a powered wheelchair .................... 26  
   4.4 Setting-up alternate controls - how to connect ....................... 27  
   4.5 Troubleshooting .................................................................... 33  
   4.6 Programming .......................................................................... 33  

5.0 Prescription ................................................................................... 35  
   5.1 Powered wheelchair comparison table and instructions .............. 35  
   5.2 Comparing PWC components .................................................. 35  
      5.2.1 Performance analysis - based on drive wheel location ...... 38  
   5.3 Final prescription summary ..................................................... 41  

6.0 Funding Application ..................................................................... 43  
   6.1 Funding application information ............................................. 43  
   6.2 Funding application - example ................................................ 44  
   6.3 Funding application - template ............................................... 46
## Contents

7.0 **Equipment Delivery** ................................................................. 48  
  7.1 Equipment final delivery checklist ................................................. 48  
  7.2 Maintenance and care guidelines .................................................. 49  

8.0 **Skill Development and Supervision** ........................................ 51  
  8.1 A graded learning process plus tips for facilitating new powered mobility users .... 51  
  8.2 Developing a skill development program for PM .................................. 53  
  8.3 Measuring and recording performance (PM Performance Record) .................. 54  
  8.4 List of potential activities .............................................................. 56  

9.0 **Equipment Information** .......................................................... 58  
  9.1 Powered mobility control options explained ....................................... 58  
  9.2 Interfacing ...................................................................................... 62  
  9.3 List of equipment suppliers .............................................................. 65  

10.0 **Working with TASC (specialist referral)** ................................... 67  
  10.1 Referral process and flowchart ......................................................... 67  
  10.2 Levels of TASC input ................................................................. 68  
  10.3 Assessment procedure ............................................................... 68  
  10.4 Working with technicians and suppliers ........................................... 69  

11.0 **References and Websites of Interest** ....................................... 70  

12.0 **Appendices** ............................................................................ 73  
  12.1 Initial needs survey ......................................................................... 74  
  12.2 Mat evaluation for powered mobility ............................................... 80  
  12.3 Powered mobility trial record sheet ............................................... 82  
  12.4 PWC comparison table ............................................................... 84  
  12.5 Final prescription summary ......................................................... 87  
  12.6 Equipment final delivery checklist ............................................... 88  
  12.7 Maintaining your wheelchair ....................................................... 89  
  12.8 PM skill development program - examples 1 and 2 ......................... 90  
  12.9 PM skill development program form ............................................ 94  
  12.10 GAS factsheet ............................................................................ 96  
  12.11 PM performance record .............................................................. 97  
  12.12 PM performance record example .............................................. 100  
  12.13 GAS attainment T-score conversion table .................................... 103
## Glossary of Acronyms

<table>
<thead>
<tr>
<th>Acronym</th>
<th>Description</th>
</tr>
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<tbody>
<tr>
<td>ASL</td>
<td>adaptive switch laboratories (company)</td>
</tr>
<tr>
<td>CAS</td>
<td>Community Access Service</td>
</tr>
<tr>
<td>COG</td>
<td>centre of gravity</td>
</tr>
<tr>
<td>ECU</td>
<td>environmental control unit</td>
</tr>
<tr>
<td>GMFCS</td>
<td>gross motor function classification system for cerebral palsy</td>
</tr>
<tr>
<td>HDJ</td>
<td>heavy duty joystick</td>
</tr>
<tr>
<td>HHP</td>
<td>hand held programmer</td>
</tr>
<tr>
<td>ICF</td>
<td>International classification of Functioning Disability and Health framework</td>
</tr>
<tr>
<td>MACS</td>
<td>manual ability classification system</td>
</tr>
<tr>
<td>MAG</td>
<td>multi-adjustable growth (seating system)</td>
</tr>
<tr>
<td>PADP</td>
<td>Program of Appliances for Disabled People</td>
</tr>
<tr>
<td>PM</td>
<td>powered mobility</td>
</tr>
<tr>
<td>PWC</td>
<td>powered wheelchair</td>
</tr>
<tr>
<td>RESNA</td>
<td>Rehabilitation Engineering and Assistive Technology Soc. of North America</td>
</tr>
<tr>
<td>RJM</td>
<td>remote joystick module</td>
</tr>
<tr>
<td>RTA</td>
<td>Road and Traffic Authority</td>
</tr>
<tr>
<td>TASC</td>
<td>Technology solutions for computer Access, Seating and Communication</td>
</tr>
<tr>
<td>TIS</td>
<td>tilt-in-space</td>
</tr>
<tr>
<td>CPA</td>
<td>Cerebral Palsy Alliance</td>
</tr>
<tr>
<td>WHO</td>
<td>World Health Organisation</td>
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Powered Mobility: empowering participation

Powered mobility (PM) can fulfil an inherent human desire to be mobile. With mobility comes access to a world of possibilities, journeys to places, people and experiences.

Cerebral Palsy Alliance promotes powered mobility as a positive pathway toward participation in life.

**Powered mobility CAN:**

- Increase opportunities for participation in social, educational, work and leisure activities
- Build self confidence and self esteem
- Promote interest in other forms of mobility
- Promote and build independence in activities of daily living
- Enhance the development of cognitive and perceptual skills
- Be introduced throughout the lifespan
- Be motivating
- Be FUN!!
1.0 Introduction, Philosophy

1.1 Introduction

This manual was developed by a cross regional working party of Cerebral Palsy Alliance. It was initiated in response to findings made by TASC, following a survey of the organisation’s therapy staff. The survey was part of the Powered Mobility Project. A summary of the Powered Mobility Project can be viewed on Cerebral Palsy Alliance’s Intranet at http://connexions/intheknow/publ-int/powered_mobility.pdf

The aims of this manual are:

- To provide a common resource for therapists across Cerebral Palsy Alliance
- To improve consistency of approach toward supporting powered mobility
- To provide comprehensive guidance, direction and information on evaluation and intervention in powered mobility
- To provide consistent evaluation and intervention tools
- To empower therapists with the knowledge and skill to use powered mobility with confidence, so that more individuals have the opportunity to experience self initiated mobility.

1.2 Powered Mobility: Philosophy

‘…mobility … is an inherent characteristic of being human…’

(Kangas, 1997)

Access to powered mobility is a key intervention provided by Cerebral Palsy Alliance. Powered mobility promotes function and participation for people with cerebral palsy. Cerebral Palsy Alliance Centre philosophy on powered mobility is outlined below.

This section was developed by the Powered Mobility working party from the following sources: the Disability Services Act, 1993, the NSW Disability Service Standards, Cerebral Palsy Alliance policy STD S08:04:09 and the Powered Mobility Project, 2005.

- Where mobility is developing or restricting, powered mobility can provide the interface between the individual and their participation in the tasks and routines that make up everyday life.
- Powered mobility shall be equated to walking in its importance to provide equal access: to participate; to maximise potential; to make choices and decisions; to access information; to engage in education, employment, leisure and family life within the community.
- The use of powered mobility can be presented as a positive option throughout the lifespan.
- Powered mobility is a therapeutic tool in its own right. Powered mobility can be presented in early childhood to facilitate learning through increasing play opportunities with independent movement. Children have been shown to be able to use powered mobility equipment at a very young age.
- The introduction of powered mobility shall not be considered in terms of ‘readiness’ or ‘eligibility’ but rather as an opportunity to explore movement and develop skills.
- Powered mobility shall not be considered a last resort option, rather as a means to promote interest in various forms of mobility and to maintain mobility independence over time.
1.3 FAQs

The answers to some frequently asked questions related to powered mobility (PM) and its application are outlined below.

**Q** ‘Is there an assessment tool to check the ability of an individual to safely use PM?’

- There is no single assessment. It is important to use a functional approach toward assessment and intervention and to consider PM equipment equivalent to other assistive devices provided.

- Current thinking supports providing the opportunity to experience self-initiated mobility to as many as possible. PM is a global sensory experience, that can positively influence the development of cognitive, perceptual, social and emotional skills at many levels and not just in those that will go on to use PM functionally.

- Anyone with the motivation to move can be considered eligible; the challenge for the therapist is to match the technology to the individual’s set of skills.

- Care must be taken to ensure safety at all times. Structure must be put into place to support the skill development process, just as we do when small children are learning to use their legs.

- A committed support person or network is vital - without this, PM may not succeed as it is beyond the role of the therapist to supervise within daily life.

- There is no short cut - you must know your client and advise them appropriately, taking care to document your findings accurately.

**Q** ‘What are the cognitive skills needed to use a powered wheelchair (PWC)?’

- It is important we remember that the cognitive perceptual skills we are keen to pre-assess may not be well established because individuals with cerebral palsy, and other neurological conditions, may have had fewer opportunities than their more mobile peers to practise them. PM use can be linked with the development of these skills.

- Kangas, 1997, stated that the only pre requisite for the introduction to PM is the desire to be mobile. (This relates to initial introduction to PM not the more advanced functional use). The ‘desire to be mobile’ might be recognised as frustration in not being able to reach a desired toy, crying when the stroller stops or attempts to move along the floor. For the introduction of PM to succeed, the technology must be suitably matched to the individual’s skill level and supervision and skill development program must match that.

- One group in the US did a considerable amount of research into the cognitive skills that were needed to use a powered wheelchair. Based on Piaget’s skill domains (cause/effect, object permanence, problem solving, spatial relations, symbolic play) their research found that problem solving and spatial relations related most significantly to successful use of PM. (Tefft, Guerette, & Furumasu, J. 1999). The assessment developed was intended to identify more individuals who could be using PM. The authors conceded that it could unfortunately prevent access to PM for those whose skills were not evident at the time of assessment.

- The assessment is standardised for orthopaedic conditions, therefore, its use with cerebral palsy is limited.

**Q** ‘How old should the client be before we begin with PM?’

- Providing an individual the opportunity to try powered mobility does not lock the therapist in to providing a system. Opportunities provided as the individual’s interest and development suggests, will assist adjustment within the family for the possibility that there will be a PWC at some stage, potentially, before school age. The readiness of the support network must be carefully considered, as they will be ultimately responsible for ongoing skill development and supervision. (See Support Network, sect. 2.4, for more information).

**Q** ‘Do you have any guidelines or suggestions for putting together a program for developing PM skills?’

- Two good references for use in developing a PM program to suit the individual needs of your client are Kangas, 1997, and Janeschild, 1997, (see ref list, both from RESNA papers). Kangas provides guidelines and practical tips on working with PM based on her own practice. Janeschild provides a set of stage progressions to use in evaluation and skill development to guide the therapist.

- This manual has a Skill Development Program and a PM Performance Record for your use. (See Skill Development and Supervision Section 8.0).

**Q** ‘How do we determine how much time is required for a client’s powered mobility session?’

- Time frames need to suit the individual and be included in the client’s daily routine. It is quite realistic to set several 15 minute sessions in a day with new users (Kangas, 1997) and to build on as tolerated. Fatigue can cause loss of concentration and error which can result in a negative outcome, e.g. a crash. This can be avoided with careful monitoring and session planning.

**Q** ‘How do we determine and guide the length of the therapy intervention?’

- It is vital to set realistic goals to guide therapy and to clarify the expectations of all relevant parties at the beginning of the process.

- The setting of observable measurable and achievable goals will provide a framework to guide progress. The model used in this manual is the Goal Attainment Scale. (See Section 8.0 for more information).

- If the goals are not met within the set time frame, it is necessary to determine the reason, the realism of the goals and the outcomes reached. It may not be a failure if a client does not reach the goals set. They may need goals adjusted or made more specific.

**Q** ‘Why is it best to start with two switches with new users and conditions affecting motor control?’

- Beginning with one or two switches (left and right) provides the user the opportunity to experience independent mobility within a safe zone, free from collision, instruction and direction. This provides predictable, consistent control and success.

- Conversely, using a proportional control, e.g. a joystick, with no previous experience or impaired motor control (i.e. difficulty controlling muscle length and tension) provides uncertainty of speed and direction at every touch. This reinforces reliance on others to succeed and remain safe.

- Adding a forward switch too early may also reinforce reliance as correction and intervention from others is usually needed to ensure safety.

- Note: a reverse switch would not be introduced in the exploratory stage at all.

**Q** ‘My client is doing circles, will they ever become functional?’

- Experimenting with mobility in the exploratory stage often includes circling. Just as children enjoy and seek out spinning toys in the playground, it is appropriate for a person to continue circling for some minutes even when they have other directions to choose from. Just like learning to walk where further skills are continually built on to the first, mobilising in a powered wheelchair will become functional with time, practice and confidence.

- For some, progress past the exploratory stage to functional use may not be expected or achieved. In this case, it is important to re-examine goals and balance them with the individual’s motivation to continue, their enjoyment, outcomes etc and determine how and where PM should be placed. A system of their own may or may not be justifiable, but could a mobility group or a short term loan occasionally fulfil their goals?

**Q** ‘What do I do if I’m asked to do a risk assessment?’

- Generate a thorough set of supervision guidelines to support the needs of the individual in the environments the
wheelchair is used. Provide education on the process of supervision, structure through a skill development program and outcome measures via goal setting. Any risk assessment should be sourced, owned and completed by the service or program requesting it. Use a problem solving approach to negotiate any remaining areas of contention and remember to reinforce to others that mobility skills take time and support to develop, just like when we learn to walk.

Q 'If my client is going to use the powered wheelchair in the community, do they use the footpath or the road?' ‘In that case, do they need to be licensed?’

The RTA was consulted during the preparation of this manual and its written response to the above question was as follows:

Motorised wheelchairs and other types of disabled persons’ conveyances are exempt from registration and operators of these vehicles must comply with the same road rules as pedestrians. This is provided that they are used solely for the conveyance of a person with a disability that substantially impairs the person’s mobility and they are not capable of travelling at more than 10 km/h or weigh more than 110 kg.

• A person driving a motorised wheelchair under these circumstances is defined as a pedestrian under the Australian Road Rules and is permitted to travel on a footpath or nature strip adjacent to the road.

• Operators are not required to hold a driver’s licence.

• Motorised wheelchairs are not required to have third party insurance and in the event of an accident are covered by the nominal defendant.

• Wheelchairs weighing more than 110 kg and travelling more than 10 km/h cannot be used on a road or road related area.

(RTA, November, 2008)
2.1 The Evaluation Process Explained

Background information

Historically, ‘readiness’ or ‘eligibility’ for powered mobility (PM) was evaluated in terms of cognitive/perceptual prerequisite skills. This approach excluded potential candidates whose development was delayed due to lack of opportunity, access or practice. As stated by Hardy, 2004, ‘…it is likely that many skills previously considered prerequisites for mobility are actually developmental achievements occurring as a consequence of mobility.’

Current Cerebral Palsy Alliance philosophy encourages the matching of technology to the individual’s skill level, in combination with the appropriate intervention programming and opportunity to practise skill development within the daily routine. Cerebral Palsy Alliance philosophy was influenced by the literature and clinical experience of staff members.

The methods presented in this manual, should be sufficient to conduct a comprehensive powered mobility evaluation. Should further direction be needed, the following models could be useful to organise thoughts and practice and to provide structure.

- The International Classification of Functioning, Disability and Health (ICF) framework, World Health Organisation, (WHO) 2001 [www.who.int/classifications/icf/en/]
- The ‘Relational Model of Wheelchair Mobility’ proposed by Routier, Vincent, Desrosiers and Nadeau, 2003.

Participation is a key element in the ICF framework. The ICF describes the situation of a person within health domains and the functional implications of health conditions. Central to the ICF is the idea that disability is a universal experience, in which there is a complex and dynamic relationship between an individual’s physical body functioning and structures, activities and participation, and personal and environmental factors. (WHO, 2001)

The Occupational Performance Model, is similarly broad and can be used to provide structure for occupational therapy intervention, whereas the Routier model was specifically designed around the evaluation of wheelchair mobility, manual or powered.

The benefit in referring to the models and references is to gather background information to enhance understanding of the process and the many interacting components.

The aims of evaluation

1. Identify need (motivation, functional needs, e.g. roles and routines, potential goals)
2. Identify person skills and limitations relative to powered mobility (use 2.2 and 2.3)
3. Identify environmental elements of importance, i.e. assets, barriers. (record in 2.2)
4. Examine the technology available (refer to 9.0).
Expected outcomes of comprehensive evaluation

1. Accurate matching of technology to skills of user
2. Guide to building skill development program

The process of evaluation

| 1. Information gathering                           | Initial Needs Survey (INS) (Section 2.2) |
| (from referral, file, client, support network)    | PM Mat Eval (Section 2.3)                |
| 2. Practical evaluation                           | Equipment trials (Sections 3.0 and 4.0)  |
| 3. Evaluation of equipment                        | Comparison and prescription of equipment (Section 5.0) |

2.2 Initial Needs Survey (INS)

The Initial Needs Survey (INS) form provides a record of the information gathered regarding personal attributes and environmental factors related to powered mobility use. The information would be gathered from referral, client file and initial interview.

The INS can be used as a guide to conduct an initial interview, however, the statements included on the INS were designed as prompts for the interviewer rather than questions to be presented directly to the client or support person.
Initial Needs Survey will cover:

- **Goals/history** - goals and expectations, current mobility, PM history, experience, transfers
- **Client information** - co-existing conditions, medication, past or planned surgery, other technology used, activities, likes and dislikes
- **Support network** - carer details, carer needs (see Section 2.4)
- **Physical** - posture, seating needs, switch sites, fatigue
- **Sensory/communication** - vision, hearing, speech, sensation
- **Cognitive/perceptual/ behaviour/psychological** - observations
- **Home** - type, access, turning space, storage, charging
- **Other environments** - work, school, leisure, access, terrain
- **Transport** - type, access, restraints

View Powered Mobility Initial Needs Survey - Appendix 12.1

The assessment interview will generate information to assist in completing a service plan.

**Guide to completing the INS:**

- Complete client details at the top right.
- Begin working down the left side. Use the spaces in left column to record the information gathered.
- The action/implication column, on the right, contains prompts for referrals to other agencies and further information to be collected.
- Add your own actions or implications to this column as you go. These will function as reminders of areas to follow-up.
- Space has been left for further notes at the end.

### 2.3 Powered Mobility Mat Evaluation

The PM mat evaluation aims to identify a person’s physical skills and limitations specifically related to accessing a powered wheelchair control system.

**Practical tips:**

Prepare the room with plinth, hoist, tool kit (for tool kit, see Section 4.1)
Ensure sufficient hands and assign roles so that everyone is clear on their part, e.g. during transfers, positioning and on plinth.

PM Mat Evaluation will cover:

- **Body measurements.**
- **Joint range of movement** - hip flexion, knee extension.
- **Physical function.**
  - GMFCS score, MACS score, muscle tone, primitive reflex activity, motor control, i.e. stability and control for PM use. Trunk, head, UL, LL.
- **Postural observations.**
- **Postural support components required.**

View Mat Evaluation for Powered Mobility - Appendix 12.2
Guide to the Mat Eval process
(Note: seek senior staff assistance if unsure, as a thorough mat evaluation is essential for a successful outcome)

- Record GMFCS and MACS scores from client file, or refer to www.canchild.ca/en/measures/gmfcs.asp and www.macs.nu

- Transfer to plinth, take body measurements, measure joint range (passive), evaluate muscle tone, note sitting balance, head control, hand function, impact of primitive reflex activity and motor control for access to PM.

- Postural observations - (page 2) record position of key body parts in sitting position (preferably on plinth) circle these and record any further information in the column to the right. This information is useful in order to position client for PM and/or to communicate postural needs later, e.g. when referring to a specialty service.

- Postural components required - note the components required to support client in optimal seated position for use of PM. This information is useful when replicating supports over successive sessions. Tip: check location of current supports and note where hands are placed to stabilise client in upright sitting (on plinth).

- Tilt-in-space - note whether T-I-S is advantageous, contra-indicated or untried and any further detail such as preferred tilt angle.

At this point the therapist should have sufficient information to decide whether a specialist referral is necessary or whether to proceed to practical evaluation (Section 3.0).

Tip: Transfer key details from INS, mat evaluation, site visits and practical trials directly to the Powered Wheelchair Comparison Table (Section 5.1), so they won’t be overlooked later. Print on coloured paper to make it easy to find in the file.

PM Practical Evaluation, Trial/s
See Section 3.0 of this manual for full details on ‘Practical Evaluation’.
See Section 4.0 ‘Setting Up To Go’ of this manual for tips on how to set up seating, alternate controls and how to program the powered wheelchair.

2.4 INS - Support Network
(Note: This page further explains ‘support network’ in the INS 2.2)

In order for the process of developing PM skills to be successful, the individual will require a level of support. The people involved in providing this support, including parents, teachers, carers etc, may be referred to as the individual’s support network. For a support network to be effective in supporting an individual to develop PM skills, supporters must have regular contact with the individual in daily life settings.

After appropriate PM equipment selection and provision, it is the readiness of the support network to accept and integrate PM into the daily routine that will largely determine the success or failure, use or abandonment of the powered wheelchair. For example, an individual may be perceived to have excellent potential to develop independence using PM but may not succeed due to limitations within the support network. Such limitations may be: time, interest, enthusiasm, confidence, etc., all of which may have a negative impact on PM skill development for an individual. Conversely, an individual with a more limited initial skill base, may indeed achieve independence with regular, short periods of practice under the guidance and encouragement of a well equipped and highly motivated support network.

Recommendations
Should an individual’s support network be evaluated as limited, globally or in a particular setting, it may still be possible for that individual to be exposed to PM experiences and attain a level of independence using one of the following strategies:
• Identifying specific environments where support is available, e.g. school, community access service, therapy sessions.

• Considering other mobility options first (depending on the physical abilities of the individual, e.g. TAD modified bike, walker).

• Utilising skills training groups, provided in a suitable, accessible environment and implemented by a motivated and well supported facilitator.

• Collaboration with support person(s), examining needs, acknowledging issues and working with them to determine suitable strategies.

It is important that therapists within Cerebral Palsy Alliance promote PM as a positive option for clients to consider throughout the lifespan. However, it is equally important that the limited resources available (including time and funding) are used where they can have the most positive impact. Effective and timely evaluation of the capabilities of the support network will assist to determine appropriate resource allocation and to optimise the PM outcome for the individual child or adult.

2.5 INS - Implications of PM for the Family

(Note: This page needs to be considered along with the INS)

An important consideration when approaching powered mobility with families is the wider implication or the impact it may have on daily life. Elements of the environment feature strongly and should be considered early in the evaluation process. Potential environmental assets and limitations should be identified in order to target intervention. Some examples to consider include:

• Access, indoors and out
  Is there access to and from the home? Is a ramp needed? Is there sufficient space within the home (bedroom, bathroom, toilet) to turn a full circle? Is the height of the dining table, bed or toilet workable? Are modifications likely to be needed? Would modifications be possible?

• School/work site
  Is there access to and from the building? Is there turning space within? Are ramps/modifications needed?

• Leisure pursuits
  Is there access to the same recreational activities with a powered wheelchair? Are ramps/modifications needed? Are there features that need to be added or changed to enable greater participation?

• Transport
  How is the powered wheelchair going to be transported? Is a modification or an upgrade needed? Where do you access information on accessible vehicles or modifications? Is there school transport? Is public transport an option? How do you get taxi vouchers? Are ramps or a hoist needed?

• Other technology
  Will a communication device fit on the powered wheelchair? Can it be interfaced with the powered wheelchair controls? Can the computer be accessed in this way? Can other environmental controls be accessed?

Recommendations

Consider the above and discuss with the team and support network as appropriate. The information is useful in the early stages of considering PM, not to exclude, but to ensure that informed decisions are made and the best possible results are achieved.

Information sessions for parents and carers regarding practical aspects of using a powered wheelchair in the home and community, have been successfully run at Cerebral Palsy Alliance locations. They have been useful in empowering individuals and families to overcome obstacles and successfully integrate use of a powered wheelchair in their daily lives.
3.0 Practical Evaluation

3.1 Practical Evaluation for New Users of PM

Practical sessions assist in determining the best possible method for the client to control the powered wheelchair. Practical sessions also provide information to assist with the prescription stage. Key information for the practical evaluation is in the box below.

**PM Practical Evaluation - Starter Guide**

1. Determine which equipment, incl. input device, to start with (see Section 3.1.1)
2. Equipment: Organise the loan of equipment (Cerebral Palsy Alliance or supplier) for trial sessions, plan this prior to confirming the appointment to ensure availability.
3. Check equipment is in working order, including alternate controls and any other equipment you may use during the session.
4. Set up seating, alternate controls and programming of the powered wheelchair in preparation for your client (see Section 4.0 - ‘Setting up to go’)
5. Record performance observations on the Powered Mobility Trial - Record Sheet (Section 3.2). Use one record sheet for each trial session. (For Instructions on how to use the PM Trial - Record Sheet, refer to Section 3.4)
6. Organise to take video or photos to review the session later.
7. Several sessions may be required over a period of time to complete the evaluation and subsequent equipment prescription. Transfer all key prescription requirements onto the Powered Wheelchair Comparison Table as they arise (Section 5.1).

### 3.1.1 Selecting the appropriate input device/method

- Use data from the INS and PM mat evaluation to identify strengths and potential difficulties.
- To decide whether to start with non-proportional or proportional control, see table below for some simple indicators. If in doubt, start with switches.

<table>
<thead>
<tr>
<th>Non-proportional, e.g. switches</th>
<th>Proportional, e.g. joystick</th>
</tr>
</thead>
<tbody>
<tr>
<td>Preschool age</td>
<td>Functional use of at least one limb</td>
</tr>
<tr>
<td>Limited mobility experience</td>
<td>Mobility experience, e.g. walker, bike</td>
</tr>
<tr>
<td>Limited communication</td>
<td>Direct access method for computer / communication device</td>
</tr>
<tr>
<td>Limited access to other devices</td>
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</table>
For definitions of proportional control and non-proportional control - see table below.

**What is the difference between proportional and non-proportional control?**

**Proportional control** offers direct 360° control, i.e. movement in every direction, plus variable speed, i.e. the further from centre the joystick is pushed/deflected, the faster the wheelchair will go (to a set maximum). A common proportional device is the joystick.

**Non-proportional control** allows the wheelchair user to move the wheelchair using a switch or several switches located anywhere that can be accessed consistently. Non-proportional control is indirect, i.e. each switch provides a set direction plus a set speed. Non-proportional control provides access to self-initiated movement for individuals for whom proportional control is not an option.

- For those in between these two groups, begin with non-proportional control. Trial proportional when control of direction and obstacle avoidance are occurring more consistently. For many reasons, some users will continue with non-proportional control. This shouldn’t be seen as failure, as they can become just as mobile and proficient as those with proportional control. Note: most head arrays are non-proportional.

- If the client has used a particular device previously, begin with a performance observation of the client using the familiar device. Where the device was unsuitable, begin with a less challenging device or an alternate site with the same device.

- Consider both the physical and cognitive demands of the input device, for example, scanning devices are non-proportional (single switch activation) with low physical demand and very high cognitive demand.

- Prepare alternatives but avoid introducing more than 2-3 devices in a single session.

- Section 9.2 details the devices available, both non-proportional and proportional.

### 3.1.2 Guide for session for new users of PM

- Set up room, clear obstacles and ensure a safe environment.

- Encourage movement in a non-directive way and promote independent interaction with the system.

- Consider setting up activities around the room that may attract the client’s attention and encourage interaction with the environment, e.g. streamers or fabrics to move through, balloons, bubble wrap, large posters to examine, bubbles to chase, therapy balls to move. Be creative. (See Section 8.4).

- Activities or materials used must be considered for appropriateness to age and interest.

- Allow time for client to explore the movement and to concentrate; silence is ok, circling is ok.

- Alter the position of the access device and supports to improve control as required, but avoid excess fiddling.

- Supervise closely. Know where the ‘off’ button is in case an assisted stop is needed.

- Consider connecting a switch to the master remote (on/off port at the rear) to allow an attendant to carry the stop switch whilst walking behind client.

- Remind supporters not to distract, direct or instruct. Encourage supporters to comment on what the person has done, i.e. ‘wow, you’ve turned around’, ‘now you’ve stopped’, which reinforces the action achieved and therefore, contributes to learning.

- Be alert to signs of fatigue. Include rest breaks as fatigue can lead to error, frustration and fear.

- If possible, change controller during a rest break.

- Choose a time or activity to end with success and leave a positive impression.

- Remember that it may take several sessions to learn to use a particular device.
3.1.3 Progression of mobility development

By the end of the practical evaluation it should be possible to use the following stage progressions presented by Janeschild (1997) to categorise performance observed. This system can assist to clarify expectations, both for evaluation and for designing a skill development program following prescription (Section 8.0).

The stages are explained in point form below:

Stage I: Exploratory

- Exploring mobility in a physically safe and motivating environment
- First learning HOW to control the device, moving through space, impact on environment
- Trial and error used by supervisor to identify strategies and activities to guide movement in an organised direction
- Client is not expected to move directly to a target but will organise movements to attempt to move to general area of target
- Verbal feedback should introduce simple mobility concepts only
- Minimise verbal directions
- Maximise fun so client can discover own solutions and method of control to achieve desired outcome.

Stage II: Directive

- The directions of Stage I still apply
- Client now ready to modify, adjust and alter the PM device to move to target and negotiate obstacles
- Verbal feedback should include assistance such as ‘push the switch longer…’
- Still no directions/commands.

Stage III: Purposeful

- Ready to apply PM skills in a contained environment like home or school
- Learning to negotiate around more specific constraints
- More than fun - now to achieve basic daily needs using independent mobility.
3.2 Instructions for Use of the Powered Mobility Trial - Record Sheet

Powered Mobility Trial Record Sheet - Appendix 12.3

• Complete client details at the top right.

• Controller/device evaluated - list the controllers compared during the session. It is usual to limit the number of changes of equipment to 2-3 per session.

• Note the wheelchair that was used, as this may change between sessions.

• Note start and finish times to monitor fatigue and to compare performance at different times of day.

• Positioning - record all of the postural components and the items (e.g. foam, straps) added to position the client for the session (it may differ from the needs recorded in the mat eval). This is to ensure it can be replicated. The location of controller/device should also be recorded. Measurements for these may be extremely useful.

• Basic Mobility - consider basic ability to make the PWC ‘GO’ and ‘STOP’. This will be most important during initial trials and trials with very young children. Comment on client’s understanding of cause and effect, plus awareness of spatial relations, their contact with the controller/device, problem solving plus other influences observed, e.g. tone, primitive reflexes, effort required, head position, visual influences. Stopping will be of particular interest as it is required for functional use of a powered wheelchair. Record client’s method of stopping/release of controller device, whether they can stop when requested and/or in response to an obstacle.

• Directional control - this may or may not occur in the first sessions depending on the client and their response to stop and go. Comment on client’s ability and interest in choosing direction and their use of this skill to access, or turn the PWC toward, objects of interest.

• Motivation - comment on the client’s mood, affect, interest and emotional investment in the trial and their perseverance during difficulty. Note any motivators to which the client responds.

• Postural observations - comment on the posture maintained by client throughout the session, comment on effect of fatigue, change in tone, stability and comfort issues.

• Difficulties - note any particular difficulties or concerns held by client or team members and any suggestions to overcome these in subsequent sessions.

• Plan for next session - itemise equipment, position, activities to trial in the next session.

Tip: Once the most appropriate access method/controller has been determined, the PM Skill Development form and PM performance record (section 8.0) can be used to set goals to measure progress during future sessions.
3.3 Practical Evaluation for Existing Powered Wheelchair Users

Changes in wheelchair performance skills as well as the need for upgrading wheelchair and access equipment will necessitate re-evaluation with existing powered wheelchair users.

Re-evaluation would begin as a new evaluation would, with the gathering of information. The therapist would examine performance and issues around any change of skills, using a problem solving approach.

Questions to consider with regard to changing skill levels are:
• What is working and what is not?
• What do we need to maintain?
• What is the reason for the change observed? e.g. bone/joint change, vision, recent events, deterioration of condition.
• What are the future expectations for the change observed?
• Do we need a specialist opinion?
• Can we modify the existing equipment or do we need to start again? (Keeping in mind that one change often causes another.)

Where appropriate, and where technically possible, modification to the existing equipment may resolve skill change difficulties.

All equipment has a lifespan, which is directly proportional to the amount of use it gets, the wear and tear, minus the maintenance it receives. When equipment needs to be completely updated, the evaluation would begin from the start with a new INS and PM Mat Evaluation to capture any change in needs. The process would follow that used to prescribe a new system.
4.1 Seating Tips and Tool Kit for Setting Up

The following is a set of useful tips to prepare the therapist for the task of securing a client in a demonstration or trial powered wheelchair. The challenge is to manipulate the temporary (if not using their own) seating supports to provide optimal posture to trial the chosen controller/access method. It is worthwhile to note that without the optimal seated position, the person will not be at the best mechanical advantage to access the device to effectively mobilise in the wheelchair.

Refer to the diagram on the next page for a quick overview of the steps involved in the seating set-up process.

Seating tips

- Do as much of the set-up as possible before the client arrives, using the body measurements and postural needs listed in the PM Mat Eval.
- Prepare alternatives.
- When the client arrives, review PM Mat Eval details on plinth. (Use this step to check for growth or change if much time has elapsed between appointments).
- If support needs are high, ensure you have extra hands for the session (2-3).
- Seat calmly and firmly; insecurity can cause anxiety and increased muscle tone.
- Have straps in position, ready for use.
- Readjust seating supports to secure.
- Use tilt-in-space to assist with positioning and posture in seat - check with client/advocate first.

The box below details the tool kit suggested for PM trial adjustments.

---

**Tool Kit**

<table>
<thead>
<tr>
<th>Tape measure</th>
<th>Thoracic supports, curved backs, commercial cushions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Straight rule or TASC calipers*</td>
<td>Foam wedges and blocks</td>
</tr>
<tr>
<td>(see below)</td>
<td>Masking tape</td>
</tr>
<tr>
<td>Goniometer</td>
<td>Tray for forearm support</td>
</tr>
<tr>
<td>Inclinometer (to measure seat</td>
<td>Mounts for equipment or supports</td>
</tr>
<tr>
<td>angle from the horizontal)</td>
<td></td>
</tr>
<tr>
<td>Tools (such as Allen keys in</td>
<td></td>
</tr>
<tr>
<td>metric and imperial, adjustable</td>
<td></td>
</tr>
<tr>
<td>spanners, socket set, screwdrivers)</td>
<td></td>
</tr>
<tr>
<td>Hook-and-loop fastener and</td>
<td></td>
</tr>
<tr>
<td>scissors</td>
<td></td>
</tr>
<tr>
<td>Straps (pelvic belt, foot straps,</td>
<td></td>
</tr>
<tr>
<td>chest harness, forearm cuffs,</td>
<td></td>
</tr>
<tr>
<td>shin/calf)</td>
<td></td>
</tr>
<tr>
<td>OR TASTrap* can be used in any of</td>
<td></td>
</tr>
<tr>
<td>the above places</td>
<td></td>
</tr>
</tbody>
</table>

* TASC calipers - Wooden arms with central wing nut to capture accurate width for measurement Supplied by TASC Equipment Services.

* TASTraps - TASC Assessment Straps are a length of webbing with a plastic buckle which loops around the wheelchair and client to hold the two securely, during a trial session. Could also be used around an arm or leg or in front of shins. Supplied by TASC Equipment Services.
4.2 Powered Mobility Trials - The Set-up Procedure

Follow the steps below to seat securely for powered mobility trials:

1 Examine posture and joint range
Use PM Mat Eval (Section 2.3)

2 Use body measurements from PM Mat Eval
to adjust seat size and angles on trial chair and attach appropriate supports.

3 Secure using Postural Support Hierarchy
Provide hands-on support at key points to stabilise.
Apply seating supports and straps to secure; begin with pelvis as shown below.
Foam wedges can provide additional support where needed, e.g. trunk, thighs, knees, upper limbs.

4 Tilt-in-space
Adjust tilt-in-space for posture and vision.

5 Mount access device/controller
This will be specific to the individual, the device, mounts and location
Start simple, adjust to suit. Don’t over-fiddle
Take measurements for follow-up sessions.

6 Use Powered Mobility Trial - Record Sheet, (Appendix 12.3)
Take photos, video
Record data for further sessions.
4.3 Basic Electronic Set-Up of a Powered Wheelchair

The diagram below looks complex, but all you need to know is that for a powered wheelchair to work it needs to have a battery, two motors (one for each drive wheel), a power module to plug everything into and a master remote to control it all. Alternate, or secondary, controllers are additional to the master remote and need to be connected to the power module (or the master remote).

The Penny & Giles electronics system, above, is one type used, others are listed below. Diagram source: http://www.pgdt.com/products/r-net/index.html

**Control systems**

There are several types of PWC electronics (or control) systems on the market, such as;

- **Dynamics** [http://www.dynamiccontrols.com]
- **Penny & Giles** [http://www.pgdt.com/]
- **Invacare** [http://www.invacare.com.au]
- **Delphi** [http://delphimedical.com/oem/mobility/]

It is important that the alternate controls you select are compatible with the control system.
4.4 Setting Up Alternate Controls - How to Connect

Each service location will have different PM equipment, ranging in age, model and brand. It is beyond the scope of this manual to describe the set-up method for each access device/controller and PWC.

It is proposed that this section be used as a reference to set up individual ‘HOW TO’ sheets for each piece of equipment at each service location.

First you will need to:

• Determine the make and supplier of the equipment present
• Establish how to use the equipment either from staff who already know or from direct contact with the supplier - organise a training session with the supplier if needed
• Photograph your equipment at each step taken to set it up
• Use point form instructions next to each photograph.

The following are examples of ‘HOW TO’ guides developed by TASC. Instructions were based on the Rollerchair Trailblazer with Dynamics electronics.

As well as providing a template, these pages also provide useful information on the devices demonstrated. There are information boxes, like the one below, included throughout.

CAUTION: Remember to switch the master control unit OFF prior to plugging in or unplugging any secondary remote.

Master Remote Unit
(usually the standard joystick)

A master remote or joystick unit can be of many different varieties/brands. Examples are the ‘Dynamics’ G80 and the newer G90. The master remote can be mounted to the left or right for the user to access or at the rear for an attendant to control. Dynamics information and manuals can be found on the website. http://www.dynamiccontrols.com/index.cfm/1,91,html/DX-master-remotes

Note: There must always be one master remote on the wheelchair for it to operate.
How to connect a master remote unit (usually a joystick) to the Powered Wheelchair (PWC)

1. Plug one end of a bus lead (a power cable - straight or curly) into joystick at rear.

2. Plug other end of bus lead into the power module located at the rear of PWC.

3. Switch master remote ‘ON’ using the ‘ON’ button on the face of the controller. If it doesn’t turn ON it may be ‘locked’. You may need to swipe a magnetic key across the unit. (See product instructions).

4. If the PWC does not respond, check if PWC will move when a different mode is selected, i.e. 2, 3, 4, 5. A Hand Held Programmer (HHP) may be needed if the PWC is programmed to respond to a secondary control device. See the troubleshooting guide at the end of this section or access the product instructions.
How to connect
Remote Joystick Module (RJM) - a proportional control unit

An RJM would be used in addition to the master remote unit when space at the access site will not accommodate the master unit, e.g. the RJM can be mounted as a chin control, a foot control, within a tray or as an attendant control at the rear of the PWC. It is a proportional control unit, therefore, provides direct input to speed and direction.

1. Turn PWC ‘OFF’ using the master remote.

2. Plug RJM cable into the power module at the rear of the PWC, as shown below.

3. Master remote must remain on the PWC and ‘ON’ in order to use RJM (position not important).

4. Mount RJM into a tray mount cradle or other mounting system, e.g. Fisso, Bodypoint, Universal.

5. PWC may need to be programmed using an HHP to accept input from RJM in priority to the master remote (see troubleshooting guide at end of section or refer to product instructions). Plug HHP into port in master remote to begin programming, turn master remote ON. Find ‘joystick source’ and switch ‘local’ to ‘remote’ within the mode you will be using (eg. 1-5).

6. Before unplugging HHP, turn master remote ‘OFF’ and ‘ON’ again or ‘Save’ to accept addition of RJM and check directions are correctly assigned - (if not, see troubleshooting guide at the end of this section or refer to product instructions).
How to connect
SWITCH systems

The switch interface allows use of up to five single switches. Switches are non-proportional, providing momentary access to a set speed and direction per switch.

1. Turn PWC ‘OFF’ (master remote).

2. Select switch interface, pictured below left

3. Plug one end of a bus lead (curly pictured) into the switch interface and the other into the power module at rear of PWC, pictured below right.

(If the power module has no available space, you can plug the bus lead into rear of master remote as either will work).

4. Connect ‘Dynamic 5-1 switch adaptor’, as pictured below left and middle, into switch interface.

5. Plug each switch into 5-1 switch adaptor port (white tags indicate direction or function, F, R, L). Make sure you push the pin in ALL the way, must click loudly, pictured below right.

6. PWC may need to be programmed with HHP to accept input from switches in priority to master remote (see troubleshooting guide at end of section or refer to product instructions). Plug HHP into port in master remote to begin programming, turn master remote ON. Find ‘joystick source’ and switch ‘local’ to ‘remote’ within the mode you will be using (eg. 1-5).

7. Before unplugging HHP, turn master remote ‘OFF’ and ‘ON’ again or ‘Save’ to accept addition of RJM and check directions are correctly assigned - (if not, see troubleshooting guide at the end of this section or refer to product instructions).
How to connect
Multi-switch units - e.g. wafer board

1. Plug Wafer board 9-pin plug into the switch interface (in place of 5-1 adaptor). See below left.

2. Plug one end of bus lead into rear of switch interface (already plugged in, as shown above left). Plug the other end of bus lead into the power module at the rear of PWC. See above right.

3. PWC may need to be programmed with HHP to accept input from switches in priority to master remote (see troubleshooting guide at end of section or refer to product instructions). Plug HHP into port in master remote to begin programming, turn master remote ON. Find 'joystick source' and switch 'local' to 'remote' within the mode you will be using (eg. 1-5).

4. Before unplugging HHP, turn master remote ‘OFF’ and ‘ON’ again or ‘Save’ to accept addition of RJM and check directions are correctly assigned - (if not, see troubleshooting guide at the end of this section or refer to product instructions).

Dynamics have a four and a five switch interface (the four is in the picture above left and the five in the pictures below). Multi-switch units such as the Wafer board can be plugged into either switch interface. The five switch interface provides access to on/off or mode functions in addition to four directions.
How to connect
the Heavy Duty Joystick (HDJ) - a non-proportional system

1. Turn PWC ‘OFF’ using master remote.

2. Connect HDJ with a bus lead to the power module at the rear of PWC or into the rear of the master remote.

3. PWC may need to be programmed with HHP to accept input from switches in priority to master remote (see troubleshooting guide at end of section or refer to product instructions). Plug HHP into port in master remote to begin programming, turn master remote ON. Find ‘joystick source’ and switch ‘local’ to ‘remote’ within the mode you will be using (eg. 1-5).

4. Before unplugging HHP, turn master remote ‘OFF’ and ‘ON’ again or ‘Save’ to accept addition of RJM and check directions are correctly assigned - (if not, see troubleshooting guide at the end of this section or refer to product instructions).
4.5 Troubleshooting

If PWC doesn’t go?
1. Check PWC is charged
2. Check wheels are IN GEAR (see centre hub of drive wheels, or lever)
3. Check all cables are fully plugged in
4. Check the joystick is in the neutral position before turning ‘ON’. (i.e. not being pushed by user)
5. Check ‘joystick source’ on Hand Held Programmer (HHP) is correct for ‘local’ (master remote) or ‘remote’ (secondary source) in the program you are using, i.e. 1-5 speed. (for Dynamics)
6. Check you have turned PWC ‘OFF’ and ‘ON’ again or ‘save’ to register any changes made
7. (For Dynamics) If the light near the ‘ON’ switch is flashing, count the number of flashes in a row before it pauses. Check this number in the Dynamics DX flash codes table for a clue as to the problem. http://www.dynamiccontrols.com/index.cfm/3,73,237/aust-flash-codes-0307.pdf
8. If PWC still won’t go, check with PWC supplier for further suggestions.

If directions are reversed?
1. If forward and backward directions are incorrect – use HHP, access ‘change joystick direction’ and reverse the option. (for Dynamics).
2. For left and right - check master remote is ‘OFF’, find the left and right motor connectors and reverse. (Locate leads plugged into power module, see diagram Section 4.3, un-plug, cross them over and plug into opposite port). Note: may not be possible with every PWC.
3. For further assistance - contact PWC supplier or access operation manual online.

4.6 Programming

Properties
The electronics system can be programmed using a Hand Held Programmer (HHP) or a computer based programmer, e.g. Wizard for Dynamics. This means that the properties of the movement or the response of the powered wheelchair can be altered to suit the client. Each operating system will have its own HHP and software. Some examples of what can be programmed are:

<table>
<thead>
<tr>
<th>Speed</th>
<th>fwd, rev, turning</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acceleration</td>
<td>fwd, rev, turning</td>
</tr>
<tr>
<td>Deceleration</td>
<td>fwd, rev, turning</td>
</tr>
<tr>
<td>Scan function</td>
<td>system can be programmed to operate using a single switch, plus inclusion of seat function and horn on switch operation</td>
</tr>
<tr>
<td>Joystick source</td>
<td>whether the PWC responds to the master remote (local) or to a secondary controller (remote), e.g. switches</td>
</tr>
<tr>
<td>Joystick direction</td>
<td>can be changed to pull back to go fwd and push for reverse</td>
</tr>
<tr>
<td>Throw</td>
<td>joystick can be calibrated to require less deflection (or travel) to reach full speed, for people with reduced strength or range</td>
</tr>
<tr>
<td>Sensitivity</td>
<td>can program PWC to respond less sensitively, i.e. to reduce the effect of a tremor</td>
</tr>
<tr>
<td>Torque</td>
<td>can improve PWC power on hilly terrain, steep inclines</td>
</tr>
</tbody>
</table>

For further information on programming, see your wheelchair supplier for guidance.
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5.1 Powered Wheelchair Comparison Table

The PWC Comparison Table - Appendix 12.4 was developed to provide the therapist with a means of comparing and recording details on the powered wheelchairs trialed with suppliers. The table will assist the therapist to sort through the list of needs and wants and set priorities. The table will also simplify comparison by prompting the therapist to seek the same information from each supplier. Compromise is inevitable; it is vital that the choices made are well considered and agreed upon by the team, including client. Further instructions follow:

• Complete client details at the top of each page.
• Use the list in the left column as a guide or set of examples of areas that you may need to compare.
• Use the ‘specific component’ column to record the specific item or function chosen for comparison, from the more general list to the left.
• **Important** - tick whether the item or function listed is ESSENTIAL OR DESIRABLE for your client. The key purpose of this table is to assist the therapist and client to determine essential items from desirable items, to ensure the best possible match of base and individual requirements.
• The top boxes of the columns on the right are for therapist to record the powered wheelchair being compared and the supplier for each. Only three comparison columns have been included, add further pages to compare more than this.
• As each powered wheelchair is compared, date the column and progress downward to detail and record how the listed features presented during the session.
• Add any additional features for comparison to a blank row on page 2.
• See Section 5.2 for further description of the features referred to in the left column of the PWC Comparison Table.

5.2 Comparing PWC Components

When prescribing (or scripting) a powered wheelchair, it is inevitable that compromise will be made because every feature is not available on every chair. In order to decide between features that are essential to the user and which are desirable, the following categories from the powered wheelchair comparison table have been given more detail, tips and examples below.

**Compatibility with seating**

The seating type, size and function need to be established prior to decision-making concerning the powered wheelchair. It is essential that the two are compatible. For example, commercial mounting hardware must match the gauge of the back and seat canes, the seat size must suit the wheelchair frame, otherwise the wheelchair should be growth adjustable. Examples of incompatible function would be, swing-away thoracics that clash with the position of backrest canes, flip-up armrests for transfers blocked by shaped hip blocks or a flip-down pommel that interferes with a centre-mounted footplate.
Drive wheel location
The classification of powered wheelchairs by drive wheel location is as follows:

1. ‘Centre wheel drive’ (CWD) (replaced mid-wheel drive - MWD) refers to a powered wheelchair with the drive wheel located directly beneath the user’s centre of gravity (COG).

2. The term ‘high ratio’ - a Front Wheel Drive (FWD) or Rear Wheel Drive (RWD), where a large percentage (e.g. 85%) of the person’s weight is over the main driving wheel of the chair because the drive wheel is located just in front or just behind the person’s COG (previously also regarded as a MWD chair).

3. The term ‘low ratio’ describes FWD or RWD where the drive wheel is either right at the front or at the rear of the chair. It was estimated that approximately 60% of the weight is on the drive wheel in this arrangement.

Analysis tables of indoor and outdoor performance based on the location of the drive wheel can be found in section 5.2.1.

Manoeuvrability / turning circle
Measure the turning circle of the chair and compare this with the space available to the client. Consider indoors and outdoors at home, day location and places visited regularly. Access to places of importance to the client and their support people is essential.

Suspension
Suspension refers to the shock absorption system fitted to the PWC. Check what it is and how it works.

Growth
Growth should be considered, sometimes into the early 20s. Most powered wheelchairs have growth adjustment inbuilt. Growth components can be useful not only for increase in size of long bones but for change of width or style of seating.

Width and length
Record the width, length, height (footprint) of each powered wheelchair trialled, for reference when scripting. This can be useful for questions relating to access.

Tyres
There are many sizes, treads and compositions to choose between. Larger tyres may travel over uneven ground better whereas smaller wheels are more space efficient when turning. The tread chosen should suit the terrain being travelled over, e.g. rough tread will grip better on uneven surfaces, smooth tread has less resistance and will glide more smoothly over indoor surfaces such as carpet. The composition of the tyre is usually of three types, solid rubber, air or a puncture-proof substance like a gel or honeycomb that can provide suspension similar to air and be maintenance-free like solids.

Castors
Like tyres, castors differ in height, width, tread and composition (see explanations above). Record the style used on the trial wheelchair for reference and select the set that most suits the user’s requirements. In doing this, it is also important to consider the relationship between the castors and the drive wheels to ensure compatibility, e.g. sizes must suit, otherwise power efficiency will be compromised. Check if there is any choice of forks (component that connects castor to chair) available. Strength, size and suspension may be variable.

Armrests
The armrest style and strength must reflect function, e.g. flip-up arms will suit side transfers but not forearm cuffs to secure arms. The strength and number of points of attachment must be noted and related to the user’s requirements for any additional attachments or retro fittings, such as an arm trough, straps, tray. The length and width must be considered for support plus function such as access under a table.

Footplates
The angle of the hanger is vital for positioning. Tight hamstring muscles are common. Position hamstrings off-stretch, that is, heels beneath knees, because tension in this muscle (due to the footplate being too far forward) often results in forward movement of the pelvis to reduce tension. If hamstrings are not tight, measure the knee extension angle that suits the user and choose the hanger angle to match. If an acute hanger angle is needed, check that there is space behind the footplate itself to make modifications, such as extended footplates. It is vital to make sure that any modification or angle selected doesn’t cause the footplate to obstruct the castor. This would impede functional use of the wheelchair.

The strength of the footplate assembly is also important. Some users may need stronger footplates than those that come with the chair; check whether the materials used will allow modification or addition, e.g. metal is preferred over plastic in this case. Sometimes an adjustable footplate angle will be advantageous. This would allow the ankle and foot to be positioned in the plane required.

Elevating leg rests can be chosen if the user has no hamstring contracture. They are a comfort option. There have been individual functional reasons for a person to use elevating leg rests, so it must be individually assessed. Swelling of the
lower limbs isn’t usually helped in this way as the limb reportedly needs to be elevated above the height of the heart to achieve results, which cannot be done with this equipment.

**Seat to-floor height**
The seat-to-floor height is most often a fixed option to be selected from a small range. It is important to select seat height based on leg length, type of transfer (standing, hoist), carer height or height of significant items such as bed or toilet. Some powered wheelchairs offer an adjustable seat to floor height, that is, adjustable by a technician. Some offer powered sit-to-stand or powered up/down seat height adjustment.

**Tilt-in-space**
Tilt-in-space has become a standard feature on most wheelchairs. It has a significant effect on posture, assisting to achieve exact angles of balance for head on body and assisting with fatigue and pressure relief, particularly as users spend long stretches of time seated. There are also practical reasons to select tilt, such as gravity assistance during re-positioning, hoisting and personal care activities. Contra-indications to tilt would include; swallowing difficulty, optical righting reflex (where client can be seen to pull forward against tilt) and other reflexes which alter muscle tone which are elicited by change of head position, such as tonic labyrinthine reflex and symmetric tonic neck reflex.

**Control system**
There are several types of powered wheelchair electronics systems (or control systems) on the market, such as:
- Dynamics
- Penny & Giles / Pride
- Invacare
- Delphi

It is important to note that these systems are individual and have their own compatible controllers. Choose a system that will support existing needs and expand to accommodate potential needs (e.g. communication device, computer access, alternate control). Most will not interact.
Controller / input device (alternate control)
The important point is to ensure that the input device, e.g. head array, is compatible with the control system. This will be the case with demo systems trialled, but the issue may arise when the powered wheelchair and controller are chosen from different suppliers or ranges. Incompatibility would mean an expensive error.

Programmability
Ask the supplier what can be altered and re-programmed using the controller itself vs. a handheld programmer vs. computer program. Access to these programmes may be useful to the therapist involved in skill development work with the user or to a user in an isolated community. It may be detrimental where others are able to alter and change settings, e.g. children. Choices should be based on individual need.

Attendant control
Does the carer need the control all the time or only part of the time? Is height and location of the controller at the rear suitable for the carer or does it need to be adjustable for many? Does it need to be on the left or the right?

Transport
Check access, check clearance on hoist or ramp, check tie-downs or locking plates are compatible with powered wheelchair. Consider replacements into the future, check with supplier where these are supplied.

Battery charge
Check with the supplier how often and how long the batteries need to be charged. Retain instructions provided and follow routinely to ensure maximum battery life and distance is achieved. Check with supplier how far the battery should take the user before needing a recharge.

Top speed
Top speed is a point of comparison between powered wheelchairs. However, according to the RTA, to be able to use the wheelchair in any community area, the speed must be under 10km/h.

Compatibility with other assistive technology
Check which other assistive technology equipment is used and whether it needs to be interfaced (electronically connected to function together) or just integrated into the same space as each other and operated independently. See Section 9.2 on interfacing for more information.

Warranty period
This should be recorded as it will be important for repairing any fault that occurs.

Tracking of equipment
It is important to Cerebral Palsy Alliance that any equipment prescribed can be tracked by the supplier in the event of a product recall, as some faults may cause injury if not addressed.

Access to spare parts
It is of great benefit if the supplier has a service department available to offer specific parts, repairs and maintenance because powered wheelchairs need to be well maintained for safety.

Individual requirements
Colour may not seem important but can be significantly interwoven with a person’s self image, self-esteem and their acceptance of the equipment. It is important to discuss and include some of the more individual requirements for features to assist with self-care, work or leisure activities, like a cup holder, sports tyres, fishing rod holder or a keyboard support. Where possible these should be accommodated to provide greater access and independence in daily life.

5.2.1 Performance Analysis - based on drive wheel location
The following Performance Analysis tables were sourced from the International Seating Symposium of 2005. The information is complex but useful when faced with the need to make a decision regarding drive wheel location. For guidance, contact a senior therapist or product supplier.

The tables below rate indoor and outdoor performance of powered wheelchairs, based on drive wheel location. A number of other factors can affect wheelchair performance, including power, power delivery and individual characteristics such as build and ability of the user. Consider these in addition to the information presented below. This information was sourced from ‘Power Wheelchairs A New Definition’, G.F. Strong Rehab Centre, presented at the International Seating Symposium, Orlando, Florida, January 2005.
# Indoor Performance Analysis

Refer to drive wheel location section on page 36 for definitions

<table>
<thead>
<tr>
<th>Action Analysed</th>
<th>Rating (best to worst)</th>
<th>Consider</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rate of turn (turning speed)</td>
<td>1. High ratio RWD&lt;br&gt;2. CWD (a close second)&lt;br&gt;3. Low ratio RWD&lt;br&gt;4. High ratio FWD&lt;br&gt;5. Low ratio FWD</td>
<td>A chair will turn between its drive wheels.</td>
</tr>
<tr>
<td>Turning radius</td>
<td>1. CWD and high ratio FWD&lt;br&gt;2. High ratio RWD&lt;br&gt;3. Low ratio FWD&lt;br&gt;4. Low ratio RWD</td>
<td>You can estimate the turning radius by measuring between the middle of the drive wheels and the point of the chair that is the furthest away (e.g. front casters, footplates, rear castors).</td>
</tr>
<tr>
<td>Space required to complete a 3 point turn</td>
<td>1. CWD&lt;br&gt;2. High ratio FWD (very close second)&lt;br&gt;3. Low ratio FWD, high ratio RWD and low ratio RWD</td>
<td>The distance between the front of the drive wheel on one side of the chair to the front of the opposite castor will give you an indication of the radius involved.</td>
</tr>
<tr>
<td>Shape of space required in front of chair to turn</td>
<td>1. Low ratio FWD&lt;br&gt;2. High ratio FWD&lt;br&gt;3. CWD&lt;br&gt;4. High ratio RWD&lt;br&gt;5. Low ratio RWD</td>
<td>FWD chairs require less space in front when turning, but more space behind them. RWD chairs require more space in front of them when turning, but less space behind them.</td>
</tr>
<tr>
<td>Corridors and doors</td>
<td>Travelling down a corridor and turning into a doorway (90°):&lt;br&gt;1. The low ratio FWD chair was the only one that could complete this task in one movement.&lt;br&gt;The others demonstrated difficulty in the following order (easiest to hardest):&lt;br&gt;2. High ratio FWD&lt;br&gt;3. CWD&lt;br&gt;4. High ratio RWD&lt;br&gt;5. Low ratio RWD</td>
<td>This order is reversed when the chair attempts to travel back through the door and into the corridor (i.e. the low ratio RWD was able to complete the task in one movement and some high ratio RWD could do it). The other chairs would need to reverse to get through the doorway successfully.</td>
</tr>
<tr>
<td>Visual cues and ease of learning (e.g. when going through doorways)</td>
<td>The drive wheel needs to be in front of the door jam to successfully proceed through the doorway. If the user needs to see the drive wheels, in order to judge this, a low ratio FWD chair may be most suitable.</td>
<td>Different chairs need to be at varying distances from the wall before beginning to turn, due to the shape of space required for their turning radius (e.g. RWD chairs need to be far away from the wall where the door is located to ensure there is enough space in front for the chair to turn). The ability to learn these skills will vary from person to person.</td>
</tr>
</tbody>
</table>
# Outdoor Performance Analysis

<table>
<thead>
<tr>
<th>Action Analysed</th>
<th>Rating (best to worst)</th>
<th>Consider</th>
</tr>
</thead>
<tbody>
<tr>
<td>Curb Cuts</td>
<td>Best performers were high ratio RWD and high ratio FWD.</td>
<td>Positioning of footplates in relation to the ground and drive wheels.</td>
</tr>
<tr>
<td>Hills – relative angle for maximum traction</td>
<td>Low ratio RWD - best up small inclines</td>
<td>Maximum traction is achieved when the vertical centre of gravity is directly over the drive wheels.</td>
</tr>
<tr>
<td></td>
<td>High ratio RWD - best up larger inclines</td>
<td></td>
</tr>
<tr>
<td></td>
<td>CWD - best on flat surface</td>
<td></td>
</tr>
<tr>
<td></td>
<td>High ratio FWD - best going down larger inclines</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Low ratio FWD - best going down small inclines</td>
<td></td>
</tr>
<tr>
<td>Straight Line Tracking</td>
<td>The low ratio RWD performed best</td>
<td>Chairs are better able to track in a straight line when the castors are located at front of the chair and are not heavily ‘loaded’ (i.e. when weight is not over the castors).</td>
</tr>
<tr>
<td></td>
<td>The low ratio FWD performed worst</td>
<td></td>
</tr>
<tr>
<td>Side Slope Tracking</td>
<td>On a side slope the RWD chairs (especially low ratio) tended to turn downwards.</td>
<td>This can sometimes be modified by programming.</td>
</tr>
<tr>
<td></td>
<td>FWD chairs (especially low ratio) tended to turn upwards.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>CWD chairs steered neutral</td>
<td></td>
</tr>
<tr>
<td>Uneven Terrain Tracking</td>
<td>High ratio and CWD chairs performed best.</td>
<td>Performance can be improved if weight is on or close to the main drive wheels.</td>
</tr>
<tr>
<td>Changing Directions</td>
<td>RWD chairs tended to under-steer (keep going straight).</td>
<td>This can be modified by weight and programming. Over-steering may impact physically upon the person, depending on the driver control used and their needs.</td>
</tr>
<tr>
<td></td>
<td>CWD chairs tended to steer neutrally.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>FWD chairs tended to over-steer.</td>
<td></td>
</tr>
</tbody>
</table>
5.3 PM Final Prescription Summary

The Final Prescription Summary (Appendix 12.5) was developed to record, streamline and highlight all of the details relating to the equipment, the dates completed and the people involved. It would provide quick access to the information, which would be of particular help when staff change midway through the process. To be of most use, the Final Prescription Summary should be printed on a coloured sheet and placed at the front of the client evaluation.

Guide to completing the PM Final Prescription Summary

• Complete client details at top right.
• Record details on the PWC, the seating and the control system as and when each is finalised.
  
  **Details required may include:** make, model, drive wheel configuration, electronics system, tilt, specific functions, e.g. powered up/down.
  
  **Supplier:** enter contact person, phone/email contact details and any specific notes or verbal details concerning the prescription.
  
  **Date of final quote.** It is important to make clear which quote was submitted to the funding body, as there may be several copies in the file if alterations were made.

• Other details of importance are:
  
  **Funding source or sources used** - enter contact details for any future communication needed. Sometimes there are different funding bodies for the components; list these.
  
  **Date applied** - this can be essential to record the time taken between application and approval.
  
  **Entered on equipment register (Cerebral Palsy Alliance)** - tick to indicate this has been done.
  
  **Date approved** - this can be useful when waiting for equipment to be delivered. May need to phone funding source to access this date.
  
  **Other equipment for interfacing** - it is useful to know which other equipment is coming or is at home to be interfaced with the new system.
  
  **Specialist service involved** - contact details are essential for continued communication with the service involved in completing the seating system.
  
  **Individuals required at equipment fitting/delivery** - this saves time when it comes to looking up the people needed to be present at the fitting of the system.

• Therapist to name, sign and date the form, bottom left.
6.0 Funding Application

6.1 Funding Application Information

Changes to the funding application process are expected in the near future. In the meantime, this section provides a guide, however, it is important to check with senior staff at the time of application to ensure that you use the correct method.

This section contains:

- Examples of funding submissions for equipment via PADP that can be accessed on the intranet at http://connexions/intheknow/publ-int/sampleletters.htm. As there was no example made for a PWC, the PM Working Party adapted an example for the manual. This is included.

- Position statements released by RESNA (Rehabilitation Engineering and Assistive Technology Society of North America) http://www.rstce.pitt.edu/ regarding the use of tilt, recline, elevating leg rests. This may be of assistance when writing a submission if seeking background and/or rationale for recommendation of a powered component.

**Tip:** Highlight functional applications/benefits and participation opportunities, wherever possible, i.e. what the person does in the chair. This will help to provide justification and secure funding where available.
6.2 Funding Application - an example

Date __________________________

Addressee _______________________________________________________

Address __________________________________________________________

RE: Name, Date of Birth, Address

REQUEST FOR NEW POWERED WHEELCHAIR AND POSTURAL SEATING SYSTEM

(Name) is an (age) man/lady/child with (condition) (type) who lives (type of accommodation, e.g. group home). (Name) was referred (referral details) to Cerebral Palsy Alliance’s Occupational Therapy team to assist in obtaining a new powered wheelchair. Name’s current wheelchair and seating are approximately (x) years old. Name is a full-time user of his wheelchair and is now finding it unreliable and prone to breakdown.

Name has strong fluctuations in muscle tone throughout his trunk and limbs, led by strong extension from the pelvis with activity, speech and poor postural support. He is unable to sit independently and requires customised seating to maintain a functional, upright, seated posture.

Name spends (x) hours per day in his powered wheelchair. Name receives support from (organisation) direct care workers during the day, to assist with all personal care including toileting, mealtimes and showering. Name is assisted with all transfers. He requires full support around management of domestic duties such as meal preparation and cleaning. He uses a (type) voice output communication device to communicate. He is able to independently access TV, air-conditioner and front door via remote control. He is able to independently access his telephone, which he uses in conjunction with his communication device.

It is imperative that Name’s wheelchair be reliable as he spends long periods of time alone both at home and in the community. Name uses his powered wheelchair to access the local shops and to manage his shopping independently. He uses taxi transport independently for appointments. He is potentially at great risk if he has a wheelchair breakdown when alone.

Name was subsequently assessed by our service. A physical evaluation of his postural support needs was completed and wheelchair requirements discussed. It was decided that Name would require customised seating and would benefit from the input from a specialised seating service. Name was referred to (seating service) and seen by (seating consultant) in (month/year). Seating consultant completed the evaluation and provided the following recommendations to meet name’s postural needs; key points are listed below.

- Fixed posterior pelvic tilt - needs 130° seat to back angle
- Anti-thrust seat cushion to block forward migration of pelvis, firm pelvic belt
- Strong fluctuating adduction of thighs - needs leg dividing channels
- Requires robust lateral trunk supports to maintain upright posture
- Slightly contoured back support to support thoracic kyphosis
- Head support with occipital guide and mild lateral curvature - to maintain symmetry
- Shin straps, toe loops and custom one-piece footplates to prevent the lower limbs extending forwards
- Right hand controller, custom stabiliser bar - to stabilise upper limb on controller
The wheelchair base needed to meet the following criteria, as agreed by the team:

- It was important to look at bases that would turn economically as well as provide good ability to manage difficult terrain outside of the home, e.g. steep gutter ramps, no footpaths
- Appropriate floor-to-seat height for access to tables, hoist
- Ability to open and fix seat-to-back angle at 130°
- One piece swing-away heavy duty footplates for strength
- Power tilt for positioning
- Height adjustable arm rests
- Headrest removable for haircuts
- Removable, height adjustable push handles to accommodate wheelchair length in taxis
- Transport ready,

Four wheelchair companies were contacted and provided with a detailed list of the required specifications. Four companies provided in-home demonstrations. Name trialled five powered wheelchairs that could be scripted to meet his needs. Three were selected for an additional 24 hour trial. After the 24 hour trial Name was able to determine that the (wheelchair name) which is a mid-wheel drive wheelchair, was the most suitable option for ease of use, manoeuvrability both inside and outside and ability to cope with the terrain within the local community.

PLEASE FIND ATTACHED QUOTATIONS FOR THE RECOMMENDED EQUIPMENT

<table>
<thead>
<tr>
<th>Name Powered Wheelchair</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Supplied by Seating service</td>
<td>Cost</td>
</tr>
<tr>
<td>Customised seating and power chair modifications</td>
<td>Seating service cost:</td>
</tr>
<tr>
<td><strong>Total cost</strong></td>
<td>$ -</td>
</tr>
</tbody>
</table>

Thank you for your consideration of this funding request for Name. I welcome any correspondence and discussion. Please notify me of your decision regarding this application.

Name of therapist
*Occupational Therapist*
Program
Contact details

CC: PADP, Client, File
6.3 Funding Application - Template

Date ______________________________

PADP Coordinator ______________________________

Address ______________________________

RE: Name, Date of Birth, Address

REQUEST FOR NEW POWERED WHEELCHAIR AND CUSTOM SEATING SYSTEM

Introduction
Client, situation, age/condition/difficulty with current system, brief description of condition and basic need to be accommodated, details of request, main concerns.

Activities of daily living statement
Include number of hours in seat, transfers, mobility, skin condition, personal care, meals, domestic duties, communication device used, other technology access (as relevant to application), community access, transport.

Assessment details
Services involved, findings in clear concise terms, postural findings and needs, wheelchair base requirements/criteria, details of process/trials performed (justification).

Costs:
(ATTACH QUOTATIONS FOR THE RECOMMENDED EQUIPMENT)

<table>
<thead>
<tr>
<th>Name Powered Wheelchair</th>
<th>Supplied by Seating service</th>
<th>Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Cost</td>
<td>$ -</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Customised seating and power chair modifications</th>
<th>Seating service cost:</th>
<th>$ -</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Total cost</th>
<th>$ -</th>
</tr>
</thead>
</table>

Concluding statement, thanks for consideration.

Name of therapist
Occupational Therapist
Program
Contact details

CC: PADP, Client, File
7.0 Equipment Delivery

7.1 Equipment Final Delivery Checklist

When everything is complete, the system is ready for delivery.

The Equipment Final Delivery Checklist contains a list of prompts, to ensure that important equipment and steps are included and completed prior to handing the equipment over to the client and their support person. Details are provided below.

- Record the client details, equipment being delivered, people present and location of delivery at the top. The date should be recorded for each item because some items may be followed up at later appointments.

- Check that PWC is in working order. If in doubt, check with the supplier. It is advisable to check PWC is in working order on delivery, to ensure that the supplier is on hand to demonstrate, examine and correct anything, as needed.

- Ensure that the instruction manual is discussed and issued to client or support person.

- Training in basic operation, (e.g. controls, tilt) should be provided by the therapist, to ensure that it is conveyed according to the client’s needs.

- Programming - it is the therapist’s responsibility to check the programming (e.g. speed, acceleration) prior to handing over to the client. If re-programming is needed for either client or attendant control, the therapist must either do this or arrange for the supplier to do this.

- The battery charger needs to be discussed and the manual provided.

- The maintenance and care guidelines (Section 7.1) should be issued and discussed to ensure that the client and support person understand the importance of maintaining the PWC to improve safety and prolong the life of the system.

- Supervision guidelines (Section 8.1) should be provided for new users, as appropriate.

- The skill development program (8.2) and the PM performance record (8.3) too should be provided for new users, as appropriate.

- Contact numbers for the services involved in the process can provide the client with back-up support in case of fault or breakdown.

- There is space at the end to record specific actions that need to be added in each case, e.g. passing information along to others, follow-up appointments.

Sign and date each item once completed and place the finished form in the client file.

View the Equipment Final Delivery Checklist - Appendix 12.6
7.2 Maintenance and Care Guidelines

TASC Equipment Services has prepared a set of maintenance and care guidelines to equip new owners with the tools to extend the life and reliability of both the wheelchair and the seating, see link below. It is recommended that each completed system should have a copy attached, which should also be discussed with the client and/or support person.

View the Maintenance and Care Guidelines in Appendix 12.7.
8.0 Skill Development and Supervision

‘Recognise that supporting an individual’s own relationship with independence and subsequent mobility is the task, not teaching an individual how to drive’ (Kangas, 1997)

8.0 PM Skill Development Program

Skill development for powered mobility moves at an individual pace and is built around each individual’s motivation, interest and functional need. Time to practice, a positive environment and feedback on achievements are important features to build in to the program.

To support the skill development process and to measure and record progress, this manual presents two complementary tools:

1. Powered Mobility Skill Development Program
2. Powered Mobility Performance Record

These are explained below with links to the printable forms. Firstly, supervision is an essential accompaniment to skill development and will be discussed in Section 8.1.

8.1 A Graded Learning Process

A graded learning process is required to support the development of independence. Intervention must be designed around individual requirements and applied to the demands of the environment. It must be graded, to allow independence to increase as skills develop. Supervisors must coordinate and oversee the process and prevent injury, just like the support provided during the process of learning to walk.

Tips for Facilitating New Powered Mobility Users (on the following page) is a single page of useful information to equip support people to facilitate the skill development process.

Note to the therapist: review, adjust and print these guidelines to individualise for each client.
Tips for Facilitating New Powered Mobility Users

• **Legs not cars.** Equate the powered wheelchair experience to moving, not driving. Remember that the individual may have little prior experience with moving independently. He/she needs to learn control of movement and how much space is needed to move and turn in a powered wheelchair.

• Some will take a little time and some will take a lot to become competent when using a powered wheelchair. Remember that in some situations more supervision will be needed than in other situations, e.g. distractions, terrain, medication, mood, space and obstacles present.

• Set **short sessions** initially to avoid fatigue (10-15min per day), Kangas, 1997. Increase the length or number of sessions, as tolerated.

• Use the lowest speed available and keep it simple, i.e. initially just ‘stop’ and ‘go’. Allow time for exploration and establishment of these concepts.

• Initial experimentation with movement may include circling on the spot. Circling allows the individual to experience control of the wheelchair without needing adult intervention, i.e. to prevent crashes. Circling = vestibular stimulation, which children, in particular, enjoy as it’s age appropriate and fun. Adults, looking on, often feel less comfortable with it. If timed, circling will go for between 20secs and 2mins, but rarely more, Kangas, 1997. Most will stop when ready, intervene if needed.

• Language used by the supervisor should relate to the movement, e.g. “you’ve stopped”, “you’re going the other way now”. This feedback reinforces the action performed and contributes to learning and repetition.

• Directions like “go left”, “turn right”, relate to driving a car. Remember - we don’t think ‘go left now’ when turning to reach something. Moving is all about going and stopping and getting to somewhere or something, reaching a target or goal, Kangas, 1997.

• It is important to support the individual’s exploration of movement and control, cause and effect, rather than set-up a driving lesson where the individual has to interpret terms like left, right, closer, turn, in addition to processing sensory information, such as location of obstacles, plus carry out a controlled motor action to complete the task. Learning will occur with experience.

• **Success builds confidence.** Make sure that activities are challenging but not too hard.

• Consider **activities** that encourage movement, which the client enjoys and finds motivating. Include a mix of functional and leisure activities.

• Watch for signs of fatigue and end the session with a positive achievement. Negative experiences, e.g. loss of control, pain, frustration, can occur when fatigued and can affect confidence.

Safety considerations

• Choose a safe environment, initially free from obstacles and uneven or cambered ground. If the individual has limited experience with independent mobility he/she may not have developed an understanding of the dangers of stairs, edges of verandahs, uneven surfaces or hitting obstacles/people.

• Supervisor must know where the OFF switch is; pulling on the handles won’t work. Follow closely.

• Safety around cars and roads is especially important to consider, as the individual will not have developed road safety or an awareness of cars in situations such as car parks and driveways.

• Follow the supplier’s recommendations with regard to charging, cleaning and maintenance. This will extend the life and reliability of the system.

The Powered Mobility Working Party
8.2 Developing a Skill Development Program for PM

The prompt sheet below provides step-by-step instructions on how to develop an individual PM Skill Development program for your client. In this section it is important to recall and use strategies for teaching any other skill and to use inherently motivating activities for the individual. There is no specific or special method for teaching powered mobility skills.

First, read the PM Skill Development Program examples in Appendix 12.9

They provide example programmes for two clients of a similar age with different PM skills.

PM Skill Development Program - Prompt sheet

View the PM Skill Development Program form in Appendix 12.10

Start with the client’s current skill level. Record what the client can do. Describe the situation in which the skill is observed or reported and the level of support that the client needs in order to be successful.

Consider use of the controller, directional control, the environments in which the wheelchair is used or could be used, the amount of time used and any fatigue, transport, maintenance and safety issues. (See categories explained below).

Consider what next steps the client needs to take to develop their skills. These observations will form the basis for setting one, two or three specific goals with the client and those involved in the skill development program, such as family, carers, teachers, CAS staff.

Then, consider strategies and opportunities that arise during the client’s daily and weekly routines that will support learning those next steps. Involve the support team in this process as their creative ideas and actions can be included. It may be useful to relate the strategies to specific steps in learning or to list these generally if the strategies will target several areas at one time. Be clear and concise!

Remember to set a review date to evaluate skill development and achievement of goals.
Categories explained

The following are examples to consider for each area of possible skill development. This is by no means an exhaustive list and is not a list for testing ability, as each will not relate to every client.

Controller
Turning on and off appropriately; ability to stop; ability to maintain consistent pressure or to grade input; use of other features such as power tilt; ability to change speed; use horn.

Directional control
Going right, left, forward; use of reverse; ability to avoid obstacles; ability to use ramps; navigate doorways; turn from hallway; move within fixed objects and also moving people.

Environments
Inside, outside, uneven ground, familiar environments, unfamiliar environments, changing speed appropriately to conditions, orientating self in environment, what to do if lost, knowing how to get from A to B, using lifts.

Time
How long able to use chair; consider fatigue over the course of a day; time taken to move from A to B; time taken to move into position; time taken in chair to perform a functional task.

Transport
Able to move in and out of vehicle (if appropriate); understanding tie-down points, safety belt position; able to direct bus/taxi driver.

Maintenance
Has a maintenance schedule, is able to direct others in charging/maintenance procedure, what do to in the event of a break down.

Safety
Awareness in unfamiliar environments; traffic safety; crossing roads; car park and driveway safety; awareness of edges, kerbs and stairs.

8.3 Measuring and Recording Performance

The Powered Mobility Performance Record is based on the Goal Attainment Scale (GAS) (Kiresuk & Sherman,1968). The Goal Attainment Scale provides an outcome measure for the intervention provided. View a factsheet on GAS in Appendix 12.11.

The Powered Mobility Performance Record was developed to guide an individual’s progress toward mastery of powered mobility goals and to record the improvement made over time.

The therapist will examine performance and write a PM skill development program as outlined in section 8.2.

Once this is done, goals can be agreed upon and written into the Powered Mobility Performance Record. The information in the PM Skill Development program should form the basis for the goals. The goals need to be clearly graded so that the difference between each level can easily be differentiated by support people. This will assist support people to be specific in their observations per session. In this way progress and outcomes on agreed goals can be measured.

The therapist should set intervals to review performance and modify or renew goals as they are achieved.

View the Powered Mobility Performance Record form in Appendix 12.12
View an example of a completed Powered Mobility Performance Record form in Appendix 12.13
Guide to completing the PM Performance Record

Complete the client information at the top right of the page: name, date, therapist, etc. The overall goal is written in the space near the top left side, labelled GAS Goal 1. Goal 1 should then be graded into five stages, see ‘Goal Setting Instructions’ below. Remember to change only one variable at a time. Goal 2 should be recorded in the same manner on the second page. Further pages can be added as needed.

Goal setting instructions

• Set minus two (-2) as base level performance, i.e. what is currently achievable.

• Set minus one (-1) up one level, i.e. marginally increase the expectation.

• Then grade performance up another level to (0) which is the expected level of achievement, i.e. what therapist expects may be achievable within the period of intervention.

• The next two levels, (+1) and (+2) would indicate a significant improvement on what was expected. If level +2 is achieved very quickly (say one or two sessions) this may indicate that the original expectations were too low and should be taken into account when setting subsequent goals.

• Set 2-3 separate goals, as appropriate.

Instructions for support person/s

• The therapist will explain use of the record form to support person/s, i.e. the following should be done:

• Date the session along the top row in the centre of the page.

• Indicate with a tick, in the vertical column below the date, the level (-2 to +2) observed during the session.

• In the horizontal rows to the right, make a progress note.

• Date and sign each progress note.

Calculating the GAS T-score

• To calculate the GAS T-score see the final page of the PM Performance Record.

• The score recorded for each goal is what the client has achieved at the end of the period of intervention, e.g. by the end of the intervention, if the client consistently is achieving at +1, then this is the final score recorded for that goal. Record this score next to Goal 1 in the column to the right.

• Calculate and record the score for each goal in the same way as for goal 1.

• The total for each goal should then be added together and placed at the bottom of the right column.

• Refer to the GAS Attainment T-score Conversion Table in Appendix 12.14.

• Locate the intersection between the number of goals used and the total score gained. This will provide the GAS T-score, which can then be used to interpret whether the result was below, above or as expected.
8.4 List of Potential Activities

Activities for use during the skill development phase of powered mobility intervention are unlimited. Current evidence recommends that activities should be chosen to promote an individual's participation in everyday activities and routines (Campbell, Milbourne, Dugan and Wilcox, 2006). Activities should be relevant to individual interests and should be age appropriate. With children, activities need to involve play and fun, as learning is known to occur through play.

Applying the Janeschild (1997) stage progressions, it would be appropriate to place sensory, play and fun focused activities into stage one. Stage two would naturally include the activities that would provide opportunity to develop and refine directional skills. Stage three could still include fun activities but the focus would shift to purposeful or functional activities as relevant to users developing independence.

The following activity ideas have been grouped as examples for your interest. Each activity should be adapted to meet the needs, skills, age, interests and relevance to the individual.

Stage One: Exploratory stage

- Set up the room with sensory props such as: hanging streamers, fabrics or balloons to move through, bubble wrap or squeaky toys to run over, macaroni or dry leaves to crunch, bubbles to follow, cardboard boxes to move around or stack.
- Boxes can be stacked and knocked down for an age appropriate fun activity like blocks/boxes are used for small children. NOTE: only use in the early phase, so as not to reinforce the idea of using a PWC as a device to run objects down.
- Play cross the pond, use a tarp to run over, add fish.
- Build a tall posting box to post letter/balls.
- Use music to play musical stop-and-go games, e.g. musical statues.
- Place snacks or drinks on a table in view. If user moves to that area, offer them a snack or drink.

Stage Two: Directive stage

- Place items around the room that will be motivating to move towards, e.g. posters of movie stars, sport stars. Include interesting items or details to examine at each station.
- Collect items from a shopping list, place them around the room to be located.
- Design a treasure hunt with clues to move from one to the next, finish with a prize.
- Use letters or numbers on the floor to spell or answer maths questions.
- Place obstacles to move around, chalk lines to follow, coloured dots to move to.
- Play a simple board game on the floor. Use chalk, coloured paper, dice, etc.
- Suspend hats from the ceiling around the room. Move under hat to select, try on, assume characters.
- Try a magnetic fishing set, move around the pond (tarp) or onto lily pads (cardboard) to reach fish with line.

Stage Three: Purposeful stage

- Go to places of interest and explore, e.g. garden/park
- Go and turn on TV/radio.
- Encourage user to identify and locate places of interest to them.
- Explore a variety of terrain, e.g. pathways, slopes, gravel, ramps.
- Daily activities: collecting the mail, choosing plate/cup/utensils for meals, putting dirty laundry in the basket, carrying shopping items, using a lift, positioning self by basin to brush teeth.
- Visit community places. Grade the level of difficulty as skills develop. Begin with quiet, non-crowded places and choose the time of day carefully. Suggestions: visit a museum, library, mall, movie theatre, social group.
9.1 Proportional and Non-proportional: Control Options Explained

Devices used to access and control powered wheelchair functions can be classified as either proportional or non-proportional.

What is the difference between proportional and non-proportional control?

Proportional control offers direct 360° control, that is, movement in every direction, plus variable speed (the further from centre the joystick is pushed/deflected, the faster the wheelchair will go, to a set maximum). A common proportional device is the joystick.

Non-proportional control allows the wheelchair user to move using a switch or several switches located anywhere that can be accessed consistently. Non-proportional control is indirect, i.e. each switch provides one set direction at a set (programmable) speed. Non-proportional control provides access to self-initiated movement for individuals for whom proportional control is not an option.

Proportional control units

The traditional proportional control system is the standard joystick. A joystick comes in many shapes and sizes and can be placed in various positions.

Joystick knob variations

(see range in pictures below)

- The typical joystick has a spherical or cone shaped knob. It can be used with the forearm in prone using a grasp or mid prone between the thumb and forefinger with a more open hand.
- A vertical (tall, slim) knob can be useful in the mid prone position.
- A ‘T’ bar handle can be used to accommodate a user in the prone position
- A ‘U’ shaped handle is a T bar with the ends turned up to keep the hand from falling off the sides.
- A forearm trough, connected to the joystick, can be used to support the forearm. Similarly, a hand splint could be modified to fit onto the joystick knob to stabilise the hand position as required.
- A ring-shaped knob is designed to be used with a finger placed through the hole to anchor the hand. Caution: make sure user can remove finger independently.
- A foam ball or similar, would allow a more open grasp.
Alternate positions for the standard joystick

- The joystick can be mounted vertically or horizontally.
- Mounting the box at an angle to the body, rather than perpendicular to it, can be more comfortable.
- Countersinking the joystick into a tray or centre mounting using a swing-away mount will assist if a mid position is required, e.g. bilateral use.
- The chin - the remote joystick (RJM) pictured above, can be mounted in front and below the user’s chin with a cup-shaped knob instead of a ball. Effective for some, but can be difficult to control over rougher terrain. (Lange, 1999)
- The foot - the RJM can be placed on the footplate to enable use of the foot/toes/shoe. A commercial mount for this joystick is the ASL foot driving platform (pictured right).

The ASL multi-axial foot driving platform can accommodate the Invacare, Penny & Giles or Dynamic joysticks, which fit beneath the platform. The platform provides wheelchair control through plantar and dorsiflexion, combined with inversion and eversion.

The products below come ready to use, incorporating a joystick

- The mini joystick can be positioned just below the chin, inside the shirt on the collar provided (1).
- The mushroom joystick is a proportional control unit, designed for users with limited range of motion or strength in the wrists, hands and/or fingers. The mushroom joystick requires minimal force/range of motion for peak response (2).
- The ‘RIM’ or halo control (head control unit), a small joystick behind a semi-circular head support, is operated using head rotation and lateral flexion.

Joystick suppliers, Stealth Products, state; ‘One drawback of this system is the user can’t actually use the headrest, as a headrest, unless power to the chair is turned off. Another drawback of this set up is that, to back up the user must activate a switch to be able to move backwards. The user must activate the switch again to move forward. Normally this is not a serious drawback, ... except when... ‘the user is in a situation where several back and forward movements are needed to get through a doorway or enter an elevator, etc’. (www.stealthproducts.com).

(1) (2)

Other forms of proportional control

The finger steering control is a proportional control that requires no force to operate. A good alternative for users who have difficulty with grasp or operating a standard joystick.

The position of the user’s finger is detected, as if it were a joystick shaft. If the user’s finger is in the centre of the control, the wheelchair will be stationary. The wheelchair will then move in the direction that the finger moves.

The finger steering control has a ‘Mode’ touch button. A light touch toggles the unit between Standby and Active modes, while a long touch moves to the next mode profile, i.e. 1, 2, 3.

The unit can be mounted at any angle or location to suit the user.
New proportional control units of interest online, NOT yet seen in Australia

The Tablet Control (or touch pad) is a unique proportional drive unit. It is reported to be similar to the touch pad control on a laptop computer.

A finger or thumb would be used to control the wheelchair in a similar manner to that used in the finger steering unit above. The finger would be moved further from centre to increase the speed proportionally and in a circular motion to change direction within the 360°. A touch pad drive could be mounted in various places depending on the ability of the user to access it.

Magitek Lautzenhiser drive control by Magitek is a proportional control system with a miniature tilt-sensor that can be worn on the head, hand, finger or foot, providing access to wheelchair drive controls and seat functions.

The Magitek system could be applied to users with sufficient stability and control of the head or limbs. As it is a proportional system, the user would use small head (or hand, foot) movements to choose direction, moving further from centre to increase speed. A stable position must be maintained to continue travelling in a chosen direction.

The Peachtree head array may have been discontinued (2003). The Peachtree was a proportional control that responded to head movement within a radio field for translation into direction and speed control of the wheelchair. It is possible that this technology will re-appear, which is why it has been included.

Non-proportional control

Non-proportional systems provide access to wheelchair motion and seat function using a switch or several switches. The speed and direction are set. Switches can be either mechanical or electronic.

1. Mechanical switches

Mechanical switches require the user to depress or displace all or part of the unit to activate. There are many types and sizes, requiring differing amounts of force. They are cheaper than electronic switches and can be placed just about anywhere.

Common types of mechanical switches are the Buddy Button, Specs, Leaf, Wand, Pillow, Tilt, Grip, Wobble and Rocker.

In addition to the single switches, there are several multi switch units, i.e. a set of five switches in a single unit. When used with a powered wheelchair there would be a switch for forward, reverse, left, right and mode/on/off. Examples are: the Star switch, Wafer Board, Penta switch and joystick switches.

1. Star switch, 2. Wafer Board, 3. Penta switch, 4 & 5. joystick switch units
The heavy duty joystick is another example of a multi switch unit. ‘It has eight driving directions allowing selection of forward, reverse, left, right and the four diagonal directions. Although a switched device, the Heavy Duty Joystick gives good performance when used with the correct acceleration and deceleration settings’.

As the name implies, the Heavy Duty joystick is particularly suitable for users who are hard on their joysticks and may otherwise damage the electronics inside a standard joystick.

**Sip and puff**

Sip and puff is pneumatic (mechanical) switch control. It is operated by intra oral air pressure, not respiration (Lange, 2005) and so can be used whilst using a ventilator. Four commands are used: hard puff, soft puff, hard sip, soft sip. The forward command is latched such that the wheelchair continues moving until a further command is received to stop or change direction. An emergency stop switch is built-in to stop the system should the mouth piece fall out of the user’s mouth.

Some versions have full directional control through the pneumatic switch commands. Others such as the ASL sip and puff system have a combination of intra oral control and head steering/veering. Further mechanical or electronic switches can be added to increase options if needed.

**2. Electronic switches**

Electronic switches eliminate the need to depress a switch. No force is required to activate, just motion across a field, beam or sensor. Electronic switches require a power source. Some options to choose from are proximity, fibre optic and infra-red switches.

- A proximity switch requires a body part to enter the field of the switch. The field and speed are programmable. Proximity switches can be placed in any position required. Some examples are near the jaw/chin, tray top or head support.

- The ASL head array consists of a three-piece head support with a proximity switch embedded in each pad. The three switches provide forward, left and right with some veer possible when pressing two. Reverse can be added to the system using a sequence of taps to change forward to reverse. Alternatively, reverse can be added using a separate switch.

- Fibre optic switches emit an invisible beam of light that can be broken by a body part. Common locations for the fibre optic switch/s are the chin/jaw area and tray top. An example of use on tray top is: several holes would be cut in a tray top with beams directed up through each. The user would move a finger across the hole corresponding to the direction of choice, to move the wheelchair. Direction and speed are set, but programmable.

- Infra-red switches are similar in that they must be placed according to individual requirements in similar places and require movement in a field to activate. Direction and speed are set, but programmable.

**Non-proportional control systems**

**Scan system**

Scan systems allow the user to operate wheelchair and seat functions with a single switch. Scan systems can be cumbersome to use and as such are mostly used when an individual has only one switch site available and good scanning skills. The location and type of switch is chosen to best match individual function. The switch can be mechanical or electronic. Scan systems are available through ASL, Penny & Giles and Dynamic. Current technology incorporates scan drive into the master control unit, e.g. G91s by Dynamic Controls (below).
To operate the wheelchair, the user would watch the visual display unit located in front of them as the direction arrows light up in sequence. When the direction of choice is lit, the user would activate the switch to select. Pressure on the switch must be maintained to continue moving, as momentary (not latching) switches are preferred for safety reasons.

**New non-proportional control units of interest online, NOT seen in Australia yet**

The Katalavox speech-recognition control system is not well known in Australia. The website (www.katalavox.com/wheelch1.htm) reports that a throat microphone/headset picks up the vibrations of the vocal cords when the user speaks the commands. The wheelchair can be moved using five sounds. The sound activated electronic switches can be programmed to accept any language or distinct sound.

The **tongue touch keypad** is mounted into a dental plate worn inside the mouth without external wires. It will operate the wheelchair plus seat functions, the computer, the bed, etc. It is a nine switch pressure sensitive unit operated with the tongue (www.newabilities.com). Switches can reportedly be latched or momentary.

**9.2 Interfacing**

Various devices may be needed by a wheelchair user to participate in their daily activities.
According to Lange (1999), there are two domains of concern when it comes to the use of multiple assistive devices. The streamlining that needs to occur can be divided into two categories, integration and interfacing. In Australia, the two are sometimes interchanged in their use. Lange’s definitions are clarified below.

‘All assistive technology must be integrated. Integration is setting up multiple assistive technology devices to work together. For example, a communication device mounted to a powered wheelchair should not obstruct viewing.’ (Lange, 1999)

‘Interfacing actually connects assistive technology devices electronically, usually for the purpose of streamlining access. Interfacing uses the driving access method to control other assistive technology through the powered wheelchair electronics’. (Lange, 1999)

To access the world spontaneously, several devices, e.g. door opener, communication device, wheelchair, lights, TV control, seat tilt, etc. could need to be used in quick succession. When the devices are not interfaced an attendant is needed to unplug and plug-in each device, each time. With an interfaced system, a person could return home, open the door, communicate, move to the TV room, switch on the light, choose a channel and put the seat back to relax. This simple sequence can make a huge difference to an individual’s quality of life (see case example below).

Case example

‘Paul is 19 years old and has cerebral palsy. Before interfacing, he drove a powered wheelchair with scanning, using a left head switch. He also used a communication device with the same left head switch. When he wished to communicate, his mother would unplug the switch from the power wheelchair and plug it into the communication device.

Paul wanted a better method of driving, speed control, a power tilt system, access to his communication device and computer as well as control over devices in the home environment, such as the TV and lights.

After extensive evaluation, four switch sites were determined - the left side of his head, under his right index finger and to either side of his right index finger. The finger switches (touch sensitive) were mounted in a splint. Through interfacing, Paul is able to use the finger switches to access various assistive technology devices and uses the head switch as a reset to change modes. His first mode is driving and the switch under his finger is his forward control. The switches on either side of his finger are for left and right directional control. The second mode toggles the forward switch to reverse. The third mode allows Paul to change his drive speed. The fourth mode allows access to the communication device using the left finger switch. The fifth mode controls the power tilt system, left switch for up and right switch for down. Paul accesses the computer and controls devices in the environment through his communication device…’.

‘Obviously, Paul’s system is very complex. He must be able to activate each of his switches accurately, monitor what mode he is in (through a display) and have good memory, sequencing and judgment skills.’

(Lange, 1999)
**Integrated control systems by NovitaTech**

A comparison of integrated control systems was conducted by NovitaTech in South Australia, in 2005, and can be viewed at [http://www.novitatech.org.au/library/IntegratedControlsComparisonTable.pdf](http://www.novitatech.org.au/library/IntegratedControlsComparisonTable.pdf)

The two devices described below are examples from NovitaTech, which provide access to multiple systems through the powered wheelchair controller.

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**The Genie Joystick**  
*By Unique Perspectives Ltd.*

**Use the one joystick to control a wheelchair, access a computer, operate a mobile phone, environmental controls and communication devices.**

**Wheelchair Control**

The Genie Joystick is ideal for a person who can use a joystick but who finds the buttons on a standard wheelchair control too difficult to use. Just one button or a flick of the joystick is all that is required to switch modes from, for example, driving the wheelchair to adjusting the seat position and back again. It is simple to use with no complex menus or displays.

On the top panel of the joystick are two buttons and the joystick element itself. Button 1 is used to turn on the chair and select one of six operating modes: Driving, Speed Selection, Seat Function, Lights, Computer Mouse, and External Device. Depending on the needs and ability of the user some or all of these modes can be made available.

3.5mm jack sockets allow connection of external switches for those who find it difficult to operate the buttons on the unit itself. If the user is unable to use switches at all a special ‘joystick flick’ mode is available whereby a flick of the joystick takes the place of a switch.

The Genie Joystick can be fitted to any wheelchair that is fitted with a DX™ power module. If you already have a wheelchair the Genie Joystick simply replaces the existing joystick. No other equipment is required.

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**ClicktoGo**  
*by Unique Perspectives Ltd*

The ClickToGo provides effective powered wheelchair control using switches.

It gives independent control of mobility to individuals who do not have the requisite strength, control or co-ordination to use a standard joystick control. The ClickToGo is operated by single or multiple switches via a scanning interface. The eight direction indicators are illuminated by ultra-bright LEDs and can be scanned in many different ways. When a direction is chosen, pressing a switch drives the chair.

- Flexible, Versatile and Easy to Program
- Sophisticated Operating Modes
- Total Wheelchair Control
- Integrating Communication, Environmental Control and Computer Access
9.3 Suppliers of Powered Mobility equipment - NSW

**Sydney Suppliers**

**Active Mobility Systems**
30 James Street,
Lidcombe, NSW, 2141
Ph 02 9649 2111
Fax 02 9649 8506
Email sales@activemobility.com.au

**Dejay Medical & Scientific**
1 Prince William Drive,
Seven Hills, NSW 2147
Ph 02 9838 8869
Fax 02 9838 7869
Email dejaymed@ozemail.com.au or therapy@dejay.com.au
Web www.dejay.com.au

**GTK Rehab**
Unit 11, 14 Boden Road,
Seven Hills NSW 2147
Ph 02 9620 9177
Fax 02 9620 9081
Email gtkrehab@gtkrehab.com.au
Web www.gtkrehab.com.au

**Life Healthcare**
4 Noonan Place,
Ingleburn NSW, 2565
Ph 02 9618 5000 or 1300 133 120
Fax 02 9618 5111
Email ktracey@lifehealthcare.com.au

**Northcott Equipment Solutions**
1 Fennel Street,
North Parramatta NSW, 2151
Ph 02 9890 0950
Fax 02 98900924
Email sales@northcott.com.au
Web www.northcottes.com.au

**Specialised Wheelchair Company**
5/26 Wattle Road,
Brookvale, NSW, 2100
Ph 02 9905 5333
Fax 02 9905 2208
Email iain@swco.com.au
Web www.swco.com.au

**Wonderland Rehab & Child Care Products**
Unit 4, 2 Railway Parade,
Lidcombe, NSW, 2141
Ph 02 9649 4044 / 1300 303 536
Fax 02 96494055
Email wonderland@adsl.on.net
Web http://www.fasequipment.com/index.html

**Rural NSW Suppliers**

**Acacia Medical Equipment**
212 Barney Street,
Armidale NSW, 2350
Ph 02 6771 4655 or 1800 805 536

**Astley Mobility**
194 Lords Place,
Orange, NSW, 2800
Ph 02 6361 4200

**Home Safety & Comfort**
2/187 Lake Road,
Port Macquarie NSW, 2444
Ph 02 6581 2400
Fax 02 6581 2422
Email homesafety@tpg.com.au

**Northern Rivers Surgical Supplies**
18 Endeavour Close,
Ballina, NSW, 2478
Ph 02 6686 6644
Fax 02 6686 9383
Web www.intermobility.com.au

(Correct as of 20.01.09. Please contact TASC to alter details or add suppliers.)
10.1 Working with TASC

**Referral Process and Flowchart**

1. **Need for PM intervention identified**
2. **Prime therapist - refers to PM Manual on intranet**
3. **Prime therapist uses Initial Needs Survey and PM Mat Eval to determine and record needs**
4. **Who will manage PM needs for this client??**
   - **Prime therapist manages case using intranet PM manual AND IF NEEDED ..**
   - **Prime therapist makes telephone referral to TASC for specialist service**
   - **Referral to TASC may be for Tertiary input (phone or email support only, referral still needed)**
   - **TASC Consultant completes phone referral plus PM insert with prime therapist - record level of input requested, see below**

**Tertiary** (See Section 10.2)
**Consultation** (See Section 10.2)
**Direct input** (See Section 10.2)

**CLIENT ON TASC WAITING LIST**

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TASC stands for Technology solutions for computer Access, Seating and Communication
10.2 Levels of TASC input

TASC is a specialist service located at Cerebral Palsy Alliance at Allambie Heights. The seating and powered mobility service is one half of the service, the other is Technology (computer access, communication, ECU).

TASC input
At TASC, three styles of input exist for PM evaluation. The client and the prime therapist may choose to refer for direct input, a consultation or for tertiary support.

Direct input
Direct input would be provided over a number of sessions when a prime therapist requests assistance and equipment to evaluate a number of options with full support. This could include assistance with the prescription. A report would be completed.

Consultation
A consultation would consist of a single session or day aimed to begin where the prime therapist has requested assistance and to finish with recommendations from the consulting therapist on how to proceed. The prime therapist would have initiated work prior to the consultation and would continue until completion. A written summary or list of recommendations would be provided. Further input, if needed, would be in the form of advice by phone or email.

Tertiary support
Tertiary support consists of contact between the prime therapist and the consultant by phone or email only. Photos and/or video would assist the consultant to provide support and guidance. A referral is necessary for discussion and consent is required for the sharing of photos or video regarding the client, to occur.

Time required
Telephone referrals take approximately 30 minutes. Sessions average two hours. Consultations may consist of two, two-hour sessions on the same day with a break in between.

10.3 TASC Assessment Procedure

Prior to referral: Therapists need to have completed the referral procedure, set goals and initiated the PM evaluation using the following forms.

IMPORTANT: Copies of the following information must be completed and sent to TASC TWO WEEKS prior to the session:

- The Initial Needs Survey (Section 2.2)
- PM Mat Evaluation (Section 2.3)

TASC session outline
- TASC Consultant will begin with a review of the referral details, goals and expectations and aims for the session.
- TASC Consultant will briefly review the following details:
  - Posture and seating needs
  - Range of movement and body measurements
  - Motor control / switch sites / past access methods used
- A trial powered wheelchair (PWC) will be set-up.
- Seating supports will be adjusted (these will have been pre-set according to measurements provided in advance, but need further checking prior to transfer).
• Client will be transferred to (PWC) using preferred method (hoist available, bring own sling).
• Seating supports and straps will be secured.
• The control system of choice will be set up. Mounting systems, if needed, and alternatives, will be pre
planned to conserve time.
• The session will focus on the interaction between client and controller. Various activities/items will be set
up around the room to encourage exploration. Some may not go beyond the sensory experience of moving
independently and this is ok.
• The session may cover several types of access or just one, according to the individual.
• Onlookers will be encouraged to comment on the client’s actions, such as ‘you’ve turned around’, ‘now,
you’ve stopped’, to reinforce the action, thus contributing to learning how to repeat the action.
• The session will finish prior to the impact of fatigue. The consultant will end with success to leave a
positive impression for the next session.
• Further sessions would follow a similar format (except for the ‘Consultation’ which consists of a single
session).
• All sessions will be recorded on a separate PM Trial Record Sheet (Appendix 12.3) to record details for
comparison as needed.
• Photos and video will be taken to assist with review and comparison. (Permission forms will be used).

10.4 Working with Technicians and Suppliers

• Technicians (TASC) or Suppliers (of commercial powered mobility) may be needed when prescribing or
fitting a complex powered mobility system or powered wheelchair.
• Role definition - The prime therapist’s role is evaluation of postural and PM needs and advocacy for
client and support network. The technician or supplier’s role is to provide full demonstration of equipment,
components and actions that are involved and to gather technical information to assist in the decision
making process. The prime therapist will lead the decision making process.
• File copies of all communication, diagrams and quotations are essential.
• On final fitting of the equipment - work through the quotation (provided by the technician or supplier) step
by step to ensure that all parts are present and connected. Extra parts, such as the battery charger, will
also need to be checked and included in training.
• The technician or supplier must provide initial training in all components and connections to the prime
therapist.
• The prime therapist is responsible for ensuring that instructions and training are received by client/carer.
This is to ensure that information is presented and/or graded to maximise understanding and if additional
strategies are required they are put in place accordingly.
• Prime therapist is responsible for initial troubleshooting as required (within basic operational instructions
provided - not repairs).
• Discuss what to do if there is a breakdown – the technician or supplier will be able to provide information
and/or the assistance of a service department.
• Prime therapist must ensure the client has a contact number for service or repairs if needed.
References

11.1 References


The Disability Services Act, 1993.

The NSW Disability Service Standards.


The Spastic Centre Policy No: STD S08:04:09


(Contact TASC for the complete reference list)
11.2 Websites of interest

Many of these links offer tools that may be utilised when developing resources for the organisation.

**Adaptive Switch Labs**
http://www.asl-inc.com/

**Mobility 4 Kids**
http://mobility4kids.com/

**Pediatric Powered Mobility: Readiness to Learn**
http://www.ranchorep.org/teamrehab.htm

**Powered Mobility: A Guide for Families**

**Powered Mobility Outpatient Evaluation Intake Questionnaire**
http://www.gillettechildrens.org/fileUpload/PoweredMobility.pdf

**Powered Mobility Training for Children with Complex Needs**

**Pediatric Powered Mobility and Young Children: A Program of Research**

**The Importance of Independent Mobility**
http://callcentre.education.ed.ac.uk/Smart_WheelCh/What_is_it_SWA/Ind_Mobility_SWA/ind_mobility_swa.html

**Safe Wheelchair Driving Suggestions**

**What is the Smart Wheelchair**
http://callcentre.education.ed.ac.uk/Smart_WheelCh/What_is_it_SWA/what_is_it_swa.html

**Power Wheelchair Features and Components**
http://wheelchair.ca/drives.php

**Peak Wheelchairs** (comparison of the range)
http://www.peakwheelchairs.com/mobility-poweredchairs.php
## 12.0 Appendices

<table>
<thead>
<tr>
<th>Section</th>
<th>Description</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>12.1</td>
<td>Initial needs survey</td>
<td>74</td>
</tr>
<tr>
<td>12.2</td>
<td>Mat evaluation for powered mobility</td>
<td>80</td>
</tr>
<tr>
<td>12.3</td>
<td>Powered mobility trial record sheet</td>
<td>82</td>
</tr>
<tr>
<td>12.4</td>
<td>PWC comparison table</td>
<td>84</td>
</tr>
<tr>
<td>12.5</td>
<td>Final prescription summary</td>
<td>87</td>
</tr>
<tr>
<td>12.6</td>
<td>Equipment final delivery checklist</td>
<td>88</td>
</tr>
<tr>
<td>12.7</td>
<td>Maintaining your wheelchair</td>
<td>89</td>
</tr>
<tr>
<td>12.8</td>
<td>PM skill development program - examples 1 and 2</td>
<td>90</td>
</tr>
<tr>
<td>12.9</td>
<td>PM skill development program form</td>
<td>94</td>
</tr>
<tr>
<td>12.10</td>
<td>GAS factsheet</td>
<td>96</td>
</tr>
<tr>
<td>12.11</td>
<td>PM performance record</td>
<td>97</td>
</tr>
<tr>
<td>12.12</td>
<td>PM performance record example</td>
<td>100</td>
</tr>
<tr>
<td>12.13</td>
<td>GAS attainment T-score conversion table</td>
<td>103</td>
</tr>
</tbody>
</table>
# Powered Mobility Initial Needs Survey

## Goals / History

<table>
<thead>
<tr>
<th><strong>Present mobility: how does client move around?</strong> (indoor, outdoor, independence level)</th>
<th><strong>PT report</strong></th>
<th>Y/N</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Referral to PT</strong></td>
<td>Y/N</td>
<td></td>
</tr>
<tr>
<td><strong>Does client currently have a powered wheelchair?</strong> Type?</td>
<td>Review current PWC</td>
<td>Y/N</td>
</tr>
<tr>
<td><strong>Does client currently have a manual wheelchair?</strong> Type?</td>
<td>Review current MWC</td>
<td>Y/N</td>
</tr>
<tr>
<td><strong>Has the client used any form of powered mobility before?</strong> (outcome/independence level)</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Client goal for mobility is ...</strong></td>
<td>Outcome measure e.g. GAS, IPPA, COPM</td>
<td></td>
</tr>
</tbody>
</table>

## Client Information

<table>
<thead>
<tr>
<th><strong>Diagnosis: If ‘cerebral palsy’, indicate type (spastic, athetoid, dystonic, ataxic) and limbs involved:</strong></th>
<th><strong>Medical Report Needed</strong></th>
<th>Y/N</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Are there any co-existing conditions?</strong> (that may affect PM use)</td>
<td><strong>Medical Report Needed</strong></td>
<td>Y/N</td>
</tr>
<tr>
<td><strong>Medication:</strong></td>
<td><strong>Action, side effects</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Orthopaedic intervention, past/current/planned/surgery?</strong> (orthoses, prostheses)</td>
<td><strong>Relevant medical or surgery dates:</strong></td>
<td></td>
</tr>
</tbody>
</table>
## Client Information (place written comments below)

<table>
<thead>
<tr>
<th>Action / Implications</th>
</tr>
</thead>
<tbody>
<tr>
<td>List all transfer methods used:</td>
</tr>
<tr>
<td>Are there personal care needs that would need to be considered in the design of the PWC? (e.g. toileting, dressing, positioning, meal times):</td>
</tr>
<tr>
<td>Day time activities (list work, school or leisure activities and relevance to use of PM):</td>
</tr>
<tr>
<td>List other technology equipment used:</td>
</tr>
<tr>
<td>Client likes/dislikes about PWC use/design:</td>
</tr>
</tbody>
</table>

## Physical

<table>
<thead>
<tr>
<th>Action / Implications</th>
</tr>
</thead>
<tbody>
<tr>
<td>Posture (describe)</td>
</tr>
<tr>
<td>Type of Seating</td>
</tr>
<tr>
<td>Does existing seating meet needs? Y/N</td>
</tr>
<tr>
<td>When was seating last reviewed?</td>
</tr>
<tr>
<td>Comments</td>
</tr>
<tr>
<td>How does or has the client accessed a switch, PWC or computer? (indicate right or left)</td>
</tr>
<tr>
<td>盒 R/L Hand</td>
</tr>
<tr>
<td>盒 R/L Wrist</td>
</tr>
<tr>
<td>盒 Other</td>
</tr>
<tr>
<td>Does fatigue affect the client and how?</td>
</tr>
</tbody>
</table>

## Action / Implications

<p>| |</p>
<table>
<thead>
<tr>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Name ___________________</td>
</tr>
<tr>
<td>Client # ___________</td>
</tr>
<tr>
<td>DOB ___________</td>
</tr>
</tbody>
</table>
## Powered Mobility Initial Needs Survey (Page 3 of 6)

### Sensory / Communication

<table>
<thead>
<tr>
<th>VISION</th>
<th>HEARING</th>
<th>SPEECH</th>
<th>SENSATION</th>
</tr>
</thead>
<tbody>
<tr>
<td>☐ No impairment</td>
<td>☐ No impairment</td>
<td>☐ No impairment</td>
<td>☐ Nil loss reported</td>
</tr>
<tr>
<td>☐ Acuity deficit</td>
<td>☐ Some impairment</td>
<td>☐ Some impairment</td>
<td>☐ Some impairment - detail:</td>
</tr>
<tr>
<td>(☐ glasses)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>☐ Visual field deficit</td>
<td>☐ Deaf</td>
<td>☐ Assistive device used</td>
<td></td>
</tr>
<tr>
<td>reported</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>☐ Eye muscle weakness</td>
<td>☐ Assistive device used</td>
<td>☐ Indicates Yes/No</td>
<td></td>
</tr>
<tr>
<td>eg. strabismus</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>☐ Legally blind</td>
<td>☐ Further info needed</td>
<td>☐ No speech</td>
<td>☐ Further info needed</td>
</tr>
<tr>
<td>☐ Further info needed</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Comments:

### Cognitive / Perceptual / Behavioural / Psychological

<table>
<thead>
<tr>
<th>Action / Implications</th>
</tr>
</thead>
<tbody>
<tr>
<td>Comment on cognitive/perceptual skills (attention, memory, judgement, insight, motor planning, spatial relations, depth, distance)</td>
</tr>
<tr>
<td>Comment on behavioural / psychological status (history, mood/affect, impulse control)</td>
</tr>
</tbody>
</table>
## Powered Mobility Initial Needs Survey (Page 4 of 6)

### Support Network

- **Lives alone**
  - Name ______________________
  - Relationship ______________________

- **Support at home**

If the client needs a support person to assist with a powered mobility programme, that person would be:

- Name ______________________
- Contact ______________________
- Role ______________________

Are there other relevant support people that need to be listed?

- Name ______________________
- Contact ______________________
- Role ______________________

- Name ______________________
- Contact ______________________
- Role ______________________

**Carer/attendant needs** (consider attendant control, goals / expectations):

### Home

- **Is home the primary environment for use of the PWC?**
  - Yes ☐
  - No ☐

- **Housing (type, construction, levels):**
  - Own home ☐
  - Rented ☐
  - Dept. of Housing ☐
  - Move or build planned ☐

- **Comment on access to the home (ramps, lift, widths, heights):**

### Action / Implications

- Refer to support network info 2.4

- Site visit required ☐

- PWC trial required ☐
<table>
<thead>
<tr>
<th>Question</th>
<th>Home mods needed</th>
<th>Other Environments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Would the client have access to all the rooms they would need to use?</td>
<td>Y / N</td>
<td>Where does the client/carer plan to use the PWC other than home? LIST</td>
</tr>
<tr>
<td>Would there be any tight turning spaces? (Measure and record. This will</td>
<td>Home mods needed</td>
<td>Site visit required Y / N</td>
</tr>
<tr>
<td>affect size and type of wheelchair base)</td>
<td></td>
<td>In these environments are there any known steep inclines, ramps, kerb lips,</td>
</tr>
<tr>
<td></td>
<td></td>
<td>camber? (consider carefully as this will affect choice of PWC)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Are there tight turning circles in any frequently used places? (Measure and</td>
</tr>
<tr>
<td></td>
<td></td>
<td>record) (this will affect size and type of wheelchair base)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Type of terrain travelled over (consider all) (will affect castor/tyre/drive</td>
</tr>
<tr>
<td></td>
<td></td>
<td>choices)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>PWC Trial required Y / N</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Check features of mobility base suit</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
### Transport Considerations

<table>
<thead>
<tr>
<th>What type/s of transport would the client use? (consider all, incl. public)</th>
<th>Action / Implications</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Trial PWC in vehicle</td>
</tr>
<tr>
<td></td>
<td>Mods needed?</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Would the client travel in the powered wheelchair or in a seat?</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Portable ramps needed?</td>
<td>Y / N</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Access to the vehicle?</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Ramp</td>
<td>Hoist</td>
<td>Side entry</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Are there any restrictions to access?</th>
<th>Other transport Info needed? (can affect choice of PWC base)</th>
<th>Y / N</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(taxi vouchers, accessible vehicles)</td>
<td></td>
</tr>
</tbody>
</table>

### Further notes:

__________________________________________________________________

__________________________________________________________________

__________________________________________________________________

__________________________________________________________________

__________________________________________________________________

__________________________________________________________________
Mat Evaluation for Powered Mobility (Page 1 of 2)

<table>
<thead>
<tr>
<th>Name</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

DOB  Client No  Therapist

(see prompt sheet for guidance)

<table>
<thead>
<tr>
<th>Measure</th>
<th>Left</th>
<th>Right</th>
</tr>
</thead>
<tbody>
<tr>
<td>A Top of head to ischial tuberosity</td>
<td></td>
<td></td>
</tr>
<tr>
<td>B Top of shoulder to ischial tuberosity</td>
<td></td>
<td></td>
</tr>
<tr>
<td>C Armpit to ischial tuberosity</td>
<td></td>
<td></td>
</tr>
<tr>
<td>D Thigh length</td>
<td></td>
<td></td>
</tr>
<tr>
<td>E Popliteal to Heel</td>
<td></td>
<td></td>
</tr>
<tr>
<td>F Trunk depth</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Measure</th>
<th>mm</th>
</tr>
</thead>
<tbody>
<tr>
<td>G Shoulder width</td>
<td></td>
</tr>
<tr>
<td>H Chest width</td>
<td></td>
</tr>
<tr>
<td>I ASIS - ASIS</td>
<td></td>
</tr>
<tr>
<td>J Hip width (widest)</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Joint Range</th>
<th>°</th>
</tr>
</thead>
<tbody>
<tr>
<td>RIGHT Hip Flexion (0 → 125°) (with knee flexed)</td>
<td></td>
</tr>
<tr>
<td>LEFT Hip Flexion (0 → 125°) (with knee flexed)</td>
<td></td>
</tr>
<tr>
<td>RIGHT Knee Extension (Measure with hip flexed)</td>
<td></td>
</tr>
<tr>
<td>LEFT Knee Extension (Measure with hip flexed)</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Physical Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>GMFCS Score</td>
</tr>
<tr>
<td>(see GMFCS website <a href="http://www.canchild.ca/en/measures/gmfcs.asp">www.canchild.ca/en/measures/gmfcs.asp</a>)</td>
</tr>
<tr>
<td>Muscle tone (comment)</td>
</tr>
<tr>
<td>Primitive Reflexes (activity vs rest)</td>
</tr>
<tr>
<td>Motor control</td>
</tr>
</tbody>
</table>
Mat Evaluation for Powered Mobility (Page 2 of 2)

Postural Observations in Sitting (circle one postural element for each area to record the dominant posture)


<table>
<thead>
<tr>
<th>Pelvis</th>
<th>Trunk</th>
<th>Hips</th>
<th>Knees</th>
<th>Ankles</th>
<th>Upper Limbs</th>
<th>Head &amp; Neck</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tilt (side)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Neutral</td>
<td>Post tilt</td>
<td>Ant tilt</td>
<td>Neutral</td>
<td>Right</td>
<td>Left</td>
<td>Neutral</td>
</tr>
<tr>
<td>Rear view</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Neutral</td>
<td>Scoliosis convex R</td>
<td>Scoliosis convex L</td>
<td>Neutral</td>
<td>Kyphosis thoracic</td>
<td>Lordosis lumbar</td>
<td>Rotation to Right</td>
</tr>
<tr>
<td>Side view</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Neutral</td>
<td></td>
<td></td>
<td>Internal rot’n</td>
<td>External rot’n</td>
<td></td>
<td>Windswept R</td>
</tr>
</tbody>
</table>

Postural Components required for Powered Mobility trial (tick ✓)

<table>
<thead>
<tr>
<th>Pelvic positioning</th>
<th>Trunk/Shoulder Positioning</th>
<th>Hip Positioning</th>
<th>Foot/Leg Positioning</th>
<th>Upper Limbs</th>
<th>Head Positioning</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pelvic positioners</td>
<td>Contoured back</td>
<td>Hip blocks</td>
<td>Calf strap</td>
<td>Forearm cuffs</td>
<td>Rear support</td>
</tr>
<tr>
<td>Pelvic strap 2pnt</td>
<td>Thoracics/ Lateral</td>
<td>Abduction block</td>
<td>Shin strap</td>
<td>Wrist cuffs</td>
<td>Lateral supp R/L</td>
</tr>
<tr>
<td>Pelvic strap 4pnt</td>
<td>Anterior curve lats</td>
<td>Lat. thigh supports</td>
<td>Ankle / foot straps</td>
<td>Elbow keepers</td>
<td>Occipital supp</td>
</tr>
<tr>
<td>Sacral pad</td>
<td>Shoulder positioners</td>
<td>Abduction straps</td>
<td>Foot guides</td>
<td>Table/tray</td>
<td>Anterior supp</td>
</tr>
<tr>
<td>Wedge/Anti-thrust</td>
<td>Harness</td>
<td>Knee blocks</td>
<td>AFO’s worn</td>
<td>Orthosis worn</td>
<td>Neck brace worn</td>
</tr>
<tr>
<td>Obliquity wedges</td>
<td>Spinal brace worn</td>
<td>Hip brace worn</td>
<td></td>
<td>Type of head rest</td>
<td></td>
</tr>
<tr>
<td>Contoured seat</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Tilt-in-space required? Yes ☐ No ☐ Name & Signature ____________________________
## Powered Mobility Trial Record Sheet

<table>
<thead>
<tr>
<th>Name</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>People present</td>
<td></td>
</tr>
<tr>
<td>Controller/device evaluated</td>
<td></td>
</tr>
<tr>
<td>Wheelchair used</td>
<td></td>
</tr>
<tr>
<td>Session start time</td>
<td>Finish time</td>
</tr>
<tr>
<td>Therapist</td>
<td></td>
</tr>
</tbody>
</table>

**Positioning** *(seating supports utilised, position of switch/controller, measurements taken for next session)*

<table>
<thead>
<tr>
<th>Positioning Details</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
</tr>
</tbody>
</table>

**Basic mobility** *(contact with switch/controller, effort required, tone/reflex activity observed)*

**Ability to 'GO'*

<table>
<thead>
<tr>
<th>Ability to 'GO' Details</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
</tr>
</tbody>
</table>

**Ability to 'STOP’ *(method of stop/release, response to obstacles, spontaneous/on command)*

<table>
<thead>
<tr>
<th>Ability to 'STOP’ Details</th>
</tr>
</thead>
</table>
Directional control (ease of use, moving between directions, looking in direction of movement, impact of reflexes and/or tone)

Turning left and right

Forward (and/or reverse if provided)

Motivation (interest, perseverance, affect, games/motivators used)

Postural observations during trial (e.g. head control, upper limb position, change in tone, motion/stability, comfort)

Difficulties (problems, concerns)

Plan for next session
### Powered Wheelchair (Base) Comparison Table (Page 1 of 3)

**Client need from assessment or trial**

<table>
<thead>
<tr>
<th>Specific Component</th>
<th>Essential</th>
<th>Desirable</th>
<th>Powered bases considered / trialled</th>
</tr>
</thead>
<tbody>
<tr>
<td>Drive (rear, centre wheel, front)</td>
<td>□</td>
<td>□</td>
<td>□</td>
</tr>
<tr>
<td>Compatibility with powered wheelchair base</td>
<td>□</td>
<td>□</td>
<td>□</td>
</tr>
<tr>
<td>Manoeuverability/turning circle</td>
<td>□</td>
<td>□</td>
<td>□</td>
</tr>
<tr>
<td>Suspension</td>
<td>□</td>
<td>□</td>
<td>□</td>
</tr>
<tr>
<td>Growth</td>
<td>□</td>
<td>□</td>
<td>□</td>
</tr>
<tr>
<td>Width &amp; Length (footprint)</td>
<td>□</td>
<td>□</td>
<td>□</td>
</tr>
<tr>
<td>Consider across measure sites</td>
<td>□</td>
<td>□</td>
<td>□</td>
</tr>
<tr>
<td>Tyres (e.g. wheel size, grip)</td>
<td>□</td>
<td>□</td>
<td>□</td>
</tr>
<tr>
<td>Castors (e.g. width, height, solid/air)</td>
<td>□</td>
<td>□</td>
<td>□</td>
</tr>
</tbody>
</table>

**Examples**

- PWC: Supplier:
- PWC: Supplier:
- PWC: Supplier:

**Name**

**DOB**

**Client Number**

**Date**

**Therapist**
## Powered Wheelchair (Base) Comparison Table (Page 2 of 3)

<table>
<thead>
<tr>
<th>Feature for comparison</th>
<th>Client need from assessment or trial</th>
<th>Powered bases considered / trialled</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Specific Component</td>
<td>Essential</td>
</tr>
<tr>
<td><strong>Examples</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Armrests (e.g. length, function, dual/single/flip up, padded, hip blocks to be attached)</td>
<td></td>
<td>□ □</td>
</tr>
<tr>
<td>Footplates (e.g. hanger angle, single, double, angle adjustable)</td>
<td></td>
<td>□ □</td>
</tr>
<tr>
<td>Seat-to-floor height (With/out cushion, adjustable, powered seat height)</td>
<td></td>
<td>□ □</td>
</tr>
<tr>
<td>Tilt-in-space (consider max. angle, ant. tilt)</td>
<td></td>
<td>□ □</td>
</tr>
<tr>
<td>Control system (Type e.g. Dynamics, P&amp;G, Inv Mark Vi)</td>
<td></td>
<td>□ □</td>
</tr>
<tr>
<td>Controller/Input device (e.g. joystick, switches, head array, compatible with system above?)</td>
<td></td>
<td>□ □</td>
</tr>
<tr>
<td>Programmability (hand-held/ comp, speed, terrain, torque, tremor)</td>
<td></td>
<td>□ □</td>
</tr>
<tr>
<td>Attendant control (L/R mount, height adjust, features)</td>
<td></td>
<td>□ □</td>
</tr>
<tr>
<td>Feature for comparison</td>
<td>Examples</td>
<td>Transport (tie-downs, locking plates compatible?)</td>
</tr>
<tr>
<td>------------------------</td>
<td>----------</td>
<td>-----------------------------------------------</td>
</tr>
<tr>
<td>Client need from assessment or trial</td>
<td>Essential</td>
<td>□ □ □ □</td>
</tr>
<tr>
<td></td>
<td>Desirable</td>
<td>□ □ □ □</td>
</tr>
</tbody>
</table>

Powered bases considered / trialled

PWC: Supplier:
Appendix 12.5

Final Prescription Summary

<table>
<thead>
<tr>
<th>Name</th>
<th>DOB</th>
<th>Client Number</th>
</tr>
</thead>
</table>

Complete each section to ensure all components are recorded.

<table>
<thead>
<tr>
<th>PWC Base</th>
<th>Seating</th>
</tr>
</thead>
<tbody>
<tr>
<td>Details:</td>
<td>Details:</td>
</tr>
<tr>
<td>Supplier:</td>
<td>Supplier:</td>
</tr>
<tr>
<td>Date of final quote:</td>
<td>Date of final quote:</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Control System (method of access)</th>
<th>Other Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Details:</td>
<td>Funding source/s: (list each)</td>
</tr>
<tr>
<td>Supplier:</td>
<td>Date applied:</td>
</tr>
<tr>
<td>Date of final quote:</td>
<td>□ Entered on Equipment register</td>
</tr>
<tr>
<td></td>
<td>Date approved:</td>
</tr>
<tr>
<td></td>
<td>Other equipment for interfacing: (please list)</td>
</tr>
<tr>
<td>Specialist service involved?</td>
<td></td>
</tr>
<tr>
<td>Contact</td>
<td></td>
</tr>
<tr>
<td>Ph</td>
<td></td>
</tr>
<tr>
<td>Individuals required at equipment fitting/delivery:</td>
<td>(please list)</td>
</tr>
</tbody>
</table>

Therapist name ___________________________ Signature ___________________________
Date ______________
## Appendix 12.6

### Equipment Delivery Checklist

Client name and number __________________________________________________________

Equipment for delivery __________________________________________________________

People present _________________________________________________________________

Location __________________________________________________________________________

<table>
<thead>
<tr>
<th>Check</th>
<th>Date</th>
<th>Signed</th>
</tr>
</thead>
<tbody>
<tr>
<td>☐ PWC in working order</td>
<td></td>
<td></td>
</tr>
<tr>
<td>☐ Instruction manual issued</td>
<td></td>
<td></td>
</tr>
<tr>
<td>☐ Basic operation training provided (on/off/modes)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>☐ PWC programmed to suit client’s needs</td>
<td></td>
<td></td>
</tr>
<tr>
<td>☐ Battery charger issued and demonstrated</td>
<td></td>
<td></td>
</tr>
<tr>
<td>☐ Battery charger instruction manual provided</td>
<td></td>
<td></td>
</tr>
<tr>
<td>☐ Method for loading into van/car, tie downs etc approved</td>
<td></td>
<td></td>
</tr>
<tr>
<td>☐ Maintenance and care guidelines discussed and provided (Section 7.2)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>☐ Supervision guidelines, for new users provided, if required (Section 8.1)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>☐ PM skill development program and PM performance record provided, if required (Sections 8.2 and 8.3)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>☐ Applicable contact numbers supplied (e.g. ☐ Therapist, ☐ PWC Supplier, ☐ Seating Service, ☐ Funding body, ☐ Pathways)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Further actions** (list below, tick, date, sign when completed)

☐

☐

☐

☐
# MAINTAINING YOUR WHEELCHAIR: HOME MAINTENANCE PLAN

Regular maintenance of your chair is required to keep moving parts and upholstery clean and brakes and wheels properly adjusted. A build up of dirt on your wheelchair can have a significant effect on its performance and durability. Cleaning and replacing of components varies according to the size and weight of the user, the way in which the wheelchair is used and the physical environment in which it is used. At TASC, we recommend the following maintenance program to keep your chair in good condition.

## Daily
- Wipe away food scraps with a damp cloth then dry thoroughly.
- Brush out or vacuum all corners of the chair where food scraps could be trapped.
- Clean tray, including top surface, sides and underneath.
- Cushions/Sheepskins - at night, lift removable cushions, shake and air.
- Change and wash covers if wet or dirty (follow manufacturers washing instructions).
- Charge the battery, every night for at least 12 hours.
- Check all connections are secure and in place for switches, controllers, etc.
- Check the battery compartment, clean to remove dust, food etc.

## Weekly
- Clean upholstery and frame, using a damp cloth with water and mild detergent. Dry thoroughly to prevent rusting of screws etc. Disinfectant may be used if needed, eg food, urine.
- Do not shower or use a hose to clean the chair.
- Check all nuts, bolts and screws, tighten when needed.
- Check tyre pressures are maintained. Inflate only to recommended tyre pressure (specified on tyre)
- After checking the tyre pressure, check the brakes and adjust as necessary.
- If removable footplates and/or quick release wheel hubs are fitted, remove and clean out any dirt. Spray fittings with a light lubricant (available in bicycle stores)

## Monthly
- Remove hair, lint and other dirt from castors.
- Check tyres for wear. If fabric/canvas shows through the rubber, the tyres must be replaced.
- Check wheels and castors for wobbles. (Tightening the locking nut under the plastic cap of the front wheel often remedies front wheel wobble at speed).
- Check headrest fitting/pelvic strap and other straps attached to the chair.
- Nourish vinyl upholstery using a commercially available upholstery restorer.
- Datex material to be cleaned using a cloth and mild detergent, wipe dry.
- Clean chrome and painted surfaces using a cloth and mild detergent or an appropriate household spray cleaner if necessary.
- Check position of footplates and adjust if necessary.

## Twice Yearly
- Check upholstery for wear.
- Check frame for rust and cracks.
- Touch up paint. (Touch up kits for powder coated surfaces are available from hardware and paint shops).

If any problems are found at any of these maintenance checks, have repairs carried out as soon as possible. Please contact TASC Equipment Services on 9975 8472.
**PM Skill Development Program - Example 1**

<table>
<thead>
<tr>
<th>Name</th>
<th>Date</th>
<th>DOB</th>
<th>Client Number</th>
<th>Present</th>
<th>Wheelchair</th>
<th>Wheelchair control system</th>
<th>Therapist</th>
<th>Therapist Contact Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kate Jones</td>
<td>20.11.2008</td>
<td>11.03.1999</td>
<td>2345</td>
<td>NC, CB</td>
<td>Glide</td>
<td>Attendant control and standard joystick</td>
<td>NC</td>
<td>02 9479 7200 <a href="mailto:nc@cerebralpalsy.org.au">nc@cerebralpalsy.org.au</a></td>
</tr>
</tbody>
</table>

### Controller
- Able to move joystick to right and left and forward for short distance.
- May need physical prompt to get started going forward.
- Stop and start independently and on verbal cue.
- Reduce physical prompts used.
- Increase opportunities to use wheelchair within motivating routine activities at school, e.g. Kate to use her wheelchair to move to the lunch table.
- Hang interesting sensory activities, e.g. streamers at eye level in the playground close to Kate so that she is encouraged to move towards them.
- Provide Kate with verbal feedback about what she has done, e.g. you have got the streamers; you stopped; you are going round and round.
- Plan for longer periods of time using chair 20-30 mins at a time of exploratory play in the playground at least 3 times/week and one trip to park on weekends.

### Directional Control
- Appears to like doing donuts R>L
- Goes forward for 1m at time in familiar task of going to playground for recess, on verbal cue with initial physical prompt.
- Initiates stopping about .5m from large obstacles such as wall. Does not avoid hitting obstacles below eye level.
- To increase purposeful movement towards place, object or person.
- To increase distance going forward.
- To stop before hitting obstacles or for therapist to determine why she is hitting obstacles below eye level.
- Uses with close supervision in playground and park on weekend.
- Attendant control is used in the classroom and inside the house.
- Begin training in indoor area with space e.g. gym
- Set-up games requiring travel between two points, use items of interest to encourage exploration and travel to further parts of the space.

### Environments
- Uses wheelchair for only short periods of time, 10 mins, 2-3 times a day.
- To increase amount of time using wheelchair independently, as tolerated.
<table>
<thead>
<tr>
<th>Current Skill Level</th>
<th>Next Steps</th>
<th>Strategies and Opportunities</th>
</tr>
</thead>
<tbody>
<tr>
<td>Transport</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Travels in school bus and mother’s van in wheelchair. Foam tray is used to maintain more midline posture and attendant control to get in and out of bus.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Maintenance</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Mother is responsible for maintenance and charging.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Safety</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Needs close supervision and should use an obstacle and hazard free environment.</td>
<td>• Gradually increase obstacles</td>
<td></td>
</tr>
</tbody>
</table>

Other things to remember: Joystick control should only be in place when Kate has opportunity to use the wheelchair herself to decrease her confusion. Further, it should be switched off at attendant control when Kate’s session is finished so that it is not accidentally activated when it is removed.

If chair breaks down contact ________________________________

Review date ___________________________  Signed ___________________________
**PM Skill Development Program - Example 2** (Page 1 of 2)

**Name**  
James Black  

**DOB**  
11.03.1999  

**Client Number**  
2345  

**Present**  
NC, CB  

**Wheelchair**  
Pride wheelchair  

**Wheelchair control system**  
Standard joystick  

**Therapist**  
NC  

**Date**  
20.11.2008  

**Therapist Contact Details**  
02 9479 7200  nc@cerebralpalsy.org.au

<table>
<thead>
<tr>
<th>Current Skill Level</th>
<th>Next Steps</th>
<th>Strategies and Opportunities</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Controller</strong></td>
<td>• Is able to independently turn on and off, operate all features of controller and adjusts speed appropriate to the circumstances.</td>
<td></td>
</tr>
</tbody>
</table>
| **Directional Control** | • Able to manoeuvre in the classroom in and out of the door, between desks and within the bathroom.  
• At home, can negotiate the ramp and turn from narrow hallway into all the rooms.  
• There are no reported incidents of running into furniture or other people. | |
| **Environments**    | • At school, is able to get from one part of school to another independently.  
• Uses wheelchair on footpaths when walking with mother from home. At school, able to stay with class when going on outing to local shop.  
• Mother reports that wheelchair has been used in a variety of environments such as the park, fishing and shops with no difficulties.  
• To find way around unfamiliar environment  
• To use lifts | • Looking at maps or plans of sites such as high school next year and shopping centres to plan route from one place to another.  
• Trips to shopping centre to include using lift. |
| **Time**            | • Spends all day in wheelchair at school and until bedtime.  
• No fatigue issues reported. | |
# PM Skill Development Program - Example 2 (Page 2 of 2)

<table>
<thead>
<tr>
<th>Current Skill Level</th>
<th>Next Steps</th>
<th>Strategies and Opportunities</th>
</tr>
</thead>
</table>
| **Transport**       | • Sits in regular seat in vehicle.  
                      • Mother loads wheelchair into van. | • To self load wheelchair into taxi / bus.  
                      • To understand tie-downs and seat belts and to identify if wheelchair has been safely secured. | • Travel on school bus next year. |
| **Maintenance**     | • Mother is responsible for maintenance and charging. | • To learn about maintenance and charging schedule in order to direct carer to be able to do this.  
                      • To know what to do if wheelchair breaks down. | • Mother and James to make maintenance chart and emergency chart together for fridge at home and breakdown procedures card for bag on wheelchair. |
| **Safety**          | • Was able to identify the hazards at school such as the stairs and car park.  
                      • Demonstrated avoidance of going too close to these hazards.  
                      • James has been taught these hazards and supervised when first getting wheelchair.  
                      • Stops at edge of road. | • To independently identify obstacles and hazards.  
                      • Age appropriate traffic safety, including crossing the road at crossings or traffic lights, awareness in car parks, going across driveways etc | • Actively teach road safety.  
                      • Provide opportunities for structured practice at crossing road, eg using the school crossing with traffic supervisors in the morning when arriving at school.  
                      • To have supervision when moving around new high school next year and program of teaching James to identify hazards as he goes. |

**Other things to remember**

James has only had wheelchair for 3 months. In this time he has become very confident in moving around familiar environments. He still requires more supervision than other students of his age, as he has not had the same experience of independent mobility.

This includes road safety, finding his way from place to place and an awareness of hazards, especially in less familiar environments.

If chair breaks down contact ____________________________

Review date ____________________________  Signed ____________________________
### Powered Mobility Skill Development Program

**Current Skill Level**

<table>
<thead>
<tr>
<th>Controller</th>
<th>Directional Control</th>
<th>Environments</th>
<th>Time</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
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</tbody>
</table>

**Strategies and Opportunities**

<table>
<thead>
<tr>
<th>Date</th>
<th>Present</th>
<th>Therapist Contact Details</th>
<th>Therapist</th>
</tr>
</thead>
<tbody>
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<td></td>
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</table>

**Client Number**

<table>
<thead>
<tr>
<th>Name</th>
<th>DOB</th>
</tr>
</thead>
<tbody>
<tr>
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</table>

**Environments**

<table>
<thead>
<tr>
<th>Time</th>
<th>Environments</th>
<th>Directional Control</th>
<th>Controller</th>
</tr>
</thead>
<tbody>
<tr>
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**Appendix 12.9**

**Powered Mobility Skill Development Program**

<table>
<thead>
<tr>
<th>Current Skill Level</th>
<th>Next Steps</th>
<th>Strategies and Opportunities</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
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</tr>
</tbody>
</table>

**Controller**

<table>
<thead>
<tr>
<th>Date</th>
<th>Present</th>
<th>Therapist Contact Details</th>
<th>Therapist</th>
</tr>
</thead>
<tbody>
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**Environments**

<table>
<thead>
<tr>
<th>Time</th>
<th>Environments</th>
<th>Directional Control</th>
<th>Controller</th>
</tr>
</thead>
<tbody>
<tr>
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</table>

**Appendix 12.9**

**Powered Mobility Skill Development Program**

<table>
<thead>
<tr>
<th>Current Skill Level</th>
<th>Next Steps</th>
<th>Strategies and Opportunities</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
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**Controller**

<table>
<thead>
<tr>
<th>Date</th>
<th>Present</th>
<th>Therapist Contact Details</th>
<th>Therapist</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
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**Environments**

<table>
<thead>
<tr>
<th>Time</th>
<th>Environments</th>
<th>Directional Control</th>
<th>Controller</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
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</tbody>
</table>

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**Appendix 12.9**

**Powered Mobility Skill Development Program**

<table>
<thead>
<tr>
<th>Current Skill Level</th>
<th>Next Steps</th>
<th>Strategies and Opportunities</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Controller**

<table>
<thead>
<tr>
<th>Date</th>
<th>Present</th>
<th>Therapist Contact Details</th>
<th>Therapist</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
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</tr>
</tbody>
</table>

**Environments**

<table>
<thead>
<tr>
<th>Time</th>
<th>Environments</th>
<th>Directional Control</th>
<th>Controller</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Strategies and Opportunities</td>
<td>Next Steps</td>
<td></td>
<td></td>
</tr>
<tr>
<td>-----------------------------</td>
<td>-----------</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Current Skill Level</td>
<td>Transport</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Maintenance</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Safety</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Other things to remember

If chair breaks down contact

Review date

Signed
Goal Attainment Scale (GAS)
Kiresuk & Sherman (1968)

Our experience and current research shows best results are achieved if we work towards an individual’s unique goals at a given time. The Goal Attainment Scale (GAS) is one way Cerebral Palsy Alliance uses to measure whether the strategies chosen are helping individuals meet their goals.

WHAT is GAS?
GAS is a tool for recording measurable changes, even small ones, in any area that you have a goal. It is recommended to work on only 2-3 goals at any one time over a short period.

WHY is it used?
GAS is based on each individual’s unique set of goals. It is recognised that individuals have different goals and progress at different rates. The tool assists in establishing an agreed starting point for intervention; setting expectations for progress and measuring the changes made.

WHO is involved?
Client, parents/carers, therapists and teachers identify goals and monitor changes collaboratively.

HOW does the scale work?
An individualised five-point scale (-2, -1, 0, +1, +2) is used to measure progress. Once a goal is identified, the expected outcome in an agreed timeframe for that goal, becomes the ‘0’ point.
-2 current skill level;
-1 less progress than expected;
0 expected outcome
+1 more progress than expected
+2 much greater progress than expected.

At the end of an agreed timeframe the current skill is reviewed. Achievement towards the goal is scored according to the scale.

WHAT do the results mean?
A score of 0 is great. It means that the individual has achieved their goal.
If the individual does not achieve their goal its time to look at why. Perhaps the expected outcome of the goal was not realistic, perhaps the intervention needs to be modified, perhaps more time is needed or perhaps there have been other factors that have affected progress.
If the individual achieves greater than expected that’s great! It should also be considered whether the expected outcome of the goal was challenging enough and whether greater expectations need to be set next time.
### Goal Attainment Scale (GAS)

**GAS Goal 1:**

<table>
<thead>
<tr>
<th>Date</th>
<th>+2</th>
<th>+1</th>
<th>0</th>
<th>-1</th>
<th>-2</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Predicted Level of Attainment**

Please date and tick the level of skill observed (below).

---

**Progress Notes (date & sign)**

---

**Client Number**

---

**Therapist**

---
## Goal Attainment Scale (GAS)

### GAS Goal 2:

<table>
<thead>
<tr>
<th>Predicted Level of Attainment</th>
<th>Date</th>
<th>Progress Notes (date &amp; sign)</th>
</tr>
</thead>
<tbody>
<tr>
<td>+2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>+1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>-1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>-2</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Please date and tick the level of skill observed (below).
### Powered Mobility Performance Record

#### Goal attainment scale for

**Date**

GAS Scores (-2 to +2)

<table>
<thead>
<tr>
<th>GAS Scores (-2 to +2)</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>SUM of Scale Scores</th>
</tr>
</thead>
</table>

Calculate GAS T-SCORE - see conversion key tables corresponding to number of scored scales

GAS T-SCORE = 

**INTERPRETATION** = Below expected / Expected / Above Expected

- (<50)
- (50)
- (>50)
### Goal Attainment Scale (GAS)

**GAS Goal 1:** For Nicole to be able to move the powered wheelchair independently using the joystick on the left hand side to reach a motivating activity (e.g. run over bubble wrap, knock over pins, push therapy ball).

<table>
<thead>
<tr>
<th>Predicted Level of Attainment</th>
<th>Date</th>
<th>22/7</th>
<th>26/7</th>
<th>31/7</th>
<th>7/8</th>
<th>17/8</th>
<th>3/9</th>
<th>6/9</th>
<th>15/9</th>
<th>Progress Notes (date &amp; sign)</th>
</tr>
</thead>
<tbody>
<tr>
<td>+2 Moves independently to activity 5+ times in a session</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>22/7 - interested in joystick, exploring motion 26/7 - continued with joystick, pushing with extended fingers, working with grasp</td>
</tr>
<tr>
<td>+1 Moves independently to activity 1-5 times in a session (0-1m)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>31/7 - grasping, working with release of knob and control of direction of movement</td>
</tr>
<tr>
<td>0 Moves independently toward activity (1-&lt;2m)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>7/8 - more interest in activity and room, looking toward areas of interest, moving toward activity 17/8 - moved toward activity today with more apparent purpose. Still working on grasp, release and direction. Approx 2m.</td>
</tr>
<tr>
<td>-1 Moves independently toward activity (&gt;2m away)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>23/8 - moved to within a metre during the session, grasp improving, still getting stuck, trialled U-shaped joystick knob with positive results, greater accuracy. 30/8 - moved straight to activity, played around there with grasp and release. Fatigued. 6/9 - moved to and from activity, 3x using U knob with greater accuracy, release improving, direction with some errors.</td>
</tr>
<tr>
<td>-2 Circles randomly not moving towards activity</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>15/9 - direction improving, control expanding in accuracy. Moved to activity 4x.</td>
</tr>
</tbody>
</table>
### Goal Attainment Scale (GAS)

**GAS Goal 2:** For Nicole to independently stop the PWC before bumping obstacles eg. cardboard boxes during PM sessions indoors over a 6 week period.

<table>
<thead>
<tr>
<th>Predicted Level of Attainment</th>
<th>Date</th>
<th>22/7</th>
<th>26/7</th>
<th>31/7</th>
<th>7/8</th>
<th>17/8</th>
<th>23/8</th>
<th>30/8</th>
<th>6/9</th>
<th>15/9</th>
<th>Progress Notes (date &amp; sign)</th>
</tr>
</thead>
<tbody>
<tr>
<td>+2</td>
<td>Stops before bumping obstacle with no prompting &gt;5 times in a session</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>22/7 - enjoying movement but hitting walls with wheelchair. 26/7 - continues to enjoy the movement and continues to bump obstacles.</td>
</tr>
<tr>
<td>+1</td>
<td>Stops before obstacle with no verbal prompting 1-5 times in a session</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>31/7 - showing more awareness and anticipation of direction and looking at obstacle as approaches it. 7/8 - noted attempts to release joystick on collision with the wall/obstacle. Prompting and encouragement given.</td>
</tr>
<tr>
<td>0</td>
<td>Stops before bumping obstacle with verbal prompting</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>17/8 - definite attempt to stop before obstacle, but still bumping it due to time taken to release. 23/8 - changed joystick knob to ‘U’ shape. Noted easier release to stop. Bumping obstacle but showing improvement.</td>
</tr>
<tr>
<td>-1</td>
<td>Stops after bumping obstacle (with verbal prompting)</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td></td>
<td></td>
<td>30/8 - Stopped before obstacle 3x still needing verbal prompt to assist with release timing. 6/9 - release occurring more consistently, timing improving.</td>
</tr>
<tr>
<td>-2</td>
<td>Stops with physical assistance after bumping obstacle</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>15/9 - Stopped 2/3 times before hitting obstacle today. Continuing to improve the release time.</td>
</tr>
</tbody>
</table>
## Goal attainment scale for Nicole White

<table>
<thead>
<tr>
<th>GAS Scores (-2 to +2)</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>2</td>
<td>+1</td>
</tr>
<tr>
<td>3</td>
<td></td>
</tr>
<tr>
<td><strong>SUM of Scale Scores</strong></td>
<td><strong>+1</strong></td>
</tr>
</tbody>
</table>

Calculate GAS T-SCORE - see conversion key tables corresponding to number of scored scales

\[
\text{GAS T-SCORE} = 56.21 \quad \text{Above Expected}
\]

**INTERPRETATION**
- Below expected / Expected / Above Expected
  - (<50) / (50) / (>50)
## GAS Attainment T-Score Conversion Table

<table>
<thead>
<tr>
<th>Total raw scores (sum of scale scores)</th>
<th>Number of goals</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1</td>
</tr>
<tr>
<td>-12</td>
<td></td>
</tr>
<tr>
<td>-11</td>
<td></td>
</tr>
<tr>
<td>-10</td>
<td></td>
</tr>
<tr>
<td>-9</td>
<td></td>
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<tr>
<td>-8</td>
<td></td>
</tr>
<tr>
<td>-7</td>
<td></td>
</tr>
<tr>
<td>-6</td>
<td></td>
</tr>
<tr>
<td>-5</td>
<td></td>
</tr>
<tr>
<td>-4</td>
<td></td>
</tr>
<tr>
<td>-3</td>
<td></td>
</tr>
<tr>
<td>-2</td>
<td>30.00</td>
</tr>
<tr>
<td>-1</td>
<td>40.00</td>
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<tr>
<td>0</td>
<td>50.00</td>
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<tr>
<td>1</td>
<td>60.00</td>
</tr>
<tr>
<td>2</td>
<td>70.00</td>
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<tr>
<td>3</td>
<td>68.61</td>
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<tr>
<td>4</td>
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<tr>
<td>5</td>
<td>72.82</td>
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<tr>
<td>6</td>
<td>77.38</td>
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<tr>
<td>7</td>
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<td>8</td>
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</tr>
<tr>
<td>11</td>
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<td>12</td>
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</table>

Adapted from Cardillo JE (1994) and www.gasbankscales.com by Linda Elliott, 2007