

Use of powered mobility for a young adult with profound and multiple learning disabilities: a practice analysis

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Abstract

Statement of context: Powered mobility has reported benefits as a learning tool for individuals limited in independent mobility. The majority of literature focuses on early years populations and there remains a need to address powered mobility for adults with profound and multiple learning disabilities. This article explores the experience of switch-operated powered mobility training for one young adult with profound and multiple learning disabilities.

Critical reflection on practice: Powered mobility provided a motivating medium through which previously unseen skills, such as upper limb use, were demonstrated. Use of switches, rather than typically used joysticks, allowed successful participation.

Implication for practice: Providing the right equipment, environment and appropriate challenge for an individual can facilitate unexpected achievement.

Keywords

Powered mobility, learning disabilities, cerebral palsy

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Statement of context

Self-initiated locomotion (for example crawling and walking) in typically developing children can be viewed as a platform for psychological changes (Campos and Bertenthal, 1989). These psychological changes include areas such as communication, understanding about their physical world (Campos et al., 2000) and spatial awareness (Kermoian and Campos, 1988). Self-initiated locomotion can be significantly limited in individuals with conditions that can severely affect motor skills. Beckung et al. (2008) reported that of a sample of 9,012 children with cerebral palsy (CP), 30% were non-ambulant. These conditions may also present with cognitive, as well as physical impairments.

The interest and investment in early years powered mobility has continued to develop and grow in recent years. There is now a substantial amount of evidence advocating that young people whose prognosis for independent mobility is limited should begin experiencing powered mobility as early as possible (Guerette et al., 2013; Lynch et al., 2009). In addition to providing a possible means for independent movement, powered mobility has been documented to have positive effects on development in the areas of cognition (Lynch et al., 2009), play (Guerette et al., 2013) and upper limb function (Richardson et al., 2013).

However, the majority of research focuses on early years powered mobility for children with both intellectual

and physical disabilities. Therefore, there remains a paucity in relation to adults with profound and multiple learning disabilities (PMLD) experiencing powered mobility. There are significant inconsistencies in the use of terminology to describe PMLD (Nakken and Vlaskamp, 2007); however, Lacey and Oyvry (2013: ix) describe the two most important facets being that there is more than one disability, with one being profound intellectual impairment. Moreover, those with PMLD often experience movement, sensory and communication impairments and additional health problems (Mansell, 2010). Therefore, it can be a challenge for health professionals to provide meaningful, age appropriate activities to develop skills and enhance participation for this population. Ikiugu et al. (2015) differentiate meaningful occupations from psychologically rewarding ones as those that provide a sense of control and self-determination, rather than immediate positive mood.

A research project entitled 'Drive to Learn' explored how two children with PMLD in Sweden could benefit from powered mobility practice in a joystick-operated powered wheelchair (Nilsson and Nyberg, 2003). The

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research found positive results in awareness of joystick use, goal-directed hand use and alertness. From this, the project was developed to include more participants and strategies were written to facilitate powered mobility learning for this group.

Although 'Drive to Learn' literature (Nilsson and Nyberg, 2003) provides valuable direction for powered mobility intervention, the research focuses on joystick use. Therefore, there is a need to review the use of switches to access this equipment for individuals who are unable to successfully use joysticks. This practice analysis will reflect on the powered mobility intervention of one young adult, Mark (pseudonym), guided by the 'Drive to Learn' literature.

Critical reflection on practice

Mark is a 23-year-old male with a primary diagnosis of spastic quadriplegic CP and secondary diagnoses of epilepsy and PMLD. He has severe dystonia in his upper limbs and presents as a Manual Ability Classification Scale (MACS) level 5 (Eliasson et al., 2006). Mark is a non-verbal communicator and utilises head turning as his most consistent means of participation and motor control.

Mark attended a special educational college in England, which teaches students from 21–25 years old. During his time here, Mark worked towards developing an understanding of cause and effect by using a single head switch. He was able to successfully press a switch button to cause a simple effect by turning his head but was not consistently motivated to do so. Mark began weekly occupational therapy powered mobility sessions guided by 'Drive to Learn' literature in order to review his ability to develop his understanding of cause and effect. In the sessions, Mark used two head switches on either side of his temple to control a powered mobility platform onto which his wheelchair was strapped. This set up was chosen in order to ensure the best postural management for participation and function. Mark's right switch allowed him to drive forwards and the left switch allowed him to turn left. The sessions took place in a hall that Mark used every day to ensure familiarity. Each session lasted from 30 to 45 minutes, dependent on fatigue. After 10 weeks, intervention intensity was increased to two sessions per week and following an additional 5 weeks, was increased to three sessions per week. After 29 sessions, a third switch was added. This enabled Mark to extend his right arm to drive forward and use the left head switch to turn left and right head switch to turn right. Over a period of 23 weeks, including school holidays and some absences for illness, Mark attended 31 sessions.

Following Nilsson & Durkin's facilitating strategies for powered mobility use, (Nilsson and Durkin, 2014: appendix 2) the therapy staff working with Mark adopted the approach of becoming a 'responsive partner'. In this sense, rather than directing Mark, the therapy team aimed to develop learning through motivating play. Initially this comprised of allowing Mark to roam freely and explore the environment and his switches. As his skills developed, the

play was extended to include others, such as initiating 'chase games' with therapy staff. Although the play and dynamics of the sessions evolved over time, the core 'Drive to Learn' principles of allowing Mark to lead the sessions and remain an autonomous explorer were maintained throughout.

Measures

The Assessment of Learning Powered Mobility (ALP) tool (Nilsson and Durkin, 2014) was used to track Mark's progress over time. Although not yet validated as an outcome measure, the tool provided a means of assessing progress in multiple areas. The domains included in the tool are:

- attention;
- activity and movement;
- understanding of tool use;
- expressions and emotions;
- interaction and communication.

To ensure inter-rater reliability, Mark's performance was recorded during a session and independently rated using the tool by five members of the therapy team. Each person rated Mark the same score across domains, suggesting that in this setting the tool was a reliable measure of performance between clinicians.

Following the implementation of three times weekly intervention, Goal Attainment Scaling (GAS) goals (Kiresuk et al., 2014) were introduced. The aims of using GAS goals were to evaluate if any obvious patterns affected performance, for example time of day. Additionally, detailed notes were written by the occupational therapist to supplement the ALP tool.

Findings

GAS scores. The following GAS goals were set for Mark by the occupational therapist after beginning three times weekly sessions: 'I will independently explore my environment using two switches; I will target and reach specific objects placed in my environment, i.e. doorways, skittles.' The resulting scores are shown in Table 1.

Table 1. GAS Light scores recorded after every session, following implementation of three times weekly intervention.

GAS Light	Number of times achieved
-2 <i>A lot less</i>	0
-1 <i>A little less</i>	0
0 <i>As expected</i>	5
+1 <i>A little more</i>	9
+2 <i>A lot more</i>	2

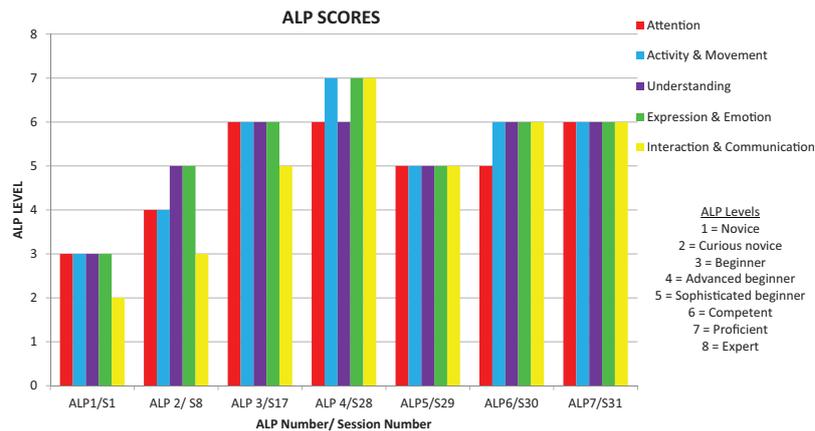


Figure 1. Assessment of Learning Powered Mobility (ALP) scores across sessions 1 to 31.

ALP scores were taken regularly to track progress with two switches. A third switch was introduced at ALP 5. ALP measures were taken at every session with three switches (ALP 6 & 7).

ALP tool. Over a period of 28 sessions with the use of two switches, Mark showed an improvement over time in all domains of the ALP tool. Measures collected on ALP 5 reflect the introduction of the third switch. Despite an initial decrease in scores, after only an additional two sessions with three switches, Mark's ALP scores (Figure 1) increased in all areas of the tool, as depicted in ALP 7.

Qualitative results. Qualitative notes written alongside the GAS scores highlighted that fatigue impacted performance and that Mark generally performed better during the afternoon.

Notes also highlighted observations from classroom staff working with Mark, that his mood was noted to generally improve over the period that he participated in sessions. Mark consistently showed enjoyment whilst engaging in the activity demonstrated through laughter and smiling, compared with frowning and negative vocalisation when the sessions finished. Additionally, the occupational therapist observed Mark may have anticipated powered mobility as he began to regularly smile upon seeing the occupational therapist prior to session times.

Powered mobility allowed Mark to demonstrate previously unseen skills and more of his personality traits. As Mark became more familiar with the sessions, he began to chase staff purposefully whilst laughing, as well as targeting game pieces positioned for him, such as skittles. This developed into following people around obstacle courses and adapted versions of hide and seek. Mark displayed some object understanding and familiarity of his surroundings by driving through doors and along small indoor routes that he would normally use in his attendant wheelchair.

Although guided by the 'Drive to Learn' literature, it was important to recognise Mark as an individual and promote the factors that motivated him. For example, although the guidance suggested periods of silence and non-interference at phases 3 and 4 (Nilsson and Durkin,

2014: appendix 2), Mark was most driven to engage when the occupational therapist offered a humorous and playful atmosphere.

Summary

For Mark, the provision of powered mobility equipment enabled him to demonstrate skills and understanding that would have otherwise been restricted due to his motor and perceived cognitive abilities. Powered mobility as an intervention encouraged the occupational therapist to incorporate multiple switches, rather than a single switch, therefore allowing Mark to be challenged. Moreover, the activity challenged the occupational therapist's thinking about Mark: use of his upper limb had previously not been routinely offered due to his stronger motor control with his head. When utilised in this activity context, Mark's upper limb use increased his participation and allowed greater success and opportunity for independence.

As well as developing a range of skills, powered mobility training had a reported positive impact on Mark's mood and allowed him a means to express parts of his personality, such as humour.

Learning to set the right challenge was key to success in this intervention. The increasingly difficult games contributed to Mark's motivation to participate; however, ensuring achievement during sessions helped to optimise his enjoyment. Review of GAS goals highlighted that for the majority of sessions, Mark achieved a little or a lot better performance than expected. Therefore, correctly setting the level of challenge not only improved the experience for Mark, but was a valuable learning process for the occupational therapist.

To ensure session outcomes did not remain an isolated experience, information about Mark's progress was shared with the multidisciplinary team. Consequently, additional input was provided by speech and language therapy to review and develop his receptive understanding.

Moreover, Mark's curriculum goals were altered to ensure he was challenged in a range of learning situations. Due to the complex picture of PMLD and difficulty with accurate assessment, the additional intervention and change to daily learning challenges are hoped to provide a more complete and holistic understanding of Mark's 'true' abilities.

To make best use of time and cost resources and to increase the social context of driving learning experiences, paired driving sessions may be considered for future practice. However, following skill development recommendations (Nilsson and Durkin, 2014: appendix 2), introduction of a partner should only be considered when both are at a competent (level 6) ALP level. Therefore, finding a peer to set similar challenges may be difficult due to the individualised nature of PMLD.

It is important for those working with individuals with PMLD to continuously push the boundaries in setting appropriate challenges and be creative and person-centred in their delivery. As therapists, we must not underestimate the capabilities of the PMLD population. It is our responsibility to provide the necessary equipment and a stimulating environment to allow this client group the opportunity for achievement. In this case study, powered mobility acted as the tool that enabled Mark to experience success and enjoyment.

Key messages

- It is important not to underestimate the abilities of individuals with PMLD to learn and participate.
- Powered mobility can be used as a tool to facilitate skill development and achievement.
- Access to a joystick is not necessary for powered mobility: switches can provide independence and success.

Research ethics

Written informed consent to publish this article was provided by the individual's father after reading the article.

Declaration of conflicting interests

The author confirms that there are no conflicts of interest.

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