Scooters as a safe alternative for cars?

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ABSTRACT

Motorised mobility devices are increasing in popularity. Some product advertising has purposefully linked the purchase of such devices with the loss of driver's licence. Currently there are few systems either under fitness to drive or pedestrian safety guidelines to inform assessment of the capacity or the safety of the user. Occupational Therapy driver assessors are called upon to make recommendations regarding safety, often when a third party is involved in the loan of such equipment, to ensure the legal liability of the loan agency has been covered. However, little can prevent a person from privately purchasing a piece of equipment despite recommendations to the contrary. In addition, there are no formal mechanisms to check the ongoing safety of users who have purchased equipment when appropriate who then go on to develop cognitive or visual dysfunction. This paper will use a recent actual clinical case study involving referral, assessment, intervention and evaluation, to highlight issues. The issues include: gaps in information required, differing training of health personnel, constraints to training, poor road design, risks to users and the community, lack of monitoring systems and potential legal liabilities. This paper offers those who are not involved in the area of mobility rehabilitation an opportunity to glimpse the complex array of emerging issues involved in the safe prescription and ongoing utilisation of what seems a superficially straightforward piece of mobility equipment. The discussion contributes to the ongoing debate regarding the systems issues in regard to motorised mobility devices. There are ranges of medico-legal and safety questions that require further research.

INTRODUCTION

" I was upset when they took my car licence away…"Unnamed Scooter Company" put me back on the road to independence"

This statement is quoted from advertising found in a major newspaper of one of Australia's capital cities. The company will not be named and it is noted the company no longer uses this slogan. However, the slogan is an interesting exemplar of the manner in which electric mobility devices have been promoted as an alternative for the car when originally designed to be a pedestrian aide. While the level of systems monitoring of this equipment remains low, this association between the scooter and the motor car may be a high risk correlation. Such advertising is purposefully using the loss of independence associated with licence suspension to capture the attention of the intended sales target market. The market is usually older people and those with mobility impairment. It could be construed as a cynical ploy to take advantage of a vulnerable person who is upset or it could be more fairly assumed the authors of the advertisement genuinely believe their product is a sensible alternative to the motor vehicle. Would the authors of the advertisement market their product to a group who have already been suggested to be unsafe while operating a motorised device if they understood the implications of this risk?

The increasing numbers of people using power mobility has led to greatly increased demand on rehabilitation professionals to determine driving competence (Letts, Dawson & Kaiserman-Goldstein, 1998). It is unknown the extent of accidents involving power mobility devices in Australia although it is estimated that in the USA the numbers are alarming and in response researchers have asserted the need for careful prescription and training (Calder & Kirby, 1990). The Pedestrian Council of Australia have identified that one in five fatalities on Australian roads is a pedestrian. The council defines a pedestrian as "any person wishing to travel by foot, wheelchair or electric scooter, throughout the community" (The Pedestrian Council of Australia, 2001).

The scooter however, is often utilised as an alternative for the car rather than as a pedestrian device. Currently in most states and territories of Australia there is no licensing requirement for the use of a scooter as it is a pedestrian device but confusion does occur. In a test case heard in the high court of London, Lord Justice Pill stated there appeared to be a loophole in the law allowing their uncontrolled use and suggested the public needed protection from them. In the case the scooter owner had argued that being on the public roads was a response to his belief that the scooter was a motorised vehicle. The high court ruled that the increasingly fashionable motorised scooter user must wear a helmet, hold a valid drivers licence, third party insurance and pay tax for the vehicles (
Verkaik, 2000; Watson-Smyth, 2000). To assume the scooter is a sensible alternative to a car when a person has had their licence "taken away" suggests a naïve understanding of the usual causes of a drivers licence suspension. For a licence to be "taken away" it is usually without the acceptance or control of the driver. The usual causes of the reluctant loss of licence are cognitive impairment, neurological disease or visual deficits.

This paper does not presume to present answers to issues and recognises that in each of the states and territories there are various bodies including clinicians, researchers, community groups and scooter users collaborating on

different aspects of scooter use. This paper offers those who are not involved in the area of mobility rehabilitation an opportunity to glimpse the complex array of emerging issues involved in the safe utilisation of what seems a superficially straightforward piece of mobility equipment. The discussion contributes to the ongoing debate regarding the multiple systems issues that are lacking clearly defined criteria. Using a recent actual clinical case study involving referral, assessment, intervention and evaluation, this paper will highlight issues including: gaps in information required, differing training of health personnel, constraints to training, poor road design, risks to users and the community, lack of monitoring systems and potential legal liabilities.

Case study part one: initial information

Mrs AF was a 78-year-old woman, born 1924. She lived alone in an independent living unit leased from an aged care provider. She was referred to a driver-trained occupational therapist by a community support agency welfare officer. The reason for referral was a request for assessment of her capacity to use a motorised scooter owned by the community agency. The agency was keen to provide Mrs AF with the equipment but was concerned about their legal liability should she come to harm using the scooter.

The original information provided by the welfare officer to commence the assessment stated:
"We would like to offer to Mrs AF the loan of a "Plega Scooter" Voyager Deluxe. The loan will be subject to her being assessed (sic) as being competent to operate such a scooter. A supportive letter from Dr. DM is enclosed, and Mrs AF is happy to be assessed."

The medical information supplied by the treating general practitioner to support the referral stated the following:
"Mrs AF has no visual, motor or intellectual problems that would prevent her being able to use a motorised scooter, in fact with her peripheral vascular disease and calloused feet she has a lot difficulty getting around and I think this vehicle would give her a much needed mobility that she doesn't have at present. Yours truly.."

The standard referral form used by the driver assessment service requests relevant medical history and current medications to be listed. This information was provided by the referring person, the welfare officer. It stated that Mrs AF had a history of peripheral vascular disease, history of by-pass surgery, history of carotid artery surgery and depression. The referral listed eleven separate medications taken by Mrs AF. The medications included treatments for vascular disease and depression.

Gaps in information

The initial information provided to inform the assessment process was overly simplified by the medical practitioner and did not acknowledge the potential cognitive impacts from chronic peripheral vascular disease, multiple medications and chronic depression. The medical information was brief and stated the equipment was well suited to her needs. There is currently no proforma for medical practitioners to use as a guide to practice in regard to medical impacts on potential scooter safety. Her previous driving history and the fact that she had been previously assessed as being unsafe when driving a motor vehicle had not been overtly addressed. It is assumed the welfare officer believed this to be a concerning factor and that this prompted the original referral. However, this information did not emerge until initial interview with the occupational therapist.

Case study part two: assessment pre-screen

The assessment consists of distinct phases, the pre-screen, the base line functional scooter assessment, the training phase and then the final assessment. The pre screen takes a period of 1.5 to 2 hours to perform and addresses domains such as physical, visual, cognitive skills and road law is covered. Previous driving history is recorded. Mrs AF presented for the pre-screen assessment at the correct time for the appointment. She was dressed immaculately in a suit. She was a very polite and articulate but seemed highly anxious. Mrs AF did not demonstrate any acute deficits in the strength or range of movement of her upper limbs, lower limbs, trunk or neck. She appeared breathless on exertion and reported that walking distances was fatiguing. Her distance vision was assessed to be 6/9-1 using a Snellen's chart, which placed her within the medical guidelines for motor vehicle driving. Eye movements were smooth and there was no evidence of peripheral field deficit. Hence, vision and physical status were not significantly impaired.

During the cognitive screen, it was difficult to keep Mrs. AF on task. She was easily distracted and wished to talk about the multiple losses she had experienced in her life. On a test which assesses visual memory by asking to client to scan, recall and report increasingly complex visual information, Mrs AF scored 56%, indicating poor visual memory. The result did not appear to be the result of poor scanning as there was no pattern in the quadrant location of the objects not recalled. There did not appear to be any impact from lighting as no pattern emerged related to lighting conditions presented in the images. It had already been established that visual acuity was sound. Mrs AF could not follow the sequence of numbers and letters used in a straightforward pen and

paper spatial and planning task. She was disorganised and showed very poor awareness of error as it occurred. She could not problem solve to remedy error when it was shown to her. Mrs AF could not recall the medications she took or the purpose for which she took them. She did mention that she had been a client of Mental Health Services for Older People. This information had not been provided by other sources. Her recall of road law was poor and generalised. Her driving history was significant. She had driven both motorcars and 2 wheel moped style motorcycles in the past. She had lost her drivers licence after a referral for practical assessment. She had failed two practical assessments despite participating in lessons between assessment one and two. These assessments had been conducted by the licensing agency of that state. Mrs AF could not recall the nature of the feedback provided to her or the content of the lessons she performed. She could recall some difficulty with being 'too close to the left" and "rolling through Stop signs". She felt this feedback was inaccurate.

Her need for a motorised scooter and her previous experience with use was questioned. She reported that she had seen "her" scooter and had driven it a short distance. She verbally described the basic mechanisms and their operation. She believed she would manage very well with the scooter and planned to use it to travel to two different shopping centres, the community club, visit a friend, a park near her home and visit the doctor. These trips included distances of between one to approximately 10 kilometre round trips. All trips necessitated crossing main arterial roads. Mrs AF expressed a high level of confidence with her capacity to execute these trips and was quite excited about the freedom that was going to be afforded to her. When asked about her personal orientation to the scooter, she stated it would replace her car, which she had been without for almost 12 months. She had adopted alternative transport systems such as using the local community bus for shopping and taxi's but stated they did not afford her the freedom she desired.

Differing training of health personnel

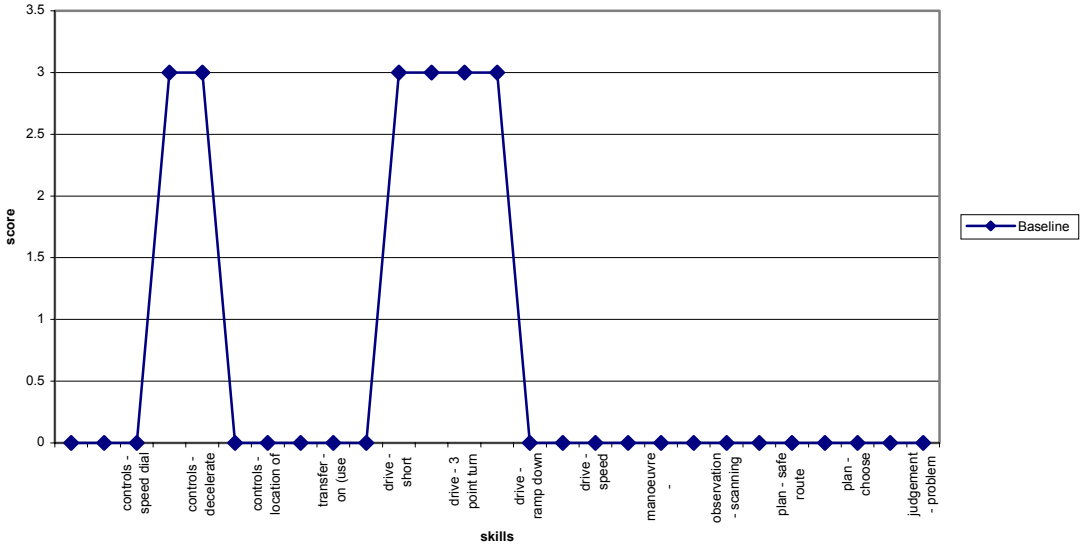
It was apparent that Mrs AF began the assessment with a very high level of expectation of success. She had seen and trialled the scooter and already viewed it as her own. It did not appear that any of the practical or complex aspects of her planned trips had been discussed with her. The fact that the scooter is a pedestrian device and not a vehicle had not been explained to her. The issues of poor memory, distractibility, lack of insight into previous driving difficulties and poor understanding of her own health conditions had not been presented to her as the reason for the referral. Her expectations of the process and those of others were not transparent. It was unclear what she believed the reason for assessment to be.

Case study part three: Training

When assessing competency for driving a motor vehicle the assessment is constructed to compare a demonstration of driving behaviours and competencies against those that are set as minimum criteria for licensing and those expected from various driving groups, e.g. the novice versus the experienced driver. In the assessment of the motorised scooter, the client has often never used the equipment previously or has a very basic level of operational understanding. Therefore, the assessment consists of a teaching, training, learning capacity and re-evaluation phase prior to a recommendation being made.

Baseline and initial session assessment was conducted from Mrs AF's home and was 2 hours in duration. Before the session, when leaving the pre-screen assessment, Mrs AF was asked to think about and plan the route to the local shopping centre. Skills assessed include understanding of mechanisms, basic operational control such as accelerate, decelerate, speed control, manoeuvres, safe selection of path choice and hazard perception (appendix 1). On baseline Mrs AF was able to demonstrate only rudimentary understanding of the mechanisms and some basic operational control such as a short drive forward and backward. Chart one below illustrates the skills with which she commenced training. A score of zero represents no knowledge at baseline and three represents an able level of skill, that is, independence or no prompting / coaching required. The score of two represents a consistently unsafe level of skill despite prompting, coaching or guidance. Two is not scored on baseline.

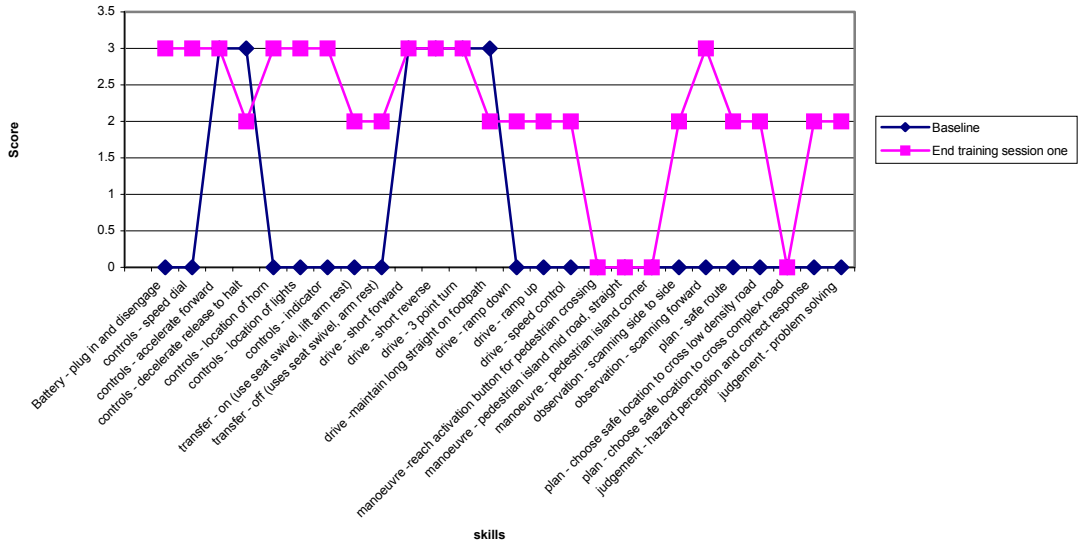
Chart one: baseline skills



Following two hours of training Mrs AF demonstrated some improvement. Field notes stated that she was able to repeat explanation and demonstration of mechanisms such as the speed dial, horn, lights and indicators after one demonstration. She was able to explain and demonstrate the correct manner in which to engage the battery. Field notes stated that Mrs AF was able to drive a straight path on speed level 1 (lowest) but as soon as the footpath gradient changed she steered sharply to the right and drove off the concrete path each time. A similar response to ramp gradients was noted, and thus the first session was devoted to speed control, travelling a straight path and approaching ramps at 90 degrees to remain on a safe gradient.

Verbal guidance was required to a sequence of 14 ramps before Mrs AF could demonstrate the skill unprompted and without steering sharply to the right. It was noted that Mrs AF needed constant prompting to travel directly across the road without stopping halfway to readjust her speed dial. She was constantly encouraged to look to her destination and drive directly there before slowing. She became easily flustered and it was noted her responses to danger were reversed. When it was safer to proceed she tended to 'halt' and when a stop was required eg for an approaching car, she would 'panic" clutch the accelerator lever and surge forward uncontrollably. Hence it was decided at end of session one; it was not safe to proceed into denser traffic conditions. At end session one her skills were rated as showing some improvement, that is a learning curve was present but it was but not consistent. Chart two shows her skill level at end of session one. It was planned that she would continue to practice speed control, ramps and gradients in her own street and another session was organised. The scooter was left in her possession and she agreed to a contract that stated she would not take it further than her own street.

Chart two: scooter assessment, baseline and end session one



Constraints to training

Scooter assessment and training is time consuming. Decisions regarding safety need to be made in the context of respect for the individual, the clients needs for increased mobility, desire to master a new skill and evidence of learning. The client is usually frail or disabled and therefore training cannot be rushed. It is not possible to entrust the training to therapy students due to duty of care issues to both the client and the student. Some agencies have therapy aides employed to assist with such programmes, others do not. This referral was made to a service not funded to employ therapy aides. It was the opinion of a driver-trained occupational therapist that that was specifically requested. Therefore the assessment and training was a costly exercise. The cost to the client was subsidised.

Case study part three (a): training continued.

Due to caseload and other commitments it was not possible to visit Mrs AF daily although every attempt was made to keep training in a consistent time frame. Session one was a Friday and session two occurred on the following Monday. Mrs AF reported she had used the scooter to travel to the local park on the weekend, well outside the agreed geographical zone. Mrs AF was able to demonstrate the skills practiced on the previous session without prompting. She stated she had planned the route she would take to the local shops and was able to verbally describe the route. It was agreed to attempt this plan in the session. Mrs AF was able to geographically orient herself from her home to the main road, a six-lane highway. The shopping centre was located on the opposite diagonal corner from her home, travelling to the northwest. Once she turned left onto the main road the traffic noise increased substantially. Field notes indicate that Mrs AF became rather passive, began asking for directions and she began to stop and start the scooter unnecessarily. The therapist then reinforced the route to her and she was asked to look forward to scan for hazards and select a safe road crossing position. Her selection was unsafe as she stated she would cross at a U-turn location in the middle of the road. She did not spontaneously select the pedestrian activated crossings despite the issue being previously discussed and her previous description of the location of said crossings.

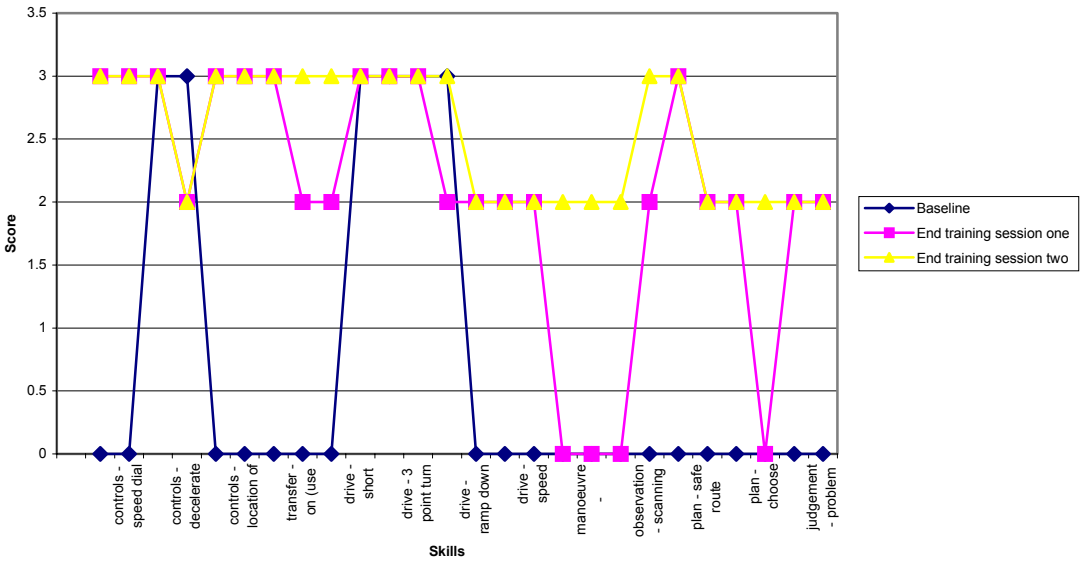
The resulting journey attempt to the shopping centre was extremely unsafe, Mrs AF was unable to;

1. look to plan her entry into the pedestrian refuges,
2. select an appropriate speed to cross,
3. reach the pedestrian activated buttons from the scooter,
4. cross within the time sequence afforded due the time she took to alighted from the scooter and
5. manoeuvre the scooter through the inadequate spaces provided across the pedestrian islands in the turn left with care sections of the road way.

It was recorded in field notes that the turning circle of the motorised device and the island cut throughs did not match and that only a highly skilled scooter rider would be able to manage them, if at all. The ramp gradients were different on each corner as were the pedestrian refuge island designs. Each required an independent

assessment, planning and decision making as to approach alignment and speed. Mrs AF was unable to perform these tasks independently. The task appeared overwhelming to her and she made several potentially injurious errors including squeezing the accelerator lever to attempt to halt, thus almost projecting herself into traffic flow (despite the therapist pulling her hand from the lever) and attempting to halt the scooter by putting her foot onto the ground on the right side. It is not possible to halt the vehicle in this manner and there is a risk of fracturing the ankle if attempting to do so while accelerating forward. Once guided out of this complex area, the shopping centre was aborted as a destination goal. Mrs AF then failed to attempt to cross at the pedestrian crossing and travelled straight in a direction away from her home. When asked where she was going, she again stated she was planning to cross the road at the U-turn section on the 6 lane road way as she was "never going to use one of those crossings again". It appeared she had reverted to thinking from a motor vehicle driver's frame of reference. She was prevented from her plan and the therapist guided her back to the safety of side roads. She self navigated from this area but performed an extremely unsafe road crossing in a low density area by angling directly across and attempting a ramp on a 35 – 45 degree angle. The result was a tip to the side of the scooter when she again "panicked' squeezed the accelerator and placed her foot down to attempt to stop. At this point the therapist stated that 'this is not going well, this is very worrying and it was time to return home." Chart three shows skills at end session two, note the similarity to chart two and the number of unsafe outcomes in areas of judgment and planning.

Chart three: scooter assessment end session two.



The therapist attempted to explain to Mrs AF that she was unsafe on the scooter and the assessment should be terminated. The results of the pre-screen were used to justify the clinical reasoning. Mrs AF became extremely upset and literally begged for the process to continue. She promised that she would be able to improve. She quite rightly pointed out that she had only had a small time spent on training and no experience of complex environments before that day. In the absence of medical information to provide context to the cluster of judgment, planning and decision making issues that were evident it was difficult for the therapist to both resist the emotive pleading and continue to provide a reasonable rationale for not continuing the program until it could be determined if complex skills could be taught and learnt. It was agreed only one more session would be attempted. The therapist left the scooter with Mrs AF with great trepidation and a sense of acting outside a duty of care to the client and the therapists own legal liability.

Poor road design, risks to users and the community

The environment is often poorly matched to the use of motorised scooters. Footpaths have different surfaces and gradients. Ramp gradients differ and are often not aligned from one side of the road to the other, 'forcing" the scooter user to drive on the road. Community members grow gardens across footpaths and overhanging trees prevent progress. Pedestrian island refuges, cut throughs and pedestrian slowing devices such as at railway line fences do not allow for the turning circle of scooters, again forcing the user onto the road way. Pedestrian refuges are often a different design on each of the four-cornered intersection (as in this example) and ramps are often angled away from the traffic light activating button so that users cannot reach without getting off the scooter to do so. Light sequences are inadequate to enable the user to realight in time. The risks associated with poor user, equipment and environmental match are those of falls and collision related accidents.

Case study part four: new information.

On return to the therapist's place of employment, after leaving Mrs AF with the scooter, a telephone call was received. The call came from a party previously unknown to the assessing therapist, a health worker associated with the aged care group that owned her independent living unit. This person began by stating that she felt it was probably acting outside limits of confidentiality but there was information the assessing therapist should know. She then related that Mrs AF had a history of impulsive behaviour, and had driven unlicensed following her failed driving tests until her motor vehicle was sold. It was believed that she would have quickly 'failed" her scooter assessment. As the process was ongoing, other care workers were becoming very worried about her safety, particularly as the scooter was in her possession. The occupational therapist explained that it is not ethical to fail a client when some evidence of skill development is present despite concerns raised in each aspect of the assessment process and that there were no set guidelines regarding competency or basic medical fitness that could be applied as an alternative. Obviously at the conclusion of this conversation, the occupational therapist was confirmed in her belief she was not meeting either her duty of care to Mrs AF or potential risks of legal liability in the advent of an accident and decided to remove the equipment from Mrs AF's possession. At 6 pm that same evening, the therapist drove to Mrs AF's home and explained that she had just learnt of new information that increased her level of concern and asked if she could take the scooter keys away until the final assessment. Mrs AF argued that she could not then practice between sessions. This was deemed to be too risky as a potential action and despite Mrs AF's sadness; the keys were removed.

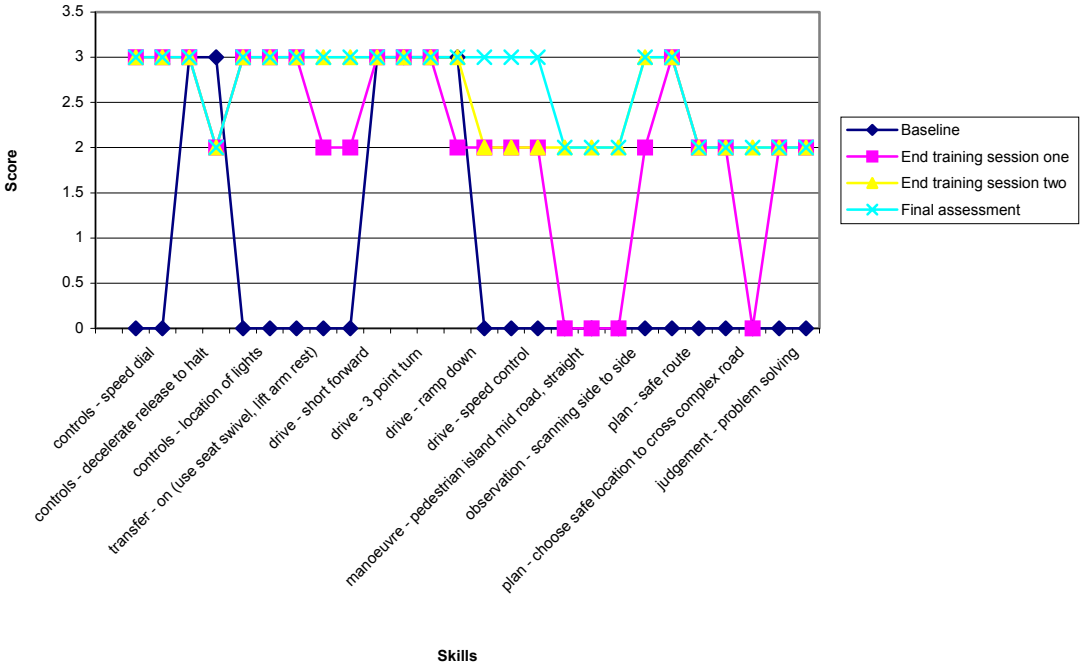
Lack of monitoring systems and legal liability

Prior to commencing the process it was impossible for the therapist to fully assess the risk posed to Mrs AF in the utilisation of this equipment due to inadequate quality or quantity of information. There was no way to monitor her usage of the equipment between sessions as no social supports were available. It could be argued that the therapist acted in a manner that inhibited Mrs AF's freedom of movement by removing the keys and it is questionable if Mrs AF had refused to allow the keys to be removed if the therapist could legally do so.

Case Study: final.

The therapist sought support and advice from a colleague. It was agreed that the colleague would conduct the final assessment to ensure objective measurement and prevent possible personal bias by the original assessor. The assessment was conducted in the same manner as session two. Mrs AF was asked to plan a route to a shopping centre. She chose an alternative centre to the previous session stating she would not use the scooter to travel there, despite this being her original goal. It was noted the same cluster of skill deficits were present. Mrs AF attempted to cross in an unsafe place on the main road, was unable to manage the pedestrian activated crossing without assistance, attempted to drive on the road way and scanned poorly for hazards. Her awareness of her own reduced safety appeared to be very poor. She again demonstrated inappropriate responses to situations that caused her anxiety. She did demonstrate improved path and ramp skills. However, the conclusion was that Mrs AF did not appear to have the cognitive capacity to use the scooter safely. She had not gained an independent level of skill. The conclusion was communicated to Mrs AF and the recommendation was made that the mobility options best suited to her were those that were of an assisted nature. Mrs AF was extremely upset and stated that her inability to learn how to use the scooter proved that she was "stupid'. She refused to allow the therapists to organise follow up counselling or refer her to other service providers for mobility support. She did not wish to see the assessing therapists again. She did agree to a follow call and it was possible at that time to talk her into accepting referral.

Chart four final assessment outcomes and alternative view of same results



Conclusion

Mrs AF was referred for the assessment of her capacity to use a piece of mobility equipment that she believed would greatly enhance her quality of life. She began the assessment believing the scooter was "almost" hers. A community agency and her medical practitioner had supported her beliefs. The initial information provided to the assessor did not provide the quality or quantity of evidence based information required to make a decision based on anything other than functional performance. During the course of the assessment a range of serious issues arose that highlighted the;

1. lack of adequate information provided or available,
2. differing knowledge bases of the various personnel involved,
3. inadequacy of the amount of support available to assist the process,
4. poor environmental conditions and the impact of these conditions on decision making processes,
5. impact of the belief of the scooter being a vehicle rather than pedestrian device and
6. difficulty in shifting this mind set to a safer paradigm.

The risk of a potential accident occurring was judged to be high. The mechanism to prevent such an occurrence was cumbersome and based in duty of care tenants but lacked guidelines to support decision-making ability of the therapist. Other than the original referring agency, there is no place for the information to be reported. The potential of legal liability for rehabilitation personnel was high. This paper offers those who are not involved in the area of mobility rehabilitation an opportunity to glimpse the complex array of emerging issues involved in the safe prescription and ongoing utilisation of what seems a superficially straightforward piece of mobility equipment. The discussion contributes to the ongoing debate regarding the systems issues in regard to motorised mobility devices.

There are a wide range of medico-legal and safety questions that require further research.

Post script.

It was learnt in the subsequent weeks following the assessment from the agent she was referred to for support that Mrs AF had applied for a scooter to be provided to her by another equipment loan agency. A private scooter retailer would have no way to access this information and there is no recording mechanism to prevent Mrs AF from privately purchasing her own scooter. She may have already done so.

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Appendix 1

Skills assessed	Baseline	One	Two	Final
Battery - plug in and disengage	0	3	3	3
controls - speed dial	0	3	3	3
controls - accelerate forward	3	3	3	3
controls - decelerate release to halt	3	2	2	2
controls - location of horn	0	3	3	3
controls - location of lights	0	3	3	3
controls - indicator	0	3	3	3
transfer - on (use seat swivel, lift arm rest)	0	2	3	3
transfer - off (uses seat swivel, arm rest)	0	2	3	3
drive - short forward	3	3	3	3
drive - short reverse	3	3	3	3
drive - 3 point turn	3	3	3	3
drive -maintain long straight on footpath	3	2	3	3
drive - ramp down	0	2	2	3
drive - ramp up	0	2	2	3
drive - speed control	0	2	2	3
manoeuvre -reach activation button for pedestrian crossing	0	0	2	2
manoeuvre - pedestrian island mid road, straight	0	0	2	2
manoeuvre - pedestrian island corner	0	0	2	2
observation - scanning side to side	0	2	3	3
observation - scanning forward	0	3	3	3
plan - safe route	0	2	2	2
plan - choose safe location to cross low density road	0	2	2	2
plan - choose safe location to cross complex road	0	0	2	2
judgement - hazard perception and correct response	0	2	2	2
judgement - problem solving	0	2	2	2

0 = No knowledge at baseline

2 = Unsafe

3= Able after demonstration, no further prompting