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PMG Bursar report on Integrated Access (B5): PMG conference, Telford, July 2019

What is integrated access?

Integrated system provides control of more than one device with the same access method. It allows incorporating the use of communication aid and environmental control devices to enable users to maximise their functional independence.

Reasons for attending the session

* Its applicability to complex neurological patient group I work with
* I was interested in finding more about the criteria, different technology and how it is used to integrate communication aid and environmental controls in the powered wheelchair.
* As a neurophysiotherapist, I work closely with the Occupational therapist and Speech and Language therapist and widening knowledge base in this area is key to understanding how to help patients with using communication aids and environmental control systems and wheelchair driving controls effectively.

The presenters were experienced clinicians working in NHS England funded Chailey communication aid services through which children and adults with complex needs in Surrey and Sussex are assessed and provided with high tech communications aids. The speakers shared their experience about the service using three case studies.

Specialist clinicians work jointly in the clinic to assist patients in integrating communication aid and environmental control systems in their powered wheelchair. The presenters shared technical and clinical knowledge they have gained by working with the complex clients in the clinic. Topics covered by the speakers ranged from advantages of integrated systems, considerations as to when to integrate and when not to, wheelchair control systems, third party integrators alongside three case studies. Their experience mainly involved integrating communication aids, environmental controls, computer/IT access, work, leisure and mobile phone access, in a powered wheelchair.

Environmental control systems are instrumental for activities of daily living for people with complex disabilities and it enables individuals to access their immediate environment by allowing them to have control over a range of appliances installed around their home. Using their most reliable method of access (e.g. direct touch, switches, voice activation, eye gaze), users operate a central controller to access a range of peripheral devices (Lincoln AT services, 2019). Communication aid is mainly used for communication.

In this report I would like to focus on key areas discussed during the talk.

Why integrated access?

* To improve client’s function/ independence
* Client convenience (i.e. switching between driving control and communication aid, mounting different access methods on the wheelchair)
* To promote energy efficiency by reducing effortful functioning

Considerations during assessment:

* Client’s cognition
* Client’s motor control, is the same access method appropriate for one or more systems e.g. joystick control or mouse access
* Changing client’s condition (i.e. medical stability) as integrated access may not be an appropriate system in some scenarios.
* Level of support client has from the family and care team (is the system going to be adaptable)

Equipment considerations discussed included,

* Commercially available systems that can be integrated (compatibility/reliable)
* Who owns the wheelchair (if charity owned permission needs to be sought prior to making adaptations to the wheelchair)?
* Who will fund the integrated equipment?
* Who will maintain the access control?
* Who will maintain the integrated equipment?
* Safety considerations and risks involved with the mounting (during transportation, wheelchair stability and who is driving)

Wheelchair control systems discussed during the talk:

* Many wheelchair control systems are available
* Patients come with their own powered wheelchair
* Most commonly used systems at Chailey are
	+ - Dynamics DX2 & LiNX
		- Penny & Giles R-Net

The speakers shared information about pros and cons of key control systems and their clinical relevance. Systems discussed included

1. DX2, a modular power chair control system
2. G91S, a scanner module/ display unit that allows user to scan through different modes.
3. DXACC4B switch box commonly used at Chailey
4. LiNX 400/500 series master remote useful in integration and needed for integrated access, these joysticks are blue tooth enabled mouse mover for windows/switch control for iOS. LiNX series does not currently allow scanning module.
5. Other systems discussed were R-Net, Omni, Omni 2 these have blue tooth module and are useful for connecting iOS devices and other blue tooth devices.

**Case studies**

The first case study showcased integrating 3 different systems with an adult cerebral palsy patient.

The patient had

* Communication aid with 2 separate trays for communication and a mouse mover
* Used 4 directional switches on powered mobility
* Had a DX2 wheelchair system which the patient drove with 4 directional switches on the other tray
* Patient used cursor on the screen and used switches to move the cursor

Chailey team added Environmental Control Unit (ECU) /wood pecker module for communication aid. Adding the ECU module with the new system meant that there was no need for the tray to be swapped.

The client was re-referred to Chailey 2 years later. After a period of hospitalisation the patient found that the directional switches for the mouse mover was difficult to be used when in bed and got frustrated because patient could only access it from the wheelchair. This set-up was not functional if the client was not in their wheelchair.

This was resolved by providing a 2nd access method with single head switch and communication aid with auto-scan option. Directional switches were still being used for driving.

The second case study was about a client in the 20’s. Client had

* No cognitive impairments
* Already had communication aid
* Used single head-switch and auto-scan on high-tech aid
* Used powered wheelchair
* Privately purchased wheelchair with R-Net control system, Omni scanner controlled with head switch

The second client was referred to assess if integrating a communication aid in the electric wheelchair was achievable using a single head switch.

Initial set-up at assessment included single head switch going into the Omni. Patient was unable to switch from one control to the other using the head switch. Omni-scan freeze-in Mode was added by Chailey, where the long press freezes or unfreezes the specified option.

Chailey team then added input/output module, power module and sunrise R-Net programmer (communication mode). Key challenge with this set-up was to use one switch to control both communication and driving. Sunrise programme enabled the team to achieve this.

The third case study was about a 15-year-old patient. Initial setup included

* Single access method identified by the school – Sip only (sip and puff switch to operate with a school communication aid system and the patient could only use the sip function for the communication aid). Sip to select the auto-scan system.
* Patient was simultaneously referred to communication aid service and specialist communication aid clinic to see if the patient could also use the system to control the powered wheelchair.
* Joint assessment was carried out by the team
	+ Client bites on mouth piece to anchor head position for stability (as patient has dystonic movements), concerns were raised regarding this
	+ Consulted specialist dentist regarding mouth piece material and potential risks with sip and puff switches
	+ Consulted Speech and Language therapist (SALT) regarding saliva management and breathing as part of safety assessment
	+ Assessment of ability to use single sip switch access for communication
	+ Challenges encountered by the clinicians to source safe and appropriate mouth pieces (SALT provided safe straws)
* Equipment:
	+ Powered wheelchair
	+ Sip/Puff systems were not appropriate as client unable to access as single system
	+ LiNX was not suitable due to lack of scanner
	+ DX G91S scanner was trialled with single sip switch input. Client showed cognitive ability but scan settings did not allow functional use.
	+ R-Net Omni was trialled, it allowed safe functional use for driving. Scanner timing was set to allow client to take a breath in between sipping.
	+ Fully integrated access was expected to be too demanding for the client.
* Provision/ solution: Powered mobility with Omni scanner, Sip/sniff switch for communication and communication aid auto-scan was a safer option for this client.

Key challenges with case study 3 described by speakers were co-ordinating patient’s breathing with using single system for driving and communication.

**Summary:**

It is important to note that significant amount of time and resources are spent on complex systems which are used to provide bespoke solutions to clients. The complex presentation of the clients necessitates integrated working from a variety of specialist professionals. Various technological advances increase the number of options available to improve independence, function and communication for the clients. Occasionally easier options were available off-the-shelf rather than using customised bespoke solutions.

The speakers emphasised the importance of managing client expectations as sometimes disadvantages outweighed benefit for the client. Important to remember that some set-ups may not work with some clients. Speakers also highlighted that while providing equipment it is important to identify the funding authority and identify who would maintain the equipment.

Other key points for considerations discussed by the presenters include,

* With reference to Medical Device Regulation, potential simple solutions must comply.
* Available options included mouse mover and wood pecker but speakers emphasized importance of considering safety and purpose of use.
* With regard to funding of communication aid, it is important to communicate with wheelchair service if long term maintenance is needed.
* Chailey has lot of environmental control service (ECS). For patients with Motor Neurone Disease, Chailey can help with ECS and mounting options for communication aid.
* In addition, for communication aids, Chailey will also do risk assessments for mounting and are able to do bespoke mounts as needed.

Integrated access could result in increased patient satisfaction, improve independence and could result in cost savings for the NHS and requires different options to be trialled and adjustments to meet individual needs.

**Challenges:**

The challenges I would like to highlight from the presenters views and my clinical experience are

1. The availability of Funding: Due to the variety of funding streams available within the NHS (NHS England, Continuing Health Care, Rehabilitation streams, Clinical Commissioning Group funding, private, charity funded etc).
2. It is imperative that therapists and other professionals treating patients who would benefit from integrated access are aware of the available services to ensure patients are referred. On the other hand, the referrals need to be appropriate to ensure effective use of professionals’ time.
3. It will also be important to manage patient’s expectation as sometimes there are limits to what technology can assist us with.

**References**

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