Wednesday 6th March, 2019

Preconference Workshops

Spotlight on Concussion Rehabilitation
A/Prof Karen Barlow, Prof Keith Yeates

Summary of Content:
• What happens after the hit: an overview of concussion and post-concussion syndrome in children
• Knowledge itself is power: Getting the right information to families after a concussion
• The development of Paediatric Head Injury Follow-up Clinical Pathway in Queensland
• The role of the rehabilitation nurse after a concussion
• Sensorimotor and physiological integration following a concussion
• Neuropsychology’s role in the management of concussion
• Monitoring and Treatment options for Persistent Post-Concussion Syndrome
• Panel discussion

Practical workshop on the Hammersmith Infant Neurological Assessment
Rachel Thomas, Carly Dickinson
The Hammersmith Infant Neurological Examination (HINE) is a simple, quantifiable neurological examination validated for infants between 2 and 24 months of age. In conjunction with other assessment tools, it has been shown to have predictive value in identifying children ‘at high risk’ of cerebral palsy. By the end of the four-hour workshop, participants will be provided with resources and have a solid understanding of the HINE including: overview of the tool; item by item administration and scoring; evidence base including scoring cut-points and their predictive validity; interpretation of results. There will be two practical demonstrations where participants will score the HINE, followed by group questions and discussion.

Champion your Child: How to be the voice your child needs in a complex system
Fiona Russo- (University of Southern Queensland)

Objectives: The Australian National Disability Insurance Scheme (NDIS) represents a significant change in the delivery of funded supports to Australians living with disability. Previous block-funding arrangements saw many people waiting on registers of unmet need. Individual funding allows for greater choice and control for participants, but it also shifts the responsibility for support coordination and access from ‘the system’ to families themselves.

The parents of newly diagnosed children are often newcomers to the world of typical parenting and have little or no experience of disability. Managing multi-system interactions – NDIS, Health, Education, Social Services and others – will become a common feature of their lives as they seek and secure the right treatments, services, and equipment to support their child/ren. This research explored the way parents develop the advocacy skills to champion their child/ren throughout their lives.

This workshop for parents and families aims to offer information and develop understanding about parental empowerment in systemic interactions as well as providing a supportive peer experience.

AusACPDM practice update – Holistic classification in cerebral palsy
Pam Thomason, Dr Leanne Sakzewski, Katy Caynes, Debbie Burmester, Dr Kelly Weir, Dr Kristie Bell

Summary of Content:
• GMFCS update: When a picture paints a thousand words
• MACS update: Clinical utility and stability
• The Functional Communication Classification System (FCCS): Development and applications
• Correlation between the Eating and Drinking Ability Classification System (EDACS) and standardised assessment of oropharyngeal dysphagia in children with cerebral palsy
• Screening for feeding difficulties and undernutrition in cerebral palsy

Second AROC paediatric rehabilitation quality form/benchmarking workshops for specialist facilities
Frances Simmonds, Jacquelin Capell
Thursday 7th March, 2019

Stream 1: 10:30am – 12:55pm

S1-1 Parent Empowerment and the NDIS
Fiona Russo (University of Southern Queensland)

Background: The Australian National Disability Insurance Scheme (NDIS) represents a significant change in the delivery of funded supports to Australians living with disability. Previous block-funding arrangements saw many people waiting on registers of unmet need. Individual funding allows for greater choice and control for participants, but it also shifts the responsibility for support coordination and access from ‘the system’ to families themselves.

The parents of newly diagnosed children are often newcomers to the world of typical parenting and have little or no experience of disability. Managing multi-system interactions – NDIS, Health, Education, Social Services and others – will become a common feature of their lives as they seek and secure the right treatments, services, and equipment to support their child/children. This research explored the way parents develop the advocacy skills to champion their child/children throughout their lives.

Objectives: Specifically, this project considered the development of the advocacy skillset and mindset, barriers to success, advocacy supports, the role of family-centred care models, and initial NDIS engagement through a series of individual interviews with parents and focus groups with service providers. The second phase of the study involved the design and delivery of a series of workshops for parents that aimed to offer information and develop understanding of individual needs, and on access to/engagement with both formal and informal supports.

Methods: Participants were recruited with the assistance of the Early Childhood Development Program (Ed Qld), Carers Qld, Children’s Health Queensland (Paed Rehab and Child Development Services), Hummingbird House, and social media (Facebook peer support groups). Participants self-identified as primary parent-carers for children with disability. Ten (10) parents participated in in-depth, semi-structured, narrative individual interviews. Two 5-member focus groups were held with service provider representatives including Education Qld, CHQ, Carers Qld, Catholic Education Qld, Allied Health (private provider), Child and Youth Mental Health Service, Qld Maternal Health Service, and Goodstart Kindy Program. Both interviews and focus groups gathered data on advocacy experience, support, development, and activities included discussion of barriers and factors for success.

A further forty (40) parents participated in a capacity building program held over four weeks in mid-2018. These respondents completed pre- and post-intervention surveys - Beach Institute Family Quality of Life (FQoL) (Summers 2006), Paediatric Inventory for Parents (PIP) (Streisand, Braniecki et al. 2001), and the Parental Empowerment and Efficacy Measure (PEEM) (Freiberg, Homel et al. 2014) – as well as a short structured interview post-intervention.

Results: Findings highlight the importance of existing family relationships with early intervention providers, the ‘no wrong door’ approach, facilitation of peer support, consistency of case managers, and the provision of timely and jargon-free information tailored to the needs of the families.

Design: Mixed Methods – Qualitative / Action research

Conclusion: Families entering the NDIS – or indeed the disability landscape more generally – require the support of peers and consistent service providers. Under the NDIS model, new families are less likely to have established relationships with early intervention support providers since the vast majority of these services are now accessible only via the NDIS itself. The early childhood early intervention (ECEI) entry pathway for NDIS participants under 7 years old acknowledges this gap and makes some effort to address it but does not address the issues of social isolation and the need for peer support links. Health – as a first responder to disability – is uniquely positioned to support families in this space.

S1-2 New Beginnings: Transition to the NDIS for children and young people with a newly acquired disability
Kirsten Bula (The Sydney Children’s Hospitals Network)

Background: For children and young people with a newly acquired disability, and their families and carers, navigating the disability services environment and the transition to self-directed funding under the NDIS represents a significant change.

Evidence indicates that variability in confidence and capacity can have an impact on the alignment of NDIS plans with individual needs, and on access to/engagement with both formal and informal supports.

Objectives: The vision of this NSW Health Information, Linkages and Capacity (ILC) Project is to: Build the capacity of clients with newly acquired Spinal Cord Injury (SCI) or Acquired Brain Injury (ABI), their families and carers across NSW, to engage with the NDIS and the broader disability and mainstream service environment. The target audience includes current, past and future paediatric clients of NSW Health services. The format and content of project deliverables will take into account the individual and diverse needs of children and young people, their families and carers.

Design: Qualitative Project

Methods: Project deliverables will be specifically tailored to the needs of people with newly acquired disability, their families and carers, and informed by deep insight into the local context, stakeholder experiences of the NDIS to date, and the availability of services (formal and informal supports).

Patient experience interviews are being conducted with an aim to gain a deep insight into the patient/family/carer and staff experiences of the NDIS to date. Interviews will continue until data saturation has been achieved. Consistent themes will be extracted to guide the project deliverables.

Results: This project proposes to deliver individual capacity-building sessions, as well as an education resource kit for clients with newly acquired disability, their families and carers. These will be rolled out in October 2018 and outcomes will be evaluated via questionnaires and qualitative interviews.
Conclusion: It is anticipated that the project deliverables will assist clients, their families and carers to work effectively with NDIA representatives and service providers to (a) develop and implement NDIS plans which are suited to their needs, and (b) establish links with other informal and community-based supports. The project deliverables will be available on an ongoing basis to ensure sustainable benefits for future clients of NSW Health services. Future directions will be outlined in the project summary report.

S1-3
Management of symptomatic mild traumatic head injury (Concussion).

Kathryn Asher (Rehab2Kids), Naomi Brookes (Rehab2Kids), Dr Anna Ward (Rehab2Kids), Glenda Mullen (Emergency Department)

Background: Research indicates that concussion has the potential for long term consequences in some children. Early identification, thorough assessment and appropriate follow-up are crucial in preventing persistent symptoms. It was identified by our team that some post concussive children were re-presenting to the Emergency Department with persistent symptoms and that the Brain Injury Rehabilitation Program (BIRP) was receiving a number of late referrals for children who continued to be symptomatic. Further investigation suggested that management strategies and expertise in the busy Emergency Department (ED) setting were quite variable and there were inconsistent approaches to follow up post ED discharge.

Objectives: Within 12 months 100% of patients (8-16 years) presenting to the Emergency Department at Sydney Children’s Hospital, within 24 hours of a symptomatic mild head injury are correctly managed according to the current available evidence.

Design: A joint Quality Project between the Brain Injury Rehabilitation Program and the Emergency Department was undertaken using Clinical Practice Improvement methodology.

Methods: Benchmarking with specialised paediatric rehabilitation services across Australia and New Zealand was undertaken. Key stakeholders were engaged. Consumer and staff feedback obtained. Problem identification was facilitated by process mapping and a driver diagram utilised to determine interventions for ongoing PDSA cycles. Quantitative and qualitative data collection was used. Interventions will include staff training, improvement in staff and patient resources, access to updated clinical resources and pathways and clarification of the referral process.

Results: Results will address our identified primary drivers including change in staff knowledge and confidence, patient / family confidence and satisfaction, numbers of representations and referrals to a tertiary service. We will address outcome and process measures along with balancing measures.

Conclusions: This paper addresses the strategies that were implemented to address knowledge, confidence and satisfaction in the delivery of consistent, evidence based management of children with concussion.

S1-4
A 5-½ year retrospective study of individuals with mild to moderate traumatic brain injury: consecutive presentations to a tertiary hospital paediatric rehabilitation outpatient clinic.

R. Zarrinkalam (WCHN), R. Russo (WCHN), J. Rice (Flinders University School of Medicine; WCHN)

Background: Traumatic brain injury (TBI) is common, with mild TBI accounting for at least 90% of them. TBI can result in lifelong physical, cognitive, behavioural and emotional consequences. Studies indicate sequelae in 5-15% of cases with mild TBI. Accurate classification of severity, careful monitoring and appropriate and timely management of children and youth with mild to moderate TBI is warranted to ensure maximal recovery.

Objectives: The primary aim was to audit the documentation of brain injury severity and provide a description of cause, services utilised, investigations and interventions that they received.

Design: Retrospective study

Methods: 128 patients, 2-18 years of age (mean [SD] 13 years 1 month [4 years 2 months]), who presented to the Rehabilitation outpatient clinic over a 5 ½ year period (January 2012 to July 2017) with a diagnosis of mild to moderate TBI were identified and their case notes reviewed. Brain injuries as a result of infection, asphyxia/hypoxia, and non-accidental causes were excluded. The severity of TBI was classified as mild or moderate based on Loss of Consciousness (LOC), Gairsow Coma Scale (GCS) score, Post Traumatic Amnesia (PTA) duration and results of cranial imaging.

Results: The Male: Female ratio = 2.3:1. Fifty percent had Mild and 46% moderate TBI. Most cases of moderate (84%) TBI did not have information on the number of missed days of school. Nearly 1 in 5 was the result of a motor vehicle accident.

Conclusions: Diligent documentation of relevant medical information is required in order to correctly classify the severity of TBI as management and outcome will vary. It seems sensible to have a lower threshold for undertaking neuropsychometric assessment in all cases of moderate TBI and those with mild TBI presenting with ongoing symptoms. With regards to safety educational campaigns, the priority appears to be in motor vehicle/road safety and high-risk sports such as AFL.

S1-5
The Friends Project: Optimizing social competency in youth with acquired brain injury and cerebral palsy.

Rose Gilmore (QPRS; QCPRRC), Nicola Hilton (QPRS), Dr Sarah McIntyre (CP Alliance; The University of Sydney), Dr Hayley Smithers-Sheddy (CP Alliance; The University of Sydney), Dr Tracey Williams (The Children’s Hospital at Westmead), Sarah Coombes (The Children’s Hospital at Westmead), Sarah Goodman (QCPRRC), Bianca Botha
The Children’s Hospital at Westmead, Kirsten Quinn (CP Alliance), Kate Hooke (CP Alliance), Isabelle Balde (CP Alliance), Honnie Gorry (QPRS), Dr Leanne Sakzewski (QCPRRC)

**Background:** For adolescents with acquired brain injury (ABI) and cerebral palsy (CP), making friends and maintaining social networks can be a major challenge influenced by comorbidities such as Attention Deficit and Hyperactivity Disorder (ADHD), Autism Spectrum Disorder (ASD) and other behavioural problems, poor social functioning, difficulties with mobility, communication and limited social opportunities.

**Objectives:** This pilot study will test the efficacy of the 14 week PEERS® (Program for the Education and Enrichment of Relational Skills) social skill group program to improve social competence and friendship skills of adolescents with a brain injury.

**Design:** A waitlist randomised control trial study, inclusive of a 12 week follow-up conducted in Queensland and NSW.

**Methods:** Adolescents were recruited through the QCPRRC research database and QPRS and the CP Alliance, NSW CP Register and Kids Rehab, Sydney Children’s Hospital Network. Participants had a diagnosis of ABI or CP; were aged 11-17, had a verbal IQ score >70 on the Wechsler Abbreviated Scale of Intelligence 2nd Edition (WASI-II) with parental reports of difficulties with social competency. Exclusion criteria included uncontrolled epilepsy, severe visual or auditory impairment or non-verbal. Participants were randomised to receive PEERS® immediately, or waitlist usual care. The waitlist group proceed to receive PEERS® after the 26 week retention time point. Outcome measures include the Social Skills Improvement System (SSIS) Rating Scales, Quality of Socialization Questionnaire (QSQ), Social Responsiveness Scale and the Test of Adolescent Social Skills Knowledge (TASSK). Analyses will follow standard principles for RCTs, using two group comparisons on all participants. The primary comparison H1 immediately post the intervention at 14 weeks will be based on the SSRS caregiver and child self-report.

**Results:** 25 adolescents were recruited; 12 were allocated to the “immediate” treatment group, (6 in QLD and 6 in NSW) completed the intervention. 24 participants completed follow up assessments immediately following the intervention in QLD (n= 6 “immediate” group; n= 7 “waitlist group”) and NSW (n= 6 “immediate” group; n=5 “waitlist group”). Results will be ready for presentation in March 2019 and will determine whether the PEERS® results in greater student competence and friendship skills of adolescents with a brain injury.

**Conclusions:** This research will guide clinical practice in rehabilitation of social skills after brain injury and for adolescents with CP and inform researchers of any modifications required to adapt the PEERS® for adolescents with a brain injury and in Australia.

---

**S1-7 Cognitive and Psychosocial Outcome of Paediatric Acute Disseminated Encephalomyelitis, Transverse Myelitis, and Guillain Barre Syndrome.**

Dr. Katherine Olsson (QPRS), Dr. Tania Malouf (QPRS), Dr. Kim McLennan (QPRS), Dr. Penny Ireland (QPRS), Ceridwen Cromac (University of QLD)

**Background:** Acute Demyelinating Encephalomyelitis (ADEM), Transverse Myelitis (TM), and Guillain Barre Syndrome (GBS) are sudden onset, inflammatory conditions, characterised by rapid progression of symptoms including neurological symptoms, motor weakness, and loss of sensation. The conditions differ in regard to their area of inflammation - central nervous system (ADEM), peripheral nervous system (GBS), or a restricted transverse section of the spinal cord (TM). To date research and clinical involvement have typically focussed on understanding and rehabilitating children’s physical symptoms. While it is expected that such sudden and severe illnesses would also be associated with complex psychological interactions, a review of the literature shows currently sparse research with regard to psychosocial outcomes. Among existing research, no studies have explored the cognitive or psychosocial

---
outcome following GBS, or compared the three conditions with each other.

**Objectives:** The objectives of the current study are
- a. Understand the cognitive, psychosocial, and academic outcomes of children with ADEM, GBS, and TM compared to normative samples, and
- b. Understand and compare outcome across conditions.

**Design:** The study is a cross-sectional research design. For the main quantitative analysis, the three conditions will serve as the independent variables while cognitive and psychosocial outcomes will represent dependent outcome measures.

**Methods:** Participants are existing QPRS patients, aged 6-16 years with ADEM, TM, or GBS. Participants are recruited through QPRS by a clinician not overseeing their treatment. An assessment protocol comprising cognitive (IQ, Memory, Executive Function, Academic attainment and Attention) and psychosocial measures (Pain, Mood, Behaviour, Parent coping) was conducted with all participants.

Statistical analyses will comprise analysis of descriptive data within groups and analysis of variance and covariance within and between groups. Given the cross-sectional nature, the specific comparisons chosen will be data led.

**Results:** Results will describe cognitive and psychosocial outcomes within and between the conditions, and explore any covariates impacting outcomes.

It is expected results will offer greater understanding of cognitive and psychosocial outcomes in these conditions, and guide future longitudinal research. Clinically, it is anticipated results will inform assessment protocols and highlight intervention needs.

**Objectives**

- a. Understand the cognitive, psychosocial, and academic outcomes of children with ADEM, GBS, and TM compared to normative samples, and
- b. Understand and compare outcome across conditions.

**Design**

The study is a cross-sectional research design. For the main quantitative analysis, the three conditions will serve as the independent variables while cognitive and psychosocial outcomes will represent dependent outcome measures.

**Methods**

Participants are existing QPRS patients, aged 6-16 years with ADEM, TM, or GBS. Participants are recruited through QPRS by a clinician not overseeing their treatment. An assessment protocol comprising cognitive (IQ, Memory, Executive Function, Academic attainment and Attention) and psychosocial measures (Pain, Mood, Behaviour, Parent coping) was conducted with all participants.

Statistical analyses will comprise analysis of descriptive data within groups and analysis of variance and covariance within and between groups. Given the cross-sectional nature, the specific comparisons chosen will be data led.

**Results**

Results will describe cognitive and psychosocial outcomes within and between the conditions, and explore any covariates impacting outcomes.

It is expected results will offer greater understanding of cognitive and psychosocial outcomes in these conditions, and guide future longitudinal research. Clinically, it is anticipated results will inform assessment protocols and highlight intervention needs.

**Summary of Content**

Centre for Healthcare Redesign Methodology was used to systematically assess data about current processes, identify key issues to be resolved and inform the design and implementation of solutions.

- The diagnostic phase identified an additional 65 children admitted to JHCH in 2016 with a diagnostic profile indicating a potential need to access rehabilitation care (e.g. multiple trauma, complex orthopaedics, neurosurgery, complex illness or disease) who did not access rehabilitation care during their admission or following discharge.
- A range of solutions were subsequently developed including: refined referral criteria, centralised referral management systems, networking with JHCH staff, and enhanced information for families.
- Case study - 16 year old young man residing in rural NSW – motorbike vs truck - and the role of specialist rehabilitation care in supporting his recovery.

**Implications and Recommendations for Current Clinical Practice**

The Centre for Healthcare Redesign Methodology provides a robust and systematic framework for project work, and involves strong involvement of staff and children, young people and families.

**Future Direction(s)**

The project is continuing to work towards ensuring equity of access to rehabilitation care for all children and young people admitted to JHCH who would benefit from specialised rehabilitation care. This work can potentially be expanded and applied within the development of the NSW Statewide Model of Care for Paediatric Rehabilitation.

S1-9

**Animal Assisted Therapy: A therapist’s best friend**

Catherine Norman, Jane Fong, Victoria Bruce (Women’s and Children’s Hospital, Adelaide)

**Background:** Animal Assisted Therapy (AAT) is an evidence based, goal directed intervention delivered by a trained handler & animal (dog) team who work under the direction of a health care professional. The Women’s and Children’s Hospital, Paediatric Rehabilitation Department pursued development of an AAT from 2014. The program was inspired by a patient story and supported by resounding international evidence demonstrating AAT as an inclusive therapy approach that is motivating, opportunistic and crosses social, cognitive and participation barriers.

The AAT program was developed through a consultative process that involved risk mitigation, securing funding and building agreements to create a sustainable and seamless model of care. The AAT program was established within the Paediatric Rehabilitation team in 2016, and is now an embedded component of the inpatient and ambulatory services. Consumer feedback and staff surveys indicate the success of the program.

**Objectives**

- To describe the implementation of the Animal Assisted Therapy (AAT) program at the Women’s and Children’s Hospital, Paediatric Rehabilitation Department.
- To summarise the program delivery model and report therapist and family experiences within the AAT program.
- To report strategies learnt to achieve interdisciplinary goals through animal interactions.

**Summary of Content**

In 2014, a submission to “Bright Ideas” panel within WCH was successful to establish AAT. Based on client need, and international evidence, the Paediatric Rehabilitation team proposed a structured mode of tailored, individual, animal assisted therapy, run under therapist prescription. The AAT program was developed...
through a consultative process to create a sustainable and seamless model of care. The program was designed to improve the physical, social, emotional and/or cognitive functioning of the patient, and enhance the rehabilitation experience.

AAT has provided a positive medium to work on goals. The nature of the therapy has provided social interaction and acted as a distraction; it removes focus from a therapist instructing. Families report joy & a good memory to relate to. The WCH team hope to share their learnings of developing and running this innovative program.

Implications and Recommendations for Current Clinical Practice: Animal assisted therapy is an established and embedded component of the Paediatric Rehabilitation inpatient and ambulatory services. This program model can be recommended to other departments or hospital based services.

Future Direction/s: The WCH Paediatric Rehabilitation team hope to achieve expansion of the AAT program to the wider hospital and other interested centres. Further systematic studies are required for collating data on the benefits of AAT within this specialised area of paediatric rehabilitation therapy practice.

S1-10
Eva’s Story: Adventures in CVI and Neuroplasticity
Laura Garcia (Parent), Kerri Weaver (Eyes & Independence)

Background: Laura and her family have needed to invite specialists into the home ever since their daughter fell ill as a 1 year old. She is almost 7 years now and her journey has been such a positive one despite her initial challenges and low vision. Her empowered parents have been such a strong supporter in rehabilitation and ensuring that Eva can achieve alongside her peers and family, with the realistic expectations of a fulfilling life ahead.

Objectives:
- Introduction to the medical world
- Share the hospital experience
- Share the importance of ongoing multidisciplinary team support and follow-up
- Enlighten audience – success stories

Summary of Content: Case Study – Acquired loss as a 1 year old
- Medical Definition – Cortical/Cerebral Vision Impairment & Neuroplasticity
- Presentation – onset, rehabilitating, ongoing, now
- Diagnosis to Prognosis
- Parents’ Perspective
- Specialist’ Perspective
- Photographic evidence

Implications and Recommendations for Current Clinical Practice:
- Recommendations from a parent
- Recommendations from support staff

Future Direction/s:
- Provide updates, sharing successes
- Share experiences to support other families and specialists
- Ongoing research – neuroplasticity and cerebral vision impairment

S1-11
The Self-Concept Feedback Loop: Describing the impact of disability on the development of self-concept
Sau Kuan Cheong (Guide Dogs Queensland)

Background: Self-concept is an individual’s perception of him/herself. This perception presents in forms of characteristics or attributes that an individual use to define themselves in various aspects of life. Recent literature supports the view that self-concept is a multidimensional construct where self-concept is constructed from several core domains that are salient at different developmental life stages. The self-concept of typically developing children is widely researched but research into the self-concept of children with specific disabilities are limited. Studies comparing the self-concept of children with disabilities to typically developing children revealed inconclusive findings. Some studies reported similar self-concept across the groups but other studies found that children with disabilities reported lower self-concept compared to their typically developing peers. However, very few literature explored the mechanics of self-concept development; especially the role of disability and its influence in the development of self-concept for children with disabilities.

Objectives: This presentation aims to introduce the Self-Concept Feedback Loop. This framework demonstrates the process of self-concept development. In addition, the Self-Concept Feedback Loop includes components to explain the potential impact of disabilities to the development of self-concept.

Methods: The Self-Concept Feedback Loop framework was first introduced in the development of a population-specific self-concept instrument for preadolescent children with cerebral palsy. It is believed that this framework can be adapted to other disabilities.

Results: Based on existing self-concept theories, it is known that self-concept develops as a result of the interaction between cognitive processes and social experiences. The Self-Concept Feedback Loop postulates that the individual first needs to be exposed to socialisation experiences or opportunities. The individual’s behaviour during social experiences is influenced by their self-concept in relevant domains. Then, the outcomes of these social experiences are analysed cognitively. The analysis involves evaluating the outcomes of social experiences against personal, social, and perceived internal standards. Lastly, this analysis may result in adjustments to existing standards or creation of new personal standards; which in turn, shape the individual’s self-concept and future behaviours. It is postulated that features of disability may directly and/or indirectly impact the individual’s behaviour during social experiences. Furthermore, features of disability may also interfere with cognitive processes and interrupts the analysis of outcomes from social experiences. Hence, features of disabilities may influence the development and processes of self-concept.

Conclusions: The Self-Concept Feedback Loop can be used as a framework to understand the development of self-concept which takes into account of the potential impact of disability.
Stream 1: 3:45pm – 4:50pm

S1-12
Neurocognitive Program: An interdisciplinary allied health care coordination approach to rehab for children and adolescents with brain injuries.
Nicola Hilton, Rose Gilmore, Katherine Olsson, Megan Jackson (QPRS)
Learning Objectives:
1. Increased knowledge of long term effects of brain injury and how to support function in the community.
2. Understanding of QPRS Neurocognitive Program and how it works.
3. Develop confidence using strategies when working with children and adolescents with acquired brain injury in the community.

Summary of Content: Provide up to date information about the cognitive, communication, social and emotional long term effects of acquired brain injury. Demonstrate a case management approach based at a tertiary hospital through clinical examples. Present methods of intervention including interpretation of assessments, use of telehealth and group programs and use of strategies built in to daily routines at home and in the community. Design: Literature review and systematic review
Interactive Elements: Problem solving and small group discussion through case studies.
Target Audience: Community and hospital therapists, case managers and insurers.
Equipment Required: Audiovisual equipment required for videos.

Stream 2: 10:30am – 12:55pm

S2-1
Upper Limb Nerve Transfer to Restore Hand Function Post Transverse Myelitis - A Paediatric Case study
Sky Fosbrook (Sydney Children’s Hospital, Randwick)
Background: Nerve transfer post SCI is a surgical procedure that involves cutting a functioning donor nerve (originating above the level of injury) and reconnecting it to a more crucial but non-functioning nerve (below the level of injury).

The following will outline the case of BF, an 11 year old boy who had upper limb nerve transfer surgery on the 8/2/16, after being diagnosed with longitudinally extensive transverse myelitis (LETM), CS AIS D on the 10/8/15.

Objectives: Our aim is to present the improvements BF had in his motor function and Canadian Occupational Performance Measure (COPM) scores, at 2 years post-surgery.

Design: Single case study
Methods: A COPM, conducted with BF, highlighted hand function as the major issue preventing his independence in completing activities of daily living and his ability to participate in activities of leisure and education. BF had needle electromyography on the 21/12/15, which confirmed the results of the manual muscle test (MMT) of nil voluntary motor units in his left C7/8 muscles and normal motor units/volitional movement of CS-C6 muscles.

BF underwent the following nerve transfer surgery on his left upper limb, with the goal of restoring hand function; brachialis to anterior interosseous nerve (finger flexion) and supinator to posterior interosseous nerve (finger extension).
Results: At 2 years post-surgery, BF’s MMT improved from 0/5 to 4/5 for left finger flexion and extension. BF’s COPM reassessment at 2 years had significant change; performance and satisfaction scores improved 5.2 and 5.8 points, respectively.

Conclusions: Current evidence is based on a small number of single case reports, BF’s results indicate that upper limb nerve transfer should be considered as a treatment option for appropriate paediatric cases of transverse myelitis. Time frame for surgery requires further investigation in regards to allowing adequate chance for natural recovery versus preventing lower motor neuron death.

S2-2
Upper limb rehabilitation for children with transverse myelitis
Cate Biesot, Debra Khan (QPRS)
Background: Very limited research exists describing rehabilitation for children with transverse myelitis. Research suggests that despite any initial neurological findings predicting poor recovery, inpatient rehabilitation brings significant functional improvement.

It has been suggested that general therapeutic principles apply equally to patients with traumatic and non-traumatic spinal cord injury. However transverse myelitis brings unique challenges due to the great variation in the imaging level and clinical presentation, and the unpredictable nature of the recovery.
Objectives:
- To define transverse myelitis – symptoms and causes
- To draw on case examples to understand:
  o The varying clinical presentations of transverse myelitis
  o Medical interventions for acute transverse myelitis
  o Upper limb interventions at different stages through recovery

Summary of content: Transverse myelitis is an acute inflammation of the grey and white matter in one or more spinal cord segments that causes loss of motor and sensory function below the level of injury. However imaging findings often do not correlate to clinical presentation and are not reliable in predicting functional outcomes.

As the state-wide rehabilitation service, QPRS have been involved in providing rehabilitation for a number of children with transverse myelitis. Their age, clinical presentation and outcomes have varied, however a number of therapeutic interventions have seemed to be effective in preventing and managing secondary complications and maximising function.

Implications and Recommendations for Current Clinical Practice: We will present the upper limb rehabilitation interventions trialled successfully with children in the months and years following transverse myelitis. We will show how we have learned from our long-term patients to inform our care of more recent patients.

Future Direction/s: We would like to support the development of clinical guidelines for upper limb
rehabilitation in transverse myelitis, especially given the long-term nature of medical treatment and recovery.

**S2-3**

**Use of electrical stimulation to prevent and manage shoulder subluxation in children.**

Debra Khan (QPRS), Erin Lunn (QCH OT Dept; QPRS), Dana Loader (UQ)

**Background:** Functional electrical stimulation can be used by patients with spinal cord injury and brain injury to improve muscle strength and assist in the recovery of functional movement. QPRS is able to offer FES to children post brain and spinal cord injury and with cerebral palsy. In the adult stroke literature there is evidence to support use of neuromuscular electrical stimulation around the affected shoulder muscles to prevent subluxation of the shoulder while awaiting recovery of shoulder muscle activity. QPRS has recently acquired small portable electrical stimulation units which have the potential to be used at the bedside to specifically address weakness at the shoulder.

**Objectives:** To develop a guideline for the use of electrical stimulation in children following acquired brain injury, including stroke, to prevent and/or manage shoulder subluxation.

The presentation demonstrates our process in reviewing the literature and benchmarking with other paediatric and adult based services to develop a guideline for the use of electrical stimulation to prevent and/or manage shoulder subluxation for children at LCCH. The guideline will be developed by the QPRS OTs and the Neurosciences OTs from the OT Department to ensure the best treatment across the continuum of care.

**Summary of Content:** The guideline will provide therapists with:

- Indications to commence therapy
- Muscles stimulated – clinical reasoning around this?
- Guidelines around dose – how often, when used, how long, settings on stimulator
- Type of stimulation FES vs NMES
- Contraindications or precautions
- Other therapy recommendations used in conjunction with stimulation e.g. exercises, use of slings or supports

**Implications and Recommendations for Current Clinical Practice:** We demonstrate how we evaluate the evidence and current practice to develop and implement guidelines for therapists across LCCH service areas.

**Future Direction/s:** Measurement of the outcomes of the use of electrical stimulation to prevent and/or manage shoulder subluxation in the paediatric acquired brain injury population. Opportunities for the development of guidelines for all treating therapists across the continuum of care within LCCH.

**S2-4**

**Getting the upper hand in early stroke management**

Alison Waite, Erin Lunn (QPRS)

**Background:** There has been extensive work in the adult rehabilitation world to establish Stroke Guidelines in an effort to ensure best practice and maximise outcomes. In paediatric rehabilitation, there is less evidence available to guide practice due to lower population numbers. This presentation will explore how we are working towards applying the adult literature to paediatric population to ensure best practice.

**Objectives:** To review best practice for the management of upper limb post stroke and the application into our daily practice in an acute paediatric tertiary hospital across the continuum of care.

**Summary of Content:** This presentation aims to outline the evidence available to guide assessment and intervention for upper limb impairments following stroke. It will apply the recommendations from the stroke guidelines to the paediatric population, and to compare and contrast this to our routine practice.

We will explore how we have engaged therapists across teams to apply available evidence to our everyday treatment and how we are striving to embed and translate the evidence in practice.

**Implications and Recommendations for Current Clinical Practice:** This presentation will outline direct implications for clinical occupational therapy practice in the management of paediatric stroke

**Future Direction/s:** Managing change in current practice and ongoing processes will be required to ensure new evidence is readily adopted into practice

**S2-5**

**What does hand function look like pre and post paediatric hemispherectomy?**

Ellena Oakes (QCH Occupational Therapy Dept)

**Background:** Hemispherectomy surgery for drug resistance epilepsy is becoming more standard practice. In the past years we have seen a shift to this surgery being carried out of younger and younger children. At present we are predicting hand function post Hemispherectomy based on studies of adults and older children. With the recent advances in both assessments available pre surgery and motor learning treatments post it is essential to review the outcomes for these children.

**Objectives:**

- Inform the audience of the current available research regarding hand function pre and post Hemispherectomy in children 0-18
- Provide pre and post case studies highlighting hand function and it implication for practice
- Highlight potential areas for change in practice and ongoing research

**Summary of Content:**

- Provide overview of systematic review looking at hand function in children 0-18 years pre and post Hemispherectomy
- Utilise case studies to highlight the differences pre and post-surgery
- Incorporate elements of a practice guideline including Ax and Rx
- Explore possibility of further research.

**Implications and Recommendations for Current Clinical Practice:**

- Provide evidence based recommendations regarding pre and post assessments
• Provide evidence based recommendation regarding post op treatment approaches

Results: Research pre and positively with LCCH cohort and other cohorts at national centres
Including looking at left and right hemispherectomy differences.
? need to have fMRI
? any other anatomical findings including corticospinal tract projects as predictors indications for hand function outcomes.

S2-6
Gait re-education in a young man with Dravet's syndrome
Erin Ralph, Dr Heather Burnett (HNEKidsRehab)

Background: Dravet's syndrome is an epileptic disorder that has a known loss of walking function into adolescence. Children tend to weaken, and develop crouch gait. This case study presents the history, progress and results of gait re-education using serial casting to progressively re-educate walking ability.

Objectives: Can casting be used to effectively re-train gait in a young man who isn't able to complete other, more conventional re-training methods?
Casting was completed over a period of several weeks, with outcome measures evaluated throughout. This presentation will present the findings of the series, including the outcome and the young man's current function.

Summary of Content: As this was a single case study, the recruitment was opportunistic, in response to a problem presented by a client during regular clinical review. Gait re-training is a known treatment method for people with gait disorders, but presents an additional challenge when they aren’t able to complete more traditional training methods. This case study evaluates the effectiveness of serial casting to change the gait pattern of this young man.

Implications and Recommendations for Current Clinical Practice: The outcome of this case study may be able to be used in the future for those people who are unable to complete more traditional gait retraining methods, or where traditional methods are unavailable. Recommendations on progression, type of casting, and positioning may be able to be extrapolated from the outcome of this case study.

Future Direction/s: Future use of this method may be considered with the use in younger children and other conditions where other methods of gait retraining have been unsuccessful or are unable to be completed.

S2-7
Pearls and Pitfalls of FES - Cycling for Children with Cerebral Palsy
Ellen Armstrong (Griffith University; QPRS), Dr Sean Horan (Griffith University), Ms Megan Kentish (QPRS), Professor Roslyn Boyd (GCPPRC, The University of Queensland), Dr Christopher Carty (Griffith University; CHQ)

Background: Functional Electrical Stimulation (FES) cycling provides a solution for children with Cerebral Palsy (CP) who have limited ability to pedal a traditional bicycle due to muscle weakness, spasticity and general deconditioning. FES refers to electrical impulses that are delivered to the muscles via surface electrodes at an intensity and frequency that is sufficient to evoke muscular contractions. When applied during cycling, FES can provide sensory cues to help the child contract a muscle at an exact point in the cycling phase, with the aim to improve the timing and synergy of muscle contractions. Alternatively, it can evoke stronger muscle contractions to help the child achieve full cycling revolutions.

As part of an ongoing Randomised Controlled Trial of FES-cycling and adapted cycling for children with Cerebral Palsy (GMFCS levels II-IV), participants have completed an 8-week training program of FES-cycling, functional exercises and recreational cycling on adapted bikes. The training program consists of two one-hour physiotherapy sessions per week, including 30 minutes of FES-cycling each session. The purpose of this presentation is to identify and discuss some of the key facilitators and barriers to incorporating FES-cycling into physiotherapy programs for children with CP, including children with cognitive impairments.

Objectives: The aims of this presentation are to:
• Identify the facilitators and barriers to delivering FES-cycling training to children with CP (GMFCS levels II-IV), aged 6-18 years.
• To discuss strategies to help clinicians introduce and describe FES-cycling to children with CP, including those with a cognitive impairment.
• To provide recommendations to clinicians who are currently using, or plan to use FES-cycling in their training programs.

Summary of Content: The presentation will focus solely on the FES-cycling component of a larger Randomised Controlled Trial. It will include:
• A brief overview of the study design
• An overview of the FES-parameters used in our training program
• Notes on describing the concept of FES to children, with quotes from participants
• Tips to help clinicians introduce FES to children with cognitive impairments
• Examples of motivation strategies to help children remain engaged over an 8-week FES cycling program
• Perceived benefits and feedback from families and children who have participated in the FES-cycling program
• Things to consider when delivering an FES-cycling program, including possible barriers
• Take home messages for clinicians who are interested in using FES-cycling as a training modality.

Implications and Recommendations for Current Clinical Practice: FES-cycling can provide an alternate mode of exercise for children with CP who have reduced mobility when the program aligns with, and is appropriately tailored to, the child’s goals. When delivering an FES-cycling program, it is important to establish a sound rationale for using the device over an alternative mode of exercise and to consider: the time required to set-up the equipment and to establish training parameters; the age and level of cognition of the child; the expectations of the family; the language and methods that will be used to explain FES to the patient and; motivational strategies that are appropriate for the individual child.
**Future Direction/s:** Information from this presentation can be implemented immediately into clinical practice and is intended to assist clinicians who are currently using, or intend to use, FES cycling with patients with CP or similar conditions. The functional outcomes of the FES-cycling and recreational cycling program will be analysed and presented on conclusion of the larger RCT. It is hoped that this information will further assist clinicians to make informed decisions around incorporating FES-cycling into their therapy programs for children with CP.

**S2-8**
**Look at those Legs! FES Cycle as an adjunct to Rehab**
Rebecca McDonald, Sky Fosbrooke, April Sutcliffe, Kath Asher, Catherine O’Sullivan (Rehab2Kids, SCH)

**Background:** The functional electrical stimulation (FES) cycle is being used as an adjunct to physiotherapy and occupational therapy sessions in Rehab2Kids. We have had successful results with children using it regularly and when presenting with hemiplegia.

**Objectives:**
1. To describe the current FES Cycle practice at SCH.
2. To present a single case study on the use of upper (UL) and lower limb (LL) FES Cycle for a male (‘Tom’) presenting with an extensive acquired brain injury.

**Summary of Content:** Discussion about current practice at SCH will include patient selection and suitability, set up of FES cycle and outcome measures collected.

Our case study will summarise Tom’s 206 day journey at SCH. We will discuss his rocky acute admission and his primary issues, which included a dense left hemiparesis. Tom’s primary goals were identified using the COPM, and included being independent in mobilising and completing self-care tasks and to be able to use his left UL in fine motor activities that require two hands. Tom was introduced to the FES cycle after being referred to sub-acute rehabilitation. This was part of his very busy activity based therapy program. He used the cycle a total of 59 UL session and 35 LL sessions. Tom worked very hard during his inpatient stay and made significant functional gains and all his measures improved. Tom and his family reported high satisfaction with using the FES cycle during his admission.

**Implications and Recommendations for Current Clinical Practice:** We strongly advocate for the use of the FES cycle in early rehabilitation for both the upper and lower limb. We have found it a useful adjunct to therapy. We are also currently investigating the option of purchasing an “Xcite” multi-channel FES program which allows for more task specific, strengthening and gross motor training activities.

**Future Direction/s:** We have successfully applied for and been granted funding to receive a Supine FES cycle. We hope that by being more proactive in the early phases of recovery, we may help prevent some of the secondary complications of long term CICU admissions.

**S2-9**
**The Role of Sport and Recreation in Paediatric Rehabilitation**
Kate Clark, Kathryn Asher, Catriona Murray

**Background:** The participation of children with disabilities in sports and recreational activities promotes inclusion and optimised physical function.

Rehab clinicians have varying experience with assessing children for sport and recreational activity. Participation in sport and recreation activities is often identified as a goal for paediatric patients. A review of data in Rehab2Kids suggested a clinical need:
- 86% of children in subacute rehab identified goals on the COPM

A survey was conducted of 212 families/children accessing SCH rehab services to ascertain Sport and Recreation needs, and gaps in services.

**Objectives:** Within 6 months, children receiving services through the Sydney Children Hospital (SCH) Randwick will have Sport and Recreational goals addressed. Patients/families will have access to information on where they can access activities.

**Design:** Quality project performed using the model for QI. Quantitative and qualitative data collection was used along with process mapping, and driver diagrams to determine interventions.

**Methods:**
- The diagnostic and problem identification phase adopted techniques of brainstorming, process mapping, and driver diagram.
- A survey was conducted of 212 families/children accessing SCH rehab services to ascertain Sport and Recreation needs, and gaps in services.
- Rehab2Kids staff were surveyed to determine current knowledge, and any links with organisations.

**Future Direction/s:**
Main findings from consumer survey:
- 50% stated sport and recreation goals were discussed & 29.89% reported goals were not addressed

Most important factors when accessing Sport/Recreation:
- child’s enjoyment 71%,
- closeness to home 53%

The biggest challenges:
- child’s physical and cognitive difficulties 63.86%
- availability of suitable services 50%
- unaware of services 41%

How we could improve our service:
- dissemination of information
- sport and Recreation services suitable to child’s needs
- 73% of staff reported that they would like information on Sport and Recreation organisations

**Conclusions:** This project has identified gaps in our current processes, and lack of knowledge of staff and families about suitable Sport and Recreation organisations

Main areas of focus:
- Improve staff knowledge through training from external rehab organisations
- Improve access of families to Sport and Recreation organisations through Sydney Children website page
- Formalised process for Rehab therapists

The team hopes to improve family's ability to access suitable organisations, and our ability to meet families and patient goals.
Stream 2: 1:55pm – 3:15pm

S2-10
Selective Dorsal Rhizotomy the Australian Experience: Selection, rehabilitation, orthopaedic management and outcomes.

Pam Thomason (Royal Children’s Hospital, Melbourne), Olivia Lee (VPRS), Kim McLennan (QPRS), Meredith Wynter (QPRS), Carly Dickinson (QPRS), Cate Biesot (QPRS), Neil Wimalasundera (VPRS)

Learning Objectives: To understand:
- the indications and selection criteria for SDR in Australia and the clinical characteristics of the ideal candidate
- the indications for and orthopaedic management of lower limb deformities in children post-SDR and the rationale for long-term orthopaedic follow-up
- the bioethical issues involved with SDR in Australia
- To gain knowledge about the outcome evidence post-SDR across the ICF domains in the context of the child and family

Summary of Content: Selective Dorsal Root Rhizotomy (SDR) is a neurosurgical procedure used to reduce spasticity in children with bilateral cerebral palsy (CP) aiming to improve gait and function. SDR has been utilised in Australia since 2003. SDR is an irreversible, time consuming procedure which requires intensive post-operative rehabilitation and time commitment by children and their families. The decision whether an SDR is the most appropriate management is a difficult one and requires a comprehensive multidisciplinary assessment, instrumented gait analysis in most instances and realistic goal setting with the child and family. Selection criteria are clinically based and vary between centres internationally. The selection criteria used in Australian will be presented and discussed. Published evidence for outcomes post SDR in Australia is limited however, follow up of a small group of children who have undergone SDR in Melbourne found short term improvements in spasticity, gait and gross motor function with emerging evidence for these to be maintained long term.

Outcomes will be discussed in the context of the ICF framework with emphasis on participation, performance and family/child perspectives and will be a focus of interactive case discussions. Musculoskeletal issues and outcomes affecting children/adolescents who have undergone SDR will be explored and compared with children who have not had SDR. The risk of complications following SDR is now considered very low however clinicians may be cautious about suggesting SDR as a management option to families. The possible reasons for this will be explored and bioethical issues relating to SDR will be discussed. The Australian SDR Research Registry will be introduced and a potential early referral and assessment pathway will be explained.

Stream 2: 3:45pm – 4:50pm

S2-11
Evaluation of a virtual clinic model for cerebral palsy hip surveillance

Dr Heather Burnett, Elisabeth Bowes, Erin Ralph, Ann Leonard (HNEkidsRehab)

Background: The HNEkidsRehab Cerebral Palsy Hip Surveillance Program (CPHS) has been operating using a virtual clinic model since 2013 to coordinate hip surveillance for children with cerebral palsy in the Child Health Network - Northern in New South Wales. The aims of this program are:

1. Engage all children requiring cerebral palsy hip surveillance
2. Ensure compliance with hip surveillance guidelines
3. Achieve early detection of hip displacement and prompt referral for orthopaedic review
4. Optimize health resource utilisation

Objectives: A five year quality assurance audit was undertaken to evaluate how well the HNEkidsRehab Cerebral Palsy Hip Surveillance Program has performed in achieving its stated objectives.

Summary of Content: Our audit demonstrated that our program is seeing 46% of the expected paediatric CP population in our area. The geographic spread of our CPHS patients was skewed toward metropolitan areas. Referrals were primarily from our CPMD clinic and community physiotherapists. Significant issues were found with delay in x-rays being completed and reports being issued. Orthopaedic referral rate was lower than our comparison site (QPRS), with similar numbers ultimately undergoing surgery. We identified two patients with progressive hip displacement and one with hip dislocation who had not been referred to CPHS. All had CP-like conditions.

Our audit included a survey of CPHS families and carers, which reflected difficulties in obtaining x-rays and interpreting CPHS reports. We also included a survey of potential referrers, which demonstrated that general paediatricians and GPs in our area want more information about hip surveillance for children with CP and CP-like conditions.

Implications and Recommendations for Current Clinical Practice: We have undertaken several changes to our CPHS program since completing this audit, including renaming the program High Risk Hip Surveillance (HRHS) in order to capture more children with CP-like conditions. We are working with families to improve access to x-rays and have changed our report format to make it more easily understandable for families. We have also changed our processes to improve timely review of x-rays. We have issued new educational materials about our HRHS program to general paediatricians and GPs in our area, and we are developing a GP HEalthpathway in conjunction with our local primary health care network in order to facilitate referrals to our service.

Future Direction/s: We will plan to reassess our HRHS program in 2021 to evaluate the impact of our recent changes on achievement of the program’s objectives.
S2-12
Australian Selective Dorsal Rhizotomy Research Registry for families and clinicians

Jennifer Lewis¹, Nadine Smith², Felicity Baker³, Meredith Wynter⁴, Simon Paget¹
(¹The Children’s Hospital at Westmead, Sydney; ²Perth Children’s Hospital; ³Women’s & Children’s Hospital; ⁴QCH)

Background: Selective dorsal rhizotomy (SDR) is a well-established neurosurgical procedure performed for the reduction of spasticity interfering with motor function in children with spastic cerebral palsy (CP). As practised today, SDR is an effective treatment for those patients who undergo a rigorous selection process, including realistic goal setting. A small number of children with CP undergo SDR in Australia each year; in addition some families seek the intervention at international sites. The Australian SDR (SDR-AUS) Research Registry committee developed a set of multidimensional outcomes to capture clinical outcomes longitudinally across the domains of the ICF.

Objectives: The primary objective of the registry is to provide clinicians with information to guide families considering SDR. One of the research questions within this objective is: “What are the characteristics of Australian children with CP who have undergone SDR?“

Design: Retrospective and prospective cohort study of children with CP who have undergone SDR in an Australian centre.

Methods: This study reports descriptive data for children who underwent SDR surgery in Australia between 2005 and 2018. Baseline data was collected as part of routine clinical assessment. This includes classification of cerebral palsy motor function, hand function and communication, physical assessment and several standardised assessment tools, including goal setting. Data collected was entered by study investigators into a purpose-designed research database.

Results: Twenty-six patients underwent SDR in this cohort (18M, 8F). All patients had the diagnosis of CP (20 diplegic, 4 triplegic and 2 quadriplegic). Spasticity was the predominant motor type. Most had evidence of periventricular leukomalacia (PVL) on brain MRI (25=PVL, 1=normal). Gestational age ranged from 24-40 weeks (median=32). Age at surgery: range 3.88-11.44 years (median=5.695). GMFCS levels: II=9, III=14, IV=3. MACS levels: I=15, II=9, III=2. CFCS levels: I=22, II=2, III=2. Functional mobility: 9/26 were independent walkers in the community with 15/26 requiring a wheelchair for longer distances. All patients had previous botulinum toxin injections. No children had previous orthopaedic surgery. 125 goals identified using the COPM framework: productivity=18/125, self-care=85/125, leisure=22/125. The majority of self-care goals were mobility (26/85), transfers (18/85) and dressing (14/85). Productivity goals were mostly mobility around school 12/18.

Conclusions: Collection of this data helps paint a picture of children who have undergone SDR in Australia. Follow up using the same multidimensional outcomes over a 10 year period will improve our understanding of the short, medium and long term outcomes and any adverse effects of SDR thereby providing clinicians with information to guide families considering SDR.

S2-13
Efficacy of new protocol guided single-level laminectomy selective dorsal rhizotomy followed by intensive rehabilitation for children with spastic cerebral palsy

Xiao Bo, Mei Rong (Shanghai Children’s Hospital, China)

Objective: To evaluate the efficacy of new protocol guided single-level laminectomy selective dorsal rhizotomy (SL-SDR) followed by intensive rehabilitation for children with spastic cerebral palsy for at least 12 months, and to investigate the factors influencing the outcomes.

Methods: A retrospective analysis was conducted for the clinical data of 67 pediatric cases with spastic cerebral palsy undergone new protocol guided SL-SDR followed by intensive rehabilitation for at least 12 months from 2015 Sep. to 2016 Oct. in our hospital, focusing on muscle tone, joint range of movement, muscle strength, the gross motor function classification system grading and the gross motor function measure-66 scores pre, 6 months post and 12 months post-operation. Multivariate Logistic regression were utilized to identify the factors influencing the outcomes.

Results: With a mean of 12.7 months follow-up, there were 22 cases downgraded one level and 4 cases downgraded two levels with regard to GMFCS. Downgrading of GMFCS was observed significantly better in cases with baseline of GMFCS II or III (20/37 vs.6/23, P = 0.034), and cases ≤ 6 years old (20/31 vs. 6/29, P = 0.001) than those of IV or V, and > 6 years old. Improvement of GMFM-66 was significantly better in cases with baseline of GMFCS I - III (13.4 ± 2.8 vs.8.7 ± 4.6, P = 0.000), and cases ≤ 6 years old (13.5 ± 3.6 vs. 9.8 ± 3.9, P = 0.000) than those of IV or V, and > 6 years old, respectively. Multivariate Logistic regression demonstrated that the age (OR : 0.491, 95%C.I. : 0.324 ~ 0.743, P = 0.001) and status of pre-operation GMFCS (OR : 0.225, 95%C.I. : 0.086 ~ 0.589, P = 0.002) were independent factors associated with the presentation of GMFCS downgrading at 12 months post-operation. The multivariate Logistic regression analysis revealed that the age (OR : 0.491, 95%C.I. : 0.324 ~ 0.743, P = 0.001) and pre-operation GMFCS (OR : 0.225, 95%C.I. : 0.086 ~ 0.589, P = 0.002) were independent factors associated with the presentation of GMFCS downgrading at 12 months post-operation. The multivariate Logistic regression analysis revealed that the age (OR : 0.575, 95%C.I. : 0.404 ~ 0.820, P = 0.002) and pre-operation GMFCS (OR : 0.103, 95%C.I. : 0.031 ~ 0.344, P = 0.000) were independent factors influencing the children's GMFM-66 improved at least 10 points 12 months post-operation.

Conclusions: The gross motor function of children with spastic cerebral palsy underwent new protocol guided SL-SDR followed by intensive rehabilitation improved dramatically 12 months after the commencement of the treatment. Children could benefit from this procedure more for those with baseline of GMFCS level I to III and younger than 6 years of age.
Acuity in Social Work Practice: Measuring the severity of the psychosocial condition of children and families in pediatric rehabilitation.

David Weatherburn (QPRS)

Background: Psychosocial acuity refers to the severity or intensity of the psychosocial state of patients and their families, and the subsequent degree of need for intervention. Measuring psychosocial acuity allows for more equitable access to social work services and can more successfully explain the complex and variable nature of social work practice. This presentation aims to explore existing psychosocial acuity measurement tools and investigate their application within a pediatric rehabilitation setting.

Objectives:
1. Briefly summarise psychosocial acuity research, including existing measurement tools that may be directly applied or adapted.
2. Consider the role of social work within QPRS and understand how measuring acuity will further enable equitable access to targeted and responsive interventions.
3. Discuss the development and future implementation of a psychosocial acuity measurement tool that is suitable for a unique pediatric population.

Summary of Content: Psychosocial acuity can tell a more compelling and complete story. Encounter data and clinical documentation are not enough to secure the future and viability of social work, and to help patients obtain the services they need. Measuring acuity can aid in resource alignment, and can also allow social workers to improve efficiency by developing a more appropriate intervention plan. Determining the severity of problems identified via a psychosocial assessment adds a complementary dimension to social work screening.

Internationally there are few acuity tools, often based on rating scales across various psychosocial domains. There are commonalities amongst these tools, but none appear to adequately account for the unique needs of our pediatric population. This will be examined via a brief case example.

Implications and Recommendations for Current Clinical Practice:
1. In consultation with existing social workers, develop a measurement tool and process to support a pediatric rehabilitation population.
2. Evaluate the effectiveness of implementing an acuity measure has on providing positive outcomes for patients and their families.

Future Direction/s: Measuring psychosocial acuity may also allow for further research into the relationship between social need and rehabilitation outcomes. It will also be necessary to examine the validity and reliability of such a tool.

Objectives:
1. Briefly summarise psychosocial acuity research, including existing measurement tools that may be directly applied or adapted.
2. Consider the role of social work within QPRS and understand how measuring acuity will further enable equitable access to targeted and responsive interventions.
3. Discuss the development and future implementation of a psychosocial acuity measurement tool that is suitable for a unique pediatric population.

Summary of Content: Psychosocial acuity can tell a more compelling and complete story. Encounter data and clinical documentation are not enough to secure the future and viability of social work, and to help patients obtain the services they need. Measuring acuity can aid in resource alignment, and can also allow social workers to improve efficiency by developing a more appropriate intervention plan. Determining the severity of problems identified via a psychosocial assessment adds a complementary dimension to social work screening.

Internationally there are few acuity tools, often based on rating scales across various psychosocial domains. There are commonalities amongst these tools, but none appear to adequately account for the unique needs of our pediatric population. This will be examined via a brief case example.

Implications and Recommendations for Current Clinical Practice:
1. In consultation with existing social workers, develop a measurement tool and process to support a pediatric rehabilitation population.
2. Evaluate the effectiveness of implementing an acuity measure has on providing positive outcomes for patients and their families.

Future Direction/s: Measuring psychosocial acuity may also allow for further research into the relationship between social need and rehabilitation outcomes. It will also be necessary to examine the validity and reliability of such a tool.

Objectives:
1. Briefly summarise psychosocial acuity research, including existing measurement tools that may be directly applied or adapted.
2. Consider the role of social work within QPRS and understand how measuring acuity will further enable equitable access to targeted and responsive interventions.
3. Discuss the development and future implementation of a psychosocial acuity measurement tool that is suitable for a unique pediatric population.

Summary of Content: Psychosocial acuity can tell a more compelling and complete story. Encounter data and clinical documentation are not enough to secure the future and viability of social work, and to help patients obtain the services they need. Measuring acuity can aid in resource alignment, and can also allow social workers to improve efficiency by developing a more appropriate intervention plan. Determining the severity of problems identified via a psychosocial assessment adds a complementary dimension to social work screening.

Internationally there are few acuity tools, often based on rating scales across various psychosocial domains. There are commonalities amongst these tools, but none appear to adequately account for the unique needs of our pediatric population. This will be examined via a brief case example.

Implications and Recommendations for Current Clinical Practice:
1. In consultation with existing social workers, develop a measurement tool and process to support a pediatric rehabilitation population.
2. Evaluate the effectiveness of implementing an acuity measure has on providing positive outcomes for patients and their families.

Future Direction/s: Measuring psychosocial acuity may also allow for further research into the relationship between social need and rehabilitation outcomes. It will also be necessary to examine the validity and reliability of such a tool.

Objectives:
1. Briefly summarise psychosocial acuity research, including existing measurement tools that may be directly applied or adapted.
2. Consider the role of social work within QPRS and understand how measuring acuity will further enable equitable access to targeted and responsive interventions.
3. Discuss the development and future implementation of a psychosocial acuity measurement tool that is suitable for a unique pediatric population.

Summary of Content: Psychosocial acuity can tell a more compelling and complete story. Encounter data and clinical documentation are not enough to secure the future and viability of social work, and to help patients obtain the services they need. Measuring acuity can aid in resource alignment, and can also allow social workers to improve efficiency by developing a more appropriate intervention plan. Determining the severity of problems identified via a psychosocial assessment adds a complementary dimension to social work screening.

Internationally there are few acuity tools, often based on rating scales across various psychosocial domains. There are commonalities amongst these tools, but none appear to adequately account for the unique needs of our pediatric population. This will be examined via a brief case example.

Implications and Recommendations for Current Clinical Practice:
1. In consultation with existing social workers, develop a measurement tool and process to support a pediatric rehabilitation population.
2. Evaluate the effectiveness of implementing an acuity measure has on providing positive outcomes for patients and their families.

Future Direction/s: Measuring psychosocial acuity may also allow for further research into the relationship between social need and rehabilitation outcomes. It will also be necessary to examine the validity and reliability of such a tool.
Dare to Team – Changes in Length of Stay and Functional Performance in the Rehab Ward at LCCH

Dr Penny Ireland (QPRS), Dr Kim McLennan (QPRS), Associate Professor Karen Barlow (QPRS; UQ), Suzanne Simpson (QPRS)

Background: Since 2017, data regarding paediatric rehabilitation outcomes has been entered into the Australasian Paediatric Rehabilitation Outcomes data base through the Australasian Rehabilitation Outcomes Centre. The accumulation over time of this data will allow paediatric rehabilitation services across Australia and New Zealand to benchmark outcomes and enhance pathways to create more effective and efficient based service provision. The Rehabilitation Sub Acute Ward (8A) at LLCH has been open since November 2014 and is a new paediatric rehabilitation ward that combines allied health, nursing and medical staff in a custom built facility. Over the past 4 years (and prior to development of the APROC database), data regarding length of stay and functional change according to the WeeFIM has been collected for the diagnostic groupings developed by the Australasian Rehabilitation Outcomes Centre (AROC).

Objectives: 1. To compare LCCH 8A rehabilitation data across 2015-2018 and identify clinical trends 2. To compare LCCH 8A rehabilitation data with length of stay data from The Royal Children’s Hospital in 2013 3. To discuss potential challenges in service delivery models that may contribute to trends

Summary of Content: Preliminary assessment identifies stability in the data across 4 years since opening of the rehab ward at LCCH with respect to length of stay and functional change. The length of stay in the 8A rehab ward has reduced when compared to data from 2013 at Royal Children’s Hospital. Possible explanations with respect to service delivery models are explored during this presentation.

Implications and Recommendations for Current Clinical Practice: Paediatric rehabilitation services are a small and specialised area of rehabilitation. Little data currently exists with respect to Australian based paediatric rehabilitation length of stay and functional change. Having a greater understanding of this will assist in identifying models of service delivery that provide better care for our children and families whilst also maximising effectiveness and efficiency.

Conclusions: As above

S3-4

Functional outcomes of children with acquired brain injury at medium-term follow-up after discharge from inpatient rehabilitation.

Olivia J Turnbull, Dr Penelope J Ireland (QPRS), A/Prof Leanne M Johnston (The University of Queensland)

Background: Childhood acquired brain injury (ABI) refers to damage to the brain occurring between two and 18 years of age. Childhood ABI encompasses children with a heterogeneous range of injuries from a variety of causes including trauma, stroke, tumour, infection and anoxia. In Australia, more than 20,000 children are diagnosed with an ABI. Injury to the developing brain can impact current and future physical, cognitive and emotional functioning, resulting in long-term challenges in participation and quality of life. Childhood ABI can result in both reduced independence with everyday tasks and increased assistance requirements that continue beyond inpatient rehabilitation. Everyday functional performance describes the essential features of daily living, such as eating bathing, mobility, and basic cognitive aspects such as memory and social interactions. It has been reported that following ABI, children can demonstrate reduced independence with these tasks, leading to an increased burden of care for families. While research exists that demonstrates improvement in functional performance following childhood ABI during inpatient rehabilitation, few studies explore changes beyond discharge. Additional research in this area will enhance clinician understanding of the recovery trajectory after discharge.

Objectives: The aims of this study were to (1) examine medium-term recovery of everyday function of children with ABI after discharge from inpatient rehabilitation, and (2) identify possible associations between follow-up and discharge function.

Methods: The Functional Independence Measure for Children (WheeFIM-IITM) was used to examine self-care, mobility and cognitive function of 20 children with ABI (aged 5–18 years; 13 males) at medium-term follow-up (3–28 months) following discharge from tertiary inpatient rehabilitation. Attributes of follow-up function were compared to discharge function using Wilcoxon Signed Rank Tests and Spearman’s Rank Correlation Coefficients statistics to determine recovery patterns and factors associated with recovery.

Results: Between discharge and medium-term follow-up, children with ABI improved in WheeFIM-IITM self-care tasks (p=0.002) and demonstrated near-significant improvement in overall function (p=0.064) and mobility (p=0.084). In contrast, most children demonstrated a non-significant reduction in cognitive performance (p=0.444). The strongest association with follow-up function was discharge function on the WheeFIM-IITM (p=0.015).

Conclusions: Data showed that most children improved in overall functional performance post-discharge, particularly with Self-care and Mobility tasks, however many children appeared to struggle with further Cognitive recovery and development. These findings support regular administration of the WheeFIM-IITM at pre-determined time-points during inpatient and post-discharge phases to monitor recovery trajectory post-ABI and identify the specific type of post-discharge rehabilitation needed to maximise functional independence for children and reduce burden of care for families and schools. Research is necessary to more accurately examine skill recovery and progress.
S3-5
Influences on achievement of active partnership and goal setting with families in paediatric acquired brain injury rehabilitation

Sarah Knight (MCRI, VPRS, The University of Melbourne), Jill Rodda (MCRI, The University of Melbourne), Adam Scheinberg (RCH, VPRS, MCRI, Monash University), Vicki Anderson (MCRI, RCH, The University of Melbourne), Emma Tavender (MCRI, Monash University), Natasha Lannin (LaTrobe University)

**Background:** Children with an acquired brain injury (ABI) and their families have the right to expect high-quality, evidence-based rehabilitation. A key clinical practice guideline recommendation (CPGR) from a recently published rehabilitation in paediatric ABI guideline recommends that the child/family and clinicians need to work as partners to achieve the optimal care for the child/family. To incorporate this CPGR into routine rehabilitation, factors affecting implementation need to be identified and minimised.

**Objectives:** Identify the factors influencing implementation of CPGR for active partnership with the child/family and goal setting in paediatric ABI rehabilitation.

**Design:** This is a qualitative study forming part of a mixed methods KT study

**Methods:** Participants: rehabilitation clinicians; parents and people with the lived experience of ABI rehabilitation. A qualitative stakeholder engagement forum was conducted using nominal group technique: silent idea generation re barriers/enablers with Domains of the Theoretical Domains Framework (TDF) as prompts; group recording of ideas/discussion; and independent voting of major barriers/enablers. Barriers/ enablers were coded to TDF Domains and thematic analysis undertaken plus votes counted.

**Results:** Ten rehabilitation clinicians from different disciplines, one parent and one adult with the lived experience participated. Most barriers were coded to the TDF Domain of Environmental Context and Resources- family background, goal setting issues and rehabilitation discipline discrepancies (total 39 votes). Other Domains with barriers coded to them with votes attached, were Skills (8 votes), Behavioural Regulation (8 votes) and Memory, Attention and Decision Processes (2 votes). The major barrier to child/family active partnership and goal setting was multiple aspects of family context: emotional trauma, culture, language, education, socioeconomic level, past experiences, disconnection within family, disconnection with clinicians, expectations regarding child’s abilities, and level of therapy involvement (n=17 votes). Other barriers included goal review and goal communication with the child/family (n=9; staff ability to set, write and prioritise goals with the child/family (n=7); and different discipline priorities, caseloads, staffing, resources (n=5). Enablers included staff skill acquisition to understand, support and empower child/family (n=5).

**Conclusions:** In paediatric ABI rehabilitation, the family context appears to be a key barrier to implementation of a CPGR for active partnership and goal setting with the child/family. Successful implementation of this CPGR needs to include communication by clinicians that is well-considered, supportive, and empowering to families and clinicians may require skill development to achieve this.

S3-6
Early Injury Pathway: Early developmental screening and assessment in Paediatric Brain Injury

Erin Cowley, Affiliates: Kylie French (BIRP), Catherine O’Sullivan, Naomi Brookes, Louise Parry, Bec McDonald, Nicole Nagler, Gabrielle Brawn, Adrienne Epps.

**Background:** As an early acquired brain injury (ABI) is known to have developmental consequences, the Early Injury Pathway (EIP) was developed within the Sydney Children’s Hospital Brain Injury Rehabilitation Program, as a way of providing child and family centred assessment and review for a child who has sustained a significant brain injury under 5 years of age.

The purpose of the protocol was to help identify any difficulties as they emerge for children in the early stages of their development and implement early appropriate intervention. The pathway includes key time points along the child’s development, including medical and multi-disciplinary clinic appointments and more formalised assessments that are conducted around the child’s 2nd birthday and in the year prior to starting school.

**Objectives:** The current project is aimed at reviewing the component of the protocol that involves the developmental assessment for children at 2 years of age. Questions that have been raised by clinicians include:

- If the resource intensity of the assessment is appropriate?
- Whether a formal assessment is required to facilitate timely referral to early intervention services, or if there is another more streamlined way to do this?
- What is the patient experience and needs for parents/carers engaging in this assessment?

**Design:** A retrospective survey of families and staff experiences of the 2 year old developmental assessment on the EIP, retrospective audit and literature review of developmental assessment methods.

**Methods:** Mixed methods approach using qualitative and quantitative data. Procedures include:

1. 12 month retrospective audit of completed assessments (2017-2018)
2. Parent/Carer Survey – including questions around information provision and feedback, time spent in assessment, and recommendations (including follow-up).
3. Staff survey – questions on experience of administering the assessments, resources utilised and barriers to assessment.
4. Literature review on available assessments and screening tools, and Benchmarking exercise with other tertiary paediatric centres across Australasia.

**Results:** Outcomes and results are yet to be collected, but will be examine:

- Patient/parent/carer satisfaction including, feasibility, information provision and feedback
- Examine if assessment facilitates early intervention
- Resources utilised (i.e. clinician time spent assessing, giving feedback and administration tasks).

Responses will be collated and analysed and a report produced summarising findings.
Conclusions: Clinical implications and future directions will be determined based on results and findings. This may include:
- A change in practice
- Changing measures utilised
- Producing resources and information for parents
It would be important to continue to review any change in practice in the future.

S3-6
A framework for facilitating a smooth transition to school in children with acquired brain injuries post intensive rehabilitation.

Jane Fong (Women’s and Children’s Hospital, Adelaide)

Background: Commencing school after an acquired brain injury is daunting for many children and incrementally so with greater severity of the brain injury. School is the one dynamic context that draws on a myriad of skills across physical, cognitive, social-communication and psychosocial domains. If the goals of intensive rehabilitation are to improve functional competence and participation in the community, readiness for school, fatigue management and a targeted plan for transition are often imperative objectives.

Formulating a personalised plan to support a successful transition to school is embedded in our interdisciplinary approaches.

Objectives:
- To describe the framework used by the Women’s and Children’s Hospital Paediatric Rehabilitation Team for enabling transition to school.
- To describe approaches for supporting the child’s insight into their fatigue level and formulating personalised strategies (presented visually on a Fatigue Scale).

Summary of Content: Pre-morbid information (past examples of school work, the child’s learning style, interests, strengths and weaknesses) is obtained early from school reports and conversations with teachers. During the course of rehabilitation, the child is supported in practising strategies that can be applied to high level language and information processing required for managing their school assignments. Approaches to scaffold learning, reading, dynamic application of concepts and formulating large amounts of written language are established. Across all disciplines and contexts, cognitive endurance, proficiency with auditory and visual processing abilities and problem solving are continually improved and challenged in a variety of busier environments. Most of our patients commence some hospital school during their rehabilitation before trialling some hours in their own school in the lead up to discharge from rehabilitation. A fatigue scale is completed with the child just prior to commencing school.

Within this framework, members of the team contribute to a written handover of personalised strategies and a plan for graded return to school. Reference is made to the fatigue scale to guide the hours and energy management at school. Verbal handover is often provided via a teleconference around the time of school transition.

Establishing a framework for supporting the smooth transition back to school enables a consistent, effective and coordinated approach amongst hospital therapists, teachers, community therapists, parents and the child. Aspects of this framework can be adopted by other practices.

Future Directions: Surveys and consumer feedback on the efficacy of this framework. Data collected should include the perceived success of transition by various parties, the child’s confidence in managing school within the first 6 months of returning to school and identify key issues that require ongoing management.

S3-W7
More than just a Multidisciplinary Management Plan
Cath O’Sullivan, Kylie French (BIERP)

Background: In 2014 NSW Health released the Care Type Policy for Acute, Sub-Acute and Non-Acute Admitted Patient Care (PD2014_010). This policy states rehabilitation is always:
“Evidenced by an individualised multidisciplinary management plan, which is documented in the patient’s medical record that includes negotiated goals within specified timeframes and formal assessment of function.”
The policy further states “a multidisciplinary management plan comprises a series of documented and agreed initiatives or treatments (specifying program goals, actions and timeframes) which have been established through multidisciplinary consultation and consultation with the patient and carers.”

This policy led the Brain Injury Team at Sydney Children’s Hospital to undertake a project to develop a Multidisciplinary Management Plan. However, the resultant changes have been much more than that.

Objectives: To create a Multidisciplinary Management Plan to be used for all patients who are sub-acute typed changed under Rehabilitation at Sydney Children’s Hospital, Randwick.

Design: The project was undertaken as part of the Clinical Practice Improvement Program through the Clinical Excellence Commission.

Methods: Diagnostic and problem identification phase using techniques of Flow charting, Brainstorming, Ishikawa diagram and Pareto chart.
- Review of NSW Health Policies and Guidelines.
- Review current literature.
- Survey of paediatric rehabilitation teams around Australia and New Zealand to ascertain current practices.
- Collate examples of existing plans from other services.
- Audit of current practices for clinical meetings, documentation and goal setting at Sydney Children’s Hospital.

Results: Multidisciplinary Management Plan developed with 5 Key Stages:
1. Initial Information Form
2. Completion of Canadian Occupational Performance Measure (COPM)
3. Identification of Patient and Family Goals
4. Patient Goals and Strategies discussed at weekly team meeting
5. Discharge Summary
- Other Changes within the team
- Coordinated team goals compared to discipline specific
- Patient goal focused

17
- Incorporation of patient goals like gardening and fishing into “early” rehab plans
- Improved structure to team meetings
- Increased use of outcome measures
- Clear team processes regarding roles and responsibilities for use of outcome measures in rehab

Conclusions: A Multidisciplinary Management Plan is now completed for every patient sub-acute type changed to rehabilitation at Sydney Children’s Hospital. The implementation of this plan has changed many aspects of the team with a hope of being patient and family focused. The team hopes to further audit the compliance and completion rates of the Multidisciplinary Management Plan and further consult families about their experiences.

Stream 3: 1:55pm – 3:15pm

S3-8
Miss P, Popeye and PEGS (A case study)
Louise Konz (HNEkidsRehab)

Objectives: To highlight the importance and benefit of good nutrition to support rehab outcomes and also improve quality of life for children with complex disabilities.

Summary of Content: Miss P always struggled with weight and strength, as well as experiencing periods of dysphagia. She underwent dilatations for oesophageal strictures which would help improve her intake short term, but the issues would return. Eventually she had an NG placed and started to gain wt, however, there were social concerns around this, including that her school would keep her inside and away from peers for fear they would pull out her NG.

Eventually she had a PEG placed and has subsequently continued to gain wt, she can now play with her friends and her overall strength and endurance has improved, which has contributed to better outcomes for her physical therapy goals.

It also means that her family feel less pressured to feed her ‘continually’ or ‘forcefully’, and have more time to work with her on OT and physio skills.

Implications and Recommendations for Current Clinical Practice: It is hoped that this case study will highlight the importance of considering nutrition as part of holistic care for patients with complex disabilities, and the role that appropriate nutrition support can play in enhancing these patient’s physical therapy outcomes, as well as improving the quality of life for the patient and their families.

Future Direction/s: We are hoping to implement nutritional screening for all CP/rehab patients, to improve early identification of those patients who would benefit from dietetic support, as part of their overall rehab experience.

S3-9
Parental Perspectives On Blenderised Tube Feeds For Children Requiring Supplemental Nutrition
Banerjee K J, Trollip A, Lindeback R E
(Sydney Children’s Hospital Network, Randwick)

Background: Blenderised tube feeding (BTF) has been gaining in popularity in recent times. There are a range of hypotheses and case reports as to why this is so, including the ability to provide: age appropriate foods with natural food composition; improvements in physiological outcomes; intimate experiences for parental nurturing; and the benefits that come with family inclusion and engagement at meals. Although dietetic associations cannot, as yet, recommend BTF’s, many families choose to commence them regardless of dietetic support.

Objectives: We aimed to better understand the demographics of these families, their sources of information and support, and the perceived benefits of BTF’s in a community setting.

Design: This was a de-identified questionnaire based study analysing quantitative and qualitative measures

Methods: Sydney Children’s Hospital (SCH) dieticians identified 21 children on BTF’s. Questionnaires and food diaries were distributed. The questionnaires focused on:
- Child/parent demographics
- Parental knowledge
- Dietetic support
- Symptoms before and after commencing BTF’s.

Results: Parents reported improvements in their children receiving BTF’s in psychosocial physiological outcomes and general health. Most notable improvements were seen in the areas of nausea and vomiting, gastro-oesophageal reflux, constipation and growth. There were some minor concerns regarding food preparation and administration via feeding tube.

Conclusions: Despite concerns from the medical community, families are still motivated to independently search for information and implement BTF for their child. Families report overall health improvements for their child on BTF’s.

Recognising that some families are choosing to use BTF’s for their child, we need to be in a position to provide them with adequate support to minimise the suggested risks. This can be achieved by responding to family’s information needs, along with open discussion about BTF’s and adequate monitoring.

Our study obtained a qualitative reflection of parents/carers perspectives of using BTF’s. We would recommend further longitudinal studies to demonstrate the effectiveness of BTF’s alone, or in combination with, commercially based formulas

S3-10
The five Ws and the H of AAC in Paediatric Rehabilitation
Claire Dunn is a Speech Pathologist with the Queensland Paediatric Rehabilitation Service at the Queensland Children’s Hospital.

Jessica Kelly is awesome at AAC. Her first communication device was prescribed in 2004, and her communication skills have been growing ever since. The vocabulary file Jess uses is Unity 45 Sequenced, and she accesses her device with a single switch that is mounted in her headrest.

Penny Jameson owes most of what she knows about AAC to Jessica Kelly. Penny is employed as the Queensland consultant for Liberator – a supplier of AAC devices, and also works as a Library Teacher Aide in a high school setting. Knowing Jess and assisting her as a Teacher Aide for most of her schooling has had a direct impact on her passion for AAC.

Background: Children with acquired brain or spinal cord injury often experience sequelae that affect their ability to communicate effectively (Fager & Spellman, 2010).
Literature suggests that access to communication reduces confusion and anxiety, decreases hospital related stress as well as feelings of isolation, fear and boredom. Effective communication is also essential to longer-term positive outcomes, improving social participation, independence and quality of life (Drager, Light & McNaughton, 2010).

**Objectives:** To use the five W's and one H questions as a simple framework to share literature and clinical experience in the area of AAC assessment and intervention in paediatric rehabilitation. Jess (23 years) is a young woman from the Gold Coast who got her first communication device at age 11. In this presentation, Jess will share her insights and experiences as an AAC user. The presentation will aim to excite the audience with the power of AAC and inspire them to consider the integral role that communication plays in shaping futures.

**Summary of Content:** This presentation will include:
- An overview of literature pertaining to AAC assessment and intervention in paediatric rehabilitation.
- A description of the personal experiences of a young person who uses AAC to communicate.
- Recent examples of AAC assessment and intervention in practice.
- Discussion regarding the importance of considering communication for all patients no matter their age, stage or level of disability.

**Implications and Recommendations for Current Clinical Practice:** It is hoped that delegates who attend this presentation will have a greater understanding of:
- The importance of communication and consideration of AAC to improve participation and quality of life both now and in the future.
- Practical tips and strategies around AAC intervention for children with acquired brain injury from hospital, to home, and beyond.

It is hoped that this presentation will empower participants to advocate for, and persist with augmentative and alternative communication despite the challenges.

**Stream 3: 3:45pm – 4:50pm**

**S3-11**

*From the hospital to the home: A practical approach to the management of feeding difficulties in children with neurological impairment across the continuum of care.*

Anna Doyle (QPRS)

**Background:** Feeding difficulties are very common in children with neurological impairment. Prevalence of feeding difficulties in the cerebral palsy population are as high as 90% (Benfer et al, 2012). Reported frequencies of dysphagia in children following stroke ranged from 24.2% to 88.6% (Sherman et al, 2018). In children presenting with a severe traumatic brain injury, the incidence of dysphagia is at 68% (Morgan et al, 2003).

It is important that clinicians working with children with acquired brain injury (ABI) have a thorough understanding of the sub-components of swallowing and potential cognitive behavioural factors that may impact on assessment, diagnosis and treatment of dysphagia.

**Objectives:** For delegates to develop an understanding of assessment and treatment strategies for feeding difficulties in children with neurological impairment across the continuum of care (acute, sub-acute and long-term management).

**Summary of Content**
- Revision of common feeding difficulties seen in paediatric populations with ABI and a management framework to support best clinical practice
- Assessment tools for feeding difficulties secondary to neurological impairment
- Treatment and management strategies for feeding difficulties

**Implications and Recommendations for Current Clinical Practice:** Increased knowledge and confidence for clinicians working with children with ABI who present with feeding difficulties across the continuum of care (in hospital, at home and in the community).
Friday 8th March, 2019

Stream 1: 10:15am – 12:40pm

S1-1
Future Directions: Spina Bifida Hydrocephalus Queensland in the community
Elizabeth Steele (Spina Bifida Hydrocephalus Queensland)

S1-2
Management of tethered cord syndrome: Current Practices
Dr Caryllyn Lim (Kids Rehab, The Children’s Hospital at Westmead), Dr Antoinette Botman (Kids Rehab, The Children’s Hospital at Westmead), Dr Charles Scarf (Rehab2Kids, Sydney Children’s Hospital), Dr Heather Burnett (HNekids Rehab, John Hunter Children’s Hospital), Dr Sabine Hennel (Monash Children’s Hospital, Melbourne), Dr Catherine Marraffa (Royal Children’s Hospital, Melbourne), Dr Kate Rodwell (QPRS), Dr Margot Bosanquet (Townsville Hospital), Dr Katherine Langdon (Perth Children’s Hospital), Dr Ray Russo (Women’s and Children’s Hospital, Adelaide), Dr Eliza Maloney (Royal Hobart Hospital, Hobart), Dr Bobby Tsang (North Shore Hospital, Auckland), Dr Raewyn Gavin (Starship Child Health, Auckland)

Background: Tethered cord syndrome (TCS) can lead to neurological, orthopaedic, genitourinary and gastrointestinal issues and pain in children. There is currently no clear consensus on the management of children with TCS in regards to monitoring and timing of cord detethering surgery. This research project aims to study the current practices of early management of TSC in children under the age of 2 across Australia and New Zealand.

Objectives: What are the current practices of neurosurgeons and paediatricians/rehabilitation specialists in the early management of tethered cord syndrome in Australia and New Zealand?

To improve the long-term outcomes and optimise the perioperative management of children with TSC.

Design: Qualitative research

Methods: Twelve centres in Australia and New Zealand with a multidisciplinary Spina Bifida service will be involved in this study. Neurosurgeons and paediatricians/rehabilitation specialists who manage this cohort will be invited to participate in an anonymous online survey on their current practices. Descriptive statistics (number of responses, percentages) will be used where appropriate. Qualitative content analysis and thematic analysis will be conducted on open-response answers.

Results: Surveys will be completed online through Research Electronic Data Capture (REDCap), a secure web application for building and managing online surveys and databases. Quantitative analysis of trends in current practice and qualitative content and thematic analysis will be conducted. Preliminary results will be presented at the conference.

Conclusions: This study will contribute to the development of improved local service provision at The Children’s Hospital at Westmead. We also anticipate this study will be formative in developing national consensus guidelines for appropriate and consistent management of tethered cord syndrome across Australia and New Zealand.

S1-3
The Early Developmental Profile of Children with Spina Bifida - a Systematic Review
Ms Rebecca Elliott (The Children’s Hospital at Westmead; University of Sydney), Dr Kristy Rose (University of Sydney), Dr Tracy Williams (Kids Rehab, The Children’s Hospital at Westmead), Dr Antoinette Botman (Kids Rehab, The Children’s Hospital at Westmead)

Background: There is a significant body of evidence around cognition in school age children with spina bifida and particularly with hydrocephalus. The early cognitive development and overall developmental profile of children with spina bifida is less documented.

Objectives: A systematic review to document the current level of knowledge that exists on development in children under the age of 5 years. The review looks at cognition, language development both in receptive and expressive language, and motor development in both fine motor and gross motor. The review analyses early development through the three broad categories: Cognition, Language and Motor development.

Design: Systematic Review

Methods: Inclusion criteria:
Data on children 59 months and younger with any type of neural tube defect.

A developmental assessment conducted with comparison to normative data or includes a control group.

The assessment can be classified in any or all of these five: Cognition, Receptive language, Expressive language and fine motor and gross motor development.

Published in English.

Electronic databases searched: Cinahl, EMBASE, Medline, Psychinfo.

Review process: Two independent reviewers with a third reviewer if decision for inclusion not unanimous.


Results: Initially over 700 abstract identified, 27 full text articles were reviewed after abstracts met selection criteria. Presentation will explore the results of these articles.

Conclusions: Results aim to guide clinical practice, assist with appropriate referrals and direct future prospective studies on early childhood development in spina bifida.

S1-4
The relationship between lower limb muscle strength and gross motor function in children with myelomeningocele
Ashleigh Gehrig (The University of Queensland), Nicole Thomas (QCH), Dr Leanne Johnston (The University of Queensland; Children’s Motor Control Research Collaboration QLD), Yolande Noble (QCH), Trish Sim (QCH, Spina Bifida Hydrocephalus Queensland), Dr Kellie Stockton (QCH).

Background: Physiotherapists regularly assess muscle strength of children with Spina Bifida to monitor changes and set realistic goals for mobility. However, there is limited understanding of the impact of lower limb muscle weakness on development of other important gross motor skills such as crawling, independent standing or running.
**Objectives**: The primary aim of this study was to examine the relationship between lower limb muscle strength and gross motor skill acquisition in school aged children with spina bifida with either open (myelomeningocele) or closed (lipomyelomeningocele) lesion diagnoses.

**Design**: Cross-sectional study design.

**Methods**: Participants were children aged 4 to 12 years with a confirmed diagnosis of Spina Bifida, recruited from a state-wide Spinal Disabilities service provided by CHQ. Children participated in a lower limb Manual Muscle Test (MMT) (Tan, Thomas & Johnston protocol, 2016) and a standardised measure of gross motor function - the Gross Motor Function Measure (GMFM-66) for children with myelomeningocele, or the Test of Gross Motor Development Version 2 (TGMD-2) for children with lipomyelomeningocele.

**Results**: Results from the first 18 children indicate significant associations between MMT and gross motor assessment scores, with further analysis aiming to assess if the lowest spinal level with grade 3 (antigravity) muscle strength on MMT can predict motor skill acquisition. Data collection and covariate analysis are due to be completed by November 2018.

**Conclusions**: An understanding of the relationship between muscle strength and motor skill development is intended to give parents an accurate expectation of what activities their child with spina bifida may achieve. The results of this study could also form the basis for further research in this population, including the development of a gross motor function assessment specific to Spina Bifida and quantification of the effect of medical, surgical and therapy interventions.

**S1-5**
**Managing multiple disabilities – case studies of Spina Bifida as a double diagnosis**

Dr Antoinette Botman (Kids Rehab, The Children’s Hospital at Westmead)

**Background**: Spina Bifida (SB) is the most complex birth defect compatible with life. With an incidence of 1: 2000 live births SB is a rare disorder. The case studies presented describe the challenges in the management of children with rare double diagnoses such as SB and osteogenesis imperfecta (OI), SB and velocardiofacial syndrome (VCFS) and SB and severe autism.

**Objectives**: We performed an audit to gain insight in the additional complexities affecting children with SB and other rare diagnoses to determine what extra resources were required to optimise their care.

**Summary of Content**: Our SB service provides multidisciplinary management for over 200 children with neural tube defects, including 1 child with SB and OI, 1 child with SB and VCFS and 3 children with SB and severe autism. The child with SB and OI sustained 10 fractures during his first 10 years of life, requiring bisphosphonate infusions, Fassier Duval nailing and spinal bracing. The child with SB and VCFS had significant respiratory and feeding difficulties necessitating additional surgeries and non-surgical interventions. The child with SB and autism had repetitive severe pressure injuries due to self-stimulatory behaviours needing intensive wound management as well as significant impacts on overall developmental progress in addition to these due to SB and hydrocephalus alone.

**Implications and Recommendations for Current Clinical Practice**: Children with SB and second complex diagnosis need tailor-made management plans to achieve the best functional outcome. This requires the multidisciplinary team to be creative with their interventions. Parents of children with rare double diagnoses also need a lot more individual support.

**Future Direction/s**: Working collaboratively with other multidisciplinary SB services and sharing and documenting creative management strategies will help optimise outcomes for children with rare complex double diagnoses.

**S1-6**
**Ponseti management of foot deformities in Spina Bifida**

Stephanie Manning, Nicole Thomas (Queensland Children’s Hospital)

**Background**: Up to 75% of children with Spina Bifida will have foot deformities, with congenital talipes equinovarus (CTEV) deformity occurring most frequently, followed by calcaneovalgus (CV) deformities. Management of these foot deformities are frequently complicated by the risk of skin breakdown or fracture post immobilisation and a high relapse rate due to reduced weight bearing options and underlying muscle weakness and imbalance.

**Objectives**: To present the current evidence for management of these complex foot deformities in children with spina bifida and present Children’s Health Queensland’s current data on the use of Ponseti management for clubfoot in spina Bifida.

**Summary of Content**: Ponseti management for clubfoot is the accepted worldwide gold standard approach for idiopathic clubfoot. Emerging evidence is demonstrating that it is also an effective first-line management option for clubfeet associated with spina bifida. This presentation will highlight the current management of clubfoot and other foot deformities in infants and children with Spina Bifida managed at the Lady Cilento Children’s Hospital. We will explore the incidence of foot deformities, outcomes of Ponseti management of foot deformities in Spina Bifida and discuss the unique challenges faced when managing these complex foot deformities.

**Implications and Recommendations for Current Clinical Practice**: Ponseti management of foot deformities in children with spina bifida is an effective management option but needs to be undertaken by experienced physiotherapists. The therapist needs to consider the risks associated with casting in this population. The therapist must also consider the child and families functional goals together with parental expectation to ensure a positive outcome.

**Future Direction/s**: Use the current evidence to formulate recommendations and guidelines for therapists on the ponseti management of foot anomalies in patients with spina bifida.

**S1-7**
**Exploring mobility options for children with spina bifida – a collaborative approach**

Nicole Thomas (QCH), Helen McDonald (Royal Brisbane and Women’s Hospital)

**Background**: Many children with spina bifida will experience difficulties in gross motor function, mobility and participation. There are multiple factors that will influence a
child’s ability to achieve independence in mobility and participation including their neurosegmental level of lesion, lower limb deformities, the individual child’s cognition and motivation and access to appropriate equipment, therapy services and orthotics. Physiotherapists and orthotists play a pivotal role in promoting mobility and participation and achieve the best outcomes when they work collaboratively to problem solve the complex mobility needs of this patient group.

Objectives: To explore the factors that influence mobility and participation outcomes in children with Spina Bifida and the role of the physiotherapist and orthotist in achieving mobility goals.

Summary of Content: This presentation will cover the mobility outcomes associated with different neurosegmental levels of lesion and relate them to the underlying muscle strength in patients with spina bifida. The benefits and limitations of upright mobility will be discussed and the use of orthotics to maximise mobility potential will be explored. The individual and environmental factors that may positively or negatively impact on an individual achieving maximal ambulatory potential will be discussed, as will the setting of realistic mobility goals.

Implications and Recommendations for Current Clinical Practice: Provide therapists, orthotists and other team members with guidelines to assist in realistic mobility and ambulation goal setting for children with spina bifida.

S1-8
Can initial physical assessment findings and comorbidity predict commencement of walking and peak mobility in children with Spina Bifida

Suzie Taylor, Rachal Quinlan, Dr Antoinette Botman, Dr Verity Pacey (The Children’s Hospital at Westmead)

Background: Identified need to develop a tool that can give both clinicians and parents information about a baby born with Spina Bifida’s potential for walking later in life.

Objectives: To investigate the amount of variance to which initial physical assessment findings, within the first three months of life, determine the age of independent walking and peak mobility.

To determine the age of walking for children with Spina Bifida and if this varies between children with different lesion types.

Design: 10 year Retrospective Chart Audit

Methods: Children presenting to CHW 2005 – 2015 (aged 0-12month)

- Included
  o Diagnosis of SB
  o Lesion Level L1 and below

- Data Collection
  - Sociodemographic data
  - Physical examination
  - Hydrocephalus +/- VP shunt
  - Development milestones
  - Walking aides
  - Statistical Analysis
  - Stepwise multiple regression analysis

- Excluded
  o Additional diagnosis of diagnosis other than SB
  o Lesion >L1
  o No initial data first 3/12 of life
  o No age of walking data

Results: Key variables identified that accounted for 71% variance in age of walking and 82% of variance in peak mobility. From these variables equations were developed to classify children on a modified Hoffer scale predicting their future potential for walking.

Conclusions: Predictive tool has been developed using results of simple assessments that can be performed in the first three months of life by clinicians of all levels of experience allowing them to give accurate information to parents of babies born with Spina Bifida

Stream 1: 1:40pm – 2:45pm

S1-9
Orthopaedic Spina Bifida Workshop
Dr John Walsh

Stream 1: 3:15pm – 4:20pm

S1-10
Assessment and management of gait problems in children with congenital neural tube defects

Pam Thomason (Royal Children’s Hospital, Melbourne)
Eliza Maloney (Royal Hobart Hospital), Abhay Khot (Royal Children’s Hospital Melbourne)

Learning Objectives: To understand:

- the complex interactions of impairments that effect gait in children with congenital neural tube defects (NTD)
- the indications for and orthopaedic management of lower limb deformities in children with CNTD
- the multidisciplinary approach to management and rehabilitation
- the use of orthotics and orthotic management in children with CNTD

Summary of Content: NTD are a family of congenital anomalies due to failure of the spinal column to close with exposure of the spinal cord and/or meninges through the incomplete spine. In Australia, the prevalence of NTD was 4.6 per 10,000 births (1998–2005). Though the incidence is declining and generally most children present with less involvement than seen in the past, these children have complex problems and require a multidisciplinary approach to management.

Gait analysis is a valuable component of the comprehensive orthopaedic assessment of children with NTD to evaluate the impact of, and compensations for muscle weakness and helps us to understand the abnormal forces around the joints. Gait analysis informs orthotic prescription and surgical planning.

Though a series of case studies the orthopaedic management of children with NTD will be presented. Lower limb orthotic management will be discussed. Outcomes post
orthopaedic surgery will be discussed in the context of the ICF frame-work.

Interactive Elements: Interactive clinical cases will be presented by the faculty to illustrate management options and outcomes for children with NTD. There will be ample time for audience participation and discussion.

Stream 2: 10:15am – 12:40pm

S2-1
What are the differences? Key psychosocial interventions for working with young people with limb difference and their families.

Katherine Olsson, Alana English (QPRS)

Background: Limb differences in paediatric populations are common. However, there is little research and information on supporting these children and their family with this journey. This presentation aims to identify, explore, and discuss key psychosocial factors and interventions for working with young people with a limb difference and their family.

Objectives:
- Increase awareness of young people and their family’s psychosocial needs in the context of limb difference.
- Understand the role and therapeutic approaches of the neuropsychology and social work team in the QPRS limb difference clinic.
- Explore and discuss suitable psychosocial resources and interventions for young people with a limb difference, and their family.

Summary of Content: The psychosocial journey of young people with a limb difference and their family will be discussed. This will include, children’s emotional well-being and self-concept, as well as the family’s journey around their own and their child’s grief and adjustment. We will discuss how we work with the limb difference team to support young people and their families. Information on key therapeutic approaches and resources for the young person, family, and community will also be discussed.

Implications and Recommendations for Current Clinical Practice:
1. Routine screening of young person’s and their family’s psychosocial well-being during clinic, specific to this client group.
2. Develop global approaches to supporting a young person’s and family’s emotional journey.
3. Targeted specific interventions from neuropsychology or social work for young person or their family, focused on addressing holistic needs and maximising positive outcomes and overall adjustment.

Future Direction/s: It is evident that further research is needed to better understand the unique social-emotional journey that young people with a limb difference and their family experience. It will also be important to establish therapeutic approaches to best meet the needs of this population.

S2-2
A Miracle on Stanley Street (Surviving Sepsis)

Dr Sasaka Bandaranayake, Dr Kim McLennan, Mandy Tanner, Suzanne Simpson, Di Greathead, Katherine Olsson, Alison Waite, Megan Thorley, Shailendra Maharaj, Tamara Callaghan

Patient/Family input (TVE)

Background: Following the journey of a patient who suffered near fatal sepsis that led to multiple limb amputations.

Objectives: To share the various phases of rehabilitation involved when dealing with catastrophic illness that leads to multiple limb loss.

Outlining the recovery from a physical and psychosocial perspective.

Summary of Content: The case study will focus on:
- Acute phase – Dealing with hard decisions
- Early Rehabilitation – Where do you start?
- Reintegration – Timetabling health and lifestyle needs in the midst of rehabilitation
- Problem Solving for the future

Implications and Recommendations for Current Clinical Practice: This case study seeks to illuminate the various issues faced by children, their families and the multidisciplinary team when working through the various phases of recovery from near-death illnesses such as sepsis.

Future Direction/s: Unique presentations require unique responses within an established rehabilitation framework.

S2-3
One step at a time (Assistive Technology in Limb Difference)

Samantha Donaghey, Shail Maharaj (QPRS)

Background: Case study of a five year old girl who survived sepsis, but required amputations in all four limbs. The case study follows her journey and the various items of assistive technology that were most useful in her rehabilitation.

Objectives: To highlight the role that simple and complex assistive technology has alongside training and anticipatory guidance, in the management of complex presentations of limb difference.

Summary of Content: The case study will cover the various phases of rehabilitation involved when confronted by a complex presentation and a myriad of options. Specifically, it will cover the importance of sharing appropriate information with families to make informed decisions. It will share how simple and novel solutions are as important as more complex assistive technology options. The case study will cover a range of assistive technology options considered in the rehabilitation phase.

Implications and Recommendations for Current Clinical Practice: This case study highlights the importance of providing appropriate information regarding assistive technology options in novel circumstances (eg. osseointegration in paediatrics).

It covers the uniqueness around clinical decision making, within a methodical framework, to achieve success in routine activities of daily living and maximising participation.

Future Direction/s: Unique presentations require unique responses within an established rehabilitation framework.
S2-4
"Achondroplasia – Levelling the Playing Field"
Dr Penny Ireland (QPRS)

Background: Achondroplasia is the most common form of disproportionate short stature but is considered a low incidence condition in our society. Research has provided some information about the developmental trajectory across gross motor, fine motor, feeding and communication skills. However, little is known about functional performance and independence after 5-7 years. People with achondroplasia/skeletal dysplasia and their families and clinicians will frequently report pain and fatigue, associated with mobility and this has been reported as an issue in the literature. Currently there is no specific screening tool that monitors this for individuals with achondroplasia/skeletal dysplasia. Identifying the extent of the issue remains a challenge for groups working with this population group. Having a clearer understanding of the magnitude of this issue will assist clinicians to better identify and develop effective methods of treating and supporting.

Objectives:
1. To provide an overview of current knowledge with respect to development of motor and communication skills in this population group
2. To review the development of functional independence in children with achondroplasia
3. To review the current literature regarding pain in this population group and examine the current Australia wide research project that is underway

Summary of Content: To provide information regarding the above objectives and discuss the current literature regarding pain and fatigue in this population group and outline the development of the Functional Mobility Screening Tool for Skeletal Dysplasia.

Implications and Recommendation for Current Clinical Practice: Currently, relatively little information is known about how best to assess, monitor and treat pain and fatigue in people with achondroplasia/skeletal dysplasia. This talk will provide an overview of current research and provide an update on the current Australia wide project looking at developing a Functional Mobility Screening Tool.

Future Directions: As above

S2-5
Neuromuscular Scoliosis
Dr Geoff Askin (QCH)

Stream 2: 1:40pm – 2:45pm

S2-6
Game On – Enabling Children with severe physical impairment engage with mainstream gaming.
James Dunn, Heather Miles, Ellena Oakes, Shailendra Maharaj (QPRS), Opal Halliday, Daniel Spargo (TADQ)
Oliver Mason (Rehabilitation Engineering Centre)

Background: Children with severe physical impairment find it difficult to participate in a wide variety of mainstream areas. Returning to mainstream gaming (eg. Playstation, Xbox, Nintendo, etc) is a key area where social interaction, participation, entertainment and fulfilment can be achieved with the use of assistive technology. Developing skills in this field may then enable children to use these set ups for functional daily use and employment opportunities eg. use of computer based software.

Objectives: To share how assistive technology can enable children with severe physical impairment to fully participate in main stream gaming.

Summary of Content: This oral presentation will highlight, through case examples, how assistive technology can be interfaced with main stream gaming consoles to enable children to participate with their peers in a meaningful way. If the opportunity allows, a demonstration event of a child gaming against others (including able bodied adults) will be included.

Implications and Recommendations for Current Clinical Practice: The medical rehabilitation model can neglect the importance of participation in leisure activities such as gaming. This presentation hopes to illuminate the psychosocial, physical and transferrable skill acquisition that can achieved through enabling success in such a motivating leisure based activity.

Future Directions: Development of therapeutic gaming model to assist with computer software skills for employment.

S2-7
Power of empowerment – Powered mobility panel discussion and case studies
Hayley Thompson, Elizabeth Maiden, Shailendra Maharaj, Jason Brooke (QPRS)

Background: Evidence exists for the early introduction of powered mobility in the paediatric population. The research demonstrates a positive effect across several developmental areas including socialisation, communication and self-initiated movement. The timing of introducing powered mobility in different paediatric populations is not yet well defined. Access to suitable power mobility devices for trial, training and prescription can be poor.

Objectives:
1. Outline when to consider a powered mobility device depending on patient presentation.
2. Consider the timing of when to introduce a powered mobility device depending on patient presentation.
3. Outline pathways to access trials and training of power mobility devices prior to prescription in different services (QPRS Inpatient, Outpatient, Community)
4. Discuss impact of concurrent powered mobility and ambulation training.
5. Discuss Barriers to uptake of powered mobility in the Rehab setting:
   - Parental perception of powered mobility
   - Funding
   - Cognition and safety
   - Communication
   - Environmental factors
   - Access to equipment, trials and training

Summary of Content:
- Define powered mobility
- Update on current evidence
- Present Case Study (HP)
- Discuss considerations for timing (sooner vs later), trialling, training and prescription (Patient Examples: CH, KM, SD, TVE)
- Barriers to uptake of Powered mobility
- How do we shift the focus of power mobility from a ‘fast resort’ to an early option?
- Panel to discuss the above
- Panel to include consumer representatives (PWC user/parent), community therapists, supplier, QPRS inpatient/outpatient, NDIS representative, audience participation.

**Implications and Recommendations for Current Clinical Practice:**
- Consider the use of power mobility alongside other forms of ambulation training.
- Pathways for appropriate power mobility devices to trial implement training programs with patients.

**Future Direction:**
- Access to other types of powered mobility devices for QPRS
- Greater access for QPRS Inpatient and Day Hospital patients for powered mobility training prior to prescription.
- Clinical research into early powered mobility in different Pediatric settings (ie. Inpatient, Outpatients, Community)
- Development of QPRS Powered Mobility training programs

**Stream 2: 3:15pm – 4:20pm**

**S2-8**

**Targeted motor learning interventions for young children with hemiplegia**

Megan Thorley, Carly Dickinson (QPRS)

**Learning Objectives:** Participants will learn
- Natural history of hemiplegic cerebral palsy
- Motor learning theory as it applies to young children with hemiplegic cerebral palsy.
- How to apply theory into motor learning, therapy goals and activities.
- What motor learning looks like in young children with hemiplegia.
- Priorities for therapy with this population.
- Appropriate dose of therapy in this population.

**Summary Content:** Young children with hemiplegia benefit from regular therapy to meet motor and functional milestones. Evidenced based therapy is underpinned by active motor learning theory and is based on parent and child goals. Setting goals for young children can be challenging due to the limited independence in activities at this age, and parent focus is often centred on mobility. This workshop will include discussion of:
- Evidenced based occupational therapy and physiotherapy interventions appropriate for young children with cerebral palsy.
- Priorities for therapy to enable children to reach their full potential across all domains of development.
- Therapy activities and ideas to progress function.
- Suggestions around dose and types of therapy for young children with hemiplegia.
- Strategies for supporting parents to set appropriate and realistic goals.

**Interactive Elements:** Case studies and video presentations will be used to demonstrate and illustrate the above content. Group discussion will facilitate sharing of ideas and learning between participants.

**Stream 3: 10:15am – 12:40pm**

**S3-1**

**Update of early detection of cerebral palsy and differential diagnosis with the general movement assessment**

A/Prof Andrea Guzzetta

Spontaneous motor activity in the fetus and in the newborn is the result of the complex interaction between cortical and subcortical structures during their development. It reflects at the same time the cause and the effect of the interplay between brain maturation and experience, in that the complexity of endogenously generated patterns of movement shape neural processes through their sensory feed-back which, in turn, affect the complexity of the developing patterns. In this view, it is not surprising that the quality of spontaneous movements, as assessed by the General Movements method, is such a strong predictor of long-term neurological outcome, as it captures, in pathological infants, the emergence and evolution of the vicious circle of maladaptive neuroplasticity triggered by the primary damage of the young brain.

Analysis of GMs in the infant has been shown to predict the development of CP with a high degree of certainty. In infants’ up to 20 weeks’ post term age, the characteristics of GMs change if there has been an injury to the nervous system. The General Movement Assessment (GMA) has been described in several studies, and it has been suggested that the method may also predict both cognitive and motor outcomes in high-risk infants who do not develop CP. We will review the recent findings in the implementation of GMs in early detection programs of Cerebral Palsy, and in the field of new approaches to explore quantitatively the maturation and the impairment of spontaneous motility.

**S3-2**

**Early Vision Assessment and intervention for Infants and Cerebral Visual Impairment and Early Brain Injury**

A/ Prof Andrea Guzzetta, Prof Glen Gole, Dr Swetha Phillip

Visual function has an enormous influence on the way infants interact with the surrounding world and develop their motor, sensory and cognitive competences. Damage to the visual system in adult age is associated with perceptual deficits that are typically consistent with the site and extent of the damage, including the functional recovery associated with the restoration of non-permanently damaged structures (e.g. ischemic penumbra). In contrast, damage to visual structures occurring during early perinatal development, the so called cerebral visual impairment (CVI), leads to clinical pictures that hardly fit with this profile. This is mainly related to the circumstance that, in case of early damage, the spared brain tissue has highest neuroplastic potentials and naturally puts in place a complex system of adaptive and environmentally modulated re-wiring that leads to unique patterns of reorganization and hence functional outcome.
This complex and broad spectrum of deficits makes the characterization and quantification of CVI extremely difficult and, as a consequence, the planning of effective and individualized intervention strategies a great challenge. Starting from the assessment methods to early detect visual problems, we will here try to explain the specific mechanisms of reorganization of the early damaged visual system, their relation to the spectrum of observable symptoms and the insights this gives to the definition of early intervention strategies.

Cerebral Visual Impairment (CVI) is the leading cause of visual impairment in children with cerebral palsy (CP) in the world. Nearly 50-70% of children with CP have CVI. There is enough evidence in literature spelling out the need for early detection and intervention of CVI in the context of effective rehabilitation of the child with CP. Role of neuroplasticity in the visual system as assessed by advanced neuroimaging and electrophysiology have been implicated in the rehabilitation outcome though understanding this association may still be in its infancy. This talk is aimed to highlight the use of simple clinical tools for early detection of vision impairment in children with early brain damage and suggest easy, patient friendly “habilitation” strategies to optimise outcome.

S3-3
MRI of Muscle in healthy children and children with Cerebral Palsy
Prof Ngaire Susan Stott

Stream 3: 1:40am – 2:45pm

S3-4
Early Interventions to Optimise Neuroplasticity: Updates on REACH, GAME, VISIBLE and LEAP-CP for infants at high risk of CP
Prof Ros Boyd, A/Prof Andrea Guzzetta, Dr Kath Benfer

GAME Study Update
GAME (Harnessing neuroplasticity to improve motor performance in infants with CP – a pragmatic randomized controlled trial) is an early training intervention based on the key neuroscience principles of activity dependent plasticity, enriched environments and on successful training interventions known to work in older children with cerebral palsy and adults post-stroke. GAME is the only published protocol of an infant-friendly early, intense, specific training intervention grounded in contemporary neuroscience, tested for safety and early efficacy, and is acceptable to parents. Supported by the NHMRC, the project is recruiting families in NSW, Vic, and now from five sites in QLD - Queensland Children’s Hospital, Royal Brisbane and Women’s Hospital, The Mater Mothers’ Hospital, Gold Coast University Hospital and the Sunshine Coast University Hospital. Currently 105 out of the required 300 families have been recruited when their infant was aged between 3 to 6 months corrected age with a diagnosis of cerebral palsy or diagnosis of high risk of cerebral palsy. Infants are randomised into one of two groups - GAME group or Traditional Early Intervention group and have follow-up assessments on a range of outcomes including fine and gross motor skills until the child reaches 24 months corrected age.

REACH Study Update
The REACH study is determining if modified Constraint Induced Movement Therapy (mCIMT) is more effective than Bimanual Therapy (BIM) in improving the symmetrical development of reach, grasp and bimanual co-ordination for infants who have an asymmetric brain lesion. The specially trained REACH therapists provide one home-visit and one virtual Skype visit each month with each family to support their child’s daily therapy administered by the child’s parents.

REACH is continuing recruitment in QLD, NSW, VIC and WA with 68 families already taking part in the study. Three new teams in Minnesota, Ohio and Riverside County in the US have been trained on the REACH protocol and certified in the Hand Assessment of Infants ready and have commenced recruitment to expand the study internationally. Families are recruited between 3 to 9 months corrected age and continue in the study until they complete the follow-up assessments at 24 months corrected age. Forty-two of the study children have already completed their 12 months assessments, with 18 of these having also completed assessments at 24 months corrected age.

LEAP-CP Study Update
The Learning through Everyday Activities with Parents (LEAP-CP) intervention is a community-based, parent delivered early detection and intervention program for babies at high risk of cerebral palsy. In low and middle income contexts, where geographical distance and the high cost of health care are barriers for families to access intervention, LEAP-CP is an innovative peer to peer approach that provides support in the home to help caregivers be their baby’s best teacher. The project has now finished recruitment in Kolkata India, with 749 babies with birth risk factors screened with the General Movements and HINE, and 142 babies at high risk of CP (12-40 weeks) recruited.

The LEAP-CP study has now been funded to commence in Queensland for indigenous families for infants at risk of Cerebral Palsy. We are aiming to recruit 86 babies at risk of cerebral palsy aged 3 months-2 years living in Indigenous communities in Queensland to receive a peer delivered multidisciplinary best practice treatment in the home. The intervention targets interaction, movement, nutrition, cognition, and parent coping and wellbeing. Babies will be detected using smart-phone technology (General Movements app), which is able to predict CP with 98% accuracy from as young as 12 weeks. This project is anticipated to result in innovative, accessible and feasible means to detect infants at risk of CP in remote communities and an intervention that can be delivered at scale in similar settings. Improvements to child development and health, and caregiver mental health will have lasting impact on child and family, and the broader community.

S3-5
Development of hand function during the first year of life in children with unilateral cerebral palsy.
Leanne Sakzewski (QCPRRC; UQ), Elisa Sicola (IRCCS Fondazione Stella Maris, Italy), Cornelia H, Verhage MSC.
Background: Little is understood about early development of hand function in infants with unilateral cerebral palsy (UCP).

Objectives: To identify different developmental trajectories of hand function in infants aged three to 12 months with UCP and describe characteristics of trajectory group membership.

Design: Cohort study

Methods: Infants at high risk of UCP including a known neonatal event that affected the brain and/or clinical signs of UCP of unknown origin were referred from three months of age for investigation of hand function. Infants were recruited from different follow-up programs and clinics at Astrid Lindgren Children's Hospital, Stockholm Sweden, Wilhelmina Children’s Hospital, Utrecht, The Netherlands, Stella Mares Hospital, Pisa, Italy and Cerebral Palsy Alliance, Sydney, Australia. Infants completed repeated assessment of hand function until 12 month of age using the Hand Assessment for Infants (HAI). Group-based trajectory modelling (GBTM) using the “traj” Plugin in Stata, with a censored normal model was used to identify and describe subgroups of infants that had similar trajectories of hand development. Multinomial logistic regression was used to determine the associations between demographic variables and trajectory group membership.

Results: Ninety-seven infants (53 males) with a confirmed diagnosis of UCP were identified and included. Infants were assessed between 2-7 times (mean 4, SD 1.2) with a total of 387 observations. Distinct trajectories of development of hand function were identified with a 3-group model (two quadratic and one cubic) chosen. The model had an appropriate proportion of the sample in each group: “Low functioning group” n=45 (46%), “Moderate functioning group” n=30 (31%) and “High functioning group” n=22 (23%). The mean posterior probabilities ranged from 0.91-0.96, exceeding the recommended 0.7. Odds of correct classification ranged between 26.3 and 33.2, exceeding 5.0, which indicates good model fit. Type of brain lesion, sex, side of hemiplegia, country, gestational age and access to intervention were not associated with group membership.

Conclusions: GBTM identified three distinct patterns of change in hand function over time with distinctly different clinical profiles. The measure at six months of age demonstrated that grasping appears to be a key clinical feature, found in infants in both high and moderate-trajectory groups. The Low-trajectory group, failed to make any substantive progress in the acquisition of hand skills over the first year of life.

S3-6
Can we drive development of the cortico-spinal tract in very young infants?: Translating recent theory and evidence into clinical practice.

Lisa Findlay (QCH; Australian Catholic University)

Background: Our tertiary infant team service provides very early intervention for high-risk infants. Outcomes of research including early detection guidelines and features of successful early intervention have driven earlier referral. This, together with knowledge surrounding neural tract development and principles of neuroplasticity has provided our team with an opportunity and mandate to embed a number of novel theories and research findings into practice.

Objectives: The aim was to design evidence based therapy services for very young infants who were at risk following neurological injury or as a result of complex medical conditions. Focus was optimum use of the period surrounding development of goal directed movement (2-5 months in particular)

Method: This presentation will highlight use of our Interaction focused Multi-Modal Action Observation Training to influence neural pathway development in the transition to goal directed movement. Current theory surrounding the role of central pattern generators, infant responses, the mirror neuron system and the central role of interaction and imitation will be considered. Case study illustrations and observations from practice will be provided

Results: Although this intervention is described with very young infants, the principles will have broad interest and applicability across multiple areas. The principles of neuroplasticity, which underpin this theory, are applicable across the lifespan.

Conclusions: The translation of current research directions holds exciting possibilities for early intervention with infants under 6 months of age

Stream 3: 3:15pm – 4:20pm

S3-7
Randomised trial of a participation-focused physiotherapy intervention to increase participation in community physical activities in children with cerebral palsy

Sarah Reedman (QCP RRC)

Background: Children with cerebral palsy (CP) participate less in physical activities compared to typically developing children. They also do not accumulate enough moderate-to-vigorous intensity physical activity (MVPA) to meet national guidelines. Traditional therapy interventions for physical activity participation are targeted at impairments or activity limitations, with the assumption that participation will change. These interventions, when used alone, are ineffective to promote participation in physical activities or increase MVPA. Evidence suggests that interventions that are directly targeted towards participation restrictions (participation-focused) and contain behavioural / motivational elements are most likely to be successful in promoting participation in physical activities. We aimed to determine the efficacy of a new participation-focused therapy (ParticipAtE CP) on leisure-time physical activity goal performance and satisfaction and MVPA in children with CP.

Method: Thirty-seven children Gross Motor Function Classification System (GMFCS) I-III were recruited (18 males, mean age 10y 0mo [SD 1y 5mo]) from a population-based register and enrolled into a randomized controlled trial. Participants were randomized to ParticipAtE CP (an 8-week goal-directed, individualized, participation-focused therapy delivered by a physical therapist delivered in the home and community) or waitlist usual care. The primary outcome was
Canadian Occupational Performance Measure (COPM). Accelerometers were worn for objective measurement of MVPA (min·day⁻¹). Barriers to participation, community participation, and quality of life outcomes were also collected. Data were analysed by intention-to-treat using generalized estimating equations.

Results: Participate CP led to significant improvements in goal performance (MD=3.58, 95% CI=2.19 to 4.97, p<0.001), satisfaction (MD=1.87, 95% CI=0.37 to 3.36, p=0.014), and barriers to participation (MD=26.39, 95% CI=6.13 to 46.67, p=0.011) compared with usual care at eight weeks. There were no between group differences on min·day⁻¹ MVPA at eight weeks (MD=1.17, 95% CI=-13.27 to 15.61, p=0.874).

There was a significant difference in response to intervention between participants who were versus were not meeting HPA guidelines at baseline (MD=15.85, 95% CI=3.80 to 27.89, p<0.0061). Following Participate CP, low active participants had increased average MVPA by 5.98 (SD=12.16) min·day⁻¹.

Conclusion: Participate CP was effective at increasing perceived performance of leisure-time physical activity goals in children with CP GMFCS I-III by reducing modifiable barriers to participation. This did not translate into change in MVPA, however low active children may have a clinically meaningful response. Clinicians need to consider whether their model of therapy contains key features (goal-direction, participation focus, understanding of motivation/behaviour, and context/environment strategies) that will enable participation.

MiYoga: A randomised, waitlist-controlled trial of an embodied mindfulness program based on hatha yoga principles for children with cerebral palsy and their parents.

Catherine Mak (QCPRRC, UQ)

Many children with cerebral palsy (CP) experience cognitive difficulties. Therapies targeting cognitive abilities are needed for these children. Mindfulness-based therapies have shown to enhance attention and executive function. This doctoral research investigated the effectiveness of a mindfulness yoga program, MiYoga, on improving attention, mindfulness, physical, behavioural, and well-being outcomes for children with CP and their parents using a randomised waitlist-controlled trial. Child-parent dyads (n=42) were randomly assigned to MiYoga (n=21) or waitlist (n=21) groups. Children in the MiYoga group showed attention improvements relative to the waitlist control group. Secondary outcomes, six-month follow-up outcomes, qualitative results, and future recommendations are discussed.
Poster Presentations

Long Term Impact of Childhood Onset Transverse Myelitis
Jodie Thompson, Dr Katie Banerjee, Anne Marie Sarandrea, Dr Karen Burton, Dr Lani Campbell (Kids Rehab, The Children’s Hospital at Westmead)

Background: TM is a rare, immune-mediated inflammatory disorder which causes demyelination of the spinal cord. It affects approximately 2 children in every million under the age of 16 years. Although there is clear literature about the physical sequelae of childhood TM, the psychosocial and participation outcomes have not been so clearly defined.

Objectives: This study aims to examine the impact of transverse myelitis on mental health, fatigue, independent functioning, pain, quality of life and participation and to delineate more clearly the wider longitudinal outcomes of TM in the paediatric age group.

Design: This study is a single-site, cross-sectional survey study exploring the psychosocial outcomes of children currently aged 5 to 18 years who were treated at CHW for TM from 2007 to 2017.

Methods: Data will be collected in the coming months by telephone, questionnaires and clinical notes review on patients aged 5-18 years admitted to CHW with a diagnosis of TM between 2007 - 2017.

Data collected will include information gathered using the:

- Strengths and Difficulties Questionnaires (Goodman, 1997, 1999)
- Peds-QL Multidimensional Fatigue Scale (Varni, 2014; Varni, Burwinkle, & Szer, 2004)
- Functional Independence Measure for Children (Weefim®2006,2009)
- Peds-QL Paediatric Quality of Life Inventory (Varni, Seid & Rode, 1999)
- Participation Survey – Developed by the Investigators
- Pain and Other Symptoms Survey – Developed by the Investigators
- Bladder and Bowel Function Survey – Developed by the Investigators
- Demographic and medical history information.

Using validated tools such as the Weefim and Peds-QL may allow us to make comparisons between other patient groups. The pain, bladder and bowel and participation questionnaires will help to further enhance our understanding of the longitudinal outcomes of this patient group.

Results: At this stage this research project is still getting through the final stages of the Ethics approval process at SCHN following suggestions of further enhancements and thus will be presented as a study protocol poster at this conference. We are aiming to start data collection in March/April this year with completion of the project by the end of 2019. If we are able to successfully conduct this project with this study protocol we will look to make this a multi-centre project in order to further investigate this small population of children who have experienced transverse myelitis and the long term impact of their illness.

Conclusions: As this is a retrospective study design, we hope that the information collected will inform us of the prevalence, severity and individual impact of these associated long term features of childhood onset transverse myelitis. This will assist with prognosis and future planning of rehab services in this population.

Educating Students with Acquired Brain Injury
Helene Chew, Kylie French (Brain Injury Teams of Kids Rehab (Westmead) & Rehab2kids (Randwick), Sydney Children’s Hospital Network)

Background: Rehab teams of the SCHN see over 200 new patients a year and review over 1500 a year through weekly outpatient clinics. The majority of children are school aged returning to educational settings at discharge or commencing school attendance at some point in their rehabilitation. Specific, multi-disciplinary support is offered to each client to facilitate and support school attendance. This includes education of school teaching and support staff at point of school entry and ongoing as the child progresses through the learning years covering all aspects of the specific cognitive, social, physical, behavioural and emotional needs of the student. SCHN Rehab Teams additionally provide a one day annual program to teachers and school support staff (Student Learning Officers, counsellors etc) which delivers a NESA Approved (National Educational Standards Authority) education program that is presented by allied health, education, medical and nursing staff and incorporates consumer participation with presentations from parents and students.

Objectives: The objective of the program is to expands, strengthens and enrich the proficient teacher’s ability to understand the possible challenges for the student with an acquired brain injury and add to their toolbox, understanding, strategies and resources to plan, design and apply appropriate learning experiences for the student with a brain injury as part of their whole class teaching program. The day aims to provide another means of widening the understanding of the needs of the student with a brain injury as they develop and move through the education system.

Design: The event is presented as single day conference which has achieved NESA accreditation for 5 years. This accreditation assists SCHN Rehab Teams to advertise to interested teachers who are required to receive ongoing education as part of their professional development. NESA accreditation allows the SCHN Rehab teams to access teachers Nationally and offer opportunity to attend via videoconferencing facilities.

The conference is built on the professional experience of medical, nursing, allied health staff and education staff who have worked with students with a brain injury. The program offers professional development based on essential knowledge around the specific specialty of brain development, neuro-anatomy, impact of injury, the principal of neuro-rehabilitation and application of principals of remediation and compensation to facilitate learning. Drawing on current literature, the most recent research around brain injury and the professional experience of a ‘hands-on team’, the program aims to equip teachers with a sound understanding of the complex nature of a brain injury and its impact on every aspect of a child’s life - particularly learning. The program addresses specifically, the impact to language development and strategies around behaviour management in the classroom and school environment.
Methods: Teachers are challenged to draw on their own knowledge of the fundamental concepts in education and evidence based strategies to support all students. Application of new learning specifically related to neuro-rehabilitation and apply knowledge of brain injury aims to maximise the teachers efficiency in their teaching role and hence the student’s abilities in the classroom and in the school environment. Principals of inclusion, participation and strategies to assist students to access to the curriculum are explored.

Results: Feedback from the attendees on the day continue to be overwhelmingly positive. Attendance at the conference has been increasing each year which reflects, changes to mandatory professional development requirements, a program that has been honed in response to consumer feedback, NESA accreditation and changes to logistics that has facilitated better access to the event (on-line registration and advertising).

Conclusions: As a tertiary teaching facility, it is appropriate for the teams of Kids Rehab and Rehab2kids to be developing more inventive and engaging ways of supporting return to school of students with an acquired brain injury. Drawing on the expertise within the team and partnering with educators and consumers is an effective means of adding depth to the knowledge of teachers regarding the challenges facing students with an acquire brain injury as they progress through the school years. The teams will continually be looking at its delivery methods and adjusting the program in response to this feedback, hence maintaining its quality and relevance into the future.

Stepping out with Day Rehab: Collecting data and saving beds while improving family outcomes
Pene Ingle, Kylie French (Sydney Children’s Hospital)

Background: Sydney Children’s Hospital were fortunate to receive an increase in funding to enable a Day Rehabilitation Program to be established. This program has now been running for two years. Day Rehabilitation enables children to receive intensive rehabilitation while being able to return home at night or alternate accommodation onsite. It is designed to provide therapy to meet specific patient goals and allows a step-down program for children transitioning from prolonged inpatient care, and a step-up program for those children across the Rehab service in the community requiring intensive therapy blocks.

Objectives: To review the patient admission and outcomes data of patients who have participated in the Sydney Children’s Hospital Day Rehabilitation Program, over the last 2 years.

Design: A retrospective audit of data collected on patients admitted under the Day Rehabilitation Program.

Methods: Review of all data collected on patients including demographics, length of stay, therapies involved and outcome measures. All data will be de-identified.

Results: The data collected is able to:
- Clearly indicate the demographics of children utilising the day rehab program (age, gender, housing)
- Demonstrate the amount and type of therapy received. Highlight the benefits of a day rehabilitation program in terms of inpatient bed days saved and financial benefits.
- Showcase the involvement of the multidisciplinary team and clearly show which disciplines are involved with these patients
- Clearly indicate that a day rehabilitation program can make improvements to outcome measures (WeeFIM and COPM)

Conclusions: The implementation of a day rehabilitation program at Sydney Children’s Hospital has enabled children to receive intensive rehabilitation programs that improve their performance and satisfaction at the same time as saving significant inpatient bed days. Utilising this data will hopefully enable us to advocate for more day rehabilitation funding in targeted areas. We hope to further review the outcomes, experiences and ideas of patients who have attended day rehabilitation.

Child & Adolescent Brain Injury Rehabilitation Service (CABIRS) Paediatric Rehabilitation, Women’s and Children’s Hospital, Adelaide, SA
Lauren Bayliss (CABIRS), Natalie Hood (Paediatric Rehabilitation)

Background: Life time Support Authority in conjunction with the Paediatric Rehabilitation Department of Women’s and Children’s Hospital have established a new service to address the support needs of children and adolescents with a mild to moderate traumatic brain injury. This cohort of children and adolescents previously did not qualify for Government funded support, despite experiencing continued physical, cognitive and behavioural challenges.

Mild to moderate traumatic brain injury (mTBI) in children and adolescents is common.1 While the physical impairments tend to be minimal, the cognitive, social and behavioural issues can be significant.2 Traumatic brain injury in this instance is misunderstood, and often mismanaged. Presentations to hospitals and medical clinic reviews occur in a significant proportion of those affected, even for the mildest of brain injuries.3 Affected children and their families need appropriate assessment, guidance and intervention in order to prevent or mitigate the short and long-term outcomes in terms of behaviour and achievement.4

One way to achieve this is through a program of specific assessments, interventions and education around the problems encountered, such that those affected will have better outcomes compared with those who do not have access to such a program. This requires a specialised, multidisciplinary brain injury team.

Objectives: The primary objectives of the new service is:
- To address unmet need among children and youth with mTBI.
- To improve function after brain injury through short-term rehabilitation.
- To ensure a timely and supported return to school and community participation following mTBI.
- To reduce carer-related stress following mTBI.
**Design:** CABIRS provides:
- Specialised multi-disciplinary team including Rehabilitation Medical and Allied Health supports
- Outpatient assessment, advice and education regarding mTBI for clients, their families, schools and community
- Time limited, goal directed Rehabilitation intervention if required
- Support for reintegration to school, sport and community activities

**Methods:** The multi-disciplinary team consists of Rehabilitation Consultant, Coordinator, Team Leader, Occupational Therapist, Neuropsychologist, Speech Pathologist, Physiotherapist, Social Worker and Administration support.

CABIRS provides services to:
- Children and adolescents aged 2-17 years
- Children under 2 years of age who are involved in a motor vehicle accident
- Have a diagnosis of concussion or mild and moderate traumatic brain injury
- Injury occurred in the past 12 months
- The injury occurred as a result of a motor vehicle accident, sporting injury, fall, or assault/knock to the head.

Referrals are received from General Practitioners, Hospital Staff, Emergency Departments and family members.

In order to evaluate the effectiveness of the service, the following measures are used:
- Post Concussion Symptom Inventory (PCSI)
- Child and Adolescent Scale of Participation (CASP)

These tools measure change at impairment and participation level, and are being administered pre and post involvement with the service.

**Results:** The CABIRS Service commenced in January 2018. Preliminary data collection only at this stage.

To June 30th, 2018, the program has received 52 appropriate referrals. There has been:
- 17 discharges
- 12 Multi-disciplinary clinic reviews
- 23 Medical reviews
- 19 males: 33 females referred

Of all the referrals, 7 have occurred as the result of an MVA (in/out vehicle), 16 due to a Fall (non sport), 22 whilst playing sport, 3 assaults, and 4 other mechanisms of injury.

**Conclusions:** The CABIRS Service has been funded to June 30th 2020. Whilst in its infancy, evidence of improved outcomes for children and adolescents involved with the service is emerging.

Common themes regarding this cohort of children and young people are also emerging which will assist in future direction for the program.

---

**The impact of anti-epileptic drugs and ketogenic diets on bone mineral density in children with cerebral palsy**

Nicola Blum, Helen MacRonald, Kate McLeod (Queensland Paediatric Rehabilitation Service, Queensland Children’s Hospital)

**Background:** Children with cerebral palsy, especially quadriplegic cerebral palsy (GMFCS IV and V), are vulnerable to fractures due to low mineral density which is impacted by several factors. These same children are also prone to epilepsy and are managed with anti-epileptics drugs (AEDs) and ketogenic diets. However, these treatments can further impact the bone mineral density in the developing skeleton of these children.

**Objectives:** This literature review will focus on the bone mineral density and fracture rates of children with quadriplegic cerebral palsy when taking AEDS and undergoing ketogenic diets to inform evidence based best practice at Queensland Children's Hospital.

**Methods:** The authors have searched 3 databases (Pubmed, Embase and Medline) and 18 articles for AEDs have been included. As no articles were found on ketogenic diets in cerebral palsy, cerebral palsy was removed and terms ketogenic and bone mineral density, was reviewed in 2 articles.

**Results:** Whilst older AEDs may have had detrimental impacts on BMD in children with cerebral palsy, the impacts of newer AEDs remain inconclusive. The use of ketogenic diets in children with epilepsy may reduce BMD however research needs to be undertaken in children with cerebral palsy.

**Conclusions:** There are several factors impacting on the BMD of the developing skeleton in children with cerebral palsy and these children should be monitored to reduce their risk of fractures.

**Recommendations:** If children with cerebral palsy are taking AEDS or on ketogenic diets, the recommended management of these children should include adequate nutrition, physical activity, vitamin D and calcium supplements and consider bisphosphonate therapy, to reduce the risk of fractures.