Government of **Western Australia**
Child and Adolescent Health Service

TELETHON KIDS INSTITUTE
Discover. Prevent. Cure.

2019 Child Health Symposium

Program Book

6-8 November 2019

Come to one, many or all sessions.

MAJOR SPONSOR | Perth Children's Hospital Foundation

Contents

Acknowledgements

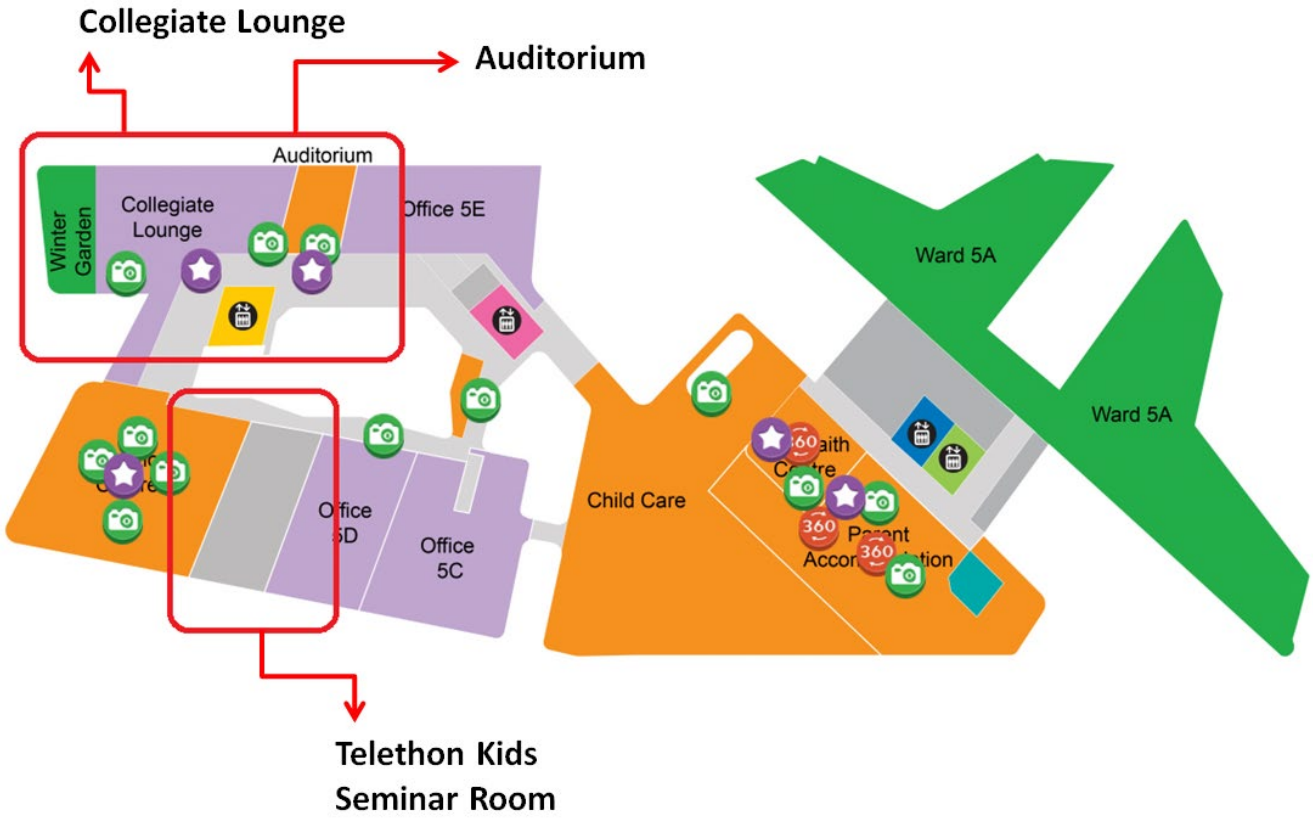
We gratefully acknowledge the PCH Foundation for their sponsorship of the Symposium.

We also extend our thanks to our partners Telethon Kids Institute, Perth Children's Hospital and the University of Western Australia. Thanks also go to the Child Health Symposium Organising Committee and all those who contributed to the prizes, planning, organisation and running of the Symposium.

Locations

- Level 5, Perth Children's Hospital
  - Auditorium
  - Collegiate Lounge
  - Telethon Kids Seminar Room
- Level 6, The Manda, Telethon Kids Institute

Map of Level 5, Perth Children's Hospital



Program overview

★Acknowledging CAHS Allied Health staff during Allied Health Week.

Wednesday 6 November		
7:30am - 9:00am	**Breakfast Session** **'Putting the 'I' in research'** facilitated by the Consumer and Community Health Research Network (CCHRN) of WAHTN	*The Manda, Level 6, Telethon Kids Institute*
10:00am - 10:30am	**Morning Tea and Event Registration**	*Foyer PCH Auditorium, Level 5*
10:30am - 12:00pm	**Symposium Official Opening** **Plenary Speaker Session:** Professor Lyn Beazley	*PCH Auditorium, Level 5*
12:00pm - 1:00pm	**Lunch**	*Collegiate Lounge*
1:00pm - 2:30pm	**Concurrent Oral Presentations:** Research presentations with research updates	
	• **Prevalence of chronic wet cough and PBB in Aboriginal children** Andre Schultz, CAHS Respiratory Medicine Consultant • **Penicillin allergy SHACK Study; Survey of Hospital and Community Knowledge** Katherine Collins, CAHS Innovation and Improvement Unit • **Structural changes on chest computed tomography in children with cerebral palsy** Katherine Langdon, CAHS Paediatric Rehabilitation Consultant • **The Role of Community Mothers in the Kwinana and Cockburn Communities** Ailsa Munns, Curtin University • **ActivRett: Parent and therapist perspectives on 'uptime' activities in Rett syndrome** Nick Buckley, Telethon Kids Institute	*PCH Auditorium, Level 5*
	• **RCT of a pre-emptive intervention for infants showing early signs of autism** Kandice Varcin, Telethon Kids Institute • **Bacterial reservoirs in the middle ear of otitis-prone children are associated with repeat ventilation tube insertion** Elke Seppanen, Telethon Kids Institute • **Child-parent screening for familial hypercholesterolaemia** Andrew Martin, CAHS General Paediatrics Consultant • **Planning and Promoting Adolescent & Young Adult Services (PAPAYAS) - The transition process and experience in Perth, WA** Kelsey Gill, WA Department of Health • **The effects of hypoxia and exercise in individuals with type 1 diabetes** Cory Dugan, University of Western Australia	*Telethon Kids Seminar Room, Level 5*
2:30pm - 3:00pm	**Afternoon Tea**	*Collegiate Lounge*

Wednesday continued…

3:00pm - 4:30pm

Future Clinical Scientist at CAHS: RACP WA State Paediatric Training Award

PCH Auditorium, Level 5

The Advanced trainee program culminates with a project oral presentation. These presenters are on their way to be consultants and clinical scientists of the future at CAHS.

- **Health profile of Syrian and Iraqi refugee children upon arrival to Western Australia: physical, psychosocial, developmental and educational complexity,** Kristen Lindsay
- **Review of systemic to pulmonary shunts: A seventeen year experience at a tertiary paediatric hospital,** Giulia Peacock
- **Enterobacteriaceae sepsis in young infants-trends, resistance and outcomes in Western Australia,** Aleisha Anderson
- **Respiratory health inequality starts early: The impact of social determinants on the aetiology and severity of bronchiolitis in infancy,** David Foley
- **Tertiary staff utilisation of interpreters for families with limited English proficiency,** Sam Brophy-Williams
- **The impact of CGM availability: real world data from a population based clinic**, Elaine Sanderson

Wednesday 6 November – Evening Session

4:30pm – 7.00pm

Research Poster Session and Networking

Meet the people behind the research who have posters on display

Clinical Research Pathways at CAHS – meet the researchers an event for prospective clinical trainees and researchers

Collegiate Lounge

'Pitch your Research' Consumer Involvement Session

PCH Auditorium, Level 5

A short oral presentation by the researchers, followed by feedback from consumer and community members in attendance.

(registration from 5pm, presentations from 6-7pm)

- **Feasibility of a targeted exercise intervention to improve bone health in youth** Paolo Chivers, CAHS Allied Health
- **Poorer perinatal outcomes for mothers with intellectual disability and their infants** Jenny Fairthorne, Telethon Kids Institute
- **The impact of new universal child influenza programs in Australia** Chris Blyth, CAHS Infectious Diseases Consultant
- **Does early oral Vitamin D supplementation and UV-light exposure have an impact on allergic disease outcome in infancy?** Kristina Rueter, CAHS Immunology Consultant
- **Rapid diagnosis of rare genetic disease in paediatric patients** Vanessa Fear, Telethon Kids Institute

Thursday 7 November		
7:30am - 9:00am	**Breakfast Session** **Utilising social media in research,** Dr Kenneth Lee	*The Manda, Level 6, Telethon Kids Institute*
10:00am - 10:30am	**Morning Tea**	*Collegiate Lounge*
10:30am - 11:10am	**The Aboriginal Health 1,000 Families Grand Challenge** Presented by Glenn Pearson, Deputy Director, Aboriginal Health, Telethon Kids Institute	*PCH Auditorium, Level 5*
11:10am - 12:00pm	**Lightning Talks** (3 minute research presentations) • **Diffuse Excessive High Signal Intensity (DEHSI) on Term Equivalent MRI to Predict Disability in Preterm Infants: A Systematic Review and Meta-Analysis** Saumil Desai, CAHS Neonatal Unit • **Managing respiratory disease in children with cerebral palsy: Systematic review** Marie Blackmore, Ability Centre • **Exploring the experiences of public sector secondary school nurses who encounter young people with mental health problems** Anita Moyes, CACH Clinical Nurse Specialist, Mental Health • **The Prevalence and Profile of Adolescents with Pre- versus Post-Puberty Onset of Gender Non-Conforming Behaviours: Perspectives from the GENTLE Cohort** Cati Thomas, CAHS Gender Diversity Service • **Cardiovascular testing detects latent dysfunction in childhood leukaemia survivors** Treya Long, CAHS Burns Unit • **Developing a frontline treatment for neonatal sepsis** Breanna Knight, Telethon Kids Institute • **The misnomer of 'high functioning autism': Intelligence is an imprecise predictor of functional abilities at diagnosis** Gail Alvares, Telethon Kids Institute • **Yarning with community in support of research** Valerie Swift, Telethon Kids Institute • **Spatial clustering of notified tuberculosis in Ethiopia: a nationwide study** Kefyalew Addis Alene, Organ, Telethon Kids Institute • **Defective Cystic Fibrosis Epithelia May Not Induce Airway Neutrophil Reprogramming** Samantha A McLean, Telethon Kids Institute • **Nephrotic Syndrome: An Update on Epidemiology and Changing Trends in Western Australia** Nadia Tan, CAHS Paediatrics Resident Medical Officer	*PCH Auditorium, Level 5*
12:00pm - 1:00pm	**Lunch**	*Collegiate Lounge*

1:00pm - 2:00pm	**Global Perspectives in Child Health** • **Who dies, where and why?** Professor Tobi Kollmann, Head Systems Vaccinology, Telethon Kids Institute • **Infection, inflammation, and vaccine alternatives** Professor Pinaki Panigrahi, Georgetown University • **Geospatial analysis in the global fight against malaria** Professor Peter Gething, Kerry M Stokes Chair of Child Health, Telethon Kids Institute & Curtin University	*PCH Auditorium, Level 5*
2:00pm - 3:00pm	**Lightning Talks** (3 minute research presentations) • **Child Development Services Evaluation & Redesign: Optimising Family Centred Practice** Martyn Symons, Telethon Kids Institute • **Lumbar Punctures in 'Fever without Source' infants at Perth Children's Hospital** Ruby Osman-Mulrany and Kirby Rex, Notre Dame University Medical School • **Catching up kids with cochlear implants** Anita Campbell, CAHS Infectious Diseases • **Development of a causal model of pulmonary exacerbations of cystic fibrosis** Yue Wu, Telethon Kids Institute • **Repeat maternal Tdap-vaccination does not enhance infant immune-interference** Sonia McAlister, Telethon Kids Institute • **Risk of major structural birth defects associated with seasonal influenza vaccination during pregnancy** Minda Sarna, Curtin University School of Public Health • **Reducing Vancomycin associated nephrotoxicity in children** Megan Nettleton, CAHS Child Development Service • **Defective epithelial cell repair in the upper and lower asthmatic airways** Thomas Iosifidis, Telethon Kids Institute • **The effect of body composition on the accuracy of continuous glucose monitoring** Claire Lim, CAHS Diabetes and Endocrinology • **Treatment Outcomes for a Day Program for Adolescent Borderline Personality Disorder** Kevin Runions, CAHS Mental Health ⋆ • **Early versus late parenteral nutrition for critically ill term and late preterm infants: Cochrane Review** Kwi Moon, CAHS Pharmacy ⋆	*PCH Auditorium, Level 5*
3:00pm - 3:30pm	**Afternoon Tea**	*Collegiate Lounge, Level 5*
3:30pm - 5:00pm	**Concurrent Oral Presentations:** Research presentations with research updates • **CHK Kinase Inhibition Amplifies the Effects of Chemotherapy in Pineoblastoma** Jessica Buck, Telethon Kids Institute • **Evidence from practice: Evaluation of A Therapeutic Day Program in CAMHS** Rosemary Skinner, CAMHS Family Pathways⋆	*PCH Auditorium, Level 5*

	• **Disease-specific bone changes in youth at risk of secondary osteoporosis** Kiranjit Joshi, Paediatrics - Diabetes and Endocrinology • **The Role of Primary Care in Transitioning Adolescents to Adult Health Services** Rachel Wixon, CAHS Graduate Officer • **PROTECT: IV pentoxifylline in premature neonates with late-onset sepsis** Amy Stenning, CAHS Neonatal Unit	
	• **Immunisation Status in Children with Down Syndrome in WA** Hannah Barnett, Notre Dame University Medical School • **Developmental-behavioural and psychosocial comorbidities within a Child Development Service cohort** Ariel Mace, CAHS General Paediatrics Consultant • **Saliva for assessing vitamin A status in extremely preterm infants: a diagnostic study** Abhijeet Rakshasbhuvankar, CAHS Neonatal Unit • **Applying knowledge translation to tailor therapy services to address consumer needs** Jodie Armstrong, CAHS Community Health★ • **Kupi - Drinking water and chronic disease** Christine Jeffries-Stokes, CAHS Medical Services Consultant	*Telethon Kids Seminar Room, Level 5*
Friday 8 November		
7:30am - 9:00am	**Breakfast Session** **Assessing pragmatism in Randomised Controlled Trials using PRECIS 2** with Julie Marsh and Prof Merrick Zwarenstein	*The Manda, Level 6, Telethon Kids Institute*
10:00am - 10:30am	**Morning Tea** ★Special event for Allied Health Week★	*Collegiate Lounge, Level 5*
10:30am - 12:00pm	**High Value Health Care empowered research** Hosted by Dr Aresh Anwar, CAHS Chief Executive Value-based healthcare is about ensuring patients get the right care at the right time in the right setting. It also involves helping patients avoid unnecessary care, which can reduce harm caused by over-testing and over-diagnosis. Ensuring we investigate where we can improve the system and outcomes is an important step in achieving this. • **Evolution of the Peripherally Inserted Central Catheter (PICC) service** Neil Hauser, CAHS Anaesthesia Consultant • **Audit of ferric carboxymaltose use and safety in 144 cases at Perth Children's Hospital** Claire Mitchell, CAHS Pharmacy • **Intravenous pentoxifylline is safe in preterm infants with sepsis or NEC** Simone Schueller, CAHS Neonatal Unit • **Children with bronchiolitis: Choosing Wisely** Luke Campbell, Notre Dame University Medical School • **Optimising infection prevention in at-risk children without a spleen** Vanessa Verissimo, CAHS General Paediatrics	*PCH Auditorium, Level 5*
12:00pm - 1:00pm	**Campus research initiatives** **Including Symposium awards announcements and closing**	*PCH Auditorium, Level 5*

1:00pm - 2:00pm	**Closing Lunch**	*Collegiate Lounge, Level 5*

Message from the PCH Foundation

Carrick Robinson,

Chief Executive Officer, PCH Foundation

The Perth Children's Hospital Foundation is delighted to again sponsor the Symposium as part of our on-going commitment to support excellence in the delivery of world class, transformational paediatric health care in Western Australia. As the largest funder of the Perth Children's Hospital and the wider Child and Adolescent Health Service, after Government, the Foundation has provided over $81 million in grants since our inception in 1998 and has committed a further $27 million over the next 5 years. The Foundation's grants support a wide range of initiatives at the Perth Children's Hospital, and across the Child and Adolescent Mental Health and Community Health services from a wide range of research projects, to attracting, training and developing clinical expertise, to procuring specialist equipment and technology and increasingly, to support a range of critical support services for patients and their families including Art programs, Music therapy programs, special patient and family assistance funds and funding healing through happiness services like the Fun on Four facility at the Hospital. The Foundation has an ambition to support world class, ground breaking research that is critical to providing excellent patient care across the full range of medical needs presented, and thus continuously improved clinical outcomes.

The 2019 PCH Foundation Grant Program has approved 19 grants, some of which you will hear about during the Symposium. These grants were provided as part of our on-going commitment of a minimum of $1.25 million in research funding annually including:

- 2 x Research Implementation grants totalling $291,115
- 8 x project grants totalling $588,312
- 8 x seeding grants totalling $144,337
- 1 x PhD scholarship grant totalling $24,000

The Foundation also supports the research and teaching component of the work of 5 Professorial Chairs in the areas of oncology, anaesthesiology, mental health, radiology and nursing, and will continue to fund further Professorial Chairs as a way to attract world class paediatric experts to Perth. These critically important Chairs attract high quality clinicians and researchers to the Hospital from the likes of Germany, the UK, Switzerland, Sweden and of course, Australia adding a significant level of expertise and educative fire power to an already highly regarded health service. The Foundations funding commitment to these Chairs represents a total annual commitment of over $2 million. The Foundation is also working collaboratively with organisations like the Telethon Kids Institute to further enhance the research, clinical and academic opportunities for the Hospital and wider Child and Adolescent Health Service. The 2018 appointment of Professor Tobias Kollmann to head the Centre of

Personalised Medicine at TKI jointly funded by the Foundation is an outstanding example of this ambition.

Message from the Child and Adolescent Health Service (CAHS)

Dr Aresh Anwar

CAHS Chief Executive

We are pleased to be hosting the second Child Health Symposium at Perth Children's Hospital and I welcome staff and visitors who are converging here to discover more about the child health research happening in Western Australia.

The symposium started many years ago at Princess Margaret Hospital as an opportunity to highlight research being undertaken by staff thanks to funding from the Princess Margaret Hospital Foundation. Now with the generous support of the Perth Children's Hospital Foundation, we have expanded the event in scope and size. I am confident that attendees will find value in this year's program, which is broad and informative.

We are pleased to co-host this symposium with our campus research partner, Telethon Kids Institute. Effective collaboration with the Institute and all our other research partners ensures that we achieve better research outcomes and translation. There is a clear vision that demonstrates a willingness to work together to ensure good health outcomes for children and families in our State and around the world.

CAHS is committed to having a lead role in child health research in Western Australia because it links so vitally to our vision of 'healthy kids, healthy communities'. Being research active means that we draw on the latest and best knowledge from around the world and participate in research that directly translates into better outcomes.

As we mature as a health service, research is becoming embedded into everyday work and we are refining our research vision and priorities so we continuously improve our approach.

I look forward to meeting many of you during the symposium and finding out more about the research happening across our health service, or via our research partners and other research organisations in WA.

Aresh Anwar

CAHS Chief Executive

Message from Telethon Kids Institute

Professor Jonathan Carapetis

Director, Telethon Kids Institute

The Telethon Kids Institute is delighted to again be partnering with the Child and Adolescent Health Service (CAHS) and the Perth Children's Hospital Foundation to present the 2019 Child Health Symposium.

As Western Australia's only child health research institute, Telethon Kids' mission is clear: to improve the health, development and lives of children and young people through excellence in research – and importantly, the application of that knowledge.

Collaborations and partnerships are integral to achieving our mission. Since moving to the Perth Children's Hospital just over a year ago, we've embraced the opportunities to work closer with CAHS, the PCH Foundation and our campus partners. We're excited by the work that is being done as, together, we challenge the traditional boundaries between research and clinical practice for a more integrated and responsive approach.

The 2019 Child Health Symposium is a fantastic opportunity for all of us working in child health research to come together to share our research, encourage greater collaborations and connections, celebrate outstanding achievement, and explore the challenges and opportunities we face as researchers and clinicians to really make a difference to the lives of kids across Western Australia, and beyond.

There is much to look forward to in this year's Symposium program. I'm particularly excited that Telethon Kids Deputy Director (Aboriginal Health) Glenn Pearson will be presenting our 1,000 Families initiative, the first of our Grand Challenges to address some of the major health issues for kids and their families.

Thanks to a generous investment by BHP of $20 million over five years, we will be working closely with up to 1,000 Aboriginal families in the Pilbara and Perth regions to develop an unprecedented understanding of the cultural, environmental and policy settings that bring about the best outcomes for kids under five. This is an ambitious project, but one which we hope will deliver many benefits for Aboriginal families and their communities.

We're pleased to be hosting the breakfast sessions in the Institute's Manda on level 6 (east) during the Symposium and look forward to welcoming people to Telethon Kids. For CAHS staff, your hospital access card also gives you access into the Manda during business hours so feel free to come and say hello, enjoy the free coffee, and have a chat to our Institute staff and students.

Enjoy the Symposium!

Jonathan Carapetis

Keynote Speaker biographies

Keynote Speakers are internationally acknowledged guest speakers invited to share their work, expertise and insight in current key areas of Child Health Research.

Professor Lyn Beazley AO is a distinguished neuroscientist and 2015 West Australian of the Year who has made a major contribution to the promotion and direction of science in Australia. As Chief Scientist for Western Australia, and the first female to hold such a role in Australia, she championed gender diversity and science in the classroom through programs such as Microscopes in Schools, in addition to shaping science policy. Lyn is also well known for promoting science and technology in the media and she played a key role in bringing the internationally successful FameLab science communication competition to Australia.

Professor Pinaki Panigrahi, a Pediatric Infectious Disease specialist spent 25 years at University of Maryland before coming to University of Nebraska Medical Center as a professor and the founding Director of the Center for Global Health and Development.

Starting his career with a Shannon Award from the NIH Director's office and a Young Investigator award from the Eastern Society for Pediatric Research for his seminal work in gut microbiota in necrotizing enterocolitis, Dr. Panigrahi has contributed to childhood diseases that affect populations worldwide.

He has directed many health initiatives with funding from NIH and Child Health Research Foundation-Bill and Melinda Gates foundation, and various funding agencies in the U.S., U.K, and India with a total funding of ~ $15 M during the last fifteen years and is currently involved with public health-related projects in multiple South Asian and African countries. He studies microbiota and impact of environmental exposures on health of women and children and utilizes large cohorts for longitudinal assessments. Dr. Panigrahi was instrumental in establishing the Asian Institute of Public Health in Odisha (converted to a university by state legislature in December 2017), a center of excellence in India engaged in laboratory, hospital, and population-based surveillance and clinical research, public health education, and service with collaborating faculty from USA, UK, and Canada.

Professor Tobias Kollmann is a paediatric infectious diseases physician with a deep passion for making an impact at the convergence of clinical care and fundamental research. He is the Telethon Kids Head of the First 1001 Days team, where multi-disciplinary research aims to transform the early life trajectory of young babies conceived and born anywhere in the world. Professor Kollmann completed both his PhD (1996) and MD (1998) at the Albert Einstein College of Medicine, New York, USA.

He then conducted his Residency and Fellowship at the University of Washington, Seattle, USA, before joining the Paediatric Infectious Disease Division at the University of British Columbia (UBC), Canada in 2005. Professor Kollmann was Head, Paediatric Division of Infectious Diseases at UBC before relocating to Australia.

For two decades his work has focused on the molecular mechanisms responsible for age-dependent susceptibility to infectious and other diseases and has identified key drivers of immune development in early life. Professor Kollmann is also leading the Institute's involvement in the Human Vaccine Project (HVP) with Telethon Kids as the only partner outside of North America. The project's mission is to decode the human immune system to transform human health research, public health education, and service with collaborating faculty from USA, UK, and Canada.

Professor Peter Gething is the Kerry M Stokes AC Chair in Child Health at Curtin University and the Telethon Kids Institute. He is director of the Malaria Atlas Project, a World Health Organization Collaborating Centre in Geospatial Disease Modelling (WHO CC).

Peter has worked in tropical health since 2002. His first degree was in Geography and he read for his PhD at Southampton in the Schools of Geography and Electronics and Computer Science, developing spatio-temporal geostatistical approaches for improving the fidelity of imperfect routine reporting data on presumed malaria in Africa. In 2005 Peter became a member of faculty at Southampton as a lecturer in GIS, before joining the Malaria Atlas Project at the University of Oxford in 2008 where he became an MRC Career Development Fellow in 2012. He was appointed as Professor in Epidemiology at the Big Data Institute, University of Oxford in 2016 until moving to Perth in 2019.

Pete's interests are in the development and application of empirical and biological models to address policy-relevant questions in tropical health. His group focuses on the geospatial modelling of changing *P. falciparum* malaria transmission, burden, and the role of changing intervention coverage and control efforts. Other work has focused on the interactions between climate and vector ecology, on the rational use of routine health reporting, and on treatment seeking behaviour and transport models.

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modelling of changing *P. falciparum* malaria transmission, burden, and the role of changing intervention coverage and control efforts. Other work has focused on the interactions between climate and vector ecology, on the rational use of routine health reporting, and on treatment seeking behaviour and transport models.

Guest Chairs providing research updates for Concurrent Oral sessions

Professor Evalotte Morelius holds a joint position as Professor of Nursing, Children and Young People between Edith Cowan University's School of Nursing and Midwifery and Perth Children's Hospital, supported by PCH Foundation. Before Evalotte moved to Australia she was the Head of the Division of Nursing Science and the Coordinator of the Paediatric Master Program at Linkoping University in Sweden. She has held positions as the President of the Swedish Association of Pediatric Nurses and also board member of the Association for Children in the County of Östergötland, and Paediatric Nursing Associations of Europe. Evalotte's research interest is Stress within the family. The aim with her research is to develop and evaluate methods to prevent and decrease stress in childhood. Evalotte has specialized in salivary cortisol and the development of the stress system in early life and aims to evaluate methods with the potential to increase the interaction between preterm infants and their parents in the NICU, since increased interaction will facilitate decreased stress levels. Please join Evalotte as she presents the top 5 findings in this important area of clinical care and research at the Concurrent Oral session, Wednesday 8 November in the PCH Auditorium.

Associate Professor Hayley Christian's research focuses on improving children's physical activity, health and wellbeing through multi-level interventions that are focused on the child, the family, and social and built environments. This includes identifying strategies to create healthy early childhood education and care environments, and investigating how the home and neighbourhood environment shapes children's health and development. To make an impact on a wider scale, Professor Christian and her team work closely with government, non-government organisations, professional bodies and the private sector to identify and implement programs and policies to help children establish healthy behaviours early to provide the foundation for lifelong health. Please join us for Hayley's research update as part of her chair role for the Concurrent Oral session on Wednesday 6 November in the Telethon Kids Seminar room.

Professor Mark Everard is one of the respiratory consultants based at PCH. Mark was the Head of Respiratory Medicine at Sheffield Children's Hospital, UK before moving to Perth in 2012 to take up his current position supported by PCH Foundation. While in Perth, Mark has continued his commitment to respiratory health in children, with research projects ranging from viral infection, to understanding the onset of asthma and best care for patients with cystic fibrosis. We hope you will join Mark as he introduces the top recent findings in paediatric respiratory health as part of chairing the Concurrent Oral session on Thursday 8 November in the PCH Auditorium.

Dr Lea-Ann Kirkham is a Senior Research Fellow based at Telethon Kids Institute. Her vision is to develop improved therapies, including vaccines and vaccine schedules, to significantly reduce the global burden of childhood ear and lung diseases. Her

team's research on identifying the predominant cause of ear infections in Australian children contributed to introduction of a new vaccine onto the National Immunisation Program. This vaccine has recently been shown to reduce ear infection rates in Indigenous Australian children. She currently leads projects investigating use of probiotics for treating infection as well as trials to assess best vaccine combinations to protect infants from pneumonia, sepsis and meningitis in Papua New Guinea. Please join Lea-Ann as she presents a research update in this area of research and the following Concurrent session held in the Telethon Kids Seminar room on Thursday 8 November.

Overview of sessions

Breakfast sessions are delivered in workshop style and designed to provide attendees with an overview of the current topic status with working examples. Attendees will leave the session with basic working knowledge and appreciation of the practical considerations for the topic being covered. Held 7.30-9.00am in The Manda, Telethon Kids Institute.

- ***Putting the I in research***
- *Consumer and Community involvement team, Wednesday 6 November*

- ***Utilising social media for research studies***
- *Dr Kenneth Lee, Thursday 7 November*

- ***Assessing pragmatism in Randomised Controlled Trials using PRECIS 2***
- *with Julie Marsh (intro) and Prof Merrick Zwarenstein, Friday 8 November*

The Aboriginal Health 1,000 Families Grand Challenge Presented by Glenn Pearson, Deputy Director, Aboriginal Health, Telethon Kids Institute this session explores the Aboriginal Health 1,000 Family Grand Challenge.

Global Perspectives in Child Health. Join three of our keynote speakers, Professor Pinaki Panigrahi, Tobias Kollmann and Peter Gething as they present their internationally recognised research in child health. This session will be hosted by Prof Jonathon Carapetis.

Future Clinical Scientists at PCH: RACP WA State Paediatric Training Research Award. This annual award is available to paediatric trainees with presenters chosen from submitted abstracts.

The Evening poster session features research posters selected from submitted abstracts. This session enables presenters to take questions and engage in discussion with guests in an informal environment. The session also includes:

- **Consumer involvement session** Hosted by the WA Health Translation Network and Consumer and Community Health Research Network, this session for consumers to showcase research that interests the community and demonstrates effective consumer engagement.
- **Pathways for clinical research** Prospective clinical trainees and researchers are invited to this session hosted by CAHS to find out about the spectrum of research projects available to you at CAHS and the resources available to facilitate research training and project completion.

High Value Health Care empowered research Hosted by Aresh Anwar, CAHS Chief Executive, this session explores value-based healthcare that ensures patients get the right

care at the right time in the right setting. Learn about some of the projects that are working towards this outcome.

Campus Research Initiatives Find out about some special projects that will impact the future of research on campus, including bio-banking, digital technologies and adaptive clinical trials. Hosted by Peter Richmond, with talks by Aresh Anwar and Jonathon Carapetis, these short presentations will provide a snapshot of what is possible with resources available now and in the near future. Please join us for this session.

- **Digital platforms at CAHS- tools facilitating research**
- *Assoc. Prof. Christopher Blyth, CAHS Infectious Diseases*

- **Adaptive trials – where are we at now?**
- *Assoc. Prof. Peter Richmond, CAHS Director or Research*

- **Sample processing and storage – biobanking resources for clinical studies**
- *Dr David Martino, Research Fellow, Telethon Kids Institute*

Concurrent oral presentations are selected from submitted abstracts. Each session comprises five 10 minute presentations, with an additional five minutes allocated to each speaker to take questions from the audience. These sessions will open with a clinical or research update from a specialist area.

Lightning talks are three minutes long and limited to five slides for each presentation. Presentations are run sequentially with speakers invited back at the end for questions from the audience. Speakers are selected from submitted abstracts.

Oral Abstracts
Wednesday 6 November

Concurrent Oral Presentations Session 1

PCH Auditorium, 1.00 – 2.00pm

Chair: Professor Evalotte Morelius, CAHS Nursing Research

Research Update: 'Whats new and what's not in assessing childhood stress'

Schultz A

Prevalence of chronic wet cough and PBB in Aboriginal children

Background and aim: Chronic wet cough is the most common and earliest symptom of a disease spectrum that encompasses protracted bacterial bronchitis (PBB) and bronchiectasis. Aboriginal children suffer a disproportionate and high burden of these conditions. Yet there is no prevalence data of chronic wet cough or PBB in any setting. The European Respiratory Society taskforce recently recommended collection of prospective data to identify disease burden and understand its natural history. Aim: To determine the prevalence of chronic wet cough and PBB in young Aboriginal children in four remote communities in northern Western Australia.

Research method: A whole population, prospective study. Aboriginal children, ≤7 years were assessed for chronic wet cough by paediatric respiratory clinicians between July 2018- July 2019. Parents were given culturally appropriate lung health information, after which clinical assessment and parental report of cough character and duration were recorded. Where children had a wet cough, but parents were unsure about duration, or reported short duration, children were followed up 1-month later. A medical record audit 6-weeks to 3-months later was used to determine those children with chronic wet cough who had PBB (based on response to antibiotics).

Results: 191/203 children (mean age 3.5y, SD 2) were enrolled. At least 21/191 (11%) had chronic wet cough with rates ranging from 5-17% between the 4 communities. Sixteen (8%) had PBB.

Conclusion: The prevalence of chronic wet cough and PBB in young Aboriginal children in remote, north-western Australia is high. There is a need to determine prevalence of these entities in other populations.

Collins K[1], Rueter K[2,3,4], Lucas M [3,4,5,6,7], Sommerfield D [1,4], Sommerfield A [1,8], Khan N[9], Ungern-Sternberg BS v[1,4,8]

Penicillin allergy SHACK Study; Survey of Hospital and Community Knowledge

Background and aim: Penicillin allergy accounts for 80% of all reported adverse drug reactions. Foregoing 1st line antibiotic therapy due to incorrect labelling of penicillin allergy increases the prevalence of antimicrobial resistance and increases the length of hospitalization.

To assess the education received, and knowledge of penicillin allergy, assessment and management in Western Australian health professionals.

Research method: An anonymous survey was completed by 272 Pharmacists, Nurses and Doctors within Western Australian Hospitals and General Practice.

Results: Only 77% (210/272) of respondents routinely assess for patient medication allergies. Of those who assess allergy, only twelve respondents met the Australian standards for allergy assessment.

Sixty-four percent of respondents had received antibiotic allergy education within the past five years. If education was provided within five years, respondents were significantly more likely to (1) understand penicillin cross reactivity rates with cephalosporin (p=0.018), macrolides (p=0.036) and carbapenem (p 0.001) antibiotics, (2) refer to an immunologist to investigate an antibiotic allergy (p =0.021), (3) correctly identify oral or IV challenge as the definitive test for antibiotic allergy (p <0.01), and (4) correctly cited indications for the administration of adrenaline in anaphylaxis (p <0.01).

Conclusion: Knowledge of penicillin allergies amongst practitioners in Western Australia is currently inadequate to provide safe and cost effective clinical care. Our results demonstrate statistically significant improvements in respondent's knowledge of allergy assessment, management and penicillin cross reactivity if targeted education is provided within 5 years. The implementation of a targeted education program to WA health professionals may therefore increase allergy de-labelling and aid safer prescription practices.

1 Department of Anesthesia and Pain Management, Perth Children's Hospital, Nedlands, Australia, 2 Department of Emergency Medicine, Perth Children's Hospital, Nedlands, Australia, 3 Department of Immunology, Perth Children's Hospital, Nedlands, Australia, 4 School of Medicine, University of Western Australia, Nedlands, Australia , 5 Department of Immunology, Sir Charles Gairdner Hospital, Nedlands, Australia, 6 Institute for Immunology and Infectious Diseases, Murdoch University, Murdoch, Australia, 7 PathWest Laboratory Medicine, Perth, Australia , 8 Telethon Kids Institute, Nedlands, Australia, 9 School of Mathematics and Statistics, University of Western Australia, Nedlands, Australia

Langdon K[1], Murray C[1], Gibson N[1], Pavleski, K[2], Blackmore A M[2], Wilson A C[1]

Structural changes on chest computed tomography in children with cerebral palsy

Background and aim: Respiratory disease is the leading cause of mortality in cerebral palsy (CP), but little is known about type and extent of lung damage. The aim was to describe for the first time the lung, oesophageal, and spinal findings of children with CP and respiratory disease using chest computed tomography (CT).

Research method: This was a retrospective review of chest CT scans from children with CP. An expanded version of a validated protocol for cystic fibrosis was used. It allowed identification of 14 features of radiological abnormalities and their distribution in the lungs.

Results: There were 23 Chest CT scans from 21 children with CP, aged 1 year, 2 months to 16 years 9 months. Their Gross Motor Function Classification System levels were IV and V. Of 394 abnormal features identified in the scans, the most frequent were bronchial wall thickening (n=88), atelectasis (n=74), decreased inspiratory attenuation (n=49), nodules (n=37), bronchiectasis (n=35), and linear opacities (n=32). These features were present in the youngest children but more widely distributed throughout the lung in older children. These features were located in the lower (49%), middle (11%) and upper (40%) zones. Bronchial

thickening was evenly spread across all three zones; atelectasis and decreased inspiratory attenuation were mostly in posterior lower zones.

Conclusion: The type, timing, and increase in lung changes suggest aspiration as a likely primary cause. Prospective studies are required to describe fully the relationship between the lung and associated findings on chest CT and clinical severity and exacerbating factors.

1 Perth Children's Hospital, Nedlands, Western Australia, Australia, 2 Ability Centre, Mount Lawley, Western Australia, Australia

Munns A

The Role of Community Mothers in the Kwinana and Cockburn Communities

Background and aim: Support for parents with young children is crucial for children's health and wellbeing. It is an area of importance for healthy family functioning with innovative strategies needed to assist parents dealing with everyday childrearing challenges. A recent initiative for families in Kwinana and Cockburn is the Community Mothers Program (CMP), where volunteer Community Mothers (CMs) undertake home visiting support for parents. The CMs are members of their local communities and work in partnership with families and community support agencies to foster healthy futures for children.

The aim of this presentation is for CMs to present outcomes of a research study investigating their role in Kwinana and Cockburn. This is part of a larger study developing the CMP.

Research method: Participatory action research is being used to investigate the development of the CMP. Within this structure, CMs have been using focus groups to examine their role as support workers for families, identifying the attributes and skills needed for their role.

Results: The role of the CM is seen as integral to effective home based parent support, linking clients with their community and supporting their parenting across a range of situations. Attributes encouraging a partnership approach with parents and agencies have been identified as underpinning their acceptance by families. Reflective practice in focus groups assisted in development of their visiting approaches.

Conclusion: The role of CMs supporting families in Kwinana and Cockburn has been demonstrated to be a positive practice improvement in supporting parents with young children.

Buckley N

ActivRett: Parent and therapist perspectives on 'uptime' activities in Rett syndrome

Background and aim: People with disabilities are less active than their typically developing peers; they spend more time sitting and lying ('downtime') and less time standing and walking ('uptime'). We conducted an online survey of caregivers and therapists who support girls and women with Rett syndrome, aiming to gather insights on how to support participation in activities involving 'uptime'.

Research method: An anonymous online survey comprising open ended questions about the facilitators and barriers to 'uptime' was administered using REDCapä software. The surveys were advertised via advocacy groups and investigator networks in Australia, Israel, Europe and the United States. Text responses were coded to the International Classification of Functioning, Health and Disability (ICF) framework and further coded to identify barriers and facilitators to uptime.

Results: One hundred and six parents and 43 therapists completed the survey. Each ICF domain was represented, particularly uptime participation in the community and outdoors, dancing and watching TV while standing. Common facilitators included using eye contact to establish interest when planning activities, music, being outdoors and engaging in purposeful activities. Common barriers included boredom, fatigue and lack of personnel.

Conclusion: This survey will inform a clinical trial (ActivRett) to increase 'uptime' in women and girls with Rett syndrome using Telehealth strategies. Strategies from this survey will be incorporated into the intervention that we evaluate. These findings are also useful to therapists working with individuals with other disabilities to increase 'uptime' participation

Telethon Kids Seminar Room, 1.00 – 2.00pm

Chairs and research update: Assoc. Professor Hayley Christian, Telethon Kids Institute

Varcin K

RCT of a pre-emptive intervention for infants showing early signs of autism

Background and aim: There is great interest in the potential efficacy of pre-diagnostic intervention within the Autism Spectrum Disorder (ASD) prodrome. Current evidence relates to samples selected based on family-history risk. The aim of this study was to test the efficacy of a pre-emptive intervention designed for infants showing early ASD behavioural signs.

Research method: In this single-blind, randomised controlled trial done at two specialist centres in Australia, infants aged 9–14 months were enrolled if they were showing at least three early behavioural signs of autism spectrum disorder. Infants were randomly assigned (1:1) to receive a parent-mediated video-aided intervention (iBASIS- VIPP) or treatment as usual. Group allocation was done by minimisation, stratified by site, sex, age, and the number of SACS-R risk behaviours. Assessments were done at baseline (before treatment allocation) and at the 6 month endpoint. The primary outcome was a measure of early behavioural signs associated with ASD, and the secondary outcomes were a number of measures of developmental ability.

Results: There was no significant effect of treatment group on early ASD behavioural signs (β=-0·74, 95%CI=-2·47,0·98). There was also no treatment effect on researcher-administered measures of expressive language (β=0·54, 95% CI=-0·73,1·80) and visual reception (β=0·31, 95%CI=-0·77,1·40). The iBASIS-VIPP group was significantly improved compared to TAU on caregiver-reported receptive (β=37·17, 95%CI=10·59,63·75), and expressive vocabulary count (incidence rate ratio=2·31, 95%CI=1·22,4·33) and functional language use (β=6·43, 95%CI=1·06,11·81). There were also a non-significant trend favouring the iBASIS-VIPP group on a research-administered measure of receptive language (β=1·30, 95%CI=-0·48, 3·08) and caregiver-reported measures of infant gesture use (β=3·22, 95% CI=-0·60,7·04) and social behaviour (β=3·28, 95%CI=-1·43, 7·99).

Conclusion: A pre-emptive intervention for infants showing early signs of ASD had no immediate treatment effect on early ASD symptoms, the quality of parent-child interactions or researcher-administered measures of developmental skills, but a positive effect on parent-rated infant communication skills.

Seppanen E

Bacterial reservoirs in the middle ear of otitis-prone children are associated with repeat ventilation tube insertion

Background and aim: Repeat ventilation tube insertion (VTI) is common in children with recurrent acute otitis media (rAOM). Identifying risk factors associated with repeat surgery will improve clinical management and prevent repeat VTI.

Research method: Surgical records were assessed at 8 years following VTI surgery for rAOM in children aged 6 to 36 months. Children were grouped according to detection of bacterial otopathogen in their MEE at the time of VTI, and outcomes for future otorhinolaryngology surgery compared.

Results: Age, gender, pneumococcal vaccination status, antibiotic usage, day-care attendance and number of AOM episodes were similar between groups ($p \geq 0.095$). Of the 63 children who had PCR+ve MEE, 58.7% required repeat VTI compared to 31.4% of the 51 children with no otopathogen detected in their MEE (Odds Ratio, OR = 3.1 [95% CI 1.4 - 6.8]; $p=0.004$). Nontypeable Haemophilus influenzae (NTHi) was the predominant otopathogen in MEE (79% of all PCR+ve MEE). Respiratory virus detection was not associated with repeat VTI.

Conclusion: Presence of bacterial otopathogen, specifically NTHi, in the middle ear during VTI was a strong predictor of children at-risk of repeat VTI. Here we identify a modifiable microbiological factor for repeat VTI that can be targeted to improve clinical management of rAOM.

Martin A

Child-parent screening for familial hypercholesterolemia

Background and aim: Familial hypercholesterolemia (FH) is the most common cause of inherited high cholesterol. Untreated, FH leads to a 20-fold increase in the risk of premature coronary events, but treatment from a young age almost completely abates this risk. Unfortunately, more than 90% of those with FH are unaware they have the condition, so new approaches to detection are needed. Measuring cholesterol at 1-2 years offers a "window of opportunity" to diagnose most cases of FH in the population.

Research method: Children aged 1-2 years were offered screening for FH with a point of care total cholesterol (Alere Cholestech LDX® System), collected by capillary sample at the time of an immunisation. An EDTA sample was also collected to allow genetic testing by next generation sequencing if the total cholesterol level was above the 95th percentile (> 5.3 mmol/L).

Results: Of the 291 children recruited between 1 November 2018 and 1 August 2019, 18 (6.2%) had a total cholesterol > 5.3 mmol/L and 3/18 (16.7%) were found to have a pathogenic FH mutation. Reverse cascade testing has been offered to families of the children with FH, with three affected family members identified to date.

Conclusion: Universal screening of children aged 1-2 years for FH, performed at the time of immunisation appears to be both feasible and acceptable to families and health professionals. Reverse cascade screening will allow effective diagnosis and treatment of the affected parent and older second -degree relatives, who are at a more immediate risk of a coronary event.

Gill K

Planning and Promoting Adolescent & Young Adult Services (PAPAYAS) – The transition process and experience in Perth, WA

Background and aim: A PAPAYAS initiative between Sir Charles Gairdner Hospital (SCGH), Perth Children's Hospital (PCH), and the Child and Youth Health Network. The project aimed to analyse the transition process and experience from the perspective of young people, their parents/carers and clinicians, who had transitioned from PCH to SCGH, and identify barriers and enablers of successful transition.

Research method: Three cases with twelve participants were recruited from the clinical areas: Cystic Fibrosis (one case); complex medical conditions seeing 3+ specialties (two cases), with nine interviews and 11 pre-interview questionnaires. Thematic analysis identified barriers and enablers of successful transition to inform future improvements.

Results: Recommendations included a formal statewide transition process with a centralised referral process, supported by a transition working group including youth representatives, and a collaborative approach across health providers. The need for active planning was identified, with patient-centred, holistic transition plans. Increasing knowledge to promote self-management was suggested, and providing links to support services/primary care. The involvement of GPs was considered an essential link between services. Transition clinics and transition coordinators was discussed, and the need for detailed documentation throughout the transition period to promote continuity of care. A strong and capable workforce was supported, and a consistent team to establish rapport.

Conclusion: Clear transition processes will enable staff to effectively prepare and transition patients and their parents/carers as recommended in the WA Youth Health Policy 2018 – 2023. A comprehensive, collaborative approach to transition is necessary to ensure the needs of young people transitioning from paediatric to adult health services are met and prioritised.

Dugan C

The effects of hypoxia and exercise in individuals with type 1 diabetes

Background and aim: To investigate the effect of hypoxia on blood glucose levels (BGL) and carbohydrate (CHO) oxidation rates during moderate intensity exercise in individuals with type 1 diabetes (T1D).

Research method: Using a counterbalanced repeated measures design, 7 individuals with T1DM free from complications completed 2 exercise sessions, one at sea level (SL) and the other under acute exposure to hypoxia (AA) roughly equating to 3,500m above sea level. Participants were required to cycle continuously on an ergometer at 45% of their $\dot{V}O_2$ max for 60 minutes in each exercise session after a 12 hour fast. A 60-minute post-exercise recovery period then followed. The collection of blood and respiratory gases allowed for analysis of a multiplicity of variables.

Results: Only AA saw a significant decrease in BGL levels after exercise compared to pre-exercising levels ($p<0.05$). SL had significantly greater BGL levels during the post-exercise recovery period compared to AA ($p<0.05$). Exercise induced a significant rise in CHO oxidation in both conditions ($p<0.05$). However, these returned to baseline levels during the post-exercise recovery period ($p>0.05$). When comparing between conditions, CHO oxidation rates were significantly higher in AA compared to SL at every time point ($p<0.05$).

Conclusion: Hypoxia alone stimulates a greater rate of CHO oxidation in individuals with T1DM. Exercise under hypoxic conditions creates a state whereby BGL levels will fall at a faster rate compared to the same exercise conducted at sea level. Hence, T1D guidelines need to consider this when recommending CHO intake for exercise at altitude.

Future Clinical Scientists at CAHS

PCH Auditorium, 3.00 – 4.30pm

RACP WA State Paediatric Training Research Award
This annual award is available to paediatric trainees with presenters chosen from submitted abstracts.

Chair: Professor Cathy Choong, CAHS Diabetes and Endocrinology

Lindsay K, Hanes G[1], Mutch R[1,2,3] , Cherian S [1,2]

Health profile of Syrian and Iraqi refugee children upon arrival to Western Australia: physical, psychosocial, developmental and educational complexity.

Background and aim: The number of Syrian and Iraqi children referred to the tertiary Western Australian paediatric Refugee Health Service (RHS) has increased, reflecting international humanitarian response efforts.1 Specific vulnerability is described including physical, educational and mental health issues, with specialised health care recommended on resettlement. 2-5

We aim to describe the demographic and clinical profile of recently arrived Syrian and Iraqi refugee children across health domains: physical, psychosocial, developmental and educational.

Methods An audit of standardised initial multidisciplinary RHS assessments of Syrian and Iraqi refugee children and adolescents (between September 2014 - May 2019) was undertaken. Ethics approval was received (CAHS HREC 1255/EP).

Results : A total of 336 new patients were assessed (mean age 8 +/- 4.4 years) from 109 families with a Syrian predominance (78.9%). Most transited through Lebanon (50.6%) and Jordan (34.8%); median transit time was 3 years (IQR 3-4) with few living in camps (12.9%). Socioeconomic resettlement vulnerability was high; 75% resided in areas with extreme disadvantage (decile 1 and 2), 16.7% reported deceased parent and/or sibling(s) and limited parental education was reported in 62.5% of mothers and 65.6% of fathers. Psychological concerns were evident at first presentation; 85.1 % described witnessed trauma, 70.5% reported somatic symptoms, 30.1 % reported psychological symptoms, 21.4% were diagnosed with or flagged at risk for post-traumatic stress disorder. Nutritional concerns were prevalent including vitamin D deficiency (71.4%), iron deficiency (39.6%) and overweight/obesity in 23.2%. Dental caries was common (78%). Child protection and educational risks were noted; 35.3% of mothers were married before 18 years and 60.6% had interrupted education. Developmental, cognitive and neurobehavioral concerns were identified in 8.6% with physical disability noted in 4.5% requiring assistance with daily living activities. Almost all (89%) required at least one onward referral; paediatric subspecialty (23.8%), surgical team (18.5%); RHS psychologist (20.5%); tertiary psychiatric services (3.3%); developmental/psychometric assessment (6.5%) and 24.4% required additional school liaison.

Conclusion: Our data demonstrate the complex and multidimensional health profiles of Syrian and Iraqi refugee children resettled in Western Australia. The particularly high rates of witnessed trauma, psychological symptoms, interrupted schooling, physical and developmental issues identified at first presentation is in contrast to previous RHS humanitarian cohorts. Multiple adverse childhood experiences were described, including risks related to maternal underage marriage. In keeping with international best practice, the RHS team provided multidisciplinary, holistic, trauma-informed health care with most patients

requiring referrals to subspecialties (hospital and community). Targeted and culturally appropriate early intervention and longitudinal support is required, specifically to improve psychological well-being and optimise resettlement outcomes.

1 Refugee Health Service, Perth Children's Hospital, 3 Division of Paediatrics, University of Western Australia and 4 Telethon Kids Institute, Perth, Western Australia, Australia

Peacock, G, Tarca, A, Andrews, D, Saundankar, J

Review of systemic to pulmonary shunts: A seventeen year experience at a tertiary paediatric hospital.

Background and aim: The Blalock-Taussig Shunt (BT Shunt) was first performed in 1944, and since then, in its modified forms, has proven to be a useful first stage of complete repair and palliation of congenital cyanotic cardiac disease. The surgical outcomes of modified BT Shunts inserted between 2000 and 2017 at a tertiary paediatric hospital have been investigated to highlight key elements to improve short and long-term morbidity and mortality. The surgical approach by the primary surgeon in this study was a lateral thoracotomy, in contrast to a central approach.

Research method: A wide search through patient notes and hospital electronic databases, explored pre, intra and post-operative aspects including short and long-term morbidity and mortality in each case.

Results: 147 modified BT shunts were placed in 126 patients in 17 years. Shunts were predominately 4mm Gore-Tex via a right thoracotomy. Underlying cardiac anatomy included double (97) as well as functionally single ventricle (29) circulations, excluding hypoplastic left heart lesions requiring the Norwood procedure. Predominant cardiac lesions included Tetralogy of Fallot (TOF)/Double outlet Right Ventricle (DORV), Pulmonary atresia (PA) with intact septum or ventricular septal defect and other complex lesions. 22 patients with an underlying genetic abnormality were included in the study. Overall all-cause mortality was 13.6% (20 patients). As expected, mortality in single ventricle circulation (17.1%) was higher when compared to double ventricle circulation (12.5%). Overall, 15.6% experienced major early cardiac morbidity within the first post-operative month, (ECMO with and without cardiac arrest, shunt stenosis, thrombosis and pulmonary over circulation). 17% of cases required shunt re-intervention prior to complete repair, and 21.7% had minor operative morbidity including pericardial effusion/tamponade, false aneurysm, wound infection, chylothorax, Horner's syndrome, vocal cord palsy and diaphragmatic palsy.

Conclusion: Mortality rates are comparable to those reported for both double and single ventricle groups. These results highlight that outcomes of BT shunts performed via lateral thoracotomy are comparable to those by midline sternotomy. Operating via the lateral approach is advantageous as it avoids complications of multiple sternotomies.
Cardiology and Cardiothoracic Department, Perth Children's Hospital

Anderson A

Enterobacteriaceae sepsis in young infants - trends, resistance and outcomes in Western Australia

Background and aim: Despite reductions in childhood deaths globally, sepsis remains a leading cause of neonatal mortality. Enterobacteriaceae spp are common pathogens. Empiric antibiotic recommendations vary, influenced by local antibiotic susceptibility data. Increasing antimicrobial resistance is being observed in Gram-negative infections globally. Data specific to the Western Australian neonatal population are limited. The aim is to describe the incidence

of early-life Enterobacteriaceae bacteraemia in Western Australia over a 6 year period. To describe the resistance patterns over this time, identify if the rate of resistant Enterobacteriaceae infections has increased and identify clinical features that may differentiate infants at higher risk of resistant infection.

Research method: Blood culture and antimicrobial resistance data for infants less than three months of age presenting to public hospitals in Western Australia, were extracted from state-wide pathology laboratory records (2011-2016). Presumed episodes of sepsis were defined as a new culture collected more than five days after a previous culture. Australian Bureau of Statistics4 data were used to calculate the total and annual incidence of proven Enterobacteriaceae bacteraemia. Organisms with resistant phenotypes were identified, including multi-drug resistance (resistance to three or more drug classes; MRE) and those with specific resistance phenotypes (extended spectrum beta-lactamase production and inducible AmpC beta-lactamases). Tertiary and non-tertiaryneonatal units were compared; an in depth review of clinical records from infants admitted to the neonatal critical care unit (NCCU) was undertaken. Statistical analysis was done using SPSS. Categorical data were compared using Chi squared tests. Numerical data were compared using unpaired t-tests. The number needed to treat (to provide appropriate empiric therapy) was calculated as 1IARR.

Results: From 29254 blood cultures, 27212 episodes of presumed sepsis were identified; 1467 positive cultures (5.4%) with 1616 separate isolates were identified. This included 166 Enterobacteriaceae isolates; E.coli, Klebsiefla spp and Enterobacter spp were most frequent. The incidence of culture proven Enterobacteriaceae bacteraemia was 80 per 100 000 births [95%CI 69-94], with no change over the 6 years. The proportion of presumed sepsis episodes confirmed as Enterobacteriaceae bacteraemia was 0.61% (range 0.53-0.69%). Gentamicin, cefotaxime and meropenem resistance in Enterobacteriaceae isolates were 11%, 9.1% and 0% respectively. Over the six years, only eight MRE were isolated (4.9%, all E.coli). Resistant Enterobacteriaceae were more commonly seen in NCCU infants, however within this subgroup no distinguishing features were identified between those with a multi-resistant and susceptible isolate.

Conclusion: There appears to be little benefit in broadening the empiric antibiotic choice for presumed sepsis but this should be considered in proven Enterobacteriaceae sepsis pending susceptibility testing results.

Foley DA

Respiratory health inequality starts early: The impactof social determinants on the aetiology and severity of bronchiolitis in infancy

Background and aim: To define the impact of demographics on the incidence, aetiology and clinical course of viral bronchiolitis in infants younger than 2 years of age.

Methods: Retrospective case review of all viral bronchiolitis admissions for patients aged younger than 2 years old from January 1 2014 to 31 December 2015 at Wellington Regional Hospital, New Zealand. Demographic data, second-hand smoke exposure (SHSE) and presence of predisposing conditions were collected, along with outcome data including use of respiratory support and intensive care unit (ICU) admission. This was compared to background rates calculated from regional census data.

Results: There were 556 admissions included (11% of paediatric medical admissions); 49% tested positive for respiratory syncytial virus (RSV) (84% tested), and 40% of admissions

received positive pressure respiratory support and 10% ICU admission. Admission rates ranged from 9.6 to 77 per 1000/year, with higher rates seen in those from areas of high deprivation. Admission rates by deprivation varied according to aetiology. RSV-positive admission rates increased from 9.7 per 1000/year to 24.6 per 1000/year in the least to most deprived areas, whereas non-RSV admissions showed even greater disparity, increasing from 10.1 per 1000/year to 37.5 per 1000/year (both P < 0.0001).

Conclusions: This study further reinforces that material deprivation contributes significantly to poor health outcomes that are apparent in infancy. SHSE is a potent risk factor for adverse respiratory outcomes in this patient population. Ongoing efforts to eradicate smoking and reduce material inequality need to continue.

Brophy-Williams S[1], Boylen S[1], Gill F[2], Wilson S[2], Cherian S[1]

Tertiary staff utilisation of interpreters for families with limited English proficiency

Background and aims: Cultural and linguistic diversity is increasing nationally; patients with limited English proficiency (LEP) require provision of professional interpreters. We reviewed hospital-wide utilisation of interpreters for LEP in a tertiary hospital across emergency (ED), outpatients (OP) and inpatient (IP) presentations.

Research method: Two cohorts with LEP presenting to Princess Margaret Hospital (PMH) were audited. Records of new Refugee Health Service (RHS) patients (Jan-July 2015) and non- RHS LEP patients (Language Services bookings) were reviewed to assess demographic profiles and use of interpreters for any occasion of service (OOS) over 12 months.

Results: Data from 188 patients were reviewed (RHS: 119 patients; non-RHS: 69 patients; total 1027 OOS). High socioeconomic disadvantage and limited education was noted. Almost all (98.5%) had LEP; 3 RHS parents spoke English; 68% of non-RHS were transitioned families). Interpreter use was poor across all areas. Of IP (n=34), all underwent a procedure; 1 RHS patient had interpreter use documented. No interpreter use was evident in 41% of IP admissions. Documented interpreter use was minimal in OP OOS (32/118, 27% RHS; 18/222, 8% non-RHS respectively). Only 1 RHS patient had evidence of ED interpreter use, reviewing 78 ED OOS (34 patients).

Conclusions: Despite documented LEP, suboptimal and inadequate use of professional interpreters persists. LEP patients are vulnerable, with socioeconomic disadvantage, likely to impact on health outcomes and compliance. Organisational risk also is highlighted, including impact on clinical handover, informed consent and non-compliance with state language services policy. Further staff education and quality improvement work is essential.

1 PCH Refugee Health Service, 2 PCH Nursing Research

Sanderson E[2] Smith G [1] Abraham MB [1,2] Jones TW [1,2] Davis EA [1,2]

The impact of continuous glucose monitor availability: real world data from a population based clinic

Background and aim: Real-world studies reporting the impact of continuous glucose monitoring (CGM) in children with Type 1 diabetes (T1D) are limited. In April 2017 CGM became fully subsidised in Australia for children with T1D <21yrs. We report the impact of this in a large population based sample of paediatric diabetes (n=1093). Almost all (99%) children (age < 18yr) with diabetes in Western Australia attend a single paediatric diabetes centre.

Prior to April 2017 6.5% of children were using CGM, 18 months following CGM funding the rate of usage was 76.1%. Mean age of the clinic group was 11.9 yrs with diabetes duration of 4.4 years; demographic and clinical charateristics of those on CGM were similar. Patients attend clinic every 3 mths. Prospective cohort analysis was used to determine change over time of key diabetes outcomes: HbA1c and severe hypoglycaemia (coma/ convulsions).

The mean HbA1c (± SE) of all T1D (n=1093) for the 6 mths prior to CGM rollout was 8.2±0.05 %. Mean HbA1c of the whole clinic reduced significantly at every 3 mth period up until 18 mths post rollout. At 18 mths, 75% of patients in the clinic were using CGM and mean HbA1c was 7.76±0.06% (p< 0.001 vs baseline).

These data suggest that in a population-based cohort of paediatric patients with T1D the introduction of CGM results in improved glycaemic control and reduced hypoglycaemia over 18 months. These real world data show similar outcomes to randomised controlled trials with CGM and add to the evidence for CGM use in clinical practice for all children with Type 1 diabetes.

1 Telethon Kids Institute, 2 Child and Adolescent Health Service

Consumer Involvement Session

PCH Auditorium, 6.00 – 7.00pm

Registration for Consumers attending this event will commence from 5.00pm. Following poster viewing and mingling with researchers, presenters and consumers will move on the PCH Auditorium from 6 -7.00pm. A prize will be awarded at the end of the evening, based on votes from the consumer audience

Chivers P

Feasibility of a targeted exercise intervention to improve bone health in youth

Background and aim: Reduced weight bearing movement is hypothesised to explain poorer bone characteristics in adolescents with Developmental Coordination Disorder (DCD). This feasibility study examined the impact of a 13-week exercise intervention on bone health in adolescents with DCD.

Research method: 13-week intervention of cardiorespiratory, strength and resistance exercises for 90 minutes, twice per week. Lower limb bone parameters (peripheral Quantitative Computed Tomography, pQCT) and fitness tests (1 Repetition Maximum leg press, vertical jump and standing broad jump) were measured pre- and post-intervention and analysed using paired sample t-tests (or Wilcoxon signed-rank test) and generalised estimating equations (GEE).

Results: 28 participants (17male), age 12.6-17.6 (14.06,+/-1.28) years, mid (n=14) or post (n=12) pubertal stages; (n=2 pre-pubertal). Significant increases post intervention for tibial mass (T66: t(27)=2.75, p=.010, d=0.23), cortical area (T66: Z=2.45, p=.014, d=0.23), 1RM leg press (Z=2.78, p=.005, d=0.53), standing broad jump (t(27)=2.74, p=.011, d=0.15) and BMI (t(27)=2.30 p=.029, d=0.10). These changes were significantly associated with the number of sessions attended.

Conclusion: Results indicate that for adolescents with DCD structural bone parameters in the lower leg can improve from targeted bone loading exercise. Further studies with a control group, larger sample and over a longer period of time are required to confirm positive changes to bone health.

Fairthorne J, Bourke J, O'Donnell M, Wong K, de Klerk N, Llewellyn G, Leonard H

Poorer perinatal outcomes for mothers with intellectual disability and their infants

Background and aim: Pregnancy in women with intellectual disability (ID) is increasingly recognised, along with their increased likelihood of experiencing risk factors for adverse perinatal outcomes. We aimed to compare risks of socio-demographic, pregnancy and infant outcomes of women with ID to other women.

Research method: Records of mothers with children born in Western Australia from 1983-2012 were linked to the population-based ID Exploring Answers database. Mothers with ID were matched by age and Aboriginality to a population sample of mothers without ID. Demographic and perinatal outcomes were compared for both groups using logistic regression to compare risks.

Results: Compared to non-Aboriginal mothers without ID, non-Aboriginal mothers with ID were more likely to be of low socio-economic status, be without partner, smoke antenatally and have pre-existing asthma. They had a 1.5 times increased risk of pregnancy complications, specifically pre-eclampsia, urinary tract infection, threatened preterm labour and post-partum haemorrhage. After adjustment for maternal medical conditions and pregnancy complications, infants of Aboriginal mothers with ID had twice the risk of preterm birth and 1.6 times the risk of having percentage of optimal head circumference <95% compared to infants of Aboriginal mothers without ID. Infants of both Aboriginal and non-Aboriginal mothers with ID were more likely to have percentage of optimal birth weight <85% compared to those without ID.

Conclusion: For mothers with ID, modifiable risk factors for adverse outcomes need addressing. They may require additional assistance during pregnancy, including more frequent consultations and support to assist with pregnancy management.

Blyth C

The impact of new universal child influenza programs in Australia

Background and aim: Jurisdictionally-based vaccination programs were established providing free quadrivalent influenza vaccine (QIV) for preschool children in 2018. This was in addition to the National Immunisation Program (NIP)-funded QIV for Indigenous children and children with comorbid medical conditions. We assessed the impact of this policy on disease burden and vaccine coverage, as well as report on 2018 vaccine effectiveness.

Research method: Subjects were recruited prospectively from twelve hospitals. Children aged ≤16 years hospitalised with acute respiratory infection (ARI) and influenza were considered cases. Hospitalised children with ARI testing negative for influenza were considered controls.

Results: A total of 458 children were hospitalised with influenza: 31.7% were <2 years, 5.0% were Indigenous, and 40.6% had medical comorbidities. Influenza A was detected in 90.6% of children (A/H1N1: 38.0%; A/H3N2: 3.1%; A/unsubtyped 48.6%). The median length of stay was 2 days (IQR: 1,3) and 8.1% were admitted to ICU. Oseltamivir use was infrequent (16.6%). Two in-hospital deaths occurred (0.45%). In test-negative-controls, 36.0% were vaccinated including 50.7% of children with comorbid conditions and 35.0% of Indigenous children. Vaccine effectiveness of QIV for preventing influenza hospitalisation was estimated at 78.8% (95%CI: 66.9; 86.4). 2019 data is currently being analysed.

Conclusion: Compared with 2017, a significant reduction in severe influenza was observed in 2018, possibly contributed to by improved vaccine coverage and high vaccine effectiveness. Despite introduction of jurisdictionally-funded preschool programs and NIP-funded vaccine for children with risk factors, improved coverage is required to ensure protection against paediatric influenza morbidity and mortality. Updated 2019 results will be presented.

Fear V, Syn G, Forbes C, Jamieson S, Lassmann T

Rapid diagnosis of rare genetic disease in paediatric patients

Background and aim: Rare diseases collectively affect more that 190,000 Western Australians, including 63,000 paediatric patients, and accordingly have been identified as a public health priority. Around 80% of all rare diseases have a genetic basis. The advent of Next Generation Sequencing has allowed high speed, affordable sequencing, with Whole Exome Sequencing implemented in WA as the rare disease diagnostic method of choice. However, disease diagnosis requires that the genetic variant is validated functionally in a living cell. This requirement for functional validation creates a major bottle-neck, with generally >5 years to patient diagnosis, and multiple clinical specialist visits. During this time the possibilities for early childhood intervention are bypassed.

The aim of this project is to revert the single nucleotide variant in the patients' own cells to restore gene function.

Research method: Patient derived inducible pluripotent stem cells (iPSCs) are edited using CRISPR-Cas9 homology directed repair. Patient iPSCs with the identified variant, and the reverted to WT variant, are induced to differentiate into mature neural or cardiac cells. Differentiated cells are investigated by RNAseq to determine cell maturation, and; pathway analysis to identify potential drug targets.

Results: We have patients with variants for diagnosis in both neural and cardiac cell differentiation. Gene targeting of variants with CRISPR-Cas9 and amplicon sequencing results indicate that we can edit living cells. In preliminary results we have successfully matured iPSCs into the different lineages.

Conclusion: The juxtaposition of genome editing and DNA/RNA analysis of IPSCs will fast-track rare disease diagnosis in paediatric patients.

Oral Abstracts
Thursday 7 November

Lightning talks Session 1

PCH Auditorium, 11.10 - 12.00pm

The lightning talks were a highlight of the 2018 Child Health Research Symposium and are three minutes long and limited to five slides for each presentation. Presentations are run sequentially with speakers invited back to the podium for questions from the audience. Speakers are selected from submitted abstracts.

Chair: Dr Amy Findlay-Jones, Telethon Kids Institute

Desai S

Diffuse Excessive High Signal Intensity (DEHSI) on Term Equivalent MRI to Predict Disability in Preterm Infants: A Systematic Review and Meta-Analysis

Background and aim: Magnetic Resonance Imaging at Term Equivalent Age (TEA-MRI) is useful in predicting neurodevelopmental outcomes of preterm infants. A finding frequently noticed on TEA-MRI is excessive white matter hyper intensity on T2-weighted sequences, known as diffuse excessive high signal intensity (DEHSI). There is controversy about whether DEHSI is associated with adverse neurodevelopmental outcomes.

Research method: A systematic review was conducted to evaluate the accuracy of DEHSI in predicting adverse neurodevelopmental outcomes in preterm infants.

Results: A total of 15 studies (N=1832) were included, of which data from 8 studies were available for meta-analysis. The pooled estimates (N=6) for sensitivity of DEHSI for cognitive or mental disability was 0.56 (95% CI 0.30, 0.79) and specificity 0.47 (95% CI 0.18, 0.78). The area under the ROC curve was low at 0.53 (CI: 0.49, 0.57). The pooled DOR value of 1 (95% CI:1-2) indicated that DEHSI does not discriminate between preterm infants with and without mental/cognitive disability. The pooled estimates (N=7) for sensitivity of DEHSI for cerebral palsy was 0.55 (95% CI 0.35, 0.74) and specificity 0.38 (95% CI 0.20, 0.61). The area under the ROC curve was low at 0.49 (CI: 0.44, 0.53). The pooled DOR value of 1 (95%CI: 0-2) indicated that DEHSI does not discriminate between preterm infants with and without CP. Limitations: There was significant heterogeneity for majority of the outcomes (I2>75%).

Conclusion: DEHSI on TEA-MRI does not predict the future development of cognitive/mental disabilities or CP.

Blackmore, A M[1], Gibson, N[1], Cooper, M[2], Langdon, K[3], Moshovis, L[1], Wilson, A C[3]

Abstract title: Managing respiratory disease in children with cerebral palsy: Systematic review

Background and aim: Respiratory disease is a major cause of morbidity and mortality for children with cerebral palsy (CP). Clinical management of respiratory illness in this population is complex. This systematic review described the evidence regarding interventions for the prevention and management of respiratory disease in young people with CP.

Research method: In this systematic review, we searched nine databases and selected original studies published since January 1998 in which an intervention for chronic respiratory illness was reported for individuals with CP aged less than 26 years.

Results: The searches yielded 3347 papers, of which 37 papers reporting 34 studies were retained. These studies included 582 participants with CP, aged 5 months to 25 years. There were no interventions aimed at preventing respiratory illness in young people with CP. Respiratory management interventions were very diverse, including airway clearance techniques, exercise, positioning, mealtime management, salivary management, upper airway interventions, antibiotics, gastro-intestinal interventions, and spinal surgery. Research designs were classified on the AACPDM rating system as levels II (n = 3), III (n = 2), IV (n = 25) and V (n = 4). Few and minor adverse effects were reported for most interventions.

Conclusion: Diverse interventions for the management of respiratory disease in young people with CP have been reported, but evidence in this population is scarce. Studies are generally methodologically weak. Interventions described in these studies may be used in

clinical practice (as there is no strong evidence of adverse effects), but both positive and adverse outcomes should be monitored.

1 Ability Centre, Mount Lawley, Western Australia, Australia, 2 Murdoch Children's Research Institute, Parkville, Victoria, Australia, 3 Perth Children's Hospital, Nedlands, Western Australia, Australia

Moyes A

Exploring the experiences of secondary school nurses who encounter young people with mental health problems

Background and aim: Mental health problems are common in Australian adolescents. In the international literature school nurses have been identified as key sources of support for young people experiencing mental health problems, yet little is known about the work of state secondary school nurses with this cohort in the Western Australian context. The purpose of this study is to articulate how school nurses in Western Australia conceptualise and describe their clinical experiences with young people who present with mental health problems.

Research method: The study uses Grounded Theory methodology (Glaser & Strauss, 1967) to examine the role school nurses perceive they have with this cohort, the clinical activities they undertake and the factors that enhance or inhibit their capacity to deliver care to this group. Thirty one semi-structured interviews have been undertaken with school nurses working in metropolitan and regional state secondary schools for the Department of Health in Western Australia.

Results: Data analysis indicates that school nurses encounter a high number of young people seeking support for complex social and mental health problems that are not easily resolved. Nurses reported significant barriers to engaging young people with more specialist services, prompting them to perceive the ongoing clinical demands as having a negative impact on their emotional wellbeing. Further data analysis identified factors which influenced this experience and how school nurses responded to these circumstances.

Conclusion: Public sector secondary school nurses provide sophisticated and complex clinical support to school-attending young people experiencing mental health problems. Findings are of value to stakeholders both within and external to the health and education settings and are expected to inform strategies to optimise the capacity of the school nurse workforce to further support this cohort in Western Australian state secondary schools.

Thomas C S[1, 2], Gammanpila D [3], Moore J K [2, 3], Siafarikas A [2], Mahfouda S [1,3], Strauss P [1, 3], Saunders L A [2, 3], Harry M [2], Van Hall H-W [2], Lawrence S J [2], Lin A [1]

The Prevalence and Profile of Adolescents with Pre- versus Post-Puberty Onset of Gender Non-Conforming Behaviours: Perspectives from the GENTLE Cohort

Background and aim: Some adolescents who present seeking gender affirming health care have a history of gender nonconforming behaviours since early childhood. Others describe the onset of gender dysphoria in adolescence, at or after the onset of physical changes of puberty, without a childhood history of gender nonconformity. There is limited research on the age of emergence of gender non-conformity and associated characteristics.

This study aims to 1) observe the proportion of pre- versus post-pubertal onset of gender non-conformity in adolescents presenting to a specialist gender clinic; and 2) compare the differences in demographic and clinical profiles of these groups.

Research method: The GENder identiTy Longitudinal Experience (GENTLE) Cohort Study is currently run at the Gender Diversity Service (GDS) in a large, metropolitan children's hospital in Perth, Western Australia. GENTLE consists of clients who have ever sought services from the GDS. All participants in the GENTLE Cohort have provided written informed consent for their clinical data to be made available for research purposes.

A retrospective case note review was conducted. Clients were classified into either a pre- or post-pubertal onset group after auditing medical files containing clinical interview notes and endocrinology reports. Demographic factors investigated will include sex assigned at birth and gender identity. Clinical profiles of the two study groups will be determined using the Utrecht Gender Dysphoria Scale and Body Image Scale, the Achenbach Child Behaviour Checklist and Youth Self Report, and the Beck Youth Inventory. Autism spectrum disorder traits will also be investigated as measured by the Social Responsiveness Scale – 2.

Results: Our preliminary results analysing data from 56 participants show just over half of the sample (56.5%) had a self-reported and parent-reported pre-pubertal onset of gender non-conformity. There were no statistically significant differences in the clinical profiles between the pre- and post-pubertal onset groups. Finally, the results indicated that both groups regardless of age of onset experience high levels of psychopathology. The presentation will report findings from a sample of over 100 participants.

Conclusion: It is currently not known whether the age of onset of gender non-conformity may be associated with differing clinical profiles and mental health outcomes. These associations are important for a deeper understanding of the development of gender identity. Understanding of age of onset and specific clinical profiles will allow for the development of tailored assessment and support pathways.

1 Telethon Kids Institute, The University of Western Australia, 2 Gender Diversity Service, Acute Child and Adolescent Mental Health Service, Child and Adolescent Health Service - Mental Health, Perth Children's Hospital, 3 University of Western Australia

Long T

Cardiovascular testing detects latent dysfunction in childhood leukaemia survivors

Background and aim: Childhood leukaemia survivors commonly develop late-onset cardiovascular disease following treatment with anthracycline chemotherapy. Resting echocardiography is the standard follow-up procedure for monitoring cardiac health but this method may not be sensitive enough to detect subclinical injury. Exercise echocardiography may help to unmask abnormalities not seen at rest.

Research method: Nineteen (9 male; age, 19±3 years) anthracycline-treated survivors of acute childhood leukaemia and 17 (8 male) healthy individuals of similar age (22±2 years) were recruited. All survivors had normal resting echocardiography upon recruitment. Exercise echocardiography was performed using contemporary imaging techniques. Flow mediated dilation (FMD), body composition and cardiorespiratory fitness (VO2peak) were assessed to determine predisposition to additional disease.

Results: Peak A velocity (interaction=0.007) increased from rest in survivors (p=0.023) and controls (p=0.020) immediately post exercise but did not recover again in the survivors following recuperation (exercise-recovery, p=0.784). As a result, E/A ratio (interaction, p<0.001) was lower in the survivors at recovery (p<0.001). The survivors had reduced FMD (p=0.030), maximal and recovery heart rates (p=0.001 and p<0.001), minute ventilation (p<0.001), and VO2peak (absolute, p=0.034; relative, p=0.013) compared to controls. They also had higher total body fat (percentage, p=0.034; mass, p=0.024) and fat mass in the central (p=0.050), peripheral (p=0.039) and visceral (p<0.001) regions.

Conclusion: Exercise echocardiography is useful for identifying subclinical diastolic dysfunction that may indicate late anthracycline toxicity in apparently-healthy survivors of acute childhood leukaemia. Presence of secondary risk-factors indicates increased predisposition to comorbidities and highlights importance of performing a thorough assessment of cardiovascular health during follow-up.

Knight B

Developing a frontline treatment for neonatal sepsis

Background and aim: Preterm infants are highly susceptible to neonatal sepsis with substantial morbidity and mortality. Early empiric treatment is mandatory as blood cultures results take up to 48h; treatment is ineffective if the wrong pathogen is targeted. Antimicrobial peptide IDR1018 is an adjuvant antimicrobial with broad activity. Importantly, IDR1018 may synergise with common neonatal antibiotics.

Research method: Antibacterial checkerboard assays were performed on IDR1018 and the neonatal antibiotics vancomycin or gentamicin against prototypical neonatal pathogens in RPMI1640 + 5% Luria Bertani broth. Time-to-kill assays were performed with samples taken over 24h, determining the effectiveness and kinetics of the drug combination in adult human serum, and compared against individual antibiotics.

Results: Synergy was observed between vancomycin and IDR1018 against 5 clinical isolates of E. coli and 1 ATCC strain using the Fractional Inhibitory Concentration Index. No synergistic activity was observed in human serum, IDR1018 and vancomycin against E. coli and S. aureus. IDR1018 had no activity against the bacteria independently.

Conclusion: IDR1018 synergised with commonly used antibiotic vancomycin, against both Gram negative and positive neonatal pathogens under standard testing conditions. IDR1018

was inactive against E. coli and S. aureus in human serum at the synergistic dose, suggesting that at low levels of the antimicrobial peptide there is a component of serum inhibiting activity. Further tests are required to find the component of the serum that is inhibiting activity, e.g. denaturing the proteins in the serum before repeating the time to kill assay, or attempting to increase the level of free IDR1018 in serum by raising IDR1018's dose.

Alvares G

The misnomer of 'high functioning autism': Intelligence is an imprecise predictor of functional abilities at diagnosis

Background and aim: 'High functioning autism' is a term often used for individuals with autism spectrum disorder without an intellectual disability. Over time, this term has become synonymous with expectations of greater functional skills and better long-term outcomes, despite contradictory clinical observations. This study investigated the relationship between adaptive behaviour, cognitive estimates (intelligence quotient) and age at diagnosis in autism spectrum disorder.

Research method: Participants (n = 2225, 1–18 years of age) were notified at diagnosis to a prospective register and grouped by presence (n = 1041) or absence (n = 1184) of intellectual disability. Functional abilities were reported using the Vineland Adaptive Behaviour Scales.

Results: Regression models suggested that intelligence quotient was a weak predictor of Vineland Adaptive Behaviour Scales after controlling for sex. Whereas the intellectual disability group's adaptive behaviour estimates were close to reported intelligence quotients, Vineland Adaptive Behaviour Scales scores fell significantly below intelligence quotients for children without intellectual disability. The gap between intelligence quotient and Vineland Adaptive Behaviour Scales scores remained large with increasing age at diagnosis for all children.

Conclusion: These data indicate that estimates from intelligence quotient alone are an imprecise proxy for functional abilities when diagnosing autism spectrum disorder, particularly for those without intellectual disability. We argue that 'high functioning autism' is an inaccurate clinical descriptor when based solely on intelligence quotient demarcations and this term should be abandoned in research and clinical practice.

Swift V

Yarning with community in support of research

Background and aim: The Urban Aboriginal Ear Health Djaalinj Waakinj (listening & talking) project commenced consultation with members of the Aboriginal Community at an early stage after they identified the need to develop an Urban Aboriginal Ear Health Program in the Perth south metropolitan region. To encourage families to enrol in the project and continue the required follow-up, we ensured the Aboriginal community had a strong understanding of the potential benefits and inconveniences of being involved in the research project.

Research method: Community forums were held and an Aboriginal Community Advisory Group (ACAG) was established. To ensure cultural governance the ACAG developed the Terms of Reference, they review project documentation to guarantee appropriate language and cultural safety.

Results: The consultation process was the commencement of strong relationships and partnerships. To guarantee true working partnerships with the Aboriginal community we must consider being in the 'Third Space', in our case adapted for Aboriginal populations. Working in the 'third space' is designed to instigate positive change between Aboriginal Australians and non-Aboriginal Australians through understanding each other's world view by working and learning together with equal power.

Conclusion: In this research project, we find each day presenting a variety of situations. Working with the Aboriginal community and having community members and Aboriginal researchers as part of the project, can assist when meeting some of these situations. This presentation will outline what we are learning that may assist others when working in this space. For example: using appropriate language, being persistent without being bossy, positive home visiting.

Ng V, Tan N, Manley E, Larkins N, Sheriff D

Nephrotic Syndrome: An Update on Epidemiology and Changing Trends in Western Australia

Background and aim: Nephrotic Syndrome is a triad of oedema, hypoalbuminemia, and proteinuria. The incidence of nephrotic syndrome varies by location and may be increasing over time. Males and those of Asian descent seem to be at higher risk. This study aims to describe the current characteristics, and treatment of, children with nephrotic syndrome in Western Australia.

Research method: A retrospective chart analysis of over 60 children with nephrotic syndrome treated at Princess Margaret Hospital/Perth Children's Hospital from 2013-2019. Patient characteristics, treatment, and outcome data were recorded. Ethnicity was estimated via a software called Onolytics.

Results: Preliminary analysis identified 68 charts with true idiopathic nephrotic syndrome. The mean age of diagnosis was 4.6 years. 69.1% of the cohort was male, 30.9% was female. 75% achieved remission with oral steroids, and 81.0% of these did so within 4 weeks. The two largest ethnic groups represented in our data were children with United Kingdom heritage (36.8%) and children of Asian descent (32.4%). Children of South Asian heritage were over-represented (13.2% vs 2.7% general population).

Conclusion: These preliminary results concur with previous findings that males are at higher risk of nephrotic syndrome. Children of Asian ethnicity are also at higher risk, particularly those of South Asian descent. Further analysis will be undertaken to identify treatment trends over time. This will provide a robust insight into the epidemiology of children with nephrotic syndrome in Western Australia.

Lightning talks Session 2

PCH Auditorium, 2.00 – 3.00pm

Chair: Dr David Martino, Telethon Kids Institute

Symons M

Child Development Services Evaluation & Redesign: Optimising Family Centred Practice

Background and aim: Western Australian Child Development Services (CDS) provide community-based services across metropolitan Perth to children and their families where the child has, or is at risk of, a developmental delay or disorder. In 2018, it received approximately 2,000 referrals and delivered approximately 22,000 service episodes. Family-centred practice (FCP) is the current gold standard method for the delivery of early interventions. The main principles include acknowledgement that parents have the most knowledge of their child, families have unique needs, and optimal child functioning occurs within a supportive family context and can be affected by the stress and coping of other family members.

Research method: Evaluation of CDS services was conducted in 2014 using a systematic review, and consultation with clients and staff. This led to service redesign across multiple areas of best-practice, including responsive service and staff training, implemented over three years. A between-groups study was conducted to compare parental experiences, collected via survey with over 400 families before (2015) and after the service redesign (2018). Changes in waiting time, consumer satisfaction and implementation of FCP were measured.

Results: The systematic review identified that FCP was best practice and should be implemented alongside short waiting-times, early provision of information and staff training. Clients become increasingly unhappy as wait times increased. Service redesign significantly increased consumer satisfaction and consumer ratings of the implementation of family-centred practice delivery improved significantly in all areas.

Conclusion: The service evaluation and redesign process resulted in better implementation of FCP and increased consumer satisfaction.

Osman-Mulrany R, Rex K

Lumbar Punctures in 'Fever without Source' infants at Perth Children's Hospital

Background and aim: Fever without source (FWS) is a common reason for infants aged <90 days to present to hospital. These infants require clinical assessment and investigations to rule out serious bacterial infections (SBI), such as urinary tract infection, bacteraemia and meningitis. Current Perth Children's Hospital (PCH) guidelines recommend lumbar puncture (LP) as part of this SBI work-up in all infants aged <28 days and for infants aged between 29-90 days based on patient appearance (eg. ill appearing) and other results. This audit aims to assess the current practice of performing LPs in infants at PCH that presented with FWS compared to the current hospital guidelines.

Research method: Retrospective audit of all infants <90 days of age admitted to PCH with FWS between April–December 2018. Information about patient demographics, LPs, other investigations and subsequent diagnosis were extracted from medical records.

Results: 106 cases were identified, with a median age of 38 days. LP was performed in 70.3% of all infants aged <28 days and 86.7% of the infants aged 29-90 days who appeared unwell. 39% (41/106) of infants were diagnosed with an SBI. Documentation about the performance of LPs was variable. Factors associated with the likelihood of performing an LP were examined.

Conclusion: LP was commonly performed, however not all infants underwent investigations as per current PCH guidelines. Further studies exploring factors contributing to LP performance would be beneficial.

Campbell A

Catching up kids with cochlear implants

Background and aim: Cochlear implant (CI) recipients are at significantly increased risk of invasive pneumococcal disease (IPD) compared with healthy children and therefore recommended additional pneumococcal vaccinations.

1. To examine the immunisation status of children with CI retrospectively and prospectively, assessing adherence to immunisation guidelines.

2. To evaluate the effectiveness of educational reminder letters to families of CI recipients, not up to date with pneumococcal vaccinations in the retrospective cohort and prospectively evaluate Specialist Immunisation Clinic review for children planning CI.

Research method: The Stan Perron Immunisation Service and the Children's Hearing Implant Program (CHIP) examined CI recipients <18 year at PCH/PMH 2008-2018. Adherence to pneumococcal vaccinations was assessed via the Australian Immunisation Register. IPD episodes from ICD-10 code and Pathwest databases were captured. Community feedback was obtained for reminder letters for those under vaccinated. Immunisations status was revaluated five-months later.

Results: Of 155 children identified, 88% were not up to date with pneumococcal vaccinations. Following the reminder letters, 56 patients received additional pneumococcal vaccinations, 27% attended PCH Immunisation service and 72% remained not up to date (p=0.0006). Three episodes of IPD were identified post CI insertion (average 143 days) in < 18-month olds, all with mastoiditis and not up to date with pneumococcal vaccinations at the time of IPD.

Conclusion: Incidence of IPD in <5yr with CI in the pneumococcal vaccine era locally is 612/100,000, more than 30 times the estimate population incidence. Letter reminders are effective in improving vaccination rates; however there is considerable need for improved community-provider awareness.

Wu Y

Development of a causal model of pulmonary exacerbations of cystic fibrosis

Background and aim: Optimising management of pulmonary exacerbations of cystic fibrosis (CF) may help preserve lung function and prolong life. Treatment of exacerbations is complex however, with wide variation in practice and little consensus on what is optimal. We aim to get a clearer understanding of pulmonary exacerbation by developing a model that describes its underlying causal mechanisms.

Research method: Australian and New Zealand CF experts, young and adult CF patients, their care-givers, and modellers used a modified Delphi approach to co-develop a model which

articulates how various factors are thought to interplay in influencing the short-term outcome of exacerbations. The model provides an explicit causal framework for integrating expert domain knowledge, knowledge from lived experience with CF, and evidence from the literature, with new data.

Results: The provisional model comprises four sub-models: background factors, treatments, acute disease processes, and outcomes. Background factors like age and mutation type drive the pulmonary disease stage. The disease stage, together with the presence of airway pathogens and use of various treatments, impact upon the outcome of exacerbations which can be measured as measures of lung function and the presence of various symptoms.

Conclusion: We used a novel method to elicit causal understandings of pulmonary exacerbations. The model will be used for research prioritisation, design and analysis of BEAT CF which aims to optimise management of CF. Backed by data from BEAT CF, we anticipate the final model will be deployed as a consumer and clinician-friendly decision-support tool to inform personalised decision-making in CF.

McAlister S

Repeat maternal Tdap-vaccination does not enhance infant immune-interference

Background and aim: Maternal pertussis immunisations protect infants against severe pertussis disease before they can receive their own vaccinations. However, these have been associated with blunting of infant antibody responses to some antigens in the primary vaccination series. We investigated if blunting was enhanced in infants whose mothers received their first or second Tdap booster immunisation during pregnancy.

Research method: Infants were recruited in Perth, Australia, before primary immunisations with diphtheria-tetanus-acellular pertussis vaccine (DTPa; 2, 4 and 6 months) and the 13-valent pneumococcal conjugate vaccine (PCV13; 2 and 4 months). Maternal pertussis immunisation status was assessed retrospectively.

IgG specific to: pertussis toxin (PT), pertactin (PRN), filamentous hemagglutinin (FHA), fimbriae 2/3 (FIM 2/3), tetanus toxin (TT) and diphtheria toxoid (DT) and PCV13-serotypes were measured pre- and post- primary vaccination series (7 months) using multiplexed immunoassays (MIA) developed in-house.

Results: Sixty-two children have been recruited to date with 20 women having received a first, and 42 a subsequent Tdap dose in this pregnancy.

GMCs and seropositive/seroprotective rates for DTPa and PCV13-specific IgG responses after primary vaccinations were comparable between groups, regardless of whether the recent dose was within two years or longer since the previous dose. Infant PT-IgG titers before and after primary vaccinations were inversely correlated ($R=-0.6$, $p<0.0001$), and the same was found for DT-IgG ($R=-0.5$, $p<0.0001$).

Conclusion: These preliminary results suggest that repeated Tdap vaccination in pregnancy does not lead to greater interference of childhood immunisation responses. These findings support administering maternal Tdap boosters during every pregnancy to protect vulnerable infants.

Sarna M [1,2], Foo D[1,2], Pereira G[1], Regan A [1,2,3]

Risk of major structural birth defects associated with seasonal influenza vaccination during pregnancy

Background and aim: Pregnant women and infants are at risk of severe influenza infection. Inactivated influenza vaccine (IIV) is recommended during pregnancy to protect both mothers and their infants. Few studies have evaluated the risk for major structural birth defects associated with prenatal administration of IIV.

Research method: We conducted a population-based cohort study using probabilistic data linkage. State-wide birth records between March 2012 and April 2016 were linked to the state's register for developmental anomalies in children and the state's database for prenatal vaccination records. Vaccinated pregnancies were defined as those with a record of IIV in first trimester of pregnancy. We estimated prevalence ratios (PRs) of any major structural birth defect. Inverse probability treatment weighting (IPTW) was used to factor for propensity for vaccination.

Results: Between 2012 and 2016, 146,935 births were identified; 16,043 (11%) had a record of IIV during pregnancy, of which 19% (n=3,072) received IIV in first trimester; 4% (n=6,071) of the cohort were diagnosed with a major structural defect: 4.2% of vaccinated births and 4.1% of unvaccinated births. We identified no association between first trimester IIV exposure and diagnosis of a major structural defect (unweighted PR: 1.02 [95% CI: 0.86-1.21]; IPTW PR: 1.03 [95% CI: 0.86-1.24]). We observed similar results after removing pregnancies where vaccination occurred after first trimester (IPTW PR: 1.05 [95% CI: 0.88-1.29]).

Conclusion: IIV exposure in the first trimester was not associated with an increased risk for major structural birth defects. These findings support the safety of IIV in first trimester and inform vaccine decision-making in first trimester.

1 School of Public Health, Curtin University, Bentley, Western Australia, 2 Wesfarmers Centre for Vaccines and Infectious Diseases, Telethon Kids Institute, Nedlands, Western Australia, 3 School of Public Health, Texas A&M University, College Station, Texas, USA.

Nettleton M

Reducing Vancomycin associated nephrotoxicity in children

Background and aim: The antibiotic vancomycin is used to treat some children for possible or proven infection and requires therapeutic drug monitoring to assist with avoiding vancomycin associated nephrotoxicity (VAN). It is accepted that high vancomycin trough levels of ≥15 mg/L are associated with significantly increased risk of nephrotoxicity and there is little evidence to support improved outcomes.

The aim of this study is to identify vancomycin usage, the number of high vancomycin trough levels and the number of VAN episodes for a pre and post intervention audit, aimed at reducing VAN through a Children's Antimicrobial Management Program (ChAMP) intervention bundle.

Research method: This is a retrospective audit of all vancomycin levels at PMH/PCH from children < 18 years in January-December 2018 from a PathWest and pharmacy dispensing data extract to determine VAN using the Kidney Disease Improving Global Outcomes (KDIGO) criteria.

Results: In 2018 there were 2671 vancomycin prescription days. 30% of vancomycin levels were ≥15mg/L (533/1757). Interim analysis of 166 prescription episodes with at least one level ≥15mg/L has shown one in every six patients (15%) did not have creatinine monitoring when

receiving vancomycin. 15% (25/166) of patients with high vancomycin trough levels had VAN. Of those with VAN, 32% were located on medical wards and 24% from Haematology/Oncology.

Conclusion: There are a significant number of children with high vancomycin levels who developed VAN, without likely clinical benefit. ChAMP vancomycin empiric trough targets and indications for usage have been modified in 2019, along with prescriber education. A post intervention analysis will be conducted.

Iosifidis T

Defective epithelial cell repair in the upper and lower asthmatic airways

Background and aim: Lower airway epithelium from asthmatics elicits a dysregulated repair response. Emerging evidence suggests significant overlap exists between upper and lower airways, which may translate to disease phenotypes, typically known as the “unified airway hypothesis”. Here, it was hypothesised that dysregulated epithelial repair is consistently observed in upper and lower airways of asthmatics.

Research method: Published transcriptomic datasets (n=3) using airway epithelium (AEC) from upper or lower airways of asthmatics were assessed against a repair signature established by our laboratory. Matched upper and lower airway epithelial cultures of children with (n=6; 3.2-12.7yr; 4 males) and without asthma (n=7; age:2.1-3.1yr; 4 males) were established. Wounding assays were performed to assess repair and cell migration trajectories.

Results: Interrogation of transcriptomic datasets corroborated pathways associated with unresolved wound repair, at baseline in asthmatics and following virus-induced exacerbations. Matched upper and lower AEC from asthmatic children displayed a 2.5-fold reduction ($p<0.05$) in wound repair compared to non-asthmatic counterparts. Furthermore, aberrant cell migration was observed in upper and lower AEC from asthmatics. Specifically, lower distance (upper and lower AEC (median(IQR)); 98.7 µm(52.9-166.0µm) and 119.0µm(67.9-200.4µm)), and velocity (0.16µm/min(0.09-0.28µm/min) and 0.16µm/min(0.09-0.31µm/min)), directionality (0.56AU(0.35-0.75AU) and 0.64AU(0.42-0.80AU)) was observed in AEC from asthmatic children compared to non-asthmatic counterparts, distance (363.5µm(222.4-451.6µm) and 239.5µm(163.9-328.4µm)), velocity (0.61µm/min(0.37-0.75µm/min) and 0.38µm/min(0.27-0.55µm/min)), and directionality (0.83AU(0.73-0.88AU) and 0.94AU(0.89-0.97AU)) ($p<0.05$).

Conclusion: Unresolved wound repair processes were present in datasets from upper and lower airways of asthmatics and were associated with viral-induced exacerbations. Response to in vitro wounding was consistently abnormal in AEC from upper and lower asthmatic airways further corroborating the “unified airway hypothesis”.

Lim C

The effect of body composition on the accuracy of continuous glucose monitoring

Background and aim: Type 1 diabetes mellitus (T1DM) is a condition that affects approximately 1 in 720 Australian Children aged between 0-14. With strict glycaemic control, complications of diabetes can be reduced. Technology such as continuous glucose monitoring (CGM) continuously measures interstitial glucose levels, providing insight into glucose trends, aiding diabetes management. CGM uptake has increased over the years. Despite this, knowledge of individual factors which could affect the performance and longevity of the sensor; in particular, an individual's body composition remain largely unknown. This study evaluates

the effect of an individual's BMI on CGM accuracy and compares the accuracy of the Guardian™ Sensor 3 in the arm and abdomen.

Research method: One hundred and thirty two subjects (14-75 years of age) with T1DM across Perth Children's Hospital and Christchurch Hospital participated in the 10-day study. Subjects wore four sensors across the arm and abdomen, paired with an iPod® touch® running a glucose monitoring mobile application. Subjects were asked to undergo an in-clinic visit of 6 h on study day 1 for frequent blood glucose testing using the CONTOUR® LINK Blood Glucose Meter. Frequent self-monitoring of blood glucose (SMBG) measurements was obtained throughout the study.

Results: Accuracy metrics include mean average relative difference (MARD) of CGM with respect to SMBG. Data collection has been completed with analysis ongoing - to be finalized by end August.

Conclusion: If MARD varies by >12% between participants, then an adjustment in sensor location could be considered a strategy to reduce variability, according to an individual's BMI.

Runions K

Treatment Outcomes for a Day Program for Adolescent Borderline Personality Disorder

Background and aim: Borderline Personality Disorder (BPD) is a mental disorder marked by intense emotional instability, relationship insecurity (e.g. fear of abandonment), and impulsivity including elevated deliberate self-harm (with a 50-fold increase in suicide rates compared to the general population). Prevalence estimates range from 1 – 6% of the population, and BPD is especially common amongst people use seek mental health services (e.g.,15-20%). Borderline personality disorder diagnosis is associated with elevated risk of hospital admission and emergency department use and poor occupational functioning.

As community-based specialist services appear to provide the best outcomes for personality disorders, the Touchstone Community Child & Adolescent Mental Health Service ("Touchstone") provides a 6-month community day-service alternative to hospital admission. Touchstone aims to reduce psychiatric morbidity and admissions to hospital. This study aims to examine self-reported morbidity and family functioning and hospital admissions pre- and post-admission to Touchstone.

Research method: An uncontrolled pre-post design was used to test for changes in self-rated BPD features and correlates, and in hospitalisation admissions prior to and following activation in the Touchstone day-service. Six-month windows were established prior to, during, and following activation in the Touchstone day-service.

Results: Self-rated symptomology data was collected prior to activation in Touchstone and prior to discharge 6 months later. Improved functioning was observed for depression ($t = -2.89$, $p < .01$, $n = 39$,) and emotion dysregulation ($t = -2.26$, $p < .05$, $n = 15$). Perceived resilient coping increased ($t = 3.65$, $p < .001$, $n = 39$) and non-suicidal self-injurious acts declined ($t = -2.61$, $p < .05$, $n = 18$). Maternal attachment avoidance declined ($t = -2.89$, $p < .01$, $n = 22$), but no other improvement in relationship with parents was observed.

Complete hospitalisation data were available for 32 clients, 12 of whom had no history of hospital admission. The number of admissions was significantly lower following discharge, from 3.75 admissions to 1.35, $z = 2.62$, $p < .01$. A reduction in mean duration of hospital admission was observed, $t = -2.97$, $p < .01$. Prior to activation with Touchstone, the mean

duration of admission was 25.08 hospital days per 6 months. Following discharge, this declined to 2.87 days.

Conclusion: Touchstone Community CAMHS provides an intensive partial-hospitalisation day service for adolescents experiencing ultra-high-risk mental health problems. These data suggest that the service may be successful in reducing negative symptomology and in hospital admissions.

The study is limited in examining only public hospital usage; data from private hospitals are currently not easily accessible within CAHS. Future research will examine presentations to emergency departments, where gains in psychological functioning during admission to Touchstone may result in less hospital utilisation.

Moon K

Early versus late parenteral nutrition for critically ill term and late preterm infants: Cochrane Review

Background and aim: During periods of critical illness in term and late preterm infants, provision of enteral nutrition is unachievable, which necessitates the use of parenteral nutrition (PN). Recent randomised controlled trials (RCTs) suggest clinical benefits of late commencement of PN in critically ill adults and children. However, currently, there is limited evidence regarding the optimal timing of commencement of PN in critically ill term and late preterm infants.

Research method: We used the standard search strategy of Cochrane Neonatal to search the RCTs comparing early versus late initiation of PN in term and late preterm infants. We performed fixed effect analyses to pool the data. Quality of evidence was assessed using the GRADE approach.

Results: Two RCTs were eligible for inclusion but relevant information was available from only one RCT (N = 209 term infants). 'Late PN' group had significantly lower risk of 'In-hospital all-cause mortality'. There were no significant differences between the 'late PN' and 'early PN' groups for the risk of acquiring healthcare associated bloodstream infections, individual types of healthcare associated infections, duration of hospital stay and the incidence of hypoglycaemia. However, 'late PN' group had a significantly shorter duration of ICU stay and shorter duration of respiratory support and mechanical ventilation than the 'early PN' group. The quality of evidence was considered low.

Conclusion: While there were some benefits of late commencement of PN in term and late preterm infants, the quality of evidence was low and hence our confidence in the results is limited.

Concurrent Oral Presentations Session 2

PCH Auditorium, 3.30 - 5.00pm

Chair and research update: Professor Mark Everard, CAHS Respiratory Medicine

Buck J

CHK Kinase Inhibition Amplifies the Effects of Chemotherapy in Pineoblastoma

Background and aim: Pineoblastoma is a rare paediatric brain tumour with a survival rate of only 50%. Inhibitors of the cell cycle checkpoint kinases 1 and 2 (CHK1/2) have shown promise in sensitising several cancers to the effects of chemotherapy, thus improving survival, but have not previously been tested in pineoblastoma. The aim of this study was to test whether the CHK1/2 inhibitor prexasertib could inhibit cell cycle checkpoints in an in vivo mouse model of pineoblastoma following exposure to DNA-damaging chemotherapy.

Research method: Mice were implanted with TK-PB452A (pineoblastoma) or TK-PB453 (recurrent pineoblastoma) cells. A single dose of the CHK1/2 inhibitor prexasertib was administered, alone or in combination with chemotherapy (gemcitabine or cyclophosphamide), and brains were harvested. Pathway inhibition, along with markers of chemotherapy response, such as DNA damage and apoptosis, were quantified using immunohistochemistry.

Results: Prexasertib mediated inhibition of CHK1/2 kinase activity was confirmed in both models by detection of increased phospho-CHK1-S345 ($p<0.0001$) and decreased phospho-CHK1-S296 ($p<0.01$) in the TK-PB452A model. DNA damage was also increased in both models following prexasertib administration as measured by gamma-H2AX ($p<0.01$). Apoptosis, as measured by cleaved caspase-3, was also increased ($p<0.0001$) in the TK-PB452A model.

Conclusion: Prexasertib effectively inhibited the CHK1/2 pathway in a mouse model of pineoblastoma, and potentiates the effects of chemotherapy by enhancing DNA damage and cell death. This suggests that chemotherapy can be enhanced using prexasertib to potentially increase treatment efficacy. Ongoing work is testing whether prexasertib can increase survival in combination with chemotherapy and radiotherapy.

Skinner R

Evidence from practice: Evaluation of A Therapeutic Day Program in CAMHS

Background and aim: The Pathways Day program provides an intensive therapeutic day program for children aged 6-12 years. Children attend the program two days a week for one school term. The program includes a multimodal approach within a multidisciplinary team targeting mental health, social skills, education, communication, learning sensory and motor skills needs. Families attend parent workshops and school liaison is conducted.

Research method: During 2018, children attending the program were assessed on pre- and post- measures of their emotional, social and behavioural functioning (n=62). All families attending the program were given the Strengths and Difficulties Questionnaire to complete. Children's mental health and functioning were rated by clinicians on the Children's Global Assessment Scale and Health of the Nation Outcome Scale for Children & Adolescents (HoNOSCA).

A General Linear Mixed Model was used to compare mental health outcomes pre- and post-attendance at the Pathways Day Program from the parent and clinician rated questionnaires described above.

Results: The outcomes showed significant improvement on discharge ratings compared to admission ratings. This was true for all measures. Descriptive analysis of the HoNOSCA explored percentages of children who significantly improved, significantly deteriorated or stayed the same.

Conclusion: The results suggest that the Pathways program plays a role in improving children's social, emotional, mental health and behavioural well-being. Accounting for potential limitations, treatment implications will be discussed.

J Kiranjit, Chivers P

Disease-specific bone changes in youth at risk of secondary osteoporosis

Background and aim: Osteoporosis is characterised by structural bone changes that lead to an increased risk of fractures. Main stay for therapy of osteoporosis are medical therapy and exercise interventions with mechanical loading. Identifying specific structural patterns can allow planning for targeted individualised interventions.

Research method: Cross-sectional observational study examining structural regional parameters of long bones in youth using peripheral Quantitative Computed Tomography (pQCT). Specific groups were those with (1) increased risk of secondary osteoporosis (neuromuscular disorders [cerebral palsy, Duchenne Muscular Dystrophy and Prolonged immobilisation]; chronic diseases; endocrine diseases; inborn errors of metabolism; iatrogenic conditions), (2) developmental coordination disorder or low motor competence and (3) non-affected controls.

Results: 600 scans were analysed at Princess Margaret Hospital between 2011-2017. Compared to non-affected controls, children with neuromuscular disorders, developmental coordination disorder or low motor competence had significantly poorer bone parameter outcomes affecting cortical area, bone surface area, total area, bone strength index and fracture risk (Stress Strain Index, SSI). Other chronic diseases did not show significant differences.

Conclusion: Neuromuscular disorders and the presence of low motor competence have a strong correlation to bone health for regional bone parameters in youth at risk of secondary osteoporosis, which suggest a mechanical loading influence. Given that effects of mechanical loading can be seen in regional bone analyses, we conclude that detailed characterisation of peripheral bone health using pQCT has the potential to identify areas for targeted exercise interventions to optimise bone health particularly in patients who present for treatment for other diseases and disorders.

Wixon R[1], Faraone S[1], Creighton M[2], Lacey M[3], Wright H[1,2], Smit A[1, 4], Deverell M[1], Collins R[2]

The Role of Primary Care in Transitioning Adolescents to Adult Health Services

Background and aim: This project was conducted by Planning and Promoting Adolescents & Young Adult Services (PAPAYAS) and the Child and Youth Health Network, WA Department of Health. The project aimed to consult with General Practitioners (GP's) to gain their perspective on and experiences in transitioning young adults from paediatric to adult health services in WA.

Research method: Consultation occurred at the Paediatrics GP Education Event, and the Rural Health West Conference. A hard copy survey was distributed and collected at each event. A total of 55 GPs participated to gain their perspective on GPs role in transition. A thematic analysis identified barriers and enablers of successful transition to inform future improvements.

Results: Major barriers included a lack of a formal transition process, inadequate collaboration between/within paediatric and adult services and irregular communication from health services to GPs. Common enablers mirrored the barriers mentioned. The majority of participants identified the role of a GP should be central in the transition process. Recommendations included enhanced collaboration between health services, a clear, well-structured transition pathway, clearer handover reports, greater GP involvement and improved availability of resources for health professionals and the community.

Conclusion: A documented, systematic and formal transition pathway involving paediatric and adult health services and community organisations, as well as clearly outlining the roles and responsibilities of health professionals, would enable optimal transition of young adults. This process should involve implementing the initiatives outlined in the Paediatric Chronic Diseases Transition Framework and WA Health Youth Policy 2018-2023 to improve health outcomes for young adults with chronic conditions.

1 Health Networks, Department of Health, 2 Perth Children's Hospital, 3 Fiona Stanley Hospital, 4 Joondalup Health Campus

Stenning A

PROTECT: IV pentoxifylline in premature neonates with late-onset sepsis

Background and aim: Premature infants are susceptible to systemic inflammation which is initiated by infections such as late-onset sepsis (LOS) and necrotising enterocolitis (NEC). There is a strong correlation between systemic inflammation and brain injury, and there is currently no routine treatment for systemic inflammation in the premature infant. Treatment is currently supportive alongside the use of antibiotic therapy.

A Cochrane review of 6 RCTs demonstrated that pentoxifylline reduced the level of pro-inflammatory mediators that contribute to brain injury, and there is evidence that pentoxifylline used as an adjunct to routine antibiotic therapy may decrease mortality and improve long-term disability outcomes in neonates who develop LOS or NEC. There were no adverse effects of pentoxifylline reported in this patient population.

Research method: A pragmatic, randomised controlled trial of intravenous pentoxifylline versus placebo in infants born at less than 29 weeks gestation with late-onset sepsis or necrotising enterocolitis. The aim of the trial is to enrol 1800 infants.

Results: As the lead site, King Edward Memorial Hospital has enrolled 222 infants to date with 81 randomisations, and over 300 babies recruited worldwide. The trial has been rolled out to numerous other sites across Australia and New Zealand, Singapore and Taiwan, with recruitment beginning imminently in Ireland and Canada.

Conclusion: Intravenous pentoxifylline as an adjunctive therapy to antibiotics shows promising signs of reducing systemic inflammation resulting from LOS or NEC in the premature neonate, as well as reducing mortality and adverse outcomes in this population.

Telethon Kids Seminar room, 3.30 - 5.00pm

Chair and research update: Dr Lea-Ann Kirkham

Barnett H

Immunisation Status in Children with Down Syndrome in Western Australia

Background and aim: Children with Down Syndrome are at increased risk of severe infection. There is currently no data available which assesses adherence of these children to the recommended vaccination schedule.

To determine the proportion of children with Down Syndrome who are up-to-date with their immunisations in accordance with the West Australian Immunisation Schedule (WAIS) for medically-at-risk children.

Research method: A database of children with Down Syndrome who have had an echocardiogram performed at a tertiary children's hospital was utilised to generate a list of 110 children born between August 2012 and November 2018. Medicare numbers were obtained and cross-referenced to obtain the child's Australian Immunisation Register (AIR) record, which advices their immunisation status. We examined both routine and recommended vaccinations for medically-at-risk children according to the WAIS.

Results: 110 cases were audited, of which 107 were included for analysis. According to AIR, 88.8% of children were up to date with routine vaccinations according to the WAIS. Only 24.3% of children were considered up-to-date for the recommended schedule for medically-at-risk children. 45.8% of children had at least one immunisation for influenza in the previous year.

Conclusion: In this cohort, immunisation rates for routine immunisations are below average and rates for medically-at-risk immunisations are low. This cohort remains vulnerable to vaccine preventable diseases. There is need for increased education for both patients and clinical staff with regards to the vaccines recommended for medically-at-risk children. We recommend implementing strategies, such as patient and clinician education, to improve vaccination rates in this medically-at-risk group

Mace A

Developmental-behavioural and psychosocial comorbidities within a Child Development Service cohort

Background and aim: Developmental and behavioural concerns are a common indication for outpatient paediatric consultation. Medical and psychosocial comorbidities are common, frequently coexist and may negatively impact on both individual health and care provision. There are limited data to describe the prevalence of comorbidities within a dedicated child development service (CDS). This study aims to examines the developmental, behavioural and psychological needs of a large paediatric cohort receiving care through the Perth CDS to help inform future practice.

Research method: Retrospective cross-sectional cohort study of all patients on a paediatrician caseload within the Perth CDS in December 2014. Univariate and multivariate analyses examining relationships between psychosocial complexities and developmental outcomes were performed.

Results: Demographic and clinical data for 4554 children are described (median age 6.77 years (IQR 4.72, 9.71)). 83.6% had at least one developmental/behavioural issue; 50% had more than two. Attention deficit hyperactivity disorder (ADHD) was the most frequent diagnosis. Learning difficulties (LD), mental health and emotional/behavioural issues were common. 28.9% had documented psychosocial complexities, particularly financial stress and parental mental health issues. Psychosocial complexities were significantly associated with general and emotional health concerns (including continence and attachment issues), all mental health concerns (particularly post-traumatic stress disorder), numerous developmental/behavioural diagnoses (including ADHD, global developmental delay/intellectual disability and LD), and social work involvement, which persisted in multivariate analyses.

Conclusion: Children seen within a dedicated CDS have varied developmental-behavioural and psychosocial backgrounds. In-depth histories to include psychosocial complexities are recommended. Partnering with multidisciplinary services may assist families and warrants further study.

Rakshasbhuvankar A[1,2,3], Clarke M[4], Simmer K[1,2], Patole S[1,2], Pillow J[1,2,3]

Saliva for assessing vitamin A status in extremely preterm infants: a diagnostic study

Background and aim: Salivary measurement of hormones and vitamins is gaining prominence as a minimally-invasive procedure with negligible potential for harm. We aimed to assess the utility of saliva for assessing vitamin A status in extremely preterm infants.

Research method: Paired saliva and blood samples were collected at four weeks of age from infants born <28 weeks' of gestation using a proprietary polymer swab. Plasma retinol was measured using high-performance liquid chromatography and salivary retinol was measured using enzyme linked immunosorbent assay. Spearman's correlation coefficient was used to determine correlation while Bland-Altman analysis was used to check agreement between plasma and salivary retinol levels.

Results: Thirty infants with median (interquartile range) gestation and birth-weight of 26.2 weeks (24.8 to 27.2) and 865 g (718 to 1002) respectively were recruited. An adequate volume of saliva (>50 µL) was obtained in 68 %. The plasma and salivary retinol levels (mean ± standard deviation) were 22.5 ± 9.9 µg/dL and 22.2 ± 11.0 µg/dL respectively. There was no significant correlation (Spearman's correlation coefficient = 0.16; p=0.3) between individual

plasma and salivary retinol levels. Bland-Altman analysis showed wide limits of agreement (-113 to +119 %) between individual plasma and salivary retinol levels.

Conclusion: Saliva may not be useful to assess vitamin A status in extremely preterm infants.

1 Neonatal Clinical Care Unit, King Edward Memorial and Perth Children's Hospitals, Perth, Western Australia, Australia, 2 Centre for Neonatal Research and Education, Medical School, University of Western Australia, Perth, Western Australia, Australia, 3 School of Human Sciences, University of Western Australia, Perth, Western Australia, Australia, 4 Metabolomics Australia, Centre for Microscopy, Characterisation and Analysis, University of Western Australia, Perth, Western Australia, Australia

Armstrong, J[1,2], Wray, J[2,3], Davidson, E[2], Mizen, J[2], Girdler, S[1], Elliott, C[1,2]

Applying knowledge translation to tailor therapy services to address consumer needs

Background and aim: through primary CF epithelia or CF fibroblasts would induce PMN reprogramming.

Research method: Migration were migrated for 10 hours from the basolateral to the apical compartment. Expression of CD16 and CD63 on migrated PMN was then assessed by flow cytometry.

Results: Comparing PMN following migration through the existing H441 model, H441 co-cultured with fibroblasts, and fibroblasts alone, we when migrated through CF vs non-CF epithelium.

Conclusion: The CF epithelium alone did not trigger PMN reprogramming. This suggests additional contributing factors like infection are required. Future work will incorporate

1 Curtin University, 2 Child and Adolescent Health Service, 3 University of Western Australia

Jeffries-Stokes C

Kupi – Drinking water and chronic disease

Background and aim: The Western Desert Kidney Health project (WDKHP) was an innovative research project that grew from the despair of the Aboriginal people of the Goldfields of Western Australia and their desire to understand more about diabetes and renal disease. Long term relationships with Aboriginal researchers embedded in the community, with cultural authority was a critical feature of this research.

Research method: The WDKHP was a community based participatory research project. It was conducted in 5 towns and 5 remote Aboriginal communities over lands of people of Western Desert Language groups. Participation was offered to all people regardless of age or ethnicity. The aims of the project were to determine the prevalence of type 2 diabetes (T2DM), kidney disease and the risk factors for these diseases in Aboriginal and Non-Aboriginal adults and children in a remote area of Western Australia and to compare those prevalence rates with national rates.

Results: The WDKHP found higher than predicted rates of T2DM, hypertension, haematuria, aciduria and elevated ACR in Aboriginal and non-Aboriginal adults and children. There was no difference between Aboriginal and non-Aboriginal children and no difference between participants living in towns compared to those living in remote communities.

Conclusion: The rates of T2DM, hypertension and markers for kidney disease for Aboriginal and non-Aboriginal participants were higher than expected suggesting ethnicity might be less important that environmental and lifestyle factors. Drinking water quality in the study communities is similar to many remote areas and often does not meet national and international safety guidelines and may be contributing to chronic disease.

Oral Abstracts
Friday 8 November

High value health care empowered research

PCH Auditorium, 10.30 - 12pm

Chair and Overview: Dr Aresh Anwar, CAHS CEO

Hauser N

Evolution of the Peripherally Inserted Central Catheter (PICC) service

Background and aim: PICC lines are frequently used for long term venous access. There was a concern at PMH that PICC lines were not being appropriately managed.

Research method: Between January 2012 and June 2013 patients referred to Anaesthesia for PICC insertion were prospectively followed up. A second audit, conducted between January 2015 and June 2016, followed the introduction of a number of measures aimed at improving the PICC service.

Results: Audit 1: Two-hundred PICC insertions were attempted in 138 patients. Successful PICC insertion rate was 81.5%. The median age of patients was 7,71 years. The commonest indication for PICC insertion was a non-respiratory infection. Less than 50% of PICC's (81/ 163 or 49.7%) remained in situ for the planned duration. Ultrasound was used to aid insertion in less than 50% of cases.

Audit 2: 310 PICC insertions were attempted in 244 patients. Successful PICC insertion rate was 95, 5%. The median age of patients was 5.3 years. The commonest indication for PICC insertion in was: Cystic Fibrosis exacerbation. The percentage of PICC's remaining in-situ for the predicted duration was 145/ 298 (48.7%). Ultrasound was used for real-time guidance in 100% of attempted PICC placements.

Conclusion: The evolution of the PICC service at PMH and PCH is well documented following these two audit periods. The introduction of a dedicated PICC service resulted in improved success rates of insertion as well as a reduction in noted complications.

Mitchell C

Audit of ferric carboxymaltose use and safety in 144 cases at Perth Children's Hospital

Background and aim: Iron deficiency anaemia has a high prevalence among children and oral supplementation is often not tolerated. Iron sucrose is the traditional preparation for

parenteral replacement, but requires a slow infusion and can have complications including extravasation injury. Increasingly, ferric carboxymaltose is becoming the preferred preparation for parenteral iron, with a rapid infusion time, favourable risk profile and ability to administer higher doses. However, data confirming safety among children in real-world settings are limited.

Research method: Retrospective audit of patients who received ferric carboxymaltose at PMH/PCH from 9/10/2014 to 31/12/2018. Pharmacy dispensing database was used to identify cases. Medical records were then audited and data entered into REDCAP for analysis.

Results: 144 cases were identified. 76 were male, 68 female. Their age range 13months to 18years. The main

treating teams were Gastroenterology (67), General Paediatrics (24), Renal (17), Oncology/Haematology (9) and Surgical (5). Identified reasons for iron deficiency included inflammatory bowel disease (50), nutritional (41), chronic kidney disease (20) and malabsorption (12). 19 cases (9.8%) experienced an adverse reaction. These included urticaria (5), redness (1), rash (4), painful infusion (2). There were no incidences of anaphylaxis or infusions ceased early. The duration of infusion ranged between 14 and 145minutes (median 25minutes, IQR15-30). The dose of elemental iron administered ranged from 4.24mg/kg to 20.59mg/kg (mean 14.28mg/kg; SD2.15).

Conclusion: Ferric carboxymaltose is a safe parenteral iron preparation. It can be infused relatively quickly, is well tolerated and given at higher doses than traditional iron preparations reducing the need for multiple infusions.

Schueller S

Intravenous pentoxifylline is safe in preterm infants with sepsis or NEC

Background and aim: Despite continued advances in neonatal medicine, sepsis and necrotizing enterocolitis (NEC) remain leading causes of death worldwide. Presently, there is no evidence-based adjuvant drug available targeting the harmful inflammatory host response associated with sepsis or NEC. Pentoxifylline (PTX) is a methylxanthine derivative with immunomodulatory properties and a candidate medication for adjuvant treatment of sepsis and NEC. However, there are only limited data on safety and tolerability of intravenous PTX in preterm infants available.

Research method:

Design: Retrospective cohort study

Setting: Tertiary NICU

Patients: 198 preterm infants (mean GA 27w; mean BW 1,060g)

Intervention: Electronic medical records of all NICU patients who received pentoxifylline for sepsis or NEC were identified (09/2012-09/2018).

Results: We analysed a total of 1,081 PTX treatment days from 217 treatment episodes. At a mean daily dosage of 28 mg/kg, no clinically relevant side effects were observed. A reversible increase in heart rate (4 ± 11 bpm; $p<0.0001$) was associated only with the first dose of PTX. PTX therapy was not associated with clinically significant changes of blood biochemistry and haematology parameters. None of the deaths in the cohort of preterm infants with sepsis or NEC were attributed to PTX. Concomitant infusion of PTX with other common

NICU medications, including antibiotics, catecholamines and standard parenteral nutrition was well tolerated and no episodes of precipitation or cloudiness in catheters were observed.

Conclusion: Intravenous PTX was compatible with standard NICU drugs and was well tolerated in critically ill newborns. Further clinical trials are needed to elucidate efficacy of intravenous PTX in infants with sepsis or NEC.

Campbell L

Children with bronchiolitis: Choosing Wisely

Background and aim: Bronchiolitis is an acute self-limiting viral infection and is the most common cause of admission to hospital in the first year of life. Despite clear evidence that investigations such as chest X-rays (CXRs) and blood tests are of limited value and that no treatment changes the natural history of the condition, many infants continue to undergo unnecessary investigations and treatments. We aimed to assess our current practice as compared to the recently published Australasian bronchiolitis guideline.

Research method: We identified infants <12 months of age who were admitted to PMH or PCH from 1st July 2017 to 30th June 2018 with a diagnosis of acute bronchiolitis, using ICD-10 codes J21.0, J21.8 and J21.0. Patient demographics, investigations and management were collected utilising patient medical records and iSOFT.

Results: 462 infants were admitted with acute bronchiolitis and we randomly selected 100 (mean age 5.1 months, 57 male). Only 11 infants were managed entirely according to the bronchiolitis guidelines. 74 infants had a nasopharyngeal aspirate, 28 had a blood test (FBC, UEC and or Blood Cultures) and 17 had a CXR. 11 infants were given antibiotics, 8 beta-2 agonists, 4 glucocorticoids, 1 hypertonic saline and none were given adrenaline. Two infants received chest physiotherapy.

Conclusion: Infants <12 months who are admitted to PMH/PCH with bronchiolitis continue to have investigations and treatments for which there is no evidence of benefit. Further education regarding the Australasian bronchiolitis guideline is planned to improve evidence-based management of these patients.

Verissimo V

Optimising infection prevention in at-risk children without a spleen

Background and aim: Children with an absent/dysfunctional spleen (asplenia) are at a lifelong risk of overwhelming post-splenectomy infection (OPSI), from some vaccine preventable diseases. National and hospital guidelines recommend antibiotic prophylaxis and additional immunisations as the cornerstone of infection prevention. Aim: to assess adherence to infection prevention recommendations for children with asplenia and identify episodes of OPSI.

Research method: Children ≤18yr at PMH/PCH with a diagnosis of asplenia were identified retrospectively over 15 years (2003-2018) through ICD-10 codes, haematology, Infectious diseases and theatre databases. Immunisation records were obtained through the Australian Immunisation Register (AIR) and education as well as OPSI episodes were assessed from the medical record and laboratory IT system.

Results: 94% (44/47) of children with asplenia commenced antibiotic prophylaxis at diagnosis, only 55% continued, median duration of 89 days (IQR 34-216). 85% were up to date with routine vaccinations; however 84% had not received additional asplenia

vaccinations. Children were more likely to be up to date (Odds ratio (OR) 13.6, p=0.04) and receive education on fever management, travel and medic alert bracelet when reviewed in the Specialist Immunisation Clinic versus other healthcare providers. Three OPSI episodes were identified with two deaths.

Conclusion: Adherence to infection prevention measures remains unsatisfactory. Children with asplenia benefit from review by a Specialist Immunisation Service. Previous studies demonstrate reduction in OPSI with a spleen registry. WA remains one of three states not part of the National Spleen Registry; this is vital to optimise patient education, infection prevention and ultimately save lives.

Poster Abstracts

Wednesday, 6 November, 4:30pm – 7:00pm

PCH Collegiate Lounge, Level 5

1 Alejandro A

Influencing Antimicrobial Resistance Awareness of Parents with Young Children: A Social Marketing Approach

Background and aim: Children consume the largest amount of antimicrobials in the community. According to the first Antimicrobial Use and Resistance in Australia Report (AURA), an estimated 57% of 0-4 year-old children received at least one antibiotic in 2016 and were prescribed large quantities of extended spectrum penicillin. A large amount of prescriptions are viewed as unnecessary, as most childhood upper respiratory tract infections are viral in nature, self-limiting and antibiotics are not shown to reduce the duration of illness.

The limited knowledge of parents about antibiotics contributes to the high prescription rate of antibiotics among children (Bosley et al., 2017). Consequently, parents represent a vital target group in raising awareness towards judicious antimicrobial use and antimicrobial resistance. Previous interventions to improve parental behaviour towards antimicrobial use lacked application of behavioural-change theories (WHO, 2017). The WHO recommended AMR campaign messages be based more rigorously on scientific evidence and behavioural change theories, while considering the specific context of each idea. Hence, this research employs social marketing principles, which have been used successfully in public previous health campaigns (Firestone, et al. 2017).

This study aims to understand the health beliefs and practices of parents with young children surrounding antimicrobial resistance. Through intervention design, this study helps develop activities that will aid health practitioners, health services, and social marketing practioners to improve awareness of antimicrobial resistance and behaviour towards prudent use of antibiotics. Finally, this study provides insights into the effectiveness of a social marketing approach to improve antimicrobial resistance awareness.

Research method: There are two stages to this mixed-methods study. Study 1 is qualitative and exploratory, and aims to establish the level of knowledge, attitudes and practices towards antibiotic use and AMR of parents with children aged 0-4 years old. In Study 2, findings of Study 1 will be used to design a multi-modal social marketing intervention aimed at influencing the behaviour of parents with young children towards antibiotics and AMR. Study 2 involves a pre- and post-evaluation of parental knowledge, attitude and practices of the proposed intervention. Parents visiting Child Health Community Centres will be recruited over an 18-

month period. A cluster, randomised-controlled trial will be undertaken. The proposed study will be conducted in local government areas, with Mandurah serving as the intervention arm and City of Melville as the control location.

2 Martin L, Long T, Wong I, Rea S, Wood F

Using Quality of Life Outcome Measures in Paediatric Burns

Background and aim: Burn injury has significant physical and psychosocial effects on children. Broad measurement of these effects can be ascertained with the use of patient-reported or parent-reported outcome measures such as the PedsQL. The PedsQL is as age-specific generic quality of life measure used in many areas of health care, including burns. The burns multidisciplinary team routinely use this measure in the burns outpatient in clinical practice. The aim of this study was to assess the staff and participant's experience of its use.

Research method: Observational data was collected in burns outpatients to assess ease of use, time taken to complete, and barriers to completion for participants. Qualitative staff feedback was obtained from the multidisciplinary team for its use as a therapeutic tool.

Results: The PedsQL was quick and easy to complete by most participants. Barriers to use included difficulties with interpretation of items, English as a secondary language, and answering specific items in reverse. Staff found the tool useful for identifying issues that would have remained unknown, and for guiding discussion around these.

Conclusion: The PedsQL was overall a quick and easy tool to assess overall quality of life for paediatric burn patients. It was deemed to be a useful therapeutic tool to identify problems and start discussion with the patient and their parents to resolve these.

3 Shripada R

Gut Microbiota in Neonates with Congenital Gastrointestinal Surgical Conditions: A Prospective Study

Background and aim: There is limited information on gut microbiota of neonates with congenital gastrointestinal surgical conditions (CGISC).

Research method: This study compared the gut microbiota of 32 term infants with CGISC with that of 36 term healthy infants (HI). Two stool samples were collected from each infant: as soon as possible after birth (week1) and 10-14day of life (week2). Stool microbiota was analysed using 16S ribosomal RNA sequencing.

Results: Bacterial richness and alpha diversity were similar in both groups at week1 and week2 (all $p>0.05$). At week1, beta diversity analysis showed that CGISC had similar community structures to HI ($p>0.05$). By week2, community structures of CGISC were significantly different compared to HI ($p<0.05$). At week1, there were no significant differences between CGISC and HI for the genera Bifidobacterium and Bacteroides. At week2, relative abundance of Bifidobacterium was significantly lower in CGISC compared to HI [mean 7.21 (SD 13.49) vs 28.96 (SD19.6); $p=0.0001$]. The relative abundance of the genus Bacteroides was also significantly lower in the CGISC [mean 0.12 (SD 0.49) vs 6.59 (SD 8.62); $p=0.000001$].

Conclusion: During hospitalisation, neonates with CGISC develop gut symbiosis with deficiency of Bacteroides and Bifidobacterium. Randomised controlled trials of Bifidobacterium supplementation in neonates with CGISC are needed.

4 Barth D, Dickerson N, Macarthur R, Chou C, Mullane M, Carapetis J, Bowen A

The epidemiology of Strep A pharyngitis and Impetigo: The Missing Piece Study

Background and aim: Acute rheumatic fever (ARF) is the commonest cause of acquired heart disease in childhood. Although a causal pathogenic pathway has been confirmed between pharyngitis and subsequent ARF, a plausible link has been proposed between impetigo and ARF. A key piece of missing evidence is that Strep A pharyngitis is truly rare. We aimed to evaluate the concurrent burden of Strep A pharyngitis and impetigo in Aboriginal children (5 – 15 years) in the Kimberley, Western Australia

Research method: This school-based study in two remote schools is designed to collect clinical, serological, microbiological, and molecular data on Strep A pharyngitis and impetigo. This study comprises two components: (a) Screening the entire consented population three times in the year, (b) weekly surveillance for symptomatic pharyngitis and impetigo. All swabs will be cultured for isolate identification, followed by molecular characterisation to inform the 30-valent vaccine formulation. Preliminary results are reported from screening visit 1.

Results: We enrolled 124 children; 76 male (61%) and 62 (50%) identified as Aboriginal. The prevalence of sore throat and skins sores were 10% (n=13) and 27% (n=33) respectively. Fifty one percent (n=52) of children had an ASOT reading of >200 IU. Throat swabs (n=118) and skin swabs (n=39) will undergo laboratory and molecular evaluations.

Conclusion: This work has important implications for guidelines and policies targeting primary prevention of Strep A infections driving high rates of ARF in Australian Aboriginal children. We anticipate our sequencing results from Strep A pharyngitis and impetigo will further contribute to vaccine initiatives underway.

5 Thomas C

Client Evaluation of the Gender Preoccupation and Stability Questionnaire: Perspectives from an Australian Adolescent Gender Clinic

Background and aim: An increasing number of young people worldwide identifying as trans or gender diverse, and service providers must ensure the most appropriate assessment tools are used for those seeking gender-affirming medical intervention. The Gender Preoccupation and Stability Questionnaire (GPSQ) is currently used by the Gender Diversity Service (GDS) at Perth Children's Hospital, Western Australia. The GDS also uses the Utrecht Gender Dysphoria Scale (UGDS). However, clients on gender-affirming hormones have expressed dissatisfaction with the UGDS because of the binary nature of the measure and perceived relevance of some items.

We sought to investigate which of the two gender measures would be rated by GDS clients as being most acceptable and relevant. It was hypothesised that clients would find the GPSQ easy to use and understand, and that those currently undergoing gender-affirming hormonal intervention prefer the GPSQ to the UGDS.

Research method: Clients seen between July to December 2018 were invited to participate as part of their routine assessments. Clients completed the GPSQ, UGDS and a feedback form consisting of seven questions about whether the GPSQ was easy to use, acceptable and preferable over the UGDS.

Results: Seventy-one participants aged 12 to 18 years old (M = 15.32 years, SD = 1.48 years) participated. On average, participants found the GPSQ easy to understand and use. Chi-

square test indicated that participants receiving gender-affirming hormones were more likely to endorse the GPSQ over the UGDS.

Conclusion: The results demonstrate that the GPSQ, when used in an adolescent gender clinic, is acceptable to 12 to 18-year-old consumers and is perceived by clinicians to be a useful tool across the spectrum of all gender identities. The findings indicate that the clinical appropriateness and consumer acceptability of gender measures may change in accordance with a young person's stage of their journey of gender transition and gender-affirming medical intervention. Consequently, our service will continue to use both the UGDS and GPSQ as assessments of gender, unless the young person commences gender-affirming intervention, after which only the GPSQ will be used.

7 Assetta R

Reviewing the orthotic management of flexible flat foot to inform service planning

Background and aim: Perth Children's Hospital (PCH) Orthotics Service (OS) waitlist had >200 patients waiting >2.5 years with no new patients receiving appointments. Many waitlist referrals were for orthotic management of Paediatric Flexible Flat Foot (PFFF). The project aimed to analyse current practices and processes to streamline services and reduce waiting times.

Research method: Attempting to reduce inefficiencies and increase new appointments, PCH OS trialled technical duty reallocation, CADCAM implementation, increasing orthotist KPIs and SMS appointment reminders. Improvements in work flows were noted however the impact on waiting times was minimal.

A quality improvement (QI) project was completed; including a literature review, comparison of PCH OS treatment data to the review and formulation of an evidence based practice (EBP) guideline for orthotic management of PFFF. With the option to 'not treat' the guideline aims to increase discharges, and appoint new patients.

Results: The QI project and PFFF guideline presentation to PCH orthotists lead to the implementation of an EBP treatment and review pathway. A report highlighting the current state of PCH OS requested a decision from CAHS executive to either reduce intake eligibility or increase staffing. PCH OS will trial a temporary increase in staffing to reduce the waitlist, collect and analyse data. This data will assist in redefining the eligibility criteria and will quantify staffing required.

Conclusion: Looking internally to review current workflows, audit EBP and streamline services is a crucial step for services attempting to reduce long waiting times for new patients. Internal review results can be used in future service planning and funding applications.

8 Smith C[1], Holmes P[2]

A retrospective review of General Medical Inpatient Note-Keeping in the Department of General Paediatrics pre and post-intervention in November 2017

Background and aim: Informed by a review of current Australian and UK standards, the following details were audited during a retrospective review of 72 medical files of all inpatients admitted under DGP (Department of General Paediatrics) during two, 3-day periods in November 2017.

Research method: For each entry made by the medical team: name and designation of doctor writing the entry, legibility, date, signature and identification of most senior doctor present, discharge diagnosis and immunisation status were recorded. The DGP implemented an intervention detailing the minimum acceptable information required for adequate inpatient progress notes and outlining why this was important. The audit

was repeated over 3-days following the intervention. November 6-8 (42 patients) fell within the pre-intervention periods and November 20-22 (30 patients) fell after the intervention had been implemented.

Results:

Measurement variable	*Improvement*
Number of Entries	N/A
Length of Stay	N/A
Discharge Diagnosis	16.5%
Follow-up plan	11.25%
Name	8.89%
Date	1.92%
Time	3.13%
Signature	-3.85%
Immunisation status	28.25%
ID of most senior doctor	3.85%

Conclusion: The results demonstrate the effectiveness of regular education in maintaining accurate inpatient medical notes. This study demonstrated the efficacy of education and highlights the importance of understanding why information documented. The most improved area within documentation is immunisation status.

Inpatient notes in busy tertiary hospitals are often the only handover between hospital admissions and primary healthcare, making them extremely important in adequate ongoing healthcare for children. The importance of attendance has also been demonstrated with regards to coronial inquests. Regular, ongoing, targeted education sessions with new employees appears to be an effective method of maintaining a legal and desirable standard of documentation. Future opportunities will be explored.

1 Perth Children's Hospital, 2 Department of General Paediatrics

9 Harb L[1], Larcombe, A[1,2]; Strickland D[1], Martino D[1], Bosco A[1]

Impairment of respiratory system via early life environmental insults

Background and aim: Early life environmental exposures can alter developmental trajectories and induce long-term changes in physiological function. We hypothesised that respiratory viral infections in early-life would perturb the respiratory development of BALB/c mice and result in altered lung function as adults.

Research method: BALB/c pups were inoculated with Mengovirus, Influenza A/Mem/1/71, Influenza A/PR/1/8 or relevant control at seven days of life. Mice were clinically scored and weighed daily and bronchoalveolar lavage (BAL) was taken from half the pups at seven days' post-infection for assessment of cellular inflammation. The remaining pups were left to grow to adulthood, at which point lung function and responsiveness to methacholine (MCh) were assessed. BAL samples were also taken post study.

Results: Infected mice showed no overt clinical symptoms or changes in body weight during acute infection, and there was no additional cellular inflammation compared with controls at either age. Infection with Influenza A/PR/1/8 at 7 days of age resulted in mice being significantly more responsive to MCh as adults with respect to central airway resistance, compared with uninfected controls. There was sexual dimorphism in response to Mengovirus (only previously infected males significantly more responsive to MCh as adults) and Influenza A/Mem/1/71 (only previously infected females significantly more responsive to MCh as adults).

Conclusion: This study showed that an early-life viral infection can impact physiological function in adulthood. Future studies will explorer the molecular basis for these changes with the goal being to assess if FDA approved drugs can ameliorate viral-induced functional deficits.

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10 Mascaro F

Reviewing the orthotic management of flexible flat foot to inform service planning

Background and aim: Influenza (flu) vaccination of young medically at-risk children reduces the risk of hospitalisation and severe infection. The PCH outpatient department sees up to 800 children a day, capturing large numbers of eligible children.

Research method: A dedicated nurse-led team delivered a 13-week targeted flu vaccination program at the Stan Perron Immunisation centre and throughout outpatient areas. In 2019, notifications for flu infection were unusually high and early in the season. With the goal of providing optimal protection to our most vulnerable children, the PCH Immunisation service broadened flu vaccine eligibility to all children and families of CAHS.

Results: Over the 2019 flu season a record 2970 flu vaccines were administered to children and their families (1049 children <5 years, 1175 children >5 years and 677 adults) totalling 3 fold increase in the number of flu vaccines delivered in previous years which exceeds the increase seen in the state overall. In addition, required routine vaccines were given with the flu vaccine.

Conclusion: This data supports the importance of a dedicated Immunisation service within a tertiary paediatric hospital, delivering the influenza vaccine to children at highest risk of severe disease, as well as using the cost-effective cocooning strategy to protect children through vaccination of the family.

11 Drake-Brockman T

Towards better monitoring of children's postoperative pain

Background and aim: Follow-up for ongoing management and monitoring of children's pain following surgical procedures is important for clinical practice and research but contacting families can be challenging and time consuming once children leave the hospital. While common, telephone follow-up is resource intensive and, in our experience, yields low success. Other modalities, such as SMS messaging or online surveys, may provide more efficient alternatives.

Research method: To assess attitudes towards electronic follow-up, we surveyed 642 parents and carers at Perth Children's Hospital, targeting demographics, device ownership and attitudes towards electronic follow-up. Following the completing of this survey we are working towards a pilot study of a novel approach to postoperative follow-up using automated SMS messaging.

Results: Mobile phone ownership is effectively universal in our family demographic. Almost all families are happy to communicate electronically with the hospital. Promisingly, 93.2% of families were happy to receive follow-up SMSs from the hospital and 80.3% were happy to reply to SMS questions. There was less enthusiasm regarding other modalities, with 59.9% happy to use a website and 69.0% happy to use a mobile app. These results have informed the design of our current pilot study.

Conclusion: Our survey results support the introduction of electronic communication for follow-up in our paediatric population, although we are investigating further to determine how best to do this. We expect that optimising this process will enable broader follow-up activities to be conducted, in turn enabling more comprehensive quality improvement activities.

13 Long T

Evaluation of the use of functional outcome measures following burn injury in children

Background and aim: Data from the Burns Registry of Australia and New Zealand indicate that 82% of burns cases admitted to Perth Children's Hospital have upper and/or lower-limb involvement. Long-term complications of limb-based burn injury include muscle weakness, gait abnormalities, impaired balance and coordination, reduced hand function and complications regarding the performance of activities of daily living. The timed-up-and-go (TUG) evaluates functionality of the lower-limbs, while the grip strength (GS) test evaluates power of the forearms and hands. Both assessments have been validated as reliable measures of recovery following adult burn injury. However, the utilisation of these tests for appraising rehabilitation following paediatric burn has not been evaluated.

Research method: Timed-up-and-go and GS were assessed in 89 children with burn scars (≥6 weeks post-burn). Assessments took place during routine follow-up clinics at Perth Children's Hospital. Clinical data was collected alongside physical outcome measures so variables such as injury site could be accounted for in analysis. Data was compared against published norms.

Results: Preliminary analysis reveals TUG results were statistically higher than age-equivalent population norms, even for those with lower-limb injury. Grip strength was within age-equivalent population norms; however, for patients with hand burns there was evidence of an effect towards reduced GS. Further analysis will be presented.

Conclusion: The TUG is not sensitive enough to detect lower-limb dysfunction in those ≥6 weeks post paediatric burn. Individuals with hand burns may experience long-term grip weakness. This finding is clinically significant and demonstrates that GS is a useful measure in this cohort.

14 Wong I

The Usefulness of a Bi-national Registry in Paediatric Burns Care and Prevention

Background and aim: The Burns Registry of Australia and New Zealand (BRANZ) records information on burn injuries that comply with specified criteria. In Western Australia, data has been collected on 1688 paediatric burns patients since 2010. This data is regularly used to appraise clinical service and drive burns prevention initiatives. Here, we highlight key areas of improved knowledge following review of BRANZ data, thereby emphasizing the usefulness of this registry.

Research method: We identified all quality indicator analyses and preventative initiatives that have been derived from BRANZ data over the past nine years. The Lund and Browder Chart and the 'Ben and Bella' book were identified as prime examples of BRANZ-driven outcomes, based on their positive implications for clinical practice and burns safety awareness.

Results: Appraisal of the BRANZ database revealed a low compliance regarding completion of the Lund and Browder Chart quality indicator in paediatric burns admissions during 2016-2018. A manuscript was then published outlining reasons for non-compliance, justifying the need for educational programs focussed on imbedding Lund and Browder Chart use in clinical practice. Retrospective analysis of BRANZ data indicated a lack of public knowledge regarding burns first aid, motivating the development of the 'Ben and Bella' book – a child-targeted, public education resource raising burns safety awareness and teaching the current evidence-based first aid.

Conclusion: Maintaining an updated BRANZ database is essential for informing targeted and effective public health campaigns. BRANZ uniquely collates and shares local and bi-national data, instrumental for benchmarking quality indicators to encourage higher standards in patient care.

15 Smith S

Parental sleep when the child is sick: A concept analysis

Background and aim: Regardless of the illness, having a sick child can be a traumatic experience for the entire family. Sleep affects not only the parents' wellbeing but also the child's care as symptoms of sleep loss may limit the parents' ability to meet the child's need. An ill child demands more care, making sleep disturbance a common challenge among parents.

The purpose of this concept analysis is to analyse and clarify the conceptual basis of parental sleep when the child is sick and determine the knowledge state. How the concept is described, used and measured in the current literature will be explored.

Research method: A principle-based concept analysis is currently underway. CINAHL, Embase, Medline, PsychInfo, Pubmed, Scopus and Web of Science have been systematically searched and 399 articles identified. Studies will be included if they are peer-reviewed, explore parental sleep and published in English. Final articles will be quality assessed and analysed using thematic analysis. NVivo will be used to manage the data.

Results: Findings will be presented in relation to the four principles: the clarity of definition (epistemology), applicability of the concept (pragmatics), consistency in use/meaning (linguistics), and differentiation from related concepts (logic).

Conclusion: The absence of effective concepts impedes the ability to recognise, discuss, define and conduct studies important to clinical practice and research. The concept analysis also has the potential to determine a measurement tool to be used in study design and future interventions post this research and will be discussed in relation to our findings.

16 Alestalo T

The Impact of Psychosocial Screening on the Intensity of Social Work Interventions

Background and aim: The Psychosocial Assessment Tool (PAT) is a screening tool used (by Social Workers in Oncology at Perth Children's Hospital (PCH)) to evaluate psychosocial risk. It provides a three tiered health model of family adjustment risk (Universal, Targeted and Clinical) based on the total PAT score. In the Western Australian Department of Health, the Allied Health System (AHS) records clinical activity and clinical support activity and is used by Allied Health professionals.

To investigate the effectiveness of the PAT in identifying the future intensity of social work interventions in paediatric oncology.

Research method: Families of 135 children diagnosed with cancer (at Princess Margaret Hospital (PMH) / PCH) in 2016 and 2017 completed the PAT with a Social Worker.

92 families were excluded due to their Universal risk status. The remaining 43 families classified in the Targeted and Clinical risk groups were correlated with the social work time recorded on AHS since date of diagnosis until one year post diagnosis.

Results: Of the 43 families included, 26 were classified into the targeted range of interventions and 17 into the clinical range of interventions. A positive and statistically significant correlation between the PAT score and the intensity of social work services provided was observed.

Conclusion: Social work practice has many ways of describing the 'cancer experience', yet the benefit of a quantitative method in research can influence the future level of psychosocial risk. Effectively identifying the families at greatest risk for ongoing psychosocial distress is important for directing the implementation of social work services.

17 Tallon M

Parental stress and coping: Caring for a child with a chronic condition

Background and aim: Chronic conditions among children are rising. Parents of children with chronic health conditions are at risk of experiencing higher degrees of parental stress due to the substantial social, emotional and personal demands associated with care-giving.

We aim to explore parents' experiences of parental stress and to identify factors that may increase/decrease stress. In paediatric nursing, it is important to have a generic perspective and find commonalities and support possibilities that suit parents irrespective of the child's condition.

This study is in collaboration with PCH Nursing Research Consumer and Youth Advisory Panels who have consulted on the study and Kalparrin, an established and recognised organisation that supports families of children with special needs.

Research method: Up to 24 parents will be interviewed from three age groups 1) birth to 5 years, 2) 6-12 years 3) 13-19 years about their child's diagnosis/management, their coping strategies, and how they feel about themselves and their relationships with others. Parents will be recruited through Kalparrin. Interviews will be semi-structured, audio-recorded, transcribed, anonymised, and analysed using the multi-perspective approach to Interpretative Phenomenological Analysis which emphasises the importance of personal meaning of experiences of major significance such as a child's complex medical needs and its impact.

Results: Preliminary findings will be presented.

Conclusion: We seek to provide a detailed understanding of the issues faced by parents caring for children with chronic conditions in WA. We aim to develop further research questions/studies and evaluate and implement new interventions based on the findings of this study.

18 Ellis J

A Physical Late Effects Clinic for Children following Oncology Treatment

Background and aim: Recognising detrimental physical effects following treatment of paediatric cancer is important as these impact school and family-life demands. We aimed to determine if a tertiary physiotherapy late effects clinic was needed and useful for identifying, preventing and/or managing physical late effects.

Research method: Six paediatric tertiary oncology services were surveyed to establish referral criteria and management information and used to develop risk categories for the pilot physiotherapy late effects clinic. Children identified as 'high risk' were allocated a appointments between 9 and 18 months post end of treatment. Assessments included gross motor function, musculoskeletal, pain, balance, strength, respiratory function and quality of life.

Results: Three risk groups for physical late effects were identified: low: already established follow up pathway; medium: limited evidence of late effects morbidity; high: likely to have late effects and risk of loss to follow up.

Twelve of thirty identified high risk patients attended the offered appointment. Of the 12 assessed, all had been treated for Acute Lymphoblastic Leukaemia and 8/12 patients identified fitness as their primary concern. Four were discharged with education/advice; the remainder improved their strength/fitness outcomes with physiotherapy. Gaps in community services for managing oncology late effects that did not require tertiary care were identified. Parents verbalised the assessment was valuable but should occur sooner.

Conclusion: A physical late effects clinic at end of treatment is beneficial to patients identified as high risk of physical late effects. There is a need to liaise with community providers to establish services closer to home.

19 Gaynor M[1,2], McGowan N[1], Bourke C [1,3], Wood J[2,3], Depiazzi J[1,3]

Transitioning to adult physiotherapy services: the Western Australian experience

Background and aim: The transition of adolescents with cystic fibrosis (CF) from paediatric to adult services is a stressful experience for patients and families for a number of reasons,

including: (i) leaving well-known caregivers; (ii) physical environment and wayfinding; and (iii) meeting a new care team.

In June 2018 the Western Australian (WA) paediatric CF centre moved to the same site as the WA adult CF centre. This provided a unique opportunity to change the experience for young people with CF transitioning to adult services. Previously, a formal outpatient transition clinic was attended by the patient and their family, and the whole adult CF team. Now that the 2 centres are co-located, physiotherapists from both the paediatric and adult CF teams provide a joint inpatient airway clearance treatment of a transitioning adolescent.

Our aim was to gain insight into the value of this new handover process.

Research method: Six patients who have transitioned from paediatric to adult services either preceding or following the re-location, and the six physiotherapists involved were surveyed.

Results: Patients transitioning via the formal outpatient transition clinic felt that a longer, and more individualised introduction to the adult CF physiotherapy service was required. Physiotherapists felt that those patients who transitioned under the new process were clearly more comfortable in “their own room”, and more clinically meaningful information was able to be handed over verbally.

Conclusion: Themes explored in this small project will guide further assessment of the transition process to enhance the partnership between the paediatric and adult CF centres in WA.

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20 Nguyen R

Bright Tomorrows: Strengthening children’s and parents’ essential life skills

Background and aim: The development of essential life skills is critical for young children, as they learn how to successfully navigate the routine tasks of daily life by staying focused, remembering and following instructions, making decisions, shifting priorities and controlling impulses. Parents also draw on these life skills, which encompass executive functions and socio-emotional skills, to effectively manage parenting and provide responsive care for their child. There is much opportunity to help both children and adults improve these life skills, thus supporting more positive outcomes in early childhood.

Research method: A literature review, competitor analysis, community consultation, content curation and end-user testing were undertaken to develop the Bright Tomorrows app to strengthen children’s and parents’ essential life skills.

Results: The Bright Tomorrows app provides parents with a library of learning activities to complete with their child (0-5 years), as well as practical advice to support their own essential life skills. These are organised into five core categories of skill development, including: attention and focus; managing and responding to emotions; communication and relationships; planning, organisation and routines, and; taking on challenges. The tailored activities and advice are also augmented through the inclusion of a Motivational Interviewing (MI) strategy to provide comprehensive, highly tailored support to parents in developing these essential life skills in themselves and their child.

Conclusion: Findings from a process evaluation of the Bright Tomorrows app will inform the future development and refinement of intervention strategies to improve children's and parents' essential life skills through a dual-generational approach.

21 Licari M

Prevalence of motor impairment in Autism Spectrum Disorder: Analysis of a population-based cohort

Background and aim: Motor impairment is not currently included in the diagnostic criteria or evaluation of autism. This reflects the lack of large-scale studies demonstrating its prominence to advocate for change.

We examined the prevalence of motor impairment at time of diagnosis in a large sample of children with autism utilising standardised assessment, and the relationship between motor impairment, core autism symptomology and other prominent clinical features.

Research method: Vineland Adaptive Behavior Scales were administered to children from the Western Australian Register for Autism Spectrum Disorders aged ≤ 6 years (N = 2084; 81.2% males, 18.8% females). Prevalence of motor impairment was quantified based on scores from the motor subscale of the Vineland and then compared to other domains of functioning within the Vineland (communication, daily living, socialization), the DSM criteria, intellectual level, age, and gender.

Results: Scores on the Vineland indicated that 35.4% of the sample met criteria for motor impairment (standard score <70), a rate almost as common as intellectual impairment (37.7%). Motor impairment was reported by diagnosing clinicians in only 1.34% of cases. Motor impairment was more prevalent in children with intellectual impairment ($p<0.001$) and those cases meeting diagnostic criteria for impairments in non-verbal behaviour and presence of restricted and repetitive behaviours. Prevalence of motor impairment also increased with increasing age of diagnosis ($p<0.001$).

Conclusion: Findings from the present study highlight the need for further consideration of motor impairment as a distinct specifier within the diagnostic criteria for autism.

22 Strowger B

Combining ATR inhibition with chemotherapy and radiotherapy enhances cytotoxicity in Group 3 medulloblastoma

Background and aim: Medulloblastoma is the most common malignant brain tumour of childhood. Surgical resection and craniospinal irradiation followed by chemotherapy are the mainstay of treatment. Despite treatment intensification, survival has plateaued for the past two decades at around 70% and patients that relapse are essentially incurable. Thus, we aimed to identify novel drugs that can enhance frontline therapies and increase cure rates as a result.

Research method: An unbiased high-throughput drug screen identified inhibitors of the DNA-damage response pathway as promising candidates, including kinase inhibitors targeting ATR. ATR is a key mediator of the pathway and its activation allows tumour cells to repair otherwise fatal damage caused by the therapy. We tested the ability of an inhibitor of ATR (iATR) to kill group 3 medulloblastoma tumour cells using in vitro drug interaction assays. In vivo testing was conducted using sophisticated, orthotopic mouse models of medulloblastoma.

Clinical radiation protocols were also mimicked in our mouse models using the state-of-the-art XRAD SmART system.

Results: iATR enhanced in vitro cytotoxicity of conventional chemotherapeutics cisplatin and cyclophosphamide as well as gemcitabine, which is currently in clinical trial. When given in combination with conventional chemotherapy, iATR significantly extended survival in several different medulloblastoma mouse models. We also found that iATR can enhance radiation induced tumour cell death.

Conclusion: We highlight the exciting new potential of iATR as an adjuvant frontline therapy. Future studies will determine if iATR can facilitate a reduction in the dose of harmful radiation without compromising survival.

23 Pickering J

Strep A survival in preservation media enables density analysis in remote settings

Background and aim: Streptococcus pyogenes, (Strep A) causes childhood morbidity and mortality. Our remote Kimberley clinical studies document the prevalence of Strep A pharyngitis and impetigo. Collection and storage of clinical specimens is challenging in remote Australia with refrigeration prior to freezing most achievable. Skim-milk-glucose-glycerol broth (SMGGB) is a validated, WHO-recommended, medium for storage, culture and molecular analysis of S. pneumoniae with rapid deep freeze (e.g. -80°C) recommended for pharyngeal carriage studies investigating bacterial density. Building on this practice, we sought to define the impact of refrigeration prior to freezing on clinical specimens in STGGB to guide our Strep A density studies.

Research method: One ATCC strain and six clinical Strep A isolates were selected from different clinical origins (skin, pharynx, blood) and emm types (4, 12, 28, 49, 53, 89). Dilutions of each were inoculated into SMGGB to mimic typical clinical specimen concentration ranges (104 -108 CFU/mL). Each spiked sample was refrigerated at 4°C before freezing at -80°C on days 0, 1, 5, and 8. Following defrosting and vortex, aliquots were plated on blood agar for viable count.

Results: Regardless of concentration, strain type or refrigeration duration, there was no significant degradation in Strep A density.

Conclusion: Refrigeration prior to freezing to meet remote transport requirements does not impact Strep A viability. We confirm that Strep A collected from children living remotely will be viable following up to 8 days of refrigeration ensuring Strep A vaccine design will be informed by studies in remote living children at highest risk of complications.

24 Gill K

WA Lesbian, Gay, Bisexual, Transgender, Intersex (LGBTI) Health Strategy 2019 – 2024

Background and aim: Health Networks have developed WA's first LGBTI Health Strategy (the Strategy). The Strategy provides the opportunity to ensure the health system is delivering a safe, inclusive and equitable services for LGBTI people in WA. LGBTI populations, especially LGBTI young people face significant health and mental health challenges and are at greater risk of experiencing marginalisation, persecution and disadvantage that make it more difficult to access health services in WA.

Research method: The Strategy has been developed with extensive input from the local LGBTI people through a series of community conversations and online surveys. Participation

from LGBTI young people occurred during consultation activities, and was important for its development.

8 of the 14 community conversation workshops hosted by local LGBTI community organisations specifically targeted LGBTI young people, where they had the opportunity to have a say what is important to them and provide their perspectives on LGBTI health and wellbeing. An online survey was also available for LGBTI people of all ages. Overall, more than 600 submissions were received.

Results: The Strategy articulates 6 priorities, outcomes and a to-do list all directly representing the feedback received during consultation. Quotes from LGBTI people are placed throughout the document, it was important to include their voices and experiences.

Conclusion: The Strategy is due to be released in September 2019, as the first Strategy on LGBTI health and wellbeing it is a significant first step to raise the profile of LGBTI health in WA.

25 Collins R

Effect of transfer from paediatric to adult cystic fibrosis centre on clinical status

Background and aim: Cystic Fibrosis (CF) is a common inherited condition that children in WA are born with. It causes many health issues such as lung problems and difficulty gaining weight. Patients with CF have a shorter life expectancy that people without CF and require any regular hospital attendances and medical treatments. Previously patients with Cystic Fibrosis did not often survive into adulthood, however due to advances in health care most patients with CF are expected to live into adulthood.

Research method: This study looked at all patients who transferred from paediatric cystic fibrosis services at Princess Margaret Hospital to Adult Services at Sir Charles Gairdner Hospital between 2008-2012. Previous research has shown that transition from paediatric to adult services can be a difficult time for young people and can be associated with deterioration in their health The aim of this study was to assess whether transfer from paediatric to adult CF services in Perth was associated with a deterioration in health or whether the presence of a structured transition process, such as that used in Perth, would help reduce deterioration.

Results: We found that there was no associated decline in health.

Conclusion: This can be explained in part by a successful, structured transition process.

26 Kicic A, Garratt L

Viral-bacterial co-infection of cystic fibrosis airway cells triggers neutrophil reprogramming

Background and aim: Neutrophils recruited to cystic fibrosis (CF) airways are reprogrammed to an exocytosis phenotype, as shown by a decrease in the functional marker CD16 (reduced phagocytosis) and a corresponding increase in CD63 (hyperexocytosis of proteolytic granules). However, the factors that induce this reprogramming are poorly understood. We created an in vitro system to model signalling between CF airway inflammatory responses and recruited neutrophils, specifically in the context of rhinovirus and Pseudomonas aeruginosa co-infection.

Research method: Monolayer cultures of paediatric CF and non-CF primary airway epithelial cells (pAEC) were infected individually and in combination with rhinovirus strain RV1b (MOI

0.5) and a mucoid P. aeruginosa clinical isolate (MOI 0.001). After 48 hours, supernatants were harvested, filtered, and inflammatory cytokines quantified by ELISA. Supernatants were also applied to an in vitro model of neutrophil transmigration to the airways. Neutrophils were migrated for 10 hours, harvested, and assessed by flow cytometry.

Results: Both infection with RV1b or RV1b+P. aeruginosa significantly increased production of proinflammatory cytokines IL-8, IL-1β, and TNFα in both CF and non-CF pAEC compared to uninfected controls or bacterial infection alone. Neutrophils migrating towards supernatants produced by CF pAEC in response to RV1b+ P. aeruginosa co-infection had significantly reduced staining of CD16 (MFI -602, $p<0.01$) and increased

staining of CD63 (MFI 526, $p<0.02$) compared to uninfected controls, indicative of exocytosis reprogramming. Neutrophils migrating towards supernatants produced by non-CF pAEC were not significantly affected.

Conclusion: Polymicrobial infection of viral and bacterial pathogens in the CF lung may be the key early trigger of CF neutrophil reprogramming.

27 Shaw N

Characterisation of a surrogate type-II alveolar cell model for ABCA-3 deficiency

Background and aim: ATP Binding Cassette Subfamily A Member 3 (ABCA-3) is a transporter protein highly expressed in type-II alveolar (AT-II) cells. Mutations in ABCA3 can result in severe lung disease in children. Cell cultures derived from patients with ABCA-3 deficiency could provide a means to study the disease in vitro. ABCA-3 is present in the nasopharynx, hence primary nasal epithelial cells (NECs) may provide a more readily accessible cell culture model than primary AT-II cells. The aim of this study was to investigate the suitability of a NEC culture model to study ABCA-3 deficiency.

Research method: Expression of ABCA3, and AT-II cell markers, SFTPB and SFTPC were quantified in NECs and primary AT-II cells by droplet digital PCR. Protein localisation of ABCA-3 was visualised by immunofluorescent microscopy. Functionality of the ABCA-3 protein in NECs derived from human subjects with or without ABCA-3 deficiency was assessed by the capacity of the cells to detoxify doxorubicin, measured using different methodologies.

Results: ABCA-3 protein was localised in the cytoplasm of primary NECs but mRNA levels were 6.35x103-fold lower than in primary AT-II cells. SFTPB and SFTPC were also significantly lower by 5.26x106- and 5.36x106-fold, respectively. Higher concentrations of doxorubicin reduced cell viability in ABCA-3 deficient NECs compared to controls, but this finding was inconsistent between assays.

Conclusion: There may be a role for NEC cultures to model ABCA-3 deficiency depending on the endpoints of interest. We are now focusing on establishing a distal lung model using induced pluripotent stem cells to more accurately replicate the AT-II cell phenotype.

28 Gill F

The ESCALATION Project: Unifying systems for recognition and response to paediatric clinical deterioration in Western Australia (WA)

Background and aim: Failure to recognise and respond to clinical deterioration can have devastating consequences. In WA no standardised approach for recognition and response to paediatric clinical deterioration has been adopted. The project aimed to develop an evidence

based state-wide system for recognising and responding to paediatric clinical deterioration inclusive of family participation.

Research method: ESCALATION is a prospective mixed methods implementation project guided by a Steering Group of consumers, WA health service providers and researchers. It involved literature review, benchmarking, stakeholder and community consultation, pilot implementation and evaluation. An early warning tool was designed that utilises human factor principles, focuses attention on timely targeted communication and incorporates family involvement.

Results: The central system tool developed in ESCALATION is the track and trigger Paediatric Acute Recognition and Response Observation Tool (PARROT) which consists of five age-specific charts, ten weighted variables and an escalation pathway. The inclusion of clinician and family concern as a weighted variable recognises the abilities of both staff and families to detect early signs of clinical deterioration beyond changes in vital signs. Incorporating iSoBAR NOW emphasises the importance of establishing level of urgency and need when communicating about deteriorating patients. The PARROT has undergone extensive iterative review prior to pilot implementation at six purposively selected sites. It has also been modelled using case based scenarios providing strong face and content validity.

Conclusion: The PARROT is the first early warning tool to combine clinical assessment, clinician and family concern, an escalation process and a clinical communication model focusing on timely action.

29 Wyber R [1,3], Cannon J[1], Katzenellenbogen J[2], Nedkoff L[2], Greenland M[2], Cunneen R[2], Bond-Smith D[2], de Klerk N[1,2], Sanfilippo F[2], Carapetis J[1]

The Cost of Inaction on Rheumatic Heart Disease in Australia

Background and aim: The disparity in acute rheumatic fever (ARF) and rheumatic heart disease (RHD) rates between Aboriginal and Torres Strait Islander (Indigenous) and non-Indigenous Australians continues to widen, despite the Rheumatic Fever Strategy (RFS) being in place since 2009. Our objective was to estimate the future costs of ARF and RHD in the Indigenous population aged <65 years in four Australian jurisdictions with the RFS.

Research method: Costs were estimated in four sequential stages: (1) linked data analysis to determine the prevalence of disease at mid-2016 and the annual incidence of disease between 2011–2016; (2) determine the numbers of people who currently have ARF/RHD under active medical management and are projected to develop ARF/RHD; (3) model the disease trajectory in these people to estimate the number who will progress from ARF to RHD, require valvular surgery, and will die (any cause); and (4) determine the cost of medical care for each trajectory.

Results: There were 3,420 Indigenous people in mid-2016 with ARF or RHD, which is estimated to result in 110 deaths and AU$27 million in medical care cost. A further 10,212 Indigenous people are projected to develop ARF and/or RHD between mid-2016 and 2031, resulting in 563 deaths and AU$317 million in medical care cost.

Conclusion: New strategies are needed to reduce the high current and projected human and economic cost of ARF and RHD borne predominantly by Indigenous Australians. This includes tackling the environmental and social determinates of health in a collaboration between health providers and communities.

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30 Gayatri J[1, 2], Esvaran M[3], Conway P[3], Nathan E[4, 5], Doherty D[4], Simmer K[1,2], Patole S[1,2]

Effect of Single versus Multi-strain Probiotic supplementation on the time to full feeds in preterm neonates – a double-blind randomised controlled trial (SiMPro)

Background and aim: Evidence suggests that multi-strain probiotics may be more beneficial than single-strain probiotics in preterm neonates. We aimed to assess the effects of single vs three strain probiotic supplementation in extremely preterm neonates (EP: Gestation <28 weeks).

Research method: EP neonates were randomly allocated to a three-strain (B. breve M-16V, B. longum subsp. infantis M-63, B. longum subsp. longum BB536) or single-strain (B. breve M-16V) probiotic while assuring blinding. Supplementation (3×109 CFU/day) was commenced with feeds and continued till 37 weeks corrected gestational age. Sample size was powered for the primary outcome time to full feeds (TFF: 150ml/kg/day). Secondary outcomes included intestinal transit time (ITT), fecal short chain fatty acid (SCFA) levels, necrotising enterocolitis (NEC ≥ Stage II), late onset sepsis (LOS), and mortality. Stool samples were collected before (S1) and after three weeks of supplementation (S2).

Results: 173 EP neonates were randomised (Three-strain: 86; single-strain: 87). Maternal and neonatal demographics were comparable. Median (IQR) TFF was comparable between the two groups [11 (8-16) vs. 10 (8-16) days; p=0.92]. There was no significant difference in ITT (median: 17 vs. 18 hrs; p=0.826), and fecal SCFA levels. However, clustering showed significantly raised butyrate (single-strain) and propionate (three-strain) levels in S2 samples. Secondary outcomes including NEC≥ Stage II, all-cause mortality, and LOS were comparable.

Conclusion: Compared with single-strain, supplementation with multi-strain probiotic had no significant effect on TFF in EP neonates. The long-term significance of raised butyrate (metabolic syndrome, neurodevelopment) and propionate (allergy, asthma) needs to be studied.

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31 O'Connor A

Neonatal Outcomes Following Prenatal Exposure to Methamphetamine attending a Specialist Service

Background and aim: Western Australia has some of the highest rates of methamphetamine use in the country. The aim of this research was to describe Maternal and Neonatal outcomes following prenatal methamphetamine exposure.

Research method: A Prospective cohort Study: was undertaken from King Edward Memorial Hospital between July 2015 and December 2016. All women referred in this time period who identified methamphetamine as their primary drug of use were invited to consent. Maternal and Neonatal data was collected. An Ages and Stages Questionnaire was administered at 4 and 12 months. A Griffiths Mental Developmental Assessment Screen was conducted at 12 months. Ethics approval was granted for the research.

Results: 112 women were recruited, and there were 110 live-born infants. The heaviest MA use (59.7%) was during the first trimester by injecting (98.2%). Neonatal complications, small for gestational age 23.6%, and admission to Special Care Nursery. The Ages and Stages assessment identified 30 infants (33.7%) as having a potential developmental delay at 4 months, and 29 infants (38.7%) as having a potential developmental delay at 12 months. The mean general quotient at around 12 months for Griffiths developmental assessment was 92.7 which was significantly lower than the population historical control. The Ages and Stages questionnaire at 4 and 8 months had no correlation with the Griffiths developmental assessment.

Conclusion: Our results highlight the complexities associated with MA use in pregnancy including concern regarding developmental outcomes. The Ages and Stages was not a useful screening tool in this population.

32 Looi K

Consecutive rhinovirus infection impacts airway barrier integrity and function

Background and aim: Tight junctions (TJ) provide a physical barrier against respiratory viral insults. Human rhinovirus (RV) has been shown to disrupt barrier integrity in airway epithelial cells (AECs). Despite TJs being extensively assessed, few studies have directly addressed the consequence on barrier integrity following TJ disassembly post consecutive RV infection. Hence, this study aimed to assess barrier integrity post three consecutive RV infection in healthy and asthmatic AEC cultures.

Research method: Healthy and asthmatic AECs, obtained and cultured as previously described (Martinovich et al 2017) were differentiated into air-liquid interface (ALI) cultures before infection with RV-1B. Consecutive RV-1B infection every 24h at a multiplicity of infection (MOI) of 1 was performed on submerged and differentiated cultures. Barrier integrity was measured by in-cell western (ICW) protein expression of the TJ proteins claudin-1, occludin and zonula occluden-1 (ZO-1). Epithelial function was assessed via transepithelial electrical resistance (RT) measurement and a permeability assay.

Results: Healthy AECs showed a decrease in TJ protein expression of claudin-1 compared to uninfected controls after the first infection. Further decreases in expression were observed after the second infection, however, after the third infection, there was a significant increase in TJ expression ($p<0.05$). Increases in occludin and ZO-1 protein expression was observed with each consecutive RV-1B infection and this was demonstrated to be concomitant with a decrease in RT and increase in permeability.

Conclusion: Consecutive infections with RV-1B induces increasing changes to epithelial junctional proteins, reduces epithelial resistance and increases epithelial permeability to ultimately alter barrier integrity.

34 Jeon A

Incidence of early-neonatal sepsis at Armadale Health Service (AHS) for 2017-2018

Background and aim: The development of early onset sepsis (EOS) in neonates is complex and multi-factorial in nature. Kaiser-Permanente has developed a calculator to predict the likelihood of developing EOS in neonates based on risk factors and background sepsis rate. This tool has been employed in hospitals to minimise the inappropriate use of antibiotics. This audit was conducted to identify and compare the incidence of EOS at AHS with King Edward Memorial Hospital (KEMH).

Research method: A retrospective cohort study of neonates born at AHS from 2017 to 2018. All neonates born at AHS (<72 hours age) who had either a primary or an additional diagnosis of Sepsis (ICD code - P36) were included in the study. Blood culture results and discharge summaries from ISOFT were used to determine if the case-subject had a culture-positive (non-contaminant) bacterial infection and/or received a course of antibiotics for >5 days on clinical criteria.

Results: The study included 81 neonates from a cohort of 4209 live newborns. There were no positive blood cultures. 3 neonates had contaminant blood cultures and 78 neonates were culture negative at <72 hours. Six neonates received antibiotics for a course of >5 days. The incidence of EOS was 1.43 per 1000 live births.

Conclusion: There were no positive blood cultures recorded in this audit. The culture contamination rate was slightly higher. The incidence of EOS in neonates is approximately 3-fold higher than KEMH. The limitations of the study are: the retrospective design of the study, absence of clear case definitions in literature and lack of confirmed cases on blood culture.

35 Rice E

Little Lungs, Clear Futures: Reducing Childhood Second-hand Smoke Exposure

Background and aim: Second-hand smoke exposure in childhood results in poorer health outcomes, more frequent hospital presentations and increased likelihood of commencing smoking in adolescence. Brief interventions to support parents to quit can increase the likelihood of smoking cessation and reduce household smoke exposure.

This project aimed to implement routine smoke-exposure screening and intervention that was acceptable to both staff and families.

Research method: Medical service redesign ('DMAIC') methodology was used to develop a parental smoking cessation program to be run as a pilot trial on the acute medical ward. Feasibility and acceptability of the program was assessed using pre and post-implementation surveys for both staff and families and file audits.

Results: A total of 50 families of inpatients to the acute medical ward were surveyed. 25 were surveyed at baseline and 25 were surveyed following implementation of the smoking cessation program. There were similar rates of household smoking between the groups (40% pre-implementation, 36% post-implementation). Rates of determining and documenting household smoking status increased from 32% to 80% following implementation. At baseline, no smoking households were offered support to quit. Post implementation, 78%

of smoking households were offered support to quit through brief interventions, referral to services (Quitline or GP) and written information.

Staff confidence discussing smoking with families increased following implementation of the program. Staff rated confidence on a scale of 1 (not confident) to 5 (very confident), increasing from 2.94 at baseline to 3.68.

Conclusion: Providing routine smoking cessation advice and support to quit through brief interventions is both feasible and acceptable to families in the acute paediatric setting.

36 van Oudtshoorn S

Opportunistic Immunisations for Burns Clinic Patients at Perth Children's Hospital

Background and aim: Children who attend the Burns Clinic at Perth Children's Hospital (PCH) come from a diverse range of demographics including children with complex comorbidities, social difficulties, from remote locations, and of Aboriginal or Torres Strait Islander heritage. The Burns Clinic presents itself as an excellent prospect in opportunistic immunisation for children who may have limited contact with health care services, or who may have a compromised immunity due to their burn injury.

Research method: A retrospective review was completed at the PCH Burns Clinic from 1/4/19 to 1/7/19 recording patient demographics and immunisation status from the Australian Immunisation Registry.

Currently, children aged six years and under who are not up-to-date with their immunisations and/or haven't received the influenza vaccine are provided with information about the flu vaccine and the Stan Perron Immunisation Clinic at PCH. These patients are followed up to see if their immunisation status was updated and if they utilised the walk-in Immunisation Clinic.

Results: Prior to starting the initiative, 109 of 116 children (94%) who fit the inclusion criteria were up-to-date with their immunisations. Only 16 children (13.8%) had the influenza vaccine, and only 1 child had utilised the Stan Perron Immunisation Clinic at PCH.

Since starting the initiative in July 2019, prospective data is being collected, and will be available for discussion at the 2019 Child Health Symposium.

Conclusion: This project evaluates whether an opportunistic immunisation program introduced into the Burns Clinic at PCH is an effective strategy to increase uptake of vaccinations.

37 Pienaar C, Gill F, Ferullo J

Engaging with families to build research capacity

Background and aim: Recruiting research participants can be a barrier to child health research. One emerging strategy is the creation of research registries. The Child and Adolescent Health Service (CAHS) does not have an organisation-wide research registry. The project aim is to develop a feasible and acceptable process to capture the agreement of families who wish to be contacted about research opportunities at CAHS. An important step in development is to understand the views and information needs of CAHS families.

Research method: A quality improvement (GEKO) project involved an audit and telephone follow-up of families who attended the Emergency Department and outpatient clinics at Perth Children's Hospital in July and August 2019. Families read a purpose-designed information

brochure and completed an online survey. Those who agreed to a follow-up telephone call were contacted 2-3 weeks later and provided feedback about the information provided.

Results: 522 families were approached and 367 (70%) families completed the survey; 196 (55%) indicated that they would choose to be on a contact list for future research. Families preferred to receive information by email (62%) or brochure (38%). In telephone follow-up, all families (31) remembered receiving the brochure; 97% indicated that they were still satisfied with their choice to be on a contact list. Families made suggestions to simplify and improve the brochure.

Conclusion: Over half of families would agree to be on a future contact list. The number of families willing to be included may be increased by further refining and simplifying the delivery of key information.

38 Soon W

Free-living glucose responses to repeated sprint exercise in Type 1 diabetes

Background and aim: Regular physical activity is recommended for people with Type 1 diabetes (T1D); however the risk of hypoglycaemia (low blood glucose) is a barrier to exercise participation in these individuals. Recent laboratory-based findings suggest that including repeated sprints during moderate-intensity exercise reduces the rate of fall in blood glucose level in individuals with T1D. The aim of this study was to investigate whether these findings translate to a free-living setting.

Research method: Individuals with T1D (n=25) wearing a continuous glucose monitor and activity-monitoring watch completed three, two-week exercise treatments in a randomised order. For each treatment, participants completed at least three times per week and for a minimum of 30 minutes, bouts of either continuous moderate-intensity exercise, moderate-intensity exercise interspersed with 4-second sprints every 2 minutes (ending with a 10-second sprint) or moderate-intensity exercise interspersed with 10-second sprints every 20 minutes (ending with a 10-second sprint). The primary outcome was the sensor glucose response during and one hour after exercise.

Results: No difference in sensor glucose response was observed between moderate-intensity exercise with or without 4-second sprints. However, the inclusion of 10-second sprints resulted in a reduced fall in mean sensor glucose from pre-exercise levels during the first 15 minutes (-2.0 vs -2.5 mmol/l, p=0.049) and full one hour of recovery (-1.7 vs -2.5 mmol/l, p=0.025).

Conclusion: In a free-living setting, the inclusion of 10-second sprints during moderate-intensity exercise reduces the early post-exercise fall in sensor glucose level, and may assist blood glucose management for individuals with T1D.

40 Harry M

The Gender Diversity Service: Five Years of Care at a Multidisciplinary Public Health Service in Western Australia

Background and aim: The Gender Diversity Service (GDS) is located at Perth Children's Hospital in Perth, Western Australia.

This poster aims to describe the GDS and its role in the public health service in Western Australia. We aim to share current numbers including referrals, activations and discharges, gender identities, current numbers accessing Stage 1 and 2 gender affirming hormonal intervention, and numbers accessing fertility preservation and "top" surgery in the private health system.

Research method: The GDS receives approximately 3-4 new referrals per week. Prior to formal funding, a small number of patients received care: in March 2015, 30 patients were engaged in care, and 20 referrals had been received in the preceding year. This poster will report on our most up to date service numbers.

Results: The GDS strives to integrate research into everyday clinical practice. There are now 131 patients who have consented to participate in the GENTLE (GENder identiTy Longitudinal Experience) Cohort Study which aims to create a research cohort of all the young people who have ever sought services from the GDS.

Conclusion: The GDS is the only specialist public health service in Western Australia for children and adolescents with gender dysphoria and their families. The service aims to operate in an evidence-based model to support the wellbeing of the children, young people and families, and to minimise barriers to accessing treatment and support. The number of referrals and the number of young people actively engaged in GDS care continues to increase and poses challenges for future planning.

41 Fathima P

Association between rotavirus vaccination and intussusception in Australian children

Background and aim: Post-licensure surveillance studies have shown a small but significant increased risk of intussusception among infants in the days following rotavirus vaccination (RV). We aimed to assess the temporal trends of intussusception-coded hospitalisations and the associated pathogens before and after the commencement of a universal RV program in Western Australia (WA) in 2007.

Research method: All hospitalisations with intussusception-related ICD-10-AM discharge diagnosis code (K56.1) occurring in a cohort of 367,476 WA-born children (2000–2012) aged <5 years were probabilistically linked to perinatal and pathology records. Age-specific incidence rate ratios (IRR) for overall and pathogen-specific intussusception hospitalisations were calculated before and after RV introduction.

Results: There were 431 intussusception-coded hospitalisations among children aged <5 years. The overall rate of intussusception-coded hospitalisation was 70% higher (95%CI: 39%, 107%) in the RV period (2008-2012) than in the pre-RV period (2000-2006). The crude rate ratios were 1.40 (95% CI:0.89, 2.18) among infants aged 2-7 months, 1.02 (95% CI:0.65, 1.60) among those aged 8-11 months, 1.55 (95% CI:1.05, 2.27) among those aged 12-23 months and 1.84 (95% CI:1.20, 2.82) among those aged 2-4 years. Compared to children born in the pre-RV period, adenovirus-positive intussusception-coded hospitalisation rates were 4.11

times (95% CI:2.29, 7.76) higher among children born in the RV period. No significant differences were seen in rotavirus-positive hospitalisation rates between the two birth periods.

Conclusion: There was an increase in intussusception-coded hospitalisations after introduction of the RV program in WA, but there was no evidence that this increase was attributable to RV.

43 Whitehouse J[1], Howlett M[1], Stanley J[1], Hii H[1], Strowger B[1], Gottardo N[1,2], Endersby R[1]

Reviewing the orthotic management of flexible flat foot to inform service planning

Background and aim: Diffuse intrinsic pontine glioma (DIPG) is an aggressive paediatric brain tumour for which there is currently no effective treatment. DIPG can arise as a primary tumour, but also can occur as a consequence of radiation therapy in survivors of other paediatric brain tumours. In order to find more effective treatments, we need mouse models that faithfully recapitulate human DIPG. We aimed to establish and characterise a patient-derived xenograft (PDX) mouse model of radiation-induced DIPG following medulloblastoma.

Research method: Tumour cells were collected at autopsy from a patient with radiation-induced DIPG following treatment for primary medulloblastoma. Cells were implanted into the brains of immunodeficient mice, and serially transplanted in vivo. Immunohistochemistry was performed on the PDX tumour tissue from each passage and compared to the patient DIPG tumour. Short Tandem Repeat (STR) analysis was also performed on both the PDX tumour tissue and patient DIPG sample.

Results: Immunohistochemical analysis of the PDX tumours revealed that their profile matched that of the patient DIPG, and the PDX tumours expressed markers associated with neural progenitor and oligodendrocyte precursor cells. Comparison of STR profiles confirmed that the PDX samples were derived from, and remained faithful to, the patient DIPG tumour.

Conclusion: Our mouse PDX model of radiation-induced DIPG faithfully recapitulates the original patient tumour. Further characterisation of this model will include immunohistochemical staining on the primary patient DIPG tumour for neural progenitor and oligodendrocyte precursor cell markers, and mutational analysis of the primary medulloblastoma, secondary DIPG and DIPG PDX.

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44 Saunders L

Metabolic health and body image perceptions in a paediatric gender diverse patient population: A clinical picture

Background and aim: Metabolic health is an increasing concern in Australia. Childhood obesity in particular, is associated with adverse physical and psychosocial outcomes. When combined with gender affirming intervention, there may be increased risk for poorer physical and mental health among transgender and gender diverse (TGD) adolescents. It is not clear if factors associated with metabolic health, such as lifestyle choices, body composition, or perceptions of satisfaction of body image play a role. The aim of this study is to determine a baseline clinical profile for body weight, body mass index, body image perception and metabolic health in the paediatric TGD population.

Research method: The Gender Diversity Service (GDS), based at Perth Children's Hospital in Western Australia, is a multidisciplinary service that provides TGD children and adolescents

with assessment, information and access to gender affirming intervention. The GDS collects clinical information at regular mental health and endocrinology follow up appointments. Lifestyle factors including hobbies and interests are also documented in clinical notes. Participants in this study are part of the GENder identiTy Longitudinal Experience (GENTLE) Cohort Study is currently run at the GDS.

Results: Clinical profiles will be determined using the Body Image Scale and metabolic health profiles, including patient weight and height to calculate BMI. Lifestyle factors will be explored and discussed as they relate to these clinical profiles. Relationships between satisfaction of body image, BMI, lifestyle factors and defining characteristics will be explored.

Conclusion: An understanding of lifestyle factors and BMI in the TGD population will help to inform clinical care regarding the possible need for healthy lifestyle intervention.

45 Collins R

Development and Evaluation of a Program for Transition from Paediatric to Adult Care in Western Australia (WA)

Background and aim:

- 19% of the population are aged 10 to 24 years
- 12% living with a chronic condition globally
- many will require health services throughout life and will transfer from a paediatric to adult service
- Successful transition is crucial to optimise integration into adult services and ensure adherence to management, positively impacting on health and resulting in reduced costs for the health service
- Importance of transition is recognised internationally
- a priority within key policies– WA Clinical Services Framework; Sustainable Health Review; CAHS Operational Plan; WA Youth Health Policy
- PAPAYAS (Planning and Promoting Adolescent and Young Adult Services) - an education, research and service improvement initiative.

Research method:

- WA Youth Health Policy led to CAHS appointing a Transition Coordinator
- Development of PAPAYAS Transition clinic for paediatric patients with complex chronic conditions.
- Focus of the PAPAYAs program and transition clinic– education for clinicians and patients, collaboration, support through transition process, rationalisation of healthcare utilisation, maximisation of community supports and primary healthcare involvement.
- Development of online resources , comprehensive transition website and utilisation of technology in keeping with the recommendations of consumers and Youth Health policy

Results:

- Development of formalised transition service – patient satisfaction data collected
- Engagement with primary health care and education.
- Creation of transition resources
- Facilitate development of clear structured transition process state wide

Conclusion:

- Planned and structured transition is essential for all young people with chronic disease
- Patient experiences and satisfaction will be collected and evaluated
- Expansion and development of PAPAYAS into comprehensive transition service to advocate and facilitate transition across all HSP's
- "(There is a need for) information and support around transition. Can be socially isolating, especially with a disability that isn't well understood." – Quote from a young person

46 O'Sullivan M

SmartStartAllergy: a novel tool to support and monitor infant feeding and allergy prevention

Background and aim: SmartStartAllergy (SSA) is a novel SMS and smartphone-based application to monitor introduction of allergenic foods and support implementation of Australasian Society of Clinical Immunology and Allergy (ASCIA) Guidelines for Infant Feeding and Allergy Prevention. We describe the SSA methodology, and design and interim results of an ongoing randomised controlled trial (RCT) assessing the effectiveness of SSA in promoting uptake of the ASCIA Guidelines.

Research method: Parents receive automated SMSs from their general practice when their child is 6, 9 and 12 months old asking whether they have started solids, eaten peanut, and/or had an allergic reaction to any food, together with an SMS link (www.preventallergies.org.au). A web-based questionnaire collects additional information about infant feeding and food allergy.

RCT design: In 22 Western Australian general practices, 6-month-old infants are randomised to receive SMSs at 6, 9 and 12 months, or to only receive SMSs at 12 months. Proportions of 12-month-olds who have introduced peanut in each group will be compared. In addition, baseline data is collected from 12-month-olds who are too old (i.e. >6 months) at study initiation to participate in the RCT.

Results: As at August 2019, parents of 4623 children in WA have received SMSs. Overall response rate to first SMS is 61.8% (2856/4623) with opt-out <2%. Baseline data revealed 86.6% had introduced peanut by 12 months and 13.1% had a parent-reported allergic reaction to any food.

Conclusion: Through its collaboration with general practices, SSA offers a unique opportunity to collect and report large scale, real-time data and may directly contribute to individual patient care including through delivery of targeted health promotion messages.

47 Bowen A

The SToP Trial: See, Treat and Prevent Impetigo and Scabies

Background and aim: In remote Australian Aboriginal communities, skin infections (scabies and impetigo) are common. At any one time, 45% (IQR 34-49%) of children have impetigo and 5 – 35% have scabies. The SToP Trial will evaluate an intervention program intended to enhance sustainable skin health practices, in four community clusters in the Kimberley.

Research method: A cluster randomised trial (stepped-wedge design), commenced in May 2019. Three components will be evaluated: a) "See"ing skin infections through development of training resources/packages within a community dermatology model through school-based

surveillance of the primary outcome; b) “Treat”ing skin infections using the latest evidence implemented using the Structured Administration and Supply Arrangements ‘standing orders’ namely co-trimoxazole 3 days BD for impetigo, ivermectin on days 0 and 8 for scabies cases and their contacts and holistic care including treatment of those identified with crusted scabies; and c) “Prevent”ing skin infections through embedded, culturally informed and developed health promotion and environmental health activities.

Results: Baseline surveillance of the primary outcome was completed May-September 2019. Step one of the intervention rollout commenced in October 2019.

Conclusion: The primary outcome is to reduce the burden of impetigo and scabies in school aged Aboriginal children (5-9 years) by 50%. School-aged children have a high disease burden and are identifiable. This outcome is likely to reflect a reduction in skin infections across all ages.

48 Bhuiyan M

Is nasopharyngeal pathogen density associated with childhood pneumonia in Western Australia?

Background and aim: Respiratory viruses and bacteria are frequently detected in the nasopharynx of asymptomatic children, making it difficult to understand their actual contribution to pneumonia. We aimed to determine and compare the nasopharyngeal density of respiratory pathogens between children with and without pneumonia to understand if pathogen density provide evidence of causality of pneumonia.

Research method: Nasopharyngeal swabs (NPS) were collected from hospitalized pneumonia cases at Princess Margaret Hospital (PMH) and contemporaneous age-matched controls at PMH outpatient clinics and a local immunization clinic in Perth, Australia. The density (copies/mL) of eight respiratory viruses and bacteria in NPS were determined using quantitative polymerase-chain-reaction. The association between pathogen density and disease status was examined using logistic regression. Area under receiver-operating-characteristic (AUROC) curves were assessed to determine optimal discriminatory pathogen density cutoffs.

Results: Through May’15 – October’17, 230 pneumonia cases and 230 controls were enrolled. Median nasopharyngeal density for any respiratory pathogens was not significantly higher in cases than controls. After adjusting for demographics and densities of other pathogens, the odds of being a case increased by 6, 3 and 2 times for every log10 copies/mL density increase for respiratory syncytial virus, human metapneumovirus and influenza A virus, respectively. The AUROC curves were <0.70 for each pathogen, suggesting poor case-control discrimination using pathogen density.

Conclusion: The nasopharyngeal density of respiratory pathogens was not substantially higher in pneumonia cases than controls, however, the odds of being a case increases with increased density for some viruses. The utility of pathogen density, alone, in defining pneumonia was limited.

49 McRae T

SToP Trial Consent: Partnering with local Aboriginal environmental health workers

Background and aim: The SToP trial (see, treat, prevent) skin sores and scabies is a cluster randomised trial with a stepped wedge design that aims to translate the results of what we know works in skin health to enhance usual care in the Kimberley region of WA, Australia. The trial is a partnership between Telethon Kids Institute and local Kimberley service providers including Aboriginal led health and environmental health services. Here we describe the consent process for the trial.

Research method: Individual consent for school-based skin surveillance of school aged children was collected by local Aboriginal people trained by study staff. This would ensure the consenting process was culturally appropriate. Aboriginal workers trained in this consenting process went house to house to 'yarn' and explain the trial to parents and careers.

Results: Eight Aboriginal environmental health workers, were recruited and trained in research methods and the consent process. Training was provided an in-depth explanation of the aims and methods involved in the SToP Trial and was facilitated through use of a study flipchart. The lead coordinator of the consenting process also attended a three day 'Introduction to Aboriginal Research' workshop at the local Kimberley University.

Conclusion: Training local Aboriginal people to collect informed consent for a clinical trial is respectful of local community culture and customs, and provides an opportunity to build local Aboriginal research capacity and upskilling. Feedback from environmental health workers confirmed they found the training valuable in understanding the principles and requirements of consent for research.

50 Mahfouda S, Panos C, J.O A, Whitehouse, Thomas C, Maybery M, Strauss P, Zepf F, O'Donovan A, van Hall H-W, Saunders L, Moore J, Lin A

The prevalence and mental health correlates of Autism Spectrum Disorder in gender diverse young people: evidence from a specialised child and adolescent gender clinic in Australia

Background and aim: Research suggests an overrepresentation of autism spectrum diagnoses (ASD) or autistic traits in gender diverse samples, particularly in children and adolescents. The primary objective of the current retrospective chart review was to explore psychopathology and quality of life in gender diverse children with co-occurring ASD relative to gender diverse children and adolescents without ASD.

Research method: Data was used from the GENTLE (GENder identiTy Longitudinal Experience) Cohort at the Gender Diversity Service at the Perth Children's Hospital. The Social Responsiveness Scale (Second Edition) generates a DSM-5 score indicating a likely clinical ASD diagnosis, which was used to partition participants into two groups (indicated ASD, n = 19) (no ASD indicated, n = 60).

Results: The prevalence of indicated ASD was far higher than expected in the general population. Indicated ASD was found to be a significant predictor of Internalising behaviours and Total behaviours on the Youth Self Report. Participants with indicated ASD were almost 8 times more likely to fall within the clinical range for the Total subscale than those with no ASD indicated. Indicated ASD was also a significant predictor of scores on all subscales of the Paediatric Quality of Life Inventory.

Conclusion: The current findings indicate that gender diverse children and adolescents with indicated ASD comprise an especially vulnerable group that are at marked risk of mental health difficulties, particularly internalising disorders, and poor quality of life outcomes. These findings should inform best care practice for working with gender diverse young people with ASD to ensure that their unique care needs are met.

51 Woods E[1], Kingsley J[1], Taylor S [1,2], Hilyard A[1,3]

Reviewing the orthotic management of flexible flat foot to inform service planning

Background and aim: Self-reported questionnaires to evaluate the outcomes of paediatric interdisciplinary pain programs (PIPPs) are well developed, with consensus on domains, recommendations for validated instruments and protocols for administration. Protocols for physical measures such as accelerometry, quantitative sensory testing (QST), and sensitivity to physical activity (SPA) are available, but guidelines for translation into clinical practice for PIPP evaluation remain limited.

Our service routinely used a battery of self-report and physical measures (including 6-Minute-Walk-Test and Sit-to-Stand). We developed an enhanced battery including these extra measures. We wished to test the feasibility of administering this battery within a clinical environment.

Research method: Participants were children attending assessments for a 60 hour PIPP at a state-wide tertiary pain service. Eligibility included aged 9 to 17 and having a primary pain disorder >6mths. The test battery was performed individually pre-PIPP, and in groups of up to 6 children post-PIPP. A priori feasibility criteria were established including retention, completion and data accuracy. Qualitative assessment was done using semi-structured interviews and framework analysis.

Results: Eighteen participants (77% female) were involved. A priori feasibility criteria were met. Median acceptability score was 9 (range 9-10, n=4).

Conclusion: Recommendations will be made for future development of these forms of testing in this cohort.

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52 Bowen A

Community Consultation in remote Aboriginal communities in WA, Australia

Background and aim: Australian Aboriginal children have some of the highest rates of impetigo and scabies in the world. The SToP trial (see, treat, prevent) skin sores and scabies aims to enhance usual skin health care in the Kimberley region of Western Australia. The trial is a partnership between Telethon Kids Institute researchers and local Kimberley service providers. Here we describe the community consultation prior to the commencement of this trial.

Research method: A situational analysis of current activities in skin health in the Kimberley was planned to coincide with community consultation. This facilitated funding, important research preparation activities, an opportunity to build relationships with communities, and a broader understanding of the scope of skin health in the region.

Results: Community consultation in the nine SToP Trial communities was co- led by a local Aboriginal research coordinator. Community elders, community council members, community members, local teaching staff, remote health clinic staff and local environmental health workers were all consulted. All communities were visited face-to-face at least once, and regular visits and communication are ongoing. This approach enabled discussions and planning to progress at a pace directed by the communities.

Conclusion: Planning the time needed (12–18 months) for culturally appropriate, considerate, respectful, collaborative community consultation is essential for successful clinical trials in remote Australian Aboriginal communities. We present an example of effective ongoing engagement (18 months) at the community's pace prior to launch of the SToP trial. Regular visits to remote communities whenever possible is important for ongoing engagement.

53 Nelson H

Child, family and nurse experience pre- and post-move to Perth Children's Hospital

Background and aim: The new Perth Children's Hospital (PCH) was designed to maximise natural light, with mainly single rooms, and to promote nurse time in patient care. It was anticipated this would improve the care experience for children, families and nurses and promote patient safety.

The study aimed to measure the impact of the new physical work environment on time spent by nurses in patient care, patient safety, and patient, family and nurse experience.

Research method: The before and after study used a mixed-methods design over four time points; Time 1 - at Princess Margaret Hospital (PMH) before the move, Time 2 - represented the move, Time 3 - three months post-move and Time 4 - one year post-move. Data collection included: Observation of nurse workflow in three wards; Interrupted time series analysis measuring quality and safety outcomes; Nurse experience of the work environment survey (PESNWI); Focus groups and interviews with nurses, patients and families.

Results: Nurses spent less time in direct patient care post move (34.4% to 32.9%), more time communicating with staff (14.2% to 20%), and walking (4.2% to 8.4%). PESNWI survey identified that post move nurses experienced poorer staffing and resource adequacy (mean 2.64 Time 1, 2.44 Time 4). Families liked the PCH physical environment and valued the nursing care. Many children grieved for PMH, which had felt like a second home. Nurses like how clean and bright PCH is but found the move stressful.

Conclusion: Patients, families and nurses have experienced benefits and challenges following the move to PCH.

54 Pavlos R

Technology solutions & usability testing of PATRIC participant materials.

Background and aim: Acute respiratory infections (ARIs) are among the most common conditions assessed in paediatric emergency departments (ED) and the leading cause of paediatric hospitalisation in Western Australia. The aim of PATRIC (Pragmatic Adaptive Trail for Respiratory Infection in Children) is to develop improved evidence-based treatment of ARI. PATRIC brings together 3 key components to inform and drive these improvements in ARI treatment: a patient registry, a platform trial and Patient Engagement through Technology Solutions (PETS).

Research method: PATRIC utilises parent-owned handheld devices for enrolment, data-collection, parental education and follow-up. A study information video, information sheet, e-consent form and follow-up surveys were developed in REDCap. The PETS application is accessed directly by the treating clinician and sends personalised discharge instructions instantly to the parent's mobile phone. All communication with parents occurs via text message with personalised links to study materials.

Results: PATRIC participant materials were developed in consultation with ED clinical staff and community members. Usability testing was conducted with ED clinical staff and parents. Evaluation of interface usability for both REDCap and PETS was assessed using semi-structured interviews and direct observation. Quantifiable measures, thematic analysis and the System Usability Scale (SUS) were utilised in usability analysis.

Conclusion: Embedding technology in PATRIC will streamline and enhance recruitment and data capture whilst improving communication and parental understanding. We will present the technology platforms for PATRIC and results of usability testing. This approach can be applied generally to create paperless clinical registries and trials with improved participant engagement.

55 Norman D [1,2,3], Barnes R[2,3], Danchin M[4,5,6], Seale H[7], Moore H [2,3], Blyth C[1,2,3,8,9]

Improving Influenza Vaccination in Children with Comorbidities: A Meta-Analysis

Background and aim: Despite Influenza vaccination being the most effective influenza prevention method for children with comorbidities, coverage remains poor compared to other childhood vaccinations. Previous narrative reviews of interventions concluded that parental reminder letters substantially improved vaccine coverage, yet numerous studies were excluded and effectiveness of these interventions were not assessed.

Research method: We searched MEDLINE/PubMed, Scopus, EmBase, CINAHL, and CENTRAL for articles published up to March 2019. Studies evaluating interventions directly targeting influenza vaccination in children with comorbidities were included. Articles were screened and data extracted from eligible publications for meta-analysis.

Results: Following assessment by two authors, 35 publications met inclusion criteria, 25 with sufficient data for pooled meta-analysis. These studies include 13 cross-sectional, 12 randomised trials, and 10 cohort studies. Overall, intervention increased children's influenza vaccination coverage by 62% (RR=1.62, [95% CI 1.48; 1.78]). Interventions targeting either parental or provider's influenza vaccine knowledge increased vaccination (RR=1.39 [95% CI 1.22; 1.58] and RR=1.39, [1.21; 1.26] respectively). Conversely, vaccination reminders directed to parents increased vaccination (RR=1.80, [1.50; 2.17]) greater than vaccination reminders for providers (RR=1.53, [95% CI 1.49; 1.58]). Interventions targeting clinical sites' processes improved vaccination likelihood by 59% (RR=1.59 [95% CI 1.41; 1.80]).

Conclusion: Interventions aimed at parents, providers and clinical changes all improved influenza vaccine uptake in children with comorbidities. Vaccination reminders had the greatest impact on uptake yet confidence intervals overlapped. Future interventions should aim to find the best combination of intervention types.

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Department of Paediatrics and School of Population and Global Health, The University of Melbourne, Melbourne, Victoria, 7 School of Public Health and Community Medicine, The University of New South Wales, Sydney, New South Wales, 8 Department of Infectious Diseases, Perth Children's Hospital, Perth, Western Australia, 9 Department of Microbiology, PathWest Laboratory Medicine WA, QEII Medical Centre, Perth, Western Australia

56 Bowen A

The CASSETTE Trial: a world first RCT involving children and adults

Background and aim: Clindamycin, a protein synthesis inhibitor antibiotic, may limit exotoxin production and improve outcomes in severe Staphylococcus aureus infections. Prospective, human data to support this is lacking. We aim to pilot the first randomised controlled trial (RCT) involving children and adults to determine whether clindamycin is beneficial in severe S. aureus infections.

Research method: An open label, pilot, multicenter RCT (n=60; 40 adults and 20 children) will compare outcome differences in severe S. aureus infection between standard treatment (flucloxacillin/cefazolin in methicillin-susceptible S. aureus; and vancomycin/daptomycin in methicillin-resistance S. aureus) and standard treatment plus clindamycin for 7 days. Participants with septic shock, necrotising pneumonia, or multifocal skin and soft tissue or osteoarticular infections are enrolled within 72 hours of index culture. Immunosuppression, moribund, severe diarrhoea or C. difficile infection, pregnancy, and anaphylaxis to beta-lactams or lincosamides are exclusions.

The primary outcomes measure is number of days alive and free (1 or none) of SIRS (Systemic Inflammatory Response Syndrome) within the first 14 days post randomisation. Secondary outcomes include all-cause mortality at 14, 42 and 90 days, time to resolution of SIRS, proportion with microbiological treatment failure. Impacts of inducible clindamycin resistance, strain types, methicillin-susceptibility, and presence of various exotoxins will also be analysed.

Results: Commencing in September 2018, 18 participants at 6 sites have been enrolled including 8 children and 10 adults.

Conclusion: We will assess the effect of adjunctive clindamycin on patient-centered outcomes in severe, toxin mediated S. aureus infections. The pilot study provides feasibility data for SNAP: S. aureus Network Adaptive Platform trial.

57 O'Gorman T

Immunisation Practices in children on Immunosuppressive therapy

Background and aim: Previous studies have identified that one of the major barriers to vaccination in children on immunosuppressive therapy is physicians knowledge of and recommendation for certain vaccines. This study aimed to evaluate the knowledge base and practices of clinical staff working at Perth Children's Hospital with regards to vaccination in children on immunosuppressive therapy.

Research method: This presentation is based on results obtained from an online survey completed by medical and nursing staff at Perth Children's Hospital in 2018-19. The survey was designed to assess knowledge and practises regarding immunisation in children on immunosuppressive therapy. The second part of the study involved a retrospective audit of pharmacy data from November-December 2018 to determine the extent to which the current

recommendations in the Australian Immunisation Handbook are adhered to in the patient population group of children on immunosuppressive therapy.

Results: Results obtained from the survey highlighted that a there remains a large knowledge gap amongst clinicians with regards to what vaccines are recommended in the patient population group of children on immunosuppressive therapy. The subsequent clinical audit supported these findings, highlighting that the majority of children have not received the additional vaccinations recommended for children on immunosuppressive therapy.

Conclusion: This study has highlighted the need for additional educational resources, and the introduction of new clinical alert systems, in order to remind clinicians of the need to ensure that their patients who are on immunosuppressive therapy have received the recommended vaccines for those medically at risk.

58 McLeod C[1, 2, 3], Norman R[4], Schultz A[5], Messer M[1], Spaapen K[1], Mascaro S[6], Wu Y[1], Webb S[7, 8], Snelling T[1,3,4,9]

IMPACT-CF: Improving the Methodology for PAtient Centred Trials in Cystic Fibrosis

Background and aim: The purpose of late phase trials is to generate evidence of sufficient validity and generalizability to be translated into practice and policy to improve health outcomes. It is therefore crucial that the chosen endpoints are meaningful to clinicians, patients and policymakers. Cystic fibrosis (CF) is a common disorder. Intermittent pulmonary exacerbations are a hallmark of disease and these drive lung damage that results in premature death. We suspect that clinicians make assumptions about outcomes that are desired by patients undergoing treatment for pulmonary exacerbations. The aim of this study is to develop a clinical utility instrument (CUI) using patient preference information that will be applied as a single endpoint to evaluate treatment success in CF pulmonary exacerbation trials.

Research method: We will develop a discrete choice experiment (DCE) in collaboration with consumers, and evaluate how people make trade-offs between different aspects of health-related status when considering treatment options. The DCE will present individuals with hypothetical choice tasks, asking participants to choose between different treatment options and alternative health states.

Results: Weighted preference information from the DCE will be incorporated into a CUI which will enable calculation of a score that can be applied as a single trial endpoint.

Conclusion: We present a novel methodology for developing a CUI using patient preference information that will be used to evaluate treatment success in the BEAT-CF trial. The validity of this instrument compared to traditional measures such as FEV1 will require subsequent clinical evaluation.

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59 E Bell[1,2], E Davis[1,2,3], S Binkowski[1], E Sanderson[1,3], H Roby[1]

Identification of Individual Patterns of Postprandial Glycaemia in Type 1 Diabetes

Background and aim: Postprandial hyperglycaemia remains a concern for individuals with type 1 diabetes (T1D). Guidelines recommend that insulin should be delivered fifteen minutes before eating, which does not account for inter-individual variation in the postprandial response to food. Recent in-clinic studies suggest that there are differences between individuals in their pattern of postprandial glycaemia, whilst there is consistency within individuals even after different meals. This study aims to investigate whether the inter-individual variability and intra-individual similarity in postprandial glycaemia, observed in a laboratory setting, is reproducible in a home environment.

Research method: Participants aged 8-15 years (n=37) completed a six day controlled period, where they consumed a standard breakfast under controlled conditions, and a fourteen day free-living period where participants maintained their usual daily routines. Continuous Glucose Monitoring (CGM) data was analysed from 30 minutes prior, to three hours after breakfast for the controlled period, and breakfast and dinner during the free-living period.

Results: From preliminary data (n=21), time to peak (TTP) during the controlled period ranged from 65–165 minutes, and differed significantly between participants (one-way ANOVA, $p<0.01$). Intra-individual variation was also observed (intra-class correlation coefficient=0.27). There was no significant difference in the mean TTP for each participant during the controlled vs free living period (paired t-test, $p=0.18$).

Conclusion: Preliminary data suggest that both intra-individual and inter-individual variation exist in the TTP glucose response to food. Ongoing data collection and analysis will reveal if an individualised approach to the timing of insulin delivery is appropriate to reduce postprandial hyperglycaemia.

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61 Srinivas Jois R

Do adults born preterm deliver preterm babies? A data linkage study from Western Australia

Background and aim: Infants born preterm at <37+0 weeks of gestation experience complications later in adulthood. However, the risk of adults born preterm delivering preterm babies themselves is not well investigated.

Research method: Midwives Notifications of births for the Western Australian population from 1980 to 2010 were obtained. A retrospective cohort study of 958,729 live-born singletons infants was conducted. Logistic regression was used to estimate odds ratios (OR) of preterm birth for preterm born parents compared to term born parents. Adjustment was made for socioeconomic status, parity, maternal age, and ethnicity.

Results: A total of 876,755 term and 81,974 preterm babies were born during the study period. Information on the preterm birth status of the mother or father was available for 138,123 children. Of these, 1,555 (12.08%) children were born preterm to preterm parents (either of the two parents were preterm), 11,504 (9.22%) preterm children were born to term parents, 11,319 term children were born to preterm parents and 113,254 were born term parents. 68,915 (8.39%) preterm children were born where parents' preterm status was unknown. The unadjusted and adjusted OR with and 95% confidence intervals (CI) for the odds of preterm born adults delivering preterm child were 1.35 (1.29-1.42, $p<0.0001$) and 1.25 (1.18-1.32, p

<0.0001) respectively. The adjusted OR (95% CI) for Aboriginal vs Caucasian adults was 1.96 (1.91-2.01, p<0.0001).

Conclusion: The delivering a preterm child is 25% greater when the parent was born preterm than when the parent was born at term in Western Australia. The effect appears to be transgenerational.

63 Buchiboyina A

Cumulative dexamethasone and outcomes of preterm with bronchopulmonary dysplasia

Background and aim: Postnatal dexamethasone is used to facilitate weaning from mechanical ventilation and prevent bronchopulmonary dysplasia in preterm infants, however concerns remain regarding long-term neurodevelopment and growth. We conducted a retrospective cohort study to compare the long-term neurodevelopmental and growth outcomes.

Research method: All infants born in <29 weeks' gestation, who were mechanically ventilated >7 days, and who survived to receive oxygen or respiratory support at 36 weeks corrected age, were included. Short-term outcomes and neurodevelopmental outcomes at 2 and 5-year follow-up were compared infants who received no dexamethasone, or a total cumulative dexamethasone dose <2mg/kg (lower) and ≥ 2mg/kg (higher).

Results: One hundred and twenty-six were treated with dexamethasone, 72 with cumulative dose <2mg/kg and 54 ≥2mg/kg, and 403 were controls. A higher cumulative dexamethasone dose was not associated with the composite outcome of long-term disability compared to controls (p=0.304), with no difference between lower and higher dexamethasone cumulative doses (p=0.185). Higher cumulative doses of dexamethasone were associated with higher odds of severe cognitive delay (p=0.046). The prevalence of cerebral palsy between the three groups did not differ significantly. Weight and height were lower in the treatment groups compared to controls. There was no difference in weight, height and head circumference between the lower and higher dose groups.

Conclusion: In this cohort, a higher cumulative dose of dexamethasone was associated with increased risk of severe cognitive delay. Dexamethasone use was associated with lower growth measurements compared to controls. We suggest caution should be used particularly in utilizing higher cumulative dexamethasone doses.

64 Clark S

Antibodies to NTHi are not reduced in remote Australian Aboriginal otitis prone children

Background and aim: Australian Aboriginal children have the highest rates of otitis media (OM) globally with chronic disease almost universal in remote areas, where common risk factors enhance pathogen exposure. We previously demonstrated that Aboriginal children with chronic OM have reduced serum non-typeable Haemophilus influenzae (NTHi) antigen-specific IgG compared to non-Aboriginal children. Little data exists on whether immune responses differ between Aboriginal children living in rural and metropolitan areas so we sought to compare NTHi titres in these children.

Research method: Serum was collected from Aboriginal children with OM undergoing surgery from metropolitan and rural Western Australia (WA). Antigen-specific serum IgG to NTHi proteins rsPilA, Protein D (PD), OMP26 and chimeric vaccine candidate, ChimV4, were

measured using an in-house multiplex fluorescent bead immunoassay. IgG Geometric Mean Concentrations (GMCs) were adjusted for age, and compared between groups using a univariate analysis model.

Results: No differences in NTHi antigen specific IgG were seen between children from metropolitian (n=31) and rural (n=38) WA for most antigens (GMCs: rsPilA=93.60 vs 83.10; ChimV4=460.62 vs 392.68 and PD=203.77 vs 183.83). IgG to OMP26 was two-fold higher in children from rural versus metropolitan WA (GMCs:1237.69 vs 643.55; p=0.012).

Conclusion: NTHi-specific IgG to promising NTHi vaccine antigens, ChimV4, rsPilA and PD, were similar in Aboriginal children from rural and metropolitan WA. This suggests that titres may be boosted in both populations by the same vaccine containing these antigens, which may offer protection from NTHi. OMP26 titres differed based on remoteness and may be a more sensitive marker of NTHi exposure.

65 Taylor S

An Occupational Therapy investigation into the use of continuing professional development to inform practice

Background and aim: There is a degree of confusion between dissemination and evaluation, often resulting in production of low level dissemination that is not monitored. The aim of this project was to create and test a method of continuing professional development (CPD) evaluation and second, measure impact on clinical practice after a recent CPD course.

Research method: A cross-sectional study design was used to determine knowledge use post CPD via an online survey. Participants were 22 allied health staff who attended a 2-day training course at PCH. Descriptive and thematic analysis of quantitative and qualitative responses was conducted.

Results: Response rate for the online survey was 50% (11/22). The majority of participants strongly agreed that; the course met outlined aims (10/11); staff were able to apply the new knowledge in practice (6/11); and that it had an impact on their practice (7/11). Slightly lower ratings were given for sharing new knowledge with colleagues (5/10); and being able to provide better support to patients (5/10). Low ratings were given for measuring the outcomes of using new knowledge (1/11). Qualitative data provided insights into the timing and format of knowledge sharing strategies and application of new knowledge to caseloads, and how CPD could be delivered differently.

Conclusion: The survey was able to provide information about how staff used their new knowledge and what is needed to support knowledge use post CPD course. With further testing we propose this evaluation framework can be modified and applied to different formats of CPD in allied health.

66 Daw J

Evidence of two pathways used by Streptococcus pyogenes for epithelial cell invasion

Background and aim: *Streptococcus pyogenes* (Strep A) is the primary cause of bacterial pharyngitis, with severe side-effects of superficial infections causing >500,000 deaths/year. Invasion of tonsil epithelium may enable Strep A's escape from the immune system and antibiotic therapy. The surface protein SfbI is variably encoded by different Strep A strains but is present on most strains that infect the tonsils. SfbI has been demonstrated to promote invasion of multiple epithelial cells and antibiotic treatment failures.

Research method: To determine the role of SfbI in mediating Strep A's invasion into different cell types, we investigated two prevalent pharyngitis-associated strains: $M6^{JRS4}$ (SfbI-positive) and $M1T1^{5448}$ (SfbI-negative). Allelic exchange mutagenesis and plasmid complementation generated a series of strains with or without SfbI for comprehensive assessment of its role. These strains were used to infect tissue culture cell lines (HeLa-Kyoto and HEp-2), with invasion rates measured using a gentamicin-protection assay.

Results: SfbI had no effect on adherence, indicating other adhesins are likely responsible. The loss of sfbI in $M6^{JRS4}$ significantly abolished invasion in HeLa-Kyoto by 92%, but there was only a small reduction in HEp-2 cells. The introduction of sfbI increased internalisation of $M1T1^{5448}$ in HeLa-Kyoto cells almost twenty-fold, but internalisation of $M1T1^{5448}$ was only doubled in HEp-2 cells with sfbI introduction.

Conclusion: These results show that SfbI is essential for invasion into HeLa cells. For invasion into HEp-2 cells, SfbI does contribute to epithelial invasion but it is not essential. This indicates there are two invasion pathways in HEp-2 cells, with SfbI mediating invasion via one of these pathways.

67 Richmond P

Using biomarkers to predict children that will require repeat ventilation tube insertion

Background and aim: Despite the effectiveness of Ventilation tube insertion (VTI) in restoring hearing loss related to otitis media, between 20-50% of children will require repeat VTI for recurrent disease. This contributes to excessive wait-lists and increased disease sequelae. Determining modifiable risk factors or indicators associated with repeat surgery at the time of first grommet insertion may help to improve outcomes.

Research method: Children were recruited prior to their first VTI surgery and followed for 2 years. Middle ear effusions (MEE) were collected at the time of surgery and analysed for otopathogens using quantitative PCR, cytokines using a multiplexed immunoassay, and for metabolites using gas chromatography mass spectrometry.

Results: Sixty children (mean age 2.3 years) were recruited with 14 (23%) requiring repeat VTI within 2 years. Ventilation tubes extruded earlier in children requiring repeat surgery (9.22 vs 12.67 months; $p=0.030$). Those requiring repeat VTI were more likely to have nontypeable Haemophilus influenzae (64% vs 15%; $p<0.001$), elevated cytokine titres including IL-1β (79% vs 36%; $p=0.004$), IL-6 (86% vs 49%; $p<0.001$), IL-8 (93% vs 64%; $p<0.001$) and IL-10 (76% vs 40%; $p=0.001$) in their MEE. Nine metabolites, including cholesterol and Myo-inositol, were between 2 and 12 fold higher in children requiring repeat surgery ($p\leq0.026$).

Conclusion: Biomarkers associated with an increased risk for needing repeat VTI surgery appear to reflect ongoing infection and inflammation at the time of surgery. These biomarkers

represent treatable risk factors that may reduce the need for repeat surgeries. These need to be validated in larger cohorts.

68 Jape G[1,2], Lim M[1,2], Sharp M[1,2]

Neurodevelopmental and growth outcomes in extremely low birth weight (<500grams) preterm infants

Background and aim: Extreme preterm survival has significantly improved with advanced neonatal care; however survival and outcomes of infants with birth weight (BW) <500 grams remain poor. We aimed to retrospectively review our institutional outcomes.

Research method: Preterm infants actively resuscitated at ≥ 22 weeks gestation (GA); BW≤500g (January 2001-December 2017) and admitted to NICU were included. Short term outcomes such as prematurity related complications, mortality and follow up data were reviewed. Moderate to severe disability were defined as: Cognitive levels (on most recent assessment) 2-3 or >3 Standard Deviations (SD) below mean, Cerebral palsy (CP) classified as Gross Motor Function Classification System (GMFCS)>2, hearing loss requiring bilateral amplification; and legal blindness.

Results: There were 92 eligible infants with median GA: 24 weeks (22-30); median BW: 427.5 (380-500) grams. 78/92 (84.7%) were small for gestational age (SGA). 46 (50%) died in the neonatal period; remaining survived atleast to age five. Prematurity related complications were common. Follow-up data was available for 41/46 (89%) infants. At median age of 5.06 years, standardized cognitive assessments showed that 70% (29/41) scored <1SD, 29% (12/41) scored 1-2SD, 22% (9/41) scored 2-3SD and 20% (8/41) scored <3SD below mean. Severe CP was diagnosed in 5%. Severe deafness (1/41) and legal blindness (0/41) was rare. Growth of most children tracked at >2 SD below normal.

Conclusion: 50% preterm infants weighing <500g at birth survived; majority had medical complications. 54% were free from moderate to severe disability at 5 years. Growth remained a concern and needs further monitoring.

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69 Evans K

A Case Study of the NHMRC's Guideline Approval Program: Autism Assessment and Diagnosis

Background and aim: The clinical presentation of autism is complex and varies between individuals. The task of providing accurate ASD diagnoses in Australia is complicated further by variability between states/territories in the autism diagnostic process and service eligibility. The objectives were to develop a guideline that describes a rigorous framework for accurately determining diagnostic outcomes and support needs, whilst maintaining sufficient flexibility to apply to individuals of any age, gender, cultural or language background, communication or intellectual capacity, and medical complexity, living anywhere in Australia.

Research method: National Health and Medical Research Council (NHMRC) processes for developing high quality clinical guidelines were followed. This included;

1. appointment of a steering committee;
2. scoping and systematic reviews;
3. community consultation activities;

4. evidence review and strength-rating;
5. public feedback on draft;
6. independent methodological and content review of revised draft;
7. review of the final draft by the Council of NHMRC;
8. final revisions and publication.

Results: The guideline recommendations were approved by the Chief Executive Officer of the NHMRC, indicating the guideline recommendations:

- Meet the NHMRC standard for clinical practice guidelines;
- Were derived systematically and based on the best available scientific evidence; and
- Developed for clinicians practising in an Australian health care setting.

Conclusion: The implementation of these NHMRC approved guideline recommendations will provide the Australian community with greater equity in access to a rigorous, transparent and comprehensive autism assessment and diagnosis, and confidence in the accuracy of diagnostic decisions and subsequent recommendations for future services and supports.

70 Fried L

Learning from schools highly supportive of students with Type 1 Diabetes

Background and aim: Schools have an important role to play in supporting the psychosocial and physical health of youth with type 1 diabetes (T1D). Studies have found that good school-based diabetes care and support for students is related to better diabetes management and quality of life. Research has indicated that support for students with T1D across schools in Western Australia is inconsistent. Schools are often faced with challenges in providing support strategies for students with chronic conditions and strategic capacity building is needed. This project therefore aimed to investigate how schools, perceived as being supportive of students with T1D, provide support for the psychosocial wellbeing and disease management of these students.

Research method: Semi-structured interviews were conducted with school staff, students and parents. Nine schools participated and a total of 34 interviews were conducted. Using a Social-ecological framework, themes were developed through inductive analysis and constant comparison of codes.

Results: Results indicated that participating schools had characteristics that enabled their support capacity. For example, they were flexible, had a focus on inclusion and shared the responsibility for students with special needs. The support they provided ranged from interpersonal, such as emotional support, to organisational including the development of appropriate policies and communication plans.

Conclusion: The findings provide a model of psychosocial support and disease management that with further development can be used to enhance the capacity of schools to support the psychosocial and physical wellbeing of students with T1D.

71 Alexander C

Connecting WA children and youth with disabilities to leisure activities

Background and aim: Participation in leisure is as a human right for children, contributing to all aspects of wellbeing (physical, social and mental). The quantity and quality of participation is reduced for children with disabilities. The Kids Rehab WA Consumer Group identified participation as a key research focus for the department. The group proposed an app-based

database for leisure opportunities for children with disabilities. The Jooay App, developed at McGill University, Canada, was selected as an app with existing structure and documented efficacy to use for the WA database.

Research method: Potential sites were identified using a combination of Google searches and word of mouth, and were contacted via email with an eligibility survey. If eligible, a unique profile for their site was created with details of the leisure activity, location and timing, accessibility information, target population, price guide and contact information.

Results: To date 134 WA sites have been added to Jooay. The majority are within the central metropolitan area of Perth, but extend north to Butler, east to Mundaring and south to Coondanup. The majority of activities fall in the "Sports" category (89), while "Arts" is the second most common descriptor (16).

Conclusion: The Jooay App is live and functioning for the general public to use. Inclusion of activities is ongoing, and future research is planned for identification and inclusion of rural WA sites. Increased engagement in the app now relies on formal and informal promotion, with ongoing research planned to assess this engagement.

73 Fitzgerald C[1, 2], Strauss P[1, 2], Thomas C[1,3], Saunders L[2,3], Pestell C[1,2], Lin A[1], Moore J[2, 3], Bebbington K[1]

Disordered eating behaviours and body dissatisfaction in youth with gender dysphoria

Background and aim: There is a paucity of research describing the rates of disordered eating in youth identifying as trans (transgender). The aim of this study is to investigate the predictors of disordered eating behaviours and the possible mediating effect of body dissatisfaction in children and adolescents with gender dysphoria attending a paediatric outpatient service.

Research method: The Gender Diversity Service at Perth Children's Hospital is one of the first child and adolescent clinical services for gender dysphoria to implement routine screening measures of disordered eating behaviours and body dissatisfaction. Participants completed self-report measures of gender dysphoria (Utrecht Gender Dysphoria Scale), body dissatisfaction (Body Image Scale) and disordered eating behaviours (SCOFF/ESP) as part of clinical care; those included in the analysis reported here are part of the GENder identiTy Longitudinal Experience cohort (GENTLE) study.

Results: Analysis is currently underway. Results from this study will improve our understanding of this high-risk population and have the potential to inform systematic screening measures for youth with gender dysphoria.

Conclusion: This study will present novel evidence regarding these associations between disordered eating behaviours and body image within the Australian transgender youth outpatient community. The findings of this study may indicate the need to develop a more tailored approach to eating disorder treatment for transgender individuals; as recent case reports highlight the importance of early intervention, family engagement and the timely provision of gender affirming medical interventions in the prevention and treatment of eating disorders in this population as opposed to solely providing traditional eating disorder treatment strategies.

1 Telethon Kids Institute, The University of Western Australia, 2 University of Western Australia, 3 Gender Diversity Service, Acute Child and Adolescent Mental Health Service, Child and Adolescent Health Service - Mental Health, Perth Children's Hospital

74 Schofield C[1], Giacalone V[2,3], Margaroli C[2,3], McLean S[1], Kicic A[1,4,5,6], Stick S [1,4,6], Tirouvanziam R[2,3], Garratt L[1]

Changes in Neutrophil Phenotypes and Lung Disease Outcomes in Early Cystic Fibrosis

Background and aim: We have recently established that a pathological phenotypic shift occurs within polymorphonuclear neutrophils (PMNs) upon recruitment to CF airways. Predominant phenotypic features are reduced phagocytic receptor expression (CD16) and hyperexocytosis of protease containing granules (CD63). Over a 3-year period, we are characterising airway PMN phenotypes in young children with CF over multiple visits. We hypothesise that the burden of airway PMN phenotype shift positively correlates with clinical lung disease progression.

Research method: Bronchoalveolar lavage (BAL) cell fraction and blood (where possible to allow baseline PMN phenotyping) was obtained from children with CF less than 3 years old. PMN were then analysed for the reprogrammed phenotype (CD16, CD63 expression) via flow cytometry. Parameters of clinical lung disease including CFTR mutation, airway microbiology, detectable neutrophil elastase and PRAGMA-CF CT score were also collected at each visit.

Results: Currently, 32 children <3 years old have been recruited to the study, with 16 at 3-months of age. We have assessed BAL from 58 visits, resulting in multiple assessments for 21 participants to date. Matched blood has been assessed for 75.9% visits. As of our interim analysis, we have found reprogrammed PMN constitute a significantly higher proportion of the BAL cell fraction at the 36-month visit compared to the initial 3-month visit (36-months = 19.22% vs 3-months = 3.49%, $p<0.05$).

Conclusion: We demonstrate it is possible to longitudinally characterise PMN phenotypes and collect clinical parameters in young children with CF. We aim to complete multi-variate analyses of PMN reprogramming and disease outcomes in 2021.

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75 Derrick C, Clarke P, Wei Hau L

Education improved adherence to bronchiolitis protocol

Background and aim: Bronchiolitis is the commonest cause for admission to Paediatric wards the world over. The common theme is one of over investigation and unnecessary treatment that have no evidence base. A retrospective audit was performed in 2012 (151 patients) and another in 2017 (88 patients) to assess adherence to bronchiolitis protocols used in our tertiary Paediatric Hospital (Princess Margaret Hospital). During the interval period regular, hour long, education sessions were given to all rotating staff through our busy ED, both RMOs and registrars, at the beginning of the new term. The same lecture was given by the same senior consultant and highlighted the importance of adherence to an up to date protocol, and the fact that too many procedures, investigations and treatments were being administered, without evidence base, which could cause harm and generate unnecessary expense.

Research method: Two junior doctors performed the same audit 5 years apart. Charts with admission, or discharge diagnosis, of bronchiolitis were reviewed. Patient demographics, investigations and treatment were reviewed. In particular we looked at blood tests done (Full blood count, CRP and blood culture), whether or not a chest x ray was done, the use of bronchodilators, antibiotics and corticosteroids. Use of enteral and parenteral fluids was reviewed as well as supplemental oxygen. Use of blood tests was deemed appropriate if the child looked septic or was in severe respiratory distress. Performing a chest x ray was deemed appropriate if the child had assymetrical signs, or an unclear clinical picture. Use of antibiotics was deemed appropriate if the white cell count and CRP were elevated (random cut off was 20 000 for white cells and 30 for CRP) or if the chest x ray had consolidation. Use of bronchodilators was deemed appropriate only after age of 6 months and a demonstrated response documented.

Results: In 2012 40% of patients received blood tests and this was reduced to 16% in 2017. Chest x ray was only performed in 21% in 2017 (11% deemed appropriate) whereas in 2012 43% underwent chest x rays. In terms of bronchodilators, in 2017 25% received bronchodilators, which was an improvement from 47% in 2012. In 2017 6% of the admissions receiving bronchodilators were under 6 months, whereas in 2012 this figure was 26%. Rates of antibiotic administration fell from 22% (2012) to 9% (2017). Rates of steroid use fell from 21% (2012) to 4.5% (2017). Oxygen administration cannot be compared because the cut off saturation for commencing oxygen were different in the two time periods (94% in 2012 and 92% in 2017). In 2012 52% received oxygen therapy and in 2017 49% did. A third of the oxygen administration in 2017 was deemed inappropriate as the cut off saturation for commencing oxygen was not adhered to.

Conclusion: Ongoing education can improve adherence to established protocol. This education needs to be repeated at the start of every rotation of new doctors to the department. There have been improvements in adherence to protocol but there are still many improvements to be made.

Improvement in adherence to bronchiolitis protocols achieved at a general metropolitan hospital in Armadale, Western Australia. Two separate retrospective audits done 5 years apart were under taken. Regular teaching on up to date management for RMOS and registrars was done, at the beginning of each rotation by a senior consultant. Outcomes included less unnecessary investigations and treatments and greater adherence to protocol used at the tertiary Paediatric hospital.

76 Martino V

Examining immunisation prescribing for inpatients at Perth Children's Hospital

Background and aim: Vaccines are prescription only medications, however little is known regarding the quality of vaccine prescribing in a hospital setting. To investigate the quality and adherence of inpatient immunisation prescribing at a tertiary paediatric hospital to the WA Immunisation Schedule (WAIS), the National Safety and Quality Health Standards for medication safety and best practice national guidelines.

Research method: An observational, retrospective study was conducted on inpatient immunisations at PCH for children aged ≤16 years who received a vaccination on the WAIS between July 2018 - February 2019. Information was obtained from medical and pharmacy dispensing records. Prescription variables for each vaccine were captured and assessed against the National Safety and Quality Standards for medication safety, the WAIS and the Australian Immunisation Handbook.

Results: Of the 110 vaccine prescriptions examined, one quarter (25%) contained at least one error. Seventeen cases (15.5%) had an incorrect dose prescribed (under dose or overdose) while five had spelling errors (4.5%). Incorrect route of administration was identified for three cases (2.7%), and one case of illegibility and another where duplicate administration were identified. Nineteen cases (17.3%) were overdue vaccination according to the child's age and the WAIS, by ≥ one month.

Conclusion: Errors in vaccine prescribing were found to be unacceptably high and can impact vaccine effectiveness, particularly for this medical-at-risk cohort of children admitted to hospital. Further provider education is required, and the WAIS in the future should contain prescribing information, as is currently done in some other jurisdictions.

77 Hand R

Reviewing the orthotic management of flexible flat foot to inform service planning

Background and aim: People who suffer from rheumatic fever, an infection that is common in school age children throughout the world, are given antibiotics (penicillin) every four weeks for many years. The infection can cause a weak heart and cause permanent heart damage.

Research method: The special penicillin has been used for decades and is produced by many different factories in the world. Some people have reactions to the medication and some people seem to process the medication very quickly.

Results: With so many people producing the medication, we wanted to see if there were any problems with the medication itself, either not enough medication or problems with the medication wasting away. We used a few different ways to see if the medication being produced was a good quality product and if it was safe to use.

Conclusion: We did not discover any problems with the medication, it tested all OK.

78 Kado J[1], Hand R[1], Henderson R[2], Wyber R[1,3], Salman S[4], Batty K[5], Manning L[4,6], Carapetis J[1,4,7]

A Pain in the Backside. Improving Secondary Prophylaxis for Rheumatic Heart Disease

Background and aim: Benzathine penicillin G (BPG) has been used since the 1950s for secondary prevention acute rheumatic fever (ARF). It is approved for intramuscular (IM) injection and is unique; with blood levels present for up to 4 weeks. Australian and New Zealand Guidelines recommend BPG every 4 weeks for a minimum 10 years to prevent progression of rheumatic heart disease (RHD).

Significant issues with the current formulation (pain, duration and frequency) are often cited as reasons for poor adherence. There is significant interest in reformulation expressed by clinicians and patients.

Research method: Observational studies have demonstrated a significant difference (up-to 86%) in plasma half-life of BPG in individuals with a high BMI (≥25kg/m2), suggesting intended IM injections may be inadvertently delivered into subcutaneous (SC) tissue.

Questions remain about the tolerability and pharmacokinetics of SC injections, with significant implications for RHD control programs worldwide – namely dose and frequency of injections.

Results: We undertook a phase 1 clinical trial on healthy male volunteers (n=15) to assess PK profile and tolerability of SC BPG administration in humans using a single-blind crossover trial design. After randomization to either ultrasound guided SC or IM injection, they were

followed by serial dried blood spots and pain levels for 42 days to establish a population pharmacokinetic model comparing the routes of administration.

Conclusion: We will present the results essential for future plans to alter dosing schedule and reformulate a better tolerated long-acting penicillin for rheumatic fever.

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80 Richmond H

Prevalence and Risk Factors of Otitis Media Among Urban Aboriginal Children

Background and aim: The prevalence of otitis media among the Aboriginal Australians is placed among one of the worst globally, with prevalence as high as 90% for Aboriginal infants in remote communities. While a high proportion of Aboriginal children now live in urban areas and high rates of OM have been reported in urban Aboriginal schoolchildren, the prevalence and risk factors of OM among urban Aboriginal infants are unknown. This study aims to address a gap in knowledge in Australia regarding the prevalence of otitis media among urban Aboriginal children.

Research method: This prospective cohort study follows 252 Aboriginal infants from birth to age 12 months in the Perth South metropolitan region (Rockingham, Kwinana and Armadale areas). Potential participants are identified through community-based Aboriginal antenatal programs and in hospital post-delivery. Families are visited in their home and otoscopy, tympanometry and general health assessments are undertaken in the home at 2, 6 and 12 months of age.

Results: We currently have 100 infants enrolled and have already identified the prevalence of middle ear infections of 31% at 2 months and 52% at 6 months of age. 73 clinical audiology assessments have been performed, with current results indicating that 58% of infants have mild, moderate or severe hearing loss between 9-12 months of age.

Conclusion: By presenting results of the study, we can help to provide data for planning and evaluating health services for Aboriginal children with OM. The study has already identified a significant burden of OM in the urban population.

81 Walley R

Reviewing the orthotic management of flexible flat foot to inform service planning

Background and aim: Poor ear health is a major issue for Aboriginal and Torres Strait Islander children. It sometimes begins within weeks of birth and can persist into adolescence and adulthood. Most OM research relating to Aboriginal Australians has been conducted in remote or rural areas despite the fact that more Aboriginal people living in urban settings.

The Kadadjiny Dwank Project (listening, thinking and learning with your ears) explores what Aboriginal people know and do about OM in the Armadale, Kwinana and Rockingham areas with a focus on families that have children aged 0 to 5 years. The project examines the barriers, impacts and how they cope from an urban context on families with children that have the disease?

Research method: The Kadadjiny Dwank Project is a qualitative research which uses Participatory Action Research (PAR) methodology, i.e working with community and not for community. This process enables community to embrace research and to take ownership. Yarning is used to provide a culturally respectful method to build trust with participants and encourages two-way learning to ensure more effective outcomes. The research questions are:

- What do people know and do about ear infections?
- What are the barriers to accessing care?
- How does OM impact on the child and family?

Community forums have been conducted in two locations. The forum was divided into two sections, the first part introduces the team and project to community, seek support and invite people on the Community Advisory Group and Focus Groups. The second part was to inform people about OM to share knowledge and lived experiences, how OM impacts child and community if left undetected and untreated.

Results: The project has a Noongar research team from community to capture the nuances of language during the community forums and focus groups to ensure what was said was clearly understood and not misinterpreted. Enabling communication between the research team and community was paramount. Through knowledge and awareness of OM it is intended to empower families to help detect and to prevent middle ear problems in their children through regular check- ups and culturally effective strategies.

Conclusion: This project will enable community to have a voice and to bring about change for children and families suffering from OM. Key findings, themes and recommendations from community will be presented at the forum.

82 Everard M

‘Gold standard’ results obtained by bronchoalveolar are far from robust.

Background and aim: Bronchoalveolar lavage (BAL) is regarded as providing ‘gold standard’ samples for infective lower respiratory tract disease. Current approaches have been adopted empirically without robust assessment and hence carry many assumptions that have not been tested. This study aimed to explore the validity some of these assumptions

Research method: BAL was undertaken via an endotracheal tube in subjects aged less than 6 years with a persistent bacterial bronchitis and healthy controls.

Results: Bacteriological results from two accredited laboratories produced discrepant results in half of the symptomatic children while potentially pathogenic organisms were cultured in 40% of completely well, asymptomatic subjects.

Conclusion: These results call into question the blind and uncritical acceptance of culture results of samples obtained from a bronchoalveolar lavage and call for a serious re-evaluation of this field.

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Research support, development and governance

The Child and Adolescent Health Service (CAHS) is committed to supporting our researchers so that a research culture is embedded into everyday clinical practice.

There is a dedicated team offering specialised support services to assist in the development, governance and implementation of effective research across our health service. The team supports CAHS researchers as well as our partners who engage in research at our sites or with our patients.

We look forward to hearing from experienced researchers or those looking to start their research journey at CAHS. There are many ways we can improve and enhance the quality of your research.

Research Support: What does the team offer?

- Research facilitation and advice
- Research development and design
- Business support and advice
- Research feasibility advice
- Research education resources
- Ethics and governance application support
- Marketing and communications
- Biostatistics and data management
- Research suites (Telethon Clinical Research Centre – Outpatient Clinic D)
- Consumer involvement / engagement
- Research funding and grant support
- Clinical Trials liaison and support
- Access to CAHS Research Nurse Register

Contact Us

Option 1: Website
You may find what you need on our website. Our pages are regularly updated and include templates, guidelines, educational resources and general information.
Website: cahs.health.wa.gov.au/Research

Option 2: General Enquiries
Not quite sure where to start or what help is available? Get in touch and we can direct your enquiry to a suitable team member who can help.
Email: CAHS.ResearchSupport@health.wa.gov.au

Option 3: Drop In Sessions
Another way to get some guidance is via ‘drop in support’ from 9am to 10am and 2pm to 3pm every work day. Individual appointments can be made outside these times. Office 5E, Level 5 Perth Children’s Hospital. Ask for the Research Facilitators.

Option 4: Direct contact with relevant team members
If you know what you need, contact the specific team member/s.