# The Royal Women's Hospital Research Week 2019

## ABSTRACT BOOKLET



# Keynote Speaker

## Tuesday 19 Nov (4.00-4.45pm)

***A journey through different worlds.***

**Dr Sarah Hanieh,** NHMRC Research Fellow, Peter Doherty Institute

*Sarah will discuss her journey from 'bedside to bush', and her work on child undernutrition in a remote Australian Aboriginal community, going beyond its conventional clinical and public health boundaries to highlight some of the invisible pathways to malnutrition*.

Dr Sarah Hanieh is a an NHMRC Research Fellow in the International and Immigrant Health Group at the Doherty Institute. Sarah trained as a paediatric infectious diseases physician and has worked in maternal and child health for over 20 years in a clinical, research and policy capacity with a number of non-governmental, academic and other international institutions including Medecins Sans Frontieres and the World Health Organization. She has previously spent time working in Nepal, Papua New Guinea, Liberia, South America, Ethiopia and Vietnam, as well as in Aboriginal communities in the Northern Territory. Sarah was awarded both the Chancellors Prize and Dean's Award for Excellence in a PhD thesis in 2016 and received a four-year NHMRC Early Career Research Fellowship. She was recently selected to take part in the largest all woman expedition to Antarctica as part of a leadership, strategic and science initiative for women in STEMM. Her current research focuses on identifying strategies to prevent child undernutrition in resource-constrained settings.

# Workshops:

## Monday 18 Nov (12.00-2.00pm)

**THEME: Strategy for developing future NHMRC Investigator Grants**

***Insights from a panel of successful Investigator Grant applicants***

**Dr Calum Roberts***
Investigator Grant Emerging Leadership (Level 1)

**Dr Beth Allison***
Investigator Grant Emerging Leadership (Level 1)

**A/Prof Graeme Polglase***
Investigator Grant Leadership (Level 1)

*The Ritchie Centre, Hudson Institute of Medical Research.

***Insights from Investigator Grant panel members***

***Prof Peter Rogers,*** *The Women's*

***Build your profile, CV and track record***

***Prof Eva Dimitriadis,*** *Dept O&G, Uni Melb*

## Monday 18 Nov (2.30-4.30pm)

**THEME: Media insight & Gaining funding from philanthropic trusts and foundations**

***How to make headlines and influence people***

**Georgia Brown**, Comms, RWH

*If you've ever wondered how studies make headlines or how expert commentators get airtime, then look no further. The Women's Senior Media Adviser Georgia Brown will give insight into the media business, what journalists want and what a good headline needs. By the end of the session you'll have a handle of the benefits and risks of using media relations to build a profile for your work.*

***Current open funding rounds at the Ian Potter Foundation and trends in Victorian philanthropy***

**Alberto Furlan and Lauren Monaghan**, Ian Potter foundation

*The Ian Potter Foundation is a major Australian philanthropic foundation which supports and promotes excellence and innovation makes grants in areas that align with its vision of a vibrant, healthy, fair and sustainable Australia. Alberto and Lauren will speak about current open funding rounds at the Ian Potter Foundation and trends in Victorian philanthropy.*

***How the Foundation can assist you to reach more potential donors***

**Fran Hoy,** Women's Foundation

# Abstracts:

# Student Symposium

## Tuesday 19 Nov (9.00-5.15pm)

## Student Symposium Session 1

**Trajectories of early depressive and anxiety symptoms in fathers of very preterm infants and associations with parenting behaviour.**

GE. McMahon[a,b], PJ. Anderson[a,b], R Giallo[b,c], CC. Pace[b,c,d], JL. Cheong[b,e,f], LW. Doyle[b,c,e,f], AJ. Spittle[b,e,g], MM. Spencer-Smith[a,b], K Treyvaud[b,c,e,h]

*[a]Turner Institute for Brain and Mental Health, School of Psychological Sciences, Monash Uni; [b]Murdoch Children's Research Institute; [c]Dept Paediatrics, Uni Melb; [d]Dept Adolescent Medicine, RCH; [e]Neonatal Services, Royal Women's Hospital; [f]Dept O&G, Uni Melb; [g]Dept Physiotherapy, Uni Melb; [h]Dept Psychology and Counselling, La Trobe Uni.*

**Background**: Mothers of very preterm (VPT) infants are at high risk of mental health difficulties. Less is known about the course of fathers' depressive and anxiety symptoms over time, and the implications this may have for early parenting behaviours.

**Objectives**: This study aimed to: 1) identify subgroups of fathers of VPT infants as defined by their trajectories of depressive symptoms and anxiety symptoms from shortly after their infant's birth to 12 months' corrected age, and 2) examine the associations between these trajectories of depressive symptoms and anxiety symptoms and a range of fathers' parenting behaviours (sensitivity, structuring, nonintrusiveness, nonhostility) at 12 months' corrected age.

**Methods**: 100 fathers of 125 infants born VPT completed questionnaires assessing depressive and anxiety symptoms shortly after their infant's birth, and when their infant reached term-equivalent age, 3 months, 6 months, and 12 months' corrected age. At 12 months' corrected age, fathers' parenting behaviours were assessed using the Emotional Availability Scales. Longitudinal latent class analysis was used to identify trajectories of fathers' depressive and anxiety symptoms, and linear regression equations examined relationships between these trajectories and fathers' parenting behaviours.

**Results**: For both depressive and anxiety symptoms, three distinct trajectories were identified. For depression, most fathers were assigned to the persistently low symptom trajectory (61%), while the remainder were assigned to the moderate (31%) and persistently high (8%) trajectories. For anxiety, most were assigned to the persistently low (48%) or moderate (42%) symptom trajectories, with 10% assigned to the persistently high trajectory. There were no significant differences in parenting behaviours between fathers assigned to the different depressive and anxiety symptom trajectories.

**Discussion**: Fathers of VPT infants are at risk of significant and ongoing depressive and anxiety symptoms over the first postnatal year, highlighting the need for screening and ongoing support. While we found no evidence for associations between fathers' mental health trajectories and parenting behaviours, further research is needed to understand the implications of fathers' mental health for other aspects of the parent-child relationship and VPT child developmental outcomes, especially in the longer-term.

## Exploring family satisfaction with breastfeeding support in the Neonatal Intensive Care Unit (NICU), and breastfeeding outcomes at six month of age.

Rebecca Hyde[1,3,4], D Forster[1,4], S Jacobs[2,5,6,7], L Bignell[5], A Moorhead[1,4], S Favorito[5], H McLachlan[3,4], T Shafiei[4]

*[1]Midwifery & Maternity Services Research Unit, Royal Women's Hospital; [2]Newborn Research Centre, RWH; [3]School of Nursing and Midwifery, La Trobe University (LTU); [4]Judith Lumley Centre, LTU; [5]Newborn Services, RWH; [6]Dept O&G, Uni Melb; [7]Clinical Sciences, Murdoch Children's Research Institute.*

**Background**: Consumer satisfaction is now a fundamental aspect of evaluating health service performance, enabling meaningful changes to the delivery of care. We worked with a group of parents who had previously had infants admitted to NICU at the Royal Women's Hospital (the Women's) to design a survey exploring family experiences. One topic area was infant feeding, given the known benefits of breast milk for babies admitted to the NICU.

**Objectives**: To explore 1) families' satisfaction with breastfeeding support in the NICU, and 2) the proportion of infants receiving breast milk at six months of age.

**Methods**: A cross-sectional design was used. Eligible families who had an infant admitted to the NICU at the Women's were sent a postal survey between March 2017 and June 2018, six months post-birth. Eligibility criteria: if infant was born in the sampling time frame, was admitted for ≥ 4 hours, and had been discharged from the Women's at the time of the survey mail-out. Topic areas included access to, and satisfaction with, breastfeeding support during the admission, infant feeding in hospital, and current infant feeding practices. Results were analysed as a whole, then in three gestational age groups: <32 weeks, 32 to 36 weeks and ≥37 weeks.

**Results**: The response rate was 31% (311/990), with 96% (291/304) expressing breast milk and/or breastfeeding their infant during the admission. Respondents rated the support they received with expressing and breastfeeding favourably, with 85% (245/287) and 78% (214/275) respectively, rating this as 'Good' or 'Very good'. Those whose infant was ≥37 weeks gestation were least likely to be satisfied with the support received. Of the 74% (206/279) who received support from a lactation consultant in the first week after birth, 83% (166/200) were happy with the support received. Suggested improvements focused on consistency of information, access to services and tailoring information to individual needs. Rates of breast milk feeding at six months are being analysed and will be presented by gestational group.

**Discussion**: The majority of women whose infant was admitted to NICU expressed breast milk and/or breastfed their baby. Despite high levels of satisfaction with support received, areas for improvement were identified, including ensuring women with term infants receive adequate feeding support. Engagement with families is important to ensure future improvements to breastfeeding support meet their needs. Further discussion will focus on differences in outcomes by gestational age groups.

## Elective Oocyte Cryopreservation: General Practitioner knowledge, attitudes and practices

Alison Slater, Dr. Raelia Lew and Dr. Michelle Peate

*University of Melbourne and Royal Women's Hospital*

**Background**: Women are delaying childbearing for many reasons including, but not limited to, being single, widely available effective contraception and focus on building a career. This increases the risk of age-related infertility, which elective oocyte cryopreservation has the potential to help prevent. General practitioners are ideally placed to provide counselling around this, however little is known of their position.

**Objectives**: This study aims to elucidate the knowledge, attitudes and practices of general practitioners on age-related infertility, ovarian reserve testing and elective oocyte preservation.

**Methods**: A survey was conducted using Qualtrics and distributed to general practitioners via RACGP e-newsletters, social media, email and flyers at medical clinics. Questions included on demographics, knowledge, attitudes and practices towards counselling on fertility decline with age, ovarian reserve testing and elective oocyte cryopreservation. Descriptive statistics were calculated.

**Results**: Participants were 66 general practitioners and 21 registrars. They answered 4.4 (±1.3) of six questions on age related infertility and fertility preservation correctly and 1.9 (±1.1) of six questions on ovarian reserve testing correctly, with ovarian reserve testing ordered infrequently. Participants are more likely to ask women aged 35-44 about their reproductive plans than for women aged 18-34. The age at which participants begin to discuss age related fertility decline is 31.7+/-5.7 years. When it is known that a woman is delaying childbearing for non-medical reasons the majority agree counselling should take place regarding age related infertility and that they should be the health professional to do this. The main barriers to providing this counselling are lack of time, knowledge, and concern for causing stress for patient. The majority believe patients are sufficiently aware of women's fertility reducing with age and believe the main barrier for undergoing elective oocyte cryopreservation is not being aware of the technology. The majority would like more resources online.

**Discussion**: General practitioners have some knowledge of fertility and elective oocyte cryopreservation and less of ovarian reserve testing. They face barriers to timely discussions about patients' reproductive plans and overestimate patient knowledge about fertility decline with age. General practitioners want more resources.

## The safety and feasibility of delivery room cuddles for very and extremely preterm infants

Bridget Howard, Marta Thio, Jennifer Dawson, Peter Davis, Grace Elliot, Louise Owen

*Newborn Research Centre, Royal Women's Hospital*

**Background**: The initial time after birth is important for bonding between parents and their infant. However, preterm birth can be a barrier to physical interactions. Kangaroo mother care and skin-to-skin care are common practice in NICUs worldwide for preterm infants of various gestational ages. Some studies have demonstrated that cuddling and skin-to-skin contact in the delivery room may be feasible for preterm infants, however there is little published data on very and extremely preterm infants (GA<32 weeks) due to clinical concerns around safety.

**Objectives**: To determine the feasibility and safety of delivery room cuddles for preterm infants born before 32 weeks' gestation. *Primary outcome* – physiological stability, defined as HR >100 bpm and $SpO_2$ >85%, during the delivery room cuddle. *Secondary outcomes* – measures of infant clinical condition in NICU.

**Methods**: Researchers attended the birth of infants <32 weeks' gestational age born at RWH. This was an observational study. Delivery room practice was observed and data collected. If an infant received a delivery room cuddle, HR and $SpO_2$ data were measured, collected via a pulse oximeter. Admission data were collected for all infants included in the study (irrespective of whether they received a cuddle).

**Results**: Forty-eight births were attended and 25 infants (52%) received a delivery room cuddle. The median (range) GA of infants who received a cuddle was $28^{+4}$ ($25^{+2}$ – $31^{+5}$) weeks. There were no significant differences between the two groups in terms of gestational age, birthweight, mode of delivery, Apgar scores and lead clinician experience. The mean (SD) duration of a cuddle was 94 (51) seconds. *Primary outcome* – Two adverse events were observed. Both were oxygen desaturations below 85% for more than 10 seconds. There were no instances of bradycardia, extubation or ventilation equipment dislodgement. *Secondary outcomes* – There were no significant differences in the time to admission, admission temperature, first glucose and presence of IVH.

**Discussion**: This feasibility study provided promising results regarding the safety of delivery room cuddles for very and extremely preterm infants. The limited number of adverse events and similarities between secondary outcomes in the two groups are particularly positive. A limitation of this study is the small sample size, particularly with only 15 infants being eligible to analyse for our primary outcome. Further investigation is required in a larger cohort of infants in order to draw more robust conclusions about the feasibility of delivery room cuddles.

## Exploring the experiences and priorities of women with a diagnosis of ovarian cancer

Maree Pasvanis[1], Michelle Peate[1], Jennifer Marino[1]

*1. Department of Obstetrics and Gynaecology, Royal Women's Hospital, University of Melbourne.*

**Background:** Ovarian cancer is the third most common gynaecological cancer. The average age of diagnosis in Australia is 63, but 3-14% are diagnosed under 40 yrs. Women who present with ovarian cancer tend to have more supportive care needs compared to women experiencing other gynaecological cancers. Age may affect experiences and priorities of women with ovarian cancer. Measuring the priorities of these women will inform supports and resources to improve their physical and mental wellbeing.

**Objectives:** To explore the experiences priorities of women with a diagnosis of ovarian cancer.

**Methods:** Participants were recruited by a community organization, Ovarian Cancer Australia (OCA), via a social media campaign promoted on Facebook; 288 people completed the consumer survey. Quantitative analysis was conducted on participant responses using STATA15 statistical software; comparisons by age (<50 vs. 50+ years) were tested using the Wilcoxon signed rank test for ranked variables and using chi-squared for categorical variables.

**Results:** Participants were aged 19 to 89, with the most common age bracket 60-69 years of age (n=97, 33.7%). Priorities did no vary around age groups. Approximately half of respondents (n=99, 51%) ranked fear of cancer recurrence as the most challenging aspect of having ovarian cancer. Younger respondents (n=23; 45.1%) were more likely to say they would use a mobile app version of the OCA resilience kit than would older respondents (n=41, 25.8%) (p=0.004). A higher proportion of young participants (n=13; 25%) reported that they would be 'very likely' to use a fertility preservation decision aid compared to older participants (n=4; 2.4%) (p<0.001).

**Discussion:** The greatest concern was fear of cancer recurrence. Consistent with previous studies, we found that younger cancer patients use technological resources as well as non-technological to find health information, while older people do not. Younger women were much more likely to use fertility preservation decision aid. We expected priorities to differ by age, as different ages correlate with specific life stages (e.g. family formation, employment, retirement), but this was largely not the case.

## Student Symposium Session 2

### An alternative method to temporarily secure umbilical catheter(s) in the Neonatal Intensive Care Unit at the Royal Women's Hospital, in routine care of newborns requiring central vascular access.

Grace Elliot, Marta Thio, Peter Davis, Jennifer Dawson and Bridget Howard.

*Newborn Research Centre, Royal Women's Hospital*

**Background**: Umbilical catheters, either umbilical vein catheters or umbilical artery catheters are the preferred method for central access in both preterm and sick term infants. Current practice at the Royal Women's Hospital (RWH) is to secure umbilical catheters by suturing them to the umbilical stump. An x-ray is taken to determine the position of the catheter tip, if this position is not satisfactory, the sutures are removed and the catheter adjusted. Once the catheter has been re-adjusted, they must be re-sutured to the umbilical stump. This study explores modifying current practice by using a plastic cord clamp to temporarily secure the catheters until an x-ray has been taken and catheters are correctly placed.

**Objectives**: This study aims to test the efficacy of a standard plastic cord clamp to temporarily secure umbilical catheters in NICU until an X-ray has been taken to confirm a satisfactory tip position.

**Methods**: Consent was gained from eligible families. The standard technique for inserting umbilical catheters was followed with one exception. An umbilical cord clamp was used to temporarily secure the catheter(s) while x-ray was completed, when the catheter tip position was confirmed the catheter was sutured. If re-adjustment was required the clamp was opened and the catheters re-adjusted. During the procedure the catheter(s) were monitored for patency using both infusion pump pressure bars and the ability to manually infuse and aspirate fluid. The time taken to complete the first x-ray and then to complete the procedure were compared with data collected in a 2017 audit of the time taken to complete stabilisation processes, including umbilical catheterisation.

**Results**: The current study found that using the cord clamp to temporarily secure umbilical catheters (n=21) was significantly faster ($p<0.001$) at both time points. For all catheters placed (n=38) aspiration failure occurred 16% of the time, infusion failure occurred 11% of the time and pump obstruction occurred 5%. No catheters were accidentally dislodged, all operators who used the clamp reported 100% satisfaction and maintained sterility from beginning to completion.

**Discussion**: The plastic cord clamp was effective in reducing the time taken for the umbilical catheterisation procedure. The moderate risk of obstruction of catheters when using the clamp must be weighed against the quick reversibility and the time improvement that the clamp provides. Despite a small sample size in this study, this low risk intervention may be suitable for implementation provided that an audit continues to monitor adverse events.

### Outpatient versus inpatient catheter balloon cervical ripening – a randomised trial

Chen V[1], Sheehan P[1,2]

*[1]The University of Melbourne; [2]Pregnancy Research Centre, Royal Women's Hospital*

**Background**: Induction of labour is a common obstetric intervention. Of the common cervical ripening agents, mechanical dilation with the balloon catheter is safer than pharmacological priming with prostaglandins as it does not cause uterine hyperstimulation. Currently, it is standard practice for women undergoing cervical ripening to be hospitalised from the time of balloon catheter insertion until after delivery. Outpatient cervical priming with the balloon catheter may shorten the length of hospital stay and be a safe option for a select subset of low-risk pregnant women.

**Objectives**: The objective of our study was to assess whether outpatient cervical ripening reduces the length of hospital stay compared to inpatient cervical priming.

**Methods**: A randomised clinical trial comparing outpatient with inpatient management of catheter balloon cervical ripening in low-risk women with an uncomplicated singleton pregnancy at term, was conducted across two maternity hospitals. The primary outcome was the total length of hospital stay. Labour, maternal and neonatal outcomes were also compared. Data from the two sites were analysed separately.

**Results**: Our primary site recruited 28 women, with 12 (43%) randomised to outpatient and 16 (57%) to inpatient care. Outpatient cervical ripening significantly shortened the pre-delivery hospitalisation time (17.8±11.4 vs 26.1±6.2 hours, $p=0.002$), with the outpatient group able to spend an average of 8.3 less hours in hospital prior to delivery than the inpatient group. The average length of labour and hospital stay was also shorter for the outpatient group (64.8±26.5 vs 73.0±23.9 hours, $p=0.50$), however this did not reach statistical significance. The rate of instrumental vaginal delivery was significantly lower in the outpatient group (0 vs 31.3%, $p=0.05$), but other maternal and neonatal outcomes were comparable between the two groups. Only 7 women were recruited at our tertiary hospital site and no meaningful data analysis was possible.

**Discussion**: Outpatient mechanical cervical ripening has the potential to reduce the total length of hospital stay. Experience gained in this study is useful for the design of larger randomised trials, which are needed to further assess the benefit and acceptability of outpatient cervical ripening before definitive recommendations can be made.

## Predicting nasal high-flow treatment failure in newborn infants with respiratory distress cared for in non-tertiary hospitals

Megan McKimmie-Doherty, Peter Davis, Brett Manley

*Newborn Research Centre, Royal Women's Hospital; Faculty of Medicine, Dentistry and Health Sciences, The University of Melbourne*

**Background**: Nasal high-flow (nHF) is a newer method of non-invasive respiratory support for newborn infants that is increasingly used in Australian non-tertiary special care nurseries (SCNs), despite a lack of evidence of efficacy. Failure of non-invasive respiratory support is associated with adverse outcomes in newborn infants. Therefore, identifying infants likely to be successfully treated with nHF may allow these infants to receive the optimal respiratory support and avoid the consequences of treatment failure.

**Objectives**: To evaluate the predictors of nHF treatment success and consequences of nHF failure in newborns with respiratory distress, cared for in Australian non-tertiary SCNs.

**Methods**: A secondary analysis of data from the HUNTER multicentre, randomised controlled trial comparing continuous positive airway pressure with nHF as primary respiratory support in newborn infants cared for in Australian non-tertiary SCNs was performed. Treatment success or failure within 72 hours after randomisation of nHF was determined using objective criteria. Univariate, multivariate and subgroup analysis was used to determine predictors of nHF success. Outcomes following nHF treatment failure were also assessed.

**Results**: A total of 363 infants were included in the analysis; mean (standard deviation) gestational age was 36.9 (2.8) weeks and birth weight 2928 (782) grams, of which 73 infants (20.1%) experienced nHF treatment failure. On multivariable analysis, nHF treatment success was predicted by greater gestational age and lower fraction of inspired oxygen immediately prior to randomisation. Subgroup analysis showed that treatment success was more likely for term (versus preterm) infants, and infants requiring ≤30% supplemental oxygen prior to randomisation. Nasal high-flow treatment failure was associated with adverse outcomes including mechanical ventilation, transfer to a tertiary hospital, and longer durations of respiratory support and hospitalisation.

**Discussion**: This is the first study to investigate predictors of nHF treatment success in newborn infants cared for in non-tertiary SCNs. Infants were more likely to be successfully treated with nHF if they were more mature or required less supplemental oxygen immediately prior to randomisation, while nHF treatment failure was associated with several adverse outcomes. These findings may be used to guide clinicians to determine the most appropriate initial respiratory support for newborn infants in non-tertiary SCNs. Further prospective research is required to better identify infants in whom primary nHF treatment is likely to be successful.

## The Heterogeneity of Endometriotic Lesions

EM Colgrave[1], S Bittinger[2], PAW Rogers[1], JR Keast[3], JE Girling[1,4] and SJ Holdsworth-Carson[1]

*[1]Dept O&G, Uni Melb and Gynaecology Research Centre, Royal Women's Hospital; [2]Dept Pathology, Royal Women's Hospital*; *[3]Dept Anatomy & Neuroscience, Uni Melb*; *[4]Dept of Anatomy, University of Otago, Dunedin, New Zealand*

**Background**: Endometriosis is defined by the presence of lesions containing endometrial-like glands and/or stroma, which are found outside of the uterus. The presence of these endometrial-like glands/stroma are the only features used by pathologists to diagnose endometriosis; more extensive phenotyping of lesions may improve diagnosis, disease classification and treatment decisions.

**Objectives**: This project aimed to characterise a broad range of morphological characteristics in endometriotic lesions to better illustrate their makeup and heterogeneity. In particular, this project aimed to determine if the features of endometriotic lesions varied based on menstrual cycle stage and if lesion features reflected those of matched eutopic endometrium.

**Methods**: Haematoxylin and eosin stained sections from endometriotic lesion biopsies were analysed by brightfield microscopy (n = 32 patients at different menstrual cycles stages, n = 10 progestin-treated patients; total of 151 biopsies and 1,051 endometriotic glands). Endometrial curettes from all patients (n = 42) were also included in the analysis. A mixed effects logistic regression analysis was utilised to determine if the characteristics of the endometriotic lesions varied significantly based on menstrual cycle stage, and if the curettes were predictors of the features of endometriotic lesions.

**Results**: There was significant inter- and intra-patient variability in the epithelium, stroma and tissue surrounding endometriotic lesions. Some subtle menstrual cycle-associated changes were observed among lesions. There was a significant increase in epithelial mitoses in endometriotic glands from proliferative phase patients (18% of glands) compared to menstrual and secretory phase patients (0% and 2% of glands, respectively; OR = 9.30, $p<0.001$, 95% CI 3.71-23.32). Bloody gland lumens were also less likely to be observed in endometriotic lesions from secretory phase patients compared to menstrual phase patients (OR, 0.30; 95% CI, 0.11-0.79; P=0.015). In contrast, there were no significant differences in the proportion of glands with haemosiderin-laden macrophages across the menstrual cycle, indicating signs of haemorrhage were present in lesions independent of menstrual stage (Prob > $chi^2$ = 0.13). Features of lesions were not consistent with those in matched endometrium.

**Discussion**: Considerable variation in the morphology of endometriotic lesions was observed, even within individual patients. Although some lesion characteristics changed in association with menstrual cycle stage, these features were not apparent in all lesions as has previously been implied in the literature. The results of this project provide a foundation for further targeted characterisation of the diverse phenotypes of endometriotic lesions to improve patient stratification and targeted treatment selection.

### A Protocol for Cell Therapy Infusion in Neonates

Elizabeth Baker

*Newborn Research Centre, Royal Women's Hospital, Department of Obstetrics and Gynaecology, The University of Melbourne, The Ritchie Centre, Hudson Institute of Medical Research*

**Objective:** Regenerative cell therapies for neonatal morbidities are progressing from preclinical studies to early phase clinical trials. However, protocols for delivering cells have not been evaluated as it has been assumed that cell doses "delivered" equal the doses received by infants. We aimed to determine the optimal infusion protocol for the administration of a leading cell therapy, human amnion epithelial cells (hAECs), to extremely preterm infants.

**Method:** A standard infusion protocol was modelled. A syringe pump delivered the hAEC suspension over 60 minutes via a paediatric blood transfusion set (200micron filter and 2.2mL intravenous (IV) line). The infusion protocol was replicated with variations in albumin concentration (2% vs. 4%), syringe orientation (horizontal vs. vertical) and IV-line volume (0.2-2.2mL) to determine how these variables influenced the hAEC dose delivered. Influence of flow rate (3-15mL/hr) was studied following optimisation of other variables.

**Results:** A mean(SD) of only 20(9) % of intended hAEC dose was delivered using the standard infusion protocol. Increasing albumin concentration to 4%, positioning the syringe vertically and decreasing IV-line volume to 0.6mL increased cell delivery to a mean(SD) of 98(6) % of intended hAEC dose. Flow rate had little effect on dose delivery when other conditions were optimised.

**Conclusion:** Consideration must be given to cell infusion protocols in preterm infants. We describe the refinement and validation of a cell infusion protocol offering reliable cell doses, suitable for small volume delivery to extremely preterm neonates which could form the basis of future cell delivery protocols.

## Student Symposium Session 3

### Occurrence of and temporal trends in fidgety general movements in infants born extremely preterm/extremely low birthweight and term-born controls

Amanda K.L. Kwong 1,2,3; Joy E. Olsen 1,3; Abbey L. Eeles 1,3; Christa Einspieler 6; Katherine J. Lee 3,5; Lex W. Doyle 1,3,4,5; Jeanie L.Y. Cheong 1,3,4; Alicia J. Spittle 1,2,3.

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*2 Department of Physiotherapy, The University of Melbourne, Parkville, Victoria, Australia*
*3 Murdoch Children's Research Institute, Parkville, Victoria, Australia*
*4 Department of Obstetrics and Gynaecology, The University of Melbourne, Parkville, Victoria, Australia*
*5 Department of Paediatrics, The University of Melbourne, Parkville, Victoria, Australia*
*6 iDN – Interdisciplinary Developmental Neuroscience, Department of Phoniatrics, Medical University of Graz, Graz, Austria*

**Background**: Fidgety movements have high predictive validity for later cerebral palsy (CP) but their temporal organisation requires further understanding for assessment accuracy.

**Objectives**: To describe the occurrence of and temporal trends in fidgety movements, and whether they differ between infants born preterm and at term.

**Methods**: Up to two videos were received at 12-13$^{+6}$ and/or 14-16$^{+6}$ weeks' corrected age of infants born extremely preterm (EP; <28 weeks' gestation) and/or extremely low birthweight (ELBW; <1000 g birthweight) or at term (37-42 weeks' gestation). Videos were scored using the Prechtl General Movements Assessment (GMA) (fidgety) and classified as normal or absent/abnormal. Infants with at least one normal GMA were classified as normal. Individual GMA trajectories were analysed over time.

**Results**: We received at least one video from 155 infants born EP/ELBW and 185 infants born at term. Overall, infants born EP/ELBW were more likely to have absent/abnormal fidgety movements than infants born at term (23% versus 3%, odds ratio [OR] 8.50 (95% confidence interval (CI) 3.48-20.8, $p$<0.001). Fewer infants born EP/ELBW and at term showed absent/abnormal fidgety movements with each week of increasing age (EP/ELBW OR 0.46, 95% CI 0.25-0.84, $p$=0.01; term-born OR 0.35, 95% CI 0.16-0.8, $p$=0.01; interaction, $p$=0.53).

**Discussion**: Absent/abnormal fidgety movements are more prevalent in infants born EP/ELBW than at term. Fidgety movements normalise with older age both infant groups between 12-16$^{+6}$ weeks' corrected age.

**Breast cancer patients' and clinicians' needs and preferences of using a web-based fertility calculator tool in clinical practice.**

Zobaida Edib[1,2], Yasmin Jayasinghe[1,2,3], Martha Hickey[1,2], Alex Gorelik[4,5], Christobel Saunders[6], Shanton Chang[7], Patrick Pang[7], Kate Stern[8] and Michelle Peate[1,2]

*[1]Department of Obstetrics and Gynaecology, University of Melbourne, Melbourne; [2]The Royal Women's Hospital, Melbourne; [3]The Royal Children's Hospital, Melbourne; [4]Department of Medicine (RMH), University of Melbourne, Melbourne; [5]School of Behavioural & Health Sciences, Australian Catholic University, Melbourne; [6]Division of Surgery, Medical School, The University of Western Australia, Perth; [8]School of Computing and Information Systems, University of Melbourne, Melbourne; [8]Fertility Preservation Service, Royal Women's Hospital and Melbourne IVF, Melbourne.*

**Background**: Treatment of breast cancer poses a threat to future fertility for many young women, yet there is no accurate measure for obtaining personalised information about likely fertility outcomes. To address the gap, we are developing a novel web-based infertility risk prediction calculator tool (FoRECAsT: **F**e**r**tility aft**e**r **Ca**ncer Predic**t**or) for young breast cancer patients.

**Objectives**: The aim of this study is to identify the perceived needs and preferences of breast cancer patients and clinicians to use the FoRECAsT tool in clinical practice.

**Methods**: A purposive sample of 12 breast cancer patients, 6 breast surgeons, 9 medical oncologists, 9 fertility specialists, 12 breast care nurses and 2 fertility preservation nurses participated in semi-structured in-depth telephone interviews. Interviews were audio-recorded, transcribed and imported into qualitative data analysis software and a constant comparison thematic approach was used to analyse the interviews.

**Results**: Data were categorized into five main themes: interest in using the FoRECAsT tool; user attributes; access and confidentiality; impact on consultation; and anticipated fertility-related outcomes. A total of fourteen sub-themes emerged. Patients' identified a need for precise information regarding post-treatment fertility outcomes. Clinicians and patients both indicated that a comprehensive web-based tool that provided explicit information about the risk of future infertility would result in better management of expectations and be supportive in fertility-related decision making. Concerns were raised in inputting the clinical data that would be collected at different times in the treatment process and the responsibilities of clinicians and patients in using the tool.

**Discussion**: Findings inform the feasibility, and breast cancer patients' and clinicians' preferences, of where and when the FoRECAsT tool might be used. Designing the tool with stakeholders' preferences in mind will increase the likelihood of its use in clinical practice.

**Exploring the views and experiences of women with diabetes in pregnancy in Australia who have been advised to express breast milk antenatally, and implications for clinical practice.**

Anita Moorhead[1,2], Sharinne Crawford[1], Lisa Amir[1,2] and Della Forster[1,2]

*[1]Midwifery and Maternity Services Research Unit, Royal Women's Hospital; [2]Judith Lumley Centre, La Trobe University*

**Background**: The Diabetes and Antenatal Milk Expressing (DAME) randomised controlled trial (RCT) was conducted in 2011-2015, at six sites in Melbourne, Australia to explore the effect of advising women with diabetes in pregnancy to express breast milk from 36 weeks gestation. The DAME study found no evidence of harm, and that infants whose mothers were randomised to express in pregnancy were more likely to be exclusively breast milk fed during the hospital stay. The total median amount of breast milk women expressed antenatally was 5 mLs and mean number of times of expressing was 22. We have identified very limited literature describing women's experiences of expressing in pregnancy, yet that is an important consideration if midwives and other clinicians plan to advise women to do so.

**Objectives**: To explore the experience of antenatal expressing for women allocated to the antenatal expressing group in the DAME trial.

**Methods**: In this two-arm RCT 635 low-risk women were randomised at 36 to 37 weeks gestation to usual care (not expressing, n=316), or to twice daily hand expressing for 10 minutes until birth (n=319). Data on women's experiences of expressing was collected by telephone interview at 1-2 and 12 weeks and by semi-structured interviews with ten women who were advised to express. Thematic analysis identified key themes.

**Results**: Emerging themes include feeling empowered, time and technique, watching the milk, and complexity of health and life.

**Discussion**: Given this relatively new practice of antenatal expressing is being advised widely, it is important that midwives and other clinicians understand the outcomes and consider the range of experiences of women who have the lived experience of antenatal expressing, especially the women for whom the 'perceived goal of getting enough milk for their baby' is not achieved. This will assist with giving evidence-based advice during pregnancy.

### Predictors of community participation in preschool age children born very preterm

Kate Cameron[1-3], Jennifer McGinley[1], Kim Allison[1], Jeanie Cheong[2-4] & Alicia Spittle[1-3]

*[1]Dept Physiotherapy, Uni Melb, [2]Victorian Infant Brain Studies, Murdoch Children's Research Institute, [3]Newborn Research, Royal Women's Hospital, [4]Dept O&G, Uni Melb*

**Background**: Preterm children (<37 weeks' gestation) have higher rates of motor impairment, such as development coordination disorder and cerebral palsy, compared with children born term. Motor impairment is associated with decreased participation for school age children, however little is known about participation at preschool age for children with motor impairment, particularly for children born preterm.

**Objectives**: This study aims to explore how preterm birth affects community participation at preschool age, and to determine the effect of motor impairment and social risk on this relationship.

**Methods**: This is a sub study of the Victorian Infant Brain Study-2, a longitudinal cohort study of children born at <30 weeks' gestation (very preterm) and term born controls, recruited from the Royal Women's Hospital, Melbourne. 48 very preterm and 97 term children were assessed at 4-5 years' corrected age for community participation, including perceived environmental barriers and supports, using the Young Children's Participation and Environmental Measure. Motor impairment was defined by a score ≤5th percentile on the Movement Assessment Battery for Children, 2nd edition, and a score of ≤67 (males) or ≤68 (females) on the Little Developmental Coordination Disorder Questionnaire. The Social Risk Index classified families as higher or lower social risk. Regression analyses were used to explore relationships between preterm birth, motor impairment and social risk with participation frequency, quality, barriers and supports.

**Results**: Higher social risk (β=-0.43; 95%CI -0.67 to -0.18, p=0.001) but not preterm birth (β =-0.15; 95%CI -0.37 to 0.07, p=0.18) was predictive of lower frequency of community participation. Belonging to the higher social risk group had a greater effect on participation frequency for children born preterm (β= -0.78; 95%CI -1.10 to -0.46, p<0.001) compared with term (β=-0.19; 95%CI -0.45 to 0.07, p=0.15). Parents of children born preterm were significantly more likely to report environmental barriers (OR=3.36; 95%CI 1.35 to 8.34, p=0.009) and less likely to report environmental supports (OR=0.23; 95%CI 0.05 to 1.00, p=0.049), adjusted for social risk and sex. Motor impairment, adjusted for social risk, preterm birth and sex, was not predictive of any aspect of community participation.

**Discussion**: Preterm birth affected frequency of community participation, and supports and barriers to participation, independent of motor impairment but not social risk. Families of children born preterm, especially those of higher social risk, would benefit from ongoing support. Further research is needed to better understand the trajectory of participation from preschool to school age for children with motor impairment.

### Improving neonatal intubation safety: apnoeic oxygenation time

Kothari R, O'Currain E, **Hodgson K**, Manley B, Owen L, Kamlin O, Dawson J, Thio M, Davis P.

*Newborn Research Centre, Royal Women's Hospital*

**Background**: Clinical deterioration with desaturation or bradycardia is common during neonatal intubation attempts. While the Neonatal Resuscitation Program (NRP) recommends a 30-second time limit for intubation attempts, there are little physiological data to support this recommendation. Apnoeic oxygenation time is the time prior to desaturation <90% during apnoea. There is an age-related decrease in this time; smaller children have a shorter apnoea time. No studies have examined the apnoeic oxygenation time of neonates.

**Objectives**: To determine the apnoeic oxygenation time of preterm infants undergoing elective endotracheal intubation.

**Methods**: An observational study of preterm neonates ≤ 32 weeks' gestation undergoing elective endotracheal intubation at the Royal Women's Hospital (RWH), Melbourne. Data were acquired from a previous trial of mask leak during positive pressure ventilation [6]. Continuous $SpO_2$ and heart rate data were recorded using a pulse oximeter (Masimo Radical 7; Masimo Corporation, Irvine California). Apnoeic oxygenation time was defined as the time from the last positive pressure or spontaneous breath, until desaturation ($SpO_2$ < 90%). Video recordings were reviewed and apnoeic oxygenation time was determined.

**Results**: Data from 78 infants were available. The mean gestational age was 27 weeks (standard deviation [SD] 2.2) and median age at intubation was 36 hours (interquartile range 10-312). All but 5 infants had $SpO_2$ <90% during apnoea (73/78, 94%). The mean apnoeic oxygenation time (time to desaturation <90%) was 25.3 seconds (SD 19.4). There was no correlation between gestational age (r=-0.04, p=0.71) or birthweight (r=-0.19, p=0.11), and apnoeic oxygenation time.

**Discussion**: Apnoeic oxygenation time is substantially shorter in preterm neonates, compared with pediatric and adult patients. These data may aid the development of clinical guidelines and studies to improve neonatal intubation safety.

## Student Symposium Session 4

### A mobile phone based tool for rapid centralized randomization in a delivery room resuscitation trial

S. Badurdeen, D. Blank, L. Stevens, S. Donath, G. Polglase, S. Hooper, P. Davis

*Newborn Research, Royal Women's Hospital, Melbourne, Victoria / The Ritchie Centre, The Hudson Institute for Medical Research, Victoria / Murdoch Children's Research Institute, Parkville, Victoria / Obstetrics and Gynaecology, Monash University, Victoria / Newborn Research, Royal Women's Hospital, Melbourne, Victoria.*

**Background**: Resuscitation trials where eligibility must be assessed after birth have historically used randomization methods that are at risk of bias, such as sealed envelopes or quasi-randomization. Randomization should ideally be methodologically rigorous, minimize treatment delay, and streamline trial administration.

**Objectives**: We aimed to evaluate a rapid, mobile phone-based, centralized randomization tool for a 2-centre trial of resuscitation-with-cord-intact.

**Methods**: A randomization table was uploaded to the REDCap randomization module. Investigators accessed the 'New Randomization' page via a mobile phone weblink which logged them into their respective Data Access Group allowing stratification by site. Following further strata selection, the investigator would reveal the allocation via a 2-step randomize-and-confirm process. Eligible infants ≥32+0 weeks gestation who were judged within 1 minute of birth to require resuscitation were randomized to either early or delayed cord clamping. Times from birth to randomization and allocation revelation were extracted from video review.

**Results**: Seventy newborns had randomization requested at a mean (standard deviation) of 26.9s (13.0s) after birth. Group allocation was called out 4.8s (1.9s) after randomization request. Two errors occurred: the investigator in each instance had progressed to the confirmation screen before birth resulting in accidental randomization. Following enforcement of the 2-step randomize-and-confirm process no further errors occurred (N=47).

**Discussion**: We describe a tool that facilitates randomization within seconds of eligibility that has applicability for trials in emergency scenarios. Advantages include centralized randomization with stratification, performed at the cot-side using any internet enabled device, rigorous allocation concealment, and automatic lock of the group allocation within the study database.

### The development and pilot testing of an online Decision Aid for women considering elective egg freezing

Sherine SANDHU[1], Martha HICKEY[1], Alice HUCKER[1], Sabine BRAAT[2], Audrey POTERIE[2], Raelia LEW[1,3], Franca AGRESTA[3], Jane FISHER[4], Karin HAMMARBERG[4], William LEDGER[5], Devora LIEBERMAN[6], Roger HART[7] and Michelle PEATE[1] on behalf of the 'Eggsurance?' Study Collaborative Group

*[1] Department of Obstetrics & Gynaecology, Royal Women's Hospital, University of Melbourne, [2] Centre for Epidemiology and Biostatistics, University of Melbourne, [3] Reproductive Services Unit, Royal Women's Hospital and Melbourne IVF, [4] Public Health and Preventive Medicine, Monash University, [5] Obstetrics & Gynaecology, University of New South Wales, [6] Genea IVF and Fertility Clinic, Sydney, and [7] Fertility Specialists of Western Australia, Western Australia.*

**Background**: The decision to freeze eggs for non-medical reasons can be difficult and complex. Women are weighing up the costs, side-effects and the uncertainty of outcomes against their personal situation and desire to become a parent in the future. With no clear medical best option, the decision is a values-based one. The gold-standard intervention for such decisions is a Decision Aid which has been shown to facilitate informed decision-making.

**Objectives**: To develop an online, interactive Decision Aid for women considering elective egg freezing and to pilot test it for acceptability and usefulness.

**Methods**: Australian women aged 18-45 years and interested in receiving elective egg freezing information were recruited through social media and the University of Melbourne staff newsletter, to complete pre/post surveys that assessed the impact of the Decision Aid on uncertainty (decisional conflict), knowledge, acceptability (including satisfaction and relevance), and usefulness.

**Results**: Twenty-seven women participated in the pilot study. Post review of the Decision Aid, participants had significantly reduced decisional conflict (p=0.002) and improved knowledge of egg freezing and fertility (p=0.047). The vast majority (93%) found the Decision Aid to be acceptable, with 96% reporting satisfaction with the tool, and 88% finding it helpful in explaining their options. Most (88%) would recommend the Decision Aid to others. There was still a need however for specific information which can only be sourced from clinical consultation.

**Discussion**: Participants were generally positive about the Decision Aid. It was considered acceptable, useful and appeared to improve knowledge and reduce uncertainty (which clinically manifests into decision delay). The Decision Aid may be a useful supplement to clinical discussions. Next step is to perform a randomised controlled trial to evaluate its efficacy against decision related outcomes.

## Gait of pre-school children born very preterm in a dual-task paradigm

Reem Albesher[1,2,3,4]; Jennifer McGinley[2]; Fiona Dobson[2]; Benjamin Mentiplay[1,5]; Jeanie Cheong[1,3,7]; Lex Doyle[1,3,6,7]; and Alicia Spittle[1,2,3]

*[1]Murdoch Children's Research Institute; [2]Physiotherapy Department, University of Melbourne; [3]Neonatal Research, The Royal Women's Hospital; [4]Physical Therapy Department, Princess Nourah bint Abdulrahman University, Saudi Arabia; [5]La Trobe Sport and Exercise Medicine Research Centre, La Trobe University; [6]Department of Paediatrics, University of Melbourne; [7]Department of Obstetrics and Gynaecology, University of Melbourne*

**Background**: Children born very preterm (VP= born <30 weeks' gestation) are at greater risk of motor impairment compared with term born peers, however, little is known about how functions such as gait may be affected by preterm birth. Activities that involve walking while performing a concurrent task may result in gait alterations in children. As preterm children are at higher risk of executive and attention dysfunction compared with children born at term, the addition of a concurrent task may be challenging to their gait.

**Objectives**: This study aimed to examine the gait characteristics of preschool-aged VP children compared with term controls in dual-task walking conditions.

**Methods**: 301 infants (150 VT, 151 term) were recruited at birth from the Royal Women Hospital. At 4.5-5 years corrected age, 232 (77%) had a gait assessment using the GAITRite system. Assessment included three walking conditions; walking at preferred speed, cognitive dual-task and motor dual-task. Spatiotemporal gait variables extracted and compared between VT and term children were; speed(cm/s), cadence(steps/min), step length(cm), step time(s), base of support(cm) and double limb support time(s). Linear regressions were used to compare variables, adjusting for sex and leg length, with clustering for multiple births. STATA software was used with p-value > 0.05 considered significant.

**Results**: 109 very preterm (Female n=59; Mean gestational age: 27.8 weeks, SD 1.4; age at gait assessment: 4.7 years, SD 0.1) and 112 term (Female n=57; Mean gestational age: 39.9, SD weeks 1.19; age at gait assessment: 4.8 years, SD 0.17) were assessed. Children born very preterm walked with a wider base of support compared with their term peers during preferred walking (mean diff=0.27cm, 95% confidence interval [CI] 0.01-0.54; p=0.042), the cognitive dual task (mean diff=0.38cm, 95% CI 0.01-0.71; p=0.02) and the motor dual task (mean diff=0.40cm, 95% CI 0.13-0.68; p=0.004). There were no other significant differences found between very preterm and term born children on the other gait variables.

**Discussion**: Children born preterm walk with a wider base of support compared with their term peers which is greater with more challenging tasks such as dual task performance. Understanding the influence of performing a concurrent task on the gait of children born preterm may help health practitioners address their needs and the challenges.

## Exploring the priorities of menopausal symptoms in women with cancer: Preliminary analyses from a clinical audit

Qinying Lan[1]; Caitlin Cusack[2]; Martha Hickey[1,2]; Michelle Peate[1]; and Jennifer Marino[1]

*1. Department of Obstetrics and Gynaecology, Royal Women's Hospital, University of Melbourne; 2. Menopause Service, Royal Women's Hospital*

**Background**: Menopause is the last menstrual period, naturally occurring around 51 years of age. Menopause-related symptoms may include hot flushes and night sweats (vasomotor symptoms), vaginal dryness and sexual dysfunction. Women with a history of cancer may have prolonged and severe menopausal symptoms. Understanding which symptoms patients most want alleviated (symptom priorities) is useful for providing better care for cancer patients and survivors, as symptoms may affect adherence to treatment and overall quality of life.

**Objective**: To identify symptom priorities of patients experiencing menopausal symptoms after cancer.

**Methods**: As part of a clinical audit undertaken as standard patient care, all first-time visitors to the specialty multidisciplinary Menopause Symptoms after Cancer (MSAC) Clinic in the Royal Women's Hospital from May 2019 to Sep 2019 were asked to complete a priority form that asked them to rank the three symptoms they most wanted alleviated from a list: hot flushes/night sweats, mood changes, vaginal dryness/soreness, sleep disturbances, fatigue, sexual problems and/or pain with intercourse and joint pain. Clinical history was extracted from the chart. Categorical data were summarised using frequencies and proportions. Continuous variables were summarised using medians, interquartile ranges, and ranges.

**Results**: One hundred forty-eight patients attended the clinic for 151 visits. The median age was 47.8 years, (IQR 18-79, range 41-55 years). Most patients had experienced breast cancer (n=69, 46.6%), gynaecological cancers (16.9%), leukemia (18.9%), or lymphoma (8.8%). A few had a second cancer (10, 6.8%) or recurrence of cancer (5, 3.4%). The average time since diagnosis was 4.2 years (IQR 1-6, range 0-33). Approximately two-thirds (n=94, 63.5%) patients were peri/postmenopausal; 3 (2.0%) were premenopausal; and menopausal status of 51 (34.5%) patients could not be determined. The most commonly top-ranked symptom was vasomotor symptoms (31.8%). The symptom most commonly ranked in the top three was vasomotor symptoms (56.8%), followed by fatigue (54.1%) and sleep disturbances (46.6%).

**Discussion**: This is the first study to evaluate symptom priorities in women seeking treatment for menopausal symptoms after cancer. Patients with a cancer history most wanted to alleviate vasomotor symptoms, similar to otherwise healthy menopausal women (Carpenter et al, Climacteric 2015;187_859-66) but placed higher importance on fatigue.

**Supporting Play, Exploration, and Early Development Intervention (SPEEDI) for Preterm Infants: A Feasibility Study in an Australian Context**

Francyne Finlayson[1,2,3], Alicia Spittle[1,2,3], Joy Olsen[2], Stacey Dusing[4], Andrea Guzzetta[5], Abbey Eeles[3]

*[1]The University of Melbourne, [2]Newborn Research Royal Women's Hospital, [3]Murdoch Children's Research Institute,* [4]Virginia Commonwealth University, [5]IRCCS Fondazione Stella Maris

**Background**: An intervention that encourages early play, exploration and development in infants born preterm has been shown to be feasible in a US context. This intervention is called Supporting Play, Exploration and Early Development Intervention (SPEEDI).[1]

**Objectives**: This study aimed to determine the feasibility of implementing SPEEDI in an Australian context with a prospective pilot feasibility randomised controlled trial.

**Methods**: Included infants were born <30 weeks' gestation without congenital abnormalities, had an English-speaking carer, and lived within 30km of the hospital. Infants were randomised to "usual care", and received services typical to this unit, or "SPEEDI" and received 10 therapist visits (5 in hospital over 3 weeks, and 5 home visits until 3 months' corrected age [CA]), in addition to usual care. After discharge, parents in the SPEEDI group provided daily home activities, based on key principles of SPEEDI. Feasibility was determined by consent rate, intervention frequency, delivery of SPEEDI key principles, parent acceptability of the intervention and developmental outcomes at 4 months' CA on the Bayley Scales of Infant and Toddler Development – 3rd Edition (Bayley-III). Results were analysed using linear regression models fitted with generalised estimating equations to account for multiple births.

**Results**: Of 19 eligible infants, 17 consented between 34-38$^{+6}$ weeks' postmenstrual age (mean gestational age = 26.63 weeks; standard deviation = 1.44; female n = 7). Eight infants were randomised to SPEEDI and 9 to usual care. All infants in the SPEEDI group received at least 2 intervention sessions in the neonatal nursery and 3 sessions at home. On average, 24 out of 25 of the key educational topics of SPEEDI were discussed twice across all sessions. On the Bayley-III at 4 months' CA there was a significant difference in favour of the SPEEDI group for gross motor (co-efficient: 1.65; 95% confidence interval [CI] 0.32, 2.99; $p$=0.02), expressive communication (co-efficient: 2.60; 95% CI 0.66, 4.53; $p$=0.01) and receptive communication subscales (co-efficient: 1.05; 95% CI 0.26, 1.85; $p$=0.01). There was minimal difference in fine motor or cognitive subscales on the Bayley-III. Parents reported that SPEEDI was an acceptable and valuable intervention.

**Discussion**: SPEEDI is a feasible intervention to implement in an Australian context, and early trends in favour of the intervention group support future larger clinical trials.

*References*: [1] Dusing SC, Brown SE, Van Drew CM, Thacker LR, Hendricks-Munoz KD. Supporting Play Exploration and Early Development Intervention From NICU to Home: A Feasibility Study. Pediatr. 2015;27(3):267-74.

# Abstracts:

## Posters presentations

### Monday 18 Nov (12.00-4.30pm)

### Tuesday 19 Nov (9.00-5.15pm)

### 1: Identifying and evaluating biological pathways associated with Endometriosis

Katie-Rose Campbell (Honours student)

Department of O&G, The University of Melbourne
Research Precinct, RWH

**Background:** Endometriosis is a complex, gynaecological disease where cells similar to the endometrium (the lining of the uterus) are found at sites external to the uterus; referred to as ectopic endometrial lesions. Currently, there is no cure for endometriosis and treatment options are insufficient. The aetiology of endometriosis is multifactorial including both genetic and environmental factors. Previous meta-analyses from large genome wide association studies (GWAS) have identified disease-risk loci that increase a woman's risk of developing endometriosis, and are located on chromosome 1 and 12, impacting the gene expression of Long-Intergenic Non-Protein Coding RNA (LINC00339) and Vezatin (VEZT), respectively, in blood and eutopic endometrium.

**Objectives:** The aim of this project is to determine the potential functional roles of LINC00339 and VEZT in endometriosis. More specifically, this project will use multiple human endometrial stromal cell (HESC) lines as an in vitro cell culture model to identify the biological pathways associated with LINC00339 and VEZT in endometrial stroma.

**Methods:** By using bioinformatics software Ingenuity Pathway Analysis (IPA) on RNA-seq data, this study revealed that genes including IFNAR1, IFNA, IFNB1, STAT1 and STAT3 were differentially expressed and that canonical pathways including Role of Pattern Recognition Receptors in Recognition of Bacteria and Viruses, Interferon Pathway and Cardiac Hypertrophy Signalling were associated with LINC00339 and VEZT overexpression. The interferon pathway was common to both eQTLs, and therefore components of this pathway were investigated to validate the IPA findings.

**Results**: It was found that INFAR1, IFNA, IFNB1, IFNE, STAT1, STAT2, STAT3, TNFA, NFKB1 and IL1B gene expression significantly changed following LINC00339 or VEZT overexpression or siRNA manipulation of endometrial stromal cells.

**Discussion**: The results of this study have identified that specific interferon molecules are directly influenced by LINC00339 and VEZT expression and demonstrates that eQTLs have functional roles in endometriosis pathophysiology.

### 2: Outpatient versus inpatient catheter balloon cervical ripening – a randomised trial

Chen V[1], Sheehan P[1,2]

*[1]The University of Melbourne; [2]Pregnancy Research Centre, Royal Women's Hospital*

**Background**: Induction of labour is a common obstetric intervention. Of the common cervical ripening agents, mechanical dilation with the balloon catheter is safer than pharmacological priming with prostaglandins as it does not cause uterine hyperstimulation. Currently, it is standard practice for women undergoing cervical ripening to be hospitalised from the time of balloon catheter insertion until after delivery. Outpatient cervical priming with the balloon catheter may shorten the length of hospital stay and be a safe option for a select subset of low-risk pregnant women.

**Objectives**: The objective of our study was to assess whether outpatient cervical ripening reduces the length of hospital stay compared to inpatient cervical priming.

**Methods**: A randomised clinical trial comparing outpatient with inpatient management of catheter balloon cervical ripening in low-risk women with an uncomplicated singleton pregnancy at term, was conducted across two maternity hospitals. The primary outcome was the total length of hospital stay. Labour, maternal and neonatal outcomes were also compared. Data from the two sites were analysed separately.

**Results**: Our primary site recruited 28 women, with 12 (43%) randomised to outpatient and 16 (57%) to inpatient care. Outpatient cervical ripening significantly shortened the pre-delivery hospitalisation time (17.8±11.4 vs 26.1±6.2 hours, p=0.002), with the outpatient group able to spend an average of 8.3 less hours in hospital prior to delivery than the inpatient group. The average length of labour and hospital stay was also shorter for the outpatient group (64.8±26.5 vs 73.0±23.9 hours, p=0.50), however this did not reach statistical significance. The rate of instrumental vaginal delivery was significantly lower in the outpatient group (0 vs 31.3%, p=0.05), but other maternal and neonatal outcomes were comparable between the two groups. Only 7 women were recruited at our tertiary hospital site and no meaningful data analysis was possible.

**Discussion**: Outpatient mechanical cervical ripening has the potential to reduce the total length of hospital stay. Experience gained in this study is useful for the design of larger randomised trials, which are needed to further assess the benefit and acceptability of outpatient cervical ripening before definitive recommendations can be made.

### 3: Is it possible to identify predictors of repeat gynaecological surgery in patients with endometriosis: a retrospective cohort study.

Jun BK[1, 2], Chung J[2], Maderazo D[3], Healey M[1, 2], Holdsworth-Carson SJ[1, 2], Rogers PAW[1, 2]

[1]The University of Melbourne Medical School; [2]The University of Melbourne, Department of Obstetrics and Gynaecology, Royal Women's Hospital; [3]The University of Melbourne, Department of Mathematics and Statistics

**Background**: Endometriosis is a common gynaecological condition with a high burden on the patient's quality of life due to the chronic pain and recurrence of disease. By studying a Melbourne cohort of surgically-confirmed endometriosis patients, we examined the incidence of repeat surgery for endometriosis recurrence, with the goal of identifying predictors of recurrence.

**Objectives**: The objective of our study was to examine those who have repeated surgical interventions with the goal of identifying possible risk factors prognostic for disease recurrence.

**Methods**: De-identified clinical questionnaires and medical histories were obtained through the Royal Women's Hospital with patient consent. Information included clinical data, including patient demographics, diagnosis, disease severity, and other medically relevant information. For women with a surgical diagnosis of endometriosis at the time of recruitment (visually confirmed at surgery, designated as surgery 1), we identified those who later returned for subsequent surgery at the Royal Women's Hospital related to their endometriosis (designated as surgery 2 to 5). For these repeat cases, additional data was analyzed from their surgical, medical, and pathological reports.

**Results**: From 2011 to 2017, we identified a cohort of 385 patients with surgically diagnosed endometriosis. The mean age at operation was 30.26 years (SD 6.85). Of those 385 women with endometriosis, 22.60% (n = 87) had further surgeries for endometriosis, ranging from a total of 2 to 5 surgeries at our institution. Of 87 patients who had repeat surgical intervention, 79.31% (69 of 87) had only 1 more repeat operation (for a total of 2 surgeries), with a mean time to repeat surgery of 30.62 months (SD 20.10). Similarly, patients with a higher body mass index (BMI), and those who have comorbid history of adenomyosis or cervical intraepithelial neoplasia (CIN) were more likely to return for repeat surgery.

**Discussion**: Our study demonstrated that almost a quarter of patients with surgically diagnosed endometriosis return for repeat surgeries within an average of 2.6 years. We identified that higher BMI and comorbid adenomyosis and CIN were associated with increased risk of repeat surgery for endometriosis. Knowledge of these clinical risk factors present at initial surgery could be beneficial to understanding the clinical indication(s) of repeat surgery for endometriosis and has implications for the surgical management of these patients.

### 4: "I felt relieved at one point, but I wasn't quite sure if it's really ok": Women's experiences of receiving variants of uncertain significance through prenatal microarray

Anaita Kanga-Parabia1,2,3, Joanne Kennedy4, Lydia Gaffney1,3, Tenielle Davis1, Susan Fawcett1

*1Clinical Genetics Service, Royal Women's Hospital, Parkville, VIC Australia; 2The University of Melbourne, Parkville, VIC, Australia; 3Victorian Clinical Genetics Services, Parkville, VIC, Australia; 4Murdoch Children's Research Institute, Parkville, VIC, Australia*

**Background**: Chromosomal microarray has significantly improved the diagnosis of chromosome conditions during pregnancy compared with conventional karyotype. However, this type of testing has led to an increased detection of 'variants of uncertain significance' (VUS). Existing research provides insight into experience of women receiving these uncertain genetic results over various phases of pregnancy and early childhood.

**Objectives**: We aimed to contribute to this research by exploring the experiences of women in Australia who received a VUS that was clinically interpreted as likely benign and the role of genetic counselling in this setting

**Methods**: Six women participated in semi-structured interviews about their experience of receiving a VUS through prenatal chromosomal microarray at the Royal Women's Hospital, Melbourne, Australia. Interviews were transcribed verbatim. Narrative analysis was used to explore the way in which participants made meaning of the VUS and to identify themes.

**Results**: Participants all had a chromosomal microarray due to a risk of a genetic condition or chromosome abnormality. They overwhelmingly expressed a sense of relief after the microarray excluded this indication for testing. Disclosure of the VUS reintroduced feelings of uncertainty and concern for some women, while others maintained the feeling of relief. Participants understood that the result was uncertain, yet likely to be benign and explained this in relation to their pregnancy and family narrative. Despite this, some women in the study attributed the VUS to developing health concerns in their child or a family history of a particular condition.

**Discussion**: This study highlights the varying experiences of women receiving a VUS on a prenatal microarray during pregnancy. Some women experienced uncertainty, anxiety and concern in relation to these results. Genetic health professionals played an important role in providing information about the uncertainty of the result, reassurance and support in relation to the VUS. Genetic health professionals are well-placed to facilitate adaptation to uncertain results arising from chromosomal microarray as well as other forms of genomic testing.

### 5: Extubation characteristics of extremely preterm infants

A. Kidman[1], B. Manley[2], R. Boland[2], P. Davis[2], R. Bhatia[3]
[1]Royal Womens Hospital, Newborn Research; [2]Monash Medical Centre, Newborn Intensive Care

**Background:** Predicting which extremely preterm infants (EPI, <28 weeks') will be successfully extubated to non-invasive ventilation is difficult. We aimed to compare the characteristics and outcomes of EPI who had extubation success and failure.

**Objectives:** To understand the differences in infants who are unsuccessfully extubated from invasive mechanical ventilation compared to their successfully extubated counterparts.

**Methods:** Dual centre retrospective audit of the first extubation of EPI conducted between 2016-2017. Extubation failure was defined as reintubation within 7 days.

**Results:** Ninety-six of 204 (50.51%) EPI required reintubation. There were important differences in the characteristics of infants in both groups. Infants requiring reintubation had poorer outcomes than those who did not (table). In a multivariable regression model GA and MAP remained the only significant predictors of extubation success (area under a receiver operating characteristic curve = 0.78).

| Variables and Outcome | Extubation Failure | Extubation Success | OR (95% CI) | *P* value |
|---|---|---|---|---|
| Multiple birth, n (%) | 14 (15) | 28 (26) | 0.5 (0.2, 1) | 0.04 |
| GA, mean (SD) | 25.7 (0.1) | 26.4 (0.1) | 0.8 (-0.4, 1.9) | <0.001 |
| Birth weight, g, mean (SD) | 774 (157) | 878 (192) | 103.1 (56, 52) | <0.001 |
| Pre-extubation MAP, cm $H_2O$, mean (SD) | 8 (1.5) | 7 (1.6) | -0.9 (-1.2,-.5) | <0.001 |
| Pre-extubation *achieved* $V_T$, mean (SD) | 3.4 (1.2) | 4 (1.3) | 0.7 (0.3, 1) | <0.001 |
| Airway trauma, n (%) | 5 (5) | 0 | 1 (1-1.1) | 0.015 |
| *Invasive* ventilation, days, median (IQR) | 30 (21-42) | 3 (1-11) | *N/A* | <0.001 |
| N*on-invasive* ventilation, days, median (IQR) | 64 (49-80) | 57 (47-70) | *N/A* | <0.001 |
| Supplemental oxygen, days, median (IQR) | 111 (88-178) | 74 (58-95) | *N/A* | <0.001 |
| Postnatal steroids, n (%) | 57 (59) | 18 (17) | 7.6 (4-15) | <0.001 |
| Bronchopulmonary dysplasia, n (%) | 82 (85) | 50 (46) | 7.4 (3.-15) | 0.71 |
| Duration of primary NICU admission, Median (IQR) | 118 (101-136) | 83 (69-107) | *N/A* | <0.001 |

**Conclusion:** Lower GA and birthweight and greater ventilator support are associated with an increased risk of extubation failure. Failure is associated with longer durations of supplemental oxygen and hospitalisation and an increased risk of BPD.

### 6: Metabolic support as treatment for intractable neonatal seizures

Julia Lay, Laura Leung, Christine Gilmartin

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**Background**: Neonatal seizures occur in 1 to 3 in 1000 live births. Infants unresponsive to third-line antiepileptics may trial metabolic support medicines in case of vitamin-responsive epilepsy. There is limited information on the use of biotin, pyridoxine, folinic acid and pyridoxal-5-phosphate for treatment of intractable neonatal seizures.

**Objectives**: This case series aims to describe use, administration, tolerance and outcomes of these therapies.

**Methods**: Seven term infants (median gestational age of 40 weeks) were included in the case series. All infants received first-line phenobarbitone and second-line midazolam, with six infants receiving third-line levetiracetam as per protocol. Clonazepam and phenytoin were trialled for one and three infants, respectively.

**Results**: All infants received pyridoxine; four received biotin, two received folinic acid and three received pyridoxal-5-phosphate. Median treatment duration during hospital stay was ten days, with one infant discharged with pyridoxine. Typical dosing for biotin was 10mg daily, pyridoxine was 50mg twice daily, folinic acid was 2.5–7.5mg daily, and pyridoxal-5-phosphate was 30mg/kg eight-hourly. Adverse effects were observed in two infants, with vomiting associated with pyridoxine and pyridoxal-5-phosphate. Five infants became seizure-free. Two infants deceased from unrelated complications. Noted challenges for the pharmacy department include sourcing up-to-date dosing and formulation information, and addressing administration strategy for nil-by-mouth infants.

**Discussion**: Literature review summary: Previous published studies have established that pyridoxine-dependent and folinic acid-responsive seizures may require long-term pyridoxine (100–500mg daily). Pyridoxal phosphate-dependent seizures may respond to pyridoxal-5-phosphate (30mg/kg/day) but not pyridoxine. Folinic acid (3–5mg/kg/day) is additive therapy if pyridoxine or pyridoxal-5-phosphate fail to control seizures. If seizures are due to biotinidase deficiency, biotin becomes unrecyclable and requires ongoing preventative supplementation (5–20mg daily).

In this case series, biotin, pyridoxine, folinic acid and pyridoxal-5-phosphate were used safely in neonates for intractable seizures. Larger studies are required to further explore treatment choice, dosing, duration, and prophylactic use in this patient population.

### 7: Safe and effective implementation of a fertility preservation program within a single paediatric institution.

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**Background**: Oncology treatment can impact the future fertility of patients. Fertility discussions and decisions regarding fertility preservation (FP) in cancer patients, particularly in a paediatric setting are difficult for both clinicians and families.

**Objectives**: Few publications on safety and efficacy of FP procedures are available, particularly in paediatric settings. We aim to report the rates of fertility discussion and procedures over time, as well as the safety and efficacy of these procedures.

**Methods**: This was a bidirectional cohort study. The RCH Melbourne introduced Australia's first paediatric FP program, governed at three levels (institutional, research and clinical ethics) in 2013. Families of patients requiring oncology treatment who had fertility discussions were invited to participate in fertility research. Families were recruited prospectively from 2013 onwards and retrospectively via mailout or follow-up appointment for those diagnosed before 2013.

**Results**: 500 patients were recruited to the study, (n=339 after the introduction of the formalised program). Overall fertility discussion rates in families of eligible patients progressively increased from 15% in 2013 to 100% by July 2019. The median age of patients who had fertility discussions decreased from 14.5 (range: 0.5-23.7) pre-program, to 8.4 years (range: 0.1-19.0) post-program. Post-program, the breakdown of FP procedures (n=214) was 96 (44.9%) ovarian tissue cryopreservation, 88 (41.1%) testicular tissue cryopreservation, 15 (7.0%) GnRH agonist, 1 (0.5%) oocyte collection and 14 (6.5%) sperm collections. The majority (93.9%) of post-program FP patients experienced no delays to the commencement of oncology treatment as a result of scheduled fertility discussions. Reassuringly, there were no intra-operative or post-operative complications from surgical interventions in the majority of FP patients (94.4%).

**Discussion**: FP programs can safely and effectively be implemented within paediatric centres. Our data demonstrate that risks to future fertility from cancer treatment and FP options are proactively discussed with paediatric patients and their families, and rates of compilations and delays to treatment are minimal. This program facilitates a paediatric centre's commitment to fertility discussions as well as safe and efficient execution of procedures.

### 8: A pilot study of male partner treatment in women with bacterial vaginosis

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**Background**: More than 50% of women experience recurrence of bacterial vaginosis (BV) within 6 months following first-line antibiotics. Increasing evidence suggests that reinfection from an untreated sexual partner may contribute to BV-recurrence. We conducted a pilot study of combined oral and topical antibiotic treatment of male partners of women being treated for BV.

**Objectives**: To determine the acceptability and tolerability of male partner treatment in women treated for BV.

**Methods**: Women attending a sexual health service with symptomatic BV (≥3 Amsel criteria and Nugent Score[NS]=4-10) were recruited with their regular male partner (RSP) to one of two pilot studies, StepUp1 or StepUp2. Women received oral metronidazole 400mg twice daily (or 2% clindamycin cream *nocte*, if contraindicated), for 7 days. Males received oral metronidazole 400mg twice daily and 2% clindamycin cream topically to penile skin twice daily, for 7 days. All women were assessed for BV (NS<7) at 4-weeks post treatment and women recruited to StepUp2 were also assessed for BV at 12-weeks post treatment. Treatment adherence and side-effects were self-reported at day 8.

**Results**: Most approached RSPs agreed to take receive partner treatment (n=66/75, 88%). Fifty couples provided data to 4-weeks post treatment and 31 couples provided data to 12-weeks post treatment. Treatment adherence was high with over 90% of participants taking >70% of prescribed doses. Headache was the most commonly reported side effect (n=19/99, 19%). The proportion of women cured was 94% (n=47/50, 95%CI 83,99%) at 4-weeks and 87% (n=27/31, 95%CI 70,96%) at 12-weeks.

**Discussion**: Male partner treatment for BV was acceptable and well tolerated. Treating sexual partners of women with BV may be an effective strategy for improving BV-cure.

### 9: The development and pilot testing of an online Decision Aid for women considering elective egg freezing

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**Background**: The decision to freeze eggs for non-medical reasons can be difficult and complex. Women are weighing up the costs, side-effects and the uncertainty of outcomes against their personal situation and desire to become a parent in the future. With no clear medical best option, the decision is a values-based one. The gold-standard intervention for such decisions is a Decision Aid which has been shown to facilitate informed decision-making.

**Objectives**: To develop an online, interactive Decision Aid for women considering elective egg freezing and to pilot test it for acceptability and usefulness.

**Methods**: Australian women aged 18-45 years and interested in receiving elective egg freezing information were recruited through social media and the University of Melbourne staff newsletter, to complete pre/post surveys that assessed the impact of the Decision Aid on uncertainty (decisional conflict), knowledge, acceptability (including satisfaction and relevance), and usefulness.

**Results**: Twenty-seven women participated in the pilot study. Post review of the Decision Aid, participants had significantly reduced decisional conflict (p=0.002) and improved knowledge of egg freezing and fertility (p=0.047). The vast majority (93%) found the Decision Aid to be acceptable, with 96% reporting satisfaction with the tool, and 88% finding it helpful in explaining their options. Most (88%) would recommend the Decision Aid to others. There was still a need however for specific information which can only be sourced from clinical consultation.

**Discussion**: Participants were generally positive about the Decision Aid. It was considered acceptable, useful and appeared to improve knowledge and reduce uncertainty (which clinically manifests into decision delay). The Decision Aid may be a useful supplement to clinical discussions. Next step is to perform a randomised controlled trial to evaluate its efficacy against decision related outcomes.

### 10: Elective Oocyte Cryopreservation: General Practitioner knowledge, attitudes and practices

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**Background**: Women are delaying childbearing for many reasons including, but not limited to, being single, widely available effective contraception and focus on building a career. This increases the risk of age-related infertility, which elective oocyte cryopreservation has the potential to help prevent. General practitioners are ideally placed to provide counselling around this, however little is known of their position.

**Objectives**: This study aims to elucidate the knowledge, attitudes and practices of general practitioners on age-related infertility, ovarian reserve testing and elective oocyte preservation.

**Methods**: A survey was conducted using Qualtrics and distributed to general practitioners via RACGP e-newsletters, social media, email and flyers at medical clinics. Questions included on demographics, knowledge, attitudes and practices towards counselling on fertility decline with age, ovarian reserve testing and elective oocyte cryopreservation. Descriptive statistics were calculated.

**Results**: Participants were 66 general practitioners and 21 registrars. They answered 4.4 (±1.3) of six questions on age related infertility and fertility preservation correctly and 1.9 (±1.1) of six questions on ovarian reserve testing correctly, with ovarian reserve testing ordered infrequently. Participants are more likely to ask women aged 35-44 about their reproductive plans than for women aged 18-34. The age at which participants begin to discuss age related fertility decline is 31.7+/-5.7 years. When it is known that a woman is delaying childbearing for non-medical reasons the majority agree counselling should take place regarding age related infertility and that they should be the health professional to do this. The main barriers to providing this counselling are lack of time, knowledge, and concern for causing stress for patient. The majority believe patients are sufficiently aware of women's fertility reducing with age and believe the main barrier for undergoing elective oocyte cryopreservation is not being aware of the technology. The majority would like more resources online.

**Discussion**: General practitioners have some knowledge of fertility and elective oocyte cryopreservation and less of ovarian reserve testing. They face barriers to timely discussions about patients' reproductive plans and overestimate patient knowledge about fertility decline with age. General practitioners want more resources.

### 11: Asking women aBout disabiLitiEs during maternity care (the ABLE study): exploring how women with a disability are identified, and what percentage of women identify as having a disability

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**Background**: There is currently no comprehensive approach to national data collection or reporting on women's disability status in pregnancy. Consequently, there is a lack of knowledge regarding the prevalence of women accessing maternity services in Australia who identify as having a disability. There is also limited understanding of how pregnant women feel about being asked and how they would like to be asked.

**Objectives**: To explore i) identification processes, and ii) the prevalence of women with disabilities that utilise maternity services.

**Methods**: Women without major obstetric or neonatal morbidity were recruited from the postnatal ward at the Royal Women's Hospital in February 2019. Women were asked to answer questions in a face-to-face survey which explored their disability status, including if they were asked about their disability status; their level of comfort about being asked; and if they identified as having a disability. An audit was also conducted on routinely collected hospital data of women who were recruited, to compare documented disability identification and women's verbal reports.

**Results**: 371 women were recruited and 17 (5%) identified as having a disability. The majority of women (n = 273, 74%) reported not having been asked about their disability status during their episode of care. Most women (n = 299, 81%) reported feeling very comfortable about being asked. Of the women who self-identified with a disability 18% (3/17) did not have their disability status recorded in their medical history. The audit identified a further 42/345 (12%) women with a condition that may have been considered to be a disability. The vast majority of those identified were mental health conditions (n = 53/62).

**Discussion**: The majority of women are not being routinely asked about their disability status during their maternity care, which impacts on the effective identification of these women. Often women do not self-identify with a disability, particularly those with mental health conditions. The rates of disability as identified by women themselves were lower than expected and is likely related to when and how women are asked about their disability status.

### 12: Potential new models of care for the management of diet-controlled gestational diabetes: preliminary analysis of compliance, costs-of-care and health outcomes

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**Background:** The incidence of gestational diabetes mellitus (GDM) in Australia has markedly increased following a 2014 consensus statement by the Australian Diabetes in Pregnancy Society (ADIPS) endorsing diagnostic recommendations proposed by the International Association of Diabetes and Pregnancy Study Groups (IADPSG). Persistent concerns remain around the resulting impact on costs of care in the management of an increased number of GDM pregnancies, with calls to develop more cost-effective treatment strategies. There may be value in stratifying patients into different management pathways according to their risk of adverse perinatal outcomes.

**Objective:** To assess compliance to a lower risk care pathway for diet-controlled GDM and identify the effects on perinatal outcomes and costs of care from implementing this management strategy.

**Design:** Quasi-experimental study assessing anticipated and realised costs of care for GDM-diet and GDM-insulin cohorts and comparing perinatal outcomes of GDM-diet pregnancies with those of matched non-GDM controls.

**Participants:** All GDM patients with singleton pregnancies giving birth in the hospital, excluding those with pre-existing diabetes, early GDM diagnosis prior to 19 weeks and exclusive management by maternal fetal medicine (MFM).

**Main outcomes measures:** Individualised costs of care were derived using figures collected from the institutional Business Performance Reporting Unit and the Medicare Benefits Schedule. Compliance was assessed with respect to ultrasound recommendations of the management protocol using data obtained from the institutional imaging records. Primary perinatal outcomes were hypertensive disorder of pregnancy, caesarean section, birth weight >90th percentile and preterm birth less than 37 weeks. A number of secondary health outcomes were also analysed.

**Results:** 55.2% of patients were managed appropriately according to the hospital ultrasound guidelines. The average cost of medical management for GDM-diet was AUD$1975 and the cost of appropriate escalation of care plus non-compliance to care pathway totalled AUD$149 435 over a 6-month period. GDM-diet pregnancies had higher rates of caesarean section, but no other primary adverse perinatal outcomes.

**Discussion:** This model of care appears to be an appropriate pathway for management of GDM-diet offering potentially significant cost savings. Preliminary findings suggest that this cohort is at no substantial increased risk of adverse perinatal outcomes. Compliance was suboptimal and it would be desirable to assess barriers to implementation. Further prospective analyses are recommended to provide conclusive evidence of the benefits of a lower risk model of care for GDM-diet.

### 13: The role of miRNA-516b-5p in late-term decidual mesenchymal stem/stromal cells using a knockdown model

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**Background**: The proportion of ageing individuals with chronic disease in our society is rising rapidly, but ageing is difficult to study in humans. Our laboratory uses the human placenta as a novel model for studying ageing. The decidua that remains attached to the placenta after delivery is a plentiful source of decidual mesenchymal stem/stromal cells (DMSCs). Our laboratory provided evidence that DMSCs show signs of advanced ageing, such as reduced survival, between early- and late-term gestation. RNA sequencing revealed several microRNAs were differentially expressed in this period. miRNA-516b-5p showed significantly increased levels in late-term DMSCs compared with early-term DMSCs, and was chosen for further study.

**Objectives**: The aim was to model the advanced ageing effect in late-term DMSCs by inactivating miRNA-516b-5p in early-term DMSCs and determine if they show signs of advanced ageing.

**Methods**: Varying concentrations of miRNA-516b-5p inhibitor were transfected into DMSCs, and miRNA-516b-5p levels were determined by RT-PCR. The optimal incubation time was investigated by transfecting DMSCs with miRNA-516b-5p inhibitor for 48- or 72-hours, and then analysed by RT-PCR. DMSCs were transfected with fluorescently labelled non-silencing siRNA for 24-hours to determine the transfection efficiency. The cell growth profile of early-term DMSCs transfected with miRNA-516b-5p was monitored by real-time xCELLigence cell analysis system. Treatment groups were: Inhibitor (n=9), Control (n=9), Negative control (n=9), Mock control (n=4).

**Results**: Optimisation results showed that 30nM of miRNA-516b-5p inhibitor with incubation time of 72 hours had the greatest inhibition effect and the transfection efficiency was approximately 90%. The cell survival profiles were analysed at four different time points: 365, 425, 483, 504 hours, using normalized cell indexes. At 365-and 425-hours, there was no significant difference in survival between the treatment groups, but there was a trend to a decrease for the 'Inhibitor' group. A significant difference ($p<0.05$) in survival was detected between the inhibited cells and the other treatment groups at 483-hours and was greatest at 504-hours between the 'Inhibitor' and 'Control' groups.

**Discussion**: This study showed that transfection of miR-516b-5p into early-term DMSCs decreased their cell index during the cell survival phase. The results suggest miR-516b-5p is a cause, at least in part, of the advanced ageing effects seen in late-term DMSCs. Further analyses are required to understand exact mechanism by which miR-516b-5p affects DMSC ageing.

### 14: RETURN OF SPONTANEOUS CIRCULATION IS ASSOCIATED WITH EXCESS OXYGEN DELIVERY IN NEAR-TERM ASPHYXIATED LAMBS

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**Background**: Tailoring delivery room management of infants with hypoxic-ischemia to minimize early secondary brain injury represents a promising therapeutic target.

**Objectives**: We aimed to describe cerebral oxygen kinetics and haemodynamics following return of spontaneous circulation (ROSC) and identify non-invasive physiological correlates.

**Methods**: Near-term sheep fetuses (139±2 (SD) days gestation, n=16) were instrumented to measure carotid artery flow, pressure, right brachial arterial and jugular venous saturation ($SaO_2$ and $SvO_2$, respectively). Cerebral oxygenation ($crSO_2$) was measured using near-infrared spectroscopy (NIRS). Fetal asphyxia was induced by umbilical cord clamping or internal iliac artery occlusion. Ventilated newborn lambs received cardiopulmonary resuscitation in 100% oxygen until ROSC, with oxygen subsequently weaned according to saturation nomograms.

**Results**: Oxygen delivery ($DO_2$) was markedly elevated until 15 minutes after ROSC. Cerebral fractional oxygen extraction (cFOE) was low during this period before returning to fetal levels, indicating excessive $DO_2$ in relation to oxygen consumption. The surge in $DO_2$ was mediated by a pressure-passive increase in carotid artery flow. $CrSO_2$ and heart rate each correlated with $DO_2$ and carotid artery pressure. $SaO_2$ remained >90% and was less useful for identifying trends in $DO_2$ or cFOE. $CrSO_2$ correlated inversely with cFOE.

**Discussion**: ROSC from perinatal asphyxia is characterized by excess oxygen delivery that is driven by rapid increases in cerebrovascular pressure, flow, and oxygen saturation. Fluctuations in $DO_2$, cFOE and carotid artery pressure may be monitored using NIRS and heart rate while $SpO_2$ levels remain >90%. The current standard of $SpO_2$ targeting during resuscitation for perinatal hypoxic-ischemia should be re-evaluated.

### 15: Embedding Technological Tools into Screening for Family Violence in Antenatal Care

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**Background**: Family Violence (FV) is behaviour by a family member that causes physical, sexual, emotional or financial harm. Pregnancy represents a period of heightened risk for the onset or worsening of FV, and is associated with significant, and potentially enduring, physical and mental health outcomes for the mother and her baby. As almost all women in Australia have ongoing contact with the health system during their pregnancy, FV screening during antenatal care is a valuable opportunity for intervention. Computerized screening modalities may facilitate screening, and aid in providing services and resources for women experiencing FV.

**Objectives**: This research aimed to explore how antenatal care midwives at the RWH currently undertake FV screening in antenatal care, and how they perceive the use of technological screening tools for FV.

**Methods**: Phase 1 involved a file audit of all women who received antenatal care by Red team midwives during an 8-week period when mandatory paper-based FV screening was being piloted at the RWH.

Phase 2 involved semi-structured interviews with 17 antenatal care midwives to understand their experiences of the current, paper-based screening modality, and to explore how they perceive the integration of computerized FV screening into their practice.

**Results**: Of the 255 files audited, 228 (89.4%) contained a screening tool. Of these, the tool was completed 92.5% of the time. Ten women (4.7%) disclosed FV with the screening tool.

Semi-structured interviews revealed midwives felt ill-equipped because FV screening is new, and paper-based screening 'feels a bit clunky'. Midwives felt technological screening tools hold the potential to assist processes, guide midwives and foster self-reflection among women. Despite acknowledging important advantages of computerized screening, midwives wanted to maintain a face-to-face element during FV screening.

**Discussion**: A high rate of screening tool completion indicates midwives were successfully able to integrate FV screening into their practice. Technological screening tools may be valuable in overcoming limitations of paper-based screening, particularly given the transition to Electronic Medical Records, and may support midwives to better handle a disclosure. A positive way forward for FV screening in antenatal care may involve a coupling of technological screening tools with face-to-face discussion.

### 16: Making breastfeeding visible: Evaluating strategies to increase women's comfort with breastfeeding in public

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**INTRODUCTION**: Breastfeeding is a crucial first step in preventative health, but many mothers do not achieve their own breastfeeding goals. Some mothers find it challenging to breastfeed outside the home, and difficulties finding appropriate public and semi-public spaces for feeding contributes to cessation of breastfeeding earlier than planned. To date, breastfeeding women have not been included in most public space designs, such as parks, shopping centres or public buildings. This project set out to explore design features that invite or deter breastfeeding in public.

**METHODS**: We conducted interviews and focus groups with breastfeeding mothers at the Royal Women's Hospital in December 2018 to understand their experiences of public space when breastfeeding outside the home (n = 28). We ran specific focus groups: one for Aboriginal women, and one for women speaking Amharic, Arabic, Cantonese and Vietnamese. Our interviews included women with a range of disabilities.

**RESULTS**: Many participants reported avoiding breastfeeding in public spaces due to social expectations or physical comfort. Mothers reported that best spaces for breastfeeding were dignified, safe, comfortable, accessible, compatible with their other needs and responsibilities with a high level of amenity. Using the data, we developed design guidelines that outlined how a range of everyday shared spaces could become breastfeeding-friendly as well as the optimal design characteristics for dedicated breastfeeding spaces.

**RECOMMENDATIONS**: We recommend use of our new design guidelines for public institutions, councils, shopping centres, or other organisations designing or managing shared spaces.

### 17: Active management of inborn versus outborn livebirths at 22-24 weeks' gestation

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**Background**: Management of periviable births at 22-24 weeks' gestation requires important clinical decisions that affect survival chances for the infant, including antenatal corticosteroid administration, in-utero transfer to a tertiary centre, mode of delivery, resuscitation at birth and provision of neonatal intensive care. There are wide variations in approaches to active management of periviable births internationally.

**Objectives**: Our aim was to report rates of active management of births at 22-24 weeks' gestation in Victoria, comparing inborn (tertiary) with outborn (non-tertiary) births. We also aimed to report temporal changes in rates of active management.

**Methods**: A population-based cohort study of all 22-24 weeks' gestation births in Victoria, from 1/1/2009 to 31/12/2017. Perinatal data and infant mortality data were obtained from the Department of Health and Human Services. 'Active management' was defined as delivery room resuscitation, comprising any of positive pressure ventilation, CPAP, intubation, external chest compressions and/or administration of adrenaline and/or volume expanders. Active management rates comparing inborn with outborn infants were analysed by logistic regression, adjusted for gestational age, birth weight and sex. Adjusted odds ratios (aOR), 95% confidence intervals (CI) and p-values were calculated. Temporal changes were analysed by logistic regression.

**Results**: Over the 9-year period, 1,423 births were recorded: 796 (56%) were liveborn: 70% (554) in a tertiary perinatal centre. Overall, 434 (55%) livebirths were actively managed: 10/191 (5%) at 22 weeks, 117/260 (45%) at 23 weeks and 307/345 (89%) at 24 weeks' gestation. Inborn infants were more likely to be resuscitated compared with outborn infants: 65% versus 31%: aOR 2.89 (95% CI 1.85, 4.53), p<0.001. Overall, 412 infants survived to nursery admission (97% inborn versus 79% outborn actively managed infants. At one year, 263 (60%) actively managed infants were alive: 65% (235/361) inborn versus 37% (28/76) outborn infants (aOR 1.84, 95% CI 1.09, 3.12, p=0.02). Survival rates were 0% at 22 weeks, 50% at 23 weeks and 66% at 24 weeks. There were no significant changes in active management rates over time.

**Discussion**: In Victoria, active management at 22 weeks is uncommon, but is offered from 23 weeks. By 24 weeks' gestation, nearly 90% of livebirths are actively managed. Inborn infants are more likely to be actively managed compared with outborn infants, and more likely to survive. Further research is required to identify barriers to active management of outborn periviable infants.

### 18: Decidual-Secreted miRs: Essential Mediators Of Maternal-Fetal Dialogue During Early Pregnancy

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**Background**: Decidualization is impaired in some women who suffer from recurrent miscarriage. Decidualization is critical for establishment of pregnancy, yet the function of decidual cells is understudied. Secreted microRNAs (miRs) are potent mediators of cell-cell communication and control target cell gene expression.

**Objectives**: We hypothesized that decidual-secreted miRs are critical mediators of maternal-fetal dialogue during early pregnancy. We aimed to identify human endometrial stromal cell-secreted miRs and to investigate their function.

**Methods**: Primary human endometrial stromal cells isolated from endometrial biopsies (n=5) were decidualized with estradiol-17β and methoxyprogesterone-acetate for 13 days. Decidualization was determined by prolactin secretion. Conditioned media (CM) was collected on days 3 (non-decidualized) and 13 (decidualized). Secreted miRs isolated from CM were identified by qPCR array. The expression of miRs was confirmed by RT-qPCR in decidualized stromal cells, CM (n=5) and whole tissue biopsies from the proliferative or late secretory phase of fertile women or women with history of recurrent miscarriage (n=3-8). THP-1 macrophages (n=6) were treated with profilin (PFN)1 for 24-48h and IL1β and IL6 expression measured by RT-qPCR.

**Results**: Decidualization significantly reduced levels of 29/234 miRs detected in stromal cell CM. 11/29 are known to be altered in placenta/blood of women with preeclampsia or recurrent miscarriage. miR-19b secretion was highly regulated by decidualization: miR-19b levels were elevated in serum and endometrial tissue of women with a history of recurrent miscarriage history compared to fertile women.

miR-19b is well known to regulate immune tolerance in other tissues. In the decidua we showed that stromal cell CM containing high miR-19b inhibited 1st trimester extravillous trophoblast secretion of a predicted miR-19 target, profilin-1. Profilin-1 reduced pro-inflammatory cytokine production in the THP-1 macrophage cell line (↓*IL1β*, *IL6*; p<0.05), supporting a role for miR-19b in regulating maternal immune tolerance via its regulation of trophoblast gene expression.

**Discussion**: Decidualization alters stromal cell miR expression and secretion. Secreted miR-19b may be a novel biomarker for impaired decidualization in women who go on to miscarry. We hypothesize that elevated miR-19b impairs maternal immune cell tolerance towards fetal trophoblast, leading to poor pregnancy outcomes including miscarriage.

### 19: Elevated galectin-7 during mid-gestation causes preeclampsia features in mice and impairs pup post-natal growth

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**Background**: Preeclampsia (PE) is a pregnancy-induced disorder, unique to humans and major cause of maternal and perinatal morbidity and mortality worldwide. PE is classically defined by the sudden onset of maternal hypertension and proteinuria >20 weeks gestation. The etiology of PE is not well understood, however there is substantial evidence suggesting that poor placentation during the 1st trimester is the underlying cause. Galectin-7 is abnormally elevated in 1st and early 2nd trimester serum of women who go on to develop PE. Galectins are animal (soluble) lectins which bind to surface glycoproteins and regulate many cell functions important for placentation.

**Objectives**: We aimed to determine whether elevated galectin-7 during early pregnancy could impair placental development and cause preeclampsia.

**Methods**: Female C57BL6J mice were treated with recombinant human galectin-7 by subcutaneous injection (400ug/kg/day) from embryonic day (E)8-12 of pregnancy. The effect of galectin-7 on PE features (systolic blood pressure [sBP] and proteinuria), spiral artery remodelling and fetal/pup growth was investigated at E13, 17 and 18 and post-natal (P) days 1, 7, 14 and 21.

**Results**: Exposure to elevated galectin-7 during mid-gestation induced elevated sBP (E14-17) and proteinuria (E12-15) only in pregnant mice. Placental weight, spiral artery remodelling and labyrinth zone vascular branching was significantly reduced at E13 but restored to be the same as control mice by E17. Glycogen cell and junctional zone area was not different at E17. Galectin-7 treatment had no effect on fetal weight but pups showed significantly reduced weight from P1-21. Pup growth trajectory (P1-21) was not different between groups suggesting growth restriction occurred between E18-P1 (birth: E19).

**Discussion**: Galectin-7 acts via the placenta to cause PE. Therapeutics which target galectin-7 may be useful to prevent placental damage leading to PE. This is a very useful model of preeclampsia which we will use in our preclinical trials of novel drugs to prevent or treat preeclampsia.