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ORAL ABSTRACT

LATE BREAKING ABSTRACT

MATERNAL INFLUENZA VACCINATION REDUCES PRETERM BIRTH AND STILLBIRTH

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Background: Preterm birth (PTB) and its consequences remain among the greatest challenges in perinatal care. The incidence of PTB in Australia is 8.7% and has increasing slightly over the past decade. Few interventions have been shown to significantly reduce the rate of spontaneous preterm birth at a whole-of-population level. It has been suggested that maternal vaccination may be such an intervention.

Methods: We analysed the rates of PTB and stillbirth among all singleton births ≥28 weeks' gestation in Victoria in 2016 and 2017, depending on maternal influenza vaccination status. We excluded women who gave birth before 28 weeks to minimize the possibility of reverse causation or 'opportunity bias'. We use multivariable logistic regression to derive adjusted odds ratios (aOR) between influenza vaccination and either PTB or stillbirth, adjusting for primiparity, maternal age, BMI, socio-economic status, smoking and admission status, previous stillbirth.

Results: Of the154,479 singleton births, 72,764 (47%) women had received influenza vaccination 70,542 (46%) had not and 11,174 (7%) were unknown. There were 317 stillbirths (0.2%) and 9,476 (6%) PTBs. Maternal influenza vaccination was associated with an aOR (95 CI) for PTB <37 weeks of 0.85 (0.82, 0.89), PTB <34 weeks of 0.64 (0.57, 0.70), and stillbirth of 0.48 (0.37, 0.63).

Conclusions: Influenza vaccination during pregnancy is associated with significant reductions in both PTB and stillbirth. Increasing maternal vaccination rates to >90% would be expected to reduce the number of PTBs in Victoria by over 500 per year and the number of stillbirths by 50 per year.

	Influenza vaccine given		Influenza vaccine not given					Influenza vaccination (+/− pertussis)	
	n	%*	n	%*	p-value	OR	95%CI	aOR	95%CI
Stillbirth	83	0.11	175	0.25	<0.001	0.46	(0.35, 0.60)	0.48	(0.37, 0.63)
Birth before 37 weeks	4005	5.5	4571	6.5	<0.001	0.84	(0.80, 0.88)	0.85	(0.82, 0.89)
Birth before 34 weeks	662	0.9	1021	1.4	<0.001	0.63	(0.57, 0.69)	0.64	(0.57, 0.70)

DEVELOPMENT OF BRAIN WHITE MATTER AND PERFORMANCE IN MATHEMATICS IN CHILDREN BORN VERY PRETERM AND FULL-TERM

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Background: Children born very preterm (VPT; <32 weeks' gestation) typically have alterations in brain white matter (WM) and poorer mathematics than full-term (FT) peers. Cross-sectional studies suggest a link between WM and mathematics that differs over time. We aimed to analyse cross-sectional and longitudinal associations between WM and mathematics in VPT and FT children.

Methods: Participants completed magnetic resonance imaging and the Math Computation subtest of the Wide-Range Achievement Test at 7 and 13 years (n=103 VPT; n=21 FT). Fixel-Based Analysis was undertaken to investigate relationships between WM Fibre Density (FD), Fibre Bundle Cross-Section (FC), and combined Fibre Density/Bundle Cross-Section (FDC) and mathematics, at 7 and 13 and longitudinally between 7-13.

Results: VPT children had poorer mathematics than FT children at both timepoints. FD, FC and FDC in widespread tracts were positively associated with mathematics at 7 and 13 years. Longitudinally, faster development of FC and FDC in the corpus callosum and corona radiata was associated with improvement in mathematics. Associations were similar between groups.

Conclusions: Faster microstructural and macrostructural development within specific fibre tracts is associated with greater improvement in mathematics. VPT and FT children did not differ in these associations, despite differences in mathematics performance.

EARLY PARACETAMOL (EPAR) TRIAL: A RANDOMIZED CONTROLLED TRIAL OF EARLY PARACETAMOL TO PROMOTE CLOSURE OF THE DUCTUS ARTERIOSUS IN PRETERM INFANTS

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Background: This study aimed to investigate whether early treatment with paracetamol reduces the number of preterm infants requiring intervention for patent ductus arteriosus (PDA).

Methods: This was a double-blind, parallel, randomized, placebo-controlled trial in preterm infants <29 weeks' gestation. At 6 hours of life, infants with a ductus arteriosus >0.9 mm

were randomized to receive either (1) intravenous paracetamol at a dose of 15 mg/kg initially, followed by every 6 hours at a dose of 7.5 mg/kg for 5 days; or (2) intravenous 5% dextrose every 6 hours for 5 days. The primary outcome was the need for any intervention for management of PDA in the first 5 days of life.

Results: Of 58 infants randomized, 29 were allocated to the intervention and 29 to the control group. The trial was stopped for benefit at 50% recruitment after reaching pre-specified stopping criteria. Less infants in the intervention group required intervention for management of PDA up to 5 days (6 [21%] vs 17 [59%] infants [p = 0.003]; relative risk reduction 0.65 [95% CI 0.23 – 0.84; NNT 2.6]). The intervention group had a higher rate of ductal closure at 5 days (20 [69%] vs 8 [28%] infants [p = 0.002]; relative risk reduction 0.57 [95% CI 0.23 – 0.76; NNT 2.4]). There were no differences in mortality and significant morbidities. Three deaths occurred (two intervention group; one control), which were not attributed to the intervention. No adverse events or side effects were reported.

Conclusions: Early paracetamol reduced the number of preterm infants requiring intervention for PDA. Australian New Zealand Clinical Trials Registry number, ACTRN12616001517460. Funded by Running for Premature Babies (registered charity).

ONTOGENY OF THE SKIN MICROBIOME IN VERY PRETER INFANTS DURING THE FIRST WEEKS OF LIFE

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Background: Preterm infants are uniquely susceptible to invasive bacterial infections with up to 50% of the most immature infants affected. Approximately 80% of sepsis episodes are caused by skin commensals. However, the development of the skin microbiome in this population is incompletely understood.

Objective: To characterise the ontogeny of the skin microbiome in very preterm infants.

Methods: As part of a prospective clinical trial of a skin care intervention in very preterm infants, we profiled the earlobe, axilla and groin microbiomes of 42 infants during the first 3 weeks of life via V3V4 16S amplicon sequencing.

Results: Here we present the data from the control group of preterm infants (no skin care intervention). 21 infants (mean gestation 27.9 (IQR 25.4-29.1) weeks; mean birthweight 950g (725-1155g); 50% male, Caesarean section: 69%)) had complete sets of swabs and were included in the analysis. Skin microbiomes were highly diverse on the first day of life, converged to stable, body-site specific communities by 1 week of life, and included several taxa associated with systemic infection in a body-site specific manner.

Conclusions: This study represents the first longitudinal survey of the skin microbiome in premature infants, and provides insights into body-site specific commensals and sources of potential infectious threats. This paves the way for prophylactic strategies to modulate skin microbiomes in this vulnerable population as a means to reduce their burden of disease.

WHAT FEATURES OF VACUUM DELIVERY CONTRIBUTE TO THE DEVELOPMENT OF SUBGALEAL HAEMORRHAGE? A CASE-CONTROL STUDY

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Background: Subgaleal haemorrhage (SGH) is a type of neonatal extracranial haemorrhage with significant neonatal morbidity and mortality. Guidelines on the use of vacuum devices aim to reduce the risk of SGH by providing recommendations on number of pulls, pop-offs and duration of application. A paucity of evidence exists to support these guidelines. The aim of this study is to assess which features of vacuum delivery are risk factors for SGH.

Materials and Methods: We undertook a retrospective case-control study of all SGH following vacuum application at John Hunter Hospital between January 2006 and December 2017. 22 cases of SGH met this criteria, diagnosed clinically by a paediatrician based on a boggy, fluctuant swelling of the neonatal head. Cases were matched in a one to two ratio with a control group of vacuum-assisted births without SGH and matched for parity, gestation, and maternal age.

Results: In univariate analysis vacuum device pop-offs (OR = 5.14, 95% CI: 1.54-17.12), more than two pulls (OR = 3.51, 95% CI: 1.15-10.7) and a prolonged second stage (mean 135 vs. 100 minutes, p = 0.025) increased the risk of SGH. Other factors such as duration of first stage, OP presentation, duration of vacuum application and birthweight were not associated with SGH.

Conclusions: Pop-offs and more than two pulls with a vacuum device were associated with SGH in our study. Understanding these risk factors can help guide the safe use of vacuum devices and aid midwives and paediatricians in early diagnosis of SGH.

RISK OF LATE STILLBIRTH FOR WOMEN OF SOUTH ASIAN ETHNICITY: IS INDUCTION OF LABOUR AT 40 WEEKS THE WAY FORWARD?

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Background: Studies have shown South Asian women are at increased risk of term stillbirth. There is a lack of evidence on the timing of stillbirth in this group.

Methods: Retrospective cohort study of singleton births between 37-42 weeks in a metropolitan maternity network between 2009-2018. Mothers were grouped by country of birth.

Overall stillbirths were analysed by stillbirths per 1000 births. The timing of stillbirths was analysed by the fetus-at-risk method.

Results: There were 50,119 births, Australian and New Zealand (ANZ) (56.1%), South Asian (SA) (15.9%) and South East Asian (SEA) (28.0%). The overall risk of term stillbirth was 1.14 per 1,000 births and was not different between groups (p = .3171). After adjusting for potential confounders the adjusted odds ratio for SA-born women remained non-significant (aOR = 1.34; 95% CI, 0.58 – 3.09: p = .491). In the fetus-at-risk analysis after 40 weeks there was a marked increase in the risk of stillbirth for SA compared to ANZ and SEA women (OR = 4.67; 95% CI, 1.1 – 16.8: p < .05) and at 41 weeks gestation (OR = 16.1; 95% CI, 3.0 – 86.4: p < .0001).

Conclusions: Beyond 40 weeks gestation SA women have an accelerated risk of stillbirth. Our data supports induction of labour from 40 weeks in this group.

CONSUMER PRIORITIES FOR RESEARCH IN NEWBORN MEDICINE: A DELPHI STUDY

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Background: Research about neonatal conditions has traditionally been directed by clinicians and researchers and focused predominantly on developing clinical treatments and evaluating outcomes. Little research has focused on identifying and understanding consumers' experiences and priorities. This limits the capacity of research to address questions of maximal impact for the end-user (patients, families and communities). We aimed to identify consensus research priorities of consumers of newborn medicine in Australia and New Zealand.

Methods: Consumers with experience of neonatal care participated in an e-Delphi survey comprising three rounds. In round I, participants described challenges experienced across four time periods (neonatal, early childhood, child/adolescent, and adulthood). Data were thematically analysed, generating a list of research questions which participants rated for importance on a 1-7 Likert scale in rounds II and III. Questions with median ratings of 6 and interquartile ranges of +/-1 were considered high-priority and high-consensus.

Results: 393 consumers participated, mostly parents of infants or young children (74%). Participants identified as high priority with high consensus key challenges including: parental mental health; relationships between parents and neonatal clinical staff (including communication and involvement in their child's care); bonding and the parent-child relationship; ongoing impacts on child health and neurodevelopment and improving neonatal medical care.

Conclusions: Future research should focus on parental mental health; how to facilitate parental involvement in care and support parent-child relationships; and continued improvement of neonatal clinical care. Consumers also highly value research into long-term outcomes, highlighting the importance of translation of the existing evidence in this realm.

POSTER ABSTRACT

AUSTRALIAN IMPACT OF THE FRENCH DISEASE: SCREENING FOR SYPHILIS IN THE ANTENATAL POPULATION

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Background: In Australia, an outbreak of syphilis began in 2011, so far affecting more than 26,000 people. During pregnancy, trans placental transmission of syphilis can occur in all trimesters and at any stage of maternal disease. Pregnancies with syphilis have an increased risk of adverse outcomes including miscarriage, stillbirth, preterm birth, congenital syphilis and neonatal mortality. 43 cases of congenital syphilis were notified between 2007 and 2017 in Australia, 55% of which were among Aboriginal and/or Torres Strait Island women. Most cases of congenital syphilis develop because the mother had poor antenatal care, or inadequate treatment. We present an atypical presentation of syphilis in pregnancy in a woman who had undergone routine screening.

Methods: A woman presented at 34 weeks of pregnancy, having ruptured her membranes at home. She was found to be contracting, with fetal distress noted on the Cardiotocograph requiring delivery by emergency caesarean section. The patient had had routine antenatal care, including negative screening for syphilis.

Results: This case highlights that routine first trimester antenatal syphilis screening for all pregnancies may not be sufficient in the context of an upsurge in disease incidence. High risk patients should be re-screened in order to avoid a missed diagnosis, and in order to optimize the opportunity for commencing the appropriate treatment. Adequate vigilance is crucial to prevent adverse maternal and fetal outcomes including congenital syphilis.

THE POWERFUL IMPACT OF PARENT-INFANT SKIN TO SKIN CARE (SSC) ON PRETERM CIRCULATORY PHYSIOLOGY

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Background: SSC increases physiological stability, reduces bradycardias and desaturations and lowers heart rate variability in preterm infants. This study assessed the impact of SSC on circulatory physiology and organ blood flow.

Methods: Forty self-ventilating infants between 28-36 weeks corrected gestational age (GA) were assessed for cardiac performance and cerebral blood flow by echocardiography within 2 hours prior to SSC and then after 60 minutes of having SSC (*while still on parent*).

Results: GA and birthweight of the cohort was 30.5 ± 0.6 weeks' and 1378 ± 133 g, respectively. Assessments were done at age 12 (9, 25) days (median (IQR). Significant increases in right ventricular global and longitudinal function was noted (**Table 1**). This coincided with a reduction in surrogate of pulmonary vascular resistance. On the systemic side, increased cardiac output accompanied ↑ cerebral blood flow and ↓ middle cerebral artery resistive index (0.81 ± 0.02 vs 0.74 ± 0.02, p = 0.0001).

Conclusions: The findings align with previously documented physiological benefits in cardiorespiratory stability and cardiac rhythm, and could be mediated through modulation of the autonomic nervous system.

Table 1

Variable	Pre-SSC	Post SSC	P
RV Fractional area change (%)	26.5 ± 0.3	27.8 ± 0.4	<0.001
RV stroke volume (ml/kg)	1.26 ± 0.04	1.41 ± 0.05	<0.001
TPV/RVETc	0.27 ± 0.007	0.3 ± 0.008	<0.001
LV stroke volume (ml/kg)	1.24 ± 0.04	1.37 ± 0.04	0.0001
Fractional shortening (%)	27.8 ± 0.1	29.2 ± 0.1	0.054

PREDICTION OF ABORIGINAL WOMEN AT RISK OF PRETERM BIRTH USING VAGINAL BACTERIAL BIOMARKERS

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Background: The rate of preterm birth (PTB) in Aboriginal women is ~ double that seen in Caucasians. We recently developed a diagnostic vaginal microbial DNA test (the GLU test) that is effective at predicting women at risk of spontaneous PTB (sPTB). However, the vaginal microbiome varies substantially with race, and it is unknown if the GLU test will be effective in Aboriginal women. Further, there are currently no data available on the vaginal microbiome in this population.

Methods: 22 Aboriginal women took part in the previously conducted Predict1000 study (Perth, Australia). These women provided self-collected vaginal swabs at 14-22 wk GA, DNA was extracted and the GLU test conducted. Pregnancy outcome was recorded and compared with GLU results.

Results: Based on GLU test results, 36% of Aboriginal women were at increased risk of sPTB, yet only one delivered in this manner (4.5%). In comparison, for Caucasian women, 40% of GLU-positive women delivered spontaneously preterm. Further, high levels of 'good' *Lactobacillus* spp. were only seen in 18% of Aboriginal women. These figures are ~ half those seen in Caucasian women from the same cohort.

Conclusions: Based on very small numbers, the GLU test does not appear to be effective at prediction of sPTB in Aboriginal women. This needs to be confirmed in a larger cohort alongside

vaginal bacterial profiling analyses to identify additional biomarkers of sPTB risk that may be used to modify the GLU test for use in this high-risk population.

FROM LITTLE THINGS, BIG THINGS GROW: NOVEL TEACHING METHODS IN EMBRYOLOGY

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Background: A good knowledge of early embryological development is relevant to perinatal care, both in terms of understanding early pregnancy care and in order to understand the complex abnormalities that result from Mullerian tract developmental anomalies.

Embryology has always been a difficult topic to learn and to teach. Historically, many methods have been trialled, including papier-mache models, animal models, and histological sections.[1] Modern students most commonly learn through online resources.[1] The dynamic nature of online media suits the three dimensional conceptualisation that is required to understand embryological development.[1]

Our medical education department is introducing an embryology teaching program aimed at junior doctors. The aim of this study is to examine the utility of a collaborative, peer-led problem solving approach to embryology education.

Methods: An afternoon workshop has been designed, utilising a peer-led education approach with the use of online teaching aids and student-created audio-visual resources. The workshop will employ a problem-based learning approach, using clinical and theoretical learning outcomes.

Results: The workshop is scheduled to take place in February 2020. Evaluations will be available to present at PSANZ.

Conclusions: Understanding of complicated concepts is an essential part of the perinatal curriculum. Peer-led teaching with learner-derived resources has the potential to engage learners and create deeper understanding. It is hoped that this approach will prove successful, and that this method of teaching could be applied in other areas of the curriculum.

References:

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AN AUDIT ON OUTCOME OF NEWBORNS BETWEEN 28-32 WEEKS OF GESTATION TRANSFERRED FROM THE MURRUMBIDGEE LOCAL HEALTH DISTRICT TO TERTIARY REFERRAL HOSPITALS

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Background: Wagga Wagga Base hospital (WWBH) being the sole paediatric referral centre for the Murrumbidgee Local health District (MLHD) currently provides special care nursery services for newborns delivered at or above 32 weeks of gestation. Mothers with anticipated delivery before 32 weeks or newborns below 32 weeks are transferred to metropolitan referral hospitals for delivery and neonatal intensive care. We undertook an audit to determine if a model of care can be implemented at WWBH to cater to newborns between 28-32-weeks gestation.

Methods: A list of newborns between 28- 32 weeks of gestation in the MLHD region between 1st January 2017 to 31st December 2018 was compiled from the Neonatal Intensive Care Units database and their discharge summaries were reviewed. The data of their morbidities was then de-identified and entered into the Excel database.

Results: There were 29 newborns identified over a 2-year period born between 28-32 weeks gestation. 7 (24%) were born at WWBH and transferred to a NICU by NETS. 6 newborns (20%) required surfactant at birth. 28 newborns (98%) received CPAP at birth and 5 (17%) required mechanical ventilation. 27 (93%) newborns were prescribed total parenteral nutrition. None of them needed high frequency ventilation or inhaled nitric oxide. There were no deaths in this cohort.

Conclusions: Upgrading the neonatal services at WWBH to cater to newborns over 28 weeks gestation is feasible if we anticipate similar number of referrals from the district hospitals within MLHD. Further cost-benefit analysis is needed.

THE EFFECT OF INTERPREGNANCY INTERVAL ON PREECLAMPSIA BY PREVIOUS PREECLAMPSIA STATUS; A POPULATION-BASED COHORT STUDY IN WESTERN AUSTRALIA, 1980–2015

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Background: Interpregnancy interval (IPI) is a potentially modifiable risk factor for pregnancy outcomes, and short and long IPI may be associated with increased risk of preeclampsia. Our aim was to investigate whether previous preeclampsia modifies effect of IPI on preeclampsia at second pregnancy.

Methods: A longitudinal retrospective cohort study was conducted using linked records from Western Australian Midwives Notification System and Hospital Morbidity Data Collection. We included 251,899 mothers who delivered their first and second singleton births (parity 0,1) between 1980 and 2015. Using logistic regression, we modelled the association between IPI (ref: 18-23 months) and preeclampsia, adjusted for propensity score of covariates at second birth. Analysis performed separately for women with and without preeclampsia in their first pregnancy.

Results: The incidence of preeclampsia was 9.5%, and 4% in the first pregnancy and second pregnancy respectively. Among mothers with previous preeclampsia risk of recurrence was 19.3%.

The risk of preeclampsia in second pregnancy increased with increased IPI for women with no previous preeclampsia with AOR ranging from (1.2, 95% CI 1.07-1.27) for intervals 24-59 months to (2.29, 95% CI 1.89-2.78) for ≥120 months compared to 18-23 months. For women with preeclampsia in their first pregnancy there was no association between IPI and preeclampsia in second pregnancy. Partner change was associated

Journal of Paediatrics and Child Health 56 (Suppl. 1) (2020) 138–153

with reduced risk of preeclampsia for both short and long IPIs in mothers with preeclampsia in their first pregnancy.

Conclusions: Long IPI (>24 months) increases risk of preeclampsia for subsequent pregnancies in mothers with no preeclampsia in their first pregnancy.

THE EFFECT OF INTERPREGNANCY INTERVAL ON PREECLAMPSIA BY PREVIOUS PREECLAMPSIA STATUS; A POPULATION-BASED COHORT STUDY IN WESTERN AUSTRALIA, 1980–2015

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Conclusions: Long IPI (>24 months) increases risk of preeclampsia for subsequent pregnancies in mothers with no preeclampsia in their first pregnancy.

PERFORMANCE OF OBSTETRIC EARLY WARNING SCORE IN PATIENTS WITH SEVERE CONDITIONS FOR THE PREDICTION OF MATERNAL MORTALITY

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Background: Bleeding and hypertension disorders constitute the majority of obstetric ICU admissions. Carle et al. Designed the Obstetric Early Warning Score (OEWS) to predict the prognosis of obstetric patients receiving ICU treatment using baseline data obtained at the beginning of ICU treatment.

Methods: This study is a cohort retrospective study, conducted at H. Adam Malik General Hospital Medan and began in October 2018. The study subject was the Medical Record of the Patient. Sample count using the total sampling method.

Result: From the OEWS analysis using the ROC curve it was found that the area under the ROC curve (AUC) with OEWS of 9, was 90.4% (95% CI: 83.1% - 97.8%).

Conclusion: OEWS in this study has a very good ability to predict maternal mortality

Keyword: ICU, OEWS, Maternal Mortality

PERIPARTUM VTE RISK ASSESSMENT IN A TERTIARY CENTRE: AN AUDIT

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Background: VTE (Venous Thromboembolism) risk assessment and prophylaxis are key aspects of inpatient care in the peripartum period for women. VTE is one of the leading causes of maternal mortality in Australia and was the leading cause of direct maternal deaths between 2008 and 2017. Pregnancy and the postpartum period are a high-risk time for development of VTE due to the unique physiology of pregnancy itself.

Methods: A new VTE risk assessment tool was introduced in our tertiary maternity hospital in late 2018. This was combined with a new VTE prophylaxis "prescribing tool". This audit compared uptake and correct usage of the previous and newer VTE tools, using cluster-based population sampling from January 2018 and July 2019. Retrospective analysis of clinical records was used to assess compliance.

Results: The percentage of VTE risk assessment tools completed postnatally significantly increased since the introduction of the new VTE tool. Overall, there was a drop in the percentage of completed risk assessment tools which also had correct VTE prophylaxis prescribed. However, the percentage of patients correctly prescribed Enoxaparin on discharge when indicated, had risen five-fold.

Conclusions: VTE risk assessment improved significantly in this maternity hospital with the introduction of a new clinical tool. Further investigation into the reasons for incomplete prophylaxis despite adequate risk assessment needs to be undertaken.

IDENTIFICATION OF RISK FACTORS AND DEVELOPMENT OF A FIRST TRIMESTER PREDICTION MODEL FOR PRETERM PRELABOUR RUPTURE OF MEMBRANES (PPROM)

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Background: PPRoM affects up to 3% of pregnancies and is associated with high rates of morbidity and mortality for the mother and newborn. We aimed to identify risk factors and develop a model for predicting PPRoM risk in the first trimester.

Methods: A retrospective analysis of women who had first trimester screening for aneuploidy and pre-eclampsia and delivered in the same institution was performed. Univariate and multivariate logistic regression analyses were used to identify maternal and pregnancy factors and then develop a clinical prediction model for PPRoM.

Results: 10,280 women were screened between April 2010 and October 2016. 144 (1.4%) had PPRoM. Maternal factors predictive of PPRoM included nulliparity (parous women, OR 0.53: 95% CI; 0.4 to 0.8), pre-existing diabetes mellitus (Type 1 DM, OR 6.7: 95% CI; 2.3 to 19.4, Type 2 DM, OR 5.3: 95% CI; 1.6 to 18.3), maternal age (*P* 0.004) and BMI (*P* 0.012). Uterine artery pulsatility index and biochemical parameters (PaPP-A, free βhCG) did not reach statistical significance. The predictive model had moderate efficacy, with an area under ROC curve 0.67.

Conclusions: Several characteristics predict PPRoM, however, the addition of other predictors is needed to improve model performance. Future studies should focus on addition of other biomarkers that may improve screening efficacy.

EXPLORING THE EARLY USE OF ASPIRIN AS PROPHYLAXIS FOR PREVENTION OF PREECLAMPSIA IN A RURAL ABORIGINAL COMMUNITY CONTROLLED HEALTH ORGANISATION

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Background: Approximately10% of women worldwide are affected by hypertensive disorders of pregnancy. Preeclampsia stands out from the others as it is the leading cause of maternal and neonatal morbidity and mortality accounting for a tenth of maternal deaths in Asia and Africa, and a quarter of maternal deaths in Latin America. The use of low dose aspirin in increased risk pregnant women is beneficial in preventing preterm pre-eclampsia. No previous preeclampsia research had been undertaken at a rural Aboriginal health service.

Methods: A retrospective audit and qualitative survey were carried out to identify moderate to high risk pregnant women in the rural community of Yarrabah and assess the knowledge of clinicians in implementing current guidelines in recognising increased risk pregnant women and appropriately treating them with low dose aspirin.

Results: Of the 70 deliveries in 2018, 25 women were identified as increased risk retrospectively, with only one woman receiving aspirin in a timely manner. 67% of clinicians did not know that aspirin was used as a prophylactic measure for the prevention of preeclampsia. Only 11% of clinicians were able to answer aspirin related questions correctly.

Conclusions: A formal preeclampsia risk calculator was developed to help initiate timely treatment with aspirin for an increased risk pregnant woman. Clinician education by the visiting obstetric team should be periodically undertaken so that primary care clinicians remain current with evidence based practice.

PERINATAL MORTALITY IN WOMEN WITH PRE-EXISTING DIABETES: A 10 YEAR REVIEW

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Background: The perinatal mortality rates are similar for women with type 1 and type 2 diabetes (30-40/1000). Congenital malformations, intrauterine growth restriction, pre-eclampsia,, placental insufficiency and chorioamnionitis explain about 50% of the stillbirths. The aim of our study was to review the common causes of stillbirth in our population.

Methods: We reviewed the records of women with pre-existing diabetes whose pregnancies were complicated by perinatal mortality (stillbirth or neonatal death), who delivered at King Edward Memorial Hospital between 2009 and 2019. Risk factors for stillbirth and cause of death were assessed.

Results: 33 out of 1247 women with pre-existing diabetes who delivered during the study period experienced perinatal mortality (PNMR 26/1000). There were 30 stillbirths and 3 neonatal deaths. 26 (78.7%) women had type 2 diabetes and 7 (21.2%) had type 1 diabetes. 24.2% (8) of these cases were terminations of pregnancy after 20 weeks. Chorioamnionitis was found in 12 (36%) of the cases. Other risk factors for stillbirth included average BMI of 34.4, smoking status 45% (15/33), and 36.3% (12/33) had IUGR. Average HBA1C was 8.3% and 7% in the first and second trimesters respectively .

Conclusion: This study is consistent with previous evidence demonstrating major causes of perinatal mortality in women with pre-existing diabetes. Poor glycaemic control, maternal obesity and smoking are major contributing factors.

REDUCING NICU ADMISSIONS FOR MANAGEMENT OF NEONATAL HYPOGLYCAEMIA IN ROYAL NORTH SHORE HOSPITAL

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Background: Between January 2017 – August 2018, 128 infants were admitted to NICU for management of hypoglycaemia. 63% of infants did not fit criteria but admitted anyway. On average, infants remained in the NICU for 65 hours and subject to 16 heel stabs.

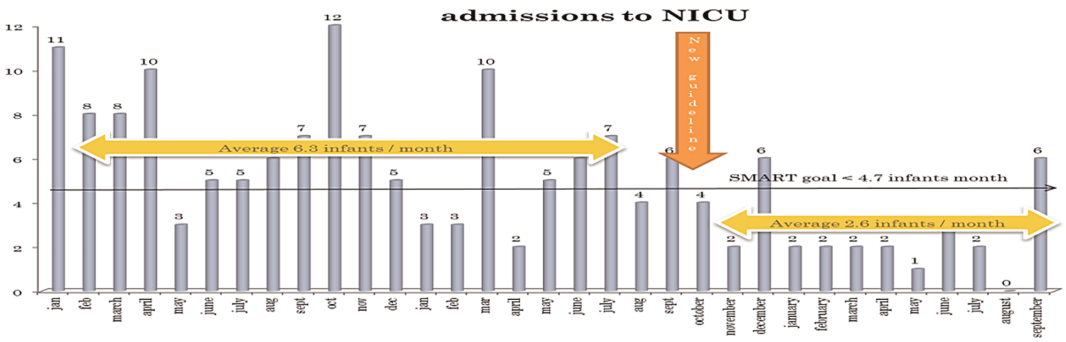
Methods: A new "Management of Neonatal Hypoglycaemia Guideline" designed incorporating 4 main changes:

1: Treating Hypoglycaemia with 40% Oral Dextrose Gel and feeding.
2: <1.7 mmol/L glucometer results to be confirmed with Formal BGL testing.
3: Faster weaning of IV dextrose and feeds once BGLs >2.6 mmol/L, to reduce Heel Stabs.
4: Adherence to admission criteria, keeping mother and infant together.

With a SMART Goal to decrease infants admitted to the NICU by 25% in 12 months.

Journal of Paediatrics and Child Health **56** (Suppl. 1) (2020) 138–153

Results: Admissions decreased from 6.3 infants/month to 2.6 infants /month = 60% reduction (Table 1)



Heel Stabs remain approximately 15 / admission, but length of stay has decreased to 54 hrs.

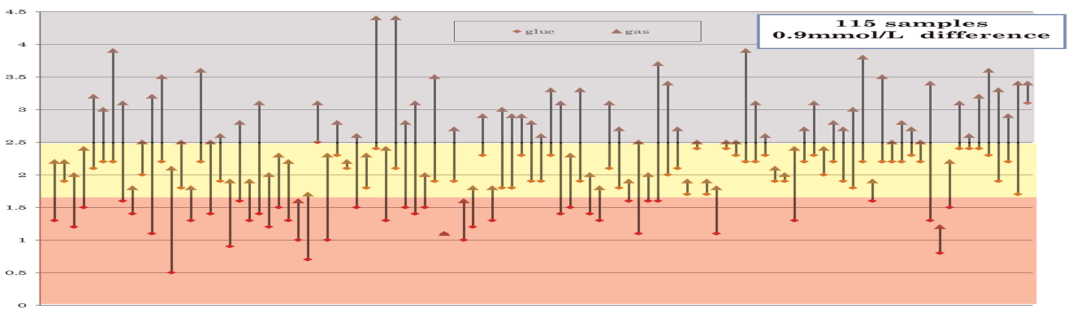
Conclusions: Two key factors made the difference:

1) Introduction of 40% Dextrose gel and feeding. 315 infants were treated with gel. 296 infants (94%) were successful. Only 19 infants (6%) required admission to NICU for further management.
2) Confirmation of a low BGL reading on glucometers showed that in 115 cases, the glucometer read on average 0.9 mmol/L lower than the formal Gas machine, changing the management of the infants (table 2). 40 infants had glucometer readings ≤1.6 mmol/L, indicating NICU admission, BUT 37 infants avoided admission after confirming formal BGL, with an approximate saving of $166,000 and kept mother and baby together.

Methods: We performed a retrospective audit on all caesareans at full dilatation using a foetal pillow from 19th October 2018 to 26th December 2019 at a tertiary maternity hospital. The records of 55 cases and 55 controls were included in the audit. Data included general demographics, uterine extension tears, estimated blood loss, need for blood transfusion, admission to HDU and length of post-operative stay.

Results: Our results revealed that the use of the foetal pillow reduced the number and severity of uterine extension tears. The foetal pillow was also associated with a lower estimated blood loss when compared to the control cases. However, it did not change the need for blood transfusions. Postoperatively, those who had the foetal pillow had a shorter average length of stay.

Conclusions: Foetal pillows allow for safer, more effective delivery of the foetal head by reducing trauma and blood loss during the delivery and ultimately reduce maternal morbidity following a caesarean at full dilatation.



MATERNAL OUTCOMES FOLLOWING THE INTRODUCTION OF THE FOETAL PILLOW AT A TERTIARY MATERNITY HOSPITAL: A RETROSPECTIVE AUDIT

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Background: There has been a significant rise in the rates of caesarean deliveries at full dilatation. A caesarean delivery at full dilatation is a technically challenging operation that is associated with increased morbidity and mortality to both the mother and child. Poor outcomes are attributed to the difficulty associated with delivering a deeply engaged head. The foetal pillow is designed to gently elevate an impacted foetal head out of the pelvis to facilitate a safer, less traumatic delivery.

LOW AVIDITY IGM POSITIVE TOXOPLASMA IN PREGNANCY: A CASE STUDY

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Background: A 36 year old, G5P4 female, at 34 + 5 presented to her GP with a viral like illness in the context of caring for a litter of kittens which were experiencing a diarrhoeal illness. The patient had searched the internet and became concerned she had contracted Toxoplasma Gondii.

Methods: Retrospective review of Patient A's medical record including laboratory results, ultrasounds and correspondence

between the treating Obstetric team, Infectious Diseases, Maternal and Foetal Medicine and Pathology. The Australian Society for Infectious Diseases Algorithms for management of Toxoplasma Gondii were reviewed and the epidemiology and consequences of Toxoplasmosis in pregnancy appraised.

Results: November 2019 bloods were positive for Toxoplasma IgG and IgM. The local laboratory was able to retrieve a blood sample from May 2019 and complete Toxoplasma serology which was also IgG and IgM positive. Samples were subsequently sent to Westmead Hospital Laboratory for avidity testing which was found to be low on both the samples. Discussions centred on whether the infection was considered to be acquired in pregnancy or prior. MFM ultrasound completed at 36 + 5 was normal. The patient subsequently delivered vaginally at 40 + 1 and mother and baby were well with no evidence of complications related to Toxoplasmosis.

Conclusion: The low avidity IgG, and IgM positive results seen on both samples six months apart indicates these tests are not diagnostic of a recent infection. Diagnosis of early Toxoplasmosis in pregnancy may be extremely difficult. Low avidity in pregnancy may be persistent and should not be assumed to reflect recent infection.

UMBILICAL CORD MANAGEMENT AT BIRTH FOR PRETERM BABIES (<34 WEEKS): A SYSTEMATIC REVIEW AND META-ANALYSIS

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Table. Neonatal mortality and key neonatal and maternal morbidities for three different comparisons of cord management interventions

Outcomes	Number of infants/ mothers(studies)	Certainty of the evidence(GRADE)	Relative effect (95% CI)	Risk difference/ Mean difference (95% CI)
Comparison 1: Later (deferred/ delayed) cord clamping compared to early cord clamping at preterm birth				
Mortality to discharge	2988 (16 RCTs)	⊕⊕⊕⊖ MODERATE	RR 0.80 (0.63 to 1.02)	RD -0.02 (−0.04 to 0.00)
Neurodevelopmental impairment in early childhood	0 (0 studies)	-	-	-
Severe intraventricular haemorrhage (IVH grades III and IV)	2972 (14 RCTs)	⊕⊕⊖⊖ LOW	RR 0.98 (0.67 to 1.42)	RD 0.00 (−0.01 to 0.01)
Chronic lung disease (CLD): oxygen at 36 weeks' PMA	2427 (10 RCTs)	⊕⊕⊕⊕ HIGH	RR 1.03 (0.94 to 1.13)	RD 0.01 (−0.02 to 0.04
Necrotising enterocolitis (≥ Bell's Stage II or any grade; surgery)	2745 (14 RCTs)	⊕⊕⊕⊖ MODERATE	RR 0.83 (0.61 to 1.13)	RD -0.01 (−0.03 to 0.01)
Peak haematocrit (Hct) within the first 24 h	1022 (13 RCTs)	⊕⊕⊕⊕ HIGH	Continuous outcome	MD 2.63 (1.85 to 3.42)
Hyperbilirubinaemia (treated by phototherapy)	908 (6 RCTs)	⊕⊕⊕⊕ HIGH	RR 0.99 (0.95 to 1.03)	RD -0.01 (−0.04 to 0.03)
Postpartum haemorrhage (≥ 500 mL)	1477 (3 RCTs)	⊕⊕⊖⊖ LOW	RR 0.93 (0.54 to 1.62)	RD -0.01 (−0.04 to 0.02)
Maternal postpartum infection	254 (1 RCT)	⊕⊕⊖⊖ LOW	RR 1.12 (0.73 to 1.72)	RD 0.03 (−0.08 to 0.13)
Comparison 2: Intact-cord milking compared to early cord clamping at preterm birth				
Mortality to discharge	945 (10 RCTs)	⊕⊕⊕⊖ MODERATE	RR 0.77 (0.49 to 1.23)	RD -0.02 (−0.05 to 0.01)
Neurodevelopmental impairment in early childhood	26 (1 RCT)	⊕⊖⊖⊖VERY LOW	RR 0.75 (0.21 to 2.71)	RD -0.08 (−0.42 to 0.26)
Severe intraventricular haemorrhage (IVH, grades III and IV)	889 (10 RCTs)	⊕⊕⊖⊖ LOW	RR 0.72 (0.44 to 1.19)	RD -0.02 (−0.05 to 0.01)
Chronic lung disease (CLD): oxygen at 36 weeks' PMA	685 (7 RCTs)	⊕⊕⊖⊖ LOW	RR 1.02 (0.63 to 1.65)	RD 0.02 (−0.04 to 0.07)
Necrotising enterocolitis (≥ Bell's Stage II or any grade; surgery)	843 (9 RCTs)	⊕⊕⊕⊖ MODERATE	RR 0.80 (0.55 to 1.18)	RD -0.02 (−0.06 to 0.02)
Peak hematocrit (Hct) within the first 24 h	774 (7 RCTs)	⊕⊕⊕⊖ MODERATE	Continuous outcome	MD 3.04 (1.28 to 4.80)

(*Continues*)

Journal of Paediatrics and Child Health **56** (Suppl. 1) (2020) 138–153

Continued

Outcomes	Number of infants/ mothers(studies)	Certainty of the evidence(GRADE)	Relative effect (95% CI)	Risk difference/ Mean difference (95% CI)
Hyperbilirubinaemia (treated by phototherapy)	480 (5 RCTs)	⊕⊕⊕⊕ HIGH	RR 1.04 (0.94 to 1.16)	RD 0.03 (−0.04 to 0.10)
Postpartum haemorrhage (≥ 500 mL)	0 (0 studies)	-	-	-
Maternal postpartum infection	0 (0 studies)	-	-	-
Comparison 3: Later (deferred) cord clamping compared to intact-cord milking for preterm infants				
Mortality to discharge	1000 (5 RCTs)	⊕⊕⊕⊖ MODERATE	RR 1.21 (0.76 to 1.94)	RD 0.01 (−0.02 to 0.04)
Neurodevelopmental impairment in early childhood	135 (1 RCT)	⊕⊕⊖⊖ LOW	RR 0.22 (0.01 to 4.40)	RD -0.03 (−0.08 to 0.02)
Severe intraventricular haemorrhage (IVH, grades III and IV)	761 (4 RCTs)	⊕⊕⊕⊖ MODERATE	RR 0.60 (0.32 to 1.12)	RD -0.03 (−0.06 to 0.00)
Chronic lung disease (CLD): oxygen at 36 weeks' PMA	734 (4 RCTs)	⊕⊕⊕⊖ MODERATE	RR 0.91 (0.67 to 1.25)	RD -0.02 (−0.07 to 0.04)
Necrotising enterocolitis (≥ Bell's Stage II or any grade; surgery)	922 (5 RCTs)	⊕⊕⊕⊖ MODERATE	RR 1.57 (0.83 to 2.97)	RD 0.02 (−0.01 to 0.04)
Peak hematocrit (Hct) within the first 24 h	841 (5 RCTs)	⊕⊕⊕⊖ MODERATE	Continuous outcome	MD -0.18 (−1.90 to 1.54)
Hyperbilirubinaemia (treated by phototherapy)	236 (2 RCTs)	⊕⊕⊕⊖ MODERATE	RR 1.05 (0.90 to 1.24)	RD 0.02 (−0.07 to 0.11)
Postpartum haemorrhage (≥ 500 mL)	0 (0 studies)	-	-	-
Maternal postpartum infection	0 (0 studies)	-	-	-

Background: The International Liaison Committee on Resuscitation (ILCOR) prioritised to review umbilical cord management at preterm birth. In this systematic review and meta-analysis, we aimed to determine the effects of umbilical cord management strategies (including timing of clamping and cord milking) for preterm infants <34 weeks' gestational age.

Methods: Cochrane Central Register of Controlled Trials, MEDLINE, PubMed, Embase, CINAHL and clinical trial registries were searched from inception until July 2019. Two authors reviewed the results of the search, selected studies for inclusion, extracted data, appraised risk of bias, and assessed certainty of evidence.

Results: We identified 41 randomized controlled trials (including 5,533 infants) investigating outcomes for three different comparisons of cord management interventions (Table). Compared to early cord clamping, delayed clamping and intact cord milking may slightly reduce mortality although both are compatible with no effect and milking is also compatible with an increase in mortality (deferred clamping: RR(95%CI) = 0.80(0.63-1.02), n = 2988 infants, moderate quality evidence; intact milking: RR(95% CI) = 0.77(0.49-1.23), n = 945 infants, moderate quality evidence). Both milking and deferred clamping probably improve hematologic measures and circulatory adaptation after birth but may not affect major neonatal morbidities. Certainty of evidence was moderate or low for most outcomes. Subgroup analyses were limited by few studies reporting subgroup data.

Conclusions: The ideal cord management strategy for preterm infants (<34 weeks) is still unknown, but early clamping may be harmful. This review will form the evidence base for the ILCOR Consensus on Science with Treatment Recommendations (CoSTR) on cord management in preterm infants.

RUPTURED TUBAL ECTOPIC PREGNANCY IN A WOMAN WITH LOW DECLINING BETA-HCG LEVELS AND CONTRALATERAL ABDOMINAL PAIN

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Background: Ruptured ectopic pregnancy with a low declining serum beta-HCG is a rare clinical event. This case presented with low declining beta-HCG, a contralateral haemorrhagic cyst and contralateral pain at time of rupture which further complicated the clinical picture.

Methods*:* Case report. An unusual case is described along with lessons learnt and future recommendations.

Results: A 33-year-old nulliparous woman presented to the Early Pregnancy Assessment Unit (EPAC) with mild abdominal pain, no gestational sac on ultrasound and slow to rise beta-HCGs. 19 days after initial presentation beta-HCG was 271 and repeat US still did not demonstrate any evidence of intrauterine or ectopic pregnancy. At EPAC follow up 38 days after initial presentation the patient complained of severe right iliac fossa pain. Beta-HCG was now 60. Ultrasound demonstrated a left sided hypoechoic lesion with a sac diameter of 11 mm in keeping with a left tubal ectopic pregnancy, and a right sided haemorrhagic cyst. Two days later the patient was reviewed with worsening right sided pain and guarding in the right iliac fossa. A diagnostic laparoscopy was performed which confirmed a left ruptured tubal ectopic and a 6 cm diameter right ovarian cyst.

Conclusions: This case shows that ectopic pregnancy rupture may occur despite low declining levels of beta-hCG. A positive pregnancy test and worsening abdominal pain should

be taken seriously even when ultrasound findings do not fit with the clinical picture. This case demonstrates the importance of close follow up until normalisation of beta-HCG levels.

MATERNAL VASCULAR DYSFUNCTION, INFLAMMATION, AND INTRAUTERINE GROWTH RESTRICTION FOLLOWING INFLUENZA A VIRUS

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Background: Influenza A virus (IAV) infection during pregnancy, drives severe maternal illness and foetal complications, such as foetal growth restriction (FGR), through enigmatic mechanisms despite a lack of vertical transmission. Although studies have identified foetal hypoxia to contribute significantly in FGR, there is uncertainty on whether maternal IAV infection induces foetal hypoxia and through what mechanism. Therefore, we aimed to examine the role of the innate and adaptive immune system on maternal vascular function following IAV infection

Methods: Eight-to-twelve-week old time-mated pregnant (E12 gestation) C57BL/6 mice were infected intranasally with IAV (HKx31; 10^4 PFU) or with PBS (n = 6-8). Mice were euthanized 3 and 6 days post-infection for analysis of aortic viral burden, maternal vascular immune profile, offspring placenta and foetal brain hypoxia via qPCR and flow cytometry. We also assessed maternal thoracic aorta vasodilation to Acetylcholine and Sodium nitroprusside via wire myography.

Results: IAV disseminated into the aorta resulting in an exacerbated systemic inflammation in the vasculature, with increases in IL-6, IFN-γ and VCAM ($p < 0.05$). Moreover, IAV induced an influx of monocytes, neutrophils, and T cells in the vessel. This altered phenotype also resulted in endothelial dysfunction ($p < 0.05$. In the offspring, maternal IAV infection resulted in placental and foetal brain hypoxia, as well as intrauterine growth restriction ($p < 0.05$).

Conclusions: IAV infection during pregnancy drives a significant cardiovascular event in pregnant mothers, which likely suppresses critical blood flow to the placenta and foetus resulting in hypoxia, concomitant intrauterine growth restriction and adverse foetal outcomes.

HOW GOOD ARE WE AT DOING DELAYED CORD CLAMPING IN PREMATURE BABIES? COMPLIANCE WITH GUIDELINES AND IMPROVEMENT FOLLOWING TARGETED STRATEGIES

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Background: The practice of delayed cord clamping (DCC) for 30-60 seconds after birth is of proven benefit to the neonate. Preterm babies have improved intravascular volume, decreased need for blood transfusions and decreased chances of intracranial bleed and necrotising enterocolitis.

Methods: At the Mater Mothers' hospital, a retrospective audit was conducted of all live births, over the duration of 19 months, observing the compliance of DCC in response to implementation of quality improvement initiatives at two stages; February 2019 when a new guideline was created for the hospital and October 2019 when simulation-based training occurred in the neonatal teams

Results: A total of 17197 livebirths were analysed from the duration of 1st June 2018 to 31st January 2020. The overall rate of DCC in early preterm group (23.0-31.6 weeks) was 53.6%. Prior to implementation of quality strategies in February 2019, DCC compliance was 37.1%, which rose to 57.6% ($p = <0.001$) in the months of February- September 2019. Subsequent to targeted education sessions from October 2019, the compliance rate observed was 73.0% (57.6% vs 73.0%, $p = 0.026$).

Conclusions: Following implementation of an updated policy on DCC and targeted education and simulation sessions, a statistically significant increase was observed in the practice of DCC. Many babies still do not receive DCC and further strategies to improve rates would be useful.

A SURVEY OF CLINICAL STAFF KNOWLEDGE ON THE LONG-TERM OUTCOMES OF VERY PRETERM INFANTS DELIVERED IN A TERTIARY REFERRAL HOSPITAL

Presenting Abdul Aziz S[1], Athalye-Jape G[1], Agrawal S[1], Sharp M[1]

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Background: Children born prematurely are at higher risk of physical, psychological, neurodevelopmental, social and behavioural difficulties well beyond the neonatal period. Accurate knowledge about long-term outcomes is crucial to assist with parental counselling and reduce moral dilemma among medical and nursing staff.

Methods: An anonymous convenience sampling survey of clinical staff in the Neonatal Directorate at King Edward Memorial Hospital was conducted from July-December 2019. Data collection included the Preterm Birth Knowledge Scale (PB-KS; Kelly et al 2017), additional questions specific to our local population, demographic information and prior education on long-term outcomes.

Results: There were 56 responses (five neonatologists, eight paediatric trainees, 19 neonatal trained nurses, 22 registered nurses and two allied health staff). The median score of this survey was 19.5 (range 4-29; possible score 0-40). Mean accuracy score for rates of cerebral palsy was 96% (highest) and 11% (lowest) for estimation of quality of life among preterm survivors. Higher scores correlated to greater level of confidence around discussion of long-term outcomes with parents. Didactic seminars were indicated as preferred choice for staff education.

Conclusions: Results of our survey will assist in developing a customized educational program to address identified gaps in the knowledge of medical and nursing staff.

CARDIAC HEALTH IN THE REDUCED UTERINE PERFUSION PRESSURE RAT MODEL OF PREECLAMPSIA

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Background: Preeclampsia (PE) is a life-threatening disorder without treatment options except delivery of the baby and placenta, often pre-term. PE increases the risk of subsequent cardiovascular complications in both mothers and offspring. In this study, our aim was to investigate the associated cardiac health in the reduced uterine perfusion pressure (RUPP) rat model of PE.

Methods: The RUPP model was induced in pregnant rats (GD14) by applying silver clips around aorta and uterine arteries, reducing the blood flow to the uterus by ~40%. On GD19, echocardiography was performed and blood pressure measured. At the end of the experiment, maternal organs were harvested and processed for downstream analyses.

Results: Whilst RUPP rats had increased systolic pressure (sham 113 ± 1 vs RUPP 125 ± 2 mmHg, n = 8, $P < 0.001$), diastolic blood pressure was substantially augmented and in the hypertensive range (sham 88 ± 2 vs RUPP 102 ± 2 mmHg, n = 8, $P < 0.0001$). Left ventricular mass by echocardiography was greater in RUPP females (n = 6-7, P = 0.03), however wet heart weight to body weight ratio did not reach statistical significance (sham 0.30 ± 0.01 vs RUPP 0.33 ± 0.01, n = 6, P = 0.07). Left ventricular systolic function remained unaffected. Increased expression of anti-angiogenic FKBPL mRNA (0.85 ± 0.15, n = 6 vs 1.82 ± 0.27, n = 6) was observed in the RUPP hearts.

Conclusions: Despite no difference in cardiac systolic function in the RUPP model, early signs of restricted angiogenesis and greater augmentation of diastolic pressure suggest that diastolic dysfunction may be occurring, which will be investigated in future studies.

MATERNAL GDM, OBESITY AND LOW BIRTH WEIGHT IMPACT BREASTMILK PRODUCTION

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Background: Many babies are born after pregnancies complicated by obesity, gestational diabetes mellitus (GDM) and low birth weight (LBW, <2500 g) with increased non communicable disease risk. Exclusive breastfeeding protects these mothers and infants however early weaning and a shorter breastfeeding duration is prevalent due to perceived or real low breastmilk production. We aimed to determine impacts of GDM, obesity and LBW on 24 h breastmilk production.

Methods: We analysed the 24 h breastmilk profiles of 122 mothers with GDM, obesity or LBW who had infants born term and aged 1-6 months compared to 63 healthy mothers. Test weights of infants before and after breastfeeds were performed over 24 h at home with electronic scales (sensitive to ±2 g). Expressed milk volumes were measured. Low milk production was defined as <600 mL/24 h.

Results: 59% of women with GDM and 64% with LBW infant had significantly lower milk production compared with the estimated 10% population average. Low milk supply mothers had significantly higher BMI (by 13%) compared to those with normal supply. Women with obesity and GDM produced less milk (by 39%) than those with healthy BMI and GDM, while the latter group produced 12% less milk than those without GDM. Mothers of LBW babies born term produced significantly less milk (by 36%) than those with normal birthweight babies.

Conclusions: Our data suggest that pregnancy complications are associated with higher rates of low milk production. Low supply may be a contributing factor to early cessation of breastfeeding but studies measuring composition, production and breastfeeding patterns are required.

FULL-TERM-PRETERM DELIVERY SEQUENCE: PLACENTA COMPARISON

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Background: Preterm birth is an outcome of many heterogeneous conditions. One major risk-factor is previous preterm birth, however the characteristics of women who have a full-term birth, then a preterm birth (FTB-PTB sequence), are poorly represented in the literature. Placental histopathology can aid in defining causes of a preterm birth; malperfusion and inflammation/infection show clear links with adverse neonatal outcomes. This can help to identify the aetiology of preterm birth, and may help with future preventative therapies.

Method: Retrospective case series of singleton, live births over 2-year period from May 2017 looking at 206 FTB-PTB sequence, and 117 recurrent-preterm births in a single tertiary centre in South Australia (preterm: >20 + 0 and < 37 + 0). Data was extracted from the electronic maternity database and case-notes. Placental histopathology was classified according to presence of placental lesions consistent with infection, maternal vasculopathy and foetal-thrombotic vasculopathy. The aim was to distinguish placental histopathology features of FTB-PTB sequence, in comparison with recurrent-preterm birth.

Results: Placental histopathology was sent in 269 (83%) deliveries overall. No significant differences were observed in abnormality rates between those with a previous preterm birth and those with only previous term births.

Conclusion: Both abnormalities overall and specific findings on placental histopathology were not significantly different in women with and without a history of previous preterm birth.

ARE WE DESIGNING OUR RCTS TO FAIL? A SYSTEMATIC REVIEW OF A NULL PRIMARY NEURODEVELOPMENTAL OUTCOME IN TRIALS ENROLLING INFANTS 6 MONTHS OF AGE OR LESS

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Background: There are numerous clinical trials recruiting at-risk neonatal populations to test a myriad of interventions which are designed to improve long-term neurodevelopmental outcome. These trials have produced mixed results. Our concern is that neurodevelopmental neonatal and infant clinical trials may be generating null findings due to the outcome measure utilised, and not necessarily because of the intervention applied. We aimed to determine the occurrence of these published randomised controlled trials that report a null finding on the primary outcome.

Methods: We conducted a systematic review (2009-2019) of published randomised controlled/clinical trials (RCTs) with the top 10 most common neurodevelopmental tools used as a primary outcome. Inclusion: RCTs were infants; intervention applied ≤6 months; neurodevelopmental outcome was primary (12 m-10y age). Exclusion: secondary analysis or published protocols/abstracts.

Results: Our search yielded 1214 records, 31 articles met inclusion for review after full text screening. 24/31 (77%) of all trials enrolling infants ≤6 months and assessing neurodevelopmental outcome, demonstrated null findings on the primary outcome.

Conclusions: There is an alarmingly high proportion of RCTs that report a null finding on their primary outcome in the field of early neonatal and paediatric interventions. This finding also reflects significant use of limited resources including research funding, time and participant involvement. The importance of robust trial design, and the reporting of significant findings along with appropriate statistical methods must be emphasized to overcome these issues.

PREGNANCY OUTCOMES IN INDIGENOUS WOMEN WITH GESTATIONAL DIABETES IN A REGIONAL CENTRE

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Background: Toowoomba Queensland has a large Indigenous population including the Jagera, Giabal and Jarowair peoples along with others. Our reginal hospital sees many indigenous women with gestational diabetes throughout their pregnancy. Gestational diabetes can be difficult to manage given the increased need for visits to our antenatal clinic at the hospital as well as daily blood sugar monitoring. Gestational diabetes that is not well controlled can have short term effects on the foetus including, large for gestation weight babies, preeclampsia, polyhydramnios, and still birth. Some long-term consequences include, hypoglycaemia, hyper bilirubinaemia, hypocalcaemia, hypomagnesaemia, polycythaemia, respiratory distress, and cardiomyopathy. It is therefore essential that these women are treated carefully during their pregnancies.

Methods: Chart review of the last year at Toowoomba hospital analysing our Indigenous women with diabetes. We recorded their diabetes status, when it was diagnosed, how often they sent their sugars into our "book club", what form of treatment was necessary, diagnosis of any antenatal issue, and the birth outcome.

Results: Our group of Indigenous women found managing their diabetes difficult and most ended in uncontrolled diabetes.

Conclusions: Toowoomba Hospital's Indigenous group with gestational diabetes are more likely to end in caesarean section due to poorly controlled gestational diabetes.

EFFECT OF AEROSOLISED PALIVIZUMAB TREATMENT IN A RSV INFECTION IN A LAMB MODEL

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Background: Respiratory syncytial virus (RSV) is the leading cause of pneumonia and bronchiolitis among children <5 years. No treatment is available. Palivizumab is the only licensed prevention but is expensive, requires several intramuscular injections and accurate information regarding RSV season. Thus, an effective method of delivery is required. We investigated if aerosol delivery of palivizumab would be effective in reducing the RSV viral load in a lamb model.

Method: Newborn lambs were allocated into: RSV-challenged (n = 11), RSV-challenged and treated by aerosolised palivizumab (n = 12) groups. Lambs were intranasally challenged with RSV-A2 (80-100×10^6 PFU) 3-4 days post-birth. Aerosolised palivizumab (15 mg/mL) was delivered 3 days post-infection by AeroNebGo®. Bronchoalveolar lavage fluid (BALF) and nasopharyngeal swabs (NPS) from all groups were collected pre-infection and 2, 4, 6, 8 and 10 days post-infection or until euthanasia. Viral load was measured using qRT-PCR in NPS and BALF. Mann-Whitney test was used for statistical comparisons between groups.

Results: Total RSV viral load over the pre and post treatment days (2, 4, 6) demonstrated a non-significant reduction in viral load with mean (SD) for treatment group (12.54 [4.41]) vs infected group (13.67 [3.42]). However, over the same period

BALF samples did not show any reduction in RSV load between the two groups.

Conclusions: Our study shows a trend towards a reduced viral load after RSV infection following aerosolisation with palivizumab in a lamb model but requires further validation with varied dose and resistant RSV strains.

FOETAL GASTROSCHISIS WITH BLADDER HERNIATION: A CASE REPORT

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Background: Gastroschisis is a congenital abnormality characterised by foetal bowel exteriorisation through a defect in the anterior abdominal wall. Other intra-abdominal structures rarely prolapse through the defect. There are multiple publications on the early detection, monitoring, and management of uncomplicated fetal gastroschisis. However, prenatal herniation of the fetal bladder is sporadically reported.

Methods: We present a case of a right-sided fetal gastroschisis with third trimester bladder herniation.

Results: A 33-year-old woman, parity 5, was referred at 22 weeks gestation to the Maternal Fetal Medicine Service at King Edward Memorial Hospital, Perth, Western Australia following the prenatal detection of a fetal gastroschisis. Initially, the gastroschisis was sonographically uncomplicated because the fetal bladder was situated within the fetal pelvis. At 35 weeks gestation, herniation of the fetal bladder was detected. This new diagnosis, and a reduction in the fetal movement pattern, prompted labour induction at 36 + 3 weeks gestation.

A non-elective caesarean delivery was subsequently required for slow progress in labour and fetal tachycardia. A 2000 g liveborn female with Apgars 7,7 and 9 was delivered without grossly apparent bladder herniation. Following immediate transfer to Perth Children's Hospital, a silo was applied. Ten days later, surgical closure of the gastroschisis was performed with commencement of enteral feeds three days later, and discharge home at 31 days old.

Conclusion: Bladder herniation complicating fetal gastroschisis typically occurs in the third trimester and almost always in female foetuses. Prenatal recognition may be of assistance in planning post-delivery management reduction strategies and the perinatal outcome is usually good.

IMPACT OF PROBIOTIC USE ON THE INCIDENCE OF NEC: A SINGLE CENTRE COHORT STUDY

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Background: Necrotising enterocolitis (NEC) is a feared complication of preterm birth. Hypotheses suggest intestinal immaturity, exaggerated immune response and lack of diversity of the gut microbiome. Probiotics are thought to reduce the incidence of NEC due to their effect on pathogenic bacteria.

Aim: To examine the impact of routine probiotic administration on the incidence of NEC in preterm infants.

Methods: Data collected over a 15 year period from infants born <32-weeks gestation and birthweight <1500 g was analysed to compare the incidence of NEC in infants that received probiotics and those that had not. The infants enrolled in the ProPrems trial were given ABC Dophilus. The ensuing routine probiotic administered was Infloran. Infants who died before 72 hours of life were excluded.

Results: 702 infants were included and of those included, 284 received a probiotic. There was a significant reduction in the rate of NEC associated with probiotic use (3.5% vs 7.4%, aOR 0.43). There was also a reduction in the rate of the secondary outcome of late-onset sepsis (22.2% to 13%, aOR 0.60). The length of stay was greater in infants that received probiotics (64 vs 68 days, p = 0.027).

Conclusion: The administration of a multi-organism probiotic formulation to very preterm infants in our unit appears to have reduced their rate of NEC.

DOES FEEDING WORSEN GUT OXYGENATION FOLLOWING TRANSFUSION IN PRETERM INFANTS?

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Background: The pathogenesis of transfusion-associated necrotising enterocolitis (TANEC) remains elusive. Splanchnic hypoperfusion associated with packed red blood cell transfusion (PRBCT) and feeding has been implicated but poorly investigated.

Methods: In this prospective observational study of 25 haemodynamically stable preterm infants (GA < 32 weeks; PMA < 37 weeks; BW < 1.5 Kg), we investigated the oxygen utilization efficiency of preterm gut and brain challenged with bolus enteral feeding during anaemia and after PRBCT using near-infrared spectroscopy (NIRS). Splanchnic and cerebral fractional tissue oxygen extraction (FTOEs and FTOEc) were measured during 75-minute feed cycles that comprised a 15-minute preprandial feed phase (FP0) and four contiguous 15-minute postprandial feed phases (FP1, FP2, FP3, FP4, each 15 minutes long). The feeding-related changes were evaluated during the pre-transfusion epoch (TE0-four hours before onset of PRBCT) and three post-transfusion epochs (TE1, TE2, TE3 – first 8 hours, 9-16 hours, 17-24 hours respectively, after PRBCT completion).

Results: Of 25 enrolled infants [Median (IQR) BW 949 (780-1100)g; GA 26.9(25.9-28.6)weeks; enrolment weight 1670 (1357-1937)g; PMA 34 (32.9-35) weeks], 1 infant was excluded due to corrupted NIRS data. Primary analysis demonstrated no overall association between FTOEs and feeding phases (P = 0.16). However exploratory analyses in a multivariable repeated measures model undertaken for each transfusion epoch separately, found increased postprandial FTOEs during TE1 (Mean (SD) FTOEs, 10.55 (5.5) at FP0 versus 13.21 (5.96) at FP4, P = 0.046) suggestive of reduced splanchnic oxygen utilization efficiency. No association between FTOEc and feeding phases were noted.

Conclusions: The findings of reduced gut oxygenation in the immediate post-transfusion period may underpin the pathogenesis of TANEC and warrant further investigation in randomised studies.

MODIFIED, OFF-LABEL DRUG DELIVERY OF INHALED ILOPROST (IILO) IN CHRONIC PULMONARY HYPERTENSION (CPH) SECONDARY TO CONGENITAL DIAPHRAGMATIC HERNIA (CDH)

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Introduction: CPH secondary to CDH may not respond to standard therapies. Currently used intermittent, inhaled delivery mode of iILO is challenging in mechanically ventilated newborns.

Case details: A 2.5 kg, term female infant with large right-side CDH with severe pulmonary hypertension (PH) required Extra Corporeal Membrane Oxygenation (ECMO) support until few days post CDH repair followed by ventilator dependent with persistent FiO_2 0.7-1.0. Serial echocardiograms showed CPH despite on low dose iNO, IV Milrinone, oral Sildenafil and Bosentan. Trial of iILO at 1 microgram/kg/dose every 2 hours commenced with single use only after reconstitution of iILO, resulting in drug wastage and also needing frequent disconnection from ventilatory circuit for intermittent dosing, resulting in respiratory instability. Therefore, an off-label modified drug delivery used wherein the whole vial of iILO (20 mcg/2 ml) was reconstituted in saline and used over 8 hours. Nebulizer was kept connected in line with proximal ventilator tubing and switched on every 2 hours to deliver 2 ml of the drug solution. After observing clinical tolerance to drug, dose was gradually increased to 2, 4 and 5 mcg/kg/dose.

Results: Baby responded well to iILO over next 7-8 days enabling weaning iNO, Milrinone and ventilator requirements. Serial ECHOs demonstrated good response to iILO (Table 1). Infant tolerated modified drug delivery well with minimal

Table 1 Pulmonary vasodilator therapy, Ventilator settings and ECHO parameters during iILO therapy:

	Pre iILO Prost	On dose of 2 mcg/kg/dose q2 hourly	On dose of 4 mcg/kg/dose q2 hourly	On dose of 5 mcg/kg/dose q2 hourly
Pulmonary vasodilator therapy				
iNO	5 ppm	5 ppm	Weaned down from 5 to off	off
IV Milrinone	0.5 mic/kg/min	0.5 mic/kg/min	0.5 mic/kg/min	off
Bosentan	4.2 mg PO Q 12 hourly	4.2 mg PO Q 12 hourly	4.2 mg PO Q 12 hourly	4.2 mg PO Q 12 hourly
Sildenafil	5 mg PO Q 12 hourly	5 mg PO Q 12 hourly	5 mg PO Q 12 hourly	5 mg PO Q 12 hourly
Ventilator settings				
Mode	PC AC	SIMV + PS	PSV	PSV
PIP/PEEP	28/10	28/8	28/8	26/8
FiO2	0.8	0.6	0.65	0.3
ECHO parameters				
TR Vmax	4.8	4.5 m/sec	4.1 m/sec	4 m/sec
RVSP	98	90	74	67
PAAT: RVET	0.2	0.3	0.3	0.4
PDA- direction of shunting	50% right to left	38 % right to left	30% right to left	32% right to left
PFO-direction of shunting	Left to Right	Left to Right	Left to Right	Left to Right
TAPSE (mm)	12	13	9	13

PC AC: Pressure Controlled *(PC)*, Assist Control *(AC)*

SIMV + PS - Simultaneous Intermittent Mandatory Ventilation + Pressure Support

PSV - Pressure Support Ventilation

PIP- Peak inspiratory pressure

PEEP- Peak end expiratory Pressure

TR Vmax - Tricuspid Regurgitation maximum velocity

RVSP - Right Ventricle Systolic Pressure

PAAT: RVET Pulmonary Artery Acceleration Time to Right Ventricle Ejection Time ratio

PDA- Patent ductus arteriosus

PFO- Patent foramen Ovale

TAPSE- Tricuspid annular plane systolic excursion

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desaturations. No other adverse events such as bronchospasm, hypotension or bleeding.

Conclusion: The case demonstrates effectiveness of iLO in CPH, allowing weaning from other invasive therapies. Further work is required to study the pharmacokinetics/ -dynamics of iILO delivered by this method.

THERAPEUTIC PLASMA EXCHANGE FOR TREATMENT OF REFRACTORY INTRAHEPATIC CHOLESTASIS OF PREGNANCY: A CASE REPORT

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Introduction: Intrahepatic cholestasis of pregnancy (ICP) represents the most common pregnancy-related liver disease, most often presenting with pruritus and elevated serum bile acids. The first line of treatment, Ursodeoxycholic Acid (Urso), is only effective in 60% of cases. This case highlights an alternative therapy for severe early ICP.

Case Study: 36-year-old diagnosed with cholestasis at 20 weeks, with pruritis and bile acids of 11 μmol/L. Her history included cholecystectomy and chronic deranged liver function of unknown aetiology. She was commenced on Urso at diagnosis, also trialled on Cholestyramine for 2 weeks with no benefit. At 30 weeks gestation she was transferred to a tertiary hospital for delivery with bile acids of 173 μmol/L and elevated transaminases. An alternative treatment protocol using therapeutic plasma exchange (TPE) was developed and trialled. Each exchange consisted of 1.5 plasma volumes using 4% albumin as replacement fluid. She received 6 weeks of therapy with a reduction in her bile acids to 16 μmol/L and normalized her liver enzymes. She was induced at 37 weeks and 3 days gestation and achieved a vaginal delivery.

Discussion: TPE is an extracorporeal exchange technique used to remove large-molecular-weight substances from the plasma. Although our case highlights the use of TPE as a safe and effective treatment for severe ICP refractory to medical treatment, it also has potential for maternal and fetal complications. Genetic testing should be considered in women with severe and early onset ICP as it might reveal underlying genetic susceptibilities.