Nursing Research and Clinical Innovations Symposium

Book of Abstracts
# Nursing Research and Clinical Innovations Symposium

**Program - Tuesday September 11th 2018**

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Professor Fiona Newall  
Donald Ratcliffe and Phyllis McLeod Director of Nursing Research, Royal Children’s Hospital  
Honorary Fellow, Departments of Paediatrics and Nursing, The University of Melbourne  
Research Fellow, Haematology Research, Murdoch Children’s Research Institution |
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Family and patient perspectives – peritoneal dialysis

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Keywords
PATIENT FAMILY DIALYSIS

Background
Family, patient and clinical priorities in the management of children on peritoneal dialysis (PD) are often conflicting. We reviewed opinions of families and patients to better understand their quality of life priorities.

Aim
To explore family and patient priorities in managing home based PD and determine best clinical practice to support families and patients while maintaining optimal clinical outcomes.

Research Method or Innovation Plan
A survey was distributed to all families that had received PD for >3 months for the management of end stage kidney disease (ESKD) from 2012-2017. Responses were collected from both caregivers and patients >7 years of age.

Results or Data about the Innovation
Caregivers and patients have differing priorities while undergoing home based PD and these priorities differ again from the treating clinical team.

Caregivers priorities focus on their preparedness and ability to manage PD as well as quality of life for their child.

Patients who responded to the survey reported feeling more empowered to manage their own health when actively involved in discussions with clinicians and focus on areas such as diet, fluid restrictions and duration of therapy. Both report ready access to members of a multidisciplinary team as key to managing PD at home.

Conclusion
Priorities in healthcare and the management of home based PD differ between caregivers, patients and clinicians. Combining all opinions and implementing a healthcare plan targeting family and patient specific goals would see comprehensive engagement. It is imperative to support open communication and ongoing education to keep caregivers and patients up to date and involved in all aspects of their healthcare.
Family experience of long-stay PICU care

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Keywords
Experience, PICU, Long-stay

Background
When a patient at the Royal Children’s Hospital has been in the Paediatric Intensive Care (PICU) more than 21 days, they are considered long-stay patients. Specific care provisions are then put in place by the multidisciplinary team. However, there is no research about the experience of this care by the families of these children.

Aim
The aim of this research was to explore the experience of care provided by the multidisciplinary team to the families of long-stay cardiac patients in PICU.

Research Method or Innovation Plan
This research utilised a qualitative descriptive exploratory method. Families were purposively recruited to participate in semi-structured interviews once their child had been in PICU for more than 21 days. Interviews were transcribed, coded manually, then analysed. The codes were grouped into themes and subthemes.

Results or Data about the Innovation
Five interviews were conducted with six parents between the months of September – December 2017. The primary theme identified was Control. The subthemes related to this were: Conflict, Chaos, Consistency, Continuity and Compassion. The theme and subthemes had both positive and negative elements, with parents experiencing a lack of control, or feeling more in control, depending on the care provided and the support given.

Conclusion
It is hoped that the results of this data will enable the PICU team to gain a deeper understanding of the experience of parents of long-stay patients. In turn that this will lead to an increase in the provision of beneficial care through improved consistency, continuity and compassion and a reduction in conflict and chaos. The findings from this study could be transferable to other tertiary PICU centres providing multidisciplinary care for long-stay patients.
Parent-reported adherence rates of warfarin in children

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Keywords
Paediatric, Anticoagulation, Adherence

Background
Warfarin management in children presents challenges unique to those experienced by adult patients. Due to its narrow therapeutic index, patients taking warfarin need regular blood monitoring tests (INRs). Little is known about adherences rates to prescribed warfarin therapy in children.

Aim
To determine parent-reported rates of adherence and self-efficacy for warfarin use in children. The relationship between these variables and the patients’ anticoagulation control was also examined.

Research Method or Innovation Plan
This research used an observational, cross-sectional, single-centre design. An online survey examined parent-reported adherence and self-efficacy for warfarin use in their child, using a validated tool. Potential participants were identified from a database of research-interested families managed by the Clinical Haematology department (n=51). Data regarding each patients' time in therapeutic INR range was retrieved from the hospital's warfarin management database within the electronic medical record.

Results or Data about the Innovation
41 parents responded to the survey (80%). Of these, 41% reported having not adhered to their child’s warfarin regimen at times across the preceding month; 76% of parents ranked highly in self-efficacy and 39% of patients were found to have had sub-therapeutic INR levels in the preceding month. A correlation between these variables was not evident.

Conclusion
This is the first study reporting adherence data relating to paediatric warfarin therapy, demonstrating anticoagulation control and adherence in this cohort is not ideal. In order to promote the safe use of anticoagulants in paediatric patients, further research is needed to identify the barriers to the optimal use of warfarin in children.
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Exploring nursing practice of therapeutic holding: a cross-sectional survey

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Keywords
Therapeutic holding, Clinical Procedures, Paediatric Nursing

Background
Therapeutic holding (TH) is used by nursing staff to ensure the success of clinical procedures, however, it can cause distress to children. Little is known about the frequency of therapeutic holding, rationale behind its use and current training practices.

Aim
This study aimed to explore the practice of Therapeutic holding amongst nursing staff in a tertiary children’s hospital

Research Method or Innovation Plan
This was a descriptive cross-sectional study. An electronic survey tool was created and distributed to 1300 nurses at the Royal Children’s Hospital (RCH) using LimeSurveyTM. Quantitative data was analysed using descriptive statistics and free text data via thematic analysis.

Results or Data about the Innovation
There was a response rate of 15.4% (n=200). The majority of nurses (104, 52.3%) participated in TH at least once per day. The key procedures utilizing TH were peripheral and central venous access device insertion or removal, nasogastric tube insertion, taking blood, insertion or removal of drains and parenteral medication administration. The clinical rationale for its use included patient and staff safety, procedural success, patients being unable to comprehend the need of the procedure and pain management. The majority of nursing staff felt they had not been adequately trained in TH and the majority do not document its use.

Conclusion
TH is known to benefit nursing practice by ensuring the success of procedures and maintaining patient and staff safety. This study has highlighted a need for wider research and implementation of new guidelines regarding training and documentation.
The experience and impact of sleep problems for parents of children with cerebral palsy

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Keywords

sleep, cerebral palsy, qualitative

Background

Research suggests that sleep problems are common for children with cerebral palsy (CP). There is little published evidence in regards to the impact of sleep disturbance and deprivation the experience of seeking sleep solutions.

Aim

The primary aims of this study were to 1) understand the impact of sleep disturbance on children with CP and their parents and 2) to understand parental experience of accessing sleep solutions from health care professionals.

Research Method or Innovation Plan

Semi-structured, one on one interviews were conducted with parents of children with CP aged 6-12 years who have sleep problems, as reported by the parents. Interviews were offered in person or over the phone. Transcriptions of the interviews were analysed using the qualitative data management program Nvivo. A thematic analysis was conducted using the techniques described by Braun and Clarke (2006).

Results or Data about the Innovation

Nine interviews were conducted over 12 months with mothers of children across all severity levels of CP. Mothers were partnered (n=7) or single (n=2). Sleep problems described by the mothers included behavioural sleep problems, sleep association disorders, short sleep duration and multiple night wakings due to abnormalities of tone and discomfort.

Each mother described a unique and multifaceted experience of sleep problems and seeking sleep solutions but common themes were identified: “feeling unheard” “being labelled”, ”seeking solutions” and “learning to survive”.

Conclusion

This study demonstrates the experience of seeking sleep solutions was often challenging, with more than half of the mothers being told that poor sleep was normal their child. Sleep disturbance and deprivation can have a significant impact on both the parent and child. This study has highlighted the need for further research in this area and the need for the development of sleep solutions for this cohort.
Responding to service demand following the 2017 continuous glucose monitoring subsidy

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Keywords
Continuous Glucose Monitoring

Background
On April 1st 2017 the federal government announced a $54 million subsidy on Continuous Glucose Monitoring (CGM) devices enabling all people with Type 1 Diabetes under 21 years old to access this technology. The federal government stipulated that these subsidised devices could only be accessed through a child’s medical treating team but no funding was provided help meet the demand. Wait time for CGM > 12 months leading to many complaints.

Aim
The aim of this innovation was to allow the RCH diabetes service able to respond to demand by changing the way children access care.

Research Method or Innovation Plan
A business case was submitted whereby children would be admitted as a day procedure for CGM commencement and education. The WIES derived from these admissions would then fund EFT for a DNE to be employed so this demand on service could be matched. The business case was approved, and a diabetes nurse educator recruited in August 2017. The business case required 92 admissions to make employing a nurse cost neutral.

Results or Data about the Innovation
Since August 2017 more than 200 CGM admissions have occurred., and the wait time for CGM has gone from > 12 months to about 6 weeks.

Conclusion
The wait time for CGM has gone from > 12 months to about 6 weeks. The WIES generated has raised >$100K revenue above the cost of a diabetes nurse employed to implement CGM access at RCH. We no longer have complaints about wait time.
The development of a business case to improve service delivery and patient outcomes

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Keywords
anticoagulation, clinical outcomes, service delivery

Background
The Anticoagulation Clinical Nurse Consultant (CNC) falls within the Clinical Haematology (CH) Department. Until recently, the position of the Anticoagulation CNC has been funded at 0.2 EFT. With the greater CH team, the role is responsible for the provision of care for all RCH patients requiring anticoagulation. There has been significant growth in this cohort and a review was necessary to explore current clinical outcomes to determine future service needs.

Aim
To review clinical data pertinent to the optimal delivery of an anticoagulant service within a tertiary paediatric hospital.

Research Method or Innovation Plan
A retrospective review of the electronic medical record was conducted. Key clinical data included an analysis of:
- Last CH appointment
- Target Therapeutic Range
- Last INR test
- Bone health monitoring

Data was used to support the development of a business case to address the identified needs.

Results or Data about the Innovation
There are over 200 patients on anticoagulant therapy managed by CH, with 190 of these on long-term warfarin therapy. Of these 53% of patients had a CH consultation in the last 12 months. 27% had not had an INR done in the preceding 6 weeks. 34% of patients were overdue for bone health monitoring. This data was used to develop a successful business case requesting an increase of 0.5 EFT Anticoagulation CNC.

Conclusion
With this increased EFT, additional nurse-led outpatient clinics will be conducted. Expected outcomes of this new model of care will be a reduction in the number of patients who haven’t been reviewed in an outpatient clinic, increased adherence to anticoagulation management plans, improved surveillance of potential anticoagulant complications, and a cost neutral impact on CH through increased clinic revenue.
Implementation of a low-risk fever and neutropenia program in an Australian hospital

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Keywords
Low-risk, febrile, neutropenia

Background
Home-based management of low-risk fever and neutropenia (FN), in a structured ambulatory program, has been shown to be safe, improve quality of life (QoL) and reduce healthcare expenditures.

Aim
To describe the process for implementation, highlight potential barriers and provide preliminary results of the low-risk FN program.

Research Method or Innovation Plan
Formative evaluation methodology is being used to identify barriers and improve the program performance. Detailed clinical, QoL and economic data is being collected and will be compared to pre-implementation study data to determine impact.

Results or Data about the Innovation
In the first four months 52 patients with outpatient onset FN have been screened of which 15 (29%) were identified as low-risk. Seven (47%) children were transferred to HITH. The median in-hospital LOS for patients on the program is 1.2 days (c/w 3.5 days pre-implementation, p=0.001) and a total of 39 in-hospital bed days have been saved, with no readmissions.

A key barrier to program utilisation include missed screening opportunities which is the target for ongoing education and EMR adaptations.

Conclusion
This program significantly reduces in-hospital LOS for low-risk FN. Ongoing evaluation will inform sustainability and identify areas for improvement. The program toolkit will be made available nationally and, together with these results, will support the implementation of similar programs.
The use of an Electronic Medical Record (EMR) to improve opportunistic immunisations for inpatients

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Keywords
EMR, immunisation, inpatients

Background
An electronic medical record (EMR) has the ability to record a patient's immunisation history, identify due/overdue vaccines and facilitate improved opportunistic immunisation of inpatients.

Aim
The Royal Children’s Hospital (RCH) Immunisation Service has utilised the opportunity to place an alert for medical and nursing staff in EMR regarding overdue vaccine status. The aim is to improve vaccination rates of inpatients.

Research Method or Innovation Plan
Inpatient lists of children aged 6 weeks and <7 years is cross-referenced daily with the Australian Immunisation Register (AIR) to determine immunisation status. Details of due/overdue vaccines are then placed in the patient’s EMR problem list, to promote communication amongst staff involved in the patient’s care regarding immunisation status. The problem is resolved once AIR is up-to-date.

Results or Data about the Innovation
Prior to the implementation of the EMR, from 01 September 2013 to 31 January 2014, a total of 42% (352/831) of due/overdue inpatients were brought up-to-date with their scheduled immunisations within one month of their admission to RCH. Since EMR, from 1st May 2016 to 30th December 2017, 57% (1,403/2,470) of inpatients were brought up-to-date. Using Fischer’s exact test, the difference is statistically significant (p<0.0001).

Conclusion
The implementation of the EMR has demonstrated a 15% increase in the opportunistic immunisation of inpatients. Immunisation is critical to protect both the individual and the population and the RCH Immunisation service will continue to maximise opportunities within the EMR to improve in-patient immunisations. All RCH staff need to be aware of immunisation documentation in the patient's problem list in EMR.
'First 3 Minutes' Resuscitation Training- Developing Competence and Confidence in New Graduate Nurses

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Keywords
Resuscitation, Graduate Nurses, Confidence level

Background
New graduate nurses experience high levels of stress in their first few months of professional nursing practice especially, when it comes to managing resuscitation scenarios in the acute paediatric setting. Reported evidence showed resuscitations were chaotic due to poor non-technical skills including leadership and communication. As such a need was identified to develop training interventions ('First 3 Minutes') to empower these staff not only on the technical skill of resuscitation (BLS algorithm) but also the non-technical (human factors) skills required to work in a team environment.

Aim
The aim of this study was to determine the impact of 'First 3 Minutes' training on graduate nurse performance in resuscitation situations.

Research Method or Innovation Plan
The ‘First 3 Minutes’ program consists of 3 modules.

- Online eLearning, knowledge component of DRSABCD (BLS algorithm).
- Correction and perfection of Technical skills (DRSABCD)
- Team training scenario where participants are given a realistic scenario and they practice within real time with real equipment with real teams for 3 minutes.

Six months post ‘First 3 Minutes’ training, pre and post-intervention surveys were administered to evaluate retention of knowledge and level of confidence in technical and non-technical skills. These skills were also observed in a repeated ‘First 3 minutes’ training by trained BLS assessors using a standardised BLS assessment tool and the Team Emergency Assessment Measure (TEAM) tool.

Results or Data about the Innovation
The results of the pre-survey identified graduates perceived themselves as very vulnerable in all areas of BLS algorithm including their understanding of the non-technical skills (human factors). After undertaking the ‘First 3 Minutes’ scenario, level of confidence in knowledge and skills were improved in both the technical and non-technical skills.

Conclusion
The use of strategic well-constructed education programs will ensure a safe and supportive environment in which new graduate nurses can develop the skills, knowledge, confidence and clinical competence when working as a part of a collaborative team in a resuscitation scenario.
Born before arrival, born too soon

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Keywords
Preterm birth, out-of-hospital birth, perinatal mortality

Background
Birth before arrival (BBA) at a hospital is a relatively rare event, but is associated with adverse outcomes.

Aim
To report 1) perinatal characteristics of very preterm BBAs and 2) perinatal and infant mortality up to one year, comparing BBAs with very preterm births in a hospital.

Research Method or Innovation Plan
A population-based cohort study of 22–31 weeks’ gestation births in Victoria in 1990–2009. BBAs were defined as unintentional births at home or on route to hospital. Perinatal and infant mortality data comparing BBAs with hospital births were analysed by logistic regression, adjusted for gestational age, birthweight and sex.

Results or Data about the Innovation
In total, 133 BBAs were recorded: 51 (38%) stillbirths and 82 (62%) livebirths. Compared with hospital births, BBAs were less mature (26.3 weeks (SD 2.9) vs 27.7 weeks (SD 2.8), p<0.001) and a higher proportion were born to teenagers: 13% versus 5% (adjusted odds ratio [aOR] 2.86, p<0.001). BBAs were significantly more likely to be stillborn (aOR 2.13, 95% confidence interval [CI] 1.41, 3.23, p<0.001) die within 28 days of livebirth (aOR 2.97, 95% CI 1.54, 5.73, p=0.001) or die within a year of livebirth (aOR 2.87, 95% CI 1.51, 5.46, p=0.001) compared with hospital births. Overall, 54 BBAs survived to one year (41% all BBAs, 67% liveborn BBAs), compared with 69% of hospital births (87% of livebirths).

Conclusion
Very preterm birth before arrival is more common in teenagers and is associated with significantly increased risks of perinatal and infant mortality compared with birth in a hospital.
Exploring nurses’ perceptions of their role in nurse-led burns procedures

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Keywords
nurse-led, burns, role

Background
Care of children with burns at The Royal Children's Hospital often involves nurse-led procedures called 'Burns Baths'. A Burns Bath involves nurses performing wound assessments, wound dressings, concurrently with personal hygiene care. The child usually requires analgesia and/or sedation administered. There is little evidence to guide nurses in conducting a Burns Bath procedure.

Aim
To explore how nurses describe their roles and responsibilities in nurse-led burns procedures, and to determine how current role perceptions are influencing team communication.

Research Method or Innovation Plan
Two focus groups were conducted. Data was collected using audio recordings, which were later transcribed, and written notes. The researchers then analysed the transcripts and written data, to generate emerging themes.

Results or Data about the Innovation
Many roles in a Burns Bath were identified, but they lacked clear definition and structure. There is usually a leader, but this role is not allocated, or announced to the team. Other roles have informal titles based on the responsibilities or tasks performed, such as ‘the nurse doing the dressing’, ‘bedside nurse’ and ‘helper’. Procedural preparation was identified as being important, although it was unclear whose responsibility it was to perform each task. Advocacy for the patient, and escalation of care, were identified as essential for patient safety, but were not necessarily prepared for. Information often needs to be actively sought by nurses, however some reported it was difficult to speak up.

Conclusion
Nurses perceptions of their roles and responsibilities in nurse-led burns procedures are influenced by role ambiguity, featuring shared beliefs and assumptions. There were no formal processes identified to facilitate procedural communication. Standardising nurse-led burns procedures, developing formal pathways to upskill nurses, and the development of further visual resources were all identified as strategies to improve burns baths.
Safe sleep practices in the neonatal intensive care unit

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Keywords
Sudden infant death syndrome, neonatal intensive care, nurses

Background
Infants admitted to the neonatal intensive care unit (NICU) have double the risk of dying from sudden infant death syndrome (SIDS) once discharged, compared to a healthy baby. Evidence suggests compliance with SIDS safe sleep in NICU's is low and education of parents is poor. NICU nurses are critical role models, as what is modelled in hospital will strongly influence parental practices at home.

Aim
To explore the nurses’ actions and perceptions in modelling safe sleep practices and educating parents prior to discharge in the NICU.

Research Method or Innovation Plan
A point prevalence survey of safe sleep guideline compliance was conducted in the NICU. This data informed 2 focus groups. Data obtained from the focus groups was transcribed and themes were developed.

Results or Data about the Innovation
Results from the point prevalence survey identified poor compliance with safe sleep guidelines in the NICU, complying only 58% of the time. Themes identified from focus groups (n= 18 participants) included the nurses’ role, barriers to best practice, and identified opportunities for improvement. Participants acknowledged that modelling and educating about SIDS was the nurses’ role, but due to a lack of knowledge and intensity of care, the nurses found it challenging to implement and educate parents about safe sleep.

Conclusion
Nurses have a powerful opportunity and play an important role in the modelling and education of safe sleep practices in the NICU. Further research is required to identify clear guidelines around safe sleeping within the NICU environment and to support nurses to transition an infant to safe sleeping prior to discharge.
Nursing adherence to vital signs documentation post intravenous opioid administration

Author(s)
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Keywords
Documentation, Nursing, Opioid

Background
A recent clinical event at RCH highlighted challenges in adhering to vital signs documentation guidelines post intravenous opioid administration. These patients are at increased risk of sedation and respiratory depression yet few studies have examined adherence to post-opioid bolus observations.

Aim
1. To investigate nursing adherence to post intravenous opioid bolus vital signs documentation.
2. To assess the percentage of abnormal patient vital signs warranting clinical review or urgent medical review post opioid bolus administration.
3. To evaluate the number of patients that received naloxone for adverse events post opioid bolus administration.

Research Method or Innovation Plan
Retrospective quality improvement audit of the electronic medical records of children in a surgical ward. Data for 5 minute, 10 minute and 15 minute vital signs of respiration rate, SpO2 and sedation score post intravenous morphine and/or fentanyl bolus administration was collected. Percentage of nursing adherence to vital sign documentation, naloxone administration and the percentage of abnormal vital signs were calculated.

Results or Data about the Innovation
Overall adherence to patients’ (n=88) post intravenous opioid bolus vital sign documentation was low 177 (23%) based on total number of boluses (n=252). Highest documentation adherence was at the 5 minute interval at 79 (45%), followed by 51 (29%) at 10 minutes and 47 (26%) at the 15 minutes. There were only 5 (3%) documented vital signs within clinical review criteria and no administration of naloxone was necessary.

Conclusion
There is low adherence to post intravenous opioid bolus vital signs documentation. Further research into understanding the challenges of adherence to pain management vital signs documentation is necessary.
Nurses weaning oxygen therapy: an implementation strategy

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Keywords
nursing implementation strategy

Background
Oxygen therapy plays an important part in the recovery of acute respiratory illnesses in children. Nevertheless, unnecessary oxygen therapy administration may occur, in part, due to the lack of clarity about the role of the nurse in weaning oxygen. In July 2017, the Oxygen Delivery Clinical Guideline was updated to include clear weaning/cessation guidance, however, these changes were not widely known.

Aim
To improve adherence to the oxygen delivery guideline with a targeted implementation strategy to engage and empower nursing staff.

Research Method or Innovation Plan
The implementation phase included hosting an Oxygen Awareness Month. An email was sent to all Sugar Glider nursing staff with a link to the clinical guideline, promoting an attempt to wean oxygen once per shift. Education sessions were conducted at the commencement of morning, afternoon and night shifts, including weekends. Posters were displayed in public places on the ward. During the audit phase nursing staff self-reported their attempts at ceasing oxygen on eligible patients via a bedside data collection tool, and indicated reasons if an attempt was not made.

Results or Data about the Innovation
Of the 68 eligible nurses employed on Sugar Glider, 84% (n=57) participated in an education session. 49 audit tools were collected over a period of six weeks. 73% of respondents weaned oxygen therapy in accordance with the guideline. The most common reason for not attempting oxygen weaning was ineligibility of the patient (80%) and 20% were not confident to wean. 40% of cessation weans were unsuccessful.

Conclusion
A targeted implementation strategy was successful in improving staff adherence to oxygen weaning guidelines.
Characterising chylothorax in paediatric cardiac patients

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Affiliation(s)
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Keywords
Chylothorax, Congenital Heart Disease (CHD), Koala

Background
Chylothorax is characterised by the accumulation of chyle, a lipid and protein rich fluid in the pleural space. Ongoing losses of chyle in post operative Congenital Heart Disease patients can promote malnutrition, immunosuppression and infection. Currently on Koala, treatment type and length vary and no formal Clinical Practice Guideline (CPG) for chylothorax management exists.

Aim
This study aims to characterise the patient profile and management strategies of patients on Koala who develop a chylothorax post cardiac surgery.

Research Method or Innovation Plan
A retrospective audit was conducted utilising 66 cardiac patients from Koala with a chylothorax. Data was collected from the Electronic Medical Record at The RCH from April, 2016 until January, 2018. Data was examined for variables and analysed for descriptive statistics.

Results or Data about the Innovation
Most patients (39%, n=26) were infants with an equal ratio between genders (1:1). Of the 15 patients with genetic anomalies, the majority had T21 (39.9%, n=6). Nine percent of patients had vascular ring surgery (n=6), with 78% of patients having a sternotomy incision (n=51). Most drain specimens appeared bloodstained (55%, n=36) and monogen was the most common treatment (71.2%, n=47). Average treatment duration and drain length insitu was 23 and 17.5 days respectively, with most patients hospitalised for 7-31 days (52.3%, n=34).

Conclusion
This study has provided novel insights into the baseline demographics of children on Koala who develop chylothorax post operatively. Not only has it paved the way for education opportunities but it also promotes further research and the potential for CPG development for chylothorax management.
Procedural pain assessment: is there a good option for this?

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Keywords
Pain assessment, procedural pain, behavioural pain scales

Background
The Face Legs, Activity, Cry and Consolability scale (FLACC) and the Modified Behavioural Pain Scale (MBPS) are observational pain scales considered valid for procedural pain assessment. However, it is not clear whether one performs better for this purpose.

Aim
The aim of this study was to compare the psychometric and practical properties (reliability, validity, feasibility and utility) to quantify procedural pain in infants and young children.

Research Method or Innovation Plan
A convenience sample of twenty-six clinicians used the FLACC scale, the MBPS and the VASobs to segments of video from 100 children aged six to 42 months undergoing a procedure.

Results or Data about the Innovation
The FLACC scale resulted in more incomplete scores ($p < 0.000$), reviewers liked the VASobs most, considered it quickest and easiest to apply but FLACC and MBPS more likely to be useful. Observers changed their FLACC scores more often than they changed MBPS or VASobs scores. Inter-rater reliability was poorest for VASobs ($ICC = 0.55$). VASobs scores were lower than FLACC and MBPS scores during the procedure but MBPS scores were higher during non-painful phases. The FLACC scale provided the best sensitivity (94.9%) and sensitivity (72.5%) for the lowest cut-off score (pain score 2).

Conclusion
This study supports the reliability and sensitivity of the FLACC and MBPS. There are practical concerns for application of both scales and doubt about the capacity of both scales to differentiate between pain- and non-pain related distress exist. However, the results of this study demonstrated that the FLACC scale may be better suited for procedural pain assessment than the MBPS.
Pain assessment in ventilated, sedated, and muscle-relaxed neonates

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Keywords
Neonatal Pain Assessment
Pain Assessment Tool

Background
Neonates admitted to the Neonatal Intensive Care Unit (NICU) undergo numerous painful procedures each day, with less than one-third receiving analgesia. Pain assessment is fundamental for effective pain management. There is currently no universally preferred scale for pain assessment in neonates, and more evidence is required to determine the reliability and validity of existing pain assessment tools.

Aim
To determine the clinical utility and inter-rater reliability of the modified Pain Assessment Tool (mPAT) when assessing pain in ventilated, sedated and muscle-relaxed neonates.

Research Method or Innovation Plan
Online surveys (n=66) of the nurses from the Royal Children’s Hospital (RCH) NICU were analysed to assess the clinical utility of the mPAT. Additionally, forty neonates were also recruited and observed by three different nurses, simultaneously but independently of each other, at rest, during a painful procedure, after a painful procedure and with non-painful stimuli to determine the inter-rater reliability of the mPAT (n=93 pain-scoring events).

Results or Data about the Innovation
The mPAT is a more clinically useful tool when compared to the original Pain Assessment Tool (PAT). The preliminary intraclass correlation coefficient (ICC) suggests that the inter-rater reliability of the mPAT (0.71) is greater than the PAT (0.57). ICCs between 0.5 and 0.75 indicate moderate reliability.

Conclusion
The mPAT seems to be more clinically useful and reliable than the original PAT when assessing pain in ventilated, sedated and muscle-relaxed neonates. Research in the area of neonatal pain should continue to build evidence for existing pain assessment tools, particularly for the population of neonates that are muscle-relaxed.
#FluidFundamentals: best practice fluid management in paediatrics and neonates

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**Keywords**
Fluid management, documentation

**Background**
Poor fluid management in children can lead to serious morbidities with inadequate fluid documentation often a contributing factor. Victorian hospitals did not have an agreed paediatric fluid balance chart (FBC). There were a variety of fluid balance charts being used for paediatric inpatient settings. Some of these were paediatric specific and some were adult fluid balance charts.

**Aim**
To develop a standardised paediatric and neonatal fluid balance chart for use in Victorian health services delivering paediatric and neonatal inpatient care.

**Research Method or Innovation Plan**
Nine pilot sites collaborated on the development of a paper-based fluid chart. A single all-in-one chart was designed to promote clear documentation of the patients’ fluid state, daily medical review of prescribed fluids and calculation of total fluid intake (TFI).

A two-stage quality improvement cycle (3 month cycles) was utilised, commencing November 2017 at 4 pilot sites. Evaluation via focus groups and chart audits resulted in a revised chart which was subsequently piloted at all 9 pilot sites (February - May 2018).

**Results or Data about the Innovation**
The colour coding, A3 horizontal layout, fluid tally areas, TFI and all-in-one (orders and documentation) were deemed beneficial. Nevertheless, neonatal clinicians reported the second-cycle chart was too paediatric focused. Higher acuity health-services found the chart did not always cater for high acuity patients.

Two Fluid Management Charts ‘Special Care Nursery’ and ‘Paediatric’ have been finalised ready for Statewide release in July 2018.

**Conclusion**
Standardising paediatric and neonatal fluid management via an all-in-one chart may improve fluid management safety through a daily review of fluids, identification of TFI and colour-coded documentation processes.
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A ten year review of infant peritoneal dialysis

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Keywords
PERITONEAL DIALYSIS INFANT

Background
Amongst children with end stage kidney disease (ESKD), those who require peritoneal dialysis (PD) within the first year of life have been thought to have poorer outcomes compared with those who commence PD later in childhood, this can lead to reticence in offering PD to these infants.

Aim
Review of all infants initiating PD between 2007 and 2017 to determine advances in management, inform centre based outcomes and establish a protocol for commencing infant PD in this centre.

Research Method or Innovation Plan
A retrospective review of infants commencing PD between 2007-2017 at RCH was completed. All patients commencing PD <1 year of age for the treatment of ESKD were included.

Results or Data about the Innovation
Data was collected on 17 patients <1yr that commenced PD in the ten year review period. Results indicate survival of infants while on PD and overall survival are comparable to patients commencing PD later in childhood. The occurrence and severity of complications have decreased in recent years. Much of this improvement can be attributed to Tenckhoff catheter choice and surgical expertise. Growth and development is varied but has shown improvement in recent years.

Conclusion
The number of infants requiring PD is small although the workload is greatly increased.

Infants present as a high-risk patient group for comorbidities and complications, however with a multidisciplinary approach, these children can be effectively maintained on PD until they are eligible for kidney transplantation and have comparable outcomes to those commencing PD later in childhood.
Agghh, not school again!

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Keywords
School refusal, Mental Health, Education

Background
School Refusal affects five percent of students in the general population and requires complex intervention by Mental Health Professionals. Data collected through RCH Mental Health Service and Travancore School found that interventions were not as effective for these consumers working in their current model. In response to this, In2School was created.

Aim
In2School works with 11-15 year olds that are RCH consumers who are diagnosed with a depressive or anxiety disorder. The objectives are to improve mental health outcomes, family relationships and increase school attendance and engagement.

Research Method or Innovation Plan
This is a three-phase project which trials a wraparound approach to working with consumers from RCH MH. This intervention for approximately six months. Wraparound is a philosophy of care with a defined planning process used to build constructive relationships and support networks among students, their families and educational settings.

Phases:
1: Assessments, therapeutic relationship building, goal setting and treatment planning
2: Attendance at Transitional classroom (focus on group social and emotional learning) and individual therapy
3: Supported outreach to students attending their regular school and ongoing mental health support.

Results or Data about the Innovation
Preliminary data collected thus far (intake 1,2,3) with a total of 24 students; 9M/15F ages from 11-15. The most prevalent diagnosis were Social Anxiety Disorder and Generalised Anxiety Disorder with co-morbid Autism Spectrum Disorder. School attendance prior to the program was at 22%, six months post the intervention attendance was at 71%. 2 young people from intake three continued to have difficulties with their mental health and school refusal. Through use of the HoNOSCA averages scores improved by 8 points which indicates significant overall improvement in the consumers mental health symptomatology. This preliminary data has shown that most consumers have met the research goals of sustained school attendance as well as improved quality of life and mental health outcomes.

Conclusion
The interface of health and education optimises consumers’ recovery. The future direction of this wraparound model would be to gain support and build capacity to people in health working with school refusal.
Aminoglycoside Therapeutic Drug Monitoring - Investigating Best Practice for blood sampling

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Keywords
Aminoglycoside, sample, therapeutic

Background
Therapeutic drug monitoring (TDM) is undertaken to monitor serum levels of aminoglycosides. Methods for acquiring TDM blood samples include via CVADs or finger prick sampling. It was noted that samples taken via CVADs reflect a higher number of probable false high results in comparison with capillary samples.

Aim
To determine best practice methods in obtaining blood samples in relation to TDM

Research Method or Innovation Plan
A retrospective review of TDM levels from May 2016-June 2017 of all children treated with an IV aminoglycoside, with TDM taken while in hospital, and under HITH.

Results or Data about the Innovation
Overall, 145 (9%) TDM results were abnormally high. Of the 400 venous samples, 44 (11%) were high, and of the 585 capillary samples, 39 (7%) were high (odds ratio 1.7, 95%CI 1.1-2.7, p=0.02) (table 2). ie overall venous samples had more high TDM results. Of the 360 HITH TDM samples, 33 (9%) were abnormally high. However, there was no difference between venous and capillary samples: 8% vs 11%, odds ratio 0.7, 95%CI 0.3-1.7, p=0.65) ie HITH venous samples did not have more high TDM results.

Conclusion
Spuriously high TDM results usually mean that patients will miss the next dose unnecessarily and be subjected to unnecessary extra blood tests, which can be painful and distressing for paediatric patients and their families in addition to wasting resources. These findings highlight the need for a prospective comparative study to determine the most accurate sampling method for TDM for children on HITH. Our plan is to do this to provide definitive evidence to optimise positive patient care outcomes.
Anxiety Prevalence in The Victoria Childhood Cancer Survivorship Repository

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Keywords
Anxiety, Oncology survivorship

Background
It is well understood that acute illness and anxiety frequently co-occur. Using the Victorian Childhood Cancer Survivorship Repository (The Repository) the frequency of anxiety or psychological distress can be quantified for survivors attending the Long Term Follow up Program (LTFP).

Aim
The aim of this study was to quantify reported and documented anxiety experienced by children attending the LTFP, in order to inform any improvements to the current model of care.

Research Method or Innovation Plan
Patients who had consented for their data to be used, was exported from The Repository to a spreadsheet, and only those where a clinician has documented anxiety as a late effect were included.

Results or Data about the Innovation
Of the consented population (n=551), 36% had a documented mental health condition in one or more domain. Anxiety was the most prevalent (n= 20%), this figure reflects that the general non-clinical paediatric population. Interestingly, that whilst the overall population of non-clinical children has a female bias, the LTFP cohort had an equal spread. In addition, the data demonstrated that anxiety is more common in children diagnosed under the age of 5 for both genders.

Conclusion
The data generated from this review demonstrates that anxiety is prevalent, and relevant to survivors of childhood cancer attending the LTFP, demonstrating higher than expected reported cases in males and those in the under 5 age group. This highlights that targeted questions/sessions within the LTFP could highlight underreported cases of anxiety. The LTFP will work towards incorporating these findings to improve the model of care delivered in the clinical service.
Asthma education: videos improving asthma management

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Keywords
Asthma, education

Background
Asthma education reduces the risk of Emergency Department visits/admissions, school absenteeism, restriction of activity and improves lung function. Parents/carers do not always receive consistent asthma education from health professionals in a format, or medium, that they can understand.

Aim
Asthma education videos will act as a standardized visual tool to provide parents/carers with a better basic understanding of asthma education, complimenting written/verbal education resulting in decreased time spent by nurses at the bedside and reduced representations.

Research Method or Innovation Plan
Medical/nursing staff on Dolphin ward have complemented an audit about a child’s asthma admission, including the time staff spend providing asthma education. This audit will be repeated after the asthma education videos have been implemented. Parents/carers on the dolphin ward are currently being asked to watch the asthma education videos and then to complete a survey to provide feedback. Hospital asthma representation rates will be collected pre/post the video implementation.

Results or Data about the Innovation
The findings of this innovation are yet to be collected/collated. The data will indicate the time and number of session’s nursing/medical staff spent providing parents/carers with asthma education, pre/post the introduction of the asthma education videos. The survey completed by parents/carers, after watching the education video, will provide data about their understanding different aspects of asthma education.

Conclusion
Final data collected will indicate whether a multifaceted approach to asthma education using verbal, written and visual aids results in less time spent providing bedside education, whether parents/carers receive the basic information they need to manage their child’s asthma and its effects on asthma representation rates.
Autism Spectrum Disorder and Challenging Behaviours Demonstrated in a Paediatric Hospital Environment

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Keywords
clinical aggression, autism spectrum disorder, paediatric hospital

Background
Children and young people with autism spectrum disorder (ASD) often exhibit challenging behaviours which can be magnified in the hospital and can result in injury and distress for the child.

Aim
The objective of this study is to review data from an Australian tertiary paediatric hospital to understand the proportion of Code Grey/ Black activations that are for children with ASD and the accompanying circumstances.

Research Method or Innovation Plan
The total number of Code Grey/Black activations from 1 July 2016- 30 June 2017 were identified through the Victorian Hospitals Incident Management System (VHIMS). Incidents triggered by patients were reviewed to identify the context, response and outcomes.

Results or Data about the Innovation
In one year 622 Code Grey/ Black responses were initiated due to the behaviour of a hospitalised child. Aggressive incidents occurred in paediatric mental health units, paediatric wards, emergency department and outpatient clinics and were triggered by 165 patients. Twelve patients triggered more than ten incidents each and contributed to 309 (50%) of all Code Grey activations. Behaviours of concern were known in 85 of the 165 (50%) children who triggered code grey activations.

Children with ASD with or without ID triggered 223 (36%) code greys. Of these, 54 were triggered by children with ASD only and 169 by children with ASD and ID. Of all patients with ASD who triggered code greys, 85% had known behaviours of concern.

Conclusion
Children with ASD account for 36% of all clinical aggressive incidents at an Australian tertiary paediatric hospital. Understanding the profile of children who trigger Code Grey/ Black incidents will enable targeted clinical strategies and staff training approaches to be developed.
Nursing Research and Clinical Innovations Symposium

Barriers affecting flow of patients with NAI in Medical Imaging

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Keywords
Barriers, Patient Flow

Background
The recommended imaging for children under two years of age, where there is suspicion of non-accidental injury, at The Royal Children’s hospital is skeletal survey and bone scan, which is a process that can span several days and be distressing for all those involved in the care of these patients. Where barriers cause delays in the imaging this serves to heighten the anxiety experienced by the patient and family.

Aim
This study aims to determine the flow of patients undergoing skeletal surveys and bone scans for investigation of non-accidental injury and identify barriers that cause delays in patients moving through modalities in which imaging is performed.

Research Method or Innovation Plan
A EMR report of all patients that had bone scans and skeletal surveys, since May 2016 was generated and was filtered down to patients aged 4 months to 3 years having imaging for investigation for non-accidental injury. A review of patients’ medical records, Synapse and Karisma was performed to determine flow through medical Imaging.

Results or Data about the Innovation
64 patients were identified in that age group, with 49 having had both skeletal survey and bone scan. 36 of these 49 (26.53%) patients had their imaging on separate days.

Factors affecting flow included: availability of a Medical Imaging RN to sedate the patient for the imaging, patients clinical condition and suitability for sedation and imaging being requested on separate days.

Conclusion
26.53% of patients experienced delays in imaging completion. These delays are due to several factors including staffing issues, the patients’ clinical condition and imaging request being made on separate days.
Building opportunities for home-based care for children and adolescents with osteosarcoma

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Keywords
osteosarcoma, home-based care, pre and post hydration

Background
Children and adolescents with a diagnosis of osteosarcoma and managed at the Royal Children's Hospital (RCH) undergo intensive, inpatient based chemotherapy (methotrexate) which includes prolonged pre and post intravenous (IV) hydration protocols and supportive care medications. Traditionally patients are admitted as an inpatient for a 5 to 6 day period, however with appropriate support this treatment may be delivered by the parent or care giver in the home environment.

Aim
The objective of this home-based care project was to develop clinical governance and educational materials to support the delivery of pre and post-methotrexate IV hydration and supportive care to the osteosarcoma patient in the home environment.

Research Method or Innovation Plan
A multidisciplinary working group consisting of representatives from the Children's Cancer Centre, Kelpie Ward, Hospital in the Home (HITH), Victorian Paediatric Integrated Cancer Service (PICS), Oncology Pharmacy, Physiotherapy and Nursing Innovation departments was established to coordinate and implement this practice change. The group developed a program to provide detailed workflow, practice guidelines, education and communication channels for staff, patients and their families to enable the safe delivery of home-based pre and post-methotrexate IV hydration fluids and the necessary supportive care required as outlined in the patient protocol.

Results or Data about the Innovation
A strict eligibility criteria for patient enrolment was developed to ensure safety and efficacy. Family information and education packages, troubleshooting advice and escalation criteria were developed to enable consistency of care. Information outlined management of IV fluid bags, home IV pumps and scheduling for supportive care, such as anti-emetic therapy and delivery of folinic acid rescue. The utilisation of an existing telehealth platform at the RCH assisted patient review and the provision of additional support to the participating families.

Nursing support in the home provided face to face input, therapeutic drug monitoring and clinical review. Over the 5 day period HITH nursing staff visited the patient and family at home in the morning to complete a fluid assessment focusing on urinary pH and total fluid balance. Patient observations and a clinical assessment were completed. On days 3 to 5, HITH nurses attended to collect bloods via capillary sample (methotrexate level, UEC and Creatinine), review IV fluid rates and CVAD care. A follow up review via telehealth in the afternoon confirmed blood test results, further patient review and discussed any areas of concern raised by the patient and family.

Conclusion
The home-based care project has been developed to improve the patient experience for children and adolescents receiving treatment for osteosarcoma. This offers families the opportunity to have greater participation in their child's care within their home environment, whilst maintaining the same high standard of clinical care that is delivered as an inpatient. The project also has the potential to be expanded to provide an alternative treatment option of home-based care to other patient groups who at present require post hydration protocols in the hospital.
Cross-sectional survey of minor bleeding rates in children prescribed Warfarin

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Keywords
Minor bleeding, Warfarin, paediatric

Background
Warfarin is one of the most commonly prescribed anticoagulant medications in paediatric populations for the prevention and treatment of thromboembolic events. Major bleeding rates associated with warfarin therapy in children have been widely reported, however the rate of warfarin-related minor bleeding is seldom studied and poorly defined. The emergence of the novel anticoagulants makes determining this information invaluable to enable optimal clinical evaluation of new agents to existing anticoagulant therapies.

Aim
To assess the type, severity and incidence of minor bleeding events in a population of children

Research Method or Innovation Plan
The patient population was selected from the warfarin management registry of the Clinical Haematology service of The Royal Children’s Hospital and are current receiving warfarin. Data was collected regarding demographics, minor bleeding events (e.g. epistaxis, minor gastrointestinal bleeding, menorrhagia, bruising) using the online Warfarin/Aspirin Bleeding Assessment Tool (WA-BAT), which has undergone extensive validity testing.

Results or Data about the Innovation
62 patients of a potential 197 on the warfarin management registry completed the survey. Of these patients, 83.9% (n=52) reported minor bleeding whilst on warfarin therapy. The most prevalent type of minor bleeding reported was bleeding from minor wounds (reported by 33 patients, 53.2%) followed by bruising (reported by 31 patients, 50.0%).

Conclusion
This study is the first of its kind to solely assess the risk of minor bleeding in paediatric patients on warfarin therapy. The data collected demonstrates that the majority of paediatric patients on warfarin therapy experience minor bleeding events. This data will prove vital for the ongoing prescribing of warfarin in the paediatric setting, as well as guide future therapy as our choices expand.
Developing an Educational Resource for Families: How it can be done

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Keywords
Evidence based, consumer education

Background
Patient and family education is an integral role for nursing. Developing resources that best enable the transfer of information from clinicians to families can be challenging on several fronts. Key elements for consideration include developing consumer-informed content that is evidence-based in its messaging, securing practical support for resource development and dissemination of the resource in practice.

Aim
To describe a step-wise approach to the development of robust educational resources for families.

Research Method or Innovation Plan
A review of processes used to develop three Educational Resources for Families in the Clinical Haematology department was conducted. Common themes were identified that supported the development of each of these resources. These themes are outlined descriptively.

Results or Data about the Innovation
Three key themes identified were: hearing the consumers’ voice; reviewing the evidence; development of the resource. Each theme was underpinned by its placement within a clear project brief that included data collection, analysis and critique against existing literature. The project briefs were submitted to either the RCH Foundation or industry competitive funding schemes, seeking financial support for a clear project budget. Financial support was used to support resource development.

Conclusion
This presentation outlines the key steps involved in enabling the development of educational resources for families. As there are limited funding options to support such resources, nurses need to be strategic in how they conceptualise the need for educational resources within the context of projects that can directly inform those resources. In this way, funding can be secured to support the development of consumer-informed, evidence based educational resources for families.
Discounting the death of a patient: Exploring the disenfranchisement of nurses' grief in the NNU

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Keywords
disenfranchised grief; patient death; neonatal nurses

Background
The literature indicates both nurses and physicians display normal grief reactions when caring for patients who die. Disenfranchised grief occurs when there is a denial of the mourner's "right to grieve", therefore it is important for healthcare organisations to approach the topic of grief with its staff.

Aim
"How does the death of a patient impact on neonatal nursing staff and what support do they find helpful?"

Research Method or Innovation Plan
A literature search was conducted. Following this, interviews were conducted with seven female Registered Nurses selected from one neonatal unit (NNU), each interview lasting 30-50 minutes. Interviews were then analysed for common themes.

Results or Data about the Innovation
All interviewees articulated some degree of awareness of the NNU debriefing opportunities. Almost all indicated they would generally defer to the Morbidity & Mortality Meetings or a personalised follow-up from a senior nurse after a patient's death, rather than EAP-led or pastoral care-led sessions. All interviewees cited (1) their partner/spouse and (2) their NNU nursing colleagues as key debrief personnel. When asked what qualities are appreciated in a debrief person, responses suggested (1) impartiality and perspective, as well as good listening skills, and (2) understanding of clinical knowledge and context, and shared experiences, respectively. Each of the seven nurses spoke of her individualised grieving process and the topic of spirituality arose through these discussions. What arose from their collective experiences was a common grief sentiment, which includes the tension a nurse feels as she must balance or manage her emotional experience with her professional responsibilities.

Conclusion
There is evidence to suggest that clinical supervision provides peer support and stress relief for nurses, as well as a means of promoting professional accountability and skill and knowledge development. This project, however, identified some potential limitations to the support mechanisms currently available in the NNU, and aimed to synthesise strategies for improvement by integrating current evidence from literature.
Establishing standardised paediatric clinical deterioration metrics

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Keywords
clinical deterioration, metrics

Background
Approximately 75 hospitals utilise the Victorian Children’s Tool for Observation and Response (ViCTOR) charts. These standardised tools prompt timely medical care to any deteriorating patient with the goal of eliminating preventable life-threatening events. To establish their impact it was necessary to develop standardised outcome and process measures.

Aim
To develop and pilot a standardised tool that allows reporting of the frequency, characteristics and outcomes of children who have a medical emergency call in Victorian hospitals.

Research Method or Innovation Plan
An expert advisory group, comprising of paediatric medical and nursing experts, reached consensus regarding the elements to be included in the trial form. These included: location of call, patient demographics, pre-call events, call details, reasons for call, significant events and patient outcomes. The trial form was piloted in 6 metropolitan and 5 regional hospitals. Descriptive statistics were summarised by the ViCTOR project team.

Results or Data about the Innovation
From December 2017 to March 2018, 222 calls occurred across 9 pilot sites (range 2-124 calls per site). The median duration of each call was 20 minutes. 33% of ward patients (n=133) had transferred from ED or Recovery during the 4 hours prior to call. 16% of patients had a significant event; the most common was initiation of high-flow oxygen therapy. 13% of patients were escalated to a higher level of care (ICU, HDU or transfer to another hospital).

Conclusion
Although there was great variability in the number of medical emergency calls across sites, the findings provide important insights into the nature of paediatric clinical deterioration. Such a tool would be suitable for a state-wide monitoring framework for Victorian hospitals.
How can medical rounds in PICU provide quality care for patients and their families?

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Keywords
Standard 6, Clinical handover, Quality and Safety

Background
Supporting care for patients and families through multidisciplinary ward rounds that is timely, relevant and structured is integral to insure quality of care. Observation of rounds in PICU at RCH would inform how our department is currently performing this and provide data for how to support effectively multidisciplinary ward rounds in the future.

Aim
Observation of multidisciplinary ward rounds performed in PICU in relation to time, structure and quality care priorities.

Research Method or Innovation Plan
Prospective observational audit of multidisciplinary rounds at two time points during the week for 13 weeks. Data entered into excel spreadsheet and binary data will be analyzed using percentage and chi squared test.

Results or Data about the Innovation
Data currently being collected (due completion August)
Data being collected includes time of rounds, time in with each patient, members of the team involved, family members involved, satisfaction with the rounds, safety checklists being used, discharge planning, interruptions to the round, communication of changes with the team.

Conclusion
Results from the study informed a change in the model of rounds to ensure nurses are present for the round on their patients and a senior member of nursing staff was available to provide quality of care. Minimising interruptions and forward planning was embedded into the culture of rounds to ensure they were completed in a timely manner.
Hyperoxia, hypocabria following commencement of Extracorporeal Membrane Oxygenation: A single center review.

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Keywords
ECMO, Hyperoxia, hypocarbia,

Background
Hyperoxia, hypocarbia following ECMO commencement are known to have potentially detrimental effects that may influence patient mortality, morbidity. Current institutional ECMO commencement settings <10kg are blood flow of 150mls/kg, gas sweep of 100mls/kg, >10kg blood flow 2.4 x surface area, sweep 1:1 with blood flow. FiO2 is 0.5 in both groups.

Aim
Does hyperoxia, hypocarbia occur in children requiring ECMO at the RCH.

Research Method or Innovation Plan
A retrospective review of all children requiring ECMO during 2016 was undertaken, with special reference to time to ECMO commencement, arterial blood gas values (ABG) and changes immediately pre, and following ECMO initiation. Hyperoxia was considered evident if the PaO2 was >100mmHg, hypocarbia if the pCO2 <35mmHg. Medos2400LTTM/7000LTTM oxygenators formed part of the circuit.

Results or Data about the Innovation
Forty nine children (median age 1.4 months, weight 4.4kg) required ECMO due to: failing maximal medical therapy (n=20), cardiac arrest (n=15), fail wean bypass (n=10), bridge to/from ventricular assist (n=2) cardiac shock (n=2). Median time first ABG from ECMO commencement was 21 minutes. All were supported veno-arterially for a median time of 93.3 hours. All survived ECMO, 36 (73.4%) to hospital discharge.

<table>
<thead>
<tr>
<th>Median values</th>
<th>Pre ECMO</th>
<th>Post ECMO</th>
</tr>
</thead>
<tbody>
<tr>
<td>pH</td>
<td>7.28 (6.5,7.6)</td>
<td>7.32 (6.6,7.6)</td>
</tr>
<tr>
<td>pCO2:(mmHg)</td>
<td>45 (22,89)</td>
<td>34 (14,78)</td>
</tr>
<tr>
<td>pO2:(mmHg)</td>
<td>67.5 (12,616)</td>
<td>225 (23,450)</td>
</tr>
<tr>
<td>Lactate:(mmol/l)</td>
<td>3.7 (0.7,19.2)</td>
<td>5.5 (1,20)</td>
</tr>
</tbody>
</table>

Conclusion
Despite alterations to ECMO commencement sweep and FiO2, further modifications to these settings may be required to avoid the potential for hyperoxia, and or hypocabria.
Infant Safe Sleeping – What Do Parents Know?

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Keywords
infant, safe, sleep

Background
Parents of hospitalised infants may have a different knowledge of safe sleeping practices that oppose national guidelines which aim to reduce sudden unexpected death in infancy (SUDI). Nurses play an important role in the provision of patient and family education regarding safe sleeping recommendations.

Aim
What knowledge of parents of hospitalised infants at the Royal Children’s Hospital have of Australian safe sleep guidelines in the home environment, to inform nurse education interventions?

Research Method or Innovation Plan
A cross-sectional descriptive study using a survey tool with convenience sampling to measure the construct variable “knowledge”. Researchers conducted four weekly data collection sessions to approach eligible families. Parents were asked to complete a survey of 20 close-ended questions that explored domains such as identification of at-risk parents, parent knowledge specific to Australian guidelines, sources of information parents prefer to access and whether nursing staff provided effective education in the participant’s opinion. Analysis of results yielded descriptive statistics to relate variables to one another and gauge a distribution of data showing a relative level of knowledge parents have about infant safe sleep.

Results or Data about the Innovation
Sixty survey responses were received. The study revealed a lack of information delivered by nursing staff despite a majority of participants declaring they are aware of safe sleep guidelines and knowing there is a difference between safe sleep practices in the hospital and the home environment.

Conclusion
The study recommends increased interaction between nurses and parents regarding safe sleeping principles. The research findings can further inform future nurse-led education initiatives to improve infant health outcomes and reduce overall rates of SUDI.
Inpatient Care Coordination

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Keywords
Inpatient Care Coordination

Background
As complexity and demand for inpatient access continues to increase, there is a need to facilitate a seamless experience for complex patients and families from admission, across inpatient areas and into the ambulatory domain. The hospital system can be challenging to navigate especially for patient with complex health and psychosocial issues.

Aim
To review and improve understanding of the current state of inpatient care coordination.

Research Method or Innovation Plan
Multi faceted review of current state including face to face interviews with nurse unit managers and inpatient care coordinators, semi structured interviews with a range of identified complex inpatients and families and an on-line survey emailed to all advanced practice nurses, bedside nurses, medical heads of department and allied health managers.

Results or Data about the Innovation
Findings are still to be determined as we continue to engage with identified key stakeholders to collect information.
However, the emerging themes include;
- defining care coordination in practice
- processes to support eligibility, referral and acceptance
- visibility of coordinated inpatients
- inconsistencies between various diagnostic groups
- certain aspects of care coordination are limited
- disparity in utilisation of EMR tools
- variation of roles and responsibilities

Conclusion
To date the review of inpatient care coordination across the RCH illustrates the extent of the variations in current practices. These inconsistencies may lead to confusion for staff, patient and families contributing to a fragmented experience of care.
Knowledge outcomes of novice nurses completing a 12 week transition to paediatric intensive care program

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Keywords
Transition, Knowledge, Paediatric Intensive Care

Background
Transition to Paediatric Intensive Care (PIC) Programs have evolved out of the recognition that PIC nursing is a specialty of its own, requiring skills and knowledge that nurses coming from outside the PICU do not possess. Transition to Intensive Care programs discussed in the literature mostly relate to adult intensive care units (ICUs) and the outcomes measured largely relate to nurse recruitment, retention and participant satisfaction.

Aim
This study aims to evaluate the knowledge outcomes of novice PICU nurses undergoing a 12-week transition to Paediatric Intensive Care (PIC) program in the PICU of an Australian tertiary specialist paediatric hospital.

Research Method or Innovation Plan
A prospective, quasi-experimental, repeated measure design was utilized. We used a convenience sample of the 13 nurses new to PICU, who completed the August intake of our transition to PIC course, the Advancing Competencies in Paediatric Intensive Care (ACPIC) program. These nurses completed a 60 item multiple choice quiz at commencement, completion and 3 months following completion of the ACPIC program. This quiz was modified from a 109 item, assessment tool previously validated in the PIC nurse population. As a comparison, the same quiz was administered once only, to existing PIC nurses of varied levels of experience and training.

Results or Data about the Innovation
All 13 nurses completed the pre-course quiz, with an average score of 29.5 out of 60 (49%), a standard deviation of 3.5 and range from 22 to 33. The low mark and small range indicates that the quiz was not assessing knowledge a nurse without specific PIC education would know. Following the 12 week program, including 10 study days, clinical support and clinical portfolio, the post course results were an average of 38.2 (63.7%) and a range from 34-48. At the 3 month mark following the ACPIC program, two nurses were not available to completed the final quiz, so the sample size for this component was only 11. Quiz results demonstrated knowledge retention and even slight continued improvement, with a mean of 40.3 (67.2%). Disappointingly only 25 of the 250 existing PICU nurses agreed to participate in the study as a part of the control group. Test results were an average of 46.1 (77%), a standard deviation of 4.5 and a range from 36 to 54. Despite the small sample size this compares favorably with the psychometric testing of the original 109 item quiz which described a mean score of 72.1 (66%) and SD of 10.7. (Data analysis is still being finalised. A multivariate analysis and p values will be available for the symposium. Will address KR-20 estimates and item analysis of the tool)

Conclusion
In a small sample there has been significant improvement in knowledge outcomes following the 12 week program. Whilst not a direct measure of PICU competence, the results of this study does provide information about key components of competence: Knowledge and knowledge application. Whilst small, the ongoing improvement in the knowledge outcome is also reassuring that once the foundations are provided in a program such as the ACPIC, knowledge and skill can continue to develop with the lived clinical experience.
Nursing Research and Clinical Innovations Symposium

Moving from self-testing to self-management: empowering families managing warfarin

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Keywords
warfarin, self-management, empowerment

Background
The Royal Children’s Hospital enables children taking warfarin to perform blood monitoring tests (INRs) at home, with results phoned to Haematology who instructs warfarin dosing. International data suggests parents can be supported to make warfarin dosing decisions themselves, a process known as self-management (SM).

Aim
Here we report the design of a study which aims to determine the safety, efficacy and acceptability of warfarin SM in children.

Research Method or Innovation Plan
Children currently performing self-testing are eligible for this study. Study participation will involve attending an individualised education session, adherence to the warfarin SM program and participation in a focus group, exploring families’ confidence and competence in SM. Demographic and warfarin-related data will be sourced from Epic™. Patients’ time in therapeutic range (TTR) for the last six months of self-testing will be compared to patients TTR for six months of SM.

Results or Data about the Innovation
The study encompass the development of an evidence-informed warfarin dosing nomogram and an education program to support families commencing warfarin SM and the novel integration between the Epic™ Patient Portal and the Epic™ Anticoagulation Tracker. As such, composite outcome assessments will be used, including clinical outcomes (TTR and safety outcomes), Patient Portal functionality and family experience.

Conclusion
This project aims to empower families to self-manage their child’s warfarin, with the goal of improving TTR. Additionally, the project aims to establish a world-first integration between the Epic™ Anticoagulation Tracker and the Epic™ Patient Portal. This model of care could be easily translated to other paediatric populations to improve adherence and reduce the burden of care of children with chronic illness.
Neonatal Intensive Care Unit - Deteriorating Patient Working Group

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Keywords
Recognition, Deterioration, Improvement

Background
The Australian Commission on Safety and Quality in Healthcare identified 3 goals for healthcare including Safety of Care. Within this Safety of Care, Recognising and Responding to Clinical Deterioration was identified as a priority. As such we developed a multidisciplinary working group to address issues relating to recognising and responding to clinical deterioration.

Aim
The aim of the Deteriorating Patient Working Group is to improve our recognition of and response to clinical deterioration in the neonatal patient admitted to the Neonatal intensive Care Unit.

Research Method or Innovation Plan
The working group consists of a two nursing and one medical clinical lead and meets monthly with an agenda to discuss key areas of interest – Basic Life Support, Simulation Program, Resuscitation Events (including role allocation, documentation and response), Intra-hospital transport and debriefing clinical events. Incident reports attaining to the deteriorating patient are identified, addressed and follow up actioned. Data is collated on all emergency buzzer events and as such data is reviewed to identify areas of educational need and clinical review. Review of the collated data and incident reports allows for regular review of current policies, procedures and guidelines as well as the development of new clinical practice guidelines to address gaps identified in our practice. All agendas and minutes are circulated to the working group as well as to our Director of Neonatology, Nurse Unit Manager, Quality assurance committee and RCH’s Improvement Manager (National Standards Strategy & Improvement).

Results or Data about the Innovation
As a result of the working group a number of improvement projects have been completed and are currently underway within our unit. The working group has ensured a timely and effective review of our systems to recognise and respond to clinical deterioration. Major projects of 2017 have included; an update of our basic life support algorithm reflecting the ARC 2016 recommendations and the development of a responding to the deteriorating patient role allocation proposal outlining the role and responsibilities required during such clinical events.

Conclusion
We understand from the literature that through early detection, a prompt and effective response to a deteriorating patient can have a significant impact on reducing adverse outcomes. The deteriorating patient working group allows for coordination, collaboration and focused effort from our multidisciplinary team to implement strategies and actions to improve our recognition and response to clinical deterioration.
Neonatal pneumonia, sepsis due to herpes simplex requiring ECMO: A case series.

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Keywords
ECMO, pneumonia, herpes.

Background
Neonatal infection due to the herpes simplex virus was first described by Hass in 1935, and given the description of hepato adrenal necrosis. Three neonates requiring ECMO for cardio-respiratory failure are described in this series review.

Aim
To describe the use of ECMO at the RCH in neonates diagnosed with herpes simplex pneumonia and sepsis.

Research Method or Innovation Plan
The Royal Children’s Hospital ECMO database was retrospectively reviewed, and the data analysed.

Results or Data about the Innovation
Three neonates (median age 6days, weight 3.3kgs) managed with high frequency ventilation, nitric oxide and inotropes, required ECMO due to failure to respond to maximal medical therapy (median serum lactate pre ECMO, 7.6mmol/l). All three were cannulated centrally (right atrium / aorta), supported with a centrifugal pump (Macquet JostaTM /Medos DP3TM) combined with a Macquet QuadroxTM TM/Medos 2400LTTM oxygenator. Median blood flow was 197 and 200 mls/kg/min at 4 and 24 hours respectively. Two required haemofiltration for electrolyte and fluid management. ECMO mechanical complications included air/clots in the circuit, cannula site exploration, patient complications included hypo/hyper glycaemia, elevated serum bilirubin, and multiple blood transfusions. Median support time was 384hours. Two infants died, one from liver, and one from multi organ failure, one survived to hospital discharge.

Conclusion
Neonates, unresponsive to conventional medical management with a diagnosis of pneumonia and sepsis due to herpes simplex may benefit from ECMO, however caution should be exercised due to the high mortality associated with this disease.
Nursing Guidelines: Local resource with an international impact

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Keywords
Nursing, Guidelines, Evidence Based

Background
Established in 2011, the Nursing Clinical Effectiveness Committee (NCEC) was created to support the developments of nursing clinical guidelines for nurses at The Royal Children’s Hospital (RCH). The membership of NCEC comprises of staff from Nursing Research, Nursing Executive, Nurse Managers, Nursing Educators, ward based clinical nurses and Advanced Practice Nurses from all areas of the hospital. Together, these nurses support the identification, development, publication and auditing of evidence based clinical guidelines supporting nursing practice.

Aim
To report the growth in outcomes of clinical guidelines supporting nursing practice over the last 7 years as evidenced by the number of published guidelines, pageviews of guidelines per annum and clinical audits of guidelines conducted.

Research Method or Innovation Plan
Data was collected and analysed descriptively regarding the numerical growth in each of previously stated outcomes enabled by the NCEC, which supports clinical guideline development for nursing at the RCH.

Results or Data about the Innovation
By December 2011 the committee oversaw 21 new and existing guidelines and as of May 2018, there are now 89 published clinical guidelines. Since data first stated being collected in mid-2013, a 256% increase in average annual pageviews of our clinical guidelines has been seen. These pageviews are from not only internal staff in which they are written for, but from across the globe. Finally, across the last 7 years, 40 clinical audits of adherence to guideline content or outcomes of care achieved through guideline adherence have been conducted.

Conclusion
The NCEC has made a significant contribution to improving the evidence base supporting nursing practice since its inception. This impact is visible locally, nationally and internationally. In this way, nursing is leading the way in terms of the governance, development, publication, implementation and evaluation of evidence-based guidelines supporting clinical practice.
Nursing in Specialist Clinics- are we meeting current clinical need?

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Keywords
Nursing, Outpatients

Background
The Victorian Government’s current focus on Specialist Clinics, via Better Care Victoria, to identify and embed innovation across the health system, provided an opportunity for the Specialist Clinics’ nursing team to examine their nursing resources and examine their work practices to optimise positive clinical outcomes across Specialist Clinics (SC). It was also an opportunity to raise awareness of the nursing work in this space and ensure its relevance and sustainability into the future.

Aim
Determine the clinical need for nursing resources in Specialist Clinics.

Research Method or Innovation Plan
Data was collected via on-line surveys, consultation with stakeholders including clinical staff, administrative staff and patients and their families attending SC appointments. Data collected included determining clinician’s current access to nursing resources and their opinion regarding what nursing resource was required to ‘add value’ and improve clinical outcomes. Nursing rosters, daily allocations, EFT and roles and responsibilities of SC nursing staff were also examined.

Results or Data about the Innovation
The results of the project quantified the clinical need for nursing support in SC. The data found that the current nursing model is not aligned to, or informed by changing clinical need. The results demonstrated widespread unmet clinical demand resulting in clinician frustration across SC. The data found the current nursing model has no capacity or flexibility to effectively manage peaks and troughs in clinical demand and nursing work varies between daily clinic allocation and nursing classification, resulting in inequitable workloads.

Conclusion
The project provides the SC nursing team with data to understand the clinical need. It assists to manage expected changing clinical demand through prioritisation and appropriate delegation of nursing resources to better meet the peaks and troughs of clinical demand throughout Specialist Clinics.
Poop n’ Scope: improving flow and preparation of the paediatric patient requiring enteral bowel washout for surgical procedures

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Keywords
Bowel washout, patient flow

Background
Bowel washouts are performed to cleanse the intestines of faecal matter and secretions. This procedure is required for the management of constipation, rectal biopsies, closure of colostomy and other bowel investigations. Enteral bowel washouts are performed as an inpatient procedure when the bowel preparation solution cannot be taken orally due to noncompliance or a failed attempt. There is currently no Royal Children’s Hospital (RCH) guideline for the management of these patients.

Aim
The aim of this study was to identify the opportunities for improving flow and preparation in the paediatric patient requiring an enteral bowel washout for surgical procedures.

Research Method or Innovation Plan
A 22 month retrospective chart audit was conducted using EMR. Using the report extracted from the RCH EMR database, study participants were identified and data collection was guided by a purpose designed data collection tool using Excel.

Results or Data about the Innovation
During the audit, 20 patients were identified. They were admitted between April 2016 to February 2018. Findings showed issues in regards to late admission times, fasting status on admission, delays in relevant orders (sedation medication & hydration), unavailability of nitrous oxide on the Possum ward, delays in nasogastric tube (NGT) insertion and thus commencement of bowel preparation. There were no Education play therapy referrals for this cohort.

Conclusion
This study identified various challenges to optimal patient flow for this cohort. New initiatives focused on standardising care and improving admission processes could significantly improve the experience of hospitalisation of these patients and their families.
Recovery Clinical Indicators Audit

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Keywords
Recovery, Clinical Indicators

Background
In 2017 the Australian Council on Healthcare Standards released the 2009-2016 Clinical Indicator Report. This report detailed a number of adverse outcomes measured in Recovery Rooms around Australia, excluding pediatric centers. Locally, temperature less than 36 degrees was the most common Clinical Indicator. The incidence of this was significantly higher than in adult cohorts.

Aim
The aim of this Clinical Audit was to identify the most significant adverse outcomes for children undergoing anaesthesia and surgery being cared for in the Recovery Room.

Research Method or Innovation Plan
A clinical audit was undertaken to identify the most prevalent clinical indicators. The Clinical indicators were added to EMR and an addition of a mandatory stop for chart verification. This occurred in order to gather data on all patients coming through the Recovery unit. Staff were educated on the updates, documentation requirements and reports generated. The EMR data was interrogated on a monthly basis and results gathered.

Results or Data about the Innovation
On a monthly basis, on average 400-500 arrive in the recovery room with a temperature under 36 degrees. This was the most common clinical indicator and equates to a range of 40-60 percent of all patients undergoing anaesthesia.

The audit demonstrated that the patients who are at most risk of perioperative hypothermia are less than five years of age and undergoing procedures of less than one hour. Of these patients most did not receive intraoperative forced air warming and their intraoperative temperature was not taken.

Conclusion
Perioperative hypothermia is a troublesome clinical phenomenon leading to an increase in adverse outcomes. The results of the audit has led to changes in the care provided by recovery nurses and the addition of this care to the temperature management Clinical Practice Guideline. Furthermore, a temperature clinical trial will be undertaken for patients who undergo procedures for less than thirty minutes to be undertaken.
Reviewing the current subcutaneous immunoglobulin home training program

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Keywords
Subcutaneous immunoglobulin, home training program, patient survey

Background
The current subcutaneous immunoglobulin (SCIG) home training program has not been evaluated since its commencement. Evaluation of SCIG program can obtain valuable feedbacks from participants' perspective and determine if any changes are needed.

Aim
The aim of this study is to examine and question whether or not the current home training program is effective in allowing parents to be confident in the administration of SCIG.

Research Method or Innovation Plan
This project is a cross-sectional and retrospective study. Kirkpatrick's evaluation model was used to formulate a questionnaire survey to assess the confidence of the participants and their satisfaction level for the delivery of the program after undertaking the SCIG home training program. 34 surveys were sent out to participants and 19 were returned to RCH and the data was analysed by descriptive statistics.

Results or Data about the Innovation
The results show that the participants were confident in administering SCIG to their children after being trained from the SCIG training program. However, drawing up medications, insertion of needles and administration of SCIG are the steps that need to be focused on to increase the participants' confidence level. Another finding discovered that participants were very satisfied with the delivery of the training program. This shows that the current training program is appropriate and requires minimal changes.

Conclusion
Overall, the participants were satisfied with the delivery of the current training program. Only minimal changes are required on drawing up medications, the delivery of SCIG and in particularly the insertion of the needle to improve confidence of future participants.
Risks of routine blood testing in paediatric patients undergoing chemotherapy

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Keywords
Blood-taking, Risks, Oncology

Background
Blood sampling is essential in the management of paediatric oncology patients receiving chemotherapy. Whilst the use of central lines in these patients allows for convenient sampling, central line use is not without its own consequences.

Aim
This study aims to assess the degree of risk posed to children experiencing routine blood sampling during chemotherapy treatment, juxtaposing this risk with an analysis of the pathology results and their influence on patient care.

Research Method or Innovation Plan
This quantitative study used an observational research design. Nurses collected data prospectively at the bedside with each blood test they performed and the pathology results were then recorded via retrospective chart audit. Lastly, the clinical significance of these tests in guiding patient care was assessed.

Results or Data about the Innovation
Paediatric patients undergoing routine blood sampling during chemotherapy treatment are subject to an increased risk of infection, iatrogenic anaemia and sleep disruption. On average, patients experienced 5 additional central line accesses for the purpose of blood testing per admission, each exposing the patient to infection. Iatrogenic blood loss of 0.5-3% of each patient's total blood volume was observed, and 30% of blood taking events woke patients overnight. Despite this, blood sampling remains essential to safe patient care when clinically indicated. Ten actionable blood results were identified, 2 of which led to medical intervention.

Conclusion
There are significant risks associated with routine blood taking in paediatric oncology patients. Critical thinking, clustering of central line related care and increased staff awareness at a nursing level can help to minimise these risks without compromising on safe patient care.
The Allied Health and Nursing Education Outreach Program – Reaching Out Across the State

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Keywords
osteosarcoma, home-based care, pre and post hydration

Background
Children and adolescents with a diagnosis of osteosarcoma typically undergo intensive, inpatient based chemotherapy.

Aim
The objective of this project was to develop clinical governance and educational materials to support the delivery of pre and post-methotrexate IV hydration and supportive therapy in the home environment.

Research Method or Innovation Plan
A multidisciplinary working group formulated detailed workflow, practice guidelines, education and communication channels for staff, patients and their families to enable the safe delivery of this treatment.

Results or Data about the Innovation
Patient eligibility criteria, education packages, troubleshooting advice and escalation criteria ensured safety and consistency of care. Information outlined management of IV fluid bags, home IV pumps and scheduling for supportive care, such as anti-emetic therapy and delivery of folinic acid rescue. The utilisation of an existing telehealth platform assisted patient review and the provision of additional support to the participating families.

Nursing support in the home each day provided face to face input, therapeutic drug monitoring and clinical review. Nursing staff visited the patient and family at home to complete a clinical assessment including patient observations, fluid balance, capillary blood sampling and CVAD care. A follow up review via telehealth later in the day confirmed blood test results, further patient review and discussed any areas of patient or family concern.

Conclusion
This project offers families the opportunity to have greater participation in their child's care within the home environment whilst maintaining the same high standard of clinical care that is delivered as an inpatient and has the potential to be expanded to other patient groups.
The FLACC scale for procedural pain? Maybe!

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Keywords
Pain assessment, procedural pain, FLACC scale

Background
The Face, Legs, Activity, Cry and Consolability scale (FLACC) is one of the most commonly and widely used behavioural observation pain scales. However, there is insufficient evidence to recommend it for procedural pain assessment.

Aim
The aim of this study was to test the measurement and practical properties of the FLACC scale to quantify procedural pain in infants and young children.

Research Method or Innovation Plan
Twenty-six clinicians independently applied the FLACC scale to segments of video collected from 100 children aged six to 42 months undergoing a procedure. Video segments were all scored by four reviewers.

Results or Data about the Innovation
Inter- and intra-rater reliability coefficients were high (0.92 and 0.87, respectively). Linear mixed modelling confirmed scale responsiveness (differences in difference between FLACC scores across phases for painful vs non-painful procedures was 4.2, 95% CI 3.67 to 4.81). Sensitivity and specificity were 94.9% and 73.5% respectively at a cut-off of 2. However, the mean difference across phases for children with baseline scores greater than 3 was much lower than for children with scores less than 3, p = 0.0001. Correlations between FLACC and Visual Analogue Scale observer (VASobs) pain and distress were good (r = 0.74 and r = 0.89, respectively).

Conclusion
This study supports the reliability and sensitivity of the FLACC scale for procedural pain assessment. However, the circumstances of procedures interfered with application of the scale and the findings question the capacity of the scale to differentiate between pain- and non-pain related distress.
The Green Dolphin – Creating sustainable healthcare through PVC recycling

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Affiliation(s)
Sustainability, recycling

Keywords
Sustainability, recycling

Background
Due to the economic and societal benefits of environmentalism, the Royal Children’s Hospital has outlined sustainable healthcare as an ongoing strategic focus point for future development. The Medical Short Stay Unit (Dolphin Ward) has been dedicated to upholding this goal by optimising a PVC recycling program.

Aim
Previous practice within Dolphin Ward was to discard PVC bags as general waste and the aim of this change in practice sought to send these plastics to be recycled instead.

Research Method or Innovation Plan
This practice change featured recycling effort education seminars and the installation of PVC plastic recycling bins. Success was measured against overall staff compliance with the recycling program, as well as kilograms of PVC bags recycled.

Results or Data about the Innovation
At the beginning of the practice change, several education sessions were held with a primary focus of informing staff members of the importance of recycling, the process for safely recycling plastics and inciting a sense of enthusiasm about the project. A recycling bin and information sheets were placed in the ward medication room to facilitate ease of recycling. The initiative was met with great enthusiasm and due to the ease of the recycling process, substantial progress has been made in reducing the amount of PVC plastics going to landfill. Dolphin ward is approximately recycling 2.4kg of PVC plastic each month.

Conclusion
Currently there are many wards transitioning to PVC recycling. Future directions would be for the RCH to become a PVC plastic collection point, allowing for organisation-wide PVC recycling and a significant reduction in general waste costs.
The impact of Extracorporeal Life Support (ECLS) on Hypoplastic Left heart Syndrome (HLHS) patients long term survival.

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Keywords
Outcomes, ECLS, HLHS

Background
Long-term outcome for children with HLHS is influenced by high inter-stage mortality, severe cardiovascular complications (thromboembolic events) and eventually need for heart transplant. ECLS after Norwood procedure is reported by ELSO as the most common indication for mechanical support in children with Congenital Heart Defects.

Aim
The aim of this study was to investigate the impact of ECLS on survival, on a cohort of children with HLHS.

Research Method or Innovation Plan
A 10-year (2007-2016) retrospective study of all patients admitted to our PICU with a diagnosis of HLHS. Patients were selected from the PICU database and further patient information was obtained from the Electronic medical record (EMR).

Key variables were; ECLS usage at each surgical stage, initial survival and survival at 10 years.

Results or Data about the Innovation
A total of 120 patients with HLHS were included. The most significant ECLS utilisation 23% (n=27) was post Norwood procedure. ECLS after Glenn and Fontan procedures was 8% (n=9) and 5% (n=3) respectively.

Currently 82 patients are alive (n=52 Fontan and n=30 Glenn/BCPC), with 81%(n=67) requiring no ECLS. Only 18%(n=15) of current survivors required ECLS, during their HLHS surgical pathway.

Conclusion
Survival of children requiring ECLS through their surgical journey, from Norwood to Fontan procedures is much lower, compared to the same population not requiring ECLS. However, the impact on survivor’s long term neurodevelopmental outcomes and quality of life is unclear.
The Impact of High Flow Nasal Cannula Therapy on weight gain in infants with single ventricle hearts

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Keywords
High flow nasal cannula, single ventricles, weight

Background
High Flow Nasal Cannula (HFNC) therapy is assumed to improve weight gain in infants with single ventricle hearts, after their first stage of palliative (S1P) surgery, however there is little evidence to show that this is the case.

Aim
The study investigated the association between HFNC therapy and weight gain in patients with single ventricle hearts following S1P surgery in a non-intensive care environment.

Research Method or Innovation Plan
A retrospective cohort design was conducted, data collection included patients documented weight on the ward and whether they were on or off HFNC therapy. Weight data was converted into weight-for-age z (WAZ) scores. Non-parametric tests were used to describe differences in distribution and to identify where differences occurred. Linear mixed model with random effects was used to analyze continuous variables over time. The primary outcome measure was change in weight(kg) and WAZ score between S1P and S2P surgery and average daily weight gain and WAZ score. Frequent vomiting and SpO2 was applied as covariates to the linear mixed model analysis.

Results or Data about the Innovation
24 infants met the inclusion criteria, they were categorized into one of three groups: ON HFNC (N=4), OFF HFNC (N=5) and Mix ON-OFF HFNC (N=15). The ON HFNC group had a trend of low weight and WAZ score starting from birth until S2P surgery. The ON HFNC group had a significantly low birth WAZ score (p=0.04) and a significantly lower weight gain between S1P and S2P surgery (p=0.000). Time was a significant factor to weight gain (p=0.000) but not WAZ score (p=0.50). The average daily weight gain of all three groups combined was 0.029kg (29g). Frequent vomiting and SpO2 was found not to be significant factors to weight gain or WAZ score on or off HFNC therapy.

Conclusion
HFNC therapy alone does not significantly improve weight gain in infants with single ventricles.
Uptake of adolescent immunisations in specialist schools in Victoria, Australia

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Keywords
Adolescent, Immunisation, Specialist schools

Background
In Australia, young people aged 12-13 years are eligible to receive Diptheria-Tetanus-Pertussis booster (dTPa) and Human Papillomavirus Virus (HPV) vaccine through the School Immunisation Program. In Victoria uptake is calculated using Year 7 enrolment, with 90% of eligible students receiving dTPa, and 79% of females and 72% of males receiving three doses of HPV in 2016. However, students with disabilities enrolled in specialist schools are usually ungraded, with immunisation uptake not consistently recorded or included in Victorian figures.

Aim
The aim of this study was to determine dTPa and HPV immunisation uptake in specialist schools in Victoria.

Research Method or Innovation Plan
In 2017 a prospective cohort study was conducted. School immunisation coordinators in consenting specialist schools entered receipt of HPV and dTPa online on each immunisation day for eligible students. Reasons for non-receipt were also recorded. Data was analysed in Excel.

Results or Data about the Innovation
Of 74 specialist schools, 27 (36%) participated, with data from 375 students included. dTPa coverage was 67% (251/375). Uptake of one dose of HPV was 66% (76/114) in females and 67% (176/261) in males. Only 25% (28/114) of females and 28% (72/261) males received three doses of HPV. Main reasons for non-receipt of immunisations were absence from school and lack of consent.

Conclusion
This study is the first to report uptake of adolescent immunisation in specialist schools in Australia and illustrates a significant disparity between specialist and mainstream schools. Further exploration of reasons for immunisation non-receipt and systems underpinning immunisation delivery will enable targeted policies to increase uptake of adolescent immunisations in young people with disabilities.
Using high fidelity simulation to provide
Management of Clinical Aggression Training - a pilot study.

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Keywords
clinical aggression, staff training, simulation

Background
Children and young people exhibit challenging behaviours daily in the hospital environment which may result in injury or distress for the child. The training program prior to this study, to manage clinical aggression involved a full day of lectures and short skill sessions. Despite delivery of this program, code grey activations are increasing each year.

Aim
This study aimed to assess if the addition of a high fidelity 2 hour simulation training program increased participants’ confidence and perceived competence in managing challenging behaviours.

Research Method or Innovation Plan
Two separate simulation exercises (of escalating difficulty) were delivered within the Management of Clinical Aggression (MOCA) training days. Participants completed a written survey prior to, at completion of the simulation training program, and at 3-6 months following the MOCA training.

Results or Data about the Innovation
Nine training days were conducted in 2017 with a total of 146 participants. Most (68%) participants had experienced clinical aggression as part of their routine work, with 51% overall reporting a lack of confidence managing these patients. Immediately following this training, 80% of all participants reported feeling more confident in managing clinical aggression. At an individual level, 47% reported a 1 point increase in confidence while 33% of participants reported a 2 or 3 point increase. At 3-6 months following MOCA training, continued confidence in managing clinical aggression was reported by 66% of respondents with 100% of participants stating they would recommend this training to colleagues.

Conclusion
This study demonstrates high-fidelity simulation training increased confidence in participant’s ability to manage challenging behaviours of young people with retention of perceived skills at 3-6 months post training.
What's bugging us: The Swiss cheese of infectious disease

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Keywords
communicable diseases infections

Background
Vaccine preventable diseases remain an issue in Australia despite a comprehensive National Immunisation Program (NIP) Schedule. Although the principles of management of a patient with a transmission risk are outlined in RCH procedures, gaps have been identified. Misses in identification and delays in interventions may further facilitate exposure to staff, patients and families.

Aim
A retrospective review of staff and patient contact with vaccine preventable diseases to describe the processes and determine areas for improvement.

Research Method or Innovation Plan
A retrospective chart review of patients with a vaccine preventable disease whose contacts required post exposure follow up by Infection Prevention and Control was undertaken to determine compliance to the procedure. Diseases reviewed include measles, pertussis and varicella.

An audit of staff immunisation records and serology results following high risk exposures was undertaken to determine number of staff and patient contacts potentially at risk of disease acquisition.

Results or Data about the Innovation
The disease burden in Victoria and RCH will be reviewed including the number of tests ordered for these infectious diseases to identify the risk.

From the review of the cases there were several opportunities to identify the transmission risk which were missed, resulting in unnecessary exposure and follow up. This includes delays in diagnosis, waiting on laboratory confirmation prior to interventions, high risk procedures performed without use of personal protective equipment (PPE).

Review of the data from each of the follow ups undertaken determined the risk to staff, patients and families, as well as the requirements for post exposure vaccination, immunoglobulin or antibiotic prophylaxis. This will include calculation of staff time and costs (example numbers to be provided including approx. cost to hospital for staff off work)

Conclusion
Strict adherence to the principle of patient isolation on suspicion of communicable disease is required to reduce the risk to patients, families and staff. This includes commencing transmission based precautions.

All staff should ensure that their immunisations and serology status is known and communicated to Infection Prevention and Control.
‘What’s the hold up?’ Investigating the timeline of long day chemotherapy treatment and the implications of delays

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Keywords
oncology patient, delays, chemotherapy

Background
Chemotherapy, an agent used to treat the majority of cancers, can be extremely toxic to many organs, sometimes necessitating pre hydration. Pre hydration duration varies between chemotherapy protocols but ranges from several hours to overnight. The frequency of delays to starting chemotherapy that requires pre hydration at RCH is not known.

Aim
The aim of this study was to identify the most common time-points for delay in commencing chemotherapy treatment for paediatric oncology patients.

Research Method or Innovation Plan
Quality improvement approval was obtained for a retrospective audit via the electronic medical record. A manual search through each patient encounter was then undertaken to determine exact time points for each patient and whether a delay occurred or not and why. Once all of the data was collected it was transferred to an excel spreadsheet and analysed.

Results or Data about the Innovation
A total of fifty-five patient encounters were investigated. 27% of encounters were delayed or deferred. 20% were deferred to another day due to lack of bed availability. 53% had a delay due to late admission as a result of no earlier bed being available. 22% received chemotherapy after hours. 7% had no reason for delay documented. 20% required overnight hydration.

Conclusion
This study demonstrates that there are frequent delays for the oncology patient population within RCH. Strategies such as; earlier clinic appointments, developing a ‘Hydration Station’ as well as creating a clear and effective process for ‘Long Day Chemotherapy’, can all work to improve the patient’s care and experience by preventing unnecessary delays and reducing length of stay within The Royal Children’s Hospital.
What's the problem with the Modified Behavioural Pain Scale?

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Keywords
Pain assessment, MBPS, measurement properties

Background
The Modified Behavioral Pain Scale (MBPS) was designed to assess procedural pain in infants and is considered valid for assessing immunisation pain. However, it has had limited testing for other procedures.

Aim
The aim of this study was to assess the practical and psychometric properties of the MBPS when applied to other commonly performed procedures.

Research Method or Innovation Plan
Twenty-six clinicians independently applied the MBPS scale to segments of video collected from 100 children aged six to 42 months undergoing one of four procedures in the emergency department.

Results or Data about the Innovation
Construct validation demonstrated scale responsiveness to painful stimuli (4.6 times increase in scores across phases). However, mean baseline scores for procedures were not zero for non-painful phases of the procedures. The scale most accurately differentiated between painful and non-painful procedures at a cut-off score of 4. The mean difference increased across phases for children with baseline scores greater than 3 was much lower than for children with scores less than 3, \( p = 0.0001 \). Inter- and intra-rater reliability coefficients were high (0.87 and 0.89, respectively). Finally, 28\% of scores changed following the second viewing of a video segment and clinicians did not think it performed well for procedural pain assessment.

Conclusion
The MBPS appears reliable and sensitive to procedural pain when applied by clinicians. However, these results raise significant concerns about the capacity of the scale to differentiate between pain- and non-pain related distress, the feasibility of this scale and the appropriateness of item descriptors for medical procedures.