Quality Improvement Oral Presentation Abstracts

1: Get SET: Optimising temperature management in preterm infants (<32 weeks gestation)

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2: Postnatal management of hypoglycaemia - a work in progress

Dr Sumaiya Mohamed Cassim[1], Wendy Ramsay[1], Dr Deepa Varghese[1], AnneMarie Bruce[1], Gillian Reid[1], Dr Satyajit Ray[1], Dr Andrew Brodie[1], Dr Sarah Cleary[1], Dr Gemma O'Reilly[1]
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3: Reducing Unintended Extubation in a Tertiary Neonatal Intensive Care Unit: A Quality Improvement Initiative (QI).

Mrs Helena Smith[1], Dr Vrinda Nair[1,2]
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1: Get SET: Optimising temperature management in preterm infants (<32 weeks gestation)

Dr Maria Isabella Duggan[1], Dr Joyce O'Shea[1], Dr Colin Peters[1], Dr Anne Marie Heuchan[1]
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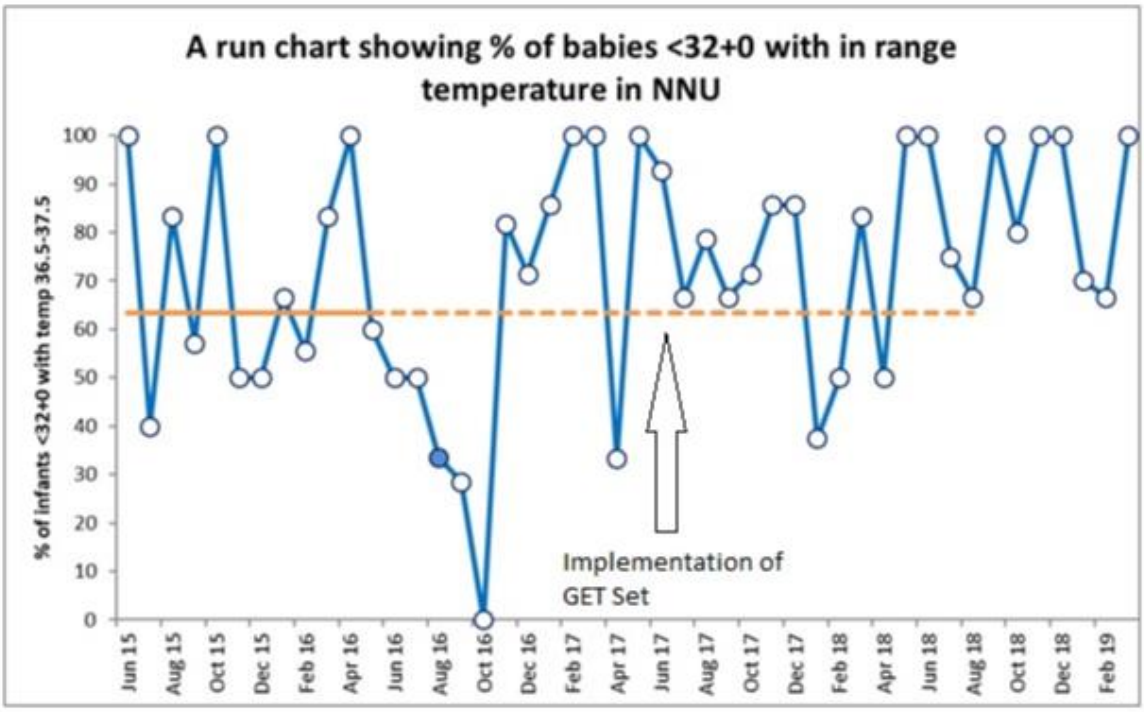
Biography:
Dr Maria Duggan is an ST6 paediatric trainee in the West of Scotland. She has a specialist interest in neonatal medicine and is hoping to attain a sub-specialty training post in neonatal medicine later in the year. Maria graduated with an MBChB from the University of Glasgow in 2010 and since 2012 has been in a run through paediatric training programme. She has a BSc (Hons) in clinical medicine and achieved a distinction in her Post Graduate Certificate in Child Health. She is passionate about quality improvement.

Objectives: Hypothermia is associated with increased neonatal mortality and morbidity. This quality improvement (QI) project aimed to improve rates of normothermia (36.5°C – 37.5°C) in preterm infants on admission to a neonatal intensive care unit (NICU).

Methods: Despite routine use of plastic bags and radiant heaters only 52% of preterm infants (<32 weeks) admitted to NICU in 2016 had an admission temperature in the normothermic range in. The national average in 2016 was 61%. Several tests of change were initiated. Evidence based process measures were based on NLS guidance of optimal environmental temperature, use of warmed mattresses, plastic wrapping, warmed incubators and warmed, humidified gases. The quality improvement project: "Get Saturation Ecg Temperature for labour ward was implemented following staff education, including advice on improving temperature if low on continuous monitoring during stabilisation. A Lifestart trolley was used to deliver stabilisation with the cord intact for 60 seconds and monitoring was with Philips XDS monitors. Compliance with the number of process measures were recorded by questionnaire following each delivery and admission axillary temperature recorded.

Results: Since implementation of Get SET in June 2017, 120 preterm infants <32 weeks have been admitted to NICU. 94 (78.3%) were normothermic, 18 (15%) were hypothermic and 8 (6.7%) were hyperthermic. 16, (88.9%) of the hypothermic infants had an admission temperature >36°C. (Image 1) Sustained improvement is now demonstrated and is shown in attached run chart (Graph 1).

Conclusions: Quality improvement measures implemented to actively monitor and maintain temperatures in the normothermic range during stabilisation increased the proportion of preterm infants admitted with temperatures in the optimal range.



Temperature range	Pre Get SET project Number of infants N = 118	Get SET project Number of infants N = 120
< 35°C	2 (1.7%)	0 (0%)
35.1°C – 35.5°C	2 (1.7%)	1 (0.8%)
35.6°C – 36°C	10 (8.5%)	1 (0.8%)
36.1°C – 36.4°C	23 (19.5%)	16 (13.3%)
Normothermic 36.5°C – 37.5°C	71 (60.2%)	94 (78.3%)
> 37.5°C	10 (8.5%)	8 (6.7%)

2: Postnatal management of hypoglycaemia - a work in progress

Dr Sumaiya Mohamed Cassim[1], Wendy Ramsay[1], Dr Deepa Varghese[1], AnneMarie Bruce[1], Gillian Reid[1], Dr Satyajit Ray[1], Dr Andrew Brodie[1], Dr Sarah Cleary[1], Dr Gemma O'Reilly[1]
[1]*University Hospital Wishaw, NHS Lanarkshire, Wishaw, United Kingdom*

Biography:
Consultant Neonatologist at University Hospital Wishaw.
Wendy Ramsay - ANNP at Wishaw

Background:
Term babies (≥ 37 weeks) at risk of hypoglycaemia are identified at birth and placed on a care pathway that includes early feeds, blood glucose monitoring and regular feeding/feed supplementation, as untreated hypoglycaemia can lead to neurological injury. The hypoglycaemia threshold for both term and preterm babies was ≤2.6mmol/l. However, some babies require admission to the Neonatal Unit (NNU), resulting in maternal separation, interrupting bonding and can adversely affect breastfeeding, maternal mental health and cause long-term morbidity to both mother and baby.
This project was carried out in the postnatal wards of a district general hospital with a level 3 NNU.

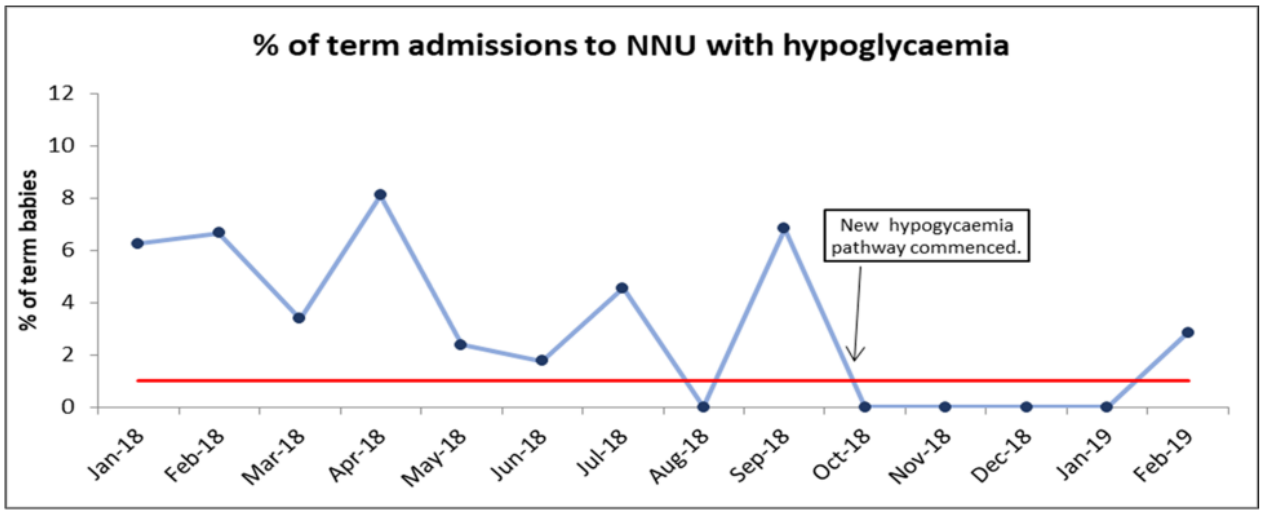
Aim:
To decrease term hypoglycaemia admissions through implementation of a new guideline for management of healthy term babies with asymptomatic hypoglycaemia in the first 48 hours; in line with the British Association of Perinatal Medicine neonatal hypoglycaemia framework for practice, by the 1st of October 2018.

Methods:
Change idea: Hypoglycaemia threshold in healthy term babies <48hours was redefined as ≤2.0mmol/l (previously ≤2.6mmol/l) and the use of buccal dextrose gel in its treatment.
A multidisciplinary working group was set up. The guideline was ratified locally and disseminated to staff using a 'read and sign' approach. A buccal dextrose monograph was developed. The blood gas analyser on labour ward was upgraded to allow neonatal sampling. Educational videos – blood gas glucose sampling and buccal dextrose administration were created. Champions were identified to support implementation. Training 'buzz' sessions were commenced. Test PDSAs were carried out resulting in further training and guideline revision.

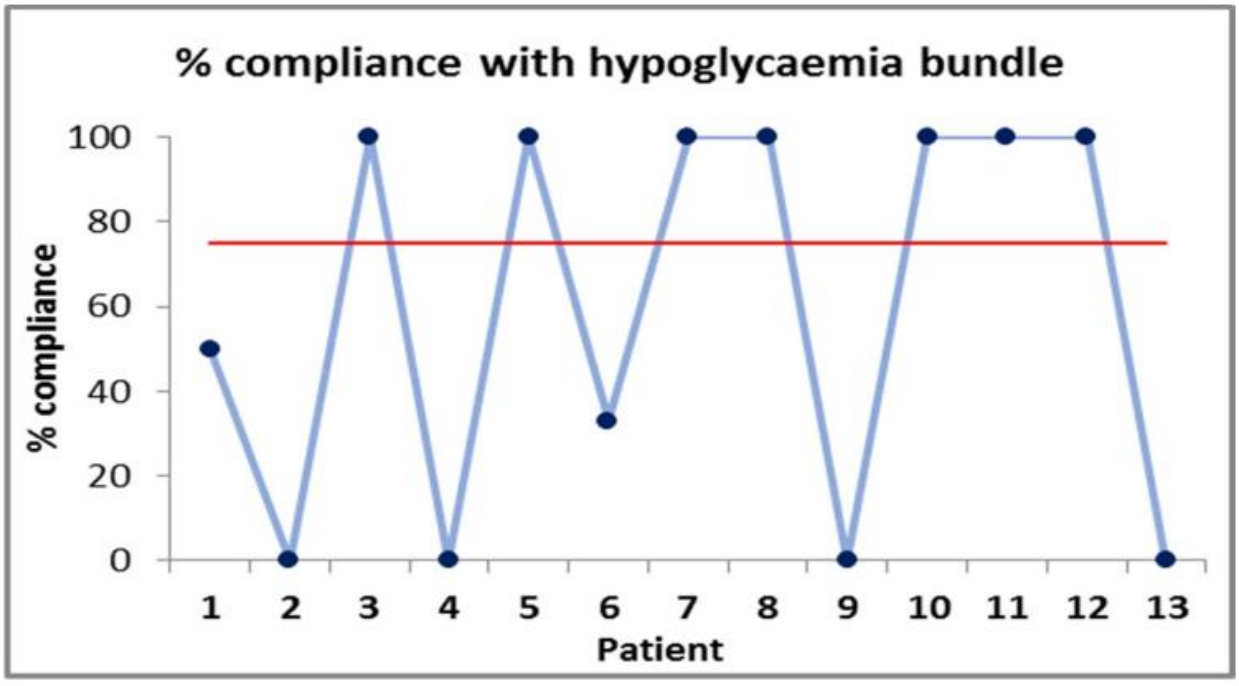
Results:
Baseline data revealed that hypoglycaemia made up 4% of term admissions (2% full admissions, 2% short stay ≤4 hours {SS}). 37% of babies were managed on IV fluids, 44% required nasogastric feeds and 19% were given oral formula top up feeds. 41% of these women intended to exclusively breastfeed, however only 7% of babies were doing so at discharge. For quality assurance purposes, a prospective audit of blood gas glucose and lab blood glucose was carried out. Our outcome measure is % of term admissions to NNU with hypoglycaemia. Since implementation there is a trend towards reduction in admissions - 1 SS admission only. Our process measure is compliance with the seven point hypoglycaemia bundle – this currently sits at 75%. Our balance measures were: any adverse events, incorrect protocol use and an increase in breastfeeding rates. 1 infant >48 hours with no hypoglycaemia risk factors was treated on this protocol. There have been no re-admissions from home with hypoglycaemia. Out of 71% of women who intended to breastfeed, 28% were exclusively breastfed at discharge.

Conclusions:
This is preliminary data, therefore too early to report trends. Due to the multidisciplinary aspects of implementation, it was important to start small and understand the current systems and processes in place. Implementation has been lengthy and understanding barriers has been key to maintaining interdisciplinary staff engagement. There are ongoing challenges around equipment, the use of two different threshold in term and preterm infants and avoiding person dependency.

Outcome measure



Process measure



3: Reducing Unintended Extubation in a Tertiary Neonatal Intensive Care Unit: A Quality Improvement Initiative (QI).

Mrs Helena Smith[1], Dr Vrinda Nair[1,2]
[1]South Tees NHS Trust, Middlesbrough, United Kingdom, [2]Newcastle University, Newcastle upon Tyne, United Kingdom

Biography:
I work as a practice development nurse/Research Nurse. I have done higher education nursing studies. I have also completed BSc Cons in promoting practice effectiveness.
I am extremely passionate about delivering high quality neonatal care with emphasis on patient safety. I have been involved in important quality improvement projects in our unit of which reducing unplanned extubations is a major one. Along with Neonatal consultant I have implemented practice changes in the unit.

Background: Unintended Extubation (UE) is the fourth most common adverse events and an important quality indicator of patient safety in Neonatal Intensive Care Unit (NICU). It is well recognised that UE in neonates are more frequent than in any other area caring for ventilated patients. UE is associated with adverse events such as hypoxia, hypothermia, airway trauma and ventilator associated pneumonia. UE could result in emergency re-intubation in a poorly controlled environment, with increasing significant stress to the already sick infant, as well as staff members. A retrospective audit in our NICU showed a base line UE rate of 8.3 per 100 ventilation days.

Objective: Through the QI initiative we aimed to reduce the rate of UE by at least 50% from a baseline of 8.3 per 100 ventilation days in 12-24 months.

Design: A retrospective audit performed on all ventilated infants in the NICU showed a rate of 8.3 UE per 100 ventilation days (Jan 2016- March 2017). We evaluated the common factors associated with these UEs with primary reasons being slipping of tube through loose fixation, multiple fixation techniques being used and carrying out cares or procedures with out assistance. Over the course of 2017-2018 we introduced sequential interventions focusing on better practices to improve or overcome these factors. Introduction of standard and uniform endotracheal tube fixation technique, continuous scrutiny of fixation through checks, regular staff education roll outs, advocating two-person technique for cares/procedures, introduction of UE log sheets and critical event reporting were few of the important interventions introduced as part of QI initiative bundle. Details of UE were collected in real time on UE log sheet. Rates of UE for each month were collected and analyzed using QI macros. We used statistical process control to understand the special cause variations and trends.

Results: UE rates reduced by 77% (8.3 to 2.0 per 100 ventilated days) during the QI period (Table 1). We used u chart adjusting UE rates with ventilation days and showed consistent trend of last six data points below the mean UE rate (Fig 1).

Conclusions: In the QI initiative significant reduction in UE rates was achieved by standardizing the fixation techniques, increasing the vigilance and regular staff education. It is important to analyze the critical event rates for continuous and longer period of time to determine the true change.

Table 1:

PDSA Cycle	Time Period	Action	Unintended Extubations per 100 ventilation days
Baseline	April-June 2017	Retrospective audit on all ventilated infants admitted between Jan 2016 to March 2017	8.3
Phase 1	July2017- Feb 2018	Introduction of commercially available ET fixation device Staff Education	5.2
Phase 2	March-May 2018	Two person technique for cares and procedures Critical Event reporting Staff Education	4.0
Phase 3	June2018-March 2019	Introduction of UE log sheets Staff Education	2.0