# Annual Neonatal Simulation & TEL Conference

"Simulating Together & Improving Outcomes"

**September 26th and 27th 2017**

**Venue: Grand Harbor Hotel**

**West quay Road**

**Southampton UK**

## Speakers

**Dr Margarita Burmester**
Consultant PICU Royal Brompton Harefield NHS Trust

**Dr Jonathan Cusack**
Consultant Neonatologist, Lead Neonatal Simulation Leicester UK

**Dr Sarah Davidson**
Consultant Neonatologist, Southampton UK

**Dr Joe Fawke**
Consultant Neonatologist, Lead Neonatal Simulation Leicester UK

**Dr Sijo Francis**
Consultant Neonatologist St George's NHS Trust

**Dr Sheyna Gifford**
Health & Safety Officer NASA HISEAS Mars Simulation Mission

**Professor David Gaba**
Associate Dean & Director of the Center for Immersive and Simulation based Learning Stanford University School of Medicine

**Professor Lou Halamek**
Division of Neonatal and Developmental Medicine, Stanford Director, Centre for Advanced Paediatric and Perinatal Education

**Professor Colin Morley**
Honorary Lecturer, Department Obs Gyn University of Cambridge UK

Dr Jasim Shihab
Sr Clinical Fellow London NTS & Royal London Hospital

**Dr Hannah Shore**
Consultant Neonatologist, Leeds University Hospital Lead Paediatric Simulation Yorkshire

**Dr Jens Christian-Schwindt**
Consultant Neonatologist & Director Sim Characters

**Kristian Thomas**
British Olympic Gymnast

**Dr Maria Tsakmakis**
Consultant Neonatologist Southmead Hospital Bristol

**Dr Donna Windebank-Scott**
Consultant Neonatologist Southampton

## Dr Alok Sharma, Chair & Lead

Dr Alok Sharma is a Consultant Neonatologist at Princess Anne Hospital Southampton. He is a founding member for the Wessex-Oxford Neonatal Education Programme and Lead for the Neonatal Simulation Programme at Princess Anne Hospital Southampton. He is one of the founding members of MPROvE which champions **M**ulti**PRO**fessional Neonatal **E**ducation through simulation and technology enhanced learning. His main areas of interest are cascading medical error and risk through in situ simulation. His current area of research is barriers to the uptake of simulation by multidisciplinary teams and latent threat identification. Work on multidisciplinary neonatal simulation done by his team, and its impact on neonatal outcomes was nominated for the National BMJ Award securing the Runner's Up position in 2014 and was awarded the Best Research Award at ASPIH 2014. He is Course Director the 'Neonatal Ethics and Difficult Situations Course' and 'Simulated Neonatal Airway' which are run nationally in multiple centres in the UK and abroad.

## Dr Ranjit Gunda Co-Organiser and Treasurer

Dr Ranjit Gunda is a Consultant Neonatologist at Rainbow Hospital in India. He was lead for the Wessex-Oxford Neonatal Education Programme and faculty on the MPROvE Neonatal Instructor Programme. Dr Gunda has trained in neonatal intensive care at Aberdeen, Southampton, Leicester and London. Ranjit is pursuing research in 'Nutritional Influence on Surfactant Metabolism in Neonates'. He has completed a research project on the parental perception towards therapeutic hypothermia. His research interest is the use of simulation as quality improvement methodology, in patient safety and risk. His work along with Dr Sharma on 'Multidisciplinary simulation, cost effectiveness and neonatal outcomes' was presented at ASPIH 2014 and awarded 'The Best Research Award'. He founded the Wessex-Oxford Neonatal Education Programme for grid neonatal training in Wessex. Dr Ranjit Gunda has also worked on 'The OPEN concept' and its implementation in procedural skills training in neonatology. This is currently being developed into an app for neonatal trainee's worldwide.

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# 6th National Neonatal Simulation Conference
# Abstract Submission for poster/podium presentations on Conference day 27th September 2017

**Submission by:**

| | | | |
|---|---|---|---|
| **Name** | H.M.Durga Herath | **Job Title** | Speciality doctor<br>( Paediatrics/Neonates) |
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**Submission for:** Both (delete as appropriate)

**Title:** Effective implementation of a protocol on initial stabilization of preterm neonates delivered at less than 32 weeks gestation through a simulation programme in a District General Hospital in Sri Lanka

**Author(s):** H M D Herath, S Somarathna, D S Rajapaksha, P Dissanayaka, G W C Malkanthi, W G Ruwan Kumara

**Abstract:** *(Please consider Background/Method/Results/Conclusions/Key/Messages)*

***Background:*** Effective initial stabilization of preterm neonates in the initial 60 minutes of life (termed neonatal golden hour) helps minimize a number of complications and lead to improved prognosis. Effective resuscitation, respiratory support, maintaining normal temperature ,blood sugar, timely parenteral nutrition, timely treatment of sepsis and a completed admission within 60 minutes of delivery are identified as key components of the golden hour. High intensity and multitude of interventions necessary and diversity of skills of staff involved make it a challenging task. A protocol specifies the essential steps of the golden hour. Simulation-based learning to practise the protocol helps to create a cohesive team.

***Objectives:*** To evaluate effective implementation of a protocol on initial stabilization of preterm neonates less than 32 weeks gestation through a simulation programme.

***Study design:*** Prospective study

***Method:*** A protocol on early stabilization preterm neonates was introduced to neonatal staff via scenario teaching comprising of a simulation followed by debriefing session for each staff member. The extent to which the key components of neonatal golden hour achieved before and after implementation of the protocol were assessed using a checklist.

***Results:*** In the post-protocol group a significant increase was seen in the number of infants resuscitated with optimal preparation ($p<0.05$), infants received glucose infusion and antibiotics ($p<0.01$), infants with blood sugar above 2.6mmol/l ($p<0.05$) and infants with completed admission within 1 hour ($p<0.01$).A significant difference in adherence to thermo-protective measures during stabilization ($p<0.01$) and admission temperature above $36.5^0$C ($p<0.01$) were seen.***Conclusions:*** Implementation of a protocol on golden hour through a simulation programme can significantly improve stabilization of preterm neonates.

# 6th National Neonatal Simulation Conference
# Abstract Submission for poster/podium presentations on Conference day 27th September 2017

**Submission by:**


| | | | |
|---|---|---|---|
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**Submission for:** Podium and Poster

**Title:** Simulation as a Tool for Improving the Quality of Neonatal Resuscitation Skills in Bihar, India


**Author(s):** Brennan Vail, Melissa Morgan, Amelia Christmas, Hilary Spindler, Aritra Das, Sunil Sonthalia, Pushpalata Sharma, Megha Joshi, Dilys Walker



**Abstract:** *(Please consider Background/Method/Results/Conclusions/Key/Messages)*

**Background**

Fourteen percent of global neonatal deaths and half of those in India occur in four Indian states, one of which is Bihar. Birth asphyxia causes one-third of neonatal deaths in Bihar. Little is known about the impact of simulation training on the quality of neonatal resuscitations (NR) in primary health centers (PHCs) in low-resource settings.

**Methods**

This analysis assessed the impact of simulation training, developed by PRONTO International and implemented within CARE India's AMANAT program, on quality of nurse-midwives' NR skills in simulated and live resuscitations. NR simulations were conducted and video-recorded at 160 PHCs across Bihar over 8 months. Mid- and post-training assessment videos were coded for clinical quality indicators. Trainees' performance in live deliveries was documented by simulation facilitators using a phone application.

**Results**

In total, 226 matched simulation videos were evaluated. From mid- to post-training, proper neck extension, positive pressure ventilation (PPV) with chest rise, and assessment of heart rate increased by 14%, 19%, and 12% respectively (all $p \leq 0.01$). No significant difference was noted in stimulation, suction, proper PPV rate, or time to completion of key NR steps. In 252 live, non-vigorous deliveries, identification of asphyxia, use of suction, and use of PPV increased by 22%, 24%, and 26% respectively (all $p < 0.01$) between weeks 1-4 and 5-8 of training.

**Conclusion**

PRONTO training, as part of the AMANAT intervention, had a positive impact on key NR skills in simulated and live resuscitations across Bihar. Simulation training is a promising tool for improving NR skills in resource-limited settings.

# 6th National Neonatal Simulation Conference Abstract Submission for poster/podium presentations on Conference day 27th September 2017

**Submission by:**


| | | | |
|---|---|---|---|
| **Name** | Elbaba M.A. | **Job Title** | Co-chair of pediatric simulation HGH |
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***Title: Need makes innovation: The MPS Solutions***


*Author(s): Elbaba M.A., Bayoumi M.A.*



*Abstract: (Please consider Background/Method/Results/Conclusions/Key/Messages)*

*Background*

*A collaborative work amongst three simulation specialists built a mobile pediatric simulation team named MPS in 2016. We have our own equipment including many manikins of medium fidelity. We also have our SPs and few task trainers. Due to the nature of the MPS which is "mobile", we used to move from our base in Qatar to other countries overseas to conduct our pediatric simulation events. The team faced many challenges because of the mobile nature of simulation to be delivered One of the major challenges is the task trainers; we need to ship or travel with many strange pieces of equipment in the flights.*

*Method*

*To overcome the difficulty of transporting many task trainers required for psychomotor skills and for interventions in simulated practice, MPS has invented four commonly required task trainers in pediatric practice from very basic materials but with high fidelity. These hand-made part task trainers are: Lumbar puncture, chest tube insertion, peripheral IV cannulation and umbilical catheterization for the newborn.*

*Outcome*

*The learners attending our workshops used the newly created task trainers and enjoyed and engaged better during those simulation experiences. The sense of realism which reflects the high-fidelity nature of the models, was achieved as learners mentioned this in their feedback. MPS successfully demonstrated the integration of high fidelity with low technology resources.*

*Conclusion*

*The author will demonstrate and share the newly innovated task-trainers with the audience. MPS believes that creativity is an essential requirement for any simulation specialist or educator.*

# 6th National Neonatal Simulation Conference
# Abstract Submission for poster/podium presentations on Conference day 27th September 2017

**Submission by:**


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|---|---|---|---|
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**Submission for:** Poster or Podium

**Title: Neonatal Education with Simulation Training**


**Author(s): Dr. Kathryn Colacchio MD, Sheila Deitz NNP, Dr. Fernando Moya MD, Deborah Stokes RN, MSN**



**Abstract:** *(Please consider Background/Method/Results/Conclusions/Key/Messages)*

**Background**: When newborns with problems are born unexpectedly in community hospitals, delivery room personnel can significantly impact morbidity and mortality as initial interventions can result in injury, developmental delays and even death. In 2014, infant mortality rates in two southeastern NC counties were more than double the state's overall rate. We travelled to small hospitals in a mobile simulation lab to provide opportunities to practice resuscitation, stabilization and teamwork with the goal of increasing caregiver confidence during the "golden hour" (the first hour after birth).

**Methods**: Led by a neonatologist, the multidisciplinary team facilitated common high risk scenarios (e.g. meconium aspiration, extremely premature infant) in three pilot hospitals with Level 1 nurseries. Nurses, respiratory therapists and physicians were invited to participate in situ allowing for identification and remediation of latent safety hazards. Using evidence-based recommendations from the Neonatal Resuscitation Program, S.T.A.B.L.E and TEAMSTEPPS curriculums, debriefs focused on standards of care and teamwork optimization. A pre and post survey was distributed to assess confidence levels.

**Results**: Participants demonstrated an improvement of confidence in maintaining golden hour measures including temperature control (2.7 out of 5 vs. 4.7 out of 5) and oxygenation levels (3 out of 5 vs. 4.2 out of 5) in the extremely premature infant.

**Conclusions**: Our goal was to improve the stabilization of the critically ill newborn by educating staff members about best practices and identifying latent safety hazards. Participants demonstrated a self-reported improvement on the confidence surveys. Anecdotally it has been a positive experience for all staff involved.

# 6th National Neonatal Simulation Conference
# Abstract Submission for poster/podium presentations on Conference day 27th September 2017


| | | | |
|---|---|---|---|
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**Submission for:** ~~Podium / Poster~~ / **Both** (delete as appropriate)

**Title: '**Transforming neonatal resuscitation training to improve neonatal clinical outcome'


**Author(s): Mrs Sarah Ball** MSc Education, CHSE, BSc(Hons), RN(Child)



**Abstract:**

*Background:*

- Corniche Hospital is the UAEs largest high-risk maternity facility, with 64 cots Level III Neonatal Intensive Care Unit. With 7,000 deliveries per year it is imperative that healthcare providers can deliver effective neonatal resuscitation. It is well documented that reflective multidisciplinary (MDT) simulation team training improves clinical outcome. In 2014 we commenced our journey away from traditional teaching methodologies towards an immersive simulation training model.

*Methodology:*

- RADAR, SMART, fish bone analysis, prioritization matrix, SWOT & literature review.
- Faculty attended CAPE in Stanford, USA and became Certified Healthcare Simulation Educators (CHSE).
- Transformed and adapted the Neonatal Resuscitation Programme (NRP).
- Formed the Neonatal Foundation Life Support Programme (NFLS): Development of a community programme, accredited by the Health Authority Abu Dhabi (HAAD) utilising hybrid in-situ simulation.
- Constructed the first bespoke neonatal and obstetric simulation centre under SEHA Abu Dhabi opened, 2015.

*Results:*

- Base line results from 2014 showed sub-optimum clinical outcome from neonatal resuscitation drills at 52%. With the transformation in neonatal resuscitation simulation training the clinical outcome from neonatal resuscitation drills improved to 91%. Improvements in neonatal clinical outcome have also been seen in the reduction of term admission rates to the NICU to 24.75% (below England and Wales) and reduced rates of HIE admissions to the NICU to 0.20%.

*Conclusions:*

- Transforming our neonatal resuscitation training into an immersive simulation experience has resulted in improved neonatal clinical outcome.

*Key messages:*

- Simulation can improve neonatal clinical outcome, patient safety and staff engagement.

# 6th National Neonatal Simulation Conference
# Abstract Submission for poster/podium presentations on Conference day 27th September 2017

**Submission by:**


| | | | |
|---|---|---|---|
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**Submission for**: Podium/ Poster / **Both** (delete as appropriate)

**Title: Pre Hospital Neonatal and Obstetric Emergencies in the Home (PHONE) 999**


**Author(s):** Samantha Fleming (Practice Development Midwife), Katherine Simpson (Clinical Skills Midwife), Darren Best (Education manager South Central Ambulance), Sara Phillips (Practice Educator Midwife), Hazel Inkster (Practice Educator Midwife), Nicola Pritchard (Neonatal Consultant) and Sunetra Sengupta (Obstetric Consultant)



**Abstract:** *(Please consider Background/Method/Results/Conclusions/Key/Messages)*

Background: The need for combined community midwife and paramedic training became apparent following a number of investigations following incidents of both obstetric and neonatal emergencies at home. Re-occurring themes were identified including poor team work and communication due to a lack of understanding of each other's roles, responsibilities, skills and limitations. There was a lack of knowledge and confidence in both professions regarding obstetric and neonatal emergencies in the home and how to safely and effectively continue neonatal resuscitation in the ambulance.

Methods: To improve team performance and neonatal outcomes South Central Ambulance Service and the practice development team at the Royal Berkshire Hospital worked together to develop the PHONE 999 study day which is multi-professional training for community midwives, paramedics, maternity and emergency support workers. The study day is a combination of lectures and low and high fidelity pre hospital simulations.

Conclusion: Candidates rated their knowledge and confidence on managing obstetric and neonatal emergencies in Pre-hospital settings using a scale of 1 – 5 pre-and post courses. On average the knowledge and confidence of community midwives increased by 31.4% and paramedics by 51.7%. The feedback received has all been positive using words such as "invaluable, excellent, innovative and practical".

Results: We have reviewed notes and seen evidence of good clinical decision making, management of emergencies and effective communication between midwives and paramedics. As part of the project a training DVD was produced to demonstrate safe and effective management of on-going neonatal resuscitation in the home and during ambulance transfer to hospital.

# 6th National Neonatal Simulation Conference
# Abstract Submission for poster/podium presentations on Conference day 27th September 2017

**Submission by:**


| | | | |
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**Submission for:** Both

**Title:** Taking simulation into the NCCU and beyond: working together to innovate and improve neonatal care


**Author(s):** Alison Michaels and Richard Mausling



**Abstract:**

Background: The Neonatal Point Of Care (POC) Simulation program adopts a multifaceted interprofessional approach to address clinical, leadership, teamwork and process issues when caring for the deteriorating neonate. This program aims to scaffold concepts learnt through simulation training offered in Mater Education Practice Improvement Centre (MEPIC) and embed these in environments where clinicians would perform neonatal resuscitation events

.

Method: Twenty neonatal POC simulations were held across a nine month period. Scenarios were developed to encompass the most common situations requiring neonatal resuscitation. These sessions were delivered as short announced simulation events with a structured debrief to follow. The commencement of this program involved a unique strategic team approach with both medical and nursing co-faculty.

Results: Significant adaptations were applied throughout the journey of embedding this program. The interprofessional team engaged in working together to improve and innovate, with this resulting in enhanced engagement staff throughout the neonatal service. Preliminary data demonstrates increased clinician confidence across non-technical skills required to resuscitate a deteriorating neonate. Furthermore, a number of process and systems issues were identified and improved as a result of allowing the review of processes involved in POC simulations that were undertaken.

Conclusions: Successfully embedding the program into the clinical area saw improved engagement in simulation-based education. This program has allowed participants to identify process and communication issues inherent in the clinical environment and has energised these participants with the ability to be innovative in improving processes and communication to ensure the provision of low variability patient care.

# 6th National Neonatal Simulation Conference
# Abstract Submission for poster/podium presentations on Conference day 27th September 2017

**Submission by:**


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**Submission for:** Podium/poster

**Title:** Supporting Care of the Sick Neonate: Networking individuals and fostering inter-unit rapport through shared learning using mixed LNU/SCBU/NICU teams


**Author(s):** Pillay T, Clarke L, Cookson J, Rasiah, V for the SSN Faculty Staffordshire, Shropshire & Black Country (SSBC) and Southern West Midlands (SWM) Neonatal Operational Delivery Networks (ODNs)



**Abstract:**

**Introduction**: A bi-network initiative aimed at optimising support for sick neonates especially where care is shared between LNU/NICU/SCBU teams was developed: its objective to facilitate engagement using small group, confidential, and shared-experience learning. This educational contract focussed on networking individuals from different neonatal units, fostering inter-unit rapport, providing consultant decision making support, and management of teams in complex clinical situations.

**Methods**: High and low fidelity simulations, together with workshops and augmented by 20 minutes reflective time post-scenario-debrief were conducted, to promote networking, sharing of experiences, and facilitate bi-directional learning and rapport. This was supported by a multidisciplinary faculty of 24. At the end of each course an evaluation form was completed by candidates; these outcomes are reported.

**Results**: Between October 2015-January 2017, 81 team members from 9 neonatal units participated in the course. This included 37 consultants (4 NICU, 18 LNU,15 SCBU), 17 neonatal nurses, 19 trainees, and 8 ANNPs. The course was rated as highly relevant with high quality materials supporting LNU/SCBU/NICU teams. Inter-team engagement was supported: 76% did not mind not knowing all the members of their simulation scenarios; 64% had no objections to this not being point-of-care; 18% had no opinion on this. Candidates found the course valuable and re-enforced their own leadership, communication and team building skills, strengthening inter/intra-unit rapport. They supported continued professional development in this format.

**Conclusion**: This shared care learning, through networking individuals from different neonatal teams has proved a useful adjunct facilitating inter-unit-engagement within our SSBC and SWM Neonatal ODNs.

# 6th National Neonatal Simulation Conference
# Abstract Submission for poster/podium presentations on Conference day 27th September 2017

**Submission by:**


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|---|---|---|---|
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**Submission for~~: Podium/ Poster /~~** Both (delete as appropriate)

**Title:** Learning from in-situ Neonatal Simulation: 3 Years of Participants' Feedback


**Author(s):** Dr Kylee Walker, Tracey Clohessy, Janice Duckett, Dr Victoria Fradd, Dr Imogen Storey, Dr Pinki Surana



**Abstract:** *(Please consider Background/Method/Results/Conclusions/Key/Messages)*

**Background:** In-situ simulation in intensive care setting prepares professionals for challenging scenarios in a safe environment. Deliberate practice in a time-pressured, task-heavy clinical environment is realistic, helping with technical and cognitive skills alongside recognition of human factors.

**Method:** A high-fidelity, in-situ simulation training was established in a tertiary neonatal unit in December 2013 with fortnightly sessions. We collected structured participants' feedback on the quality of debriefing, their self-confidence before and after each session and whether the simulation was realistic, relevant to their training and would change their practice. Participants were also asked to provide two "learning points" and suggest areas for programme improvement. Feedback from 59 sessions covering 16 different clinical scenarios from December 2013 to October 2016 was analysed.

**Results:** Of the 292 feedback forms reviewed, majority of the participants reported the simulation was highly relevant to their training and would change their practice. The debrief quality was rated highly. There was notable improvement in reported self-confidence after the session. 39% of the learning points related to clinical management, 38% to human factors and 24% to clinical skills. Human factors which featured highly were communication, leadership and anticipation or planning. Suggested improvements were to create a more believable environment and more frequent sessions.

**Conclusion:** In–situ neonatal simulation training is highly valued by both doctors and nurses and improves their reported confidence – more than a third of reported learning related to human factors. Given the human factors contribution to clinical incidents, this would be expected to improve patient safety.

# 6th National Neonatal Simulation Conference
# Abstract Submission for poster/podium presentations on Conference day 27th September 2017

**Submission by:**


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**Submission for:** Poster

**Title:** Quality Improvement of Peak Inspiratory and End Expiratory Pressure Settings during Infant Resuscitation at Birth.


**Author(s):** Felicity Brokke, Amy Skinner, Victoria Lander, Alison Clark and Ghada Ramadan



**Abstract:** *(Please consider Background/Method/Results/Conclusions/Key/Messages)*

**Aims:**
In-situ simulation training indicated the need for accurate setup of peak inspiratory pressure (PIP) and positive end expiratory pressure (PEEP) prior to newborn resuscitation. Our project aimed to improve the quality of team learning from latent inaccuracies in PIP and PEEP settings, to reduce harm and improve outcomes for newborn infants through a series of targeted interventions.

**Methods:**
During 2016, we undertook a quality improvement project to measure baseline set-up of resuscitaires in the delivery suite. The first PDSA (plan do study act) cycle was performed through a prospective daily check of all resuscitaires (n=12) PIP and PEEP settings over a one-week period. When issues were identified, an “on the spot” one to one training of midwifery staff was performed. During the second PDSA cycle we introduced “resuscitaire flashcards” to be used as an aid memoire for the daily safety checklist.

**Results:**
During the first PDSA cycle, 10% of resuscitaires PIP was high (>30 cm H2O) and PEEP was set incorrectly in 48%. Inaccuracies in PEEP were either too high flow settings (>5 cm H2O) in 22% of cases or too low flow settings (<5 cm H2O) in 26%. Following the interventions, 100% of PIP was correctly set and only 11% of PEEP was inaccurate. Overall, this quality improvement programme led to 76% improvement in performance.

**Conclusion**:
Targeted quality improvement interventions through simulation have improved PIP and PEEP resuscitaires settings. This led to a reduction in latent errors and improved care given to newborns requiring resuscitation at birth.

# 6th National Neonatal Simulation Conference
# Abstract Submission for poster/podium presentations on Conference day 27th September 2017

**Submission by:**


| | | | |
|---|---|---|---|
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**Title:** The Use of Simulation Education to Promote Delivery Room Euthermia in Preterm Infants


**Author(s):** Alana Barbato, Elizabeth Wetzel, Lisa Mayer, Bobbi J. Byrne



**Abstract:**

Background:

Thin skin, decreased brown fat and increased surface area to mass predispose preterm infants to heat loss in the delivery room. Hypothermia leads to cardiorespiratory compromise, hypoglycaemia, and increased long term morbidities and mortality. Preterm infants born in community hospitals versus tertiary centers also have increased morbidities and mortality.

Methods:

To improve admission temperatures and outcomes, the Indiana University Neonatal Outreach Simulation team provided education on preterm infant delivery room management at 25 community hospitals in the state of Indiana, USA. 471 providers completed pre and post-tests on cognitive knowledge and participated in standardized simulated scenarios with team scoring. After structured debriefing participants repeated the scenario which was also scored. 6-12 months later, the sites were revisited to evaluate knowledge and skill retention.

Results:

Improvements in provider knowledge was demonstrated on cognitive tests with average scores improving from 49% to 94% (p-value <0.001). Scenario scores demonstrated team deficits most notably with regards to thermoregulation methods and polyethylene bag usage (Figure 1). Repeat scenario scores showed statistically significant improvements in all aspects of the resuscitation. Preliminary data from second visits has shown some attrition in knowledge and skills though overall improvement from initial performance (Figure 2). Chart reviews demonstrating the effect of education on preterm admission temperatures are underway.

Conclusions:

A structured simulation education intervention on preterm infant thermoregulation improves community provider's immediate knowledge and skills as well as performance 6-12 months after the education. Chart reviews to ultimately show the true clinical impact of the education are underway.


| | Visit 1, Initial Scenario | Visit 2, Initial Scenario | Visit 1, Repeat Scenario | Visit 2, Repeat Scenario |
|---|---|---|---|---|
| Baby in bag | 68/108 (63%) | 72/86 (84%) | 108/108 (100%) | 86/86 (100%) |
| Time (sec) | 44 | 18 | 13 | 5 |

Figure 1: Percentage of polyethylene bag usage by groups along with time to place the infant in the bag after birth. *Visit 2 Data is preliminary.

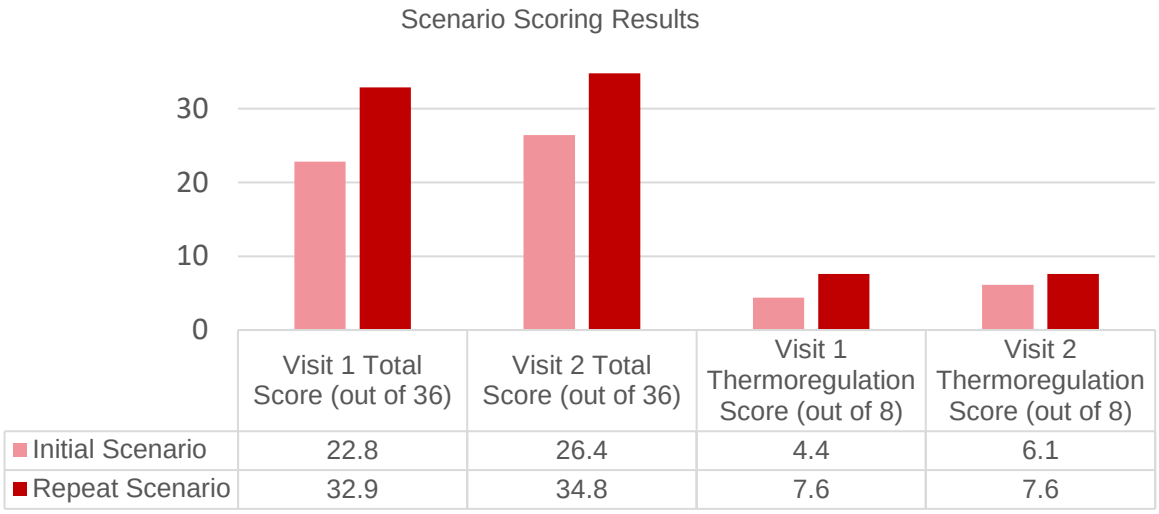


Figure 2: Team scenario scoring based on total team performance and performance of thermoregulation tasks. *Visit 2 Data is preliminary.

# 6th National Neonatal Simulation Conference
# Abstract Submission for poster/podium presentations on Conference day 27th September 2017

**Submission by:**


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**Submission for:** Both

**Title:** Quality Improvement (QI) Program to improve the healthy survival of preterm neonates without severe retinopathy of prematurity (ROP) in Level-2 Neonatal Units in India


**Author(s): Anu Sachdeva, Deepak Chawla, Praveen Kumar, Ashok K Deorari, Sonica Raj**
**Presenting author: Anu Sachdeva**



**Abstract:** *(Please consider Background/Method/Results/Conclusions/Key/Messages)*

*Background*

Quality improvement initiatives can improve the healthy survival of preterm neonates without ROP by adherence to evidence-based healthcare practices,

*Objectives*

- To assess current levels of knowledge, skills, attitudes and practices of health-care personnel's, parents and administrators about clinical care pathways
- To formulate, pilot test and finalize an educational package of interventions to improve the practices and the processes of care related to risk of ROP

*Methods*

A mixed-methods cross-sectional study (for objective 1) was conducted at level 2 neonatal units in India. The listed parameters were assessed in five domains i.e. good control of oxygen therapy, improving nutritional status, less exposure to blood products, less systemic infections and good developmental support. Study tools included focussed-group discussions, in-depth interviews, multiple-choice questions, objective structured clinical examinations and direct observation of care.

*Results*

A total of 4 SNCUs, 27 doctors, 46 nurses and 19 parents were enrolled for the study. Monitoring of oxygen therapy was hampered by lack of knowledge of alarm limits, practice of muting alarms and non-availability of pulse oximeters. Majority of participants knew that breast-milk is first choice for feeding of preterm neonates; however, babies invariably got other milk. Involvement of families in the care of preterm neonates was hampered by restriction of entry in the unit. Lack of knowledge of criteria of screening for ROP, non-availability of local ophthalmologist and lack of sensitization of parents about importance of ROP screening was resulting in poor screening of ROP.

Educational package (will be shared with participants) is planned to be tested using debriefing in simulation labs. Delivery will be as "hub and spoke" model wherein nodal center hub being the medical college and the level 2 neonatal units in the adjoining areas as the spokes, and thus the dissemination of knowledge and competency based skills shall be imparted.

**Conclusions**

Prevalent poor healthcare practices which result in high incidence of ROP and lack of quality screening of eligible neonates indicates an urgent need to implement QI methodology in level 2 units.

# QCPR Feedback trial: Comparison of different resuscitation feedback methods during randomized pediatric simulation training

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**Background**

Highest quality of pediatric resuscitation skills is required to ensure the safety of hospitalized children. Therefore, Medical Universities provide pediatric resuscitation trainings to their students. The positive effect of feedback devices has been reported previously, respective studies showed limitations due to either small numbers of trainees or their focus on adult life support only.

**Methods**

A total of 653 medical students, who participated in their mandatory pediatric basic life support (PBLS) course were included. Participants were instructed to practice at one of two different manikin models (baby and adolescent; n= 344 and 309, respectively). Participants were randomized to three different groups: **Group A** (n=225, instructor feedback (IF) group) received a traditional instructor-led class without additional feedback devices. **Group B** (n=223, device feedback (DF) group) had access to direct visual feedback during PBLS from a feedback device only. **Group C** (n=205, instructor and device feedback (IDF) group) received feedback from an instructor who simultaneously received feedback about the trainees' chest compression performance from a feedback device in real-time.

**Results**

The overall Kruskal-Wallis test showed significant group differences ($p<0.0001$). Participants in both feedback groups (B and C) had statistically significant better chest compression scores when compared to instructor led-classes. Of all studied parameters, „enough depth" (all groups $p<0.0001$) and „release" (group A and C $p<0.0001$, group B $p=0.0205$) showed the highest statistically significant difference with better results in the baby compared to adolescent manikin.

**Conclusion and Discussion**

Our study compared three different feedback methods in two different manikin groups. We could show a significantly improved chest compression performance in a pediatric resuscitation simulation setting depending on feedback method. High quality chest compressions are the cornerstone of cardiopulmonary resuscitation to improve outcomes. Feedback devices should be used during pediatric resuscitation training to improve resuscitation performance.

# 6th National Neonatal Simulation Conference
# Abstract Submission for poster/podium presentations on Conference day 27th September 2017

**Submission by:**


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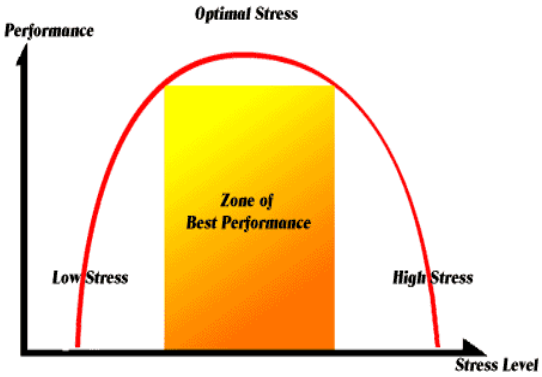
**Submission for:** Both

**Title:** **Neonatal simulation, the new fat burner for paediatric trainees**: Effect of in situ high fidelity neonatal simulation training on the heart rate of neonatal trainees at a single tertiary NICU.


**Author(s):** L Boucher, S Ellis, J Daly, A Dunlop


**Abstract:**

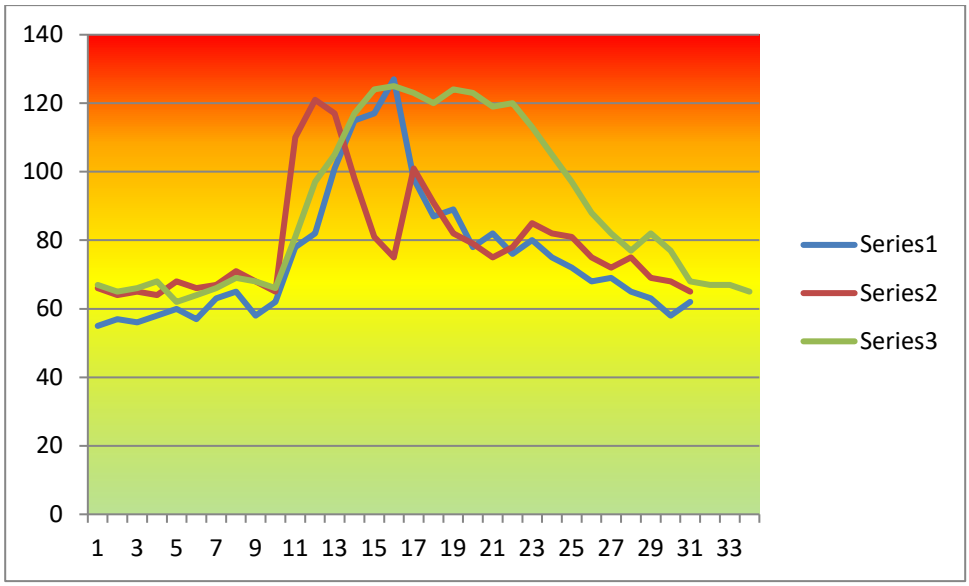

Stress is not necessarily a negative state and cognitive literature demonstrates an inverted U relationship with performance showing an optimal level of stress for performance.




Finan et al. states that within paediatrics there is a risk of trainees becoming over stressed in emergencies due to their relative infrequency and the need to perform at the highest level of competency.

**Methods**: Prospective pilot study of Paediatric trainees at a single tertiary NICU. Heart rate was recorded for the 10 minutes prior to simulation, for the duration of the simulation and during the de-brief. Pilot study was performed over 2 months in 2016

**Results:**




An average rise in HR of 61bpm a 96% increase from baseline. An average of 18 minutes was spent with a heart rate above baseline from the start of simulation taking 8 minutes to return to baseline. Dips In heart rate were noted when more senior help arrived whereas inter-team conflict created further rises in heart rate.

**Conclusions**: Neonatal simulation does provoke a physiological response that can be objectively measured and there is feasiblity to upscale this project. There is scope to compare data from simulation and “real life” resuscitation as well as expanding the measures of physiological stress to include salivary cortisol levels, peripheral skin temperature and electro dermal skin activation. This data could be used to tailor simulations to target an optimum stress response to improve team performance and learning with the aim of improving outcomes in real life resuscitations potentially improving outcomes on the neonatal unit.

# 6th National Neonatal Simulation Conference
# Abstract Submission for poster/podium presentations on Conference day 27th September 2017

**Submission by:**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**Submission for:** Podium

**Title: Feasibility and Usability of a Mobile Neonatal Simulation Training Tool**


**Author(s): Ms. Elena Taylor, Dr Hilary Edgcombe, Dr Chris Paton, Dr Anne Geniets, Mr Jakob Rossner, Dr. Linden Baxter, Prof. Niall Winters, Prof. Mike English**



**Abstract:** *(Please consider Background/Method/Results/Conclusions/Key/Messages)*

BACKGROUND: Simulation for training health workers in neonatal resuscitation techniques is well established in both high-income and low-income settings. However, many health workers in the low-resource world have difficulty accessing up to date training at sufficient frequency to maintain their skills and knowledge. Scaling context-appropriate training remains a considerable challenge in much of the world. We have developed simulation-related training tools employing low-cost smartphone technology, based on the East African ETAT+ course content.

METHOD: We conducted a mixed-methods feasibility and usability study to determine the stability, performance and acceptability of a prototype smartphone-based neonatal training application. A rapid iterative stepwise study was conducted over an 8-month period with nursing students from the UK, exploring usability and new features introduced into the tool over 8 iterations. Both “experienced” and “naïve” groups tested the app in each version, and qualitative data was retrieved using interview and focus group methods to inform the next stage.

RESULTS: We describe a novel approach to the rapid development of a technology-based training tool for neonatal simulation, based on iterative testing of new versions with both experienced and naïve users. This provides a basis for further research in the LMIC setting.

CONCLUSIONS: Collaboration between Kenyan and British teams including paediatricians, specialists in education and medical simulation and software developers has resulted in successful development of a basic proof-of-concept mobile app based in a simulated 3D environment.

# 6th National Neonatal Simulation Conference
# Abstract Submission for poster/podium presentations on Conference day 27th September 2017

**Submission by:**


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**Submission for:** Podium only please (delete as appropriate)

**Title: Using simulation to identify latent safety threats during neonatal MRI intramural transport**
**Using simulation to identify latent safety threats during neonatal MRI intramural transport**

**Author(s):** Jonathan Wong[1,3], Kaarthigeyan Kalaniti[1,3]. Michael Castaldo[1,3], Kyong-Soon Lee[1,3], Hilary Whyte[1,3], Manohar Shroff [4], Douglas M. Campbell[1,2,3]

**Background**
In-situ simulation can be used to identify latent safety, allowing for improvement of process and policy in complex health organizations. Magnetic resonance imaging (MRI) is a frequently used imaging modality but is remotely located from the neonatal intensive care unit (NICU) and can be hazardous for fragile patients. Our aim was to use simulation to identify latent safety threats (LST) during intramural transport for neonatal MRIs and to improve understanding of neonatal intramural transport processes.

**Methods**
A prospective observational study was conducted in a tertiary neonatal intensive care unit after ethics approval. Simulated 'runs' consisted of taking a neonate with hypoxic brain injury (MRI-compatible low-fidelity manikin: intubated or non-intubated) to the MRI suite and returning to the NICU. Data was obtained through: LST checklist, debriefing and video observation.

**Results**
Of 10 simulated runs, 4 were completed by trained transport teams, 3 by ad-hoc clinicians and 3 by scheduled intramural teams (intramural nurse & transport MD). 116 LSTs were seen (11.6 LST/sim). LSTs included: medication, equipment/environment, anticipation, communication, and systems issues. Medication-related safety hazards were self-reported in all sims. Environmental threats included: patient tubing/lines, poor knowledge of MRI room layout, and activating assistance. Differences in checklist performance were noted between dedicated transport teams and other teams. 68% of clinicians reported increased mental & physical workload during the simulations.

**Take home Messages**
In-situ simulation was able to identify a number of significant LSTs during neonatal MRI transport, with variation among different team configurations. Intramural checklists and team orientation are now being changed to improve safe practice.

# 6th National Neonatal Simulation Conference
# Abstract Submission for poster/podium presentations on Conference day 27th September 2017

**Submission by:**


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**Submission for:** Both (delete as appropriate)

**Title: Debriefing immediately following acute events: a neonatal unit experience**


**Author(s): J Hull, N Velauthan, N Aziz, D Duffy, C Battersby**



**Abstract:** *(Please consider Background/Method/Results/Conclusions/Key/Messages)*

**Background**: The PEDAL (post event debrief and learning) project aims to implement routine team debriefs following actual acute events, gathering the team during or immediately after the shift. It is difficult to integrate simulation into in-house teaching. Debrief post simulation is an integral part of the learning. Adult learning theory emphasises practical, relevant, experiential learning. We hypothesise PEDAL will both enhance the learning process and reduce repeat system and communication errors by identifying areas for development within the clinical governance framework.

**Methods:** Our multidisciplinary survey identified prior practice of debriefing, attitudes toward debriefing and perceived barriers. The PEDAL proforma was designed and implemented.
A monthly bulletin was sent out summarising learning points. Educational and system issues were addressed. The Survey will be repeated post intervention.

**Results**: Of 29 staff surveyed, only 17% felt debrief often occurred with 8% having never experienced it. Those with experience of debrief found it useful. 74% felt debrief should occur immediately. Our first monthly bulletin reflected 5 debriefs involving 20 clinicians. Common themes in learning points included communication and equipment. Learning needs identified are being addressed in ongoing departmental training.

**Conclusion:** Feedback suggests clinicians find acute debriefs useful and they identify areas for development. It is feasible to run acute debriefs on a busy neonatal unit. Our experience suggests leadership and engagement from senior team members and a shift in culture is needed for the programme to be sustainable. We aim to embed the PEDAL process in routine clinical practice giving both training and governance benefits.

# 6th National Neonatal Simulation Conference
# Abstract Submission for poster/podium presentations on Conference day 27th September 2017

**Submission by:**


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**Submission for:** Podium

**Title: Pitstop-perfect performances: lessons to be learnt from industry**


**Author(s):** Hayward R, Hayward A, Cleaton L, C Doherty



**Abstract:**

**Aim**

To optimise practices in neonatal resuscitation using the processes used by a Formula One (F1) team.

**Methods**

Processes involved in neonatal resuscitation were identified and analysed. Three main components were selected for development: resuscitation equipment, the space available for resuscitation teams and team dynamics. Each component was analysed with a F1 team and comparisons drawn with practices conducted during a pitstop i.e. a dynamic, time critical task performed by a multi-professional team. Changes were made to each component for example, streamlining the equipment trolley, implementing a neonatal footprint in delivery theatres and developing key elements of effective team working.

**Results**

A colour coded resuscitation trolley has been developed enabling direct access to essential items during resuscitation. Checklists, a user manual and 'on-the-spot' tests have reinforced learning and familiarisation with the resus trolley. The implementation of a dedicated area in delivery theatres (cleared in neonatal emergencies) has enabled direct access to the patient and equipment by all members of the team. Clear allocation of roles to team members, critical appraisal of each resuscitation, fault listing and debriefing sessions will improve how team members interact and identify factors that influence their performance.

**Conclusions**

Lessons from F1 can be incorporated throughout the healthcare system. Team performance is dependent upon having a defined leader and clearly identified responsibilities for all team members. Access to essential equipment, adequate training and preparation (simulation scenarios) checklists and debriefing opportunities are essential for optimising team efficiency and providing optimal patient care.

# 6th National Neonatal Simulation Conference
# Abstract Submission for poster/podium presentations on Conference day 27th September 2017

**Submission by:**


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**Submission for:** Both (delete as appropriate)

**Title: Combining Learning Theories and Research With Clinical Experience to Design Effective Simulation Sessions For Neonatal Trainees**


**Author(s): Dr Sarah Mccullough**



**Abstract:**

**Aim**

To design the most effective simulation learning activity with the objective of allowing trainees to recognize and manage a neonate with a pneumothorax.

**Background**

The implementation of the Working Time Directive invariably reduced clinical exposure for trainees to conditions that occurred less frequently such as neonatal pneumothoraces. On questioning previous trainees at the end of their neonatal post on our unit on which procedures they would like more training on, chest drain insertion was frequently mentioned.

**Method**

A review of the current literature was undertaken to identify the key features required to ensure an effective design. Mastery learning, deliberate practice and progressive fidelity were identified as features of simulation that led to effective learning.[1,2] Further review of the literature was then undertaken to understand the underlying theories and evidence for the use of these concepts.

**Results**

The final teaching session involved two teaching models, a didactic session focusing on acquiring knowledge and simulation sessions allowing practical application of that knowledge. The simulation sessions were based upon real clinical cases, included domain-related activities required to develop expert practice and incorporated a mastery learning model. The fidelity of the simulation sessions progressed from low to high fidelity as the participant's competence improved.

**Conclusion**

A teaching session was designed to meet the needs of inexperienced trainees working on a tertiary neonatal unit. All teaching should be based on sound theoretical background and scientific evidence.


**References**


1. Issenberg et al, 2005. Medical Teacher, 27(1), pp 10-28
2. Motola et al, 2013. Medical Teacher, 35(10), pp e1511-e1530