

## 'STEP UP': UTILISING SIMULATION TO ASSIST IN THE TRANSITION FROM MEDICAL SENIOR HOUSE OFFICER TO REGISTRAR

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**Background:** Core medical training was replaced by Internal Medicine Training (IMT) in August 2019. One of the more notable changes was the introduction of a 3<sup>rd</sup> year, known as IM3, to IMT. This year is considered a step-up year or a junior registrar year, where advice from a supervising physician is readily available. To assist with this transition, we created step-up simulation-based scenarios. Previously, it has been demonstrated that simulation is an important tool in improving the confidence and knowledge of first year doctors. Simulation provides doctors an ethically and educationally safe setting to develop their practice [1]. The purpose of these scenarios is to replicate the complex patients and dynamic environments that on call general medical registrars need to manage.

**Methods:** We created an in-person teaching day, entitled 'Step up', which consisted of four 20-minute, IM3 specific, high-fidelity scenario-based simulations. In each scenario, a computerised full-body manikin (SimMan Essential) was used. The manikin could be programmed to provide physiological response to scenario participants' actions. The participants were each tasked to assess an acutely deteriorating patient (the manikin), whilst managing a demanding bleep to add realistic distractions and human factor issues to the scenario. Each participant completed one scenario and watched their peers complete the others from a separate room. Following this, participants were debriefed by qualified member of staff and then taught by a speciality registrar or consultant. Feedback forms were collected. The participants were tasked to rate the simulation day, using a nominal Likert scale from 1 to 10, for usefulness, relevance, clarity, and overall quality. 1 represented strong disagreement and 10 strong agreements with a particular domain.

**Results:** Across 4 full days, we had 11 IM3 doctors take part in the 'step up' scenario-based simulations. 9 of the 11 participants completed feedback forms. Scores ranged from 8 to 10. Median scores for all domains were 10.

**Conclusion:** We have demonstrated that 'step up' scenarios are a useful and relevant aid for those transitioning into IM3. Further research utilising comparative data will provide more meaningful conclusions. We will be repeating the simulation programme for the next cohort. We will have baseline, one and three-month follow up questionnaires to assess these scenarios further.

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## SIMULATING PRETERM BIRTH IN THE COMMUNITY

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**Background:** Childbirth can be unpredictable in its timing and clinical course. Unplanned pre-hospital birth occurs in 0.5% of babies [1]. Premature babies are also born in the community and in these cases, every minute matters in order to reduce morbidity and mortality. Hypothermia has been shown to cause a rise in mortality in low-birth-weight infants – in fact a 28% rise per 1 degree decrease in admission temperature [2].

In 2020–21 webinars were delivered to West Midlands Ambulance Service (WMAS) paramedics to improve their knowledge and expertise when attending preterm births [3]. This encompassed training on basic Neonatal Life Support skills and a focus on thermoregulation. A heated mattress is also now carried routinely by WMAS. There was overwhelming positive feedback [3] so the education was expanded.

Our aim was to show the clinical management of a marginal preterm infant in the community focussing on simple interventions known to improve outcomes such as delayed cord clamping and optimal thermal care.

**Methods:** The simulation involved a low-risk term pregnant woman who went in to preterm labour and quickly delivered at 35 weeks. The paramedics attended as the baby delivered. It established regular respirations with simple airway manoeuvres. They used a heated gel mattress to maintain the baby's temperature and allowed delayed cord clamping and then conveyed the mother and infant to hospital for assessment.

**Results:** The simulation was recorded and is now being used to deliver training to West Midlands Ambulance Service. The paramedics who attended stated how much it had increased their confidence in managing a preterm delivery and consolidated their learning from the previous webinar.

**Conclusion:** We expect that with increased staff training and confidence, the incidence of preterm babies admitted with hypothermia following an unexpected birth in the community will reduce, thus reducing mortality.

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## VISUALISATION OF THE TRANSMISSION OF MICROBIAL PARTICLES IN THE NEONATAL INTENSIVE CARE UNIT

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**Background:** Neonates in intensive care are vulnerable to colonisation and invasive infections from multi-resistant gram-negative bacteria [1]. In 2021 our neonatal unit (NNU) fell victim to an ESBL-Klebsiella outbreak. An outbreak control plan was formulated that included education; hand-hygiene

and cleaning auditing; cohorting infants; mass screening infants and environment; and reduction of equipment in clinical areas. Our NNU has an active multidisciplinary simulation programme. Simulation is an effective educational tool to increase competence of healthcare providers [2]. We wanted to use simulation to highlight the ease of transmission of particles from a colonised infant.

**Methods:** The simulation involved a preterm 28-week infant corrected to 35-week gestation with numerous desaturation episodes. The baby was known to be colonised with pseudomonas. A 'monitored' low-fidelity manikin was placed in a cot in an isolation room. Candidates were unaware that the manikin was covered with ultraviolet powder. The manikin had numerous desaturation and bradycardic episodes necessitating airway and breathing support, clinical assessment, and septic screen. The spread of powder was assessed afterwards with a black-light.

**Results:** The simulation lasted just 8 minutes. There were exemplary unprompted infection-prevention measures with appropriate handwashing and personal protective equipment. Despite this the powder spread to staff facemasks, stethoscope, resuscitation equipment, patient trolley, and monitor.

**Conclusion:** This demonstrated the ease of transmission of particles to other surfaces despite adherence to infection prevention policies. Most striking was the transmission to candidates' facemasks which are not routinely changed, and could be a potential risk of carriage of microbes to other infants.

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## SIMULATING COMMUNITY OBSTETRIC AND NEONATAL EMERGENCIES

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**Background:** Childbirth can be unpredictable in its timing and clinical course. Low-risk pregnant women can choose to deliver their infants at home, with 1 in 50 women in England and Wales choosing a home birth [1]. However, for those giving birth for the first time, there is an increased risk of adverse perinatal outcomes when compared to an obstetric unit – 5 in 1000 for a hospital birth compared to 9 in 1000 for a home birth [1], and 45% of nulliparous women are transferred to an obstetric unit [2]. Obstetric emergencies can occur and infants are born in poor condition. In these cases, every minute matters to reduce morbidity and mortality. Expertise and resources are also limited in the community; midwives and paramedic crews must work synergistically to achieve the best outcomes. Our aim was not only to show ideal clinical management of a combined neonatal and obstetric emergency but also to explore multidisciplinary

team working, communication, and human factors of these complex situations.

**Methods:** The simulation involved a low-risk term pregnant woman who has chosen to have a home birth. It was filmed in a house for authenticity. In attendance were a community midwife and maternity assistant. The baby was born in poor condition: floppy, pale with no respiratory effort, and bradycardic. Neonatal life support was given up to and including chest compressions with good recovery of heart rate but no spontaneous breathing, therefore, requiring supraglottic airway insertion. The handover was given to the paramedics and the infant was conveyed to the neonatal unit. The scenario then unfolded with the mother also having a postpartum haemorrhage requiring oxytocin, syntometrine, misoprostol, tranexamic acid, and fluid resuscitation, utilising a second paramedic crew and transfer.

**Results:** The simulation was recorded as exemplary management of this situation. It will be used to deliver training to West Midlands Ambulance Service and community midwives; aiding as a discussion point for clinical management, communication strategies, team leadership, roles, and delegation. We will collate written feedback on its impact on both paramedic and midwifery confidence levels. The community midwife, midwifery assistant, and paramedics who attended stated how much it had increased their confidence in managing a dual emergency, and affirmed their roles and responsibilities in such cases.

**Conclusion:** We expect that with increased staff education and confidence, the outcomes of babies born in the community in unexpectedly poor condition will improve.

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## WIDENING ACCESS TO SHINE (SIMULATION TO HELP IN NEONATAL EMERGENCIES) TO INCLUDE NEONATAL QUALIFIED IN SPECIALTY (QIS) COURSE STUDENTS

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**Background:** Simulation is known to improve clinical skills and team communication. A full-day neonatal emergency simulation course was established in 2018 for paediatric postgraduate doctors in training. It consists of four scenarios and two workshops for eight candidates; running 4 times per year. The candidates are split into 2 groups allowing each to 'lead' a scenario with traditionally faculty placed as nursing plants. In contrast, simulations run on our neonatal unit involve both nursing staff and medical candidates, allowing for true multidisciplinary working. Access and funding for simulation can be more difficult for nurses but it is known that the protected environment and the sense of security enhance nursing students' self-esteem and confidence, thus promoting learning [1]. The aim of the study was to make the SHINE course more authentic to real life with a multidisciplinary approach to the scenarios; to see if inviting