More and more eminent healthcare professionals are working together to help embed simulation training within the paediatric healthcare curriculum. Seventeen UK consultants at the forefront of paediatric healthcare came together at the Royal Children’s Hospital in Manchester on 6th February 2012 to deliver the latest findings at the national inter-professional paediatric simulation symposium.

Over one hundred nursing, medical and allied healthcare professionals from around the country converged to listen to an impressive programme of presentations about how simulation is being used to hone communication, clinical and social skills in all situations ranging from birth and uncommon treatments to palliative care and death.

Introducing the symposium on behalf of the Inter-professional simulation network, symposium organiser Ralph McKinnon stated how rapidly interest in simulation has grown in recent years. He encouraged delegates to take home inspiration from the emerging ‘showcase’ material and help increase the use of simulation across all paediatric-training disciplines.

Throughout the day, common themes included the merits of using simulation to improve understanding of roles in inter-professional teamwork at all levels and in all disciplines. Many agreed that although simulation training was making a difference, one of the biggest hurdles to overcome was the problem of releasing nurses for training.

**Accelerated learning**

Simon Newell, Royal College of Paediatrics and Child Health, opened the presentations by discussing the use of simulation in training and assessment. “Twenty years ago, it was necessary to have 45,000 hours of training experience before going into practice. Now, the number of required hours has been reduced to only 15,000 hours of training. To improve and sustain patient safety, we need to develop different training methods, such as on-site training facilities so that it can become easier to release staff for regular training during working hours,” he said.

“Inter-professional communication problems are the root cause of term perinatal mortality. Simulation can be used very effectively to give people experience in uncommonly
encountered clinical and emotional situations, and can dramatically help people understand the need for improved communication and assertiveness. This kind of experience helps people deal with incidents safely, efficiently and with confidence. Unless you are already seeing the benefits of using simulation training, it is impossible to understand how it can accelerate skills learning. The use of simulation is increasing but to reach the stage at which we can embed it in the curriculum we need everyone to be aware of what’s on offer.”

Talking about the possibility of simulation being used for assessment purposes in the future, Mr Newell mentioned the new START assessment for level 3 candidates, on which David Grant is leading on simulation. He explained, “Simulation is perfectly suited to being a formative tool. Here in the UK, we are lucky that the NHS system allows many of us to develop progressive networks, come to meetings of this type and drive new ventures to help embed simulation into the curriculum. Once simulation’s validity, reliability and feasibility and a framework of standards have been measured and fully evidenced, it may well be used widely as an assessment tool.”

“Simulation is perfectly suited to being a formative tool.”

The current employment of simulation in inter-professional training

Suzanne Gough, Manchester Metropolitan University, is looking at current drivers, innovations, challenges, barriers and research gaps in order to evidence the importance of using simulation to improve inter-professional teamwork. She is in the process of studying local, regional, national and international projects, particularly at collaborative nursing projects in America and in physiotherapy across Australia. “Simulation has an increasingly important role in bridging the gap between university-based education and clinical placements in undergraduate healthcare programmes,” she said, “but providing either inter-professional simulation or clinical placements are often difficult due to the variability of different professions’ programme requirements.”

In simulation, no two experiences are the same. It is unlikely in some countries that simulation will replace clinical placement experience due to cost issues.

“It is possible that the use of simulation could be used to accelerate experience, and there are positive, qualitative results. But there is still a way to go before it is embedded in the curriculum the world over. Right now, in most cases, it’s being used as a bolt-on or short course. Evidence is lacking in the impact of simulation in undergraduate and paediatric healthcare training, but we have narrowed down a hundred and twenty studies to look at processes and products used in eighteen international projects. These range from national disaster training in Canada to sustaining skills in rural healthcare provision in Tasmania. Very few of the articles relate to paediatrics, but across the board we are finding that there is a lack of patient safety training and human factor training, and that one-off training is much less efficient than regular training. There is a lot of good information about the power of debriefing after a scenario, but we need to further explore the consequences of regular simulation training. To achieve better documentation, we need to support objectives and define some goals.”

The use of simulation in logistics

It’s not just in the hospital setting that inter-professional teamwork training is crucial to patient safety. Steve Hancock, from Embrace Yorkshire & Humber Infant & Children’s Transport Service, explained the merits of using patient simulators such as SimBaby within a simulated ambulance or helicopter scenario. “In order to control an effective handover, our first step is to establish leadership and define roles,” he said. “Simulation is ideal for creating unexpected scenarios where teams have to work closely and quickly in uncommon situations. We can introduce all aspects of events into a handover or journey, such as cardiac arrest, vehicle crash and loss of power. Simulation helps to deliver practical experience in critical thinking, verbal and written communication, teamwork in emergencies and clinical skills.”

Embrace uses one of their four emergency ambulances to run scenarios with high and low fidelity simulators that can be packaged realistically in harnesses and baby pods. A variety of kit and techniques are used to enable students to practice realistic transfer processes and emergencies, and to identify and manage physiological changes in the patient in different environments. Dr Hancock described how students experience practicing preparations such as calculating gas supply and ensuring the right kit is on board, and practice procedures so they would be prepared should any systems fail. Scenarios, which were showcased from across the UK, can include ambulance, helicopter and aeroplane simulations. “Teamwork is of the essence,” he said, “especially with minimal human resource, clinical isolation and restricted space. Although standards for simulation training are progressing slowly, we recognise the need for more research and shared experience to enable us to maximise the potential to train for excellence in transportation professionals.”

“After the course, most people felt their knowledge and experience had improved”

Simulation in Intensive Care Unit training

From the South Thames Retrieval Service and Evelina Children’s Hospital, Sara Hanna runs training courses that aim to address competency and inter-professional issues largely encountered through the restructuring of intensive care units.
Ms Hanna explained how the initial courses incorporated very high fidelity patient simulators and focused on the recognition of symptoms in children, and how to resuscitate a child. Following discussions and reports after the course, it was apparent that the people attending the course generally already had plenty of experience. For those who didn’t have the experience the course fell short because the simulation centre environment wasn’t true to their own. In short, Ms Hanna found that the course was not reflective of the requirements of different hospitals, so decided that the course would be better run as a funded outreach programme - in situ - for those who needed it.

At no cost to the hospitals, Ms Hanna ran twenty to thirty minute, clinically important scenarios based on real cases; for example, a six year old boy who was suffering appendicitis and needed treatments including blood tests, gases, resuscitation etc. Three and a half thousand individuals whose disciplines have included nursing, anaesthesia, consultancy and allied healthcare have now taken the in-situ course. Between 50% and 90% of the people who experienced the scenario had had no previous experience of training for this uncommon situation.

“After the course, most people felt their knowledge and experience had improved and that they would be able to cope in a real-life situation,” said Ms Hanna. “The key performance indicators were practical, technical and communication. The uptake of the course has been extremely positive, but unevenly spread. Some hospitals have had several training sessions whereas others have only had one. To increase the regularity of training across all hospitals we need to continue to network and drive simulation training into the curriculum.”

**Simulation training in situ**

Joe Fawke and Jonathan Cusack from the Leicester Neonatal Simulation Team are keen advocates of point of care simulation training and have run scenario-based neonatal healthcare training on the neonatal units in Leicester for around four years.

“We should train people in skills they need to do their job,” said Dr Fawke. “By training people in their actual place of work, we can identify realistic needs. We deliver one-hour sessions to a team of a senior doctor, a junior doctor, a senior nurse and a junior nurse. The session includes a fifteen-minute introductory lecture to familiarise the participants with the scenario and to clarify that this is training, not assessment, followed by a fifteen-minute high fidelity simulated scenario and a thirty-minute debrief. The session is run by two instructors and if necessary, an additional person taking on the role of the parent.”

“The advantage of using this kind of training is to see how the team dynamics work with the people who would actually be working together. There is nothing hypothetical about the teamwork. Sometimes the scenario will end well and sometimes it will end in death, but we are always clear that it is not an assessment and there is no fail. It’s a learning process; an educational tool. We have run so many scenarios now that people expect to partake in regular simulation training. It’s not an add-on. It’s part of the working week. The only difficulty we find is releasing nursing staff from duties, but the problem isn’t insurmountable. Quite a lot of nurses come along for a course in their own time, but are given time in lieu. Alternatively, with buy-in from matrons, cover can be arranged.”

Dr Cusack added, “For multi-disciplinary scenario training, we often use the expertise of senior nurses or doctors to debrief certain actions as they are much more in-tune with the relevant requirements of each individual role. It adds credibility to the debrief. Nurses in particular appreciate the additional training as it helps to break down protocols and improve communication in the traditional hierarchy of the medical profession. Although we are well practiced in running good scenarios now, we are focusing on outcomes. Factors such as institutional and staff buy-in will lead to the development of more in-house facilities and training that will deliver training solutions for localised problems. In-situ simulation training can deliver real value for money. It is more cost-effective than releasing people for training courses, will increase the regularity of training, and will help standardise training across departments.”

**Simulation on the Move**

One in five of Scotland’s five million inhabitants is a child. There are fourteen health boards and forty acute hospitals. North of the border, two hundred children a year become critically ill each year and rural areas present massive issues in terms of human resource and transportation.

In 2008, after delivering national healthcare training on a shoestring for a number of years, the Scottish Government initiated a scheme to deliver paediatric healthcare training more locally. This led to the introduction of a Mobile Clinical Skills Unit that would visit the more remote areas of Scotland to allow those unable to travel for training, to engage in specialist training on site. The ‘skills bus’ was built to a bespoke requirement, so that it would fit on island ferries as well as enable a vast range of equipment and space to be employed. The size of a small double garage, it can accommodate a scenario for up to sixteen people.

“In the first two years, we delivered twenty courses in nine locations. We have just completed our third year,” said David Rowney and Dennis Kerr; Royal Hospital for Sick Children, Edinburgh. “We have trained anaesthetists, GPs, physicians, paediatricians, emergency services, nurse practitioners, nursing students and allied healthcare providers. Courses have evolved...”
to include checklists, action cards and evaluation forms. Over eighty per cent of participants have agreed that their skills and confidence levels have improved and a hundred per cent have told us that the course has had a lasting impact on their practice by giving them a better understanding of complicated child retrieval issues, inter-professional roles, drug guidelines, better communication skills and a greater understanding of the care of an injured or critically ill child. SimBaby has been the star of the show! It has really made a difference to what we are aiming to do. We were fully booked for 2011, so the system is obviously working!“

Using simulation to hone skills and deliver new experiences

Kate Parkins and Kathryn Claydon-Smith run paediatric healthcare simulation training courses for the North West and North Wales Paediatric Transport Service. Kate runs between eight and ten full-day courses a year. High dependency courses for nursing staff are run between two and four times a year and there have been three inter-professional study days in the last twelve months. A recent study day focused on skills that anaesthetists and consultants need in the care of a sick child. The format of the day - which can be tailored for any discipline and multi-disciplines - includes case discussions, scenarios, debriefs and supporting actors. The next course, in May 2012, will centre on how to manage and cope with the death of a child.

Discussing the set up of the training, she explained how educators have used simulation to build stronger team relationships. “The key is not to be too ambitious,” she said. “Simulation is as important for allowing students to apply their theoretical knowledge, as offering new experiences. Attention to detail is very important. A realistic environment is a must, medical props help and if a patient (for example SimMan) is breathing or talking, it enhances the realism. After delivering a course tailored for High Dependency Unit skills-learning, participants said the experience brought home to them that they had more skills than they had previously realised. Many participants gain a lot from the multi-disciplinary learning, with key learning points for better team-working drawn from reflection in the debrief. The retention rate for lectures is 10%. The retention rate for simulation is around 90%. It makes sense to run more simulation courses.”

Simulated death and palliative care for children

In the UK, one hundred and fifty children are newly diagnosed with cancer each year. Thankfully, seventy per cent are cured. In 2011, there were thirty-three deaths of children requiring palliative care for cancer-related illness or terminal tumours. Ralph McKinnon and Andrea Stevenson from RMCH are ensconced in a project that delivers training in the care of the dying child. “Gaining experience in palliative care in the case of children is particularly challenging,” explained Mr McKinnon.

“End of life care requires clinical skills and a social, spiritual and practical understanding of the death of a child. The families of 60% of children in palliative care choose for them to die at home. In the Manchester area in 2011, nineteen community teams were involved in home deaths of eleven children. The average career span of a GP includes palliative care of only one child with cancer. We are privileged to have tremendous support from three specialist children’s hospices in the North West, but even so, 93% of medical and nursing staff within our paediatric oncology units say they would like to receive more training in symptom recognition and control, pain management and care of the deceased and their families in the community environment.”

“SimBaby has been the star of the show!”

Simulation provides a bubble of safety in which to learn

“It was a personal driver to improve training in palliative care of the dying child,” Mr McKinnon said. “I had a lot of help the first time I had to deal with a child’s death, but I believe that better training should be given to anyone who is likely to be involved with the death of a child. Simulation training provides a bubble of safety so that students can learn best practice without the emotional involvement of a real-life death.”

Keen to collaborate on a research pathway, Mr McKinnon and Ms Stevenson have secured funding from their local health authority, and are piloting a paediatric death scenario in April 2012.

“Our aim is for every healthcare professional to know a good death,” said Ms Stevenson. “Having no experience of death is frightening when family members expect you to be in control of the situation. Practitioners should be able to identify and be one step ahead of every single symptom - whether this is pain, respiratory distress, excessive secretion, or reduced conscious level. Fear of the unknown is the biggest barrier to confidence. Having the experience to control pain, avoid unnecessary medication and transport, and be able to deal with issues as they arise enables the practitioner to give the best possible care to the dying child and support families through the ordeal without fear.”

Mr McKinnon and Ms Stevenson have contacted twenty-seven cancer and paediatric palliative care networks to identify any gaps in current training standards, the most experienced trainers and best simulation centres for mimicking the home, ward and hospice environments, and are planning to talk about their pilot scheme in a national symposium in the summer of 2012.
A pilot scheme for a competency assessment package

As a Consultant in Paediatric Anaesthesia and Intensive Care at Bristol Royal Hospital for Children, Patricia Weir is active in the integration of simulation into the Severn School of Paediatrics. She is working on a pilot of competency assessment package at ST1-3 level, and the department is hoping to validate it.

Through research into core competencies and skills gaps, Patricia has led the development of a ‘Key Competencies’ course and a ‘Step up to Registrar’ course. The latter gives ST3 level students who are in preparation for being middle grade trainees or registrars, the experiences of handling situations as a senior:

“The Severn School of Paediatrics bought into the idea of using simulation in education in 2009,” she said. “Since then we have run six courses a year for Level 1 and Level 2 students. More and more students are agreeing that simulation exercises could be used in assessment. The fear is being dissipated! Our Paediatric SHOs have had simulation embedded into their curriculum and they have therefore had a lot of exposure to this kind of training. It has definitely made a difference to their mind-set. It has given them an appetite for more!”

Simulation exercises help improve infection control processes

Among her many credentials, Fiona Horrox, Senior Lecturer, Paediatric Nursing, LSBU belongs to the International Paediatric Society of Simulation and educates both pre-registration and post-registration nurses in care of the acutely ill child. In a project that aims to link simulation training with increased patient safety, Ms Horrox is looking at increasing the competence and confidence of nurses. This is with the learning objective of assessing and escalating treatment for children who are deteriorating using ABCD assessment, implementing patient warning systems and communicating effectively utilising initiatives such as SBAR. Constructively aligning the curriculum, culminating in a simulated scenario exam has seen over eight hundred post registered paediatric nurses undertaking this process over a six year period.

“Two research papers, twelve years apart, analysing children who have become critically ill or died through mismanagement of severe sepsis, have shown little improvement,” she reported. “It is worrying that despite being cognisant of human factors that contribute towards failing to recognise serious illness, escalating appropriate management and communicating concerns effectively, there are still errors causing the death of a child and costing the NHS millions per annum. It is thought that many of these deaths could have been prevented. Simulation training is an excellent way of giving nurses the experience of situations they will encounter regularly. “We run numerous simulation sessions finding nurses evaluate them as one of the best ways to learn, develop and reflect upon human factors and clinical skills. With the help of simulation, we are looking at improving systems that provide opportunities to instill cognitive, affective and psychomotor skills in our nurses.”

After undertaking one of four, eight-week modules with Ms Horrox and other team members, the simulated exam centres around a scenario. SimBaby or SimJunior is assessed using the ABCD model, immediate interventions are given, findings communicated, evidenced-based rationale for clinical interventions and altered pathophysiology stated and clinical questions answered. Early evaluation of fifty-four nurses undergoing a simulation assessment shows a significant improvement in confidence. Trust managers are noticing increased competency in practice, which helps secure further contracts for the modules. The next area of development is inter-professional courses with medical schools starting this later year.

A case for better support

Charlotte Bennett, Neonatal Consultant at the John Radcliffe Hospital, has a long-standing interest in resuscitation training and has been Course Director for the Resuscitation Council (UK) Newborn Life Support Course (NLS) since 2001. She has developed and run a wide variety of courses that integrate simulation, founded a multi-professional collaborative group ‘NeoSim’ to advance neonatal simulation training in the UK, and has been awarded an ‘Innovation in Care’ grant from Bliss to establish a national ‘advanced’ neonatal resuscitation training course, ‘ARNI’. Dr Bennett is also trying to develop scenario-based learning in India.

“On-going training is vital to improve patient safety”

“We need better support to keep the momentum going,” said Dr Bennett. “On-going training is vital to improve patient safety through team working. Simulation provides a perfect platform for learning new skills and refreshing existing skills - for students through to experienced consultants. We are all working towards the same goals. We have had a lot of success with our Oxford programme and are happy to share material and software/scenario resources on NeoSim and the Laerdal SimStore, so that we can continue to provide simulation centre, point of care and outreach education for primary healthcare teams, community nurses and midwives. Working together, we can create exemplars of excellence that push forward standards for training that will make a difference to patient safety.”

MEPA bridges the skills gap with simulation network

David de Beer is a consultant anaesthetist and the anaesthesia lead for simulation at Great Ormond Street Hospital. He is also involved in other simulation networking groups, including MEPA.
Managing Emergencies in Paediatric Anaesthesia). The mission of MEPA is to give all anaesthetic trainees the opportunity to develop management strategies for emergencies in paediatric anaesthesia using high fidelity simulation. The group is based primarily in the UK but new groups are developing MEPA courses in Canada and the USA.

“Simulated scenarios can really empower students with skill, confidence and knowledge.”

Owing to a change in paediatric anaesthesia training with less exposure to clinical cases, simulation may be a useful tool in bridging the resulting skills gap. “MEPA was developed as a national collaborative venture from the outset, which makes it unique,” said Dr de Beer. Consensus agreement was reached regarding the content, structure and educational goals of the course and evidence-based, peer reviewed management strategies developed for a number of important paediatric emergencies based on the competency-based training requirements of the Royal College of Anaesthetists (RCoA). First piloted in Bristol in 2006, MEPA has expanded nationally and more recently internationally, with on-going collaborative research focusing on the reliability and validity of simulation-based learning.” Following on from the success of MEPA for trainees, MEPA for Consultants has been developed to provide simulator training as part of the continuing education of consultants who do not anaesthetise children on a regular basis as recommended by the RCoA.

Keeping it real

In a series of short break-out sessions at the end of the day’s presentations:

• Tobias Everett from Bristol Royal Infirmary and Anna Johnson from Derriford Hospital in Plymouth discussed scenario development.

• Suzanne Gough from Manchester Metropolitan University and Will Marriage from Bristol Paediatric Simulation Programme discussed the power of debrief using different debriefing techniques and technologies.

• David Grant from Bristol Paediatric Simulation Programme and Ralph McKinnon from Royal Manchester Children’s Hospital held an interactive workshop on asking the right questions during a debrief.

Talking about the best methodology for debrief, Dr Grant suggested that learners tend to find their own solutions through shared exploration of their scenario. “Mistakes are often the result of intentionally rational actions,” he said. “If the facilitator is able to lead the learner in exploring the rationale behind the action, then the learner and the team involved are more likely to develop a deeper understanding of the principles governing their actions, correct them and change their critical-thinking process.”

“Simulated scenarios can really empower students with skill, confidence and knowledge,” he said. “However, simulation does have limitations. It is beneficial to identify at the beginning of the scenario that although the realism isn’t perfect, it is as close as it can be, so that this does not become the excuse for poor performance. The real key is for the relationship between student and facilitator to be comfortable and for the facilitator to be assertive and to acknowledge mistakes with good judgement whilst maintaining a stance of curiosity. As long as the debrief discussion is open, safe and confidential, it will be an extremely valuable experience.”

Closing remarks

Thanking delegates, presenters and Laerdal for their support of the networking meeting and their interest in simulation, Ralph McKinnon urged everyone to collaborate further to accelerate the speed of uptake for more simulation within the curriculum for paediatric healthcare.

Sarah Wimlett, Consultant Paediatric Anaesthetist from Derriford Hospital, Plymouth, commented, “We have just taken possession of a SimJunior after using SimBaby and SimNewB. This is the first simulation symposium I have attended and have found it very useful for information and for establishing links.

Sue Langworth, Paediatric Unit Manager at Withenshaw Hospital, University Hospital South Manchester agreed, “We have a clinical skills unit but it is mainly used for adult patient education. We need to start utilising the facility and want to develop multi-disciplinary training using low and high fidelity patient simulators. The timing of this symposium was just right for us. It was interesting to hear how others run scenarios and about the development of courses.”