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EMBRACING A SYSTEM-BASED APPROACH TO SIMULATION – THE EXPERIENCE OF A PAEDIATRIC HOSPITAL DURING A GLOBAL PANDEMIC

Emma Broughton[2], Alasdair Ross[2], Linda Chigaru[1], Pratheeban Nambyiah[2], Sam Williams[1], Chris Ingram[1]; [1]*Great Ormond Street Hospital for Children, London, UK*[2]*OSH Learning Academy, London, UK*

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Background: The GOSH Clinical Simulation Centre (CSC) delivers an established paediatric *in situ* simulation programme at Great Ormond Street Hospital. Prioritizing advancement of the patient safety agenda, we work closely with our quality and safety teams to embed key safety themes within our trust-wide *in situ* curriculum. A fundamental objective of *in situ* simulation is to identify and remove risks or 'latent safety threats' in the clinical environment, which could cause unintended harm to patients or staff[1]. Fitting with the safety II approach advocated in the National Patient Safety Strategy [2]; another emerging application of *in situ* simulation is its use to evaluate clinical systems and processes [3].
Aim: The aim of the study was to expand the applications of our pan-trust *in situ* programme to adopt a prospective approach to simulation delivery via 'Systems Safety' exercises.
Method: Over the course of 18 months, simulation exercises were designed to focus on rehearsal and refinement of processes and systems, towards uncovering latent safety threats or gaps in practice. A reporting tool was developed; to capture risks and identify mitigating actions. In addition to this, an established reporting structure enabled faculty to share findings and escalate risks to the local patient safety team. The COVID-19 pandemic presented healthcare workers with many new or unfamiliar working practices. This context further shifted our focus towards systems safety simulations (SSS) with the aim of enabling teams to focus on rehearsing and preparing for new ways of working.
Results: Ten different exercises were delivered with clinical teams across the trust: successfully informing the development of five new clinical guidelines relating to COVID-19-specific practices. In one exercise alone, 11 latent safety threats (LSTs) were captured and managed with the appropriate teams (Figure 1). A system-based approach to simulation has since been used to inform equipment location and fire evacuation processes in two new clinical environments (Figures 2 and 3).

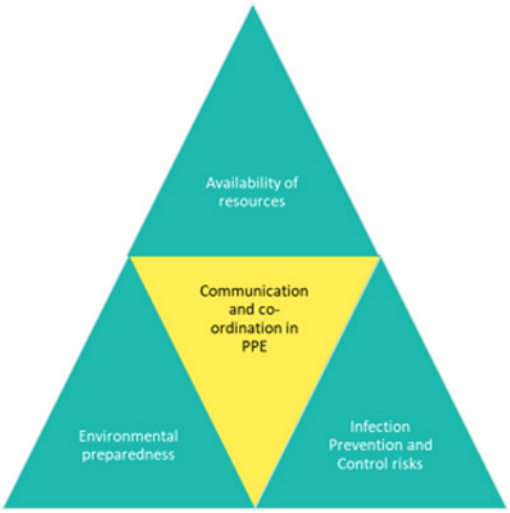

Figure 1: Themes from LSTs captured during COVID-19 CT transfer simulation

Figure 2: SSS fire evacuation exercise in the IMRI suite

Figure 3: SSS fire evacuation exercise in the new sight and sound building

Implications for practice: These exercises demonstrate the potential applications of simulation to support process and system improvement. Beyond the pandemic, we aim to continue to deliver SSS exercises to help make clinical systems and spaces safer for patients and teams. Following in the footsteps of successful simulation teams in the USA, we aim to advance this work to deliver SSS at the preconstruction level in future to inform the design of new clinical spaces.

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SIMULATED SURGICAL ASSESSMENT UNIT – A QUALITY IMPROVEMENT PROJECT TO INCREASE MEDICAL STUDENT CONFIDENCE IN ASSESSMENT AND MANAGEMENT OF ACUTE SURGICAL CONDITIONS THROUGH HIGH-FIDELITY SIMULATION

Sumaiya Aziz[1], Ayaa Ali[1], Steve Satheesan[1,2]; [1]*Peterborough City Hospital, North West Anglia NHS Foundation Trust, UK*[2]*Leicester Medical School, UK*

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Background: The COVID-19 pandemic resulted in limited opportunities for medical students to assess patients in the

Surgical Assessment Unit (SAU) at an acute teaching hospital. Inadequate exposure to acute surgical conditions affected student-reported confidence and preparedness for Objective Structured Clinical Examination (OSCE). We hypothesized that simulation-based teaching during the pandemic could supplement disrupted learning [1] and improve patient safety [2].
Aim: The aim of the study was to address the quality dimension of patient safety. This Quality Improvement Project (QIP) was designed to increase student confidence by 50% in the assessment and management of acute surgical conditions, and preparedness for OSCE.
Method: The educational intervention 'Simulated SAU', consisting of scenarios based on common acute surgical presentations, was co-designed with project champion, placement lead, teaching fellows and medical education department, utilizing transformational leadership. Model for improvement approach was utilized with Plan-Do-Study-Act (PDSA) cycles. During the first PDSA cycle, intervention was delivered over 3-hour sessions in March 2021 to 12 third-year medical students, through the use of simulated patients. The second cycle encompassed integration of learning points including amended scenario and debrief timings, and improved questionnaires, delivered in April 2021 to a further 11 third-year medical students. Students completed paired 14-item pre- and post-intervention paper questionnaires consisting of 5-point Likert scale questions on confidence and preparedness. The Wilcoxon signed-rank test was used for statistical analysis, with a p-value of <0.05 considered statistically significant.
Results: During the first cycle, student-reported median confidence in assessment increased by 50% ($p = 0.01$), and in management by 66.7% ($p = 0.02$). Students felt 50% more prepared for OSCE assessment ($p = 0.02$). During second cycle, median confidence in assessment increased by 100% ($p = 0.003$), in management by 100% ($p = 0.004$), and students felt 50% more prepared for OSCE assessment ($p = 0.015$). 100% of students felt simulated SAU is useful and future sessions would further enhance surgical learning.
Implications for practice: The QIP achieved its aim to increase student confidence with statistically significant differences, through a high-fidelity simulation intervention. Through QI methodology and leadership for improvement, this QIP has successfully bridged the educational gap resulting from the pandemic, with emphasis on delivering safe patient care. Next steps encompass integration of learning points over the following PDSA cycle, engagement of new staff and resource sharing for future implementation and sustainability. Simulated SAU intervention is low-cost, requires minimal staff and is simple to deliver, hence has the potential to become integrated within medical education across numerous educational settings and enhance patient safety.

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160 APPLYING HUMAN FACTORS PRACTICES AND SIMULATION TO DEVELOP SYSTEMS AND PROCESSES FOR A PANDEMIC VACCINE SERVICE

Phil Gurnett[1], Julia Scott[1]; [1]*Dartford And Gravesham NHS Trust, Chatham, UK*

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Background: The COVID-19 vaccine hubs required rapid implantation. While organizations had plans as part of the emergency resilience response to the community, there were particular challenges for setting up and running vaccine hubs for COVID-19 that Human Factors and Ergonomic practices could help to identify and address prior to opening as a vaccine hub.
Aims: The aim of the study was to assist with understanding the abilities of vaccinators and design of processes for the vaccine service at Dartford and Gravesham NHS Trust.
Method: Simulation, observation, semi-structured interviews and Hierarchical Task Analysis (HTA) were used to understand the complexity of the vaccinator role and potential challenges for the implementation of the vaccine service. This was then used in identifying an area that could meet the capacity requirements identified and to help design the process and flow through the vaccine hub.
Results: The work undertaken was used to identify and design the processes required to deliver the vaccine service. This in turn helped to identify the space required and, due to changes in practice following potential reactions to the Pfizer BioNTech vaccine [1], develop the process within the identified footprint. The process developed went into operation in late December and ran largely as designed throughout its operating life delivering first and second dose vaccines to trust staff and the wider keyworker community while community sites were identified and developed for mass vaccine hubs.
Implications for practice: Using simulation and HFE processes as part of a collaborative process with staff trained with these skills can help to design safer, more effective processes in healthcare.

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103 UNPICKING THE MECHANISMS USED IN SIMULATION-BASED EDUCATION THAT SUPPORT UNDERGRADUATE STUDENTS' DEVELOPMENT OF THEIR COLLABORATIVE PRACTICE SKILLS

Leisle Ezekiel[1], Robyn Stiger[1]; [1]*Oxford Brookes University, Oxford, UK*

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Background: Annually, approximately 80 undergraduate physiotherapy and occupational therapy students participate in simulation-based learning, as part of a second-year module. The experience provides opportunities for students to achieve core module outcomes, such as developing communication skills, inter-professional practice and clinical reasoning. The simulation is supported by a small team of academic faculty and a professional actor, all trained in simulation and debriefing. The students are required to assess an older person at home as part of an emergency response team. They work in groups of up to eight students, are pre-briefed and given a profession-specific written brief of their role in the scenario. A two-pronged approach to debriefing is used; the origami approach, utilizes pauses to capture teachable moments [1], and the advocacy-inquiry approach, used to reflect on the experience [2]. The simulation itself is not assessed; the students write a reflective assignment through the simulation lens, discussing the concepts of effective collaborative practice.