a simulation-based training focused on reducing restrictive practices in acute settings with the aim of improving skills and knowledge in caring for mental health patients.

Methods: The simulation courses were interprofessional and delivered online over 2 days. Day one involved didactic teaching around common mental health presentations, de-escalation skills, the public health approach to reducing restrictive practices when working with mental health patients in the Acute Trust, legal frameworks, referral pathways, and personal wellbeing. Day two comprised of 4–5 scenarios covering a range of common mental health presentations in the acute Trust, including Delirium/agitation/psychosis; Emotionally Unstable Personality Disorder, Angry Relative scenario, Hypoxia and craving meds/cigarettes, Bipolar. The simulations involved specially trained actors as simulated patients to ensure consistency and to allow for improvisation in their responses to participants. Actors represented the diverse communities of South London, and Equality, Diversity, and Inclusion was considered from the development stages discussed in debriefings. Participants (n=65) completed a pre- and post-course questionnaire measuring their confidence in course specific skills and human factors skills, as well as collecting qualitative feedback on their experience of the course and intention to apply the learning.

Results: Participants (n=65) showed a statistically significant difference between their pre- (M=90.40, SD=19.96) and post- (M=100.03, SD=21.01) course human factors scores, $t(64)=5.06$, $p<.001$, CI[0.359, 0.891], with a moderate effect size of $d=0.63$. There was also a statistically significant difference between their pre- (M=33.11, SD=6.18) and post- (M=38.83, SD=4.59) course specific skills scores, $t(64)=8.78$, $p<.001$, CI[0.778, 1.393], with a large effect size of $d=1.09$.

Conclusion: The course was effective at improving participants' self-efficacy in working with mental health patients. Improving knowledge, skills, and confidence across disciplines and professions in Acute Trusts will enhance the quality of care that mental health patients from diverse backgrounds receive when requiring hospital care.

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THE EMERGING ROLE OF 3D PRINTING IN AIRWAY TRAINING: A NARRATIVE REVIEW

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Background: 3D printing allows for the rapid production of novel 3 dimensional (3D) models. Its use, both for medical [1] and non-medical purposes, has seen exponential growth in recent years. Including the 3D printing of airways as part of the preassessment process [2]. Within medical education it has already been used for a variety of purposes [3]. Here we explore how it is being used for simulation-based training in airway management and how its use could be further developed.

Methods: Pubmed was searched using the terms; 3 dimensional (or 3D) and printing and airway or anaesthesia/ anaesthetic and teaching (or training or education). Papers were excluded if their focus was not on airway training, if they were not written in English or did not contain original research. The themes of model creation process and their role for teaching was reviewed.

Results: 20 results were returned. However, 13 did not focus on airway management, leaving only 7 results. Models design was created via, de novo design, from pre-existing electronic 3D renders or from cross sectional imaging and then using a computer processing to extract a 3D render which is then optimised before being printed. These cross-sectional images came from either patient specific datasets or from open-source image libraries. Of the papers reviewed the majority were regarding designs for front of neck airway trainers with other uses being for bronchoscopy as well as one paper that was looking at recreating patient specific pathology both for preoperative simulation but also helps in discussions with patients.

Conclusion: These methods provide an interesting opportunity for training. The ease of creating one off components with 3D printing, allowing for the creation of a variety of pathology, seems to be poorly exploited. Instead, most of the work so far has been on 3D printing 'normal' airways. There is a significant technical skill required to convert patient anatomy into specific models, which slows adoption of such techniques. Work will also need to be done to assess if these models have greater educational value compared to more traditional models, especially when considering patient specific models for use for pre-procedure practice.

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PREPARATION FOR ST4 (SKILLS AND DRILLS IN EMERGENCY MEDICINE)

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Background: A hybrid course was designed utilising areas of the Specific Learning Objectives (SLOs) within the new Royal College of Emergency Medicine (RCEM) curriculum launched in August 2021 [1]. Emergency Medicine (EM) trainees must develop a wide range of clinical knowledge, practical skills, as well as critical thinking and rapid decision-making ability to assess, resuscitate, and manage critically ill and injured patients. The low occurrence of these situations within the clinical arena results in significant challenges with regards to providing experience and training.

Methods: The new RCEM curriculum was reviewed with a focus on SLO 6 (Proficiently deliver key procedural skills in Emergency Medicine) and SLO 7 (Deal with complex or challenging situations in the workplace), and a one-day ST4 course was developed. Half of the course featured interactive presentations and hands-on procedural workshops with

medical meat, models, and part-task trainers. The other half provided immersive simulation-based scenarios covering additional presentations and skills. Each session was facilitated by senior faculty who are experts in their respective domains. A high-definition audio-visual system streamed the simulation to the other candidates viewing it from the debriefing room. Each scenario was followed by a structured debriefing discussing technical and non-technical objectives. Pre- and post-course questionnaires were completed. The course ran in November 2021, March, and April 2022.

Results: All trainees (n=29) provided scores on how useful they found the day, with an average score of 9.8 out of 10. The pre-course questionnaire highlighted that the trainees were looking to be more confident in approaching high acuity, low occurrence (HALO) procedures. In the post-course questionnaire, majority of the trainees described increased confidence and safe techniques learnt from being able to practise skills and drills on appropriate models and medical meat.

Conclusion: The post-course questionnaires were reflective of our course meeting SLO 6 and 7 of the new RCEM curriculum. The majority of trainees commented on feeling a lot more confident in approaching HALO procedures after having had the opportunity to practise during the course. Our plans are for all ED ST3/4s to attend in the next few months, with a view to this becoming a regular part of their training programme. Furthermore, we plan to develop advanced courses for higher speciality trainees, as these would be beneficial in meeting the RCEM curriculum outcomes but also ensuring trainee satisfaction and encourage confident and safe practice.

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VIRTUAL REALITY SIMULATION FOR THE FOUNDATION PROGRAMME

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Background: Recent events have resulted in widespread migration to technology-enhanced learning (TEL) including virtual reality (VR). Simulation remains essential [1] for foundation year doctor (FYD) training but access is dependent on significant resource and faculty requirements. VR allows FYDs to interact safely with virtual patients/healthcare professionals in 3D with a headset. This could complement existing simulation-based training. Over 200 FYDs work across the sites of Oxford University Hospitals NHS foundation Trust (OUHT). They already receive high-fidelity simulation and online teaching. We aimed to identify the best way to add VR to this teaching programme and assess its value in the context of anticipated challenges such as cohort/faculty sizes, space/equipment limitations, and available teaching time.

Methods: The Oxford Medical Simulation (OMS) VR platform was used [2] as we already have extensive experience with this system in undergraduate education. FYDs were consulted in the design of teaching models with varying faculty and equipment requirements (Figure 1). Sessions involving faculty were offered on a voluntary sign-up basis. Feedback was requested from FYDs and educators.

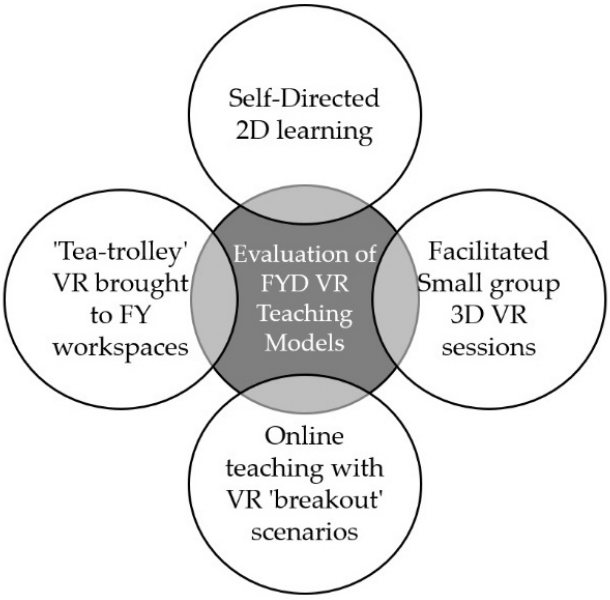

Figure 1. Virtual Reality (VR) Teaching Models for the Foundation Year Doctors (FYD)
Virtual Reality Simulation for the Foundation Programme

Figure 1: Virtual Reality (VR) teaching models for the Foundation Year Doctors (FYD). Virtual Reality Simulation for the Foundation Programme.

Results: Initial reaction was encouraging. An FYD consulted at the design stage remarked: '...the scenarios were all really useful and enjoyable to work through. I think they are pitched at exactly the right level for FY1/FY2 ... I also found it straightforward to access any of the investigations and resources that I needed in the scenarios and found the guided feedback really helpful too.' Despite this, participation was surprisingly low, thereby limiting model evaluation. Early qualitative feedback suggested a preference for 3D over 2D this is supported by only 39/208 FYDs requesting home access. In response 3D sessions were increased but attendance remained low. Ongoing efforts are being made to maximise exposure and evaluate the programme as well as investigating the low participation level. Availability of dedicated teaching time and proximity to the end of the academic year could be important contributors.

Conclusion: The negative impact of the pandemic on trainees' wellbeing and burnout risk has been nationally recognised alongside the reduced ability of trainers to protect training time [3]. Although the limited initial response was positive, technology and novelty alone cannot be relied upon to support training recovery. Learning from this project is being used directly to improve models for the next cohort and feedback to those involved in organising FYD education at the Trust.

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