

Training reinvented: NHS staff embrace free VR education platform

BY JONATHAN R ABBAS

A groundbreaking VR platform is transforming NHS training, offering immersive, cost-free simulation experiences to boost skills across multiple clinical fields.

ENT is a specialty that demands precision, rapid decision-making and familiarity with complex anatomy, especially in emergency contexts such as paediatric airway obstruction. Yet training is continually facing challenges such as limited study budgets, a move to online remote learning and reduction in training opportunity due to the requirement of service provision, shortening of working hours and, ultimately, overall training time [1].

For decades, simulation skills training has been widely understood to be the gold standard for education and training across many disciplines, popularised in aviation and later adopted across medicine, nursing and allied health training. Whilst clearly effective, there are limitations including high cost, the requirement for expert trainers and specialised training locations, the high carbon footprint and the lack of replayability. Extended reality (XR) technology – including virtual reality (VR), augmented reality (AR) and mixed reality (MR) – has been gaining popularity as a way to bridge gaps in traditional education and expand access to replayable simulation-based training [2].

Through three case studies, this article aims to introduce ExR Education as the first free VR education platform available to NHS staff and healthcare students [3]. It was established to help address educational gaps, delivering 360-degree

“ExR has collaborated with more than 25 institutions, including NHS trusts, universities and charities, to co-create evidence-based, scenario-specific training content that is clinically relevant and widely accessible”

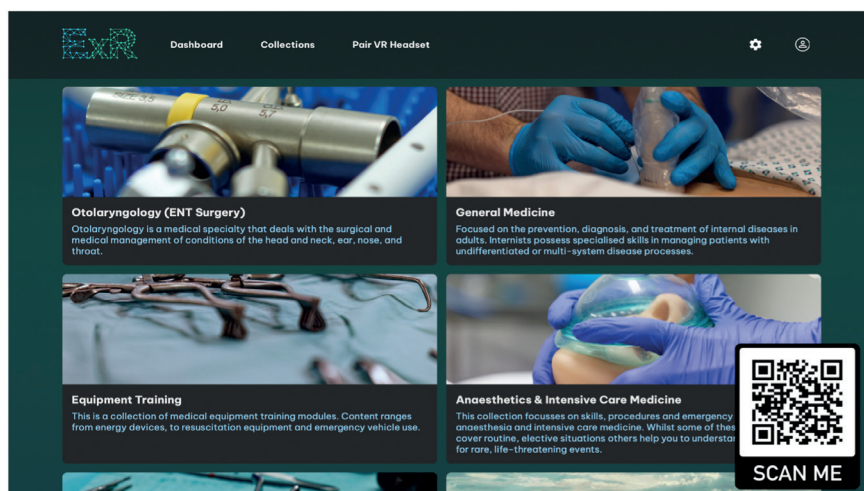


Figure 1. ExR Education platform content dashboard.

video experiences and fully immersive, interactive simulation modules, which can be delivered at a scale far beyond traditional training methods. Since publicly launching in 2023, ExR has collaborated with more than 25 institutions, including NHS trusts, universities and charities, to co-create evidence-based, scenario-specific training content that is clinically relevant and widely accessible (Figure 1).

Bringing rigid paediatric bronchoscopy training into VR

In a project with clear resonance for ENT teams, inspired by a trainee's experience of difficult emergency cases, ExR co-developed a series of immersive simulations around the emergency deployment of the rigid paediatric bronchoscope, a vital but infrequently practised procedure used to remove foreign bodies from the airway (Figure 2).

This module's immersive video components were created in collaboration with Mr Sunil Sharma, ENT Consultant and filmed in Alder Hey Children's NHS Foundation Trust. Using a blended format, the training includes both:

- 360-degree video walkthroughs of bronchoscope setup and team

preparation in a real clinical environment, and

- 6DOF (six degrees of freedom) interactive VR simulation, enabling the learner to perform the procedure in a virtual theatre environment.

The simulation component was evaluated at the University of Plymouth, where early feedback highlighted its value in building both procedural familiarity and team-



Figure 2: Filming the 360-degree video in Alder Hey Children's Hospital with Mr Sunil Sharma around the simulated deployment of the rigid paediatric bronchoscope (bottom). Associated playthrough screengrab of the full-immersive equipment setup VR simulation (top).



Figure 3: Use of the transoral dissection simulator during a national dissection course, led by Professor Ajith George, in Keele University.



Figure 4: Filming a simulated medicine safety ward round for University of Greater Manchester undergraduate nurses.

based situational awareness. Of note, in a cohort of 30 undergraduates, we found in a single session, a tripling of knowledge was achieved and the students found the experience comfortable and highly acceptable [4].

Outside of a central tertiary paediatric hospital, foreign bodies in the airway are rarely managed. The entire surgical team is required to work together in these situations and are expected to have a high level of knowledge of complex equipment. To support this, the module is now freely accessible to all NHS staff and trainees, offering a scalable solution for building confidence and competence in managing this critical scenario.

Faster surgical skill acquisition: head and neck collaboration with Keele University

In late 2024, ExR collaborated with Professor Ajith George, Consultant Head & Neck Surgeon and Professor at Keele University, to create a virtual training module focused on transoral surgical dissection anatomy (Figure 3).

Designed for use alongside, before and during the Endoscopic 3D Transoral Anatomy Dissection Course at the Keele Anatomy and Surgical Training Centre (endorsed by BAHNO), the VR content included both 360-degree instructional videos and a fully immersive dissection simulation.

Through pre- and post-test anatomy spotters, a significant improvement of anatomy understanding was demonstrated, with all students progressing appropriately through the cadaveric dissections.

"This project represents a critical shift in how we teach complex surgical anatomy – students engage with the material more deeply and the knowledge transfer is faster and more lasting," said Professor George.

Cadaveric dissection courses are fantastic but are, for many training programmes, prohibitively expensive. We feel there is an opportunity to improve the

efficiency of these sessions and, ultimately, help trainees and institutions get the most out of these activities in terms of educational outcomes.

Wider NHS applications: nursing numeracy and medication safety

ExR's work also extends beyond surgery. A recent collaboration with the University of Greater Manchester aimed to replace traditional simulation teaching in medication calculation and numeracy education for undergraduate nurses (Figure 4).

Led by senior lecturer, digital innovation lead, and clinical nurse Sean Freeman, the project created a 360-degree experience simulated medication round, including common distractions and clinical decision points, designed to help students gain confidence in medication safety.

"Learners have responded really positively, particularly to the opportunity to pause, reflect, and revisit key moments," said Freeman. "It's allowed us to bring the complexity of a clinical drug round to life in a way that traditional methods often can't."

Trialled with 70 students, the module demonstrated equivalent learning outcomes to face-to-face simulation and will be formally integrated into the university's curriculum from September 2025.

Why this matters for ENT and beyond

ENT departments, especially those involving paediatric care or complex procedures like skull base or airway surgery, face increasing pressure to deliver high-quality training despite diminishing protected time and access. By combining different approaches to VR education, there is opportunity to experience limitless operations, emergencies and equipment training, to name a few examples [5]. ENT-specific VR content is currently in development across the NHS in a number of domains, and the platform remains open to partnership proposals.

Conclusion

As NHS training needs continue to evolve, immersive VR platforms like ExR are no longer just future-facing novelties – they're becoming essential tools in clinical education. By offering realistic, low-cost, and on-demand learning opportunities, ExR is helping ENT professionals and other clinicians build and maintain vital skills, when and where they need them most.

To learn more or explore collaboration, visit <https://app.exr.education> or email jonny@exr.education.

References

1. Burton OE, Asif A, Fleming S. Today's surgeons: are we cutting edge or are we being forced to cut corners? *Bull R Coll Surg Engl* 2024;**106**(2):106–9.
2. Abbas JR, Chu M, Jayarajah C, et al. Virtual reality in simulation-based emergency skills training: A systematic review with a narrative synthesis. *Resusc Plus* 2023;**21**:100484.
3. ExR Education: VR Education – Otolaryngology. <https://app.exr.education/collections/otolaryngology-ent-surgery> [Link last accessed June 2025].
4. Watson PWL, House S, Hart R, et al. A Case Study Using Virtual Reality to Prime Knowledge for Procedural Medical Training. In: Duffy J, Moore J, Thomas A (Eds.). *Lecture Notes in Computer Science*. Springer 2023; **14145**:189–208.
5. Abbas JR, Kennion S, Bertram-Ralph E, et al. Feasibility of a virtual reality course on adult tracheostomy safety skills. *Anaesth Rep* 2024;**12**:e12305.

AUTHOR



Jonathan R Abbas, MBChB, MRCS(ENT), PGCERT, PhD,

ST6 Trainee North West Deanery; ExR Co-Founder; Honorary Senior Lecturer, University of Manchester, UK.

www.linkedin.com/in/jonathan-abbas-9b7a35113
<https://exr.education>

Declaration of competing interests: JA is a founding member of the American Medical Extended Reality Association and on the editorial advisory group for the Journal of Medical Extended Reality, a Co-Founder of ExR Solutions Ltd and a shareholder of VREvo Ltd.