



Robotics at Scale: Delivering Surgical Transformation Across the NHS

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THE SESSION 'Robotics at Scale: Delivering Surgical Transformation Across the NHS', presented at the Global Innovation and New Technology (GIANT) Health Event 2025 in London, UK, united leading innovators and specialists to explore how robotics is reshaping surgical practice across the UK.

FOSTERING COLLABORATION AND TRAINING CHALLENGES

Manish Chand, Associate Professor of Surgery and Consultant Colorectal Surgeon at University College London, UK, opened the discussion by sharing his perspective from a teaching hospital. He set the scene for current trends and progress, outlining how the surgical robotics landscape is evolving as we move into 2026. As the field expands, the criteria for ideal robotic programmes are becoming increasingly well-defined. At the same time, robots at various price bands are entering the market, providing wider optionality. Chand highlighted that innovations do not truly function as innovations unless they are widely accessible; therefore, it is important to avoid 'ivory towers' of robotic surgery by encouraging nationwide buy-in. He emphasised that the success of these programmes relies not only on technology but also on manpower, training, and laying out standards.

Leading on from this, Jamil Ahmed, Consultant General and Colorectal Surgeon at Northampton General Hospital, UK, reflected on his own experience with a successful robotics surgery programme in Northampton, despite challenges in putting the case forward. He explained the need to build large, robust datasets that demonstrate the benefits of robotic surgery

and highlight improvements across different parameters. Wide participation across specialties and departments is vital when establishing these programmes, supported by equitable access to new technology and robotic theatres, whilst also considering patient load. Ahmed discussed how the collection of over 1,700 cases across 3 years presented the board with evidence of substantial improvements in patient care at Northampton General Hospital. Establishing robust training events also contributed to this success, allowing trainees to get hands-on learning immediately. Ahmed then stressed the need to consistently maintain this training so that clinicians buy into the programme and invest in upskilling their robotic surgery skills.

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Tan Arulampalam, President of the Association of Laparoscopic Surgeons of Great Britain and Ireland (ALSGBI), supported the discussion by drawing on his own personal experience in leading training for laparoscopic surgery as part of the Laparoscopic Colorectal Surgery (LAPCO) national programme, designed to introduce nationwide laparoscopic

colonic surgery. Arulampalam mentioned how rates of laparoscopic surgery for colorectal procedures reached 50% during that time, owing to a considerably large budget compared to other training programmes. He further emphasised how vital training is for these programmes, given that "a fool with a tool is still a fool." In the early 2000s, laparoscopic surgery training was characterised by inadequate training, insufficient incentive for clinicians to develop their skill sets, and a lack of leadership. The introduction of clear, legislative benchmarks provided a goal to work towards, showcased by the 2006 edict requiring every multidisciplinary team to offer laparoscopic colorectal surgery, as described by Arulampalam.

The conversation then moved back to Chand, who used Formula 1 pit crews as an anecdote representing the concept of "unconscious competency" that should be applied to the robotic surgery sector of healthcare. More specifically, reaching the end goal of unconscious competency relies on every stakeholder being trained through deliberate, extensive practice.

EXTENDED REALITY TECHNOLOGY: A REALITY FOR 21ST CENTURY MEDICAL TRAINING?

Joe Varraso, Regional Director and Strategic Partnerships, apoQlar medical, offered a unique perspective of extended reality (XR) technology and its associated digital interface. He described the utility of headsets as a virtual training opportunity that can address many of the previously mentioned obstacles in upscaling robotic surgery. Similar to flight simulators, this approach could take the flip-classroom format of building hands-on experience in a safe environment before moving to one that is high-cost. This is supported by infrastructure investments in connectivity, including the development of 5G, which has opened up the possibility of telesurgery.

Chand added to the discussion by comparing immersive systems to open consoles. He explored the advantages of the da Vinci virtual reality headset (Intuitive Surgical, Sunnyvale, California, USA) as an immersive tool: by allowing the eyes to focus only on the surgeon's actions without



distraction, this technology aligns with performance theory criteria. However, this often makes surgeons feel as though they have less control over the external theatre.

Adding to this dialogue, Arulampalam stated that "the headset has to be the stethoscope of the 21st century," emphasising how the education system has evolved, and how XR technology provides a catalyst to make training faster and more engaging. He details one of his recent projects, which involved sending headsets to Sri Lanka, allowing over 100 operations to be carried out that would not have been possible otherwise. Arulampalam then reinforced the concept of unconscious competency by comparing medical training to military training: more often than not, medical training is sidelined due to routine work, limiting investment in upskilling clinicians, whilst military training requires extensive training-dedicated hours.

Varrasso then provided his input on HoloLens technology (Microsoft, Redmond, Washington, USA), and how it has been used to transform medical data visualisation despite its high cost and practical limitations in the operating theatre. Instead, robotic surgery is moving towards miniaturisation.

THE FUTURE OF ROBOTIC SURGERY IN THE NHS

Ahmed tied the conversation back to the NHS by stratifying the current stances of UK institutions into three categories: those who have consolidated their robotic experience and are trying to move across specialties, like in Coventry; those attempting to upscale their technology, like Northampton; and those in the experimental

phase of robotic surgery, like Portsmouth University Hospital. While different institutes are on their own trajectory, he emphasised the importance of a centralised system that allows patients to receive treatment of the same standard at a different hospital if required.

 **Neural pathways can be adapted to allow plasticity and familiarity when training on a 3D platform** 

Chand reflected on the growth of XR technology over recent years, with a focus on how neural pathways can be adapted to allow plasticity and familiarity when training on a 3D platform, as people's brains are often accustomed to 2D computer screens.

Finally, Arulampalam shifted the discussion towards the future of robotics and its growing market, arguing that if competitors drive down costs and the commercial goal becomes selling as many units as possible, training may suffer as a consequence. Certain levels of training must be mandated, and the benefits to the patient need to be clearly outlined through data analysis. He also discussed the role of integrated care boards and potential resistance from this perspective, emphasising that every dataset should be treated as a "harvesting event" to showcase outcomes.

Asif Chaudry, Robotic Oesophageal Cancer Surgeon at The Royal Marsden, London, UK, concluded the session by once again highlighting the rapid development of surgical robotics, and the vast number of opportunities it presents.