



Robotics training: Residents Perspective

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Robotic-assisted surgery (RAS) adoption is growing year on year. For the next generation of surgeons, including residents, the adoption of these technologies is both an opportunity and a challenge. Ensuring that residents gain safe, structured, and equitable access to robotic training remains an unresolved issue. This editorial examines the principal obstacles encountered by surgical residents in robotic surgery, and proposes potential solutions grounded in recent pilot studies, curricular developments, and technological innovations.

One of the most pressing challenges is the paucity of structured training pathways for residents at the formative stages of their surgical career. Access issues arise due to a combination of factors such as, a limited number of robots, consultants on their learning curve, and high utilisation of clinically used systems. A nationwide survey in 2024 highlighted 58% of trainees in the UK reported that they had no access to robotic training¹. In contrast, a comparative survey showed that all US residents had robotic simulator experience and substantial hands-on console time, whereas UK and Irish trainees had limited or no such exposure. Only 38% of UK trainees had spent any time on a simulator and over 80% had never operated at the console².

When exposed to robotics, many trainees remain confined to roles as bedside assistants without any console exposure. Surveys indicate that only 18% of trainees reported having console time³. This may be exacerbated by a lack of trained bedside assistants, which has resulted in trainees not having anyone to relieve their bedside duties. Furthermore, the “cherry

picking” of training cases preferentially for the consultant robotic learning curve has worsened this⁴.

Current robotic training is industry-led and targets specialists. There is no bespoke wider training initiative addressing residents. Moreover, the industry driven nature of existing robotic training programmes raises concerns about governance, conflict of interest, and curriculum control. While collaboration with industry provides crucial resources, residents worry that the lack of national training frameworks and standards leaves strategy in the hands of vendors, with inadequate trainee input and oversight.

With regards to system access, this is likely to improve over time with recent documents from NHS England recommending procurement and optimal training considerations⁵. This also advocates for training the extended surgical team, including surgical care practitioners (SCP). SCPs differ from surgical first assistants, whereby they can assist robotically after obtaining an additional degree⁶. The NHS long term workforce plan supports employment of SCPs which will also improve the consistency of care⁷. This may be an underestimated factor, especially since staffing levels and service provision often result in only one trainee allocated per robotic list. Having an SCP attend a robotic list would free the trainee to gain console experience. However, with the financial constraints of a public healthcare system, alternative solutions need to be explored. The utilisation of resident doctors within core training may offer a cost-effective solution and their early training in robotics should be advocated.



Technology enhanced surgical training has been recommended by the Royal College of Surgeons (RCS)⁸. Implementing this within robotic surgery may alleviate some of the access issues. Virtual reality (VR) headsets have been demonstrated to improve simulator performance⁹ and independence in performing setup tasks of the related to robotic operating room configuration¹⁰. This has the added benefit of allowing self-directed learning in the comfort of one's own home and overcoming the limitations of console access. Further attempts to standardise the setup of robotic platforms may guide learning and ensure homogeneity when trainees rotate hospitals¹¹. Moreover, standardisation of competency assessment rather than reliance on case numbers is essential. Assessment tools such as the Global Evaluative Assessment of Robotic Skills (GEARS), or procedure-specific structured assessments, combined with blinded video review, offer objective measures of trainee proficiency¹².

One encouraging example is a UK pilot training scheme, which demonstrates that a structured robotic programme is feasible and effective for junior trainees. This model incorporated online modules, simulator training, first-assist courses, and live operating, achieved entirely within a year of consultants starting their own robotic practice. Trainee feedback was overwhelmingly positive, and the programme was delivered cost-efficiently through collaboration between the deanery, hospital and industry subsidy¹³. This “ground-up” model offers a pragmatic blueprint to democratise access to robotics for trainees, not just senior doctors.

Another means to enhance access, is through national coordination of curricula incorporating both generic robotic skills and specialty-specific operative competence. The importance of structured curricula including e-learning, simulation, cadaveric training, supervised operating, and objective competency assessment has been highlighted^{5, 12}. The role of industry within this pathway should also not be overlooked, with collaboration a potential avenue for increasing training opportunities. Subspecialty associations have proposed interventions such as enhancing robotic exposure at a junior level and even train the trainers courses to enable skills and proficiency in training RAS¹⁴.

Ultimately, implementing robotic training within the surgical curriculum will gear towards a structured approach for the standardisation of robotic training to surgical residents across various surgical specialities.

The rapid adoption of robotic surgery in the NHS has provided immense educational opportunity. Current training programmes are aimed at consultants with little attention to robotic resident training. Hence, trainees currently face limited access, steep learning curves, inconsistent governance, and dependence on industry-influenced pathways. Several mechanisms have been proposed to aid progression. By combining validated assessment tools, blended simulation, accessible technology and robust training governance, the surgical community can ensure that trainees gain the skills necessary not only to use robotic systems competently and safely, but to lead innovation and excel in robotic surgery.

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