# 10 Year Health Plan Supporting Documentation - Robotic Assisted Surgery Plan

**BACKGROUND**

Since the introduction of robotic-assisted surgery (RAS) in the UK in the late 1990s, more than 12 million robotic-assisted procedures have been performed in more than 70 countries.[1] In 2022, the Royal College of Surgeons estimated that over 1.8 million RAS procedures were done internationally, and it was available in more than 100 UK hospitals (RCS 2023). There is consensus across NHS organisations, professional societies and industry that RAS use is expanding in the UK.[2]

Given that 867,000 procedures were undertaken in US in 2020[3], it is estimated that at least half of all RAS procedures globally are performed in the US.

Robotic-assisted surgery was first introduced in the UK in the late 1990s. In 2018, a Royal College of Surgeons (RCS) led commission on the future of surgery predicted the rapid expansion of RAS across the UK and internationally due to its proposed advantages in ergonomics and operative precision, as well as its potential for improving training and service practices. However, in July 2023 a further RCS publication "Robotic-Assisted Surgery: A Pathway To The Future A guide to good practice" highlighted that despite wide recognition of the potential of robotics adoption had not moved as quickly or consistently as other surgical innovations. Reasons put forward were the acquisition and running costs of the technology and the difficulty of obtaining complex enough evidence to understand the full impact of the implementation of RAS.

The lack of a national strategy in England, in contrast to Wales and Scotland, has meant that the use of robotics is often based on local availability, resources and expertise rather than patient suitability and care. [4]

At time of writing, work is underway on a centralised national programme in England, supported by NICE Early Value Assessment in both soft tissue and orthopaedic indications. The programme, under the auspices of GIRFT is welcome, however:

**Scale of the Opportunity**

RAS has many potential benefits for patients, surgeons, and the NHS, including:

- Reduced length of hospital stay and recovery time.
- Reduced physical strain on surgeons.
- Increased access to minimally invasive surgery.

However, the implementation of RAS can be disruptive and requires new areas of knowledge and realignment. This includes reconfiguring space for different equipment, training the workforce, and developing new clinical pathways.

[1] https://www.rcseng.ac.uk/standards-and-research/standards-and-guidance/good-practice-guides/robotic-assisted-surgery/

[2] https://www.nice.org.uk/guidance/indevelopment/gid-hte10043#

[3] https://pmc.ncbi.nlm.nih.gov/articles/PMC9225798/

[4] https://www.rcseng.ac.uk/standards-and-research/standards-and-guidance/good-practice-guides/robotic-assisted-surgery/

A national approach to deployment of RAS technology would help mitigate disruption and maximise benefits.

RAS procedures have grown significantly with a 13-fold increase in robotic procedures from 2011 to the projected 45,000 by the end of this year, in soft tissue alone. The data indicates rapid adoption in urology, colorectal, and gynaecology, with RAS procedures now accounting for nearly 50% of pelvic cancer surgeries.

**TECHNOLOGY**
RAS brings together a number of advanced technologies:

- **Surgical Robots**: precise, multi-armed robotic controls for delicate procedures.
- **3D and High-Definition Imaging**: Enhances visualisation during surgery, allowing for better accuracy.
- **AI and Machine Learning**: Helps improve decision-making by analysing surgical patterns and outcomes.
- **Sensors**: Real-time feedback for precise movement, pressure, and tissue response.
- **Augmented and Virtual Reality**: Used in training and to assist in complex procedures with real-time guidance.

This requires highly skilled R&D and manufacturing capabilities supported by strong clinical foundations, educational competencies and service infrastructure.

**RECOMMENDATIONS**
The are 4 domains in which action can be taken

1. Data and Real World Evidence.
2. Equity of Access – system deployment.
3. Education and Training.
4. Sustainable Financing.

**A strategy for robotic-assisted surgery should emphasise the following core elements to maximise the benefits and adoption of RAS across the UK healthcare landscape:**

1. Real-World Evidence Collection: Establishing a standardised evidence framework, with protocols for real-world data collection, is essential. This data will validate RAS's clinical and economic value, allowing it to be integrated into mainstream NHS. The data can also identify key areas where system utilisation is saturated and therefore need for additional capacity.
2. Equity of Access: Access to RAS should not vary by geographic location, socioeconomic status, or gender. National incentives and standardised access benchmarks will ensure that all qualifying patients benefit from RAS, promoting equity and better outcomes across the healthcare system. The use in surgical hubs should be explored for certain clinical specialities to support utilisation and throughput, particularly relevant for orthopaedics, where RAS supported pathways could support hub efficiency.
3. Comprehensive Training and Education: A standardised, measurable RAS training curriculum should be developed for NHS surgical staff across all levels. This would not only enhance surgical expertise but also integrate RAS knowledge among non-surgical staff involved in patient care.
4. Patient Pathway Innovation: Investment in new RAS-aligned patient pathways can increase efficiency and reduce hospital stays. The industrial strategy should incorporate flexible budgeting for RAS, allowing healthcare providers to plan and invest in long-term RAS solutions that yield sustained benefits beyond single budget cycles.

5. Sustainable Financing Models: To overcome financial barriers, the strategy should introduce flexible financing and reimbursement mechanisms, including value-based procurement and activity-based payment models. Centralised funding would support strategic procurement and deployment of systems. This ensures that RAS adoption is feasible and beneficial across the NHS**.**

We strongly support the current work being undertaken by NHSE to develop a national programme. This work and its implementation needs to have sustainable funding and formal mechanisms for industry engagement given the critical role in delivering training support, technical infrastructure and expertise.