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The relationship between the volume of robotic-assisted surgery (RAS) performed and the outcomes achieved

SHTG Assessment

Plain Language Summary | 03-21 | January 2021

What is robotic-assisted surgery?

Robotic-assisted surgery (RAS) uses robotic arms that contain a telescope and surgical instruments. The surgeon operates the robotic arms by remote control from a console that may be outside the theatre. The surgeon views a magnified 3D surgical field on a monitor. RAS is used for certain types of minimally invasive surgery. Minimally invasive surgery is performed through small incisions/cuts, rather than a large opening.

Why is this important?

The National Planning Robotic Review Group have been evaluating the use of robotic surgery in the future. As part of this work, they requested a summary of the evidence on whether or not hospitals/surgeons who do lots of RAS every year do better than hospital/surgeons who do fewer. They asked us to look at the use of RAS for gynaecological, colorectal and urological procedures.

Answering this question might make clearer the optimal number of surgeries a hospital/surgeon should undertake each year. In turn, this may help when making decisions around the provision of robotic services in Scotland.

What we did

We searched for the best available, recently published evidence to address this topic.

What we found

Our search identified only a small number of publications, and most of them were not completely reliable because of the way in which they had been conducted. There were many differences between the studies, meaning that comparing the results between them was not possible. Finally, many of the studies evaluated the results of minimally invasive surgery more generally, rather than just RAS on its own.

No evidence was identified to inform decisions about using RAS to perform gynaecological procedures.

One observational study reported that when surgeons use RAS for colorectal procedures, the length of time required for the operations is reduced when the surgeons do a lot of robotic surgery every year. The patients treated by surgeons with more experience needed fewer conversions to open surgery and had a lower length of hospital stay, compared to surgeons who do fewer robotic procedures per year.

The most evidence was about using RAS for urological procedures. These studies suggested that patients have better outcomes when they have a RAS procedure in the hospitals that do lots of robotic surgery, compared to patients in hospitals that do less. Costs may also be less in the higher-volume hospitals.

What is our conclusion?

The evidence suggests that when patients are treated by RAS, their outcomes are likely to be better in hospitals that do higher numbers of robotic surgeries. Some literature also suggests that better patient outcomes are more likely if done by surgeons who do more robotic surgeries each year.

However, we did not find many studies, and most of the studies we did find had issues which may make them unreliable. This means that based on the evidence so far, it is not possible to define the optimal amount of gynaecological/colorectal/urological RAS that should be done each year by a hospital or surgeon.

What next?

This review has been used to inform the deliberations of the National Planning Robotic Review Group.

This plain language summary has been produced based on SHTG Assessment 03-21 January 2021.