# Adapting an Existing Laparoscopic or Advanced Energy Device for a Robotic Platform

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Robotic Assisted Surgery (RAS) has seen impressive and sustained growth for the past decade with little sign of slowing down. New surgical modalities, differentiated visualization & navigation solutions along with increased connectivity continue to drive market adoption and increased utilization.

As the market matures, access to a broad catalogue of surgical tools will be one of the differentiating factors when hospital buyers evaluate the purchase of a new platform. We have seen first movers innovate and build a strong, ground-up offering while more established players look to leverage and adapt their existing portfolio for robotic solutions to take advantage of growth opportunities. Partnerships between platforms and laparoscopic and minimally invasive device manufacturers will bring new offerings to the table.

### Important Considerations When Developing or Adapting an Existing Toolset for Robotic Applications

The sophistication of today's surgical robotic platforms has evolved beyond simply designing a mating interface for coupling a laparoscopic instrument with a robot. The intelligence of today's systems with regards to identifying the instrument type, length registration, and use count as well as the user's interface in terms of actuation or energy delivery, is highly integrated.

There are fundamental design challenges when adapting a laparoscopic instrument for robotic integration. These challenges include: understanding the specific instrument task and workspace, how the instrument is manipulated, the loads and forces it undergoes as well as the haptic feedback the laparoscopic surgeon currently experiences with the manual device. Other factors like draping, setup, breakdown, and reprocessing must also be taken into consideration.

### Our Process

To overcome these challenges, Ximedica starts with contextual inquiry around the laparoscopic use to identify usability and task flow as well as technical requirements and opportunities. This inquiry may include credentialed visits to ORs for observation, or bench-top studies with subject matter experts.

Once these human factors are fully understood, we develop custom tools by strategically integrating load cells, strain gauges, and data acquisition systems within the laparoscopic device and then have surgeons repeat the surgical tasks required. The data obtained is documented and referenced as rationale to support the design inputs for robotic integration. Our fully integrated approach enables us to assist larger players seeking to offer a complete portfolio that spans capital equipment, end effectors, and digital solutions as well as niche players with unique insight and expertise who will seek to disrupt segments of the market with differentiated solutions.

Ximedica is a full-service ISO 13485-certified and FDA-registered product development firm. For 30 years Ximedica has provided a unique growth platform enabling organizations to successfully deploy medical technology products into the market.