sagentia innovation

Carina™ Robotic Assisted Surgery platform development

Ronovo Surgical®

Expertise and domain knowledge

- Surgical robotics
- Medical product development
- Systems engineering
- Mechanical design and mechatronics
- Electrical engineering
- Software engineering
- Design for manufacture and assembly
- Product risk management
- Industrial design
- Human factors and usability

RONOVO SURGICAL
SIMPLICITY. PRECISION. INTELLIGENCE.

Our client asked:

Ronovo Surgical® asked Sagentia Innovation to work collaboratively with its internal R&D team to ready its concept for detailed design and take the first iteration of the platform into product development. Carina™ is designed to enable more laparoscopic procedures to be done robotically, and it targets the clinical needs of patients being treated by laparoscopic surgery in China.

Results: deliverables and outcomes

Our work enabled the Ronovo Surgical® team to continue the development into a second iteration of the Carina system for human clinical testing. Ronovo Surgical® unveiled Carina™ in December 2022 and plans to commercialise Carina™ in China in 2024.

Contact us

info@sagentiainnovation.com
+44 1223 875200
sagentiainnovation.com

The project story:

Our involvement in the programme started with a design review to identify risks and areas for attention. We took the concept to a system architecture suitable for subsequent detailed design, with identification of all key components, usability analysis and industrial design. The work on the overall system included the patient-side cart, surgeon console, set-up and active robotic arms, instrument drive and endoscope drive, as well as wristed instruments. Working alongside the Ronovo Surgical® team, we then detailed the following subsystems and built functional prototypes: instrument arm, instrument drive, monopolar curved scissors with sterile adapter. Most recently we designed a custom-made surgeon input device for the surgeon console, improving range of motion and COGS over the existing solution.

Key challenges included: enabling the maximum range of procedures by optimising set-up and active arm geometries; keeping the arms compact enough to allow easy OR staff interaction; and collaboration across time zones.

We took the following approach throughout the programme:

- Rigorous but pragmatic system architecture development
- Informing the architecture with user insights, usability and workflow studies
- Targeting COGS across the system, using our knowledge of design for manufacture and local supply chains
- Rapid pace, compressing duration without unduly increasing risk