

PICO 7

Smith & Nephew



Development of an advanced negative pressure wound therapy system

Smith & Nephew, a market leader in advanced wound care, wanted to upgrade its PICO single use negative pressure wound therapy system. Smith & Nephew needed a partner capable of the enabling technology development, subsequent product development and detailed design for manufacture

Expertise and domain knowledge

- Mathematical modelling
- Technology landscaping
- Concept generation
- Device design
- User experience
- Mechanical design
- Energy storage
- Pump technology
- Medical device regulation
- Transfer to manufacture
- Patient experience
- De-risking
- Device miniaturisation





Our client asked:

Could the device be made smaller and quieter and what battery-powered vacuum pump would enable these performance improvements? Could performance improvements be achieved using off-the-shelf pump technology or would a custom design be required? Could a custom design satisfy the commercial considerations of cost-of goods and time-to-market?

The project story:

Sagentia Innovation mathematically modelled sources of loss and inefficiency in candidate vacuum pumps to understand how the needs could be met. We explored the technology landscape for off-the-shelf pumps and with no suitable options, developed a range of bespoke concepts using structured innovation techniques to target the best blend of performance, cost and development risk. We de-risked three lead pump concepts through development of looks-like, works-like prototype pump heads and electronic drive systems. Iterative performance improvements directed by high-speed video analysis of the pumps in operation, came from optimisation of both micro-moulded components and the drive electronics and software. Prototypes were tested to compare key criteria such as efficiency and noise. The focus then shifted to full device concepts. We took a systems approach to generating and evaluating device concepts, considering the impact of pump efficiency on energy storage needs, and the potential for overall device miniaturisation.

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Results: deliverables and outcomes

We worked alongside Smith & Nephew's contract manufacturing partner to optimise the design for manufacture and to initiate design transfer. In February 2018 Smith & Nephew announced the European launch of its PICO 7 product. PICO 7 delivers several enhancements which benefit both clinical effectiveness and the patient experience. Clinically PICO 7 delivers a more efficient vacuum and superior leak management. It's designed to support improved application on anatomically challenging areas where it is traditionally more difficult to achieve and maintain a seal. PICO 7 is 25% quieter making it less intrusive which is of great value to the patient when they are outside the home or sleeping. Smith & Nephew has filed a patent application using embodiments from Sagentia Innovation's work.

“Our innovative custom design was optimised for the requirements of this NPWT application and provided a step change in pump efficiency, meaning a smaller and quieter device.”