AI-POWERED STERILE PROCESSING

EVALUATION OF SCALPEL AI AT UNIVERSITY COLLEGE LONDON NHS

CURRENT CHALLENGES

Background

UCLH is one of the UK's leading NHS hospital trusts, providing world-class care to the best medical professionals for nearly 200 years. Their sterile service technicians are responsible for packing the trays with medical instruments to be used in actual operations. It was highly important that the tray containing the medical instrument was free of errors and assembled using the correct steps.

Problem

At UCLH, it took a minimum of 6 months to onboard a sterile service technician, and the error rate of packing trays was around 1-2%. It was nearly impossible to bring it down as the processes already had standardization, and skills took much work to automate. UCLH needed an efficient way to reduce the error rates and improve the time efficiency of their technicians.

"We needed a platform that would enable us to accurately onboard new and semi-skilled technicians while ensuring that the tray packing was done with the same quality within a shorter duration."

Chris Webster, Director of Surgery and Anaesthesia, UCLH

Onboard new and semi-skilled technicians	Highest quality tray packing and inspection	Efficient packing of surgical trays

OUR SOLUTION

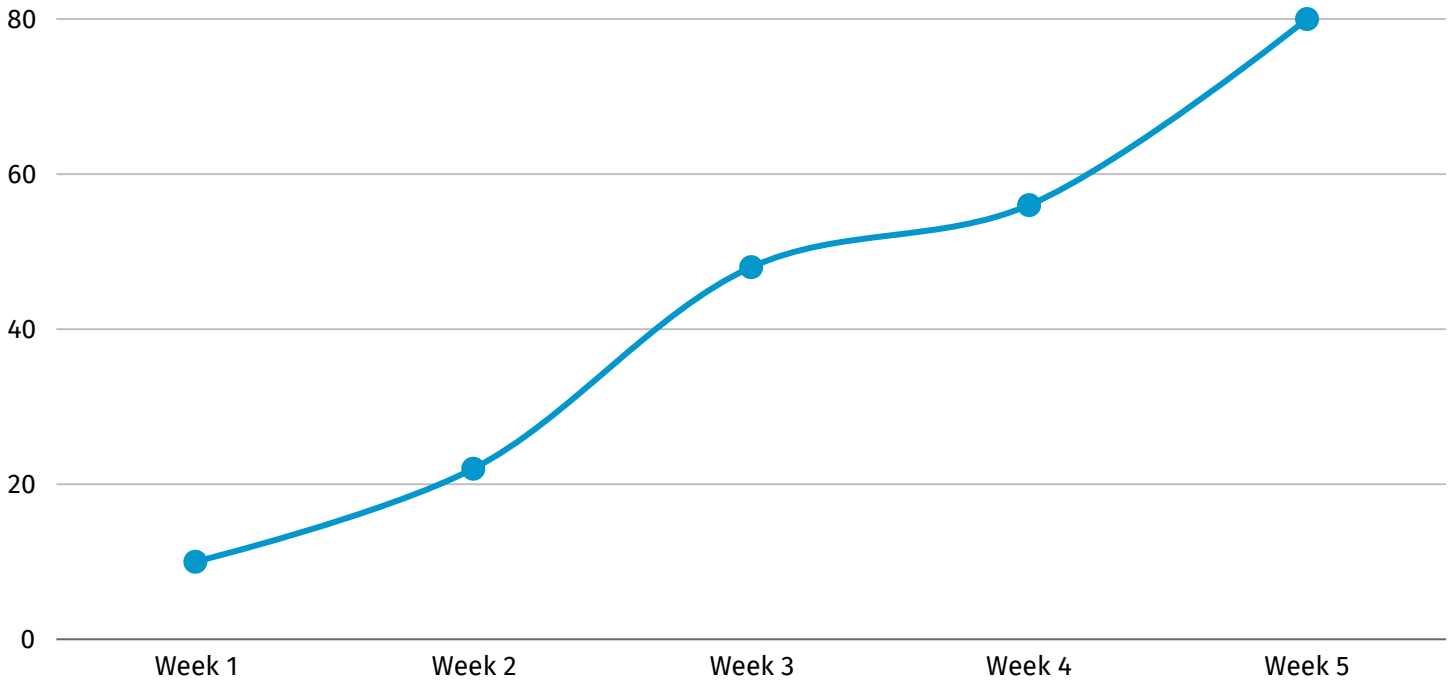
Scalpel (https://www.linkedin.com/company/scalpel-ltd/) is the enterprise AI platform for the surgical supply chain. They are at the forefront of surgical instrument detection and validation technology.

Scalpel AI introduced its fully integrated AI platform that identifies surgical instruments using machine vision and tracks them without tags. The system connects Scalpel’s proprietary datasets with the images and tray build lists to compare and validate tray readiness before surgery.

Scalpel's Active Vision was the perfect solution to UCLH's challenge. The platform supported autonomous and assisted operations, making it suitable for new and semi-skilled technicians. This technology allowed the technicians to visually check their trays to ensure that safety protocols were followed and that the right combination of instruments was assembled in each tray.

While the technology improved accuracy and efficiency in tray packing, the biggest value added was to increase staff confidence in tray packing.

Increase in staff confidence over a five-week period



STUDY OVERVIEW

Chris Webster, Ajay Gumani, and the team from UCLH engaged with Scalpel and deployed their technology on a vast number of Orthopaedic instruments during a Six-week study. The evaluation focused on validating the AI platform and measuring the quality and efficiency of tray packing and how it impacted training new staff members at a top sterile service division in the UK.

SCOPE AND METHODOLOGY

- Twenty technicians took part in a single-blinded study; ten were part of the study group, using Scalpel AI copilot, and the remaining ten were in the control group using manual methods in tray processing.

- Each technician’s accuracy and efficiency were measured by independent observers using a time and motion study.

- In the study group, Scalpel AI’s accuracy was tested independently to ensure the system always gave correct answers to object detection.

Measure accuracy of tray packing

Measure efficiency of tray packing

Staff onboarding and training

KEY FINDINGS

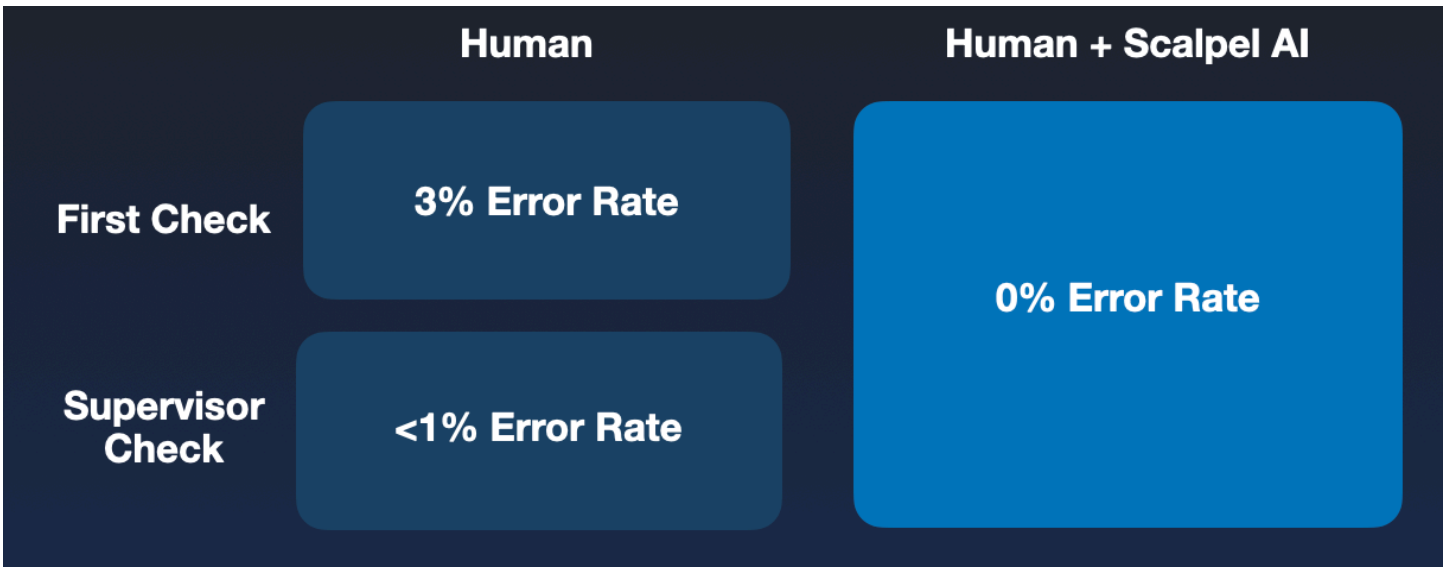
Impact on Accuracy:

- Accuracy of the AI copilot (100% accuracy rate): The AI co-pilot consistently performed at the highest accuracy in identifying the surgical instruments.

- In addition to identifying the nuances within various instruments, the platform was able to identify discrepancies in the tray build sheets.

- During the control period, technicians performed at a 3% error rate on the first attempt, followed by less than 1% error rate upon a second check.

In the study group, Scalpel's AI Copilot reduced the error rate to 0%, with the AI performing an independent check alongside humans.



Impact on Efficiency:

- The technicians found an enhanced speed in packing trays using AI assistance.

- For example, for some common Orthopaedic trays with 30 instruments, new technicians took 5 to 7 minutes to inspect a tray using their regular pen and paper method. Scalpel AI-assisted technology reduced that period to 2:28 min, significantly increasing the speed without compromising the quality of tray packing.

- This increase in efficiency allows UCLH to unlock additional capacity in their team and workflows.

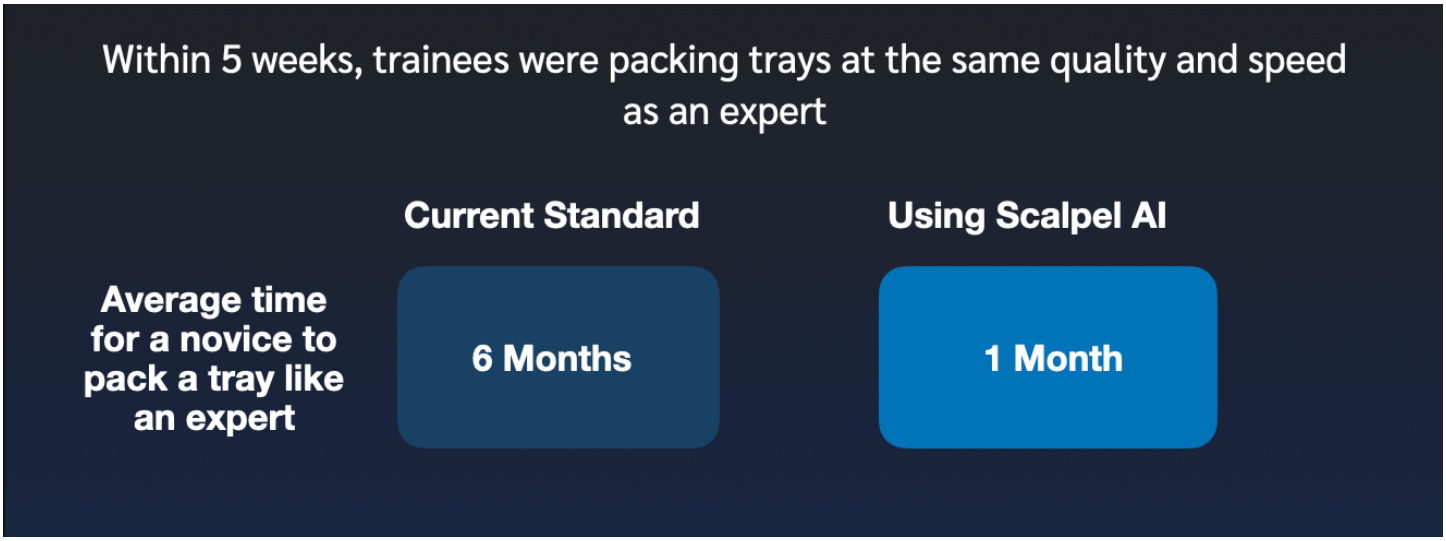
Impact on Staff Onboarding:

- Accelerated expertise development was found in novices.

On average, it takes six to nine months to raise a novice to the level of a skilled technician. Then, there is on-the-job training.

- Using Scalpel AI, novice technicians unfamiliar with the trays were packing them at the same quality and better speed than experts within five weeks, reducing the staff onboarding time by over 66%.

This is the biggest finding in the study, as improvement in staff onboarding and training addresses one of the biggest choking points in sterile services.

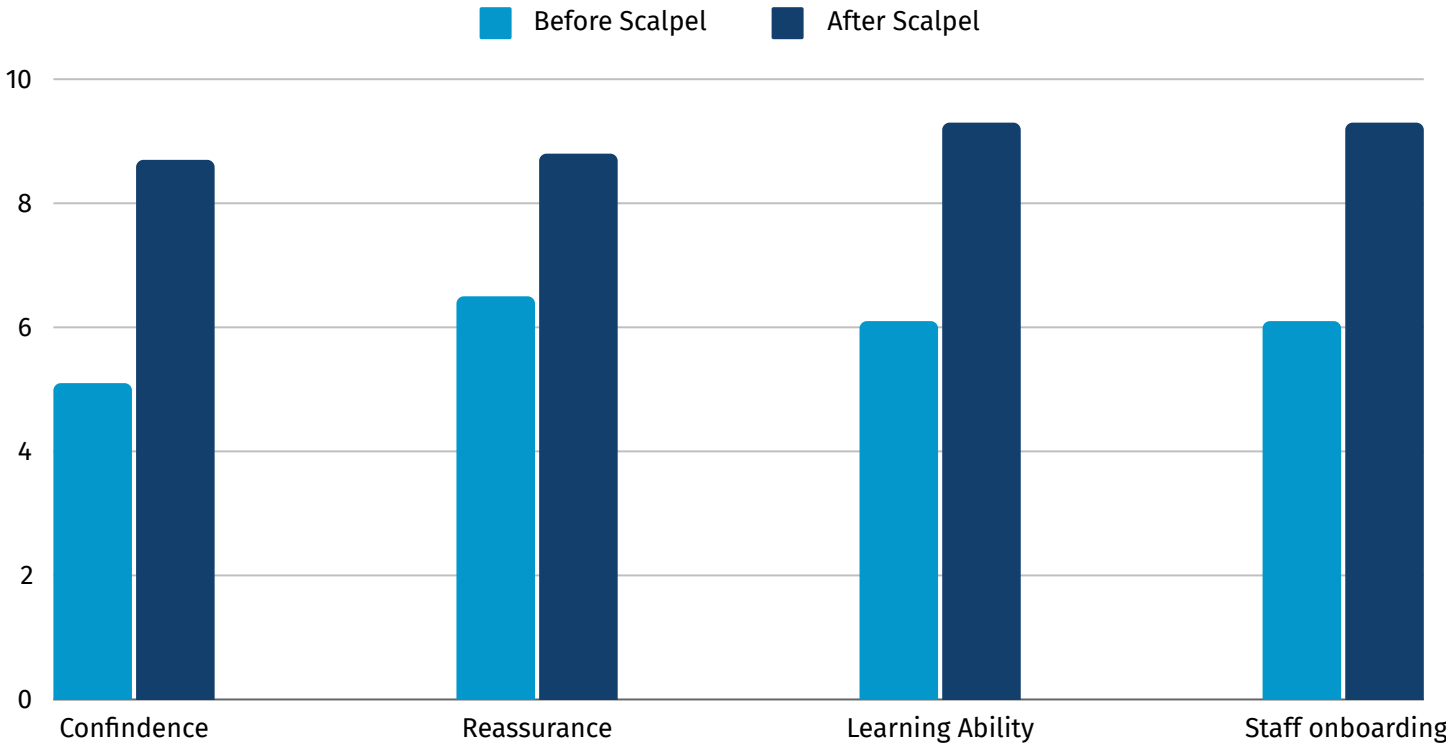


Impact on Overall Confidence and Learning Ability

- Qualitative measurement of staff confidence and ability to learn new instruments revealed that

Scalpel AI Improved confidence by 70% and learning ability by over 55% among novice and semi-skilled technicians.

This measurement of staff confidence and learning ability is an important metric for UCLH as it demonstrates how AI could be used today in the hospital, even for technicians at the beginning of their careers.



STAFF FEEDBACK

“Scalpel AI provides peace of mind; it ensures we always inspect the trays for their cleanliness and functionality appropriately.” - Ajay Gumani, Sterile Service Section Manager, UCLH

“I am really really really very impressed. This helps us to prevent errors. It gives our staff confidence. When you walk into this place as a new technician, it could be quite intimidating. They think, “How will I learn all these trays?” Some staff leave within one week. If they see this AI copilot, it gives them confidence. it keeps them longer, helping in staff retention.” - George Mukwaya, Sterile Service Section Manager, UCLH

“It will be so good to train new staff. It will be number one in that.” - Monica Coleman, Sterile Service Section Manager, UCLH.

"If you think about the scrub teams in the OR, they are experts within that specialty as they see the same trays daily. Unlike that, a sterile service tech has to learn a lot of instruments; they could be packing urology today and gynecology tomorrow, and they have to learn to inspect each and every instrument for their imperfections. There is a lot of pressure on new technicians, retention is so low, there is not a lot of knowledge about instruments, and when they come in, it is quite daunting. If a system like this could help them perform better, it would keep them longer in the game." Chris Webster, General Manager - Theatres & Anaesthetics, UCLH.

The future is now.

This implementation of Scalpel AI at UCLH shows AI's transformative potential in sterile processing workflows. The study's significance suggests a clear pathway to setting a new standard in healthcare operations.

References

- Scalpel AI Website - https://www.scalpel.ai

- UCLH - https://www.uclh.nhs.uk/