

Hospitals prioritise patients most in need of surgery and increase capacity with AI

NHS trusts have increased operating capacity, whilst more safely and accurately prioritising patients for surgical procedures, with the help of AI technology that is preventing avoidable harm and saving surgeons many thousands of hours as they deal with a growing national backlog.

Surgeons across several NHS trusts have improved surgery waiting times and reduced A&E admissions, especially for the highest risk patients, after successful clinical trials of an AI decision support model that is helping to make prioritisation safer and more equitable for patients. The approach is now seeing uptake in dozens of NHS trusts, as integrated care systems prepare to implement elective recovery plans.

The Cheshire and Merseyside model, pioneered by clinicians and operational teams at St Helens and Knowsley Teaching Hospitals NHS Trust, uses a system created by healthcare analytics and AI company C2-Ai, to allow surgeons to more accurately prioritise patients according to their specific clinical risk and impact of delays in treatment.

The tool applies robotic process automation to build on and enhance a prioritisation model from the Royal College of Surgeons. It uses hospital data to risk stratify a trust's or an integrated care system's elective surgical waiting list. It does this based on patients' mortality and morbidity risk, and their risk of increasing complexity as they wait, as well as other factors.

Three trusts in Cheshire and Merseyside - St Helens and Knowsley Teaching Hospitals NHS Trust, Warrington and Halton Teaching Hospitals NHS Foundation Trust and Liverpool University Hospitals NHS Foundation Trust - applied the model, commissioned by NHS England and Improvement, to a cohort of 125,000 patients.

Benefits observed by surgeons, who remain in full control of prioritisation decisions, include:

- More than 8% reduction of emergency admissions from waiting list patients.
- 125 bed-days saved for every 1,000 patients on the list as a result of reduced avoidable harm.
- Faster clearing of the elective waiting list backlog – including a 27.1% reduction in patients waiting more than 52 weeks, within just six weeks of starting programme.
- Reduced deterioration of patients which would result in increasing length of stay and cost.
- Better use of independent sector hospitals treating NHS patients – rejection rate reduced from 60% to near zero. Rejection sometimes occurs if patient risk is considered too great.
- 30% reduction in surgeon time spent on triage.
- Better use of surgeon time and reduced burnout.

Professor Rowan Pritchard Jones, a surgeon and medical director at St Helens and Knowsley Teaching Hospitals NHS Trust, and clinical lead for the Cheshire & Merseyside Elective Recovery and Transformation Programme, said: "As a surgeon, I want to make sure I have the right patient, in the right place at the right time.

"Through the Cheshire and Mersey model and our work with C2-Ai, surgeons have granular intelligence to plan our workforce, reduce the admin burden, and prioritise patients. I can quickly identify the patients with the most to gain when we intervene, and I can bring forward patients who have most to lose by waiting longer.

"I know the risk of a patient having an operation now. I can evidence decisions about where to send patients for surgery to avoid risk of harm, and make better decisions with patients. And I know the

risk of not doing an operation. I can identify groups of patients at greater risk of deterioration whilst on the waiting list, who may have very worse outcomes if they present as an emergency.

“I feel far more comfortable as a clinician working on each patient’s individual risk. Some can wait well, others can’t. This is a far more equitable way to deliver care.”

Benefits realised are set to spread more widely. The model has been deployed at more than two dozen NHS trusts within the last six months, helping integrated care systems across three regions, with dozens of other trusts in conversation.

The system works in practice as a clinical decision support tool, helping to reduce variation and improve objectivity, but healthcare professionals still make the final decision on how to prioritise patients. Surgeons using the tool have corroborated its accuracy and have benefitted from an automatic risk assessment for every patient, with priority scores calculated from four to 100.

The news comes after the elective waiting list in England passed record levels in December, with more than six million people waiting for hospital treatment. Reports have also estimated that 14 million people could be on NHS waiting lists by late 2022.

The underpinning platform provided by C2-Ai, known as CRAB, is already used in the NHS to understand performance and improve patient safety across a range of areas. Applied in this case to surgical prioritisation, it also takes into account the impact of a patient’s social determinants of health and qualitative factors captured through clinical assessment, such as pain.

Dr Mark Ratnarajah, a practicing paediatrician and UK managing director at C2-Ai, said: “This powerful new tool is based on proven technology already in use in the NHS and in hospitals around the world, where we are helping hospitals understand and respond to risks. In this new application to risk stratifying patients on waiting lists, there is real potential to help the NHS clear the elective backlog more quickly. It is helping to ensure patients are prioritised fairly and safely for important operations as demand continues to rise.

“Clinical professionals in Cheshire and Merseyside are showing that the most significant change in surgical waiting list management in a generation is possible now – and it is extremely encouraging to see growing interest in the work they have started.”

ENDS

Notes to editors

About C2-Ai

C2-Ai is a trusted NHS digital approved partner with access to full national datasets and running on the HSCN/N3 network. C2-Ai has provided national support for the Keogh Review and to Professor Sir Mike Richards at the CQC, and our systems are locally in use in dozens of NHS trusts and in 11 countries.

C2-Ai provides a unique, AI-backed suite of hospital care quality/efficiency improvement tools (CRAB, Patient List Triage, Observatory & Compass). They are developed from 30 years of research, ten years of development and the world’s largest (350m) and geographically broadest patient data set (from 46 countries). In the UK these have a track record for delivering demonstrable improvements in:

- Reducing avoidable harm and unwarranted variation
- Reducing length of stay
- Reducing critical care demand
- Improving clinical cost effectiveness