

AID-GI

// Project Case Study - Health and Wellbeing

Utilising Space to Help Prevent Bowel Cancer

Satellite technology and artificial intelligence can enable thousands more patients to benefit from preventative endoscopy screening

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Arden and
Greater East Midlands
Commissioning Support Unit

We work with
Innovate UK

CATAPULT
Satellite Applications

PROJECT BACKGROUND

In 2018, Bowel Cancer was the third most commonly occurring type of cancer, being diagnosed in 1.8 million people worldwide (World Health Organisation). Bowel Cancer is one of the few cancers that can be fully prevented if its precursors – polyps – are detected early.

Screening tests such as endoscopies and colonoscopies of the gastrointestinal (GI) tract can significantly increase the survival rate of colorectal cancer patients.

Currently the vast majority of these screenings are undertaken at a clinic, which requires intensive clinician support and can be an uncomfortable procedure for the patient. However, resource constraints have led to a 'diagnostic bottleneck'.

Over 750,000 screenings of this type are performed per year in England alone, and overall demand has doubled in many UK centres over the last 5 years. National targets are repeatedly missed, with the latest figures showing 20% of acute units in England and 40% in Scotland failed to meet cancer targets.

With screening ages being reduced from 60 to 50 the number of individuals on waiting lists or being treated in weekend clinics will only increase. Shortages of endoscopists and nursing staff are cited as the biggest barriers to tackling what Bowel Cancer UK describes as an 'endoscopy crisis'.

As a means of addressing this crisis wireless capsule devices have been developed as an alternative, designed to record the inside of the digestive tract with minimal patient discomfort, while simultaneously reducing the level of resource required.

This approach has the potential to revolutionise the screening of conditions such as polypoid syndromes or Crohn's disease.

Following the success of these capsules, further capabilities are now being developed to automate the analysis of the images captured by the capsule, so as to further increase availability due to reduced resource requirements.

WHAT IS AID-GI?

AID-GI refers to Artificial Intelligence-supported Diagnostics of Gastrointestinal diseases. It is a project designed to decrease the time spent analysing capsule endoscopy videos while improving the quality of the images.

A capsule containing tiny cameras is swallowed by a patient and passes through their gastrointestinal tract, capturing up to 400,000 images which are then transmitted to experts for analysis. It follows on from the Pillcam Pilot project which established that the existing diagnostic data being collected by capsules was not of sufficient quality to be accurately analysed by Machine Learning and AI systems.

Project partners working alongside the Catapult include Highlands and Islands Enterprise, NHS Highland, Medilogik Limited, NHS Arden & Greater East Midlands Commissioning Support Unit, the University of Barcelona, the University Hospital Val d'Hebron in Barcelona and Corporate Health International, who are leading the project.

THE ROLE OF THE CATAPULT

To maximise the potential of capsule endoscopy, Innovate UK awarded nearly £1.5million in funding to partners, including the Satellite Applications Catapult, to help enable the use of Artificial Intelligence (AI) to review captured images.

Working with Arden & GEM CSU, who have led on the evaluation of the pilot and automated screening, the Catapult created and tested the data transfer links, providing satellite connectivity advice and supporting on the AI developments.

This input ensures that images transmitted from the capsule, can be seamlessly uploaded via satellite link avoiding any issues with poor connectivity, particularly in rural locations.

“With the NHS Long Term Plan placing such an emphasis on the adoption of digital solutions, this is a fantastic opportunity to assess the roll-out and benefits of a radical innovation and fully capitalise on the learning from the initiative to ensure that the service can be replicated at scale across the UK. Most critically, we will be assessing ways to ensure that this digital technology can be sustained and integrated into new models of care and service delivery for patients.”

Wendy Lane

Director of Consultancy Services
Arden & GEM CSU

“AID-GI represents a unique opportunity to drive significant improvements in the early diagnosis of Bowel Cancer, while helping to ease the burden on our stretched health resources. By combining our connectivity expertise with the clinical experience of health professionals, we have been able to demonstrate the significant tangible benefits of this technology, and hope to utilise it in different applications in the future.”

John Vesey

Business Manager, Health and Wellbeing
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