Towards a Participatory Design of a Digital Application to Support Future AI-Supported Colon Capsule Endoscopy Services

Authors: Charline Roussel[1], Jay Bradley[1], Louise McCullagh[2], Marilyn Lennon[2], and Roma Maguire[2]

1 Glasgow School of Art (GSA)
2 University of Strathclyde (UofS)

Contact: c.roussel@gsa.ac.uk

Future AI-Supported Colon Capsule Endoscopy

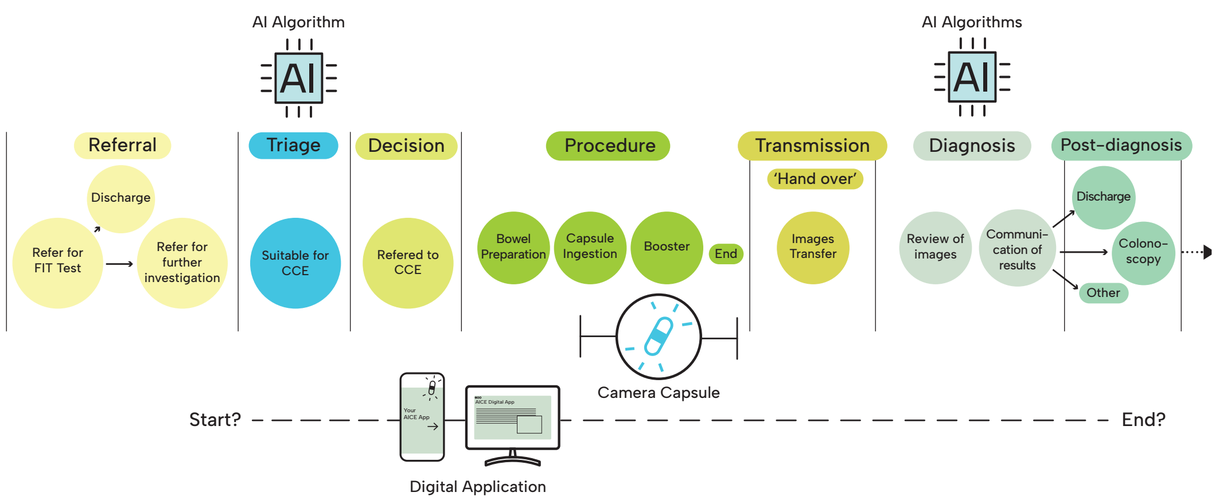


Figure 1 - Proposed AICE pathway

Some Findings from Interviews with AICE Team Researchers and Implementers Involved in CCE Pathway

How could the AI and future procured user-facing App interact with Healthcare Professionals and Citizens/Patients?

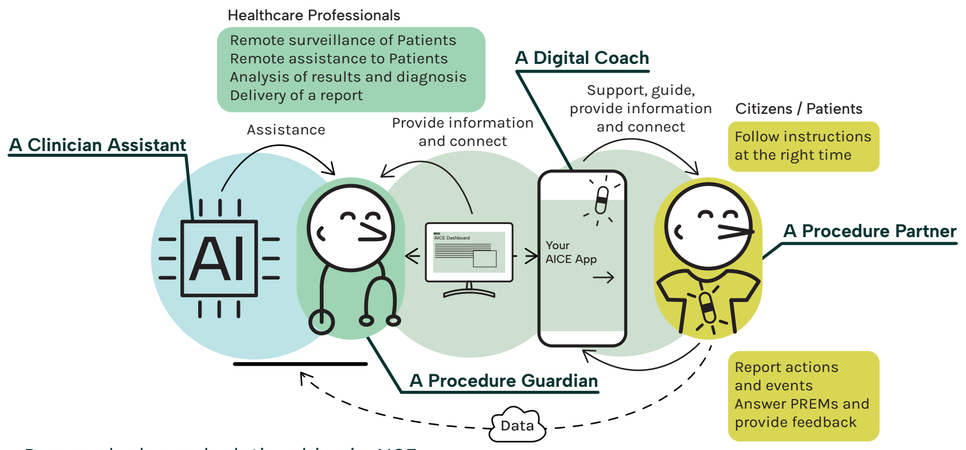
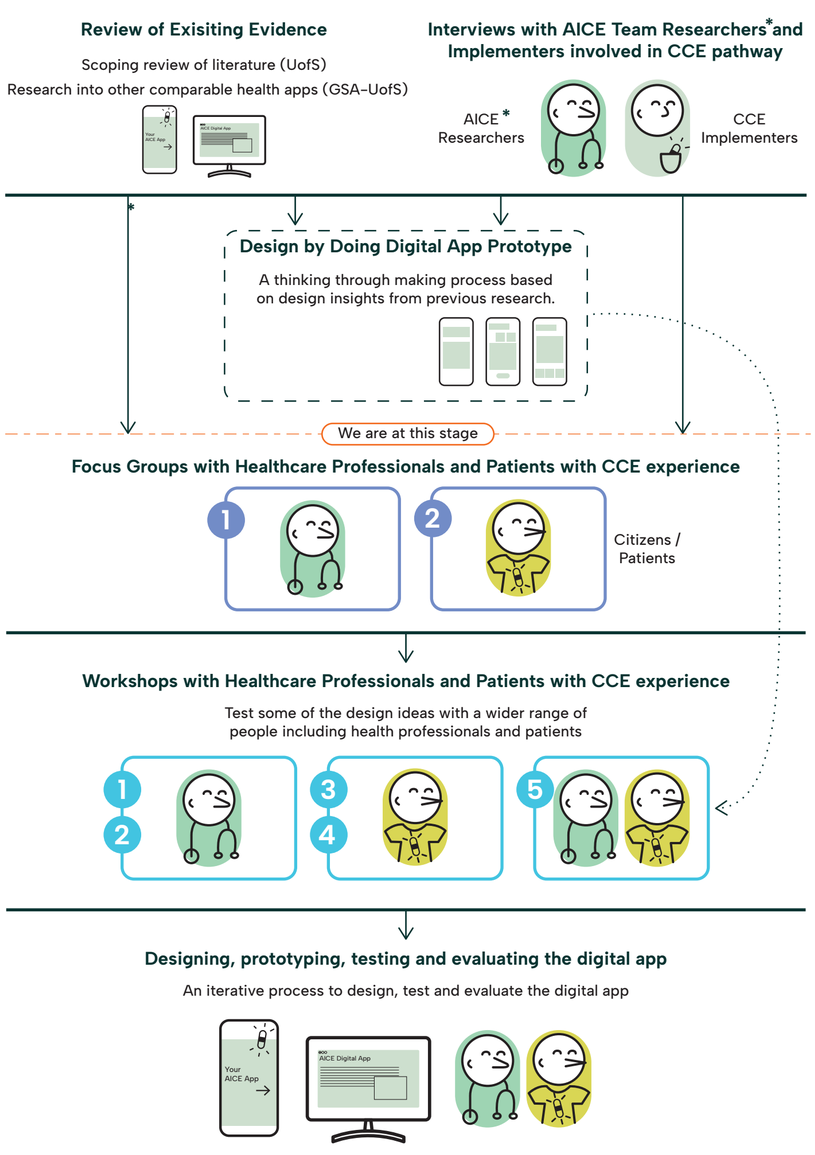


Figure 3 - Proposed roles and relationships in AICE

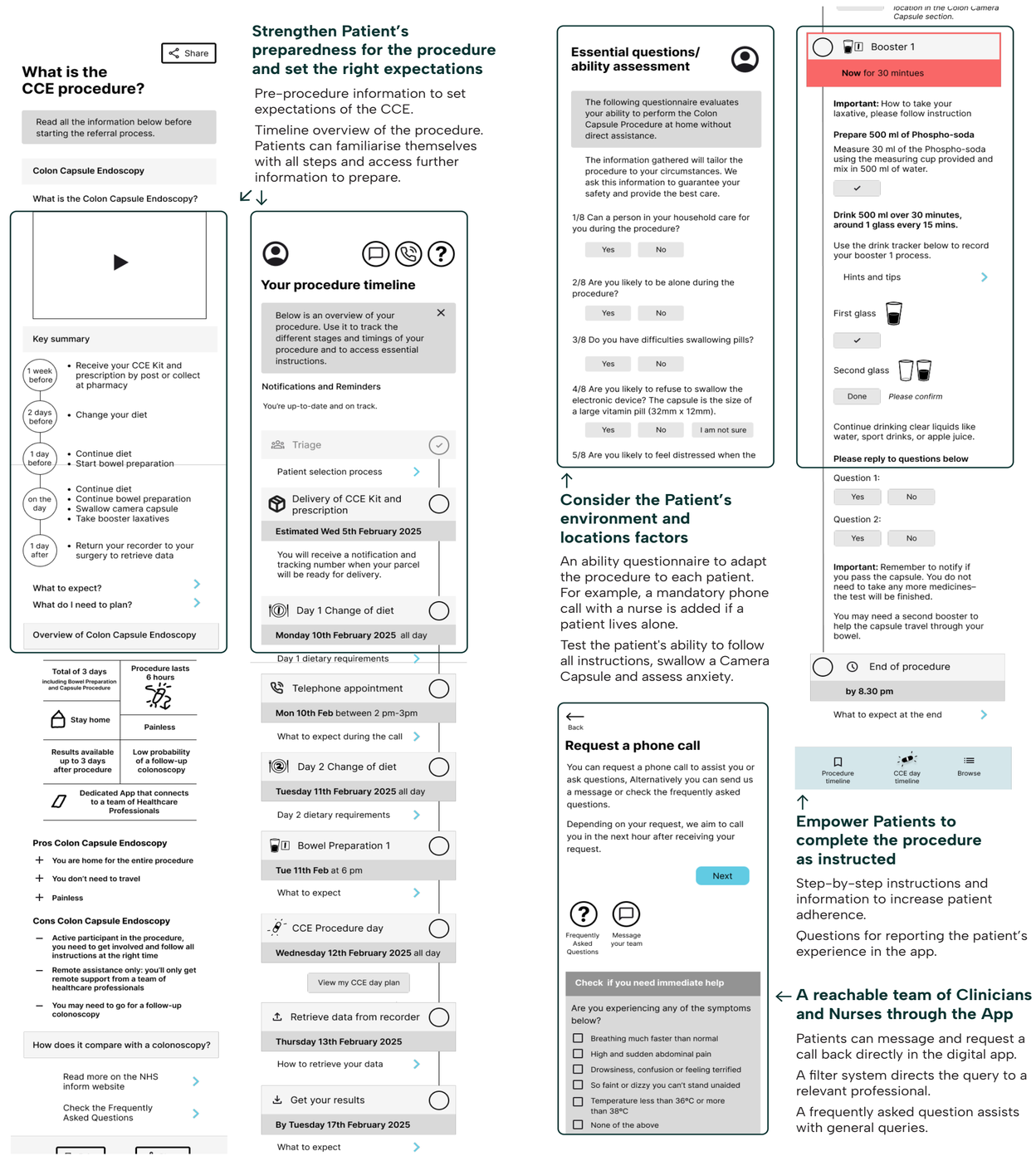
Participatory Design Methods



* The AICE researchers interviewed were gastroenterologists, surgeons, PhD fellows, researchers, and professors involved in various aspects of the project.

Figure 2 - AICE methods

Design-By-Doing Digital App Protoype



Consider the Patient's environment and locations factors

An ability questionnaire to adapt the procedure to each patient. For example, a mandatory phone call with a nurse is added if a patient lives alone.

Test the patient's ability to follow all instructions, swallow a Camera Capsule and assess anxiety.

Empower Patients to complete the procedure as instructed

Step-by-step instructions and information to increase patient adherence.

Questions for reporting the patient's experience in the app.

A reachable team of Clinicians and Nurses through the App

Patients can message and request a call back directly in the digital app.

A filter system directs the query to a relevant professional.

A frequently asked question assists with general queries.

Figure 4 - Screens from the design-by-doing prototype. The design ideas will be tested during participatory design workshops with Patients and Healthcare Professionals.

Figure 5 - A patch may soon replace the current belt recorder, capturing images from the camera capsule inside the body. It would sync with the digital app for real-time data and notifications.

Summary Abstract

The AI-Supported Image Analysis in Large Bowel Camera Capsule Endoscopy (AICE) project, funded by Horizon Europe and UK Research and Innovation, aims to develop an AI-assisted patient pathway for Colon Capsule Endoscopy (CCE). The AICE pathway will enhance comfort and efficiency, improve patient compliance, and identify those best suited for CCE, leading to earlier detection of bowel pathology and better outcomes.

The University of Strathclyde and Glasgow School of Art are developing a user-facing digital app to enhance the patient experience during the AICE pathway. Patients may prefer CCE as it can be performed outside hospitals and reduces travel.

Interviews with AICE Team researchers and CCE implementers informed participatory design preparation and an initial prototype created using a "design through doing" approach. The prototype will serve as a prompt for participatory design workshops involving both patients with prior CCE experience and healthcare professionals delivering CCE. Future workshops and focus groups will generate and test design ideas with a wider range of people.

The user-facing app will support and empower patients to prepare and manage their procedures, including facilitating healthcare professional care. The research aims to inform remote procedure delivery, establish principles for patient professionalisation, and create a digital app adaptable to various contexts and patient needs. It will also explore the role of AI algorithms and patients' relationship with them.