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AN INVESTIGATION OF ENGINEERING RESOURCES TO SUPPORT SMART CONTINENCE MANAGEMENT

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- Faecal incontinence (FI) is defined as the uncontrolled release of faecal matter from the bowels including both stool and gas. [1]
- FI is a symptom associated with a number of factors including physical injury, secondary damage from diseases or psychological issues. [2]
- FI is a debilitating condition that can severely affect self-esteem and quality of life. Population-based studies worldwide suggested the prevalence of FI is in the region of 0.4%-18%.[2]

Research Synopsis

The research will investigate engineering solutions including exploration of manipulation of the anorectal angle and the use of closed-loop systems to aid diagnosis and/or control of faecal incontinence. The effectiveness of the engineering technique(s) will be measured based on the ability of those solutions to control/diagnose continence in a model of the human defecatory system. The research will focus on non-invasive solutions and where necessary ex vivo prototyping will be used.

Proposed Research

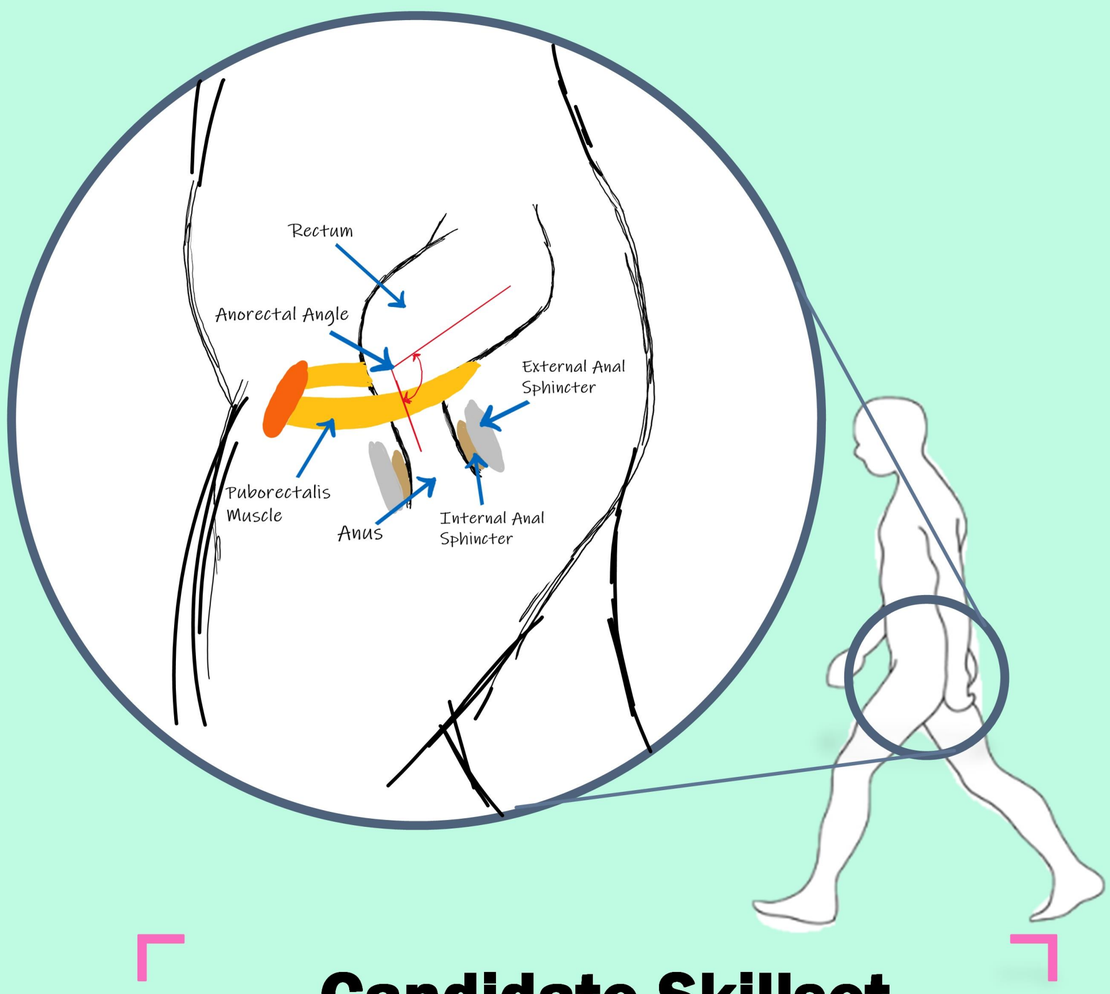
- Identify prevalence of faecal incontinence issues
- Investigate and create engineering solutions to FI
- Investigate solution types for the entire patient journey from diagnosis to management

Research Goals

- Decrease social and societal isolation
- Enable independent living with technology driven solutions
- Create awareness of faecal incontinence
- Create technology driven improvements in diagnosis, measurement and treatment of faecal incontinence

Methodology

- In-depth literature review
- Engage with patients, clinicians and allied health professionals to identify user needs and requirements
- Conceptualise design prototypes using 3-D design and simulation
- Create prototype solutions with custom-designed electronic circuits and software
- Create test methods and carry out test protocols using ex-vivo defecatory models (or similar) and prototypes



Candidate Skillset

- Electrical/Electronic Engineer
- 2 years experience in medical device industry in R&D
- Development and analysis of digital and analogue systems
- Design and development of mixed signal multilayer PCBA's
- Worked across capital systems and single use devices

Possible Stakeholders

- Medical device developers
- Clinicians and healthcare provider organisations
- Patient groups
- Medical imaging researchers

TU DUBLIN — Ollscoil Teicneolaíochta Bhaile Átha Cliath / Technological University Dublin

Host Institution

UCC University College Cork, Ireland / Coláiste na hOllscoile Corcaigh

MTU Ollscoil Teicneolaíochta na Mumhan / Munster Technological University

Maynooth University National University of Ireland Maynooth

Trinity College Dublin, Coláiste na Tríonóide, Baile Átha Cliath, The University of Dublin