Project Title

Real-time Artificial Intelligence (AI)-aided endoscopy improves adenoma detection rates even in experienced endoscopists

Project Lead and Members

Project lead: Clin Asst Prof Frederick Koh Hong Xiang, Consultant, Colorectal Surgeon

Project members:

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- Foo Fung Joon, Head, Endoscopy Centre & Colorectal Service, Consultant
- Lin Cui Li, Head, Gastroenterology, Senior Consultant
- Goh Pei Shi, Nurse Clinician, Endoscopy Centre
- Li Xiao Ke, Asst. Nurse Clinician, Endoscopy Centre

Organisation(s) Involved

Sengkang General Hospital

Healthcare Family Group(s) Involved in this Project

Medical, Nursing

Applicable Specialty or Discipline

Endoscopy

Aims

To improve the detection of polyps during colonoscopy

Background

See poster appended/ below

Methods

See poster appended/ below

Results

See poster appended/ below

Lessons Learnt

Real-time AI-aided colonoscopy have the potential to improved ADR even for experienced endoscopists and would therefore, improve the quality of colonoscopy.

Conclusion

See poster appended/ below

Additional Information

Currently, the implemented technology is being used in 50% of the endoscopy rooms with a plan to equip the rest of the facility with the technology after 1 year. With further talks and publicity from mainstream media and in local/regional conferences, we hope that more institutions take up this technology routinely.

Project Category

Technology

Keywords

Artificial Intelligience

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Real-time Artificial Intelligence (AI)-aided endoscopy improves adenoma detection rates even in experienced endoscopists

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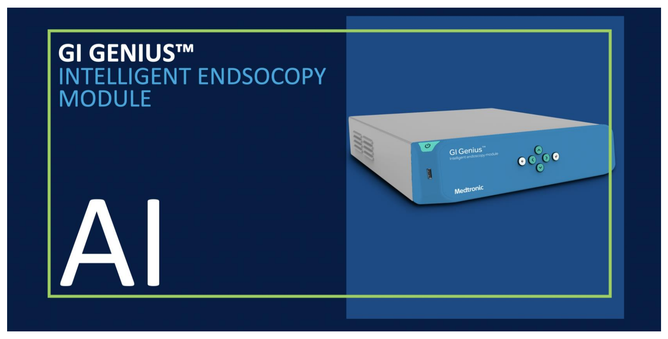


INTRODUCTION AND AIMS

Colorectal cancer is the number 1 cancer type in Singapore. Regular colonoscopy and the removal of colonic polyps remains the most effective means of reducing colorectal cancer risks for an individual.

Whilst commonly done, colonoscopy is still regarded as a technically demanding procedure. We have to split our focus on mucosal exposure, manoeuvring the scope, and identification of polyps.

Since July 2021, SKH have introduced an Artificial Intelligence (AI)-enabled software to improve the detection of polyps during colonoscopy.

Stakeholders / Methods of implementation

Endoscopists

- may be sceptical of new technologies and are worried of the medicolegal implications of using AI.
- Many felt initially that the system would not improve their polyp detection rate and felt as though AI was a tool for audit rather than a tool to improve the quality of colonoscopies.

Nurses

- were likely going to be enablers as there are ever-present in the endoscopy rooms. By educating them on the utility and benefit of the device to identify polyps, they acted as reminders and advocates for the adoption of the device, whilst at the same time upskilling in their assistance for endoscopy.

Routine and periodic assessment of results shown to the endoscopists and nursing team

- Reinforce the impact of the GI Genius™ on our own practice
- Good opportunities to allay their fears of using the technology
- The staff were also able to provide feedback to refine processes and protocols around the use of the device.

Industry collaboration

- Provision of sufficient units for trial and subsequent adoption was necessary to ensure quick and prompt adoption with sufficient momentum
- Trial period to generate data to justify the continuous use of the device

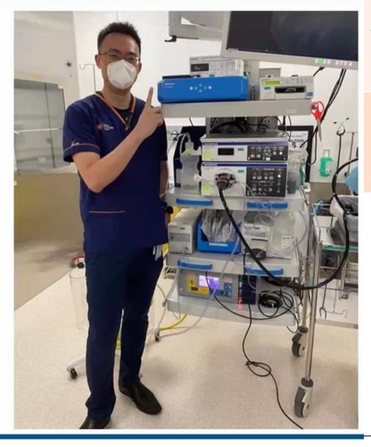
CMB and CFO

- After efficacy and cost analysis data was available, along with the survey results from our endoscopists, the pitch and buy-in from the Chief Finance Officer and Chief Medical Board would be required to support the perpetuation of the device

Results – 3months into implementation

DEMOGRAPHICS	n (%)
Total number of endoscopists	29
Endoscopists with ≥5 procedures with AI	18 (62.1)
Specialty • Gastroenterologist • General surgeon	 5/10 (50.0) 13/19 (68.4)

OVERALL PERFORMANCE	n
Number of AI-aided colonoscopies performed	298
Number of “hits”	487
Polypectomy:”hit” ratio (%)	250 : 487 (51.3)
Adenoma : polypectomy ratio	171 : 250 (68.4)
Number of sessile serrated adenomas	14 (5.6)



The post-intervention adenoma detection rate was 30.4% was higher than the baseline polypectomy rate of 24.3% (*p*=0.02)

Knowledge of AI:

- All understand common terms like “artificial intelligence” and “machine learning”.
- Only 56.3% understood more in-depth terms like “neural network” and “deep learning”.

Perceptions of AI in medicine:

- Most were optimistic about AI’s capabilities in performing objective administrative (81.3%-93.8%) and clinical (62.5%-93.8%) tasks.
- But most were reserved (93.8%) about AI providing personalised, empathetic care.

Behaviours regarding use of AI-aided colonoscopy:

- **68.8% of endoscopists agreed or strongly agreed that GI Genius should be used as an adjunct in colonoscopy.**

Results – after 1 year

50% of our endoscopy facilities being equipped with the GI Genius™ with >2500 colonoscopies performed with the GI Genius™ software. With >2000 polyps removed.

Take home messages

AI is increasingly permeating into healthcare where precision medicine is concern, from assisting doctors with diagnosis, reporting radiological scans and also guiding treatment for oncology. As healthcare professionals, we also do need to **move with the times** and **embrace technology** with the sole purpose of **providing the best care for our patients**.