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Final Report: APAGE/JGH Foundation Clinician-Scientist Training Fellowship 2020

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Research Project: The optimization of gastrointestinal cancer screening and surveillance in consideration of cancer risk and cost-effectiveness

Dear APAGE/JGH Foundation Committee,

It has been an immense honor to receive the APAGE/JGH Foundation Clinician-Scientist Training Fellowship for 2020. I extend my deepest gratitude to the APAGE/JGH Foundation Committee for their generous support throughout my fellowship. This funding has allowed me to conduct significant research aimed at improving the outcomes of gastrointestinal cancer through early detection, under the guidance of Professor David Watson at Flinders University.

Research Overview and Key Achievements

The primary focus of my research has been to optimize strategies for early detection and treatment of gastrointestinal cancer, with a particular emphasis on esophageal adenocarcinoma via Barrett's esophagus screening. Throughout the fellowship, I made substantial progress in the following key areas:

1. Systematic Review:

A systematic review was conducted to evaluate existing literature on Barrett's esophagus detection tools. We screened over 4000 articles and completed data extraction, synthesizing critical information on the efficacy of different screening modalities. The findings have informed the parameters of our economic model and laid the foundation for future research publications.

2. Health Economic Modelling:

With the support of the fellowship, I obtained a license for TreeAge Pro software, attended specialized training in health economics, and participated in relevant conferences. I successfully developed a health economic model to assess the cost-effectiveness of six potential strategies for Barrett's esophagus detection. The model incorporated both conventional and novel detection tools, such as biomarkers and machine learning-based prediction tools. This modeling has been instrumental in identifying more cost-effective

strategies for early cancer detection and treatment, particularly in high-risk populations. Our health economic modeling highlights the usefulness of incorporating weighted risk stratification and less-invasive devices such as Cytosponge-TFF3 to deliver cost-effective identification of Barrett's esophagus in the community. It is important to consider the device costs and Barrett's esophagus prevalence in the targeted population when proposing an optimal strategy.

Research Outcomes and Contributions

1. Publications and Presentations:

As a result of my research, an original research article, for which I am the first author, was accepted in the *Journal of Gastroenterology and Hepatology (JGH)*. This publication addresses the cost-effectiveness of early detection strategies for Barrett's esophagus. In addition, I presented my findings as an oral presentation at Australian Gastroenterology Week 2024, the largest gastroenterology conference in Australia, sharing insights with fellow researchers and clinicians.

2. Contribution to JGH Journal:

In addition to publishing my work, I have contributed to the JGH journal as a reviewer, assessing a submitted manuscript and offering feedback. This experience has broadened my understanding of the field and allowed me to contribute to the scientific community in a meaningful way.

3. Future Directions and Impact:

The research I conducted during this fellowship has provided valuable insights into optimizing cancer screening protocols. Moving forward, I have initiated the next step towards developing a full screening pathway over a lifetime horizon that combines the detection and surveillance of Barrett's esophagus. Furthermore, I plan to extend this work to other types of gastrointestinal cancer and further refine the models to include patient-specific risk factors. The outcomes of this research have the potential to influence clinical guidelines and improve the cost-effectiveness of cancer screening programs globally.

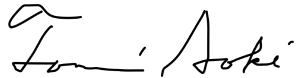
Reflections and Acknowledgements

This fellowship has been a transformative experience, both personally and professionally. It has allowed me to grow as a clinician-scientist and equipped me with the skills to continue contributing to the field of gastroenterology. I am deeply grateful for the mentorship of Prof. David Watson, A/Prof. Erin Simonds, and Dr. Norma Bulamu, whose guidance has been

invaluable throughout this journey.

Once again, I would like to express my sincere gratitude to the APAGE/JGH Foundation for their support and look forward to sharing the long-term impact of my work in future research endeavors.

Yours sincerely,

A handwritten signature in black ink, reading "Tomonori Aoki". The signature is written in a cursive, flowing style with a prominent initial 'T' and 'A'.

Tomonori Aoki