

**Issues in the Diagnosis and Management of  
Functional Gastrointestinal Disorders:  
The Development of a Novel Clinical  
Pathway**

By

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BSc (Hons), Grad Dip Sc. Comm., Grad Dip Psych

A thesis submitted for the degree of

**Doctor of Philosophy**

School of Medicine

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THE UNIVERSITY  
*of* ADELAIDE

June 2017

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## ABSTRACT

### Introduction

Functional gastrointestinal disorders (FGIDs) affect one in four people during their lifetime and are a growing public health concern. These disorders are characterised by distressing, chronic recurring symptoms that reduce quality of life, and negatively impact patients physically, psychologically, socially and economically. Although largely managed in primary care, referrals for specialist care represent up to 50% of ambulatory gastroenterology care. New developments in diagnostic criteria and effective management options are available but under-utilised.

### Aims

The aims of this study were to 1) determine current issues in the diagnosis and management of FGIDs in primary and tertiary care; 2) explore tested models of care for FGID; and 3) design and evaluate an algorithm-based approach to the diagnosis and management of FGIDs (ADAM-FGID).

### Methods

A cross sectional, mixed-methods study was undertaken based on referrals (July 2013-15) to one gastroenterology outpatient department triaged as 'likely FGID'. Patient characteristics, concerns and satisfaction with care, and reasons for referral were explored. The clinical approach to FGID diagnosis and management in tertiary care was assessed via audits of specialist correspondence and endoscopic procedures. A systematic review of FGID models of care was performed and a novel algorithm-based approach to the diagnosis and management of FGIDs was developed and trialled.

### Results

There was a clear paucity of research into models of care for FGID, with only 6 low-quality studies. Primary healthcare providers (PHCPs) referring to tertiary care lacked confidence in the diagnosis and management of FGIDs, and patients expressed dissatisfaction with the lack of provision of a diagnosis or effective management options. Within tertiary care, unclear diagnostic language was more prevalent in FGIDs than organic disorders (63% vs. 13%;  $p < .001$ ), as were endoscopic investigations (79% vs. 63%;  $p < .05$ ). Almost 80% of all patients diagnosed with FGID were found to have undergone upper gastrointestinal endoscopy (UGIE) or colonoscopy. Existing endoscopic appropriateness criteria were inadequate in their consideration of functional symptoms, and preliminary evidence



showed locally developed alarm-based appropriateness criteria to have better negative predictive value.

The ADAM-FGID was found to be both safe and effective. 39% of referrals required more urgent gastroenterological review than original triage category, with organic disease subsequently diagnosed in 31% of these. 82% of FGID diagnoses were stable during follow-up. Patient buy-in to the model was good, with 80% entering management and 61% reporting symptom improvement at 6 weeks. Moreover, 68% of patients, and all referring doctors found the approach to be at least moderately acceptable. Patients reported being reassured by the approach, and found the management options useful. Primary health care providers acknowledged the potential of this approach to reduce waiting times for endoscopic procedures and to provide reassurance to both patients and themselves.

## Conclusion

FGIDs are poorly handled in the public health system and little research into effective models of care has been conducted. This study identifies multiple issues and opportunities to improve patient care and strategies to achieve these improvements are presented. The clinical pathway for the diagnosis and management of FGIDs, which is not dependent upon specialist review, is safe, feasible and acceptable and has potential to capacity build by reducing specialist burden and expediting effective care.

## DECLARATION

I certify that this work contains no material which has been accepted for the award of any other degree or diploma in my name, in any university or other tertiary institution and, to the best of my knowledge and belief, contains no material previously published or written by another person, except where due reference has been made in the text. In addition, I certify that no part of this work will, in the future, be used in a submission in my name, for any other degree or diploma in any university or other tertiary institution without the prior approval of the University of Adelaide and where applicable, any partner institution responsible for the joint-award of this degree. I give consent to this copy of my thesis when deposited in the University Library, being made available for loan and photocopying, subject to the provisions of the Copyright Act 1968. I acknowledge that copyright of published works contained within this thesis resides with the copyright holder(s) of those works. I also give permission for the digital version of my thesis to be made available on the web, via the University's digital research repository, the Library Search and also through web search engines, unless permission has been granted by the University to restrict access for a period of time.

I acknowledge the support I have received for my research through the provision of an Australian Government Research Training Program Scholarship.

Ecushla Linedale

## ACKNOWLEDGEMENTS

I would firstly like to offer my sincere gratitude to all my principal supervisor Professor Jane Andrews, and my co-supervisors Dr. Antonina Mikočka-Walus and Professor Peter Gibson. Thank you for your knowledge, guidance and support throughout my PhD. I feel very blessed to have had a brilliant supervisory team, who also happen to be top-quality people! I have learned a lot (even though if sometimes in hindsight) and have enjoyed the PhD process.

Jane, thank you for your tireless effort in all areas of my PhD, and managing to cover copious amounts of ground in our meetings. I count myself extremely lucky to have had you supervise me. I also appreciate all the opportunities you opened for me with colleagues, institutions and companies in the field. Your passion and drive to transform healthcare has been inspiring, and I hope to continue in this vein in the future.

Antonina, through our chance meeting you saw my area of interest and linked me with Jane - and the rest is history. Thank you for all your perfectly timed and encouraging emails. You were a font of knowledge and great help, particularly in study design, qualitative research and analysis. Although you were in the UK for the most part, your input via email and skype was very helpful.

Peter, thank you for supervising me from afar, and providing opportunities for me to connect with your colleagues at The Alfred. I quickly learned that if you responded to an email, then what you had to say was very important! You always made time to catch up at conferences and provided valuable direction. Your guidance in restructuring manuscripts was invaluable, even if it resulted in supervisory grammar battles resolved by you pulling seniority. I hope you were right. Seriously though - thank you!

I would also like to give special acknowledgement and thanks to Professor Anna Chur-Hansen for her valuable input into the qualitative aspects of my research. Thank you to Quarat Ul-Ain Rizvi (MD) for her assistance in the medical records audit, and Muhammad Shahzad (MD) for his assistance in auditing referral quality. Also, a big thanks to team at the Royal Adelaide Hospital Department of Gastroenterology for your encouragement and support-particularly the IBD team.

Lastly, thank you to Mr. Tony Andrews for voluntarily proofing this thesis and identifying all the errors I had missed. Where I had got bogged down in facts, figures and results, you helped me see the importance of finessing the finer details of editing. I really appreciate your help, and this thesis is much better because of your input.

## CONFERENCE PRESENTATIONS

The following are published abstracts from national and international conferences that have arisen thus far from the work leading to this thesis: (conference talk presenter underlined).

**Linedale, E.C.**, Shahzad, M.A., Mikocka-Walus, A.M., Gibson, P.R., Andrews, J.M. Referrals to a tertiary hospital: A clinical snapshot of patients with functional gastrointestinal disorders and effectiveness of primary care management. Poster presentation: United European Gastroenterology Journal, vol. 4, 5\_suppl: pp. A484 (P0955), October 16, 2016.

**Linedale, E.C.**, M.A., Mikocka-Walus, A.M., Gibson, P.R., Andrews, J.M. Performance of a novel care pathway for functional gastrointestinal disorders: A pilot study-interim results. Poster presentation: United European Gastroenterology Journal, vol. 4, 5\_suppl: pp. A293 (P0395), First Published October 16, 2016.

**Linedale, E.C.**, Mikocka-Walus, A.M., Gibson, P.R., Andrews, J.M. Could a structured screening approach be the answer to the avalanche of functional gastrointestinal disorder referrals? (An interim report). Conference talk presented: AGW 2015, Volume: 30 Suppl. 3 Journal of Gastroenterology and Hepatology p.20

**Linedale, E.C.**, Chur-Hansen, A., Mikocka-Walus, A.M., Gibson, P.R., Andrews, J.M. Diagnostic uncertainty signalled by specialists and ongoing investigations may contribute to patient insecurity in functional gastrointestinal disorders. Conference talk presented: AGW 2015, Volume: 30 Suppl. 3 Journal of Gastroenterology and Hepatology p.19

Shahzad, M.A., **Linedale, E.C.**, Mikocka-Walus, A.M., Gibson, P.R., Andrews, J.M. Gastrointestinal outpatient referral quality: safe to use? Poster presentation: WGO International Congress, Gastroenterological Society of Australia Australian Gastroenterology Week 2015. Journal of Gastroenterology and Hepatology 30(Suppl. 3):21-22 . October 2015.

Rizvi,Q. **Linedale, E.C.**, Mikocka-Walus, A.M., Gibson, P.R., Andrews, J.M. Can we better target colonoscopies using standard "appropriateness" guides? Poster presentation: AGW 2015, Volume: 30 Suppl. 3 Journal of Gastroenterology and Hepatology p.58

Rizvi,Q. **Linedale, E.C.**, Mikocka-Walus, A.M., Gibson, P.R., Andrews, J.M. Do Criteria to Judge " Appropriateness " of Endoscopic Procedures Improve Diagnostic Yields or Allow Safe Avoidance of Upper Gastrointestinal Endoscopy? A Retrospective review. Poster presentation: AGW 2015, Volume: 30 Suppl. 3 Journal of Gastroenterology and Hepatology p.58-59

**Linedale, E.C.**, Shahzad, M.A., Mikocka-Walus, A.M., Gibson, P.R., Andrews, J.M. How can we better manage functional gastrointestinal disease? Internal Medicine Journal 46:23, January 2016. Conference talk presented: RACP Congress May 2016, Adelaide, South Australia.

## ADDITIONAL PUBLICATIONS ARISING FROM THE PHD RESEARCH

Narrative Review: The Diagnosis and Management of Irritable Bowel Syndrome (IBS) in 2017 - a guide for the generalist. Linedale, E.C. & Andrews, J.M. (Invited Review: Medical Journal of Australia, Under Review, 14th May 2017) [Appendix H](#)

Linedale, E.C., A. Mikocka-Walus, and J.M. Andrews, Future challenges and directions in FGIDs - Integrated and biopsychosocial care approaches., in Functional Gastrointestinal Disorders: A biopsychosocial approach. S.R. Knowles, J. Stern, and G. Hebbard, Editors. 2017, Routledge Taylor and Francis Group. [Appendix I](#)