

# **Creative Professional Activity (CPA) Dossier**

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## Creative Professional Activity (2014 – 2019)

Given my role as an Education Researcher in the SickKids Learning Institute and a Scientist with the SickKids Research Institute, my research is highly integrated with my teaching, creative professional activity and leadership. Through my creative professional activities, I aim to contribute to the reform of clinical practice and health professions education in ways that allow health professionals and learners to maximize their potential and enhance clinical care. I draw on my research to inform education and assessment design and enhance patient care. My Creative Professional Activities fall under two broad categories:

1. Contributions to professional and educational innovation in *Celiac Disease*
2. Exemplary professional practice in *Endoscopy Education and Assessment*

In this dossier, I will outline my Creative Professional Activity in these two areas with focus on (1) my professional innovation and creative excellence (2) development of professional practices, and (3) exemplary professional practices.

### 1. *Celiac Disease*

After starting in the Department of Paediatrics in 2014, I co-founded the Celiac Clinic at SickKids with Dr. Peggy Marcon to ensure comprehensive, leading-edge care of patients with celiac disease. As clinic co-lead I have worked to enhance the clinical care and the education of patients with celiac disease and their caregivers. I have contributed to the development of clinical care pathways and computer order sets related to celiac disease, as well as EPIC note templates to ensure key data is captured within the patient chart and communicated to outside care providers in a timely and comprehensive manner. I have also worked to ensure cost-effective care. For example, I led a study that sought to determine the positive predictive value of the newer deamidated gliadin peptide (DGP) serological screening test for biopsy-confirmed celiac disease in pediatric patients with elevated DGP and normal tissue transglutaminase (tTG); the most accepted marker for celiac disease. The results showed that while DGP may be a useful and necessary serological test to further investigate children who have a negative tTG and a high clinical suspicion for celiac disease, first line screening with DGP in IgA sufficient children over the age of two is likely unnecessary and has the potential to increase healthcare costs for both patients and healthcare systems, along with adding unnecessary invasive follow-up diagnostic testing (Gould et al *JPGN* 2019;68(1) and Gould et al *JPGN* 2019;69(1)). The results of this study have informed the serological screening tests used at SickKids.

As part of the clinic mandate, we have worked to enhance the education of patients with celiac disease and their caregivers, and to become a hub for educational activities within the medical and lay communities. We have collaborated with AboutKidsHealth to develop patient and caregiver educational webpages to help maximize health outcomes for children and families in Canada and around the world, including educational materials on:

- 1) Celiac disease (see: <https://www.aboutkidshealth.ca/Article?contentid=816&language=English>)
- 2) Celiac disease: The gluten-free diet (<https://www.aboutkidshealth.ca/Article?contentid=956&language=English>)
- 3) Celiac disease: Tips to maintaining a gluten-free diet (<https://www.aboutkidshealth.ca/Article?contentid=957&language=English>)
- 4) Celiac disease and diabetes (see: <https://www.aboutkidshealth.ca/Article?contentid=2527&language=English>)

**Figure 1:** Screen shot from one of the AboutKidsHealth educational websites I co-developed

## Symptoms of celiac disease

When a person with celiac disease is exposed to gluten, they may have trouble with their digestive system, malabsorption-related issues and other symptoms. The symptoms of celiac vary and some people with celiac disease may have no symptoms at all.

**Brain**

- headaches or migraines
- difficulty concentrating
- depression
- anxiety
- mood swings and irritability

**Skin**

- skin rash (dermatitis herpetiformis)
- brittle nails

**Mouth**

- mouth sores
- tooth enamel defects

**Digestive system symptoms**

- excessive gas
- diarrhea
- constipation
- irritable bowel symptoms
- stomach cramps and/or tummy pain
- nausea
- vomiting
- bloating of the abdomen (tummy)
- decrease in appetite
- indigestion

**Malabsorption-related symptoms**

- poor growth (being shorter than expected)
- weight loss or poor weight gain
- delayed puberty
- anemia (low blood haemoglobin from iron malabsorption)
- vitamin or mineral deficiencies (for example, calcium, B12, vitamin A, D, E and K)

**Reproductive**

- infertility (difficulty conceiving children, in both men and women)
- miscarriage
- menstrual irregularities

**Body**

- osteopenia (mild) or osteoporosis (more serious bone density problem)
- joint pain
- fatigue
- liver and biliary tract disorders

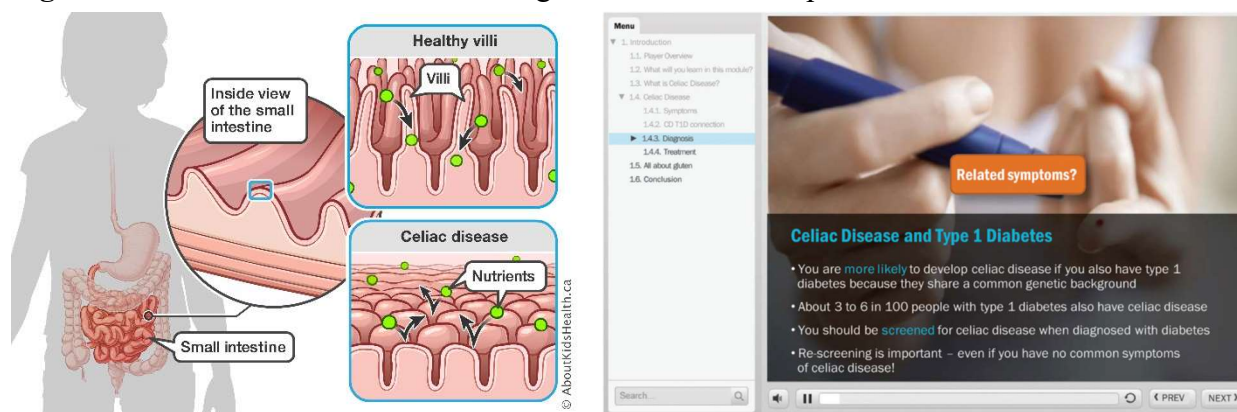
Talk to your child's doctor if you are concerned they may have celiac disease.  
For more information visit [www.aboutkidshealth.ca/GI](http://www.aboutkidshealth.ca/GI).

SickKids | AboutKidsHealth.ca

At the time of diagnosis patients and their families are typically educated with regard to the gluten-free diet during a 60-90 minute teaching session with a registered dietitian. However, this type of individualized education is resource intensive. In addition, despite education, parental knowledge regarding specific dietary information has been shown to be poor. To improve educational practices, I co-lead the development of 2 online modules that provide interactive e-learning on the gluten-free diet for children with celiac disease, and their caregivers. The modules offer an accessible, user-friendly and reliable overview of the gluten-free diet with specifics on how to maintain the diet inside and outside the home, and over time. E-learning is advantageous as it permits users to access resources remotely at any time, thus limiting travel to and from the hospital and reducing the number of missed days of school and/or work. Additionally, online educational materials can potentially facilitate education of additional caregivers who may be involved in celiac disease meal preparation; an important factor given that parents report struggling to get schools and daycares to understand children's need for a gluten-free diet and spending a lot of time and effort to inform relatives, friends, and caregivers. I have integrated prospective research into the fabric of the SickKids Celiac Clinic. I am currently leading a funded randomized trial to determine the effectiveness of online learning (e-learning) to educate pediatric patients and their caregivers on the gluten-free diet as treatment for celiac disease, as compared to a 60-minute one-on-one educational session with a registered dietitian (current standard of care).

I also co-lead development of 2 additional online modules that provide interactive e-learning on the gluten-free diet for children with both diabetes and celiac disease, and their caregivers (see Module 1: [http://bigroar.ca/demo/CD1/story\\_html5.html](http://bigroar.ca/demo/CD1/story_html5.html); Module 2: [http://bigroar.ca/demo/CD2/story\\_html5.html](http://bigroar.ca/demo/CD2/story_html5.html)). These modules fill a knowledge gap for Canadian families and for young patients dealing with diabetes, who are up to six times more likely to develop celiac disease than those without diabetes. The goal is to standardize care across institutions and to let patients focus on personalized questions during their time with specialists rather than on gluten-free diet basics that can be covered in detail online. I obtained research funding through the University of Toronto Joannah and Brian Lawson Centre for Child Nutrition to conduct mixed-methods usability testing to refine and evaluate the module, using qualitative semi-structured interviews, observations, and satisfaction and knowledge questionnaires in two iterative cycles involving 18 caregivers and 15 patients. Using a multifaceted user-centered usability approach, we demonstrated that an innovative, interactive e-learning module is effective in knowledge retention and can provide comprehensive and accessible information in the implementation of the gluten-free diet teaching in children with celiac disease and type 1 diabetes (Connan et al *Pediatric Diabetes* 2019;20(3))

**Figure 2:** Screenshots from the e-learning modules we developed related to celiac disease



**A.** An image we designed to demonstrate the harmful effects of gluten exposure in children with celiac disease

**B.** Screenshot of slide “Celiac disease and type 1 diabetes” demonstrating the table of contents that was introduced after usability testing, which enables users to navigate freely within the module

The aforementioned e-learning modules are currently being used at SickKids to enhance patient education. Once the SickKids external Learning Management System launches in the fall the modules will be shared freely with patients external to the organization. Dissemination will be enhanced through our partnerships with the Canadian Celiac Association, Diabetes Canada, the North American Society for Pediatric Gastroenterology, Hepatology and Nutrition the University of Toronto Joannah and Brian Lawson Centre for Child Nutrition and other organizations. We are also working to translate the work into French and Spanish for a global reach. Additionally, we are collaborating with AboutKidsHealth to create a celiac “learning hub” which will house all celiac-related web-based information and e-learning modules under one roof to enhance accessibility.

### 1.1 Peer-reviewed funding (trainees names underlined)

**Principal Investigator.** Online education for gluten-free diet teaching: Development and usability testing of an e-learning module for children with concurrent celiac disease and type 1 diabetes. Centre for Child Nutrition and Health Nutrition Medical Education Grant. Principal Investigator(s): **Walsh, Catharine**. Collaborator(s): Marcon, Margaret A; Bandsma, Robert; Connan, Veronik; Mahmud, Farid H; Assor, Esther; Vresk, Laura. Amount: \$10,000 CAD. (09/2016 - 08/2017)

**Senior Responsible Author.** Online education for celiac disease and the gluten-free diet teaching. Canadian Foundation for Dietetic Research. Principal Investigator(s): Vresk, Laura. Collaborator(s): **Walsh, Catharine** (SRA); Marcon, Margaret. Amount: \$14,906 CAD. (07/2015 - 07/2018)

**Principal Investigator.** Celiac disease and gluten-free diet teaching: Is online education effective? Hospital for Sick Children, Paediatric Consultants Educational Scholarship Grant. Principal Investigator(s): **Walsh, Catharine**. Collaborator(s): Marcon, Margaret; Vresk, Laura. Amount: \$5,000 CAD. (06/2016 - 06/2017)

### 1.2 Peer Reviewed Publications (trainees names underlined)

1. Gould M, Brill H, Marcon MA, **Walsh CM**. Response to a letter to the editor regarding the original article, in screening for celiac disease, deamidated gliadin rarely predicts disease when tissue transglutaminase is normal. *Journal of Pediatric Gastroenterology and Nutrition*. 2019 Jul;69(1):e23-e24. doi: 10.1097/MPG.0000000000002378. Impact Factor: 3.0 . **SRA**
2. Connan V, Marcon MA, Mahmud FH, Assor E, Martincevic I, Bandsma RH, Vresk L, **Walsh CM**. Online education for gluten-free diet teaching: Development and usability testing of an e-learning module for children with concurrent celiac disease and type 1 diabetes. *Pediatric Diabetes*. 2019 May;20(3):293-303. doi: 10.1111/pedi.12815. Impact Factor: 3.4 . **SRA**
3. Gould M, Brill H, Marcon MA, Munn NJ, **Walsh CM**. In screening for celiac disease, deamidated gliadin rarely predicts disease when tissue transglutaminase is normal. *Journal of Pediatric Gastroenterology and Nutrition*. 2019 Jan;68(1):20-25. doi: 10.1097/MPG.0000000000002109. Impact Factor: 3.0 . **SRA**

### 1.3 Online publications and resources

1. Marcon P, Martincevic I, Assor E, **Walsh CM**. Celiac disease and diabetes. AboutKidsHealth. 2017 Nov 20. Available at: <https://www.aboutkidshealth.ca/Article?contentid=2527&language=English>. **SRA**
2. Marcon P, Martincevic I, **Walsh CM**. Celiac disease. AboutKidsHealth. 2017 Feb 6. Available at: <https://www.aboutkidshealth.ca/Article?contentid=816&language=English>. **SRA**
3. Marcon P, Martincevic I, **Walsh CM**. Celiac disease: The gluten-free diet. AboutKidsHealth. 2017 Feb 6. Available at: <https://www.aboutkidshealth.ca/Article?contentid=956&language=English>. **SRA**
4. Marcon P, Martincevic I, **Walsh CM**. Tips to maintaining a gluten-free diet. AboutKidsHealth. 2017 Feb 6. Available at: <https://www.aboutkidshealth.ca/Article?contentid=957&language=English>

### 1.4 Invited Lectures and Workshops

**Invited Speaker.** Celiac disease: Diagnosis and management. Canadian Digestive Diseases Week. Banff, Alberta, Canada. Presenters: **Walsh CM**, Pinto Sanchez MI. (03/02/2019)

### 1.5 Presentations (trainees names underlined)

**Presenter.** Online education for gluten-free diet teaching: Development and usability testing of an e-learning module for children with concurrent celiac disease and type 1 diabetes. NASPGHAN Annual Meeting. Hollywood, California, USA. (Poster 197). Presenters: **Walsh CM**, Connan V, Mahmud FH, Assor E, Bandsma RH, Martincevic I, Vresk L, Marcon MA. (*Poster presentation*). (10/25/2018)

*Publication Details:*



**Walsh CM, Connan V, Mahmud FH, Assor E, Bandsma RH, Martincevic I, Vresk L, Marcon MA.** Online education for gluten-free diet teaching: Development and usability testing of an e-learning module for children with concurrent celiac disease and type 1 diabetes. *Journal of Pediatric Gastroenterology and Nutrition*. 2018;67(S1):S111-S112. (Abstract 197). **Principal Author**

**Senior Responsible Author.** The usefulness of deamidated gliadin peptide in screening pediatric patients for celiac disease. Canadian Paediatric Society Annual Meeting. Quebec City, Quebec, Canada. (Abstract 37). Presenters: Gould M, Brill H, Marcon MA, **Walsh CM**. [Trainee presentation]. (*Oral presentation*). (05/30/2018)

*Publication Details:*

Gould M, Brill H, Marcon MA, **Walsh CM**. The usefulness of deamidated gliadin peptide in screening pediatric patients for celiac disease. *Paediatrics and Child Health*. 2018;23(suppl\_1):e14. doi:10.1093/pch/pxy054.036. (Abstract 37). **Senior Responsible Author**

**Senior Responsible Author.** Online education for gluten-free diet teaching: Development and usability testing of an e-learning module for children with concurrent celiac disease and type 1 diabetes. Pediatric Academic Societies Meeting. Toronto, Ontario, Canada. Presenters: Connan V, Marcon MA, Mahmud F, Assor E, Bandsma RH, Vresk L, **Walsh CM**. [Trainee presentation]. (*Poster presentation*). (05/06/2018)

**Senior Responsible Author.** The usefulness of deamidated gliadin peptide in screening pediatric patients for celiac disease. NASPGHAN Annual Meeting. Las Vegas, Nevada, USA. (Abstract 483). Presenters: Gould M, Brill H, Marcon MA, **Walsh CM**. [Trainee presentation]. (*Oral presentation*). (11/04/2017)

*Publication Details:*

Gould M, Brill H, Marcon MA, **Walsh CM**. The usefulness of deamidated gliadin peptide in screening pediatric patients for celiac disease. *Journal of Pediatric Gastroenterology and Nutrition*. 2017;65(S2):S221-S222. (Abstract 483). **Senior Responsible Author**

## 1.6 Media Appearances

1. **Interviewee.** Caledon dad says more awareness needed to curb celiac disease testing costs. SickKids, McMaster University, William Osler Health System raising awareness of celiac testing burden. *Caledon Enterprise*. 2019 Feb 28. Interview conducted by Matthew Strader. Available at: [www.caledonenterprise.com/news-story/9199076-caledon-dad-says-more-awareness-needed-to-curb-celiac-disease-testing-costs](http://www.caledonenterprise.com/news-story/9199076-caledon-dad-says-more-awareness-needed-to-curb-celiac-disease-testing-costs)

## 2. *Endoscopy Education and Assessment*

My multi-disciplinary expertise in endoscopy and education uniquely equips me to lead work to study endoscopic skills acquisition and assessment and to inform endoscopic education and practice. I have developed several endoscopy-related curricula, both internationally and locally, which aim to improve clinical endoscopy skills and/or improve endoscopy-related teaching skills. These curricula, which are largely simulation-based, allow me to translate the evidence generated by my program of research to improve education and clinical practice. For example, I co-developed and have co-led endoscopy skills faculty development workshops for the North American Society for Pediatric Gastroenterology, Hepatology and Nutrition since 2017. I also developed and co-directed the American Society of Gastrointestinal Endoscopy's inaugural Train the Endoscopic Trainer workshop at the 2019 international Digestive Diseases Week conference. At a local level, I co-developed and co-lead the University of Toronto Endoscopic Simulation Course for incoming adult and pediatric gastroenterology fellows and surgical residents. Now in its 9<sup>th</sup> year it is one of the longest running

evidence-based simulation courses in Toronto. In recognition of its innovative approach to improve learner outcomes the course was awarded the 2015 St. Michael's Hospital Education Innovations Award.

I regularly teach and lead workshops on endoscopy training and assessment worldwide, across all levels of medical education. Internationally, I was recently invited to participate as faculty for the World Endoscopy Organization's Program for Endoscopic Teachers. I also co-directed the 2019 American Society for Gastrointestinal Endoscopy's First Year Fellow's course which aims to teach American gastroenterology fellows' fundamental gastrointestinal endoscopy skills. Nationally, I am faculty for the Canadian Association of Gastroenterology's Skills Enhancement in Endoscopy (SEE) program, for both the Colonoscopy Skills Improvement (CSI) and Train-the-Endoscopy Trainer courses. I am the only pediatric gastroenterologist who is certified as faculty for this prestigious national program and I regularly teach endoscopy-related skills to both adult gastroenterologists and surgeons. I have also served as faculty for the Canadian Association of Gastroenterology and McMaster University's Residents' Endoscopy Training Course since 2014.

My work in the area of endoscopy education and assessment has been globally recognized by invitations to speak and chair sessions. For example, I recently presented on the current gaps and novel innovations in endoscopy simulation-based training at the American Gastroenterological Association Technology Summit; an international meeting that aims to bring together and foster collaboration among innovators, entrepreneurs, clinicians, MedTech companies, regulatory agency representatives and venture capitalists, to help ensure a pipeline of innovation that ultimately improved delivery of care and patient outcomes. Additionally, I was invited to present to over 100 American program directors at the GI Training Program Director's Workshop to provide guidance on how to best incorporate simulation into gastroenterology training.

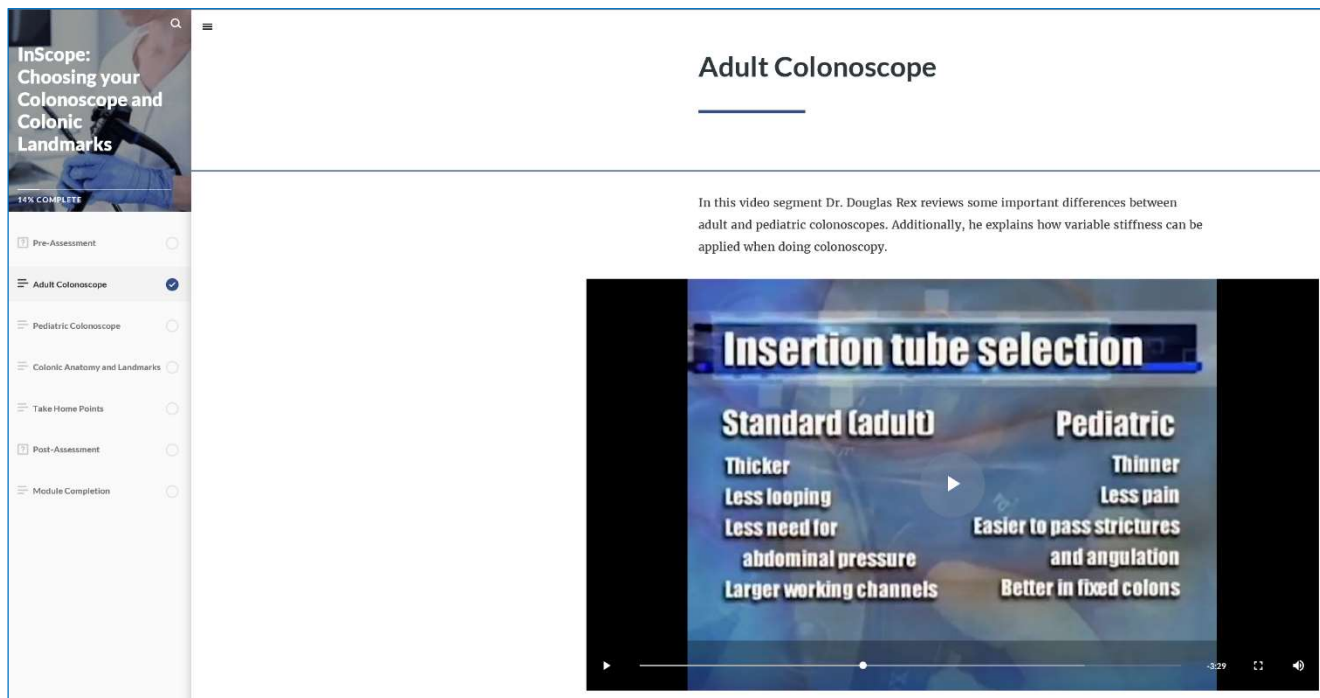
I have also been highly productive with regard to scholarly output and grant funding related to endoscopy education and assessment. Reflective of my international reputation, I was invited to co-lead a White Paper outlining key recommendations generated from the American Society for Gastrointestinal Endoscopy's EndoVaters Summit on Simulators and the Future of Endoscopic Training. The summit, which was partially supported by a National Institutes of Health grant, brought together over 70 thought leaders in simulation research and simulator development and key decision makers from industry to define the role and value of simulators in the future of endoscopic training and to reach consensus regarding priority areas for simulation-related education and research and simulator development. I am also co-lead of the Pediatric Endoscopy Quality Improvement Network (PEnQuIN), an international working group of pediatric endoscopists, from 31 centers across 11 countries, charged with developing quality and safety indicators tailored to pediatric endoscopic practice using consensus building methodology.

My research in the area of endoscopic assessment has influenced assessment practices at a national level. The Gastrointestinal Endoscopy Competency Assessment Tool that I developed has been adopted as the first common endoscopy assessment tool for Canadian pediatric gastroenterology fellowship programs and it forms the basis of the Royal College of Physicians and Surgeons' Entrustable Professional Activity (EPA) on "performing colonoscopy" (Core EPA #7P). Additionally, a novel endoscopy logging and assessment smartphone application I developed for gastroenterology trainees was recognized by a Division of Gastroenterology Intramural Award in Quality of Care, Patient Safety or Education.

My expertise in the area of endoscopy education and assessment has also led to invitations to sit on several national and international endoscopy-related committees. I was selected as the first ever pediatric gastroenterologist to sit on the American Society of Gastroenterology's Training Committee. As a

member of this committee I am leading development of InScope, an online e-learning curriculum that aims to provide gastroenterology trainees with monthly teaching modules designed to reinforce key concepts important in early endoscopic training. The curriculum is due to launch in September 2019. I am also a member of the North American Society for Pediatric Gastroenterology, Hepatology and Nutrition's (NASPGHAN) Endoscopy and Procedures Committee and I was selected by NASPGHAN as their representative to sit on the Scientific Committee of Endoscopy to help determine the endoscopy-related research content for the upcoming World Congress Pediatric Gastroenterology, Hepatology and Nutrition Conference.

**Figure 3:** Screenshot from one of the InScope online learning modules I developed for gastroenterology trainees.



In recognition of my contribution to education in the area of endoscopy education and assessment I have received prestigious national and international awards including the esteemed Canadian Association of Gastroenterology Education Excellence Award in recognition of outstanding contribution to education on a national or international basis and the Teri Li Award from North American Society for Pediatric Gastroenterology Hepatology and Nutrition in recognition of my early career impact and emergence as an international expert in health professions education.

## 2.1 Awards

**Division of Gastroenterology Intramural Award in Quality of Care / Patient Safety or Education,** Recipient, Division of Gastroenterology, Faculty of Medicine, University of Toronto, Toronto, Ontario, Canada. 05/2018

*In recognition of the development of EndoTracker: A novel endoscopy logging and assessment smartphone application for gastroenterology trainees*

**CAG Education Excellence Award,** Recipient, Canadian Association of Gastroenterology, Oakville, Ontario, Canada. 02/2018

*In recognition of outstanding contribution to education on a national or international basis.*



**WCPGHAN Endoscopy Prize**, Principal Author, World Congress of Pediatric Gastroenterology, Hepatology and Nutrition, Montreal, Quebec, Canada. (Research Award) 10/2016  
*In recognition of the best endoscopy-related research abstract entitled “A simulation-based training curriculum of progressive fidelity and complexity improves clinical colonoscopy performance: A blinded randomized trial.”*

**2015 Inaugural St. Michael’s Hospital Education Innovations Award for the “University of Toronto Endoscopic Simulation Course” (Course Co-director)**, Recipient, Toronto, Ontario, Canada. 06/2015

*In recognition of the courses’ innovative approach to improve learners’ outcome and experience.*

**Teri Li Award**, Recipient, North American Society for Pediatric Gastroenterology, Hepatology and Nutrition, Flourtown, Pennsylvania, USA. 10/2015

*In recognition of novel and/or extensive educational efforts in pediatric Gastroenterology for a junior faculty (within 10 years of fellowship).*

**NASPGHAN Endoscopy Prize**, Principal Author, North American Society for Pediatric Gastroenterology, Hepatology and Nutrition Annual Meeting, Washington, District of Columbia, USA. (Research Award) 10/2015

*In recognition of the best endoscopy-related research presentation entitled “Self-assessment accuracy of pediatric endoscopists: A prospective cross sectional study.”*

## 2.2 Peer-reviewed funding (trainees names underlined)

**Principal Investigator.** Conceptualizing entrustment in endoscopic training. Canadian Association of Gastroenterology. Education Research Grant. Principal Investigator(s): **Walsh, Catharine**; Jeyalingam, Thurarshen. Collaborator(s): Brydges, Ryan.

Amount: \$7,500 CAD. (01/2019 - 01/2020)

*Contribution: I am a co-PI on this grant, and conceptualized all facets of the study with my Master’s Student, Thurarshen Jeyalingam.*

**Principal Applicant.** Clinical skills training and assessment: Bridging the gap between theory and practice. Ontario Ministry of Research, Innovation and Science, Ontario Early Researcher Award.

Principal Applicant: **Walsh, Catharine**. Amount: \$150,000 CAD. (04/2018 - 03/2023)

**Principal Co-Applicant.** Pediatric Endoscopy Quality Improvement Network (PEnQuIN) consensus conference. North American Society for Pediatric Gastroenterology, Hepatology and Nutrition. Principal Co-Applicant: **Walsh, Catharine**. Collaborator(s): Lightdale, Jenifer. Amount: \$10,000 USD [contract]. (01/2018 - 12/2018)

*Contribution: I co-led the consensus conference to develop quality and safety indicators for pediatric endoscopy which was funded by this grant and I am leading writing of the resultant manuscript.*

**Principal Investigator.** A structured simulation-based training curriculum to improve the non-technical performance of endoscopy trainees: A randomized control trial. Canadian Association of Gastroenterology Education Research Grant. Principal Investigator(s): **Walsh, Catharine**.

Collaborator(s): Grover, Samir C. Amount: \$7,500 CAD. (02/2016 - 02/2017)

**Co-Investigator.** Do progressive levels of simulation fidelity enhance colonoscopic skill acquisition and transfer in novice endoscopic trainees? Canadian Association of Gastroenterology Education Research Grant. Principal Investigator(s): Grover, Samir C. Collaborator(s): **Walsh, Catharine**. Amount: \$7,500 CAD. (07/2014 - 06/2015)

### 2.3 Peer Reviewed Publications (trainees names underlined)

1. **Walsh CM**, Cohen J, Woods KL, Wang KK, Andersen DK, Anderson MA, Dunkin BJ, Edmundowicz SA, Faigel DO, Law JK, Marks JM, Sedlack RE, Thompson CC, Vargo JJ. ASGE EndoVators Summit: Simulators and the future of endoscopic training. *Gastrointestinal Endoscopy*. 2019 Jul;90(1):13-26. doi: 10.1016/j.gie.2018.10.031. Impact Factor: 7.2. **CPA**
2. Khan R, Plahouras J, Johnston BC, Scaffidi MA, Grover SC, **Walsh CM**. Virtual reality simulation training in endoscopy: A Cochrane review and meta-analysis. *Endoscopy*. 2019 Jul;51(7):653-664. doi: 10.1055/a-0894-4400. Impact Factor: 6.4. **SRA**
3. Jeyalingam T, **Walsh CM**. Video-based assessments: A promising step in improving polypectomy competency. *Gastrointestinal Endoscopy*. 2019 Jun;89(6):1231-1233. doi: 10.1016/j.gie.2019.04.203. Impact Factor: 7.2. **SRA**
4. Scaffidi MA, **Walsh CM**, Khan R, Parker CH, Al-Mazroui A, Abunassar M, Grindal AW, Lin P, Bechara R, Grover SC. Influence of video-based feedback on self-assessment accuracy of endoscopic skills: A randomized controlled trial. *Endoscopy International Open*. 2019 May;7(5):E678-E684. doi: 10.1055/a-0867-9626. Impact Factor: N/A. **C**
5. Khan R, Scaffidi MA, Grover SC, Gimpaya N, **Walsh CM**. Simulation in endoscopy: Practical educational strategies to improve learning. *World Journal of Gastrointestinal Endoscopy*. 2019 Mar 16;11(3):209-218. doi: 10.4253/wjge.v11.i3.209. Impact Factor: N/A. **SRA**
6. Scaffidi MA, Khan R, Carnahan H, Ling SC, Lightdale JR, Mamula P, Yu JJ, Grover SC, **Walsh CM**. Can pediatric endoscopists accurately assess their clinical competency? A comparison across skill levels. *Journal of Pediatric Gastroenterology and Nutrition*. 2019 Mar;68(3):311-317. doi: 10.1097/MPG.0000000000002191. Impact Factor: 3.0 . **SRA**
7. Scaffidi MA, Khan R, **Walsh CM**, Pearl M, Winger K, Kalaichandran R, Lin P, Grover SC. Protocol for a randomised trial evaluating the effect of applying gamification to simulation-based endoscopy training. *BMJ Open*. 2019 Feb 24;9(2):e024134. doi: 10.1136/bmjopen-2018-024134. Impact Factor: 2.4. **C**
8. Ling SC, **Walsh CM**. Achieving high quality outcomes for ERCP: Can pediatricians match the adults, and should they try? *Journal of Pediatric Gastroenterology and Nutrition*. 2019 Jan;68(1):1-2. doi 10.1097/MPG.0000000000002103. Impact Factor: 3.0. **SRA**
9. Khan R, Plahouras J, Johnston BC, Scaffidi MA, Grover SC, **Walsh CM**. Virtual reality simulation training for health professions trainees in gastrointestinal endoscopy. *Cochrane Database of Systematic Reviews*. 2018 Aug 17; (8) Art. No.: CD008237. doi: 10.1002/14651858.CD008237.pub3. Impact Factor: 7.8 . **SRA**
10. Wani S, Keswani RN, Petersen B, Edmundowicz SA, **Walsh CM**, Huang C, Cohen J, Cote G. Training in EUS and ERCP: Standardizing methods to assess competence. *Gastrointestinal Endoscopy*. 2018 Jun;87(6):1371-1382. doi: 10.1016/j.gie.2018.02.009. Impact Factor: 7.2. **C**
11. Scaffidi M, Grover SC, Carnahan H, Khan R, Amadio JM, Yu JJ, Dargavel C, Khanna N, Ling SC, Yong E, Nguyen GC, **Walsh CM**. Impact of experience on self-assessment accuracy of clinical colonoscopy competence. *Gastrointestinal Endoscopy*. 2018 Mar;87(3):827-836. doi: 10.1016/j.gie.2017.10.040. Impact Factor: 7.2. **SRA**
12. Scaffidi MA, Grover SC, Carnahan H, Yu JJ, Yong E, Nguyen GC, Ling SC, Khanna N, **Walsh CM**. A prospective comparison of live and video-based assessments of colonoscopy performance. *Gastrointestinal Endoscopy*. 2018 Mar;87(3):766-775. doi: 10.1016/j.gie.2017.08.020. Impact Factor: 7.2. **SRA**
13. Grover SC, Scaffidi MA, Khan R, Garg A, Al-Mazroui A, Alomani T, Yu JJ, Plener IS, Al-Awamy M, Yong EL, Cino M, Ravindran NC, Zasowski M, Grantcharov TP, **Walsh CM**.

- Progressive learning in endoscopy simulation training improves clinical performance: A blinded randomized trial. *Gastrointestinal Endoscopy*. 2017 Nov;86(5):881-889. doi: 10.1016/j.gie.2017.03.1529. Impact Factor: 7.2. **SRA**
14. **Khan R, Scaffidi MA, Walsh CM, Lin P, Al-Mazroui A, Chana B, Kalaichandran R, Lee W, Grantcharov TP, Grover SC.** Simulation-based training of non-technical skills in colonoscopy: Protocol for a randomized controlled trial. *JMIR Research Protocols*. 2017 Aug;6(8):e153. doi: 10.2196/resprot.7690. Impact Factor: N/A. **C**
  15. **Kramer RE, Walsh CM, Lerner DG, Fishman DS.** Quality improvement in pediatric endoscopy: A clinical report from the NASPGHAN Endoscopy Committee. *Journal of Pediatric Gastroenterology and Nutrition*. 2017 Jul;65(1):125-131. doi: 10.1097/MPG.0000000000001592. Impact Factor: 2.8. **C**
  16. **Walsh CM, Anderson JT, Fishman DS.** Evidence-based approach to training pediatric gastrointestinal endoscopy trainers. *Journal of Pediatric Gastroenterology and Nutrition*. 2017 Apr;64(4):501-504. doi: 10.1097/MPG.0000000000001473. Impact Factor: 2.8. **PA**
  17. **Walsh CM, Garg A, Ng SL, Goyal F, Grover SC.** Residents' perceptions of simulation as a clinical learning approach. *Canadian Medical Education Journal*. 2017 Feb 24;8(1):e76-e87. Impact Factor: 3.4. **PA**
  18. **Walsh CM.** In-training gastrointestinal endoscopy competency assessment tools: Types of tools, validation and impact. *Best Practice & Research Clinical Gastroenterology*. 2016 Jun;30(2): 357-374. doi: 10.1016/j.bpg.2016.04.001. Impact Factor: 3.8. **PA**
  19. **Ruco A, Walsh CM, Cooper MA, Rabeneck L.** Training non-physicians to do endoscopy: Feasibility, effectiveness and cost-effectiveness. *Best Practice & Research Clinical Gastroenterology*. 2016 Jun;30(3):389-396. doi: 10.1016/j.bpg.2016.04.006. Impact Factor: 3.8. **C**
  20. **Walsh CM.** Training and assessment in pediatric endoscopy. *Gastrointestinal Endoscopy Clinics of North America*. 2016 Jan;26(1):13-33. doi: 10.1016/j.giec.2015.08.002. Impact Factor: 1.4. **PA**
  21. **Walsh CM.** Assessment of competence in pediatric gastrointestinal endoscopy. *Current Gastroenterology Reports*. 2014 Aug;16(8):401. doi: 10.1007/s11894-014-0401-5. Impact Factor: N/A. **PA**
  22. **Grover SC, Garg A, Scaffidi MA, Yu JJ, Plener IS, Yong E, Cino M, Grantcharov TP, Walsh CM.** Impact of a simulation training curriculum on technical and non-technical skills in colonoscopy: A randomized trial. *Gastrointestinal Endoscopy*. 2015 Dec;82(6):1072-1079. doi: 10.1016/j.gie.2015.04.008. Impact Factor: 6.2. **SRA**
  23. **Walsh CM, Ling SC, Khanna N, Grover SC, Yu JJ, Cooper MA, Yong E, May G, Walters TD, Reznick R, Rabeneck L, Carnahan H.** Gastrointestinal endoscopy competency assessment tool: Reliability and validity evidence. *Gastrointestinal Endoscopy*. 2015 Mar;81(6):1417-1424. doi: 1016/j.gie.2014.11.030. Impact Factor: 6.2. **PA**
  24. **Walsh CM, Ling SC, Mamula P, Lightdale JR, Yu JJ, Walters TD, Carnahan H.** The Gastrointestinal endoscopy competency assessment tool for pediatric colonoscopy. *Journal of Pediatric Gastroenterology and Nutrition*. 2015 Apr;60(4):474-480. doi: 10.1097/MPG.0000000000000686. Impact Factor: 2.4. **PA**
  25. **Cooper MA, Tinmouth J, Yong E, Walsh CM, Carnahan H, Grover SC, Ritvo P.** Surgical residents' perceptions on learning gastrointestinal endoscopy: More hours and more standardization wanted. *Journal of Surgical Education*. 2014 Nov-Dec;71(6):899-905. doi: 10.1016/j.jsurg.2014.05.016. Impact Factor: 1.4. **C**

26. **Walsh CM**, Ling SC, Walters TD, Mamula P, Lightdale JR, Carnahan H. Development of the Gastrointestinal Endoscopy Competency Assessment Tool for pediatric colonoscopy (GiECAT KIDS). *Journal of Pediatric Gastroenterology and Nutrition*. 2014 Oct;59(4):480-486. doi:10.1097/MPG.0000000000000358. Impact Factor: 2.6. **PA**
27. **Walsh CM**, Ling SC, Khanna N, Cooper MA, Grover SC, May G, Walters TD, Rabeneck L, Reznick R, Carnahan H. Gastrointestinal endoscopy competency assessment tool: Development of a procedure-specific assessment tool for colonoscopy. *Gastrointestinal Endoscopy*. 2014 May;79(5):798-807.e5. doi: 10.1016/j.gie.2013.10.035. Impact Factor: 5.4. **PA**

## 2.4 Invited Lectures

### INTERNATIONAL

- 10/16/2019 **Invited Speaker**. Endoscopy upskilling. The North American Society for Pediatric Gastroenterology, Hepatology and Nutrition's Course in Hands-on Innovation and Methods in Endoscopy (CHIME). Downers Grove, Illinois, USA. Presenter: **Walsh CM**.
- 07/26/2019 **Invited Speaker**. Introduction to GILeap and InScope. American Society for Gastrointestinal Endoscopy First Year Fellow's Course. Downers Grove, Illinois, USA. Presenter: **Walsh CM**.
- 06/08/2019 **Invited Speaker**. Teaching cognitive skills. Program for Endoscopic Teachers, World Endoscopy Organization and New York Society of Gastrointestinal Endoscopy. New York City, New York, USA Presenters: **Walsh CM**, Cohen J, Vargo J.
- 06/07/2019 **Invited Speaker**. Principles of teaching endoscopy and giving feedback. Program for Endoscopic Teachers, World Endoscopy Organization and New York Society of Gastrointestinal Endoscopy. New York City, New York, USA Presenters: **Walsh CM**, MacIntosh D.
- 05/19/2019 **Invited Speaker**. Bedside teaching (Session: How to be an effective gastroenterology educator). Digestive Diseases Week, San Diego, California, USA. Presenter: **Walsh CM**.
- 04/20/2019 **Invited Speaker**. How to incorporate simulation into gastroenterology training. GI Training Program Director's Workshop. Fort Lauderdale, Florida, USA. Presenter: **Walsh CM**.
- 04/18/2019 **Invited Speaker**. Current gaps and novel innovation in simulation-based training. American Gastroenterological Association Technology Summit. San Francisco, California, USA. Presenter: **Walsh CM**.
- 04/18/2019 **Invited Speaker**. Training and competency assessment for polypectomy. American Gastroenterological Association Technology Summit. San Francisco, California, USA. Presenter: **Walsh CM**.
- 10/26/2018 **Invited Speaker**. Quality in endoscopy: The road forward. NASPGHAN Annual Meeting. Hollywood, California, USA. Presenter: **Walsh CM**.
- 11/20/2017 **Invited Speaker**. Simulation training of non-technical skills. American Society for Gastrointestinal Endoscopy Simulators and the Future of Endoscopic Training Summit. Downers Grove, Illinois, USA. Presenter: **Walsh CM**.

- 11/20/2017 **Chair and Invited Speaker.** Incorporating simulators in a standardized curriculum for endoscopic training. American Society for Gastrointestinal Endoscopy Simulators and the Future of Endoscopic Training Summit. Downers Grove, Illinois, USA. Presenter: **Walsh CM.**
- 06/02/2017 **Invited Speaker.** Clinical skills education: From the simulated environment to the bedside. Texas Children's Hospital Grand Rounds. Houston, Texas, USA. Presenter: **Walsh CM.**
- 06/01/2017 **Invited Speaker.** Colonoscopy upskilling. Division of Gastroenterology Rounds, Texas Children's Hospital. Houston, Texas, USA. Presenter: **Walsh CM.**
- 05/06/2017 **Invited Speaker.** State-of-the-art lecture: Endoscopy training and future learning. Digestive Diseases Week 2017. Chicago, Illinois, USA. Presenter: **Walsh CM.**
- 10/07/2016 **Invited Speaker.** Assessment of competency in pediatric colonoscopy. World Congress of Pediatric Gastroenterology, Hepatology and Nutrition. Montreal, Quebec, Canada. Presenter: **Walsh CM.**
- 10/21/2011 **Invited Speaker.** Endoscopic competence. NASPGHAN Fellowship Program Directors Meeting, NASPGHAN Annual Meeting 2011. Orlando, Florida, USA. Presenter: **Walsh CM.**

#### NATIONAL

- 02/12/2018 **Invited Speaker.** Assessment tools. Training: The Key to Cost Effective Endoscopy Symposium. Toronto, Ontario, Canada. Presenter: **Walsh CM.**
- 02/10/2018 **Co-Chair.** Endoscopy in 2018. Canadian Digestive Diseases Week, Toronto, Ontario, Canada. Presenter: **Walsh CM.**
- 02/09/2018 **Invited Speaker.** Pediatric endoscopy. Canadian Digestive Diseases Week. Toronto, Ontario, Canada. Presenter: **Walsh CM.**
- 02/25/2011 **Invited Speaker.** The future of endoscopic training. Gastroenterology Residents-In-Training (GRIT) Course, 2011 Canadian Digestive Diseases Week. Vancouver, British Columbia, Canada. Presenters: **Walsh CM, Waschke K.**

#### REGIONAL/LOCAL

- 04/23/2018 **Invited Speaker.** Clinical skills education: Integrating theory and research to enhance learning. Child Health Evaluative Sciences Rounds, SickKids Research Institute. Toronto, Ontario, Canada. Presenter: **Walsh CM.**
- 12/07/2015 **Invited Speaker.** Clinical skills education: From the simulated environment to the bedside. Child Health Evaluative Sciences Rounds, SickKids Research Institute. Toronto, Ontario, Canada. Presenter: **Walsh CM.**
- 05/20/2015 **Invited Speaker.** Gastrointestinal endoscopy training and assessment: Current research and future directions. Farncombe Gastroenterology Rounds, Farncombe Family Digestive Health Research Institute, McMaster University. Hamilton, Ontario, Canada. Presenter: **Walsh CM.**



- 01/21/2015 **Invited Speaker.** Simulation-based training: How can we “optimally” challenge our learners? Medical Education Scholarship Rounds, Hospital for Sick Children. Toronto, Ontario, Canada. Presenter: **Walsh CM.**
- 11/04/2014 **Invited Speaker.** Gastrointestinal endoscopy: The future of training and assessment. Gastroenterology Research Rounds, St. Michael’s Hospital. Toronto, Ontario, Canada. Presenter: **Walsh CM.**
- 03/20/2014 **Invited Speaker.** Challenging our learners optimally: Removing the “crutches” from medical education. The Hodges Education Scholarship International Symposium (THESIS). Toronto, Ontario, Canada. Presenters: **Walsh CM, Brydges R.**

## 2.5 Invited Workshops

### INTERNATIONAL

- 10/19/2019 **Co-Director/Invited Facilitator.** Train the pediatric endoscopy trainer. NASPGHAN Annual Meeting. Chicago, Illinois, USA. Presenters: **Walsh CM, Fishman D.**
- 10/19/2019 **Co-Director/Invited Facilitator.** Colonoscopy skills workshop. NASPGHAN Annual Meeting. Chicago, Illinois, USA. Presenters: **Walsh CM, Fishman D.**
- 10/18/2019 **Co-Director/Invited Facilitator.** Train the pediatric endoscopy trainer. NASPGHAN Annual Meeting. Chicago, Illinois, USA. Presenters: **Walsh CM, Fishman D.**
- 10/18/2019 **Co-Director/Invited Facilitator.** Colonoscopy skills workshop. NASPGHAN Annual Meeting. Chicago, Illinois, USA. Presenters: **Walsh CM, Fishman D.**
- 05/17/2019 **Co-Director/Invited Facilitator.** Train the endoscopic trainer workshop. Digestive Diseases Week. San Diego, California, USA. Co-Directors/Presenters: **Walsh CM, Vignesh S.**
- 10/27/2018 **Co-Director/Invited Facilitator.** Train the pediatric endoscopy trainer. NASPGHAN Annual Meeting. Hollywood, California, USA. Presenters: **Walsh CM, Fishman D.**
- 10/27/2018 **Co-Director/Invited Facilitator.** Train the pediatric endoscopy trainer. NASPGHAN Annual Meeting. Hollywood, USA. Presenters: **Walsh CM, Fishman D.**
- 10/26/2018 **Co-Director/Invited Facilitator.** Colonoscopy skills workshop. NASPGHAN Annual Meeting. Hollywood, California, USA. Presenters: **Walsh CM, Fishman D.**
- 11/04/2017 **Co-Director/Invited Facilitator.** Colonoscopy skills workshop. NASPGHAN Annual Meeting. Las Vegas, Nevada, USA. Presenters: **Walsh CM, Fishman D, Waschke KA.**
- 11/03/2017 **Co-Director/Invited Facilitator.** Colonoscopy skills workshop. NASPGHAN Annual Meeting. Las Vegas, Nevada, USA. Presenters: **Walsh CM, Fishman D, Waschke KA.**
- 10/09/2015 **Co-Director/Invited Facilitator.** Putting assessment of endoscopic competence into practice. NASPGHAN Annual Meeting. Washington, District of Columbia, USA. Presenters: **Walsh CM, Lightdale JR.**

### NATIONAL

- 02/10/2014 **Invited Facilitator.** Pediatric endoscopy: Approaches for quality and safety. Canadian Digestive Diseases Week. Toronto, Ontario, Canada. Presenters: **Walsh CM, Forget S.**

## 2.6 Curriculum Design

**InScope**, American Society of Gastrointestinal Endoscopy, Downers Grove, Illinois, USA. (Co-developer) (01/2019 – present)

*This online curriculum that is due to launch in September 2019 is designed to provide gastroenterology trainees with monthly teaching modules which reinforce key concepts important in early endoscopic training*

**Train the endoscopic trainer workshop**, American Society of Gastrointestinal Endoscopy, Downers Grove, Illinois, USA. (Co-developer, Co-director) 05/2019 - present

*This simulation-based workshop is designed for teachers of endoscopy, with specific aims to improve teaching skills and procedural conscious competence needed to teach endoscopy. I co-developed the workshop curriculum and co-directed the first workshop at the 2019 international Digestive Disease Week conference.*

**Train the paediatric endoscopy trainer workshop**, North American Society for Pediatric Gastroenterology, Hepatology and Nutrition Annual Meeting, Ambler, Pennsylvania, USA. (Co-developer, Co-director) 10/2018 - present

*This simulation-based workshop is designed for teachers of endoscopy, with specific aims to improve teaching skills and procedural conscious competence needed to teach endoscopy. I co-developed the workshop curriculum and co-directed the first workshop at the 2019 international Digestive Disease Week conference.*

**Colonoscopy skills workshop**, North American Society for Pediatric Gastroenterology, Hepatology and Nutrition Annual Meeting, Ambler, Pennsylvania, USA. (Co-developer, Co-director) 10/2017 - present

*This simulation-based workshop is designed for all practicing pediatric endoscopists and provides up-skilling and improvement of colonoscopy skills. I co-developed the workshop curriculum and have co-directed workshops at the NASPGHAN Annual Meetings since 2017.*

**Annual Endoscopy Simulation Curriculum**, Endoscopic Simulation Course, Division of Gastroenterology, University of Toronto, Toronto, Ontario, Canada. (Co-developer) 2011 - present

*The simulation-based course is that is designed to teach first year gastroenterology fellows' and surgical residents' fundamental gastrointestinal endoscopy skills. I co-developed the initial curriculum and continue to iteratively refine it based on best available evidence.*