

MAY 5TH, 2021



14th Annual Research Night
Information booklet



Foreword by

Steven Paraskevas MD PhD FRCSC FACS

Associate Professor of Surgery

Director – Pancreas and Islet Transplantation Research

Director of Research – Division of General Surgery

Dear Residents and Students,

Congratulations! You've all made it through the unprecedented year that is behind us! Your training, and your teaching, were fundamentally altered in 2020, and continue to be so in 2021, but you adapted, accommodated and kept moving. As with clinical care and teaching, research was severely impacted last year, not only in the Division of General Surgery, but across the university and around the world. By some estimates, 80% of on-site research activity ground to a halt last year¹, and the effects of that shut-down are still being felt. With that in mind, this evening represents a defining moment in your training. Not only will this be an opening into an academic career for some of you, but you will be participating in the great post-pandemic reanimation of research at our institution, and in society. If the last year has shown us anything, it is that research is not just exciting, or good for your resumé, it's not just an experience to be had. It's actually essential for our survival. Witness the availability, within months of the identification of SARS-CoV2, of not one but several novel vaccines, some of them based on technologies which had never before reached the market, but which had been the subject of intense developmental efforts in the preceding years. The world owes an incalculable debt to the many researchers who helped pave the way for vaccine technology to be where it was in January of 2020. And so it is with the research you may choose to do. You may find it focused and specific. You may spend months and even years making what seems like slow progress. But never underestimate the cumulative effect of these efforts on future medical treatments. The consequences of the work you will do may not even be immediately evident to you, but rest assured it will have an impact. In the wide array of interests pursued by the members of our division of General Surgery, we hope you will find something that sparks your interest, or even defines a career-long question. Take the time you need to find out what our PI's are up to, how they see the months and years ahead, and which lab or research group might be the right fit for you. After this period of great upheaval and challenge, welcome to a moment of opportunity!

Steven Paraskevas, MD, PhD

Élise Di Lena, MD, PhD candidate

¹ NS Wigginton, et al. Moving academic research forward during COVID-19, *Science*, 2020;368(6496):1190.



Brief History of the Annual Research Night

The McGill General Surgery Research Night was founded in 2008 by the McGill General Surgery Resident Committee (MGSRC). This is a resident organised and staff funded event.

It gives residents & students interested in pursuing research as part of their training at McGill an opportunity to explore the vast research opportunities available to them. The different research areas in General Surgery include research in epidemiology, public health, surgical education and innovation as well as cutting edge basic science lab work. These are all available at your disposal.

This booklet includes most of the research laboratories available to you along with the interests of each lab and its supervisor. Once you have discovered the group that interests you the most, you can approach the supervisor and ask them questions pertaining to joining their group at the Research Night, which is highly encourage. You can always contact the staff via email that is provided in the booklet as well.

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Sinziana Dumitra MD, MSc(Epi), FRCSC

Surgical Oncology
Royal Victoria Hospital, MUHC
Jewish General Hospital
sinziana.dumitra@mcgill.ca

RESEARCH PROGRAM

I am a Surgical Oncologist with a Masters of Epidemiology. Our Lab focuses on building an exciting research program for Retroperitoneal Sarcoma exploring all aspect of care at the populational as well as the patient level. We are also working on aspects of delivery of care for other malignancies such as melanoma and GIST. We offer a very strong methodological background to our trainees, a highly sought-after, portable skillset applicable to all specialties and sub-specialties. We have international collaborations and access to large datasets essential in undertaking research on rare diseases.

We offer a mentorship and variety of supervision and co-supervision from students undertaking a Masters of Epidemiology/ Experimental Surgery to completion of individual projects throughout your time at McGill University.

Weekly lab meetings in conjunction with Dr Sarkis Meterissian's lab will allow you to present your work and receive feedback in a timely fashion. Funding for travelling at national and international meetings to present our work is available.

CURRENT PROJECTS

- Quality of Life after Retroperitoneal Sarcoma Resection: A Systematic Review
- Developing a tool to assess quality of life after Retroperitoneal Sarcoma Resection
- Systematic Review of Access to Care in Retroperitoneal Sarcoma based on distance to tertiary care center
- Impact of time to radiation therapy and surgery on oncologic outcomes in retroperitoneal sarcoma
- Impact of time from neo-adjuvant radiation to resection on post-operative complications in RPS
- Morbidity and Mortality after Retroperitoneal Sarcoma Resection: a Systematic review
- Oncologic outcomes of R1 resection in well-differentiated vs poorly differentiated liposarcomas
- Access to supportive care in non resectable and metastatic sarcoma
- Management of Pelvic Sarcoma: A systematic review
- Adoption of MSLT-2 trial results in Melanoma
- CKIT mutations and targeted therapy in melanoma: a systematic review
- Pelvic Sarcoma: A systematic review

Current trainees:

Elena Parvez, MD
Dominique Morency, MD
Giuseppe Frenda, MD

FUNDING

- MUHC Foundation 25,000/year x 3yrs
- Girls Scouts for Breast Cancer 20,000\$
- Cedars Cancer Foundation 20,000\$



Mark Basik, MD

Jewish General Hospital

mark.basik@mcgill.ca

Primary focus : Breast & Colon Cancer

1. *The development of novel blood biomarkers involving the measurement of circulating tumor DNA in the plasma of patients with early and advanced breast cancer. Based on the DNA sequence of breast tumors, we are now able to quantify the amount of tumor-specific DNA in the blood of breast cancer patients. The persistence of circulating tumor DNA in the blood of patients after surgery has the potential to be a powerful novel biomarker that can predict the presence of micro-metastases and thus the prognosis of patients with early breast cancer.*
2. *Mechanisms of resistance and response to chemotherapy and targeted anti-drugs such as anti-angiogenic drugs, and tamoxifen. We are investigating gene alterations occurring during the acquisition of acquired resistance to these drugs. We are also testing potential biomarkers of treatment response in clinical samples of breast tumors, hoping to be able to use these to better select patients for these therapies.*
3. *Investigating gene expression and DNA changes in breast and colon cancers. Using modern microarray technology, we are investigating the relationship between DNA copy number changes and gene expression across the genome in both cell lines and primary tumors. One goal is to find genes that are overexpressed as well as amplified in these cancers. These genes will then be candidate targets for novel anti-cancer therapies.*
4. *Stromal-epithelial interactions active in breast tumor biology. It is clear that the tumor microenvironment affects tumor biology and response to treatment. We are characterizing fibroblasts found in the tumor stroma, and using*

gene expression profiling, we are dissecting the interactions between these fibroblasts and tumor cells. Specifically we are studying how these tumor fibroblasts affect drug response in breast tumors, and thus can be used as predictive biomarkers, as well as therapeutic targets.

PUBLICATIONS

1. Cavallone L, Al-Damry M, Lafleur J, Lan C, Gonzalez-Ginestet P, Aguilar-Mahecha A, **Basik M**. A study of pre-analytical variables and optimization of extraction method for circulating tumor DNA measurements by digital droplet PCR. *Cancer Epidemiol Biomarkers Prev*. 2019 Mar 1. doi: 10.1158/1055-9965.EPI-18-0586. [Epub ahead of print] PMID: 30824523
2. Darini C, Ghaddar N, Chabot C, Assaker G, Sabri S, Wang S, Krishnamoorthy J, Buchanan M, Aguilar-Mahecha A, Abdulkarim B, Deschenes J, Torres J, Ursini-Siegel J, **Basik M**, Koromilas AE. An integrated stress response via PKR suppresses HER2+ cancers and improves trastuzumab therapy. *Nat Commun*. 2019 May 13;10(1):2139.
3. Aguilar-Mahecha A, Joseph S, Cavallone L, Buchanan M, Krzemien U, Batist G, **Basik M**. Precision Medicine Tools to Guide Therapy and Monitor Response to Treatment in a HER-2+ Gastric Cancer Patient: Case Report. *Front Oncol*. 2019 Aug 6;9:698.
4. Gui Y, Aguilar-Mahecha A, Krzemien U, Hosein A, Buchanan M, Lafleur J, Pollak MN, Ferrario C, **Basik M**. Metastatic breast carcinoma-associated fibroblasts have enhanced pro-tumorigenic properties related to increased IGF2 expression. *Clin Cancer Res*. 2019 Dec 1;25(23):7229-7242. doi: 10.1158/1078-0432.CCR-19-1268. PMID:31515454
5. Sirois I, Aguilar-Mahecha A, Lafleur J, Fowler E, Vu V, Scriver M, Buchanan M, Chabot C, Ramanathan A, Balachandran B, L egar e S, Przybytkowski E, Lan C, Krzemien U, Cavallone L, Aleynikova O, Ferrario C, Guilbert MC, Benlimame N, Saad A, Alaoui-Jamali M, Saragovi HU, Josephy S, O'Flanagan C, Hursting SD, Richard VR, Zahedi RP, Borchers CH, Bareke E, Nabavi S, Tonellato P, Roy JA, Robidoux A, Marcus EA, Mihalciou C, Majewski J, **Basik M**. A Unique Morphological Phenotype in Chemoresistant Triple-Negative Breast Cancer Reveals Metabolic Reprogramming and PLIN4 Expression as a Molecular Vulnerability. *Mol Cancer Res*. 2019 Dec;17(12):2492-2507.
6. Cavallone L, Aguilar-Mahecha A, et al. Prognostic and predictive value of circulating tumor DNA during neoadjuvant chemotherapy for triple negative breast cancer. In Press, *Scientific Reports* 2020.

A complete list of recent publications can be provided upon request.

COLORECTAL SURGERY
RESEARCH GROUP



In Honor of
Philip Gordon, MD, FRCS, FACS
Founder of Colorectal Surgery at McGill, Master Surgeon, Generational Leader, Academic, Mentor and Friend



Marylise Boutros, MD, FRCS
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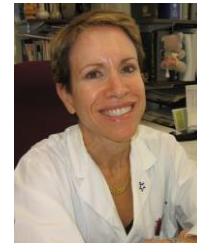
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Our vision for the JGH Colorectal Surgery Outcomes Research lab is to make it a venue for productive outcomes research focused on improving morbidity and mortality of colorectal surgery (CRS) through assessment of innovative interventions.

Our aim is to provide a strong framework wherein trainees can participate in research to further their personal growth and have the opportunity to contribute to our knowledge in the field of colorectal surgery. As mentors, our goal is to facilitate your research endeavors, provide support and guidance, and help you achieve your career goals, all while having a good time.

Our primary interest is to address clinical problems witnessed in our daily practice with the aim of improving the lives of patients with colorectal diseases. Using large, administrative, and prospectively maintained databases, we investigate CRS outcomes, and employ prospective study designs including randomized controlled trials and cohort studies to assess innovative strategies to reduce morbidity.

Examples of Ongoing Prospective Clinical Trials:

1. Does bowel stimulation before loop ileostomy closure reduce postoperative ileus? A multicenter randomized controlled trial
2. Impact of a Patient-Centered Program for Low Anterior Resection Syndrome: A Multicenter Randomized Controlled Trial
3. An Online Application for Patients with Low Anterior Resection Syndrome A Pilot Study
4. Oral health and risk of colorectal cancer: A population-based case-control study

Examples of Ongoing Qualitative and Survey Studies:

1. Patient Activation, Quality of Life, and Bowel Function in Rectal Cancer Survivors: A cross-sectional survey study
2. Patient Preferences and Perceptions on Surgery for Recurrent Diverticulitis: A cross-sectional survey study
3. Defining Outcomes and Non-Inferiority Margins in Acute Uncomplicated Diverticulitis: A Modified Delphi Consensus Process Involving Patients and Physicians
4. Sexual Dysfunction in patients with LARS: Patient Perspectives
5. Interest and Preference for Online Peer Support in patients with Low Anterior Resection Syndrome (LARS)

Examples of Ongoing Observational Cohort Studies

1. Emergency Department Admissions for Uncomplicated Diverticulitis: A Nationwide Study.
2. Surgical treatment of splenic flexure colon cancer: does segmental resection of the splenic flexure provide an adequate lymph node harvest?
3. Diverting Loop Ileostomy Versus Total Abdominal Colectomy for Clostridium Difficile Colitis: what happens after discharge?
4. Comparable Mortality, Improved Morbidity and Gastrointestinal Restoration Rates for Diverting Loop Ileostomy with Colonic Lavage vs. Total Abdominal Colectomy for Fulminant *Clostridioides difficile* Colitis: Results of a Multicenter Retrospective Cohort Study.
5. Would Lowering the Age for Screening Colonoscopy Really Help? Understanding the Burden of Adenomas in Patients <50 Years of Age Who Underwent Colonoscopy.
6. The Fate of Sphincteroplasty in the Post Sacral Nerve Stimulation Era: A National Inpatient Sample Database Analysis.
7. Conditional Recurrence-Free Survival After an Episode of Diverticulitis Managed Nonoperatively.
8. Oral Antibiotics Without Mechanical Bowel Preparation Prior to Emergency Colectomy Reduces the Risk of Organ Space Surgical Site Infections: An ACS-NSQIP Propensity Score Matched Study
9. Long-Term Implications of Persistent Diverticulitis: A Retrospective Cohort Study of 997 Patients

SELECT PEER-REVIEWED PUBLICATIONS BY TRAINEES 2015-2021

54. Vogel JD, Feingold DL, Stewart DB, Turner JS, **Boutros M**, Chun J, Steele SR. Clinical Practice Guidelines for Colon Volvulus and Acute Colonic Pseudo-Obstruction. *Dis Colon Rectum*. 2016 Jul;59(7):589-600. doi: 10.1097/DCR.0000000000000602. PMID: 27270510.
55. Nout RA, Devic S, Niazi T, Wyse J, **Boutros M**, Pelsser V, Vuong T. CT-based adaptive high-dose-rate endorectal brachytherapy in the preoperative treatment of locally advanced rectal cancer: Technical and practical aspects. *Brachytherapy*. 2016 Jul-Aug;15(4):477-484. doi: 10.1016/j.brachy.2016.03.004. Epub 2016 Apr 16. PMID: 27090225.
56. Garfinkle R, **Boutros M**, Hippalgaonkar N, Maimon G, da Silva G, Potenti F, Wexner SD. Electrothermal bipolar vessel ligation improves operative time during laparoscopic total proctocolectomy: a large single-center experience. *Surg Endosc*. 2016 Jul;30(7):2840-7. doi: 10.1007/s00464-015-4565-3. Epub 2015 Oct 28. PMID: 26511115.
57. Al-Khamis A, Abou Khalil J, Demian M, Morin N, Vasilevsky CA, Gordon PH, **Boutros M**. Sigmoid Colectomy for Acute Diverticulitis in Immunosuppressed vs Immunocompetent Patients: Outcomes From the ACS-NSQIP Database. *Dis Colon Rectum*. 2016 Feb;59(2):101-9. doi: 10.1097/DCR.0000000000000513. PMID: 26734967.
58. Strong S, Steele SR, **Boutros M**, Bordineau L, Chun J, Stewart DB, Vogel J, Rafferty JF; Clinical Practice Guidelines Committee of the American Society of Colon and Rectal Surgeons. Clinical Practice Guideline for the Surgical Management of Crohn's Disease. *Dis Colon Rectum*. 2015 Nov;58(11):1021-36. doi: 10.1097/DCR.0000000000000450. PMID: 26445174.
59. Maya AM, **Boutros M**, DaSilva G, Wexner SD. IPAA-related sepsis significantly increases morbidity of ileoanal pouch excision. *Dis Colon Rectum*. 2015 May;58(5):488-93. doi: 10.1097/DCR.0000000000000330. PMID: 25850835.
60. *Kleiman A, Al-Khamis A, Farsi A, Kezouh A, Vuong T, Gordon PH, Vasilevsky CA, Morin N, Faria J, Ghitulescu G, **Boutros M**. Normalization of CEA Levels Post-Neoadjuvant Therapy is a Strong Predictor of Pathologic Complete Response in Rectal Cancer. *J Gastrointest Surg*. 2015 Jun;19(6):1106-12. doi: 10.1007/s11605-015-2814-3. Epub 2015 Apr 10. PMID: 25859755
61. *Al-Khamis A, Abou Khalil J, Torabi N, Demian M, Kezouh A, Gordon PH, **Boutros M**. Operative management of acute diverticulitis in immunosuppressed compared to immunocompetent patients: A systematic review. *World J Surg Proced* 2015; 5(1): 155-166.

RESOURCES

Members

Our JGH Colorectal Surgery Outcomes Research lab includes 5 full-time colorectal surgery faculty, surgical residents, medical, graduate and undergraduate students. In addition, our lab runs smoothly thanks to the expertise of our dedicated full-time research staff. We are very fortunate to have three research coordinators, research administrator and a data collector working with us full-time. We also have consultant biostatisticians who collaborate with us. Our faculty and staff are available for insight and advice on projects, and are all present for a monthly working meeting to brainstorm ideas, discuss progress and polish work for publication. We also conduct a weekly graduate research meeting so as to guarantee a continued progress.

Large Databases

We utilize the RAMQ/MedEcho databases; the ACS-NSQIP database; ERAS databases; NIS database; NRD and NED databases; CIHI databases; and CPRD databases to assess post-operative outcomes.

Funding

Funding is made available for trainees presenting at National and International meetings. Trainees will also be encouraged and funded to take short courses pertinent to their projects (e.g.: Cochrane systematic review and meta-analysis).

Office space

Thanks to Dr. Shannon Fraser, we now have a dedicated office, A-551 for our Colorectal Surgery Outcomes Research lab. Office space with a computer is also available in Room G-308 and G-317. We facilitate external online access to JGH to help with work off site.



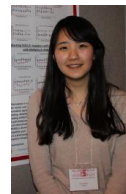
Colorectal Surgery Outcomes Research Lab: A-551

PRESENTATIONS AT MEETINGS BY TRAINEES 2012-2021

Presentations at National and International meetings by Trainees 2012-2020

International Colorectal Disease Symposium, American College of Surgeons (ACS), American Society Colon and Rectal Surgeons (ASCRS), Digestive Disease Week (DDW), Tripartite Colorectal Meeting, Society of American Gastrointestinal and Endoscopic Surgeons (SAGES), Canadian Association of General Surgeons (CAGS), American College of Surgeons National Surgical Quality Improvement Program (ACS NSQIP), Association Quebecoise de Chirurgie Generale (AQC), ISUCRS Biennial Congress, IRR-Experimental Surgery Joint Research Day, American College of Surgeons-NSQIP National Conference, Scientific Forum Clinical Congress

GRANTS / AWARDS TO TRAINEES 2014-2021



- 1) Interactive Online Informational and Peer Support Application for Patients with Low Anterior Resection Syndrome: A Multicenter Randomized Controlled Trial. Society of American Gastrointestinal and Endoscopic Surgeons 2020 Awarded to **Jeongyoon Moon**
- 2) Utilisation d'une application mobile informative de soutien par les pairs pour les patients avec syndrome de résection antérieure du rectum : un essai randomisé contrôlé multicentrique. Programme de bourses de formation en recherche pour les médecins résidents - Ministère de la Santé et des Services sociaux (MSSS), Fonds de Recherche Sante Québec (FRSQ). Awarded to: **Jeongyoon Moon**.



- 3) Impact of a Patient-Centered Program for Low Anterior Resection Syndrome: a Multicenter Randomized Controlled Trial. Rossy Cancer Network Research Grant 2018. Awarded to **Richard Garfinkle**
- 4) Patient activation for low anterior resection syndrome: A multicenter randomized controlled trial. Canadian Society of Colon and Rectal Surgeons 2018. Awarded to **Richard Garfinkle**



- 5) Operative management of fulminant Clostridium difficile colitis: minimally invasive options and predictors of mortality. The Richard and Edith Strauss Clinical Fellowship in Medicine 2017. Awarded to **Maria Abou Khalil**
- 6) Preoperative biopsies as a prognostic tool in rectal cancer? Correlating intratumoral budding and response to chemoradiation. American Society of Colon and Rectal Surgeons Medical Student Grant 2017. Awarded to **Jessica Lie**.
- 7) Less May be More: Loop Ileostomy with Colonic Lavage for Fulminant Clostridium difficile Colitis - A Prospective National Multicenter Cohort Study. American Society of Colon and Rectal Surgeons Resident Research Grant 2017 Awarded to **Maria Abou Khalil**.



- 8) Est-ce la stimulation de l'intestin avec la fermeture de l'iléostomie réduit l'iléus postopératoire? Un essai contrôlé randomisé multicentrique. Programme de bourses de formation en recherche pour les médecins résidents – Phase 1. Ministère de la Santé et des Services sociaux (MSSS), Fonds de Recherche Sante Québec (FRSQ) 2017. Awarded to: **Richard Garfinkle**.

- 9) Canada Graduate Scholarship-Master's (CGS M), Canadian Institutes of Health Research (CIHR) 2017. Awarded to **Richard Garfinkle**.
- 10) Does Bowel Stimulation Before Loop Ileostomy Closure Reduce Postoperative Ileus? A Multicenter Randomized Clinical Trial" 2016 SAGES Grant 2016. Awarded to **Richard Garfinkle**.
- 11) Canada Graduate Scholarship-Master's (CGS M), Canadian Institutes of Health Research (CIHR) 2017. Awarded to **Richard Garfinkle**.
- 12) Does Bowel Stimulation Before Loop Ileostomy Closure Reduce Postoperative Ileus? A Multicenter Randomized Clinical Trial" 2016 SAGES Grant 2016. Awarded to **Richard Garfinkle**.
- 13) Long Term Outcomes of Fistula in Ano Surgery. American Society of Colon and Rectal Surgeons. Medical Student Grant 2016. Awarded to **Corrado DeMarco**
- 14) Does Bowel Stimulation Before Loop Ileostomy Closure Reduce Postoperative Ileus? A Multicenter Randomized Controlled Trial. Canadian Surgery Research Fund Award 2015. Awarded to **Richard Garfinkle**.
- 15) Less May be More: Loop Ileostomy with Colonic Lavage for Fulminant *Clostridium difficile* Colitis - A Prospective National Multicenter Cohort Study. (Canadian Surgery Research Fund Award 2014 \$10,000) Awarded to **Maria Abou Khalil**.
- 16) Diverticular Abscess Managed with Long-Term Definitive Non-Operative Intent is Safe. ASCRS Medical Student Grant- \$4000 (**Richard Garfinkle** 2014)

Awards

- 1) SAGES Reseracher in training Award (**Richard Garfinkle** 2021)
- 2) Sir Edward W. Beatty Memorial Scholarship - Winter Research Bursary - \$2000 (**Vincent Brissette** 2020)
- 3) Smith International Surgical Scholarship - \$3000 US (**Jenny Moon and Nathasha Caminsky** 2020)
- 4) Sir Edward W. Beatty Memorial Scholarship - \$3125 (**Yossef Levin** 2020)
- 5) Class of Medicine 1960 Research Bursary Award - \$3125 (**Rachel Szwimer**)
- 6) Rising Star Award Graduate Excellence Fellowship Fund. \$915.00 (**Richard Garfinkle** 2020)
- 7) Dr. Clarke K. McLeod Memorial Scholarship – Summer Research Bursary - \$3125 (**Vincent Brissette** 2019)
- 8) Julius Gordon Traveling Award, in recognition of research excellence, from the Division of General Surgery at McGill University (**Richard Garfinkle** 2019)
- 9) Compliance with Preoperative Elements of the American Society of Colon and Rectal Surgeons Rectal Cancer Surgery Checklist Improves Pathologic and Postoperative Outcomes. People's Choice Award Best Presenter at the 17th annual L.D. Maclean McGill General Surgery Research Day (**Richard Garfinkle** 2019)
- 10) ACS Resident Member Scholarship Award October 2019. Awarded to (**Richard Garfinkle** 2019)
- 11) Does time to closure of loop ileostomy increase the risk of postoperative ileus? A large, single-institution review. Best Clinical Science Presentation Award – LD Maclean (**Richard Garfinkle** 2018)
- 12) Acute diverticulitis with microperforation is a subset of uncomplicated diverticulitis. GREAT McGill Experimental Surgery Travel Award (**Turki Al-Malki** 2018)
- 13) Right-sided Colectomies for Diverticulitis Have Worse Outcomes Compared to Left-sided Colectomies for Diverticulitis: An ACS NSQIP analysis of Predictors and Outcomes. Canadian Society of Colon and Rectal Surgeons Best Poster Award (**Nathalie Wong-Chong** 2017)
- 14) Right-sided Colectomies for Diverticulitis Have Worse Outcomes Compared to Left-sided Colectomies for Diverticulitis: An ACS NSQIP analysis of Predictors and Outcomes. Association Quebecoise de Chirurgie (AQC) Best Poster Award (**Nathalie Wong-Chong** 2017)
- 15) A Nomogram for Prediction of Mortality in Patients who Undergo Surgery for Fulminant *Clostridium difficile* Colitis: Results from ACS-NSQIP Database. 2017 People's Choice Award - LD Maclean (**Maria Abou Khalil** 2017)
- 17) Impact of immunosuppressants on post-operative complications following colectomies for Crohn's disease: results from ACS-NSQIP database. People's Choice Award - LD Maclean (**Maria Abou Khalil** 2016)
- 18) Impact of Bowel Preparation on Surgical Site Infection, Ileus, Anastomotic Leak, Major Morbidity and Mortality after Elective Colorectal Surgery: An ACS-NSQIP Analysis by Coarsened Exact Matching. American Society of Colon and Rectal Surgeons Poster of Distinction (**Richard Garfinkle & Jad Abou Khalil** 2016)
- 19) Diverticular Abscess Managed with Long-Term Definitive Non-Operative Intent is Safe. CSCRS Poster Award (**Richard Garfinkle** 2015)
- 20) Diverticular Abscess Managed with Long-Term Definitive Non-Operative Intent is Safe. People's Choice Award - LD Maclean (**Richard Garfinkle** 2015)
- 21) Cost of ulcerative colitis in Quebec, Canada: a retrospective cohort study. CIHR Health Professional Student Research Award - McGill Summer & Fall Research Bursaries - \$2834. (**Andrei Dan** 2015)
- 22) The impact of mechanical bowel preparation on colon cancer recurrence and mortality following right hemicolectomy. CIHR Health Professional Student Research Award - McGill Summer Research Bursaries - \$2834 (**Uri Bender** 2015)
- 23) Tumor budding predicts recurrence after curative resection for T2N0 in colorectal cancer. People's Choice Award - LD Maclean (**Richard Garfinkle** 2014)
- 24) Normalization of Carcinoembryonic Antigen levels post-neoadjuvant therapy is a strong predictor of pathologic complete response in rectal carcinoma. McGill Department of Surgery Award –\$2000 (**Ariella Kleiman** 2014)
- 25) Tumor budding predicts recurrence after curative resection for T2N0 in colorectal cancer. Podium Prize from the Canadian Society of Colon and Rectal Surgeons - \$500 (**Richard Garfinkle** 2014)
- 26) Laparoscopic Colorectal Cancer Resections In The Obese: A Systematic Review. CIHR Health Professional Student Research Award McGill Summer & Fall Research Bursary - \$2000 (**Alastair Fung** 2013)
- 27) Pain in the Behind: Perineal Wound Infections. CIHR Health Professional Student Research Award - McGill Summer Research Bursaries - \$2834. (**Melanie Bernstein** 2013).
- 28) Tumor budding predicts recurrence after curative resection for T2N0 in colorectal cancer. CIHR Health Professional Student Research Award - McGill Summer Research Bursaries - \$2834 (**Richard Garfinkle** 2012).

- **Current Residents/Fellows/Graduate Students**
 - Maria Aboukhalil, MSc, PhD Candidate (2014-to date)
 - Richard Garfinkle, MSc, PhD (2013-to date)
 - Jenny Moon MSc Candidate (2019 to date)
 - Natasha Caminsky (2018 to date)
 - Mohammed Shafic Abdulkarim (2019-to date)
 - Mohammed Al Ajhar MSc Candidate (2018-to date)
 - Safiya Masrouri (2018-2019)
 - Faisal Al-Rashid (2018-2019)
 - Ebram Salama MBA (2015-to date)
 - Maryam Al Farsi (2018 to date)
 - Ali Alnaki (2019-to date)
 - Najla Al-Ghaiti (2019-to date)
 - Oleksandra Kostenko (2019-2020)
 - Marjolaine Bourque (2019-to date)
 - Hatim AlSulaim (2019 to date)
 - Fawaz Abdulraheem (2020 to date)
 - Abrar Alhashemi (2020 to date)
- **Current Undergraduate/Medical students**
 - Alexander Banks (2018-2019)
 - Olivia Monton (2018-2020)
 - Alex Ni (2018-2020)
 - Vincent Brisette (2019 to date)
 - Noah Oiknine (2019 to date)
 - Allister Smith (2018-2020)
 - Hegagi, Mehdi (2019-to date)
 - Yossef Levin (2019-to date)
 - Zineb Harra (2019-to date)
 - Jiachen Liang (2020-to date)
 - Rachel Szwimer (2020-to date)
- **Past Fellows**
 - Sebastien Lachance (2016-2018)
 - Nathalie Wong Chong, MSc Candidate (2016- 2018)
 - Noura Alhassan (2014-2016)
 - Johnny Chau (2017-2018)
 - Allison Pang (2019-2020)
- **Past Residents/Graduate Students**
 - Turki Almaki MSc (2017-2019)
 - Alexandre Gosselin-Tardif (2013-2018)
 - Tanya Castelino (2014-2015)
 - Nora Trabulsi (2014-2016)
 - Nahar Alselaim (2015-2016)
 - Andrea Petrucci (2013-2015)
 - Adulaziz Saleem (2012-2015)
 - Alen Antoun (2014-2018)
 - Jad Aboukhalil (2014-2016)

- **Past IMG Residents**
 - Elizabeth Kmiotek (2016 – May 2017)
- **Past Undergraduate/Medical Students**
 - Michael Frohlich (2014-2016)
 - Jesse Zuckerman (2016-2017)
 - Edgard Medawar (2017-2018)
 - Melanie Bernstein (2012-2014)
 - Caitlin Cahill (2012-2014)
 - Alastair Fung (2013-2015)
 - Avigyle Grunbaum (2012-2014)
 - Rebecca Hazan (2013-2014)
 - Samuel Jessula(2013-2014)
 - Ariella Kleiman (2013-2015)
 - Sabrina Piedimonte (2014)
 - Benoit Bichara (2016)
 - Uri Bender (2014-2016)
 - Maude Trepanier (2015-2016)
 - Petro Youssef (2015-2017)
 - Gregory Sigler (2016-April 2018)
 - Andrei Dan (2014-2018)
 - Corrado DeMarco (2014-2018)
 - Jessica Lie (2015-2018)
 - Doulia Hamad (2016-2018)
 - Billy He (2018-2019)





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FACS**

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The Ferri Lab is dedicated to improving our understanding of upper GI malignancies through carefully coordinated basic science, clinical, and translational research. Degrees at the Masters and Doctoral level are offered in Experimental Surgery and Clinical Epidemiology.

Clinical Epidemiology/Outcomes Research

Residents choosing this theme approach the investigation of surgical complications, and the consequences thereof, through standard clinical epidemiological approaches using both in-house, prospectively-generated, databases as well as population-based administrated databases.

Current research projects in this theme include:

- a. The role of post-operative pneumonia on survival after lung cancer surgery
- b. Identifying predictors of Barrett’s Esophagus progression
- c. Establishing criteria for endoscopic resection of early esophageal adenocarcinoma
- d. The utility and accuracy of intra-operative margin assessment in upper GI cancers.
- e. Predictors of anastomotic leak after esophagectomy
- f. The management of dysphagia in metastatic esophageal cancer
- g. Predicting the rate of lymph node metastasis in early esophageal cancer
- h. The influence of surgical approach on quality of life after resection of upper GI cancers

Translational Research

Trainees undertaking translational research bridge the two entities of clinical outcomes and benchwork. Research is primarily centered on accessing the vast tumor and tissue bank from patients with gastric and esophageal cancer at all stages and employs the following techniques: laser capture microdissection, RNA isolation and amplification, whole genome cDNA microarrays and analysis, Tissue Microarray construction, immunohistochemistry, FISH. Data is then correlated to disease outcome garnered from a comprehensive clinical database.

The following projects are underway in this theme:

- a. Identifying the molecular signature profile of lymph node metastasis in gastro-esophageal cancer
- b. Identifying novel soluble biomarkers in esophageal cancer
- c. The role of Toll like receptor tumour expression on survival after esophagectomy in patients with and without post-operative infectious complications.
- d. Molecular determinants of peritoneal metastasis in resected gastric cancer

RESEARCH PROGRAM

Bench Research

The overriding theme in the basic science lab centers on the short and long term effects of post-operative complications and carries the hypothesis that “post-operative systemic inflammation increases cancer metastasis”. Through this theme the trainees learn and perform numerous techniques common to most cancer laboratories including western blot, PCR, transfection, cell culture, animal metastasis models, ELISA, spectrophotometry. The strength of the lab, however, resides in the advanced single cell imaging techniques such as confocal microscopy and intravital microscopy.

Current research projects in this theme include:

- a. Lipolysaccharide-TLR-4 interactions in cancer metastasis
- b. CEACAM family in cancer progression
- c. Acute bacterial pneumonia promotes cancer metastasis
- d. The role of activated neutrophils in metastasis

Past supervision 2008-2018

- Postdoctoral Fellows
 - Carlos Chan (2009 – 2012)
 - Atuhani Burnett (2016 – 2018)
- Graduate Students/Residents
 - Mathieu Rousseau – Experimental Surgery – MSc(2008 –2012)
 - Rich Hsu – Experimental Surgery – MSc (2008 – 2010)
 - Rushika Perera – Experimental Surgery – M.Sc. (2009 – 2011)
 - Simon Chow – Experimental Surgery – MSc (2010 – 2012)
 - Amin Andalib – Clinical Epidemiology – MSc (2010 – 2012)
 - Saleh Al Nasser – Experimental Surgery – MSc (2010 – 2012)
 - Jonathan Cools-Lartuigue – PhD (2011-2016)
 - Stephen Gowing – PhD candidate (2012-present)
 - Ugo Mancini – MSc (2012-2015)
 - Etienne St-Louis – MSc (2014-2015)
 - Phil Vourtzoumis – MSc candidate (2015-2017)
 - Arielle Leone – MSc candidate (2015-2017)
 - Vivian Stavrakos – MSc candidate (2015-2017)
 - Chantelle Janeiro – MSc candidate (2017-present)
 - Ramin Rohanizadeh – PhD candidate (2017-present)
- Undergraduate/Medical Students
 - Phillip Guervrement – Medicine – Summer Research Bursary 2008
 - Suzan Ergun – Medicine – Summer Research Bursary 2008
 - Phil Levine – Medicine – Summer Research Bursary 2009
 - Marcel Edwards – Summer Research Bursary – 2010
 - Hee Won – Summer Research Bursary 2012
 - Crystal Chen – (2012-2014)
 - Jack Mouhanna – Undergraduate student volunteer (2013-2016)
 - Cyril Boulila (2017-present)
 - Charles Rajadurai (2017-present)
 - Phil Bouchard (2017-present)
 - Alexander Gosselin-Tardif (2017-present)

Meetings Presented by Trainees 2010-2018

American College of Surgeons; American Association for Cancer Research; Keystone Symposia; Digestive Diseases Week; Society of American Gastrointestinal and Endoscopic Surgeons; American Society for Clinical Oncology – Gastrointestinal Cancers Symposium; American Association of Thoracic Surgeons; American Thoracic Society; Canadian Surgery Forum

FUNDING & SALARY SUPPORT

Laboratory Funding PRESENT

- 1 “La formation des metastases du cancer de l’oesophage facilitee par l’inflammation; le role de L’axe selectin-ligand selectin”. Fond de la Recherche en Sante Quebec (FRSQ) – \$40,000 - 2008-2012 -
- 2 “The Role of Systemic Inflammation in Esophageal Cancer Metastasis: Exploring Neutrophil Dependent and Independent Mechanisms” Canadian Cancer Society Research Institute (formerly National Cancer Institute of Canada) \$276,000 – 2009-2012 –
- 3 “Acute bacterial infection promotes cancer metastasis through toll like receptor signal transduction” Canadian Institutes of Health Research 2011-2015 \$497,572 –
- 4 “Acute bacterial infection promotes cancer metastasis through toll like receptor signal transduction” Canadian Association of General Surgeons \$ 10,000- 2011-2012 –

Salary Support of Residents in the Lab

1. L’investigation de la transduction du signal des recepteurs de type Toll dans les metastases du poumon - Fond des Reserche en Sante Quebec – \$66,721 2012-2014 – Stephen Gowing
2. Les pneumonies bacteriennes facilitent le developpement de metastases cancéreuses chez les patients atteints du cancer du poumon. Formation de maîtrise pour les détenteurs d'un diplôme professionnel - Fond des Reserche en Sante Quebec – \$66,721 2011-2013 – Jonathan Cools
3. “Acute bacterial infection promotes cancer metastasis through toll like receptor signal transduction” - Master's Award: Frederick Banting and Charles Best Canada Graduate Scholarships - Canadian Institutes of Health Research 2011-2012 \$17,500 – Jonathan Cools
4. L'Influence des Complications Infectieuses Post-Opératoire sur la Survie à Long-Terme dans les Patients Atteints du Cancer des Poumons. Formation de maîtrise pour les détenteurs d'un diplôme professionnel - Fond des Reserche en Sante Quebec – \$66,721 2011-2013 – Amin Andalib



Veena Sangwan PhD

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RESEARCH PROGRAM

The Spicer lab is primarily committed to exploring the intimate link between innate immunity and cancer progression as a therapeutic target in the management of thoracic malignancies. Specifically, we are focused on the interplay between neutrophils and circulating tumor cells during the metastatic process. Our laboratory has been a pioneer in this area and one of the first to establish a clear link between neutrophil function and metastatic spread. Our work in the area of Neutrophil Extracellular Traps (NETs) as they pertain to cancer metastasis has been highlighted as one of the top 10 cancer research discoveries in 2013 and continues to be a major focus of our investigations. Projects are currently available at the Masters and PhD level in the Department of Experimental Surgery. Due to the broad scope resulting from research in innate immunity and cancer, such projects are widely applicable for resident surgeons contemplating careers in a diverse range of specialties including thoracic surgery, surgical oncology, hepatopancreaticobiliary surgery, cardiovascular surgery as well as trauma and acute care surgery.

In addition to our basic and translational science projects, the Spicer lab is exploring a number of large animal models to investigate novel therapies for complex thoracic surgical problems. These projects fuse innovative, ultra-modern techniques with a throwback to “old-school” surgical research and form an excellent subject for a Master’s or PhD:

Firstly, we are developing novel models of airway reconstruction in collaboration with industry (Harvard Apparatus). This particular project has a major focus in regenerative medicine. Our goal is to develop practical airway replacement devices, aided by stem-cell seeding to re-establish airway structure and function in patients with tracheobronchial malignancies and complex benign airway disorders. This project involves close collaboration with industry as well as surgical work on pig models to test these new airway devices.

Secondly, we have developed the world’s largest network of institutions tracking outcomes for esophageal perforation. Currently, we are in the process of amalgamating over 500 patients with esophageal perforation from over 20 institutions across North

America and Europe into a common database. The first portion of this two-part project is focused on mining this database for high-quality clinical outcomes projects on esophageal perforation – a rare but highly complex problem with rapidly evolving management strategies. The second component of this research project is focused on developing a large animal model of esophageal perforation to test the effectiveness of a variety of therapeutic strategies. These therapies range from endoscopic stents and closure devices to stem cell based esophageal replacement conduits, again in collaboration with our industry partners at Harvard Apparatus.

Overall, your experience in the Spicer lab will be a FUN and highly productive one. Our laboratory works closely with the Ferri lab, both located at the new state of the art Research Institute at the Glen site. As such, trainees are exposed to excellent supervision and mentorship with the objective to become elite surgeon scientists and obtain placement in the most prestigious fellowship/faculty positions available. We share weekly lab meetings with a common goal to establish ourselves as one of the world’s premier thoracic surgery research labs.

CURRENT LAB MEMBERS

- Roni Rayes, PhD – Research Associate
- France Bourdeau – Animal Health Technician
- Simon Milette – PhD Candidate
- Jessica Mancuso – MSc candidate
- Megan De Meo – Undergraduate honors thesis
- Harika Dasari – Research volunteer
- Claire Wang – MSc candidate (2016-2018)
- Christina Kalos – Undergraduate student volunteer (2015-2016)
- Alexandra Tinfow – Undergraduate student volunteer (2016-2017)
- Jack Mouhanna – Undergraduate Honors Thesis (2016-2017)
- Julie Breau – Research volunteer (2016-2018)
- Carson Wong – Undergraduate Student volunteer (2017-2018)
- Rebecca Falutz – Undergraduate student volunteer (Summer 2018)

CURRENT FUNDING

- McGill University Health Center Research Institute Foundation; 2018 – 2021 - \$50,000(CAD)/year x 3 years
- Fonds de Recherche Québec – Santé Clinician Scientist Award Junior 1; 2017-2021 Salary support for 50% research activity and \$15,000 (CAD)/year x 4 years
- Cancer Research Society Operating Grant; 2018-2020 \$60,000(CAD)/year x 2 years



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COMPUTATIONAL GENOMICS

Current strategies to treat cancer are often specific to the tissue-type and anatomical location of the tumour. However, individual cancers arise from a unique set of genomic alterations and, as a result, individual tumours may not respond well to the current one-size-fits-all treatment strategies. Precision cancer medicine aims to treat cancers based on specific molecular alterations found within individual tumours regardless of their tissue of origin. Although, molecular classification and precision medicine have proven successful the paucity of actionable molecular events is hindering the development of novel therapies and treatment strategies. Detecting new actionable molecular alterations and the specific genes that drive cancer development and progression is vital to the continued success of precision cancer medicine.

We are a computational genomics lab interested in identifying novel cancer/metastasis genes and actionable biomarkers, such as genetic alterations, for oesophageal and gastric cancers. We are primarily focused on leveraging molecular alterations found in non-coding regulatory regions of the genome, an area that remains poorly explored, to elucidate new cancer and metastasis driver genes.

Current areas of interest include: (1) identification molecular biomarkers predicting progression to metastases from oesophageal and gastric cancers, (2) The role of non-coding regulatory elements in driving cancer development and progression to metastases and (3) Computational approaches to assess the impact of non-coding somatic alterations.



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RESEARCH PROGRAM

Numerous projects are ongoing and available in both Surgical Education and Clinical Outcomes, with grant funding in place to support research activities and travel for presentations. Weekly structured lab meetings in collaboration with the Surgical Outcomes and UGI Surgery groups and support from research coordinators ensure productivity. Possible projects include:

Surgical Education

- Evaluating AI computer vision technology for video-based performance assessments in surgery
- Development and implementation of peer coaching programs for continuous practice improvement in surgery
- Development and validation formative feedback tools in surgery
- Using virtual assessments to determine proficiency in surgical procedures

Clinical Outcomes

- Role of palliative resection in gastric cancer
- Role of anemia and peri-operative transfusions in UGI surgical and oncologic outcomes
- Role of patient remoteness from hospital and oncologic outcomes for gastroesophageal cancers
- Hospital and provider volume-outcome relationships in gastric cancer Surgical approaches to cancers of the gastroesophageal junction
- Long-term outcomes after redo-paraesophageal hernia repair
- Role of immunofluorescence imaging in reducing leaks after esophagectomy
- Impact of pre-operative nutritional status on surgical and oncologic outcomes in gastroesophageal cancer patients

FUNDING

McGill University & RI start-up funds: \$90,000 CAD
SSAT Faculty Development Award: \$40,000 USD
RCPSC Medical Education Research Grant: \$50,000 CAD
MGH Foundation Support: \$25,000 CAD

SUPERVISION

Previous Graduate Students (completion date):

- Dr. Rafik Sorial - MSc Experimental Surgery – Outcomes (2019)
- Dr. Anitha Kammili - MSc Experimental Surgery – Outcomes (2019)

Current Graduate Students

- Dr. Anitha Kammili – PhD Experimental Surgery (Education)
- Dr. Sofia Valanci - PhD Experimental Surgery (Education)
- Dr. Alen Antoun - MSc Experimental Surgery (Education)
- Dr. Hamzeh Naghawi – MSc Experimental Surgery (Education)

Past and Current Project Supervision

- Dr. Maude Trepanier (Outcomes)
- Dr. Johnny Chau (Education)
- Dr. Dominique Morency (Outcomes)
- Dr. Araz Kouyoumdjian (Outcomes)
- Dr. Alex Gosselin-Tardiff (Outcomes)
- Dr. Juan-Carlos Molina (Outcomes)

RESOURCES

- Working space at Montreal General Hospital with computer access
- Structured research meetings
- Research assistant support for IRB, statistical analysis, project organization, literature searches, etc
- Funding for travel to all meetings where work will be presented

SELECTED PUBLICATIONS

**Denotes students under my supervision*

*Valanci S, Wong K, Fiore J, Lee L, Feldman LE, Fried GM, **Mueller CL**. (2020) *Identifying Optimal Program Structure, Motivations for and Barriers to Peer Coaching Participation for Surgeons in Practice – a Qualitative Synthesis*. Accepted by Surgical Endoscopy, July 26, 2020.

*Kammili A, Cools-Lartigue J, Mulder D, Feldman LS, Ferri LE, **Mueller CL**. (2020) Transition from open to minimally invasive en bloc esophagectomy can be achieved without compromising surgical quality. *Surgical Endoscopy*. ePub doi: 10.1007/s00464-020-07696-0.

*Gosselin-Tardif A, Abou-Khalil M, Mata J, Guigui A, Cools-Lartigue J, Ferri LE, Lee L, **Mueller CL**. (2020) *Cost-effectiveness analysis of laparoscopic vs. open subtotal gastrectomy for gastric adenocarcinoma*. *British Journal of Surgery (Open)*. Accepted June, 2020.

*Valanci AS, Alhassan N, Feldman LS, Landry T, Mastropietro V, Fiore Jr J, Lee L, Fried GM, **Mueller CL**. (2020) *Implementation and Effectiveness of Coaching for Surgeons in Practice - A Mixed Studies Systematic Review*. *J Surg Ed*. 77(4);837-853.

*Sorral RK, Ali M, Kaneva P, Fiore Jr J, Vassiliou M, Fried GM, Feldman LS, Ferri LE, Lee L, **Mueller CL**. (2020) *Modern Era Surgical Outcomes of Elective and Emergency Paraesophageal Hernia Repair at a High-Volume Referral Center*. *Surgical Endoscopy*. 34(1);284-289.

Dumitra T, Alam R, Fiore Jr JF, Mata J, Fried GM, Vassiliou M, **Mueller CL**, Lee L, Feldman LS. (2020) *Is There A Gender Bias In The Advancement To Sages Leadership?* *Surgical Endoscopy*. 34(1);458-463.

Dumitra TC, Trepanier M, Lee L, Fried GM, **Mueller CL**, Jones DB, Feldman LS. (2019) *Gender distribution of speakers on panels at the Society of American Gastrointestinal and Endoscopic Surgeons (SAGES) annual meeting*. *Surgical Endoscopy*. (ePub doi: 10.1007/s00464-019-07182-2).

*Trepanier M, Sorral R, Siblini A, Vassiliou M, Fried GM, Feldman LS, Ferri LE, Lee L, **Mueller CL**. (2019) *Comparison of Dor and Nissen Fundoplication Following Laparoscopic Paraesophageal Hernia Repair*. *Surgery*. 166(4);540-546.

Bouchard P, Molina JC, Cools-Lartigue J, Spicer J, **Mueller CL**, Ferri LE. (2019) *Endoscopic Submucosal Dissection for Esophageal Adenocarcinoma: A North American Perspective*. *J Gastrointestinal Surg*. 23(6); 1087-1094.

Mueller CL, Braun J, Sorral R, Siblini A, Ferri LE. (2019) *Sentinel Lymph Node Mapping for Early Gastric Cancer - Preliminary Results of a North American Prospective Study*. *J Gastrointest Surg*. 23(6); 1113-1121.

St Louis E, Gowing S, Mossallanejad P, Leimanis ML, **Mueller CL**, Ferri LE. (2018) *Outcomes after completion total gastrectomy for gastric remnant cancer: experience from a Canadian tertiary center*. *Can J Surg*. Aug; 61(4):270-277.

*Molina, JC., Al-Hinai, A., Gosseling-Tardif, A., Bouchard, P., Spicer, J., Mulder, D., **Mueller, CL.**, Ferri, LE. (2018) *Multivisceral Resection for Locally Advanced Gastric and Gastro-Esophageal Junction Cancers – 11-year Experience at a High Volume North American Center*. *J Gastrointest Surg*. 23;43-50.

*Gosselin-Tardif A, Lie J, Nicolau I, Cools-Lartigue J, Feldman LS, Spicer J, **Mueller CL**, Ferri LE. (2018) *Gastrectomy with Extended Lymphadenectomy: A North American Perspective*. *J Gastrointest Surg*. Mar 22(3):414-420.

*Molina, JC., Misari, AM, Nicolau I., Spicer, J., Ferri, L. **Mueller, CL.** (2018) *Same day discharge for benign laparoscopic hiatal surgery: a feasibility analysis*. *Surgical Endoscopy*. Feb;32(2):937-944.

*McKendy K, Li MYL, Bilgic E, Li J and **Mueller CL**. (2017) *Understanding surgical resident motivation in the era of duty hour restrictions*. *J Med Ed and Training*. Sept 26; 1:022.

Mueller, CL, Cyr, G et al (2017) *The Steinberg Centre for Simulation and Interactive Learning at McGill University*. *J Surg Ed*. Nov-Dec; 74(6): 1135-1141.

Mueller CL, Braun J, Leimanis ML, Mouhanna J, Feldman LS, Ferri LE. (2016) *Application of an Individualized Operative Approach For Wedge Resection Of Gastric Gastrointestinal Stromal Tumours: Effectiveness For Tumours In Difficult Locations*. *Surgery*. 160(4); 1038-1048.

Najmeh S, Cools-Lartigue J, **Mueller C**, Ferri LE. (2016) *Comparing Laparoscopic to Endoscopic Resections for Early Gastric Cancer in a High Volume North American Center*. *J Gastrointest Surg*. 20(9); 1547-1553.

Mueller CL and Ferri LE. (2016) *Endoluminal Therapies for Barrett's Esophagus*. *Obesity Surgery*. 26(4); 721-726.

Mueller CL, Kaneva P, Fried GM, Mellinger JD, Marks JM, Dunkin BJ, van Sickle K, Vassiliou MC. (2016) *Validity Evidence For A New Portable, Lower Cost Platform For The Fundamentals Of Endoscopic Surgery Skills Test*. *Surgical Endoscopy*, 30(3); 1107-1112.



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RESEARCH PROGRAM

The goal of my research program is to **understand the mechanisms that lead to sub-optimal cancer care.**

Over a third of cancer patients experience challenges with the quality of care they receive. Problems such as delays, adverse events and inappropriate treatment decisions have a major impact on cancer recurrence, patient experience and health care costs. Our multi-disciplinary group brings together experts from surgery, medicine, nursing, pharmacy, evaluative sciences and industry to develop knowledge on how to optimize cancer care.

Residents joining my lab will have an opportunity to learn about:

- Personalizing risk profiles for adverse events in cancer care;
- Improving our ability to monitor cancer care delivery in comprehensive, continuous and real-time fashion, through the systematic application of quality metrics;
- Identifying factors related to patient, physician, disease and treatment type that are associated with a higher risk of sub-optimal care;
- Developing health informatics applications that enable real-time, patient-specific clinical decision support tools that promote better, safer care;
- Knowledge synthesis and transfer strategies, to promote a clinical practice driven by evidence;
- Assessing the impact of internet / social media in treatment decision-making.

CURRENT PROJECTS

OPTIMUM: A novel e-health approach in optimizing cancer care

This multi-site clinical trial is evaluating the impact of embedding real-time alerts of irregularities in cancer care directly in daily clinical processes. OPTIMUM provides a unique opportunity to access administrative databases such as RAMQ in real-time and connect them with clinical data. It also offers an opportunity to understand challenges of IT update by health care professionals.

McGill Breast Cancer Care Quality Initiative:

This longitudinal study brings together McGill experts from Surgery, Epidemiology, Nursing and Computer Sciences to assess the quality of province-wide breast cancer care. Using the prospective cohort of all new breast cancer cases in Quebec from 1998 to 2018 and accessing RAMQ administrative health data, the study evaluates quality along the comprehensive cancer trajectory.

Node surgery in cancer: good, better, best

This recently-approved study will provide a comprehensive assessment of nodal surgery in cancer with a particular focus on melanoma and sarcoma. Recent publications have highlighted the need for a re-centering of its role in surgical oncology. We need to optimize evidence-driven surgical approaches, and validate their impact through real-world evidence.

CUR-IT: Emerging Teams in Improving Patient Safety and Chronic Disease Management

This network project is evaluating informatics-enabled patient safety optimization strategies in collaboration with The Ottawa Hospital and Partners Health (Harvard University).

RightRX: McGill University's medication reconciliation software

This recently completed multisite clinical trial is evaluating the impact of informatics-enabled medication reconciliation at admission & discharge processes with an opportunity to correlate clinical course to health administrative datasets.

RUBY: Reducing the Burden of Breast Cancer in Young Women

This pan-Canadian collaboration focuses on young women with breast cancer including prospective clinical databasing, tissue and blood sampling, patient-reported outcomes collection and development of practice enhancement tools.

The Sherman Initiative: understanding Merkel Cell cancer

This prospective longitudinal study of a cohort of patients with Merkel Cell cancer will enable: 1) understanding health service utilization 2) characterizing the impact of adverse events on disease outcomes; 3) clinical correlation with biological profiling.

Montreal Cancer Consortium: melanoma research network

This Montreal-wide collaboration recently funded by the Terry Fox Research Institute aims to develop a molecular understanding of the impact of targeted therapy and immune checkpoint inhibitors in melanoma.

****A variety of other single-institution prospective or retrospective smaller, chart-based studies are also available.***

Trainees

Nina Morena, PhD candidate, Communication Studies
Ania Syrowatka, PhD Epidemiology & Biostatistics
David Henault, Resident General Surgery (UdeM)
Nora Almana, Resident
Nora Trabulsi, Masters' Clinical Epidemiology
Mohammed Nassif, Masters' in Experimental Surgery
Aliya Ramjun, Masters' in Clinical Epidemiology
Monisha Sudarshan, Resident General Surgery
Calvin Young, Resident General Surgery (Yale)
François Khazoom, Resident General Surgery (UdeM)

RESOURCES

Opportunities are available for Masters trainees (experimental surgery or clinical Epidemiology) as well as 6-month research rotations.

The following resources are provided to trainees working in our group:

- Full time research assistant offering support for IRB/ethics approval processes, data collection and maintenance, statistical analysis, literature review and manuscript editing;
- Clinical implementation coordinator for support with implementation, training and consenting of health informatic applications at clinical sites
- Multiple large population-based datasets such as RAMQ health administrative data (province-wide medical, pharmacy and hospital care), MED-Echo, Provincial tumor registry, clinical databases, patient-reported outcomes data;
- Computer tools (desk top, lap top) including all necessary software and research applications;
- Software programmer for health informatic application development
- Graphic designer support
- Dedicated research space (off-site work also possible via remote access to secure servers)
- Funding for conferences and presentations
- Possibility of embedded collaboration with the Institut national d'excellence en santé et services sociaux (INESSS).

In addition, regular journal clubs, progress meetings and peer-review groups allow for trainees to develop their own network of collaborations.

RECENT PUBLICATIONS

- Moldoveanu D, Pravongviengkham V, Best G, Martínez C, Hijal T, **Meguerditchian AN**, Lajoie M, Dumitra S, Watson I, Meterissian S. Dynamic Neutrophil-to-Lymphocyte Ratio: A Novel Prognosis Measure for Triple-Negative Breast Cancer. *Ann Surg Oncol*. 2020 Apr 20.
- Parvez E, Martel K, Morency D, Dumitra S, **Meguerditchian AN**, Dionisopoulos T, Meterissian S, Basik M, Boileau JF. Surgical and Oncologic Outcomes of Nipple-Sparing Mastectomy for a Cohort of Breast Cancer Patients, Including Cases with High-Risk Features. *Clin Breast Cancer*. 2020 Mar 8:S1526-8209(20)30048-3.
- R. Tamblyn, DL. Buckeridge, M. Bustillo, AJ. Forster, B. Habib, J. Hanley, A. Huang, S. Kurteva, T. Lee, **AN. Meguerditchian**, T. Moraga, A. Motulsky, D. Weir, N. Winslade. The Impact of an Electronic Medication Reconciliation Intervention on Medication Discrepancies, Adverse Drug Events, Emergency Department Visits and Re-admission: A Cluster Randomized Trial. *JAMA Network Open*. 2019 Sep 4;2(9):e1910756..
- Syrowatka A, Hanley JA, Weir DL, Dixon WG, **Meguerditchian AN**, Tamblyn R. Ability to predict new-onset psychological distress using routinely collected health data: A cohort study of breast cancer patients. *Journal of the National Comprehensive Cancer Network* 2018 Sep;16(9):1065-1073.
- Henault D, Westley T, Dumitra S, Chang SL, Kremer R, Tamblyn R, Mayo N, **Meguerditchian AN**. Osteoporosis Screening in Older Breast Cancer Patients Treated with Anti-Estrogen Therapy: A Population-Based Cohort Study. *Bone* 2018 Nov;116:94-102.
- Tamblyn R, Winslade N, Lee CT, Motulsky A, **Meguerditchian AN**, Bustillo M, Elsayed S, Buckeridge D, Couture I, Qian CJ, Moraga T, Huang A. Improving Patient Safety and Efficiency of Medication Reconciliation Through the Development and Adoption of a Computer-assisted Tool with Automated Electronic Integration of Population-based Community Drug Data. *The Right Rx Project. Journal of the American Medical Informatics Association* 2018 May 1; 25(5): 482-495.
- Westley T, Syrowatka A, Henault D, Rho, YS, Khazoom F, Chang SL, Tamblyn R, Mayo N, **Meguerditchian AN**. Patterns and Predictors of Emergency Department Visits among Older Patients after Breast Cancer Surgery: A Population-Based Cohort Study. *Journal of Geriatric Oncology* 2018 May 9(3): 204-213.
- Syrowatka A, Motulsky A, Kurteva S, Hanley J, Dixon WG, **Meguerditchian AN**, Tamblyn R. Predictors of Distress in Female Breast Cancer Survivors: A

Systematic Review. Breast Cancer Research and Treatment. Breast Cancer Research and Treatment 2017 Sep 165(2): 229-245.

- Syrowatka A, Chang SL, Tamblyn R, Mayo N, **Meguerditchian AN**. Psychotropic and Narcotic Drug Use in Older Breast Cancer Patients across the Care Trajectory: A Population-Based Cohort Study. Journal of the National Comprehensive Cancer Network 2016 Nov 14(11): 1412-1419.
- **Meguerditchian AN**, Tamblyn R, Meterissian S, Law S, Prchal J, Winslade N, Stern D. Adjuvant Endocrine Therapy in Breast Cancer: A Novel E-Health Approach in Optimizing Treatment for Seniors (OPTIMUM Study): A two-group controlled comparison pilot study. Journal of Medical Internet Research - Research Protocols 2016 Nov 7;5(4):e199.
- Syrowatka A, Kroemker D, **Meguerditchian AN**, Tamblyn R. Features that Can Be Integrated into Computer-Based Decision Aids: A Systematic Review, Thematic Synthesis and Meta-Analysis. Journal of Medical Internet Research 2016 Jan 18(1): 1-19.
- Ramjaun A, Sudarshan M, Patakfalvi L, Tamblyn R, **Meguerditchian AN**. Educating medical trainees on medication reconciliation: A systematic review. BMC Medical Education 2015 March 15:33.

RECENT PRESENTATIONS

POSTERS

- Kurteva, S. Tamblyn R, **Meguerditchian AN**. Opioid prescription characteristics associated with frequent emergency department use among hospitalized cancer patients: a comparative cohort study. AACR Annual Meeting, San Diego (CA) April 2020
- Tchuente V, Stern D, Prchal J, Martin J, Winslade N, Tamblyn R, **Meguerditchian AN**. Primary non-adherence to adjuvant endocrine therapy in older women with breast cancer. The Canadian Cancer Research Conference (CCRA), Ottawa November 2019.
- Tchuente V, Stern D, Prchal J, Martin J, Winslade N, Tamblyn R, **Meguerditchian AN**. Primary non-adherence to adjuvant endocrine therapy in older women with breast cancer. 19th Conference of the Société internationale d'oncologie gériatrique. Geneva (Switzerland) November 2019.
- Tchuente V, Stern D, Prchal J, Martin J, Tamblyn R, **Meguerditchian AN**. Primary Non-adherence to Adjuvant Endocrine Therapy in Older Women with Breast Cancer. ASCO Quality Care Symposium, San Diego, September 2019.

RECENT PRESENTATIONS

- Kurteva S, Tamblyn R, **Meguerditchian AN**. Opioid use among cancer patients undergoing surgery and their associated risk of re-admissions and emergency department visits in the one-year post-surgical period. Canadian Surgical Forum, Montreal September 2019.
- Parvez E, Shaul J, Dumitra T, Morency D, Martel K, **Meguerditchian AN**, Tremblay F, Meterissian S, Dumitra S. Life After MSLT II: Adoption of Nodal Basin Observation for Melanoma Patients with Sentinel Lymph Node Metastases. SSO Annual Symposium, San Diego, March 2019.
- Parvez E, Morency D, **Meguerditchian AN**, Dumitra S, Basik M, Meterissian S, Martel K, Boileau JF. Therapeutic nipple sparing mastectomy: practice patterns and surgical outcomes for high-risk cases at two academic cancer centers. SSO Annual Symposium, San Diego, March 2019.
- Kurteva S, Tamblyn R, **Meguerditchian AN**. Opioid use among cancer patients undergoing surgery and their associated risk of re-admissions and emergency department visits in the one-year post-surgical period. NCCN Annual Conference: Improving the Quality Effectiveness, and Efficiency of Cancer Care, Orlando, March 2019.
- Viganò A, Raskovic G, Arboleda MF, Aprikian S, Christodoulopoulos R, Thomas D, Bacis V, Aubin N, **Meguerditchian AN**, Borod M. Integrating Medical Cannabis Within a Quaternary Oncology Center: The Cannabis Pilot Project at the McGill University Centre. CannMed 2018, Los Angeles (USA), October 2018.
- Kavan P, Fox R, Raskovic G, Barrera I, Sateren W, Batist G, Palumbo M, Muanza T, Johnson N, Mamo A, Alcindor T, Turcotte R, **Meguerditchian AN**. A patient-centered approach to the re-development of supportive care services for oncology adolescent and young adult (AYA) patients across McGill University hospitals. ESMO, Madrid (Spain), September 2017.
- Syrowatka A, Chang S-L, Mayo N, Tamblyn R, **Meguerditchian AN**. Psychotropic and narcotic drug use in older women diagnosed with breast cancer across the cancer care trajectory. 2016 Epidemiology Congress of the Americas, Miami, June 2016.
- Henault D, Dumitra C, Chang SL, Kremer R, Mayo N, **Meguerditchian AN**. Adherence to osteoporosis screening guidelines in seniors with breast cancer treated with anti-estrogen therapy: A population-based study. 2016 Congress, Quebec Surgical Association, Quebec City, QC May 2016.

RECENT PRESENTATIONS

- Henault D, Dumitra C, Chang SL, Kremer R, Mayo N, **Meguerditchian AN**. Adherence to osteoporosis screening guidelines in seniors with breast cancer treated with anti-estrogen therapy: A population-based study. 2015 Breast Cancer Symposium, ASCO, San Francisco, CA September 2015. Tchuente V, Stern D, Prchal J, Martin J, Winslade N, Tamblyn R, **Meguerditchian AN**. Primary non-adherence to adjuvant endocrine therapy in older women with breast cancer. SIOG 19th Conference, Geneva, November 2019.

ORAL COMMUNICATIONS

- Viganò A, Raskovic G, Gamaoun R, Kasvis P, Arboleda MF, Aprikian S, Thomas D, Aubin VN, Christodoulouopoulos R, **Meguerditchian AN**, Borod M. Integrating Medical Cannabis within a Quaternary Oncology Center: The Cannabis Pilot Project, McGill University Health Centre. MASCC / ISOO Annual Meeting, San Francisco (CA), June 2019.
- Moldoveanu D, Best G, Pravongviengkham, **Meguerditchian AN**, Dumitra S, Meterissian S. Dynamic Neutrophil to Lymphocyte Ratio: A Novel Prognosis Measure for Triple Negative Breast Cancer. Society of Surgical Oncology Annual Symposium, San Diego (CA), March 2019.
- Tamblyn R, Huang A, Motulsky A, **Meguerditchian AN**, Winslade N, Buckeridge D, Forster A, Lee T, Bonnici A, Couture I. The RightRx Medication reconciliation Trial: Impact on Potential Adverse Drug Events. 34th International Conference on Pharmacoepidemiology and Therapeutic Risk Management. Prague (Czech Republic), August 2018.
- **Meguerditchian AN**. Palliative Surgery: A Time and Place for Everything. McGill University National Palliative Care Week, Montreal (May 2018).
- **Meguerditchian AN**. Optimum: Optimizing Cancer Care Through Health Informatics Innovations. McGill University Health Centre Department of Oncology Grand Rounds, Montreal (November 27th 2017).
- **Meguerditchian AN**. Building on excellence: a perspective on the way forward for Cancer Research. Cancer Care Manitoba, Winnipeg (October 2017).
- **Meguerditchian AN**, Panelist "What are the five things we can do now to immediately improve cancer care in Canada?" Innovative Approaches to Optimal Cancer Care in Canada, Canadian Partnership Against Cancer, Toronto (April 2017).
- Chang S-L, Syrowatka A, Mayo N, Tamblyn R, **Meguerditchian AN**. Psychotropic and narcotic drug use in older women diagnosed with breast cancer across the cancer care trajectory. 21st International Congress on Palliative Care, Montreal (October 2016).

RECENT PRESENTATIONS

- Chang S-L, Syrowatka A, Mayo N, Tamblyn R, **Meguerditchian AN**. Psychotropic and narcotic drug use in older women diagnosed with breast cancer across the cancer care trajectory. 21st International Congress on Palliative Care, Montreal (October 2016).
- Henault D, Rho Y, Khazoom F, Syrowatka A, Chang SL, Wesley T, **Meguerditchian AN**. Evaluation of Emergency Department visits and associated predictors among seniors after breast cancer surgery. Canadian Surgical Forum, Toronto (September 2016).
- Syrowatka A, **Meguerditchian AN**, Tamblyn R. Features of Computer-Based Patient Decision Aids: Systematic Review, Thematic Synthesis, and Meta-Analyses. 2nd International Meeting on Well-being and Performance in Clinical Practice, Greece (May 2016).



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SURGICAL ONCOLOGY RESEARCH PROGRAM

I am involved in clinical and basic science research projects in these areas:

A. Basic research:

Breast Cancer:

For those interested in a career in Surgical Oncology and, in particular, in establishing a laboratory I can help you find a project with two investigators that I actively collaborate with. Dr. Morag Park works on both the molecular and the immunologic aspects of triple-negative breast cancer. She is at the Goodman Cancer Center and has been an excellent supervisor for a number of surgical residents over the years.

Canadian Cancer Society Grant: I have a grant with Dr. Luke McCaffrey. He also works at the Goodman Cancer Center and he is interested in early breast cancer particularly DCIS and its causes. He is an excellent supervisor and I believe surgical residents would really enjoy working with this young investigator. I would co-supervise you on this research. I enjoy fruitful collaborations with both of them and look forward to co-supervising you with them for either a Masters or, preferably, a PhD.

B. Clinical Research:

1) Breast

For residents interested in completing a Masters in Epidemiology or a Masters in Public Health I have available large databases that you can work with. We have of course the Breast Tumor Registry which is complete and up-to-date and has over 3000 breast cancer cases. We also have the Breast Center Database which includes over 2000 cases of breast biopsies, both benign and malignant, done at the Breast Center. These databases can be used during your Masters as projects to fulfill the requirements. We can ask a myriad of questions and I have a number of research questions that are

available. Also I invite all residents embarking on a 6-month research period to think of completing their research with me since these databases will allow you to complete at least 2 research projects in the 6-month period. I have an excellent track record of publication of abstracts and manuscripts and will make sure that you are able to present at national and international meetings.

2) NSERC Grant

In breast cancer, 20-40% of all breast conserving surgery procedures result in margins with residual disease. Since cancer left at the margins is associated with an increased risk of recurrence, patients with positive margins always require a second operation. This high percentage of re-excision procedures leads to additional costs, patient anxiety and an increased risk of post-surgical complications. This project will lead to the development of a label-free (no need to inject a contrast agent), light-based technique to detect cancer during breast surgery. The intraoperative instrument will combine a new method called quantitative Raman and fluorescence spectroscopy with diffuse reflectance spatial-frequency domain imaging to provide tissue biomarkers able to detect the tissue signature associated with cancer cells based on morphological and biochemical properties. These developments will leverage recent advances in the Laboratory for Radiological Optics at Polytechnique Montreal and will set the stage for ODS Medical (the industry partner) to initiate commercialization of an instrument helping breast surgeons ensure completeness of tumour excision during lumpectomy procedures. The project will include the development of a cancer detection model based on machine learning techniques using data to be acquired in patients at the McGill University Health Center (MUHC). While there is a crucial need for the new label-free rapid imaging technology in breast cancer surgery, it can also find applications in a wide range of surgical oncology procedures, including neurosurgery, prostate and skin cancer surgery. You will be working with me to validate this instrument and determine its reliability and sensitivity.

My goal for residents working with me is to maximize the number of abstracts and manuscripts published to help you secure a competitive fellowship. I also want to make sure that you complete, on-time, your Masters or PhD degrees.

PUBLICATIONS

1. **Dumitra S.**, Wong S.M., Meterissian S., Featherstone R., Barkun J. and Fata P. 2015 The operative dictation: a review of how this skill is taught and assessed in surgical residency programs. *J. Surg. Educ* 72:321-9
2. Boileau J.F., Poirier B., Basik M., Holloway C.M., Gaboury L., Sideris L., Meterissian S., Arnaout A., Brackstone M., McCready D.R., Karp S.E., Trop I., Lisbona A., Wright F.C., Younan R.J., Provencher L., Patocskai E., Omeroglu A. and Robidoux A. 2015 Sentinel node biopsy after neoadjuvant chemotherapy in biopsy-proven node-positive breast cancer: the SN FNAC Study. *J. Clin Oncol.* 33:258-64
3. **Mandilaras V.**, Bouganim N., Spayne J., Dent R., Arnaout A., Boileau J.F., Brackstone M., Meterissian S. and Clemons M. 2015 Concurrent chemoradiotherapy for locally advanced breast cancer-time for a new paradigm? *Curr. Oncol.* 22: 25-32
4. Minter R.M., Amos K.D., Bentz M.L., Blair P.G., Brandt C., D’Cunha J., Davis E., Delman K.A., Deutsch E.S., Divino C., Kingsley D., Klingensmith M., Meterissian S., Sachdeva A.K., Terhune K., Termuhlen P.M. and Mullan P.B. 2015 Transition to Surgical Residency: A multi-institutional study of perceived intern preparedness and the effect of a formal residency preparatory course in the fourth year of medical school *Acad Med.* 90: 1116-1124
5. Coroiu, A., Körner, A., Burke, S., Meterissian, S., & Sabiston, C. M. 2015 Stress and Post-traumatic Growth Among Survivors of Breast Cancer: A Test of Curvilinear Effects. *International Journal of Stress Management* Epub ahead of print May 2015
6. **Parsyan A.**, Moldoveanu D., Balram B., Wong S., Zhang D.D., Svadzian A., Allard-Coutu A., Delisle M., Mesurolle B. and Meterissian S. 2016 Influence of pre-operative magnetic resonance imaging on the surgical management of breast cancer patients. *Am. J. Surgery* 211:1089-94
7. **Mahdanian A.A.**, Looper K.J., Bacon S.L., Mesurolle B., Meterissian S.H. and Rej S. 2015 Serotonergic antidepressants and increased bleeding risk in patients undergoing breast biopsy *Ther Adv Psychopharmacol* 5:332-338
8. **Proulx F.**, Correa J.A., Ferre R., Omeroglu A., Aldis A., Meterissian S., and Mesurolle B. 2016 Value of pre-operative breast MRI for the size assessment of ductal carcinoma in situ *Br. J. Radiol* 89: 201-205
9. Meguerditchian A, Tamblyn R, Meterissian S, Law S, Prchal J, Winslade N, Stern D. 2016 Adjuvant Endocrine Therapy in Breast Cancer: A Novel e-Health Approach in Optimizing Treatment for Seniors (OPTIMUM): A Two-Group Controlled Comparison Pilot Study. *JMIR Res Protoc.* 5(4):e199
10. **Sivakumaran L.**, Ayinde T., Hamadini F., Meterissian S., Razek T., Puckrin R., Munoz J., O’Hearn S. and Deckelbaum D. 2016 Support infrastructure available to Canadian residents completing post-graduate global health electives: current state and future directions. *Canadian Medical Education Journal* 7(3), Special Issue: E41-E50
11. Gagnon J, Lévesque E, Borduas F, Chiquette J, Diorio C, Duchesne N, Dumais M, Eloy L, Foulkes W, Gervais N, Lalonde L, L’Espérance B, Meterissian S, Provencher L, Richard J, Savard C, Trop I, Wong N, Knoppers BM, Simard J. 2016 Recommendations on breast cancer screening and prevention in the context of implementing risk stratification: impending changes to current policies. *Curr Oncol.* 23:e615-e625
12. **Marcil G.**, Wong S, Trabulsi N, Allard-Coutu A, Parsyan A, Omeroglu A, Atinel G, Mesurolle B, Meterissian S. 2017 Fibroepithelial breast lesions diagnosed by core needle biopsy demonstrate a moderate rate of upstaging to phyllodes tumors *Am J Surg.* 214:318-322
13. **Halaoui R.**, Rejon C., Chatterjee S.J., Szymborski J., Meterissian S., Muller W.J., Omeroglu A. and McCaffrey L. 2017 Progressive polarity loss and luminal collapse disrupt tissue organization in carcinoma *Genes Dev.* 31:1573-1587
14. **Savage P.**, Blanchet-Cohen A, Revil T, Badescu D, Saleh SMI, Wang YC, Zuo D, Liu L, Bertos NR, Munoz-Ramos V, Basik M, Petrecca K, Asselah J, Meterissian S, Guiot MC, Omeroglu A, Kleinman CL, Park M, Ragoussis J. 2017 A Targetable EGFR-Dependent Tumor-Initiating Program in Breast Cancer. *Cell Rep.* 21:1140-1149
15. Marta GN, Poortmans P, de Barros AC, Filassi JR, Freitas Junior R, Audisio RA, Mano MS, Meterissian S, DeSnyder SM, Buchholz TA, Hijal T. 2017 Multidisciplinary international survey of post-operative radiation therapy practices after nipple-sparing or skin-sparing mastectomy. *Eur J Surg Oncol.* 43:2036-2043
16. Marta GN, Poortmans P, de Barros AC, Filassi JR, Freitas-Junior R, Audisio RA, Mano MS, **Meterissian S**, DeSnyder SM, Buchholz TA, Hijal T. 2018 Reply to: Mastectomy skin flap thickness *Eur. J. Surg. Oncol.* April 27th (Epub ahead of print)
17. **Wong SM**, Prakash I, Trabulsi N, Parsyan A, Moldoveanu D, Zhang D, Mesurolle B, Omeroglu A, Aldis A, Meterissian S. 2018 Evaluating the Impact of Breast Density on Preoperative MRI in Invasive Lobular Carcinoma. *J Am Coll Surg.* 226:925-932
18. Lubarsky S, Dory V, **Meterissian S**, Lambert C, Gagnon R. 2018 Examining the effects of gaming and guessing on script concordance test scores. *Perspect Med Educ.* 7:174-181.

PUBLICATIONS

19. Sabiston CM, Wrosch C, Fong AJ, Brunet J, Gaudreau P, O'Loughlin J, Meterissian S. 2018. Life after breast cancer: moving on, sitting down or standing still? A prospective study of Canadian breast cancer survivors. *BMJ Open*. 8:e021770
20. Yu N, Leung VWY, **Meterissian S**. 2019 MRI Performance in Detecting pCR after Neoadjuvant Chemotherapy by Molecular Subtype of Breast Cancer. *World J. Surg*. 2019. 43:2254-2261.
21. Savage P, Yu N, Dumitra S, **Meterissian S**. 2019. The effect of the American Joint Committee on Cancer eighth edition on breast cancer staging and prognostication. *Eur J Surg Oncol*. 57:48-7983:30355-5.
22. Grusso T, Gigoux M, Manem VSK, Bertos N, Zuo D, Perlitch I, Saleh SMI, Zhao H, Souleimanova M, Johnson RM, Monette A, Ramos VM, Hallett MT, Stagg J, Lapointe R, Omeroglu A, **Meterissian S**, Buisseret L, Van den Eynden G, Salgado R, Guiot MC, Haibe-Kains B, Park M. 2019. Spatially distinct tumor immune microenvironments stratify triple-negative breast cancers. *J Clin Invest*. 1;129:1785-180.
23. Li X, Grusso T, Zuo D, Omeroglu A, **Meterissian S**, Guiot MC, Salazar A, Park M, Levine H. 2019. Infiltration of CD8+ T cells into tumor cell clusters in triple-negative breast cancer. *Proc Natl Acad Sci USA*. 116:3678-3687.
24. Yip CH, Evans DG, Agarwal G, Buccimazza I, Kwong A, Morant R, Prakash I, Song CY, Taib NA, Tausch C, Ung O, **Meterissian S**. 2019. Global disparities in breast cancer genetics testing, counselling and management. *World J Surg*. 43:1264-1270.
25. Morency D, Dumitra S, Parvez E, Martel K, Basik M, Robidoux A, Poirier B, Holloway CMB, Gaboury L, Sideris L, **Meterissian S**, Boileau JF. 2019. Axillary lymph node ultrasound following neoadjuvant chemotherapy in biopsy-proven node-positive breast cancer: results from the SN FNAC study. *Ann Surg Oncol*. 26:4337-4345.
26. Lagacé F, Ghawazi FM, Le M, Rahme E, Savin E, Zubarev A, Alakel A, Sasseville D, Morau L, **Meterissian S**, Litvinov IV. 2019. Analysis of incidence, mortality trends and geographic distribution of breast cancer patients in Canada. *Breast Cancer Res Treat*. 178:683-691.
27. Sabiston CM, Fong AJ, O'Loughlin EK, **Meterissian S**. 2019. A mixed-methods evaluation of a community physical activity program for breast cancer survivors. *J Transl Med*. 19:206.
28. St-Louis E, Shaheen M, Muhktar F, Adessky R, **Meterissian S** and Boutros M. 2020. Towards development of an open surgery competency assessment for residents (OSCAR) tool: a systematic review of the literature and Delphi consensus. *J Surg Edc*. 77:438-453.
29. Parvez E, Martel K, Morency D, Dumitra S, Meguerditchian AN, Dionisopoulos T, **Meterissian S**, Basik M, Boileau JF. 2020. Surgical and oncologic outcomes for nipple-sparing mastectomy for a cohort of breast cancer patients, including cases with high-risk features. *Clin Breast Cancer*. S1526-8209(20)30048-3.
30. Moldoveanu D, Pravongviengkham V, Best G, Martinez C, Hijal T, Meguerditchian AN, Lajoie M, Dumitra S, Watson I and **Meterissian S**. 2020. Dynamic neutrophil-to-lymphocyte ratio: a novel prognosis measure for triple-negative breast cancer. *Ann. Surg. Oncol*. Online ahead of print.
31. Savage P, Pacis A, Kuasne H, Liu L, Lai D, Wan A, Dankner M, Martinez C, Munoz-Ramos V, Pilon V, Monast A, Zhao H, Souleimanova M, Annis MG, Aguilar-Mahecha A, Lafleur J, Bertos NR, Asselah J, Bouganim N, Petrecca K, Siegel PM, Omeroglu A, Shah SP, Aparicio S, Basik M, **Meterissian S** and Park M. 2020. Chemogenomic profiling of breast cancer patient-derived xenografts reveals targetable vulnerabilities for difficult-to-treat tumors. *Commun Biol*. 16;3:310.

ENDOCRINE SURGICAL ONCOLOGY RESEARCH



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Mission Statement *Understanding the mechanisms involved in the initiation and progression of endocrine-related cancers and using this knowledge to improve the care of patients afflicted with these malignancies.*

RESEARCH PROGRAM

Clinical Epidemiology / Outcomes Research

1. The influence of solid organ transplantation on the rate and aggressiveness of de novo thyroid cancer
2. The influence of diuretics on the positive predictive value of sestamibi scans in patients with hyperparathyroidism

Bench / Translational Research

1. Identifying a unique metastatic gene expression profile in papillary thyroid cancer (PTC) with loco-regional metastasis
 - a. Tissue microarrays will be used for high-throughput analysis of single gene or protein biomarkers that are biologically significant for PTC tumor progression. Hierarchical clustering analysis using both molecular and clinicopathological data will be performed to prognostically classify tumor specimens.
 - b. Determine a molecular gene expression profile by analyzing a known panel of genetic and epigenetic markers for tumor metastases. Bioinformatics and high-throughput technologies will be used to determine a unique genomic biomarker profile aimed at characterizing the evolving nature of thyroid cancer aggressiveness. Validating the identified genes prospectively will be necessary to determine a PTC metastatic gene profile.
 - c. Thyroglobulin represents a key biomarker for recurrent PTC. Yet, thyroglobulin produced by metastatic or recurrent thyroid follicular cells undergoes posttranslational modifications affecting glycosylation, phosphorylation and iodination. Using mass spectrometry, structural changes in the thyroglobulin molecule during PTC progression and dedifferentiation will be identified.
2. Characterizing Gene Expression Profiles in Resected Adrenal Metastases – A Seed vs. Soil Phenomenon
3. The Biologic Relevance of mtDNA Damage in Hurthle Cell Neoplasms: A 3-Dimensional Molecular Model

Past supervision

- 1 Post-Doctoral fellow
- 2 PhD students
- 3 MSc students
- 7 (Surgery/Endocrinology fellows, technicians & research assistants/associates)

Resources / Facilities

Our laboratory, located at the **Lady Davis Institute-Segal Cancer Centre**, has the basic equipment needed for molecular and cellular biology experiments, including apparatus for DNA/protein electrophoresis, balances, fridges (4°C), freezers (-20°C and -80°C), heating blocks, a 37°C incubator for growing bacteria, magnetic stirrers, microcentrifuges, pipettors, PCR machines, laser capture microdissection, platform shakers, a pH meter, a refrigerated centrifuge, a vacuum dryer, water baths, and computers with Internet access.

A tissue culture room which contains a laminar flow hood and 37°C CO₂ incubators, allowing for propagation of a variety of mammalian cells. Additional equipment in this room includes centrifuges, fridges, a microscope for examining cells and a laminar flow hood for preparing PCR reactions.

In addition, the Lady Davis Institute for Medical Research (LDI), SMBD-Jewish General Hospital, has fully equipped core facilities that are provided for all researchers including cold (4°C and -20°C) and warm (27°C and 37°C) rooms, dark rooms with X-ray film developers, and equipment such as bacterial shakers, hybridization ovens, plate readers, scintillation counters, sonicators, ultracentrifuges, UV spectrophotometers, etc. All research laboratories have access to imaging systems (confocal, electron microscopy) and a fluorescent-activated cell sorting (FACS) facility. The LDI has its own in-house animal quarters with a staff of animal care technicians.

Collective Lab Accomplishments over past 5 years

- 21 publications (published/in press)
- 8 book chapters (published/in press)
- 54 abstracts
- 14 presentations

FUNDING & SALARY SUPPORT

- 1 **Canadian Institutes of Health Research (CIHR)**
- 2 **National Cancer Institute of Canada (NCIC)**
- 3 **Natural Sciences and Engineering Research Council of Canada (NSERC)**
- 4 **Fonds Québécois de la Recherche sur la Nature et les Technologies (FORNT)**
- 5 **Prostate Cancer Research Foundation of Canada**
- 6 **Boehringer Ingelheim (Canada) Ltd**
- 7 **Networks of Centres of Excellence (NCE)**
- 8 **Sir Mortimer B. Davis-Jewish General Hospital Foundation**

PUBLICATIONS

A complete list of recent publications can be provided upon request.

MUHC SURGICAL OUTCOME RESEARCH GROUP



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The Steinberg-Bernstein Centre for
**MINIMALLY INVASIVE
SURGERY**
at McGill University



RESEARCH VISION

Patients undergoing surgery invariably experience a rapid health decline postoperatively, which is followed by a gradual return towards baseline (preoperative) health. Length of postoperative recovery (i.e. the time to return to preoperative health or 'normal') varies depending on patient characteristics, extension of surgery and occurrence of postoperative complications. Prolonged or incomplete postoperative recovery not only increases healthcare costs but is also associated with substantial burden to patients and caregivers (e.g. time away from work, leisure, family and social activities). Several perioperative interventions are proposed to improve recovery for patients, but for these to be adopted, they should increase the value of surgery – defined as health outcomes achieved relative to the cost of achieving those outcomes.

Our research program focusses on:

- (1) Developing and investigating novel and creative interventions to improve postoperative recovery and increase the value of surgery. This includes reorganization of perioperative care into pathways, novel surgical techniques, new pharmacological therapies, pre- and post-operative exercise interventions.
- (2) Creating innovative measurement strategies to value the process of postoperative recovery through patient-reported (e.g. self-report questionnaires), clinician-reported (e.g. readiness for hospital discharge) and performance-based (e.g. functional exercise tests) outcomes.
- (3) Assessing the economic aspects of surgical recovery, cost-effectiveness of interventions aimed to improve recovery and impact on healthcare and societal costs.
- (4) Comparative-effectiveness research and health technology assessment of surgical technologies, in particular those pertaining to MIS and colorectal surgery
- (5) Behavioral economics, in particular studying how patients make treatment decisions
- (6) Digital health technologies to improve postoperative outcomes
- (7) Measurement and improvement of intraoperative performance

CURRENT PROJECTS

- Development of a novel patient-reported outcome measure to assess recovery after abdominal surgery.
- Effect of video-based guided self-reflection on intraoperative performance: a pilot randomized controlled trial
- Impact of the Covid-19 pandemic on rates emergency department utilization due to general surgery conditions.
- Opioid-free analgesia after outpatient surgery: A pilot randomized controlled trial.
- Opioid versus opioid-free analgesia after postoperative discharge: a systematic review and meta-analysis.
- General surgeons' attitudes and beliefs regarding the prescription of opioids after postoperative hospital discharge: A qualitative study.
- A prospective evaluation of opioid prescription and consumption after hospital discharge following colorectal surgery.
- Systematic review of the impact of enhanced recovery pathways on patient-reported outcomes after abdominal surgery.
- Functional outcomes after rectal cancer surgery –laparoscopic versus transanal approach to total mesorectal excision
- Perioperative probiotics in ERAS colorectal: a randomized trial
- Mobile app technology to reduce unnecessary ER visits and unplanned readmissions after elective colorectal surgery
- Transanal surgery skills assessment
- Development of web-based video library
- Defining expertise in laparoscopic cholecystectomy
- Functional trajectories after rectal cancer surgery
- What bothers patients the most after rectal cancer surgery? A mixed-methods study
- Creation of a shared decision making tool for rectal cancer
- Association of patient activation/engagement with surgical outcomes

CURRENT GRANTS

- (2020) Central Surgical Association (CSA) Turcotte Award: "Use of mobile health technology to improve postoperative outcomes after GI surgery" - \$20,000 USD (Lee)
- (2020) American Society of Colon and Rectal Surgeons (ASCRS) grant : "Helping patients choose – improving decision making in rectal cancer" - \$150,000 USD (Lee)
- (2019) FRQS operating grant: "Improving the value of colorectal surgery" - \$75,000 CAD (Lee)
- (2019) CIHR Project Grant: "Opioid versus opioid-free analgesia after surgical discharge: a systematic review and meta-analysis - \$80,325 CAD

- (2019) Society of American Gastrointestinal and Endoscopic Surgeons (SAGES) Grant: "Opioid-free analgesia after outpatient surgery: A pilot randomized controlled trial" - 40,248 CAD (Fiore, Feldman)
- (2019) Theodor Educational Grant – 30,000 CAD (Feldman)
- (2018) Johnson & Johnson Grant: "Use of a Mobile App (CareSense) to Improve Patient-Physician Communication, Patient Engagement & Health Outcomes in Digestive Diseases" - \$110,000 (Lee, Feldman)
- (2018) CIHR Opioid Crisis Knowledge Synthesis Grant: "Preventing opioid prescription after major surgery: A scoping literature review on opioid-free postoperative analgesia" - \$59,866 CAD (Fiore, Feldman)
- (2018) Mitacs Accelerate Program: "Value-based care in abdominal surgery: Measuring recovery outcomes that matter to patients" 2018 - \$120,000 CAD (Fiore, Feldman)
- (2017) Merck Investigator Studies Program Grant: " Value-based care in abdominal surgery: Measuring recovery outcomes that matter to patients " - \$313,729 CAD (Fiore, Feldman)
- (2017) FRQS Établissement de jeunes chercheurs. Grant, Operating - 60,000 CAD (Fiore)
- (2017) Medtronic Educational Grant - \$175 000 CAD (Feldman)

RESOURCES AND FACILITIES

Office space for students and research staff is provided at the Centre for Health Outcomes Research (CORE) and the Steinberg-Bernstein Centre, located at the Montreal General Hospital. Our group comprises faculty, graduate students, general surgery residents and fellows. A full-time research coordinator (Ms Pepa Keneva) is available to facilitate administrative and research related work. We have a weekly research meeting to brainstorm ideas and discuss ongoing projects. We work closely with faculty member from the Division of Clinical Epidemiology (Dr. Nancy Mayo) and Biostatistics (Dr. Nandini Dendukuri) who are available to provide methodological and statistical advice as needed. We also work in collaboration with an expert Medical Librarian (Mr Alex Amar) who provide ongoing support for literature reviews. Funding is available for students to present their work in national and international meetings.

SUPERVISION

Current graduate students

- (2018-present) Teodora Dumitra PhD Experimental Surgery
(2018- present) Ghadeer Olleik. PhD in Experimental Surgery
(2018- present) Bernardo Verdolin. MSc in Experimental Surgery
(2019- present) Brent Hopkins. MSc in Epidemiology
(2019- present) Jules Eustache. MSc in Epidemiology
(2019- present) Charbel El Kefraoui. MSc in Experimental Surgery
(2019- present) Yuen Do. MSc in Experimental Surgery
(2020- present) Makena Pook. MSc in Experimental Surgery
(2020- present) Saba Balvardi. MSc in Epidemiology

Past graduate students (past 5 years)

- (2018- 2019) Maude Trepanier. MSc in Epidemiology
(2017- 2019) Roshni Alam, Masters in Experimental Surgery
(2017-2018) Teodora Dumitra, Masters in Epidemiology
(2016-2019) Juan Mata, Masters in Experimental Surgery
(2014-2019) Negar Karimian, PhD Experimental Surgery
(2015-2018) Nicolo Pecorelli, Masters in Experimental Surgery
(2015-2017) Philippe Paci, Masters in Epidemiology
(2012-2016) Jimmy Bejjani. Masters in Experimental Surgery
(2014-2016) Tanya Castelino Masters in Experimental Surgery
(2012-2014) Lawrence Lee, PhD in Experimental Surgery

SELECTED PUBLICATIONS (PAST 5 YEARS)

- *Hopkins B, Eustache J, Ganescu O, Cipolla J, Kaneva P, Fried GM, Khwaja K, Vassiliou MC, Fata P, **Lee L**, Feldman LS. Impact of incisional negative pressure wound therapy on surgical site infection after complex incisional hernia repair: a retrospective matched cohort study. *Surg Endosc* 2020
- Balvardi S, Pecorelli N, Castelino T, Niculiseanu P, Alhashemi M, Liberman AS, Charlebois P, Stein B, Carli F, Mayo NE, **Feldman LS**, **Fiore JF Jr**. Impact of Facilitation of Early Mobilization on Postoperative Pulmonary Outcomes After Colorectal Surgery: A Randomized Controlled Trial. *Ann Surg.* 2020. Online ahead of print.
- Carli F, Bousquet-Dion G, Awasthi R, Elsherbini N, Liberman S, Boutros M, Stein B, Charlebois P, Ghitelescu G, MD, Morin N, Jagoe T, Scheede-Bergdahl C, Minnella EM, **Fiore JF Jr**. Multimodal Prehabilitation for Frail Patients Undergoing Resection of Colorectal Cancer. A Randomized Controlled Trial. *JAMA Surg* 2020; 155(3):233-42.

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- **Lee L**, Trepanier M, Renaud J, Liberman S, Charlebois P, Stein B, Fried GM, Fiore Jr J, Feldman LS. Patients' Preferences for Sphincter Preservation Versus Abdominoperineal Resection for Low Rectal Cancer. *Surgery* 2020
- *Kouyoumdjian A, Trepanier M, Al Shehhi R, Cools-Lartigue J, Ferri LE, **Lee L**, Mueller CL. The effect of preoperative anemia and perioperative transfusion on surgical outcomes after gastrectomy for gastric cancer. *J Surg Res* 2020
- Karimian N, Kaneva P, Donatelli F, Stein B, Liberman AS, Charlebois P, **Lee L**, **Fiore JF Jr**, Carli F, **Feldman LS**. Simple versus complex preoperative carbohydrate drink to preserve perioperative insulin sensitivity in laparoscopic colectomy: a randomized controlled trial. *Ann Surg* 2020; 271(5):819-826.
- *Chau JK, Bilgic E, Hada T, Trepanier M, Naghawi H, Kaneva P, Mueller CM, **Lee L**. Development and Validation of a Transanal Endoscopic Rectal Purse String Simulator. *Tech Coloproctol* 2020 (epub 2020 June 6).
- Caycedo-Marulanda A, Brown C, Chadi S, Ashamalla S, **Lee L**, Stotland P, Hameed U, Melich G, Ma G, Letarte F, Karimuddin A, Quereshy F, Phang T, Raval M, Vikis E, Liberman AS, Bouchard A, Bouchard P, Drolet S. Canadian tatME Expert Collaboration (CaTaCO) Position Statement. *Surg Endosc* 2020 (epub 2020 June 5)
- *Trépanier M, Valin-Thorburn A, Dumitra T, Alhashemi M, Pecorelli N, Kaneva P, Liberman SA, Charlebois P, Stein B, Feldman LS, **Lee L**. Intracorporeal versus Extracorporeal Anastomosis for Right Colectomy Does Not Affect Gastrointestinal Recovery within an Enhanced Recovery After Surgery Program. *Surg Endosc* 2019 (epub 2019 Oct 23)
- *Chau J, Solomon J, Liberman AS, Charlebois P, Stein B, **Lee L**. Pelvic dimensions on preoperative imaging can identify poor quality resections after laparoscopic low anterior resection for mid- and low-rectal cancer. *Surg Endosc* 2019 (epub 2019 Oct 16)
- Dumitra TC, Trepanier M, **Lee L**, Fried GM, Mueller CL, Jones DB, Feldman LS. Gender distribution of speakers on panels at the Society of American Gastrointestinal and Endoscopic Surgeons (SAGES) annual meeting. *Surg Endos* 2019 (epub 2019 Oct 11)
- Valanci S, Alhassan N, Feldman LS, Landry T, Mastropietro V, Fiore Jr JF, **Lee L**, Fried GM, Mueller CM. Implementation and effectiveness of coaching for surgeons in practice – a mixed studies systematic review. *J Surg Educ* 2020;77(4):837-853
- *Paradis T, Zorigtbaatar A, Trepanier M, Fiore Jr JF, Fried GM, Feldman LS, **Lee L**. Meta-analysis of the diagnostic accuracy of c-reactive protein for infectious complications in laparoscopic versus open colorectal surgery. *J Gastrointest Surg* 2020;24(6):1392-1401.
- *Alsharqawi N, Alhashemi M, Kaneva P, Baldini G, Fiore JF Jr, Feldman LS, **Lee L**. Validity of the I-FEED score for postoperative gastrointestinal function in patients undergoing colorectal surgery. *Surg Endosc* 2020;34(5):2219-2226

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- Karimian N, Kaneva P, Donatelli F, Stein B, Liberman AS, Charlebois P, **Lee L**, Fiore JF Jr, Carli F, Feldman LS. Simple Versus Complex Preoperative Carbohydrate Drink to Preserve Perioperative Insulin Sensitivity in Laparoscopic Colectomy: A Randomized Controlled Trial. *Ann Surg* 2020;271(5):819-826.
- Alam R, Montanez J, Law S, **Lee L**, Mayo NE, Feldman LS, Fiore J. Development of a Conceptual Framework of Recovery After Abdominal Surgery. *Surg Endosc* 2020;34(6):2665-2674.
- Albert MR, **Lee L**. Tips and Tricks. *Clin Colon Rectal Surg* 2020; 33:173-179.
- **Lee L**, Kelly J, Nassif GJ, deBeche-Adams TC, Albert MR, Monson JR. Defining the learning curve for transanal total mesorectal excision for rectal adenocarcinoma. *Surg Endosc* 2020;34:1534-1542
- *Trepanier M, Paradis T, Kouyoumdjian A, Dumitra T, Charlebois P, Stein BS, Liberman AS, Schwartzman K, Carli F, Fried GM, Feldman LS, **Lee L**. The Impact of Delays to Definitive Surgical Care on Survival in Colorectal Cancer Patients. *J Gastrointest Surg* 2020;24:115-122
- *Sorail RK, Ali M, Kaneva P, Fiore Jr JF, Vassiliou M, Fried GM, Feldman LS, Ferri LE, **Lee L**, Mueller CM. Modern Era Surgical Outcomes of Elective and Emergency Paraesophageal Hernia Repair at a High-Volume Referral Center. *Surg Endosc* 2020;34:284-289
- Mata J, Pecorelli N, Kaneva P, Moldoveanu D, Gosselin-Tardif AI, Robitaille S, Balvardi S, **Lee L**, Stein B, Liberman AS, Charlebois P, Fiore Jr, JF, Feldman LS. A mobile device application (app) to improve adherence to an enhanced recovery program for colorectal surgery: a randomized controlled trial. *Surg Endosc* 2020;34:742-751
- Dumitra T, Alam R, Fiore Jr JF, Mata J, Fried GM, Vassilious MC, Mueller CM, **Lee L**, Feldman LS. Is there a gender bias in the advancement to SAGES leadership? *Surg Endosc* 2020;34:458-463
- **Lee L**, de Lacy B, Gomez Ruiz M, Liberman AS, Albert MR, Monson JR, Lacy A, Kim SH, Atallah SB. A Multicenter Matched Comparison of Transanal and Robotic Total Mesorectal Excision for Mid- And Low-Rectal Adenocarcinoma. *Ann Surg* 2019;270(6):1110-1116
- *Trepanier M, Alhassan N, Sabapathy C, Liberman AS, Charlebois P, Stein B, Feldman LS, **Lee L**. Cost-Effectiveness of Extended Thromboprophylaxis In Patients Undergoing Colorectal Surgery from a Canadian Healthcare System Perspective. *Dis Colon Rectum* 2019;62:1381-1389
- *Trepanier M, Erkan A, Kouyoumdjian A, Nassif G, Albert M, Monson J, **Lee L**. Examining the Relationship Between Lymph Node Harvest and Survival in Patients Undergoing Colectomy for Colon Adenocarcinoma. *Surgery* 2019;166:639-647
- *Trépanier M, Sorail R, Ali M, Siblini A, Vassiliou M, Fried G, Feldman LS, Ferri LE, **Lee L**, Mueller CL. Comparison of Dor and Nissen fundoplication following laparoscopic paraesophageal hernia repair. *Surgery* 2019;166:540-546

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- **Lee L**, Trepanier M, Renaud J, Liberman S, Charlebois P, Stein B, Fried GM, Fiore Jr J, Feldman LS. Patients' Preferences for Sphincter Preservation Versus Abdominoperineal Resection for Low Rectal Cancer. *Surgery* 2020
 - *Kouyoumdjian A, Trepanier M, Al Shehhi R, Cools-Lartigue J, Ferri LE, **Lee L**, Mueller CL. The effect of preoperative anemia and perioperative transfusion on surgical outcomes after gastrectomy for gastric cancer. *J Surg Res* 2020
 - Karimian N, Kaneva P, Donatelli F, Stein B, Liberman AS, Charlebois P, **Lee L**, **Fiore JF Jr**, Carli F, **Feldman LS**. Simple versus complex preoperative carbohydrate drink to preserve perioperative insulin sensitivity in laparoscopic colectomy: a randomized controlled trial. *Ann Surg* 2020; 271(5):819-826.
 - Trépanier M, Minnella EM, Paradis T, Awasthi R, Kaneva P, Schwartzman K, Carli F, Fried GM, **Feldman LS**, **Lee L**. Improved Disease-free Survival After Prehabilitation for Colorectal Cancer Surgery. *Ann Surg* 2019;270(3):493-501.
 - **Fiore JF Jr**, **Feldman LS**. Tracking Postoperative Recovery-Making a Case for Smartphone Technology. *JAMA Surg* 2019. doi: 10.1001/jamasurg.2019.4703.
 - Benchimol EI, Bernstein CN, Bitton A, Murthy SK, Nguyen GC, Lee K, Cooke-Lauder J, Windsor JW, Carroll MW, Coward S, El-Matary W, Griffiths AM, Jones JL, Kuenzig E, **Lee L**, Mack DR, Mawani M, Otley AR, Singh H, Targownik LE, Weizman AV, Kaplan GG. The Impact of Inflammatory Bowel Disease in Canada 2018: A Scientific Report from the Canadian Gastro-Intestinal Epidemiology Consortium to Crohn's and Colitis Canada. *J Can Assoc Gastroenterol* 2019;2:S1-S5.
 - Kuenzig ME, Benchimol EI, **Lee L**, Targownik LE, Singh H, Kaplan GG, Bernstein CN, Bitton A, Nguyen GC, Lee K, Cooke-Lauder J, Murthy SK. The impact of inflammatory bowel disease in Canada 2018: Direct costs & health services utilization. *J Can Assoc Gastroenterol* 2019;2:S17-S33.
 - Kuenzig ME, **Lee L**, El-Matary W, Weizman AV, Benchimol EI, Kaplan GG, Nguyen GC, Bitton A, Lee K, Cooke-Lauder J, Murthy SK. The impact of inflammatory bowel disease in Canada 2018: Indirect costs of IBD care. *J Can Assoc Gastroenterol* 2019;2:S34-S41.
 - *Alhassan N, Yang L, Wong-Chong N, Liberman AS, Charlebois P, Stein B, Fried GM, **Lee L**. Comparison between conventional colectomy & complete mesocolic excision for colon cancer - a systematic review and pooled analysis. *Surg Endosc* 2019;33:8-18
 - **Lee L**, Wong-Chong N, Kelly JJ, Nassif GJ, Albert MR, Monson JR. Minimally-invasive surgery for stage III colon adenocarcinoma is associated with less delay to initiation of adjuvant systemic therapy and improved survival. *Surg Endosc* 2019;33:460-470.
 - **Lee L**, Mata J, Drosier RA, Kaneva P, Liberman AS, Charlebois P, Stein B, **Feldman LS**. Incisional hernia after midline versus transverse specimen ext incisions: a randomized trial in patients undergoing laparoscopic colectomy. *Ar* 2018 Jul;268(1):41-47
- * Complete list of publications is available upon request.



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RESEARCH PROGRAM

Clinical Epidemiology / Outcomes Research

- Clinical outcomes & quality of care studies in bariatric surgery using population-level & large multi-centric datasets
 - RAMQ/Med-ECHO
 - ACS-NSQIP

CURRENT PROJECTS

- Evaluation of opioid prescription and consumption after hospital discharge following bariatric surgery (*Prospective cohort study; collab with Dr Fiore's lab; grant application ongoing*)
- Combined bariatric surgery and atrial fibrillation ablation in the reduction of atrial fibrillation recurrence (*BAF study; RCT; collab with EP cardio team at MUHC; grant application ongoing*)
- Clinical outcomes and quality assurance of bariatric surgery in Quebec (*RAMQ data available*)
- Prospective cohort study comparing short- & long-term outcomes of laparoscopic biliopancreatic diversion with duodenal switch (BPD-DS) *NCT02792166*
- Impact of bariatric surgery in morbidly obese patients who are kidney transplant candidates

CURRENT FUNDING

- Faculty Research Award - Division of General Surgery: \$15,000
- QuEST fund – Patient donation: \$45,000

PAST SUPERVISION

- Philippe Bouchard – MSc Epidemiology (2017-2019; completed)

MEETINGS PRESENTED BY TRAINEES

- ASMBS (ObesityWeek), IFSO, SAGES
- Canadian Association of Bariatric Physicians and Surgeons
- Minimally Invasive Surgery Symposium
- Canadian Transplant Summit

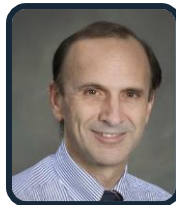
SELECTED PUBLICATIONS (2020-2021)

1. Andalib A, *Bouchard P, *Alamri H, Bougie A, Demyttenaere S, Court O. Single Anastomosis Duodeno-ileal Bypass with Sleeve Gastrectomy (SADI-S): Short-term Outcomes from a Prospective Cohort Study. *Surg Obes Relat Dis.* 2021 Feb;17(2):414-424.
2. Hajjar R, Lafrance JP, Tchervenkov J, Gingras S, Boutin L, Elftouh N, **Andalib A**, Pescarus R, Garneau PY, Chan G. Successful Surgical Weight Loss with Sleeve Gastrectomy for Morbid Obesity prior to Kidney Transplantation. *Transp Int.* 2021. DOI: 10/1111/TRI.13855.
3. *Bouchard P, Tchervenkov J, Demyttenaere S, Court O, **Andalib A**. Safety and Efficacy of the Sleeve Gastrectomy as a Strategy towards Kidney Transplantation. *Surg Endosc.* 2020 Jun;34(6):2657-2664.
4. *Bouchard P, Demyttenaere S, Court O, Franco EL, **Andalib A**. Surgeon and Hospital Volume Outcomes in Bariatric Surgery: A Population-level Study. *Surg Obes Relat Dis.* 2020 May;16(5):674-681.
5. **Andalib A**, *Bouchard P, Demyttenaere S, Ferri LE, Court O. Esophageal Cancer after Bariatric Surgery: A Population-based Comparative Cohort Study. *Surg Obes Relat Dis.* 2020. DOI: 10.1016/j.soard.2020.12.011.
6. Andalib A, *Alamri H, *Almuhanna Y, *Bouchard P, Demyttenaere S, Court O. Short-term Outcomes of Revisional Surgery after Sleeve Gastrectomy: A Comparative Analysis of Re-sleeve, Roux en-Y Gastric Bypass, Duodenal Switch (Roux en-Y and Single-Anastomosis). *Surg Endosc.* 2020. DOI: 10.1007/s00464-020-07891-z.

HARVEY E. BEARDMORE DIVISION OF PEDIATRIC SURGERY RESEARCH TEAM

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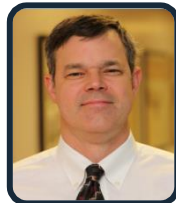
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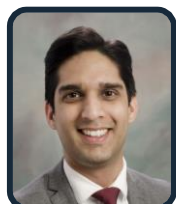
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ABOUT US

The **Harvey E. Beardmore Division of Pediatric Surgery** at the Montreal Children's Hospital consists of 6 attending surgeons with a broad range of research interests and activities. More than 200 peer-reviewed papers were generated between 2012-2020 with input from students, residents and fellows, most of which are published in specialty journals. These projects cover the entire spectrum of practice in pediatric surgery through various research methodologies, including randomized controlled trials, prospective and retrospective studies, health services research, case-control studies, database analyses, systematic or scoping reviews, guidelines, position papers, editorials, and case reports.


Our special interests include global pediatric surgery, trauma, public health, and congenital anomalies including congenital diaphragmatic hernia (CDH), chest wall anomalies, appendicitis, & colorectal disorders. Continuing with our existing interests, our current research endeavors include patient- and family-centered care, communication in surgery, shared decision-making, patient-reported outcomes, and implementation of pathways related to enhanced recovery after pediatric surgery.

Our division is leading the **Canadian Consortium for Research in Pediatric Surgery (CanCORPS)** in multi-centre research. This consortium consists of 15 pediatric surgical centres across Canada collaborating in research to minimize variability in care and optimize patient outcomes through collaboration and innovation. Furthermore, we are trending towards increasing interdisciplinary and multi-institutional collaborations, thus broadening the scope of future research activities.

The division has secured research funding through private grants, including the *Mirella & Lino Saputo Foundation Chair in Pediatric Surgical Education & Patient- and Family-Centered Care*, CIHR funding, as well as an FROQ-funded research scholar career grant.

Fourteen research fellows and graduate students are now engaged in a number of research projects. A full-time research project manager, Elena Guadagno (elena.guadagno@muhc.mcgill.ca) is available to assist with project conception, conduct, research ethics approval and completion.

A personalized research experience can be provided depending upon a candidate's previous research experience and interests. Each surgeon has a particular research focus within the context of pediatric surgery, although significant collaboration occurs within the division. All research is performed on a strong methodological foundation and in a collaborative environment. The next sections summarize ongoing research activity, with current research residents involved in multiple projects. New research residents are encouraged to identify novel research areas in which they may be interested.

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GLOBAL PEDIATRIC SURGERY

Global pediatric surgery is a major focus of the division, including several students, residents, and research fellows at varying levels. Presentations at multiple national and international meetings is expected from trainees, with the listed research graduates presenting on average 2-3 times annually.

Students are actively involved in diverse projects, ranging from pediatric trauma care in low-resource settings, capacity assessment in hospitals providing surgical care to children in LMICs, and indicators of pediatric surgical access and care in LMICs. Research in the development of novel scoring systems and DALYs for pediatric surgical conditions is also underway.

The opportunity also exists to become involved with the Global Initiative for Children's Surgery (GICS), an LMIC-centric collaborative organization dedicated to improving access to safe and timely surgical care for children in under-resourced environments.

The **Jean-Martin Laberge Fellowship in Global Pediatric Surgery** is another unique training program for surgical residents and practitioners interested in global pediatric surgery, offered in conjunction with the Centre for Global Surgery at the McGill University Health Centre. This 1- to 2-year long training program is primarily research-focused, and can lead to a Master's or Doctoral degree in Experimental Surgery (Global Surgery track). Fellows are expected to be active participants in the divisional research team, pursuing projects in various global surgical research areas, including burden of disease, access to surgery, human and material resources for surgery, global surgical training, economic valuations of surgical interventions, and others. Fellows are offered the opportunity to participate in at least one surgical mission trip with an attending surgeon through Mercy Ships. On-the-ground research in low-resource settings is optional, but encouraged. Clinical activity within the division of pediatric surgery is possible, depending on licensing requirements.

Global Surgery projects related to LMICs include:

- Screening of Neonatal Congenital Anomalies in LMICs
- Management of Anorectal Malformations in LMICs
- Patient-Reported Outcomes in pediatric surgery in LMICs
- Trauma training in LMICs
- Determining disparities in access to pediatric surgical care
- Distinguishing outcomes based on elective versus emergency pediatric surgical care (North Kivu, DRC)
- Risk adjusting pediatric surgical outcomes in low-resource settings
- Essential Pediatric Surgery - burden, feasibility & cost-effectiveness analysis
- Pediatric Surgical Volume systematic review
- Evaluating laparoscopic procedures in LMICs

Principal Investigators: Drs. Dan Poenaru, Sherif Emil

CLINICAL EPIDEMIOLOGY/OUTCOMES RESEARCH

Multiple single or multi-institutional research projects have successfully been completed by students and residents working in the Division. These studies typically fall into one of three broad categories:

1. **National Database Inquiries**
 - a. Canadian Pediatric Surgery Network (CAPSNet)
 - i. Gastroschisis Database
 - ii. Congenital Diaphragmatic Hernia Database
 - b. Canadian Biliary Atresia Registry (CBAR)
 - c. National Trauma Data Bank (NTDB)
 - d. Quebec Trauma Registry and Canadian Pediatric Injury database (CHIRPP)
2. **Multi-Institutional Clinical Research**
 - a. Transanastomotic feeding tubes & stricture rates in esophageal atresia
 - b. Pan-Canadian retrospective study on female fetal abdominal cysts
 - c. Prospective int'l pediatric appendicitis Core Outcome Set
 - d. Congenital Diaphragmatic Hernia projects
3. **Single-Institution Clinical Research**
 - a. Multiple projects related to chest wall anomalies conducted through the Shriners' Chest Wall Anomaly Center, including chest wall and spinal deformities after thoracotomy
 - b. Various trauma projects
 - c. Various projects related to colorectal malformations

Principal Investigators: Drs. Sherif Emil, Pramod Puligandla, Jean-Martin Laberge, Dan Poenaru, Kenneth Shaw, Hussein Wissanji

PATIENT- & FAMILY-CENTERED OUTCOMES

Thanks to the *Mirella & Lino Saputo Foundation Chair in Pediatric Surgical Education & Patient and Family-Centered Care*, the Division has embarked on a new research area in patient-centered pediatric surgical care processes, patient-reported outcomes, and enhanced recovery from pediatric surgical procedures. These include:

- ERAS – development of pediatric chest wall repair pathway, patient education survey and patient surveys and tools for appendicitis
- Shared decision-making in pediatric surgery and decisional aid development
- Patient reported outcomes in pediatric surgery

Principal Investigators: Drs. Sherif Emil, Dan Poenaru

The **CommiSur (Communication in Surgery) Lab** focuses on the various communication processes in surgical care, both between children, families/caregivers and their providers, and within surgical care teams.

At the "commissure" between families and surgical providers we are exploring the risk communication process taking place whenever a key surgical decision needs to be made. Our goal throughout these studies is to develop communication tools to improve the interactions between patients, families, and the surgical care team, and to instruct medical students and surgical trainees to do the same. At the "commissures" between various surgical team members we explore the communication processes within trauma teams in action. We explore actual and theoretical team communication patterns, aiming to distill the findings into formal communication modules to be incorporated into trauma courses.

Across both of these major communication domains we endeavor to innovate technologically through novel applications of artificial intelligence. This includes machine learning algorithms for rendering risk communication more precise, and virtual and augmented reality for creating low-cost, remotely deliverable immersive simulations for trauma team communication.

Projects include:

- Risk communication preferences between surgeons and families
- Consenting process in pediatric surgery
- Artificial Intelligence in risk communication
- Trauma team communication processes
- VR in trauma simulation training

Principal Investigator: Dr. Dan Poenaru

machine learning algorithms for rendering risk communication more precise, and virtual and augmented reality for creating low-cost, remotely deliverable immersive simulations for trauma team communication.

Projects include:

- Risk communication preferences between surgeons and families
- Consenting process in pediatric surgery
- Artificial Intelligence in risk communication
- Trauma team communication processes
- VR in trauma simulation training

Principal Investigator: Dr. Dan Poenaru

Current Research Fellows

- Fabio Botelho (PhD candidate, Brazil)
- Felix Oyania (PhD candidate, Uganda)
- Naomi Wright (PhD candidate, UK)
- Julia Ferreira (MSc candidate, Brazil)
- Anne-Sophie Besner (MSc candidate)
- Zoe Atsaidis (MSc candidate)
- Justina Seyi-Olajide (PhD candidate, Nigeria)
- Sabrina Wimmer (MSc candidate, Netherlands)
- Irina Boldeanu (MSc candidate)

Research Fellows near completion

- Etienne St-Louis (PhD candidate)
- Kathryn LaRusso (PhD candidate)
- Nadia Safa (MSc candidate)
- Yasmine Yousef (PhD candidate)
- Pier-Luc Beaudoin (MSc candidate, UdeM)

Current Research Students

Anudari Zorigtbaatar, Asra Toobaie, Bianca Sarkis, Brent Hopkins, Charlotte Rosen, Christian, Danielle Leblanc, David Paterson, Jenny Ji, Kacper Niburski, Mélyssa Fortin, Nam Nguyen, Natasha Caminsky, Neyla Boukhili, Olivia Ganesco, Rosa Lakabi, Sara Medina Kasasni, Zahia Attari, Arthega Selvarajan, Brandon Arulanandam, Cassandra Poirier, Cristina Pop, Danny Kim, Dylan Patel, Etienne Leveille, Frederic Grou-Boileau, Joseph Sayegh, Laura Pinkham, Leen Makki, Marianne Plourde, Michelle Taillefer, Minahil Khan, Nasim Haghbandish, Noemie Elfassy, Oana Jumanca, Rana Gaffar, Rim Elost, Ruxandra Penta, Ryan Antel, Sadaf Mohtashami, Salima Ramdani, Sarah Chibane, Vedasamhitha Ramavarapu, Xiya Ma.

2019-2020 publications

1. Nguyen N, Leveille E, Guadagno E, Kalisya LM, Poenaru D. Use of mobile health technologies for postoperative care in paediatric surgery: A systematic review. *Journal of Telemedicine and Telecare*. 2020 Jun 30;1357633X20934682.
2. Traynor Jr MD, St. Louis E, Hernandez MC, Alsayed AS, Klinkner DB, Baird R, Poenaru D, Kong VY, Moir CR, Zielinski MD, Laing GL, Bruce JL, Clarke DL. Comparison of the Pediatric Resuscitation and Trauma Outcome (PRESTO) model and pediatric trauma scoring systems in a middle-income country. *World J Surg* 2020 <https://doi.org/10.1007/s00268-020-05512-3>
3. Rocha TA, Vissoci JR, da Silva NC, Poenaru D, Shrime MG, Smith ER, Rice HE. Towards defining the surgical workforce for children: a geospatial analysis in Brazil. *BMJ Open* 2020;10:e034253. doi:10.1136/bmjopen-2019-034253
4. Beaudoin, P. L., Anchouche, S., Gaffar, R., Guadagno, E., Ayad, T., & Poenaru, D. (2020). Barriers in Access to Care for Patients With Head and Neck Cancer in Resource-Limited Settings: A Systematic Review. *JAMA Otolaryngology Head & Neck Surgery*, 16, 16. doi:<https://dx.doi.org/10.1001/jamaoto.2019.4311>
5. Bhanji, F., Miller, G., Cheung, W. J., Puligandla, P. S., Winthrop, A., Baird, R., . . . Webber, E. M. (2020). The future is here! Pediatric surgery and the move to the royal college of physicians and surgeons of Canada's competence by design. *Journal of Pediatric Surgery*, 55(5), 796-799. doi:<https://dx.doi.org/10.1016/j.jpedsurg.2020.01.031>
6. Concepcion, T. L., Dahir, S., Mohamed, M., Hiltbrunn, K., Ismail, E. A., Poenaru, D., . . . Global Initiative for Children's, S. (2020). Barriers to Surgical Care Among Children in Somaliland: An Application of the Three Delays Framework. *World Journal of Surgery*, 44(6), 1712-1718. doi:<https://dx.doi.org/10.1007/s00268-020-05414-4>
7. Hamad, D., Yousef, Y., Caminsky, N. G., Guadagno, E., Tran, V. A., Laberge, J. M., . . . Poenaru, D. (2020). Defining the critical pediatric surgical workforce density for improving surgical outcomes: a global study. *Journal of Pediatric Surgery*, 55(3), 493-512. doi:<https://dx.doi.org/10.1016/j.jpedsurg.2019.11.001>
8. Meng, F., Zuo, K. J., Amar-Zifkin, A., Baird, R., Cugno, S., & Poenaru, D. (2020). Pediatric burn contractures in low- and lower middle-income countries: A systematic review of causes and factors affecting outcome. *Burns*, 46(5), 993-1004. doi:<https://dx.doi.org/10.1016/j.burns.2019.06.001>
9. Smith, E. R., Concepcion, T. L., Shrime, M., Niemeier, K., Mohamed, M., Dahir, S., . . . Global Initiative for Children's, S. (2020). Waiting Too Long: The Contribution of Delayed Surgical Access to Pediatric Disease Burden in Somaliland. *World Journal of Surgery*, 44(3), 656-664. doi:<https://dx.doi.org/10.1007/s00268-019-05239-w>
10. St-Louis, E., Petroze, R., Baird, R., Razek, T., Poenaru, D., Calland, J. F., . . . Ntaganda, E. (2020). Calibration and validation of the pediatric resuscitation and Campos, B. A., . . . Tatsuo, E. S. (2019). A 25-year study of gastroschisis outcomes in a middle-income country. *Journal of Pediatric Surgery*, 54(7), 1481-1486.

11. Alakaloko, F. M., St-Louis, E., Ademuyiwa, A. O., Poenaru, D., & Bode, C. (2019). Determination of Visual Portfolio for Surgeons Overseas Assessment of Surgical Needs Nigeria Study: Consensus Generation through an e-Delphi Process. *Nigerian Journal of Surgery*, 25(1), 30-35
12. Baird, R., Ingelmo, P., Wei, A., Meghani, Y., Perez, E. V., Pelletier, H., . . . Poenaru, D. (2019). Nebulized analgesia during laparoscopic appendectomy (NALA): A randomized triple-blind placebo controlled trial. *Journal of Pediatric Surgery*, 54(1), 33-38.
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14. Concepcion, T., Mohamed, M., Dahir, S., Adan Ismail, E., Poenaru, D., Rice, H. E. Global Initiative for Children's, S. (2019). Prevalence of Pediatric Surgical Conditions Across Somaliland. *JAMA Network Open*, 2(1), e186857.
15. Concepcion T., Smith ER, Mohamed M, Dahir S, Ismail EA, Leather AJM, Poenaru D, Rice HE. Global Initiative for Children's, S. (2019). Provision of Surgical Care for Children Across Somaliland: Challenges and Policy Guidance. *World Journal of Surgery*, 11, 11.
16. Duggan, E., & Puligandla, P. S. (2019). Respiratory disorders in patients with omphalocele. *Seminars in Pediatric Surgery*, 28(2), 115-117.
17. Emil, S. (2019). Error traps and culture of safety in the treatment of abdominal wall defects. *Seminars in Pediatric Surgery*, 28(3), 124-130.
18. Emil, S., Langer, J. C., Blair, G., Miller, G., Aspirot, A., Brisseau, G., & Hancock, B. J. (2019). The Canadian pediatric surgery workforce: A 5-year prospective study. *Journal of Pediatric Surgery*, 54(5), 1009-1012.
19. Global Initiative for Children's, S. (2019). Global Initiative for Children's Surgery: A Model of Global Collaboration to Advance the Surgical Care of Children. *World Journal of Surgery*, 43(6), 1416-1425.
20. Global Initiative for Children's, S. (2019). Optimal Resources for Children's Surgical Care: Executive Summary. *World Journal of Surgery*, 43(4), 978-980.
21. Knaapen, M., Hall, N. J., van der Lee, J. H., Butcher, N. J., Offringa, M., Van Heurn, E. W. E., . . . Paediatric Appendicitis, C. O. S. d. g. (2019). Establishing a core outcome set for treatment of uncomplicated appendicitis in children: study protocol for an international Delphi survey. *BMJ Open*, 9(5), e028861.
22. LaRusso, K., Schaack, G., Fung, T., McGregor, K., Long, J., Dumas, M. P., . . . Emil, S. (2019). Should you pick the PICC? Prolonged use of peripherally inserted central venous catheters in children with intestinal failure. *Journal of Pediatric Surgery*, 54(5), 999-1004.
23. Miranda, M. E., Emil, S., de Mattos Paixao, R., Picarro, C., Cruzeiro, P. C. F., Campos, B. A., . . . Tatsuo, E. S. (2019). A 25-year study of gastroschisis outcomes in a middle-income country. *Journal of Pediatric Surgery*, 54(7), 1481-1486.

PUBLICATIONS

24. Petroze, R. T., Caminsky, N. G., Trebichavsky, J., Bouchard, S., Le-Nguyen, A., Laberge, J. M., Emil, S., & Puligandla, P. S. (2019). Prenatal prediction of survival in congenital diaphragmatic hernia: An audit of postnatal outcomes. *Journal of Pediatric Surgery*, 54(5), 925-931. doi:https://dx.doi.org/10.1016/j.jpedsurg.2019.01.021
25. Petroze, R. T., & Puligandla, P. S. (2019). Preoperative cardiopulmonary evaluation in specific neonatal surgery. *Seminars in Pediatric Surgery*, 28(1), 3-10.
26. Poenaru, D., & Seyi-Olajide, J. O. (2019). Developing Metrics to Define Progress in Children's Surgery. *World Journal of Surgery*, 43(6), 1456-1465.
27. Reda, A., Ashraf, M., Soliman, M., Ragy, H., El Kersh, A., Abdou, W., . . . El Shorbagy, A. (2019). The pattern of risk-factor profile in Egyptian patients with acute coronary syndrome: phase II of the Egyptian cross-sectional CardioRisk project. *Cardiovascular Journal of Africa*, 30(2), 87-94.
28. St-Louis, E., Miao, J., Emil, S., Baird, R., Bettolli, M., Montpetit, K., . . . Laberge, J. M. (2019). Vacuum bell treatment of pectus excavatum: An early North American experience. *Journal of Pediatric Surgery*, 54(1), 194-199.
29. Toobaie, A., Yousef, Y., Balvardi, S., St-Louis, E., Baird, R., Guadagno, E., & Poenaru, D. (2019). Incidence and prevalence of congenital anomalies in low- and middle-income countries: A systematic review. *Journal of Pediatric Surgery*, 54(5), 1089-1093.
30. Whitaker, J., Denning, M., O'Donohoe, N., Poenaru, D., Guadagno, E., Leather, A., & Davies, J. (2019). Assessing trauma care health systems in low- and middle-income countries, a protocol for a systematic literature review and narrative synthesis. *Systematic Reviews*, 8(1), 157.
31. Wright, N., Abantanga, F., Amoah, M., Appeadu-Mensah, W., Bokhary, Z., Bvulani, B., Davies, J., Miti, S., Nandi, B., Nimako, B., Poenaru, D., Tabiri, S., Yifeyeh, A., Ade-Ajayi, N., Sevdalis, N., & Leather, A. (2019). Developing and implementing an interventional bundle to reduce mortality from gastroschisis in low-resource settings. *Wellcome Open Research*, 4, 46.
32. Yousef, Y., Lee, A., Ayele, F., & Poenaru, D. (2019). Delayed access to care and unmet burden of pediatric surgical disease in resource-constrained African countries. *Journal of Pediatric Surgery*, 54(4), 845-853.

Highlights/Highest impact (2017-2018)

33. Yousef Y, Youssef F, Dinh T, Pandya K, Stagg H, Homsy M, Baird R, Laberge JM, Poenaru D, Puligandla P, Shaw K, Emil S. Risk stratification in pediatric perforated appendicitis: Prospective correlation with outcomes and resource utilization. *J Pediatr Surg*. 2018;53(2):250-5.
34. Wirth S, Emil SGS, Engelis A, Digtyar V, Criollo M, DiCasoli C, et al. Moxifloxacin in Pediatric Patients With Complicated Intra-abdominal Infections: Results of the MOXIPEDIA Randomized Controlled Study. *Pediatr Infect Dis J*. 2018;37(8):e207-e13.
35. Smith ER, Concepcion T, Lim S, Sadler S, Poenaru D, Saxton AT, et al. Disability Weights for Pediatric Surgical Procedures: A Systematic Review and Analysis. *World JSurg*. 2018;13:13.
36. MacKinnon N, St-Louis E, Yousef Y, Situma M, Poenaru D. Out-of-Pocket and Catastrophic Expenses Incurred by Seeking Pediatric and Adult Surgical Care at a Public, Tertiary Care Centre in Uganda. *World J Surg*. 2018;01:01.

PUBLICATIONS

37. Goodman LF, St-Louis E, Yousef Y, Cheung M, Ure B, Ozgediz D, Ameh EA, Bickler S, Poenaru D, Oldham K, Farmer D, Lakhoo K, Collaborators G. The Global Initiative for Children's Surgery: Optimal Resources for Improving Care. *Eur J Pediatr Surg*. 2018;28(1):51-9.
38. Canadian Congenital Diaphragmatic Hernia Collaborative, Puligandla PS, Skarsgard ED, Offringa M, Adatia I, Baird R, et al. Diagnosis and management of congenital diaphragmatic hernia: a clinical practice guideline. *CMAJ Canadian Medical Association Journal*. 2018;190(4):E103-E12.
39. Yousef Y, Youssef F, Homsy M, Dinh T, Pandya K, Stagg H, Baird R, Laberge JM, Poenaru D, Puligandla P, Shaw K, Emil S. Standardization of care for pediatric perforated appendicitis improves outcomes. *J Pediatr Surg*. 2017;52(12):1916-20.
40. Wei S, Saran N, Emil S. Musculoskeletal deformities following neonatal thoracotomy: long-term follow-up of an esophageal atresia cohort. *J Pediatr Surg*. 2017;52(12):1898-903.
41. Puligandla PS, Baird R, Skarsgard ED, Emil S, Laberge JM, Canadian Pediatric Surgery N. Outcome prediction in gastroschisis - The gastroschisis prognostic score (GPS) revisited. *J Pediatr Surg*. 2017;52(5):718-21.
42. Poenaru D, Pemberton J, Frankfurter C, Cameron BH, Stolk E. Establishing disability weights for congenital pediatric surgical conditions: a multi-modal approach. *Popul Health Metr*. 2017;15(1):8.
43. Emil S, Sevigny M, Montpetit K, Baird R, Laberge JM, Goyette J, et al. Success and duration of dynamic bracing for pectus carinatum: A four-year prospective study. *J Pediatr Surg*. 2017;52(1):124-9.
44. Emil S, O'Neill J, Poenaru D. Let our fellows go: a plea for allowing global surgery electives during pediatric surgical training. *J Pediatr Surg*. 2017;52(12):2088-90.



Peter Metrakos, MD, PhD,
FRCSC, FACS

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Mission Statement

The study of cancer progression and metastasis. The study of metabolic syndrome, fatty liver disease, insulin resistance, and perioperative metabolic response and recovery.

RESEARCH PROGRAM

Bench research

Fatty Liver Disease and Liver Ischemia/Reperfusion Injury

- Mapping of hepatocyte proteome in NAFLD and NASH: A systems Medicine Approach.
- Ischemia/Reperfusion Injury during Liver Transplantation
- The metabolic effect of insulin therapy on patients with chronic Hepatitis C infection
- The metabolic effect of insulin therapy on the quality of organs from brain-dead organ donors
- The role of ER stress and Unfolded Protein Response (UPR) in the development of Hepatocellular Carcinoma

Cancer progression and metastasis:

- The role of the proprotein convertases in cancer progression
- The effect of lipid metabolism in hepatocellular cancer progression, cell line analysis with augmented and knock-down of the perilipin family of proteins which control lipid droplet storage of TAGs.
- The effect of liver regeneration on the progression of liver metastasis (post portal vein embolization and/or liver resection)
- Co-option mechanism of cancer vascularization
- Histological Growth patterns of liver metastasis and their effect on prognosis and choice of therapy (RNAseq, Genomic analysis)

Clinical Trials

SELECTED PUBLICATIONS

- Article II. High dose Insulin therapy for patients undergoing major liver resections
- Article III. The effect of portal vein embolization on liver tumor volume
- Article IV. The use of DC beads in the treatment of HCC
- Article V. Phase II Trial: Combination treatment Sorafenib + Y90 for the treatment of unresectable HCC
- Article VI. MRI and CT-Scan texture analysis of patients with liver metastasis to predict their Histological Growth patterns

PAST SUPERVISION

PhD - Obtained

- 2007 - 2011 Mazen Hassanain, MD, PhD in Experimental Surgery
"Improving Glycogen Liver Content Will Improve Morbidity and Mortality of Major Liver Resections"
- 2002 - 2009 Tarek Boutros, M.Sc., PhD. in Anatomy and Cell Biology
"Transcriptional Profiling of human liver during the reperfusion phase of transplantation"
- 2002 - 2006 Anouk Emadali, M.Sc., PhD. in Anatomy and Cell Biology
"Molecular profiling of ischemia reperfusion in human liver"

Ph. D. In Progress

- 2013 - present Ayat Salman, B.Sc, MSc., Ph.D. Candidate in Family Medicine
"Bio repository and Primary Health Care"
- 2012 - present Eve Simoneau, MD, Ph. D. Candidate in Experimental Surgery
"Effect of Portal Vein Embolization on Colorectal Liver Metastases"
- 2012 - present Hussam Alamri MD, Ph.D. Candidate in Experimental Surgery
"Mapping of proteins and phospholipids in hepatocyte lipid droplets"

Masters – Obtained

- 2008 - 2015 Jeanne Bouteaud, B.A & B.Sc, Masters in Experimental Surgery
"Combined Treatment of patients with advanced Hepatocellular Carcinoma with Sorafenib and Radio-embolization improves overall survival: A Phase II Trial"
- 2012 - 2015 Zaher Fadel MD, MSc. Masters in Experimental Surgery
"Carcinoembryonic antigen cell adhesion molecule1 (CEACAM1) in metastatic colorectal cancer"
- 2012 - 2015 Nouran Molla, M.D., Masters in Experimental Surgery
"Does liver regeneration affect the growth of colorectal cancer micrometastases in the remnant liver?"
- 2010 - 2015 Mohammed Shaheen, M.D., Masters of Science in Experimental Surgery
"Insulin/Glucose Clamp in Patients with HCV Cirrhosis"
- 2011 - 2013 Rasha AlShaalan, B.Sc, Masters in Experimental Surgery
"Non-invasive Diagnostic Methods for Non-Alcoholic Fatty Liver Diseases"
- 2011 - 2013 Ayat Salman, B.Sc, Masters in Experimental Surgery
"Gender Affects Patterns of Muscle Mass Loss in Pancreatic Cancer Patients"
- 2010 - 2012 Janet Kwan, MD, Masters in Experimental Surgery
"The role of Proprotein Convertases 1 and 2 in Colorectal Cancer Liver Metastasis"
- 2008 - 2011 Mamatha Bhat, MD, Master in Experimental Medicine
"Expression of PCSK9 in Human Hepatocellular Carcinoma"
- 2009 - 2012 Murad Aljiffry, MD., Masters in Experimental Surgery
"The effect of high dose insulin therapy in the inflammatory state of brain dead organ donors"

PAST SUPERVISION

- 2011 - 2013 Rasha AlShaalan, B.Sc, Masters in Experimental Surgery
"Non-invasive Diagnostic Methods for Non-Alcoholic Fatty Liver Diseases"
- 2011 - 2013 Ayat Salman, B.Sc, Masters in Experimental Surgery
"Gender Affects Patterns of Muscle Mass Loss in Pancreatic Cancer Patients"
- 2010 - 2012 Janet Kwan, MD, Masters in Experimental Surgery
"The role of Proprotein Convertases 1 and 2 in Colorectal Cancer Liver Metastasis"
- 2008 - 2011 Mamatha Bhat, MD, Master in Experimental Medicine
"Expression of PCSK9 in Human Hepatocellular Carcinoma"
- 2009 - 2012 Murad Aljiffry, MD., Masters in Experimental Surgery
"The effect of high dose insulin therapy in the inflammatory state of brain dead organ donors"
- 2005 - 2009 Theodora Kandeava, Masters in Experimental Surgery
Co-supervised with Dr. Jean Tchervenkov
"Humoral response to carbohydrate antigens in the context of ABO incompatible transplantation and xenotransplantation."
- 2005 - 2008 Reza Tavana, MD, MSc Experimental Surgery
Co-supervised with Dr. Jean Tchervenkov
"Increased Expression of IL-21 Receptor on B-lymphocytes of Highly Sensitized Renal Transplant Recipients. A possible target for B-lymphocyte antibody production in sensitized renal recipients."
- 2004 - 2007 Prosanto Chaudhury, MD, Masters of Public Health, Oxford University, Oxford, England
"The role of preoperative chemotherapy in the management of colorectal cancer liver metastases"
- 2001 - 2004 George Tzimas, MD, FACS, Masters in Experimental Surgery
"Expression of pro-protein convertases in human colorectal cancer liver metastasis"
- 1999 - 2002 Michael Tan, M.D., Masters in Experimental Surgery
"The role of endothelial cell activation in an in-vitro model of xeno-islet transplantation"
- 1996 - 1998 Jonathan Fridell M.D, Masters in Experimental Surgery
"Characterization of pig anti-dog xenoantibodies and target xenoantigens on dog endothelial cells and dog platelets"

FUNDING & SALARY SUPPORT

2012-2015 PhD Candidate Eve Simoneau, MD
Bourses de Formation de Doctorat
Fonds de la Recherche en Sante du Quebec (FRSQ)
"The Prometheus Effect: The Effect of Liver Regeneration on Established and Potential CRC Metastasis" (\$64,000)

2011-2015 Fonds de la Recherche en Sante du Quebec (FRSQ)
One of four Principal Investigators
"Towards the Systems Medicine of Fatty Liver Disease"
\$1,400,000 for 4 years

2012 - 2017 CIHR Operating Grant: "CEACAM1 in colon cancer progression and metastasis" co-applicant with Dr. Beauchemin as PI applicant.
\$200,000/year for 5 years

2014-2016 CCSRI innovation grant: "Host genetic determinants of colon cancer metastasis". (2012/2013:\$100,000), (2013/2014: \$99,376), co-applicant with Dr. Riazalhosseini as PI applicant.

2013 – 2015 CCSRI innovation grant: "Integrated molecular histology and imaging mass spectrometry of lipid signatures: application to human colorectal cancer liver metastasis" (2013:\$100,000), (2014/2015: \$98,100),

2013 – 2015 MSc. Candidate – Evette Yassa
Canadian Liver Foundation Graduate Student Award
"Lipid Droplets and Associated Proteins in Hepatocellular Carcinoma"
(\$40,000)

PUBLICATIONS

Full list is available upon request



**JEFFREY BARKUN, MD, MSc (Epi.),
FRCS, FACS**

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RESEARCH PROGRAM

I propose a rotation based on the development of tools to carry out surgical epidemiology-based research.

My background in Epidemiology and international networking in HBP Surgery and Surgical research methodology provide a truly unique experience. In general, I will work with 1 resident per year.

There is also an opportunity to get involved with clinical informatics to improve quality of care through my role as chief clinical officer for technology at the MUHC.

Research Highlights

Goals of research rotation:

- Understand surgical research methodology, including randomized trials.
- Perform supervised statistical analysis
- Acquire presentation skills
- Acquire skills in manuscript writing and critical assessment of literature
- Many residents have taken the full 1.5 years to acquire an MSc in Epidemiology, but this is not a requirement.

Ongoing studies:

Most study topics center around MUHC clinical practice, which involves a combination of bilio-pancreatic surgical cases and ERCPs. We also have access to the very rich McGill liver transplantation database.

Current topics include:

- Description and validation of a classification of biliary injuries after Orthotopic Liver Transplantation
- Surgery vs. ERCP for biliary strictures after liver transplantation
- Clinical predictors of survival after surgery for pancreatic cancer
- Performance of CA-19-9 to predict pancreatic cancer and prognosis

- Randomized trial of abdominal incision for liver transplantation and resection (pending)
- Validation of the CCI, clinical score replacing the Clavien Dindo classification (in assoc. with PA Clavien)

Past supervision

- Mehdi Tahiri- Ongoing
- Jad Abou Khalil – 2015 (MSc epidemiology)
- Sinziana Dumitra -2014(MSc epidemiology)
- Mohammed Jamal - 2013 (MSc experimental sciences)
- Amy Neville – 2012 (MSc epidemiology)
- Marylise Boutros – 2010 (MSc experimental sciences)

SELECTED PUBLICATIONS

4. Establishing a clinic-based pancreatic cancer and periampullary tumour research registry in Quebec. A.L. Smith bsc, C. Bascuñana msc, A. Hall msc,*†A. Salman msc, A.Z. Andrei bsc, A. Volenik msc,*†§H. Rothenmund msc, D. Ferland ba bscn,*‡D. Lamoussener y bscn, A.S. Kamath md,R. Amre md mbbs, D. Caglar md, Z.H. Gao md phd,D.G. Haegert md, Y. Kanber md,# R.P. Michel bsc mdcm,G. Omeroglu–Altinel md# J. Asselah md, N. Bouganim md,P. Kavan md phd, G. Arena md, *J. Barkun md msc,P. Chaudhury md msc, S. Gallinger md msc,W.D. Foulkes mbbs phd, A. Omeroglu md,P. Metrakos md, and G. Zogopoulos md phd* **Current Oncology** – Volume 22, number 2, April 2015
5. Post-Transplant Liver Function Score as an Early Surrogate marker of Long-Term Outcome, Hassanain M, Simoneau E, Madkhali A, Al-Saati N, Aljiffry M, Tchervenkov J, *Barkun J, Metrakos P.* **Ann Transplant.** 2015 Apr 9;20:198-205. doi: 10.12659/AOT.892414.
6. Recommendations for laparoscopic liver resection: a report from the second international consensus conference held in Morioka. Wakabayashi G, Cherqui D, Geller DA, Buell JF, Kaneko H, Han HS, Asbun H, O'Rourke N, Tanabe M, Koffron AJ, Tsung A, Soubrane O, Machado MA, Gayet B, Troisi RI, Pessaux P, Van Dam RM, Scatton O, Abu Hilal M, Belli G, Kwon CH, Edwin B, Choi GH, Aldrighetti LA, Cai X, Cleary S, Chen KH, Schön MR, Sugioka A, Tang CN, Herman P, Pekolj J, Chen XP, Dagher I, Jarnagin W, Yamamoto M, Strong R, Jagannath P, Lo CM, Clavien PA, Kokudo N, *Barkun J, Strasberg SM.* **Ann Surg.** 2015 Apr;261(4):619-29.

SELECTED PUBLICATIONS

7. Consensus conference on laparoscopic liver resection: a jury-based evaluation. Clavien PA, *Barkun J. Ann Surg.* 2015 Apr;261(4):630-1. Editorial
8. Hepato-pancreato-biliary surgery workforce in Canada. Edwards JP, Bressan A, Dharampal N, Grondin SC, Datta I, Dixon E, Cleary SP, *Barkun JS, Butte JM, Ball CG. Can J Surg.* 2015 Jun;58(3):212-5..
9. Expert Intraoperative Judgment and Decision-Making: Defining the Cognitive Competencies for Safe Laparoscopic Cholecystectomy. Madani A, Watanabe Y, Feldman LS, Vassiliou MC, *Barkun JS, Fried GM, Aggarwal R. J Am Coll Surg.* 2015 Aug 5. pii: S1072-7515(15)00955-2. [Epub ahead of print]
10. **Chapter in *Blumgart textbook of HPB.*** Ed: Jarnagin and Blumgart : Percutaneous approaches to gallbladder disease, an introduction that includes a technical note on radiological techniques, followed by indications, complications, and finally management guidelines. Co-Authors Jad Abou Khalil, G Zogopoulos, *J Barkun* 2015
11. **Chapter in *Management of Benign Biliary Stenosis: A Comprehensive Guide.*** Ed: Vollmer C, Dixon E and May G. (Springer) Management of Benign Biliary Stenosis: A Comprehensive Guide" . Chapter: Intraoperative Management of Bile Duct Injuries by Non-Biliary Surgeon. Co-authors: Chaudhury, P, *Barkun J* 2015



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RESEARCH PROGRAM

The Transplant and Immunology Research Lab has several active lines of investigation linked under the theme of organ/cellular injury signalling and their link to innate and adaptive immune mechanisms. Fundamentally, this work is connected to the biological processes involved in organ and cellular transplantation, and the development of donor-specific immune responses. However, the concepts we work on have wider applicability, in the study of tissue injury, inflammation, sepsis and autoimmune diseases. If your interests fall in some of these areas, you may also find our lab a place in which to develop a research project.

Work done in our lab includes fundamental bench research, translational work with human clinical samples from donors or recipients (including the study of ex-vivo preserved organs) as well as database driven studies of the transplant recipient population. Recent projects include:

1. The measurement of extracellular vesicles produced by human islets as carriers of autoantigen and stimuli of autoimmune diabetes.
2. Extracellular vesicles in kidney perfusates as markers of graft injury and immunological risk
3. The function and cytokine expression on T & B lymphocytes in kidney transplant recipients that are highly sensitized
4. Regulatory T-cell functional status and immunological risk in transplant recipients
5. Database analysis and looking at our results with expanded criteria renal transplant donors and immediate renal transplant function recovery and long term allograft survival

INVESTIGATORS AND RESOURCES

The Investigators

Drs. Paraskevas and Tchervenkov have, combined, over 40 years of experience in mentoring research trainees and publishing scientific work.

Team and Environment

The Transplant Research Lab benefits from the full time work of Dr. Sarita Negi, our Research Associate, whose breadth of experience allows her to train and supervise most of our students from the perspective of experimental methodology, troubleshooting and study design and presentation. Sarita is based at the RI-Glen, in our lab space on E2(W). The Islet Lab Manager, Marco Gasparrini, is in charge of the 2200 sq. ft. MUHC Islet Transplant Laboratory, a state-of-the-art facility at 420 Dr. Penfield Avenue in the Genome Building. Marco's expertise includes islet isolation and assessment, biobanking, and SOP design and management.

The Transplant Research Lab benefits from the full time work of Dr. Sarita Negi, our Research Associate, whose breadth of experience allows her to train and supervise most of our students from the perspective of experimental methodology, troubleshooting and study design and presentation. Sarita is based at the RI-Glen, in our lab space on E2(W). The Islet Lab Manager, Marco Gasparrini, is in charge of the 2200 sq. ft. MUHC Islet Transplant Laboratory, a state-

of-the-art facility at 420 Dr. Penfield Avenue in the Genome Building. Marco's expertise includes islet isolation and assessment, biobanking, and SOP design and management.

Most of our lab work is performed at the RI-Glen, where we have 2 bays on level E2(W) of the CTB. There, we also have access to a variety of core facilities relevant to our work, including flow cytometry and CytoFlex, cell imaging and small animal surgery. In addition, the Islet Transplant Lab offers a fully equipped clean room for cell purification and culture and additional generic lab space. Trainees wishing to do database research have workspaces available on D5 at the RVH, close to our transplant database manager and the transplant clinic.

Our Network

The investigators are part of the new Centre of Excellence in Translational Immunology, a trans-programmatic research group at the RI-MUHC led by Dr. Ciro Piccirillo. The Centre provides valuable collaborations in our particular field and is a focus for collaborative grants and fundraising, student training and academic presentations.

SUPERVISION

A. Rutman (Ph.D. enrolled)
C. Hasilo (Ph.D. enrolled)
M-T. Nguyen (Ph.D. enrolled) (FRQS bursary awardee)
E. Fryml (M.Sc. 2015)(FRQS bursary awardee)
T. Kandeewa (M.Sc. 2014)
R. Tavana (M.Sc. 2013)
S. Kalyanasundaram (M.Sc. 2011)
A. Jetha (M.Sc. 2010)
S. Park (M.Sc. 2008)
J. Tector (Ph.D. 2004)
A. DiCarlo (M.Sc. 2004)

FUNDING & SALARY SUPPORT

Canadian National Transplant Research Program (CIHR) - \$200,000, 2013-18
Astellas Pharma-MUHC Transplant Research Program - \$90,000, 2016-2019
CIHR Project Grant - Bridge fund - \$30,000, 2017-18
We are also funded by collaborative work supported by the following entities:
Juvenile Diabetes Research Foundation
Liana's Dream Foundation

SELECTED PUBLICATIONS

The investigators have authored over 160 publications, of which 40 have been in the last 5 years. About 1/3 of these have been first authored by residents at McGill. Some relevant examples:

1. CP Hasilo, S Negi, I Allaey, N Cloutier, A Rutman, M Gasparrini, E Bonneil, P Thibault, E Boilard, **S Paraskevas**, Presence of diabetes autoantigens in extracellular vesicles derived from human islets. *Sci Rep*, 2017 Jul 10;7(1):5000.
2. S Wan, M Cantarovich, I Mucsi, D Baran, **S Paraskevas**, J Tchervenkov, Early renal function recovery and long-term graft survival in kidney transplantation. *Transplant Int*. 2016 May; 29(5):619-26.
3. MT Nguyen, E Fryml, SK Sahakian, S Liu, M Cantarovich, M Lipman, JI Tchervenkov, **S Paraskevas**, Pre-transplant recipient circulating CD4+CD127lo/-TNFR2+ Treg: a surrogate of Treg suppressive function and predictor of delayed and slow graft function after kidney transplantation, *Transplantation*, 2016 Feb; 100(2):314-24.



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POSITIONS AVAILABLE

PhD/MSc candidate in Experimental Surgery, Experimental Medicine or Human Genetics.

Past Graduate Students:

Zoe Andrei (MSc, Experimental Medicine)
Alyssa Smith (PhD, Experimental Medicine, MD-PhD Program)
Patrick Park (MSc, Experimental Medicine)
Cavin Wong (MSc, Human Genetics)

Current Graduate Students:

Yifan Wang (PhD, Experimental Surgery)
Amanda Tanti (MSc, Experimental Medicine)
Yen-I Chen (MSc, Experimental Medicine)
Madelyn Abraham (PhD, Experimental Medicine)
Tatiana Lenko (MSc, Human Genetics)

RESEARCH PROGRAM

I am a clinical research scholar of the Fonds de recherche du Québec studying the genetics and onco-genomics of pancreatic cancer. I established and direct the Québec Pancreas Cancer Study, a familial research registry, which consists of clinical, family history and epidemiologic data as well as biospecimens and patient-derived tumour xenograft models. By integrating the QPCS into the clinical practice unit at the MUHC, we have improved access to genetic counselling and testing for patients in the ambulatory setting. The QPCS infrastructure has facilitated collaborations with individual scientists and participation in multi-centre initiatives and consortia, such as Pancreatic Cancer Genetic Epidemiology Consortium (PACGENE). Together with colleagues from other Canadian centres, we have established the Canadian Pancreatic Oncology Network (PancOne) and the pan-Canadian Pancreatic Cancer Profiling for Individualized Care (EPPIC) study. Over the next 5 years, we will build a knowledge bank of integrated tumour molecular signatures and outcome data from 400 cases with advanced pancreatic cancer from across Canada to classify pancreatic cancer into clinical subtypes. This translational research

infrastructure allows for trainees to be integrated into a pan-Canadian research program, including opportunities for research trainees with a clinical background to contribute to the program's monthly multicenter molecular tumour board.

Trainees in my lab undertake projects that are focused on the genetics, onco-genomics and therapeutics of pancreatic cancer. A major research area of our lab is the pancreatic cancer subtype that arises from germline mutations in *BRCA2* and other genes involved in homology directed DNA repair. My lab has also contributed to studies investigating novel therapeutic targets and biomarkers more broadly. We have conducted and contributed to genetic and genomic studies demonstrating the heterogeneity of hereditary pancreatic cancer and the evolution of this disease.

TRAUMA & ACUTE CARE
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RESEARCH PROGRAM

Please contact us for information on our research program.

Select Research Projects

Bone Marrow Derived Mesenchymal Stem Cells Differentiate Into Hepatocytes And Contribute To Liver Regeneration At The Blunt Trauma Site

The recent years witnessed many advances in the field of stem cells research. The success in experimental animal models encouraged scientists to move to human clinical trials. For example, there are 220 clinical trials currently registered at clinicaltrials.gov that involve using stem cells to treat liver diseases. We aim to explore the effects of using stem cells in the context of trauma. We examined the effect of using stem cells in bluntly injured rats' livers. The primary outcome of interest was to demonstrate the ability of the stem cells to locate to the liver and differentiate to liver cells after the blunt trauma. The next step would be to demonstrate whether these stem cells could lead to enhanced liver regeneration after the trauma. We aim to expand our experience in this field by studying the effects of using stem cells after the induction of trauma to different organs in the body.

Review of open abdomens in McGill University Health Centre

Open abdomen (OA) is an abdominal wall defect created by intentionally leaving an abdominal incision open at the completion of intra-abdominal surgery or by opening (or re-opening) the abdomen because of concern for abdominal compartment syndrome. We have explored different aspects of using this technique on both trauma and general surgery patients. We aim to construct a high quality prospective data to further study the effects of using this technique with emphasis on optimizing the approach to close the fascia for those patients and to study the nutritional aspect of this category of patients.

Closure Of Open Abdomen In The Same Admission By Using Component Separation Technique

Achieving fascial closure in patients with open abdomen can be challenging. Component separation technique is usually used 6-12 months after discharge to obtain closure. Its use in the same admission is not well studied. We studied the effects of using this technique to close the fascia at the same admission.

Does The Timing Of Tracheostomy Affect The Outcomes Of Open Abdomen Patients?

Benefits of early tracheostomy (ET) have been discussed in literature, describing less days of ICU and earlier weaning from ventilator. Yet, it appears that those effects are not very well studied in the open abdomens (OA) patients. Our objective is to know the benefits of performing ET in patients with an OA.

Getting Closure In Abdomens That Will Not Close:

Inability to close fascia in patients with an open abdomen (OA) is a recurrent problem after frequent take backs to the OR. When fascia is deemed "unclosable", skin only is closed, or abdomen is allowed to form granulation tissue with skin grafting applied later on. Our objective was to describe these two options when fascia cannot be closed and identify which one would lead to better clinical outcomes.

Predicting The Need for Surgery and Mortality in Patients With Severe Gastrointestinal Hemorrhage in the Intensive Care Unit

Gastrointestinal bleeding presents a significant challenge to surgeons when non-surgical therapies fail to achieve hemorrhage control. We aim to identify risk factors that predict failure of non-surgical management and can guide and accelerate surgical decision making for this patient population. Retrospective chart review was carried out on all ICU admissions for gastrointestinal bleeding in the period of January 2008 to December 2010. Patient's clinical criteria were reviewed in order to identify independent clinical predictors for the need of surgery and for mortality.

Does using a high FFP:PRBC ratio lead to improved Survival in massive gastrointestinal bleeds?

Gastrointestinal bleeding (GIB) is a common clinical situation encountered by clinicians. Using a high ratio of FFP:PRBC has been shown to improve clinical outcomes in trauma population. However, the efficacy of using this strategy in non-trauma patients need to be explored further. In this retrospective study, we hypothesize that using a high FFP:PRBC ratio leads to improved survival in GIB patients that receive massive blood transfusion (MBT).

Select Research Projects (cont'd)

Non-Operative Management Of Blunt Splenic Injuries: Should We Do Routine Follow Up?

There is little evidence regarding follow up recommendations for Blunt Splenic Injury (BSI) patients managed non-operatively. Furthermore, the optimal time to return to full activity is not clear. It is known that the persistence of splenic hematoma predisposes to splenic rupture. Therefore, we aim to identify predictors of persistence of hematoma in this group of patients in order to identify which patients should be followed up routinely.

Nutritional Assessment of Open Abdomen Patients following trauma or acute surgical intervention. Are they adequately feed?

Feeding open abdomen patients represent a unique health care challenge at the intensive care unit. A retrospective review of all trauma and general surgery admissions from January 1st, 2010, to September 1st, 2013 was performed to compare our current practice with the Penn state equation target to determine if the open abdomen patients were adequately fed. We noted that, the vast majority of open abdomen patients (91%) were inadequately feed during two weeks of ICU admission. Moreover, the unadjusted survival was higher in the group who achieved $\geq 90\%$ of estimated protein target at the second week of admission (100% vs. 64%), P value = 0.011 and the use of TPN in the group who achieved the optimal protein targets were also higher (68% vs. 13%), P value = 0.002. Due to many challenges associated with open abdomen patients, the careful monitoring of their energy needs may potentially improve their nutritional status and subsequently their clinical outcomes

Implementing the indirect calorimetry as a guide/assessment tool:

Controversy persists about the optimal time and route of providing nutritional support as well as the best way to estimate the caloric needs of those critically ill patients. The fundamental goal of nutritional support is to meet the energy and protein needs in addition to minimize protein catabolism. The nutrition support after trauma should be dynamically adjusted according to metabolic responses. Therefore, utilizing the indirect calorimetry as a tool for guiding and accurately measuring the resting energy expenditure before and after abdominal closure may contribute optimizing their nutritional target. Knowing the variation of the measured energy before and after abdominal closure still a very vague area and also an area of increasing concern and interest.

CENTRE FOR GLOBAL SURGERY RESEARCH GROUP



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SUPERVISORS

Dr. Dan Deckelbaum - Co-director

Dr. Dan Deckelbaum is assistant professor at the Divisions of Trauma and General Surgery at the McGill University Health Centre (MUHC), associate member of the Department of Epidemiology, biostatistics and occupational health at McGill University, and honorary associate professor of the National University of Rwanda. He obtained his subspecialty training in trauma surgery and critical care at Jackson Memorial Hospital in Miami. During his fellowship he also completed a Masters of Public Health at the University of Miami.

In addition to his passion for clinical practice, he has developed an avid interest in global surgical education and development, as well as disaster preparedness and response, establishing and co-directing the MUHC Centre for Global Surgery. His interest in global health is founded upon on-site clinical experience in government hospitals in East Africa as well as disaster response activities. This clinical experience is the basis for ongoing capacity building programs in resource limited settings across the globe. This includes education programs in resource limited setting.

Dr Tarek Razek - Co-director

Dr. Tarek Razek is the trauma program director and the chief of the division of trauma surgery at the McGill University Health Center (MUHC) since 2004. He completed his postgraduate training in trauma surgery and critical care at the University of Pennsylvania. His interest in global surgical issues began early in his career with participation in the medical educational programs of the Canadian Network for International Surgery (CNIS) in Tanzania and Ethiopia. He has continued to participate in and develop medical educational programs over the past ten years, especially the Trauma Team Training program. He has been the Chair of the Board of the CNIS, which oversees hundreds of surgical, obstetric, and injury prevention programs predominantly in sub-Saharan Africa. Additionally, He has been active in the area of disaster response in the regional, national and international arenas acting as chair of the disaster committee for the Trauma Association of Canada and participating as part of the Canadian federal Disaster response teams deployed to support surgical services at the Vancouver Olympics of 2010. He consulted for the preparations of the Euro 2012 in the Ukraine.

Mission Statement *The divisions of trauma and general surgery at the MUHC have recognized the impact of injury and acute surgical disease, and have been committed to addressing this major problem.*

Our ultimate goal is to reduce injury and acute surgical disease-related morbidity and mortality in low- and middle- income countries through local capacity building involving a multidisciplinary approach.

Specifically, we are currently involved in education programs, research programs, on-site clinical work, exchange programs, and trauma system development in several East African nations and most recently in Haiti.

These programs have been implemented through the development of strong local alliances with universities, hospitals, and governments, in the respective nations, setting the foundation for long-lasting partnerships with a common vision.

RESEARCH PROGRAM

Operative interventions performed at Kigali Central University Hospital: Descriptive epidemiology

There is a paucity of literature regarding the operative interventions performed in resource-limited settings. This project will consist of a comprehensive review of all operative procedures performed at CHUK between December 2010 and December 2011 patient demographics and surgical procedure performed (General Surgery, Urology, Neurosurgery, Orthopedic Surgery, Obstetrics and Gynecology or Otorhinolaryngology). Approximately 1,500 cases will be reviewed. This evaluation will have a significant contribution to future capacity building interventions.

Student motivators for choice of postgraduate training in Rwanda

The driving forces in the decision - making for choice of postgraduate physician training in resource limited settings is unknown. A survey of all medical students at the National University of Rwanda will elucidate some of the local factors influencing medical student decision-making in their choice of postgraduate training. This will be compared to medical students at McGill University. Improvements in enrolment and interest in target specialties will be based on the knowledge of such current motivating factors.

Program evaluation in resource limited settings

With the collaborative implementation of one of an academic surgical education programs in Rwanda, a simultaneous program evaluation was instituted. Surgical program evaluations in such settings are rare. These evaluations are multi-faceted and continue to improve program design based on local needs.

Burden of trauma in a resource-limited setting : Dar Es Salaam, Tanzania

The WHO has recently elucidated the contribution of injury to the global burden of disease through the Global Burden of Disease Project. Nonetheless, hospital based trauma registries are still lacking. This is the largest analysis of a hospital

based trauma registry implemented in 2006 in resource-limited settings. The pilot study of over 4,500 injured patients is underway revealing crucial information regarding injury epidemiology and forms the basis for registry development and injury prevention strategies.

Trauma Team Training: implementing successful multidisciplinary training programs in resource limited settings. A successful paradigm for local program independence

Using the "train the trainer" model, after the first administration of the Trauma Team Training program, A three day course focusing on the multidisciplinary approach to the injured patient, instructors for the future independent course administration were trained. Since the first course administration eight years ago, the course has been administered by local physicians every three months. A descriptive evaluation of the independent course administration and regional dissemination will now ensue.

Burden of trauma in a resource-limited setting : Haiti

Similar to the Tanzanian study, this project is being implemented.

Burden of trauma in a resource-limited setting : Mozambique

Similar to the Tanzanian study, this project is being implemented. It utilizes a unique electronic trauma registry application tool that will allow for the trauma registry to be scaled up nationally within 1-2 years.

Duty Hour restrictions in Quebec and their impact on resident well being and training.

The duty hour restrictions in Quebec represent a further curtailment to the current 80-hour model in the U.S., which was in effect the model that all Canadian programs was using since the late 90s. We are studying the impact these controversial laws are causing.

Global surgical interventions: history, the present and future

Literature review of all global surgical interventions, paradigms, and patterns with recommendations for future effective surgical capacity- building interventions.

Improving the Quality of Trauma and Acute Surgical Care in Northern Quebec

Delivering trauma care to the population of Northern Quebec presents unique challenges. This multifaceted project aims to quantify and evaluate the current resources in place as well as to describe the epidemiology of trauma and acute surgical diseases in Northern Quebec. This will be done through a prospective database in collaboration with various stakeholders of the Régie régionale de la santé et des services sociaux du Nunavik (RRSSSN).

SELECTED PUBLICATIONS & PRESENTATIONS

Wong EG, Gupta S, Deckelbaum DL, Razek T, Kamara TB, Nwomeh BC, Haider AH, Kushner AL. The International Assessment of Capacity for Trauma (INTACT): An index for trauma capacity in low-income countries. *Journal of Surgical Research*. 2014 Aug;190(2):522-7. doi: 10.1016/j.jss.2014.01.060.

Wong EG, Gupta S, Deckelbaum DL, Razek T, Kushner AL. Prioritizing injury care: A review of trauma capacity in low and middle-income countries. *Journal of Surgical Research*. 2015 Jan;193(1):217-22. doi: 10.1016/j.jss.2014.08.055.

Wong EG, Razek T, Luhovy A, Mogilevkina I, Prudnikov Y, Klymovitsky F, Yutovets Y, Khwaja KA, Deckelbaum DL. Preparing for Euro 2012: Developing a hazard risk assessment. *Prehospital and Disaster Medicine*. 2015 Apr;30(2):187-92. doi: 10.1017/S1049023X15000096.

Wong EG, Razek T, Elsharkawi H, Wren SM, Kushner AL, Giannou C, Khwaja KA, Beckett A, Deckelbaum DL. Promoting quality of care in disaster response: a survey of core surgical competencies. *Surgery*. 2015 Jul;158(1):78-84. doi: 10.1016/j.surg.2015.02.011.

Wong EG, Deckelbaum DL, Razek T. Global access to surgical care: Moving forward. *Lancet Global Health*. 2015 3(6): e298-e9. doi: 10.1016/S2214-109X(15)00004-2.

Wong EG, Ntakiyiruta G, Rousseau MC, Ruhungande L, Kushner AL, Liberman AS, Khwaja K, Dakemandji M, Wilson M, Razek T, Kyamanywa P, Deckelbaum DL. Acute care surgery in Rwanda: Operative epidemiology and geographical variations in access to care. *Surgery*. 2015 Jul;158(1):37-43. doi: 10.1016/j.surg.2015.04.012.

Ntakiyiruta G, Wong EG, Rousseau MC, Ruhungande L, Kushner AL, Liberman AS, Khwaja K, Dakemandji M, Wilson M, Razek T, Kyamanywa P, Deckelbaum DL. Trauma care and referral patterns in Rwanda: Implications for trauma system development. *Canadian Journal of Surgery*. 2016 Feb;59(1):35-41. doi: 10.1503/cjs.008115.

Hamadani F, Razek T, Massinga E, Gupta S, Muataco M, Muripha P, Maguni C, Muripa V, Percina I, Costa A, Yohannan P, Bracco D, Wong EG, Harper S, Deckelbaum DL, Neves O. Trauma surveillance and registry development in Mozambique: Results of a 1-year study and the first phase of national implementation. *World Journal of Surgery*. 2019 April 19 doi: 10.1007/s00268-019-04947-7.

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Felizaire MR, Paradis T, Beckett A, Fata P, Grushka J, Johnson W, Khwaja K, Meara JG, Ndayisaba G, Prakash I, Razek T, Somprason T, Wong EG, Yohannan P, Deckelbaum DL. Perioperative mortality rates as a health metric for acute abdominal surgery in low- and middle-income countries: A systematic review and future recommendations. *World Journal of Surgery*. 2019 April 5. doi: 10.1007/s00268-019-04993-1.

Prakash I, Neves O, Cumbe E, Hamadani F, Razek T, Fata P, Beckett A, Khwaja K, Grushka J, Wong EG, Jacobo M, De Costa A, Deckelbaum DL, Yohannan P. The financial burden of road traffic injuries in Mozambique: A hospital-related cost-of-illness study of Maputo Central Hospital. *World Journal of Surgery* 2019 Sep 10. doi: 10.1007/s00268-019-05152-2.

Points of Interest:

This is a research project on medical education using virtual online patients with an emphasis on exploring various aspects of clinical reasoning and entrustable professional activities (EPAs). The purpose is to improve clinical teaching in an effective and engaging manner that provides a forum for students at all levels to apply didactic knowledge in a clinical context.

Some details:

Virtual patients (VPs) are an emergent mid-level fidelity simulation technology that are effective decision-based learning strategies. They usually follow lectures and readings and precede Simulation Centre activities and better prepare students for work in the clinical areas. VPs align with McGill's new outcome and competency-based curricula, provide required clinical scenarios for accreditation and provide access to clinical situations not frequently available. They help learners identify and address knowledge gaps, improve clinical analysis and reasoning skills and can support the development of EPAs.



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At McGill, VPs are used as core curriculum in the clerkship trauma rotation, as part of the 'boot camp' experience for residents, and more recently, as a teaching module on UTIs designed for hospital staff.

Features of Virtual Patients include:

- Active and interactive decision-making
- Opportunities for medical problem-solving associated with realistic outcomes, pattern recognition and internalization of illness scripts
- Multiple assessment features
- Associated with rich databases for tracking student performance, and associated metrics that can be used for assessment and research
- Immediate, continuous and iterative feedback and exemplars of expert practice with rationales
- Access to resources, exercises in evidence-based medicine
- Supportive of collaborative interprofessional strategies

Underlying Pedagogical Frameworks:

- Principles of Adult Learning
- Social Constructivism
- Cognitive apprenticeship
- Experiential learning
- Situated learning
- Just-in-Time Learning
- 4Component/Instructional Design (4C/ID)