

ADVANCED PEDIATRIC INTENSIVE CARE MEDICINE RESEARCH FELLOWSHIP

Institution: McGill University

Department: Division of Pediatric Critical Care / Department of Pediatrics

Location: The Montreal Children's Hospital - McGill University Health Centre

Program: Advanced Pediatric Intensive Care Medicine Research Fellowship

Fellowship Director: Dr. Patricia Fontela

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Length: 2 (two) years

Program video: http://www.mediafire.com/file/lbiczp8iu0dyvaj/New_Project_-_Made_with_Clipchamp_x264_001.avi/file

Overview of Program Information:

The McGill University Pediatric Critical Care Medicine (PCCM) program offers a two-year advanced research fellowship to qualified candidates who have already completed their base PCCM specialty training. This fellowship is distinct from the Royal College accredited subspecialty residency training program ("fellowship") in Pediatric Critical Care which we also offer at McGill (<https://www.mcgill.ca/peds/programs/pediatriccriticalcare/residency>). Our Advanced Pediatric Critical Care Medicine program will accept up to two candidates per year.

Faculty

Fellows will be mentored and trained by the multidisciplinary faculty of the Division of Pediatric Critical Care Medicine. Our faculty has appointments in Pediatrics, Epidemiology, Pediatric General Surgery, Pediatric Anesthesia, Nursing, and Bioethics.

- Dr. Saleem Razack, Professor, Pediatrics
- Dr. Farhan Bhanji, Professor, Pediatrics
- Dr. Sam Shemie, Professor, Pediatrics
- Dr. Patricia Fontela, Associate Professor, Pediatrics
- Dr. Tanya DiGenova, Assistant Professor, Pediatrics
- Dr. Ronald Gottesman, Professor, Pediatrics
- Dr. Pramod Puligandla, Professor, Pediatric General Surgery
- Dr. Davinia Withington, Professor, Pediatric Anesthesia
- Dr. Samara Zavalkoff, Associate Professor, Pediatrics
- Dr. Franco Carnevale, Associate Professor, Ethics
- Dr. Janet Rennick, Associate Professor, Nursing

Fellowship objective

The Advanced Pediatric Critical Care Medicine Research Fellowship aims to teach pediatric critical care fellows research skills that will allow 1) the development of their own independent research program and/or 2) their effective collaboration in multicentre research programs. During the fellowship, 70% of the trainee's time will be dedicated to research activities and 30% to clinical activities. The research and clinical training will be personalized based on the trainee's career goals and needs. Completion of this fellowship is expected to facilitate future recruitment to a faculty position at an academic institution as a clinical scientist.

This two-year fellowship provides the trainee with the possibility of pursuing a MSc (thesis) in Epidemiology (Department of Epidemiology, Biostatistics and Occupational Health, McGill University) or a MA (thesis) in Educational Psychology, Health Professions Education concentration (Department of Educational and Counselling Psychology, McGill University). Fellows will also have the opportunity of participating in the Clinician Investigator Program (CIP; https://mcgill.ca/pgme/files/pgme/cip_website_application_process_may_2019.pdf) offered at McGill. Research areas may include clinical epidemiology, medical education, qualitative studies and quality improvement.

Curriculum

The objective of the Advanced Pediatric Critical Care Medicine Research Fellowship is to allow the trainee to gain experience in all steps of a research project. Specific knowledge and skills to be developed include:

- Principles of epidemiology and biostatistics
- Principles of medical education and quality improvement research
- Formulating a research question
- Conducting a literature review
- Developing a study protocol
- Developing and submitting an application for ethical approval
- Taking part in grant applications
- Developing a database and the statistical analysis approach (under guidance)
- Performing (under guidance) statistical analysis
- Presenting study results at a scientific conference (local, provincial, national, and or international)
- Writing and submitting a manuscript for a peer-reviewed journal

Research activities – Division of Pediatric Critical Care Medicine

The research activities available for trainees include:

- ***Division of Pediatric Critical Care Research Meetings (weekly)***: attended by interdisciplinary PICU team members involved in research including residents, staff, research team and nurses. A variety of research related issues are discussed, such as new research protocols, progress of ongoing studies, and peer-review of protocols, grants, poster presentations and manuscripts to be submitted to peer-reviewed journals. On a monthly basis, residents and fellows will present their research/scholarly projects. Feedback will be provided by our divisional members, including our epidemiologists and medical educators.
- ***Pediatric Critical Care Journal Club (monthly)***: As part of the fellows' protected academic halfday, these sessions provide practical training in the methods and tools that are used for the appraisal of scientific studies. Pediatric Critical Care Medicine fellows will participate in leading these critical appraisal sessions and engaging the rest of the group in a discussion about the strengths and weaknesses of each article, as well as its validity and usefulness for our clinical practice.

The overall learning objectives of the journal club are to:

- Learn to recognize controversies and/or knowledge gaps from clinical practice to determine critical appraisal questions
- Learn how to critically appraise critical care journal articles
- Develop an understanding of the fundamental differences between study designs, as well as their strengths and weaknesses
- Become skilled at identifying the most important types of study biases (i.e., selection and information biases, and confounding)
- Acquire knowledge of basic biostatistical methods

Other research activities:

Other research activities available for trainees include:

- ***Canadian Child Health Clinician Scientist Program (CCHCSP) – MCH curriculum***: this program complements our divisional research curriculum and aims to teach practical aspects of becoming a clinician scientist to our trainees. One monthly session from October to June (total duration: 2 years). Topics presented at the CCHCSP sessions include:
 - Formulation of hypothesis and research questions
 - Searching the biomedical literature
 - Ethical principles applied to research
 - Sample size calculations
 - Data collection and database preparation
 - Grant writing skills
 - Abstract and manuscript preparation
 - Poster preparation and presentation
 - Mentorship and supervisor/supervisee relationship
 - Patient engagement / patient-oriented research
 - Authorship
 - Contracts and relation with industry/pharmaceutical industry
 - How to plan a career as a clinical-scientist

- Knowledge translation
- **Department of Epidemiology, Biostatistics and Occupational Health (McGill University) – Summer session:** fellows who will not pursue a MSc in Epidemiology will be required to take the following courses offered by the Department of Epidemiology to McGill residents during the summer session (descriptions were adapted from the website: <http://www.mcgill.ca/epi-biostat-occh/summer>):
 - EPIB 600-001 - Clinical epidemiology: this course aims to provide students with a basic understanding of the methods of epidemiology, as applied to clinical research. Issues to be addressed include measurement issues, study design, analysis, and inference in the clinical research setting. Students will have the opportunity to apply these concepts to their own areas of interest. Previous course work in epidemiology or research experience is not required.
 - EPIB 507 – Biostatistics for health professionals: this course aims to present basic principles of statistical inference applicable to clinical, epidemiologic, and other health research. Topics include: methods of describing data, statistical inference for means and proportions, non-parametric statistics, correlation, and introduction to linear regression.
 - EPIB 619 - Systematic reviews and meta-analyses: this course provides a detailed description of the systematic review process, discuss the strengths and limitations of the method, and provide step-by-step guidance on how to actually perform a systematic review. Topics to be covered include: formulation of the review question, searching of literature, quality assessment of studies, data extraction, meta-analytic methods, and report writing. The course also covers the selection of a proper statistical model for meta-analysis, as well as examples of methods to evaluate heterogeneity and publication bias; graphical and tabular templates for the presentation of data from a meta-analysis. Software packages will be discussed, along with tutorials on how to effectively use PubMed and EndNote for conducting systematic reviews.
- **Department of Educational and Counselling Psychology:**
- **CCCTG Research Career Development Day:** the Canadian Critical Care Trials Group (CCCTG) hosts an annual Research Career Development Day to promote research education for all critical care trainees across Canada. The day consists of talks geared to trainees from CCCTG members on research-related topics, including career planning, how to write a grant and manuscript, how to find a research supervisor. In addition, trainees have the opportunity to present their research projects for feedback from the CCCTG membership on issues such as methodology, statistics, patient recruitment, among others.
- **Research seminars:** trainees will have the opportunity to participate in the “Monday Noon Seminars”, as part of the Child Health and Human Development Research Program, and in the “Monthly Seminar Series” of the Centre for Health Outcomes Research (CORE).

Academic facilities

Fellows have access to a shared office, with computers including statistical software packages and data storage. They will have access to shared administrative services and all associated office services (Fax, printers, scanners, photocopiers, etc.). Finally, they also have access to the research infrastructure of the Division of Pediatric Critical Care, including research personnel, templates for protocols and care report forms, and epidemiology and biostatistics support.

Duties and responsibilities

The duties and responsibilities of trainees are the following:

Research responsibilities: fellows will be required to establish, in collaboration with their project supervisor and fellowship director, a timeline for their research projects. They will be expected to manage their time in an effective and efficient way to advance all stages of their project. Fellows will be expected to actively participate in all divisional research activities listed below, in the MCH CCHCSP sessions, in the CCCTG Research Career Development Day. During their training, fellows will be expected to prepare at least one abstract for the Canadian Critical Care Forum and/or an international meeting and submit at least one peer-reviewed manuscript under the guidance of their primary supervisor.

Clinical responsibilities: Fellows in this stream will continue to advance their practice in Pediatric Critical Care through clinical service in the Pediatric ICU at the Montreal Children's Hospital. Fellows will participate in the on call roster during both clinical PICU rotations and during academic rotations with less on calls during research rotations. In addition, they will also participate in all academic clinical activities of the division. These include:

- 1) Clinical rounds (eg daily bedside PICU rounds, preoperative cardiac surgical rounds, weekly cardiology-cardiac surgery- PICU rounds, psychosocial rounds)
- 2) Simulation training (eg weekly PICU-based, multidisciplinary simulations, interspeciality complex airway simulations, trauma simulations and mass casualty simulations and ECMO simulation)
- 3) Fellow Academic half day curriculum including journal club, ECG rounds, clinical question presentations, core topics in PCCM and ethics reviews
- 4) Quality Improvement and Patient Safety training through LEAN/Six Sigma yellow belt, participation in monthly quality improvement rounds
- 5) Point of Care Ultrasound training

Evaluation

An in-training evaluation (ITER) will be used to assess fellows on their research skills and performance.

Fellows will be evaluated through direct observations and interactions on clinical rotations by the PCCM faculty and multidisciplinary team members. Fellows will also be evaluated through feedback from families, junior residents and evaluations of rounds and presentations. An in-training evaluation will be used to assess fellows on their research skills and performance.