

## Health Informatics Fellowship

**Name of Institution:** Jewish General Hospital (JGH), McGill University Health Center (RVH, MGH, MCH), St Mary's Hospital (SMH), and other potential McGill affiliated hospitals

**Type of Fellowship:** Health Informatics Fellowship

**Number of positions ( total of 4):**

- 3 for Emergency Medicine graduates ( Adult EM or Peds EM )
- 1 for General Internal Medicine graduates

**Length:** 1 year (12 consecutive months) / 13 consecutive periods

**Name of the Fellowship Program Director:** Dr. Antony Robert

**Funding:** For information regarding salary amount and acceptable sources of funding please visit the link: <https://www.mcgill.ca/pgme/fellowships/admissions>

**Program Information (please append description):**

- Number of fellowship positions requested: 4
- Academic affiliation: Department of Emergency Medicine / Royal College program
- Name of hospitals involved in training:
  - Jewish General Hospital (JGH)
  - Montreal General Hospital (MGH)
  - Royal Victoria Hospital (RVH)
  - Montreal Children's Hospital (MCH)
  - St Mary's Hospital (SMH)
- % time spent by the fellow in each institution:
  - 11 clinical academic periods ( 2-4 consecutive months per above mentioned hospitals)
  - 2 elective periods

**Background:**

Health Informatics is rapidly changing and playing an increasing role in patient care, planning and management in the emergency department. There are a few Master of Health Informatics programs in Canada; however, they are designed for professionals with backgrounds in public health or healthcare in general. They do not explore the many applications possible within the emergency department. Unique to the emergency department are many specific time and resource constraints and characteristics that require a contextual exposure to develop the necessary expertise. The various sites involved in emergency

training offer this expertise exposure, which taken together, offer an unparalleled array of learning opportunities in this field in Quebec.

**Research activity:**

Research in the field of Health Informatics is limited. However, the many systems in place within the different sites hold very large amounts of patient care data that is conducive to yield clinically impactful research. Some projects under consideration include the use of decision support systems, real time data analytics including big data, artificial intelligence, deployment of IT solutions, and use of data to support LEAN management.

**Publications:** None at this moment in time.

**Mission:**

To train future leaders in Health Informatics to improve the quality and efficiency of patient care in the Emergency Department or other acute care settings (for EM physicians and Internal Medicine physicians).

**Outline how intended fellowship will enhance residency training:**

Health informatics is an emerging field with increasing presence within the clinical workflow in the emergency department. The fellowship will provide the trainee with enhanced knowledge and skills to leverage health informatics and improve patient care. The fellow will participate in residency rounds as well as collaborate with resident research projects. Furthermore, the fellowship will serve as a platform to offer elective rotations for residents and other complementary training.

**Names of the Teaching Faculty:**

- Dr Marc Béique – Associate Professor, McGill University. Emergency physician since 1991. Fellow of the Royal College in Emergency Medicine (1991) and CMQ (1999). Department Chief at the RVH and later at the MUHC (1996 to 2008). HI Director at the MUHC from 2008 to present. Responsible for the deployment of full HI solutions for the ED at the MUHC, including Med-Urge, voice recognition systems as well as adapting ED hospital systems (Oasis). Lead for the McGill Department of Emergency Medicine HI Working Group. Dr. Béique’s main area of interest is user interface and HI integration into day-to-day operations.
- Dr Adrian Florea – Assistant Professor, McGill University. Emergency physician since 2013 at St Mary’s Hospital. Graduate of McGill University’s CCFP (EM) program. Currently pursuing an MSc in Health Informatics at Johns Hopkins University and gaining exposure to healthcare transformation through information technology from an American perspective. Dr. Florea has an interest in EHR analytics, clinical decision support and change management in the healthcare context. At SMH, he is currently involved with the Strategic Committee on adoption of a new EHR.

- Dr Lars Grant – Assistant Professor, McGill University. Emergency physician since 2014 at the JGH after completing CCFP (EM) in 2014. Also holds a PhD in Physics from Harvard. His area of interest is AI and machine learning in medicine.
- Dr Rick Mah – Assistant Professor, McGill University. Emergency physician since 1999 and currently on staff at St Mary’s Hospital. Received his CCFP (EM) in 2006. He was the Chief at St Mary’s Hospital from 2009 to 2018. Currently pursuing a Masters in Clinical Informatics at Oregon Health & Science University (capstone on predicting outcome of elderly patients discharged from the ED based on their frequency and pattern of ER usage). Very interested in the predictive aspect of data. Working with PhD candidate in Industrial Engineering at Concordia University on two LEAN projects: Radiology / ER interface for Scheduling and Application of LEAN to optimize ED operations.
- Dr Antony Robert – Graduated from the FRCP program in June 2019, and now newly joined MUHC staff since July 2019 as Assistant Professor. Graduated from the MSc in Health Informatics at Waterloo University in 2020. He recently completed a certificate in Machine Learning at McGill University. He also holds a BSc in Electrical Engineering and has over 4 years of software development and project management experience. Dr. Robert is interested in the optimization of the user interface and the applications of AI and decision support systems to improve patient care.
- Dr Stephen Rosenthal – Assistant Professor, McGill University. Emergency physician since 1989 at the JGH. Holds CCFP (EM) and CSPQ certification and has an MSc in Informatics. Held the role of CMIO and CIO positions at the JGH between 2006 and 2015, deploying many clinical systems and working on mobility. Throughout the years, he has served on several boards, including the QMA, the FMSQ and the ASMUQ (former President). Dr. Rosenthal was at the forefront of the JGH ER and hospital-level integration of various platforms, and has lectured worldwide on many topics. His experience and interests include project management, business intelligence and analytics. His main area of interest is design and deployment of clinical IT solutions.
- Dr Bernard Unger – Associate Professor, McGill University. Emergency physician since 1983, employed by the JGH since 1987. He received his certification from the College of Family Physicians of Canada and since 2000 is an Emergency Medicine Specialist at the CMQ in Quebec. He has been the Associate Chief of Emergency at the JGH for the past 25 years. He has worked for the MSSS “Direction national des urgences”. He has been the lead author of the Canadian Emergency Department Diagnosis Shortlist (CED-DxS), co-author of the Canadian Triage and Acuity Score (CTAS) and co-author of the Canadian Emergency Department Information Systems (CEDIS) Presenting Complaints List and has worked in collaboration with the Canadian Institute for Health Information (CIHI) on various projects and served on ad-hoc CIHI advisory panels. He has been responsible for and co-managing the HI ED databases at the JGH since 1988, wherein he

gained access to and managed multiple province-wide databases covering several years. He has an interest in big data analysis and management.

**Roles:**

The fellows will have a mix of clinical and non-clinical responsibilities.

- EM fellows: Clinical workload will include regular shifts in various zones of each ED under the supervision of faculty. Other physicians working in the emergency department may supervise some of the shifts.
- GIM fellows: Graduates from General internal medicine training will be spending their clinical time with GIM physicians

**Summary of clinical practice:**

The objective of the clinical component of the fellowship is to experience first-hand the challenges with the user interface, the perception by staff and to develop a perspective on design, deployment and upgrade of emerging technologies within the clinical workflow.

- EM Fellows: will spend their clinical time in the emergency department.
- GIM fellows: will be exposed to GIM clinical environments.

**Major Strengths:**

The various EDs offer a wide array of site-specific dynamics that will prepare the trainee for work in the majority of emergency medicine environments in Canada. The faculty offers a wide variety of backgrounds, expertise and interests.

**Academic Facilities:**

Outline facilities for clinical and academic pursuit:

- All sites are part of McGill University's accredited teaching hospitals. Mandates and patient characteristics vary from primary / secondary care to quaternary. All sites have IT infrastructure with varying levels of functionality deployment.
- Library access, materials relevant to fellowship training:
  - Reference textbooks will be made available for the trainee including:
    - i. Information Technology for the Health Professions, Burke et Weill, 4th edition
    - ii. Biomedical Informatics: Computer Applications in Health Care and Biomedicine, Shortliffe et Cimino, 4th edition
  - Journal articles and other textbooks will be made available via the McGill University Library

- Multimedia learning materials available
  - Various PowerPoint presentations will be made available to the fellow after each seminar
  - Online training modules pertaining to various software used in the ED will be made available to the fellow
- Availability of a skills lab if applicable: nil

**Fellow Duties and Responsibilities:**

- Call responsibilities to cover service
  - EM fellows are expected to work 8 shifts per period (on average).
  - GIM fellows will do an equivalent of 6-8 days of work per period.
- Include whether the fellow is the senior supervisor of residents: Yes, on occasion
- Outline whether there are fixed rotations at various institutions: All rotations (except electives) are emergency department or GIM rotations. Electives may or not involve clinical duties.
- Outpatient clinic responsibilities need to be outlined: Nil for EM graduates, Yes for GIM graduates
- Outline role of the fellow towards residents on service:
  - Fellows graduated from EM programs will have the same supervisory role as a senior resident, but this is not the primary focus of this fellowship.
  - Fellows graduated from GIM program will have a role equivalent to a GIM resident in the Transition to practice stage of CBD during their clinical service and should not be on ward/CTU/ED GIMCS at the same time as a GIM resident.
- Teaching responsibilities towards residents:
  - For fellows graduated from EM programs, other than usual teaching during shifts (occasional), fellows will present twice (2) at general ED rounds.
  - For fellows graduated from GIM programs, they will supervise junior learners (medical students, core IM residents, and non-IM junior residents doing “off service” training on GIM wards/GIMCS)
- Outline participation in academic activities involving the residents: Seminars, outcome assessment (morbidity and mortality rounds, etc.)
- Fellows will participate in academic activities of IH group (every two weeks) including journal club, presentations, and strategic meetings.
- Describe any support staff available to the fellow: Program Coordinator, Nurse Clinician, Secretarial support
  - The fellowship is supported by the FRCP program

- Proposed meetings to be attended by the fellow: See above

#### **Curriculum:**

- Intended case load:
  - For EM graduates:
    - As per ED volume during shift; 8 shifts per academic period. Focus is on integration of HI in day-to-day clinical roles. The trainee will keep a log of IH issues observed during the shift. The log will assist the trainee in formulating small improvement projects at the site.
  - For GIM graduates: Per 2 academic periods:
    - 2 full weekends of ED GIMCS,
    - 1 week (7 days) of ED GIMCS
    - 4 half-day GIM clinics per month (GIM, Preoperative medicine, Thrombosis or Obstetrical medicine clinics).
- Intended Percentage of varieties of cases: Each site provides variety of cases, as well as different IH platforms and functionalities.
- The fellow must attend one or two University-level courses that are pertinent to HI and the trainee's objectives. Alternatively, the trainee can enroll in an HI MSc Program (in Montreal or on-line). Copies of reference textbooks and journal articles will be available to the fellow.
- Conference weekly schedules: Seminars every two (2) weeks - protected academic half day (1/2) to discuss various topics pertaining to HI led by teaching faculty. The trainee must also attend one major HI conference during the academic year.
- During the fellowship year, the trainee must participate in a research publication, position paper, data management project or significant HI deployment/improvement project.
- Role of the fellow in attending, presenting, supervising, and organization: The fellow will participate in rounds, academic reviews and other endeavors. They will participate in hospital-based HI meetings and discussions. As opportunities arise, fellow will participate in provincial or national HI forums.

#### **Assessments and conditions for completion of fellowship**

Completion is contingent on passing all of the components of the fellowship.

The candidate will have an interim progress assessment with the fellowship director every trimester and with staff as assigned for each component ( A, B, and E) .

- A. (for each site) Clinical component: (30% overall)

- For EM graduates: includes one45 eval as per ED existing procedure.
- For GIM graduates: One GIM Narrative assessment per week of service, and One GIM Narrative assessment per 2 months of clinic.

trainee must also keep a log of HI issues during clinical shift and discuss findings with site supervisor. (20%)

Preferentially would hold 1 training session per period with staff on optimization of IT platform; if not easily applicable, must submit a detailed improvement concept for the rotation. (50%)

(Evaluation by site coordinator)

- B. Longitudinally, the trainee will receive feedback on 2 presentations (assigned supervisor depending on topic) at rounds and participation in seminars (faculty at large will assess every quarterly- feedback by the fellowship director)
- C. Trainee must attend one HI conference
- D. Trainee must pass 1 to 2 HI courses
- E. Trainee must submit at the end of the training Written project, or summary of area of focused expertise 15-20 page document to be submitted at the end of the fellowship or equivalent (research paper, or other). Final assessment will be done by program director and project supervisor; progress meetings with supervisor every 3 mo. or more if needed. The project director will be assigned based on the trainee's area of interest.

Faculty assessment will be discussed with fellowship director at quarterly meeting and at the end of each rotation using the standard McGill faculty of medicine format.

### **Objectives for Post Graduate Health Informatics (HI) Fellowship**

#### **McGill Emergency Medicine Program.**

#### **General Objectives**

The post graduate fellowship in health informatics of the Emergency Medicine residency program is a one-year supervised training program open to qualified residents who have completed a postgraduate program. Fellows will develop an understanding of health informatics and be able to apply this knowledge to participate in health informatics (HI) innovations, quality improvement projects and research in the clinical environment.

Once they graduate, they are expected to take on a leadership role in HI in their emergency department (ED) / internal medicine department and become part of the hospital, regional or national HI leadership organizations.

The health informatics fellowship is developed around four pillars: health data acquisition and management, health data analysis, clinical HI applications, as well as HI innovation and change management (refer to details in section below)

The curriculum is based on our four pillars and derived from the eight digital health Canada learning modules for the Certified Professionals in Health Information and Management Systems (CPHIMS) certification (<https://digitalhealthcanada.com/core-hi-education/core-hi-education-online/>).

### **Supervisor**

The fellow will be supervised by assigned project advisor, and report to the Royal College Emergency Medicine Residency program director as well as the fellowship director.

### **One year fellowship**

- 11 periods of clinical rotation (8 shifts per period)
- 2 periods of 4-week elective in a Canadian or American organization with advanced HI databases, HI solutions such as AI or real time decision support systems. (may or not be ED specific)
- 20 seminar lectures half days and small group discussion sessions (3 hours) occurring every 2 weeks which will be the foundation of our HI curriculum (lead by the fellow and supported by the fellowship instructors)
- Participation in ED leadership HI group meetings and other IT committees across sites.
- Research or HI project, where the fellows is encouraged to collaborate with other academic programs and outside organizations with expertise in fields such as epidemiology and engineering)
- 2 academic presentation at EM/IM rounds.
- 1 or 2 university level courses to enhance knowledge of any of the four pillars, based on the individuals needs
- Self-directed learning plan and 2 progress assessment with the fellowship director
- Reference course textbook includes, but not limited to: Biomedical Informatics and Computer Applications in Health Care and Biomedicine.
- Attend 1 American or Canadian Health Informatics conference

## **SPECIFIC OBJECTIVES**

### **Medical Expert**



The fellow will develop and expertise in health informatics with an emphasis on four pillars:

- **Health data acquisition and management** : The fellow will develop an understanding of the Canadian health care system and the challenges of data acquisition in the emergency room as well as learn to evaluate and optimize user interfaces. The fellow will also develop and understanding of the management of health data including Canadian and American guidelines for health data access, privacy, security and confidentiality.
- **Data analysis** : The fellow will learn to analyze data from large databases such as Big Data for QI projects research as well as to improve the quality and efficiency of patient care and the clinical workflow.
- **Clinical HI applications** : The fellow will learn to understand the various clinical HI solutions used in the ED as well as emerging technologies including decision support systems and artificial intelligence.
- **HI innovations and change management** : The fellow will learn to understand the process of HI innovations within the healthcare setting ranging from needs analysis to solution design, deployment and maintenance as well as financing. Fellow will be learn to understand the software development lifecycle and IT project management. The fellow will also learn the challenges of HI system deployment and strategies to effectively lead change management

### **Communicator**

The fellow should be able to demonstrate effective communication skills by their ability to :

- Evaluate user experience
- Develop strategies to communicate with user of ED HI systems in line with deployment, maintenance of skills and upgrades
- Support the team through transitions towards advanced HI applications
- Address concerns in change management

### **Collaborator**

The fellow will collaborate with the multidisciplinary clinical team and

- Support team in change management
- Seek/understand issues users face
- Partner with both clinical and non-clinical groups to bridge the gap.

### **Leader**

The fellow will develop and apply leadership skills to

- Promote an fertile environment to promote HI innovations such as Big Data, AI and clinical decision support systems to optimize of ED flow
- Promote and participate in quality improvement projects
- Acquire leadership skills in HI solutions lifecycle including planning, deployment, support and upgrades
- Understand cybersecurity issues and solutions

### **Health Advocate**

The fellow will be able to incorporate HI towards better patient care

- Guide the design HI tools for communications with families, users
- Be able to identify priorities for decision support for improving quality of care
- Be able to articulate positive and negative impacts of deployment of innovative HI applications (i.e. impact of AI on the care of patients. )

### **Scholar**

The fellow should be able to demonstrate an intellectual approach to HI in the emergency department in the following areas during participation on patient rounds, teaching sessions, journal clubs and interdisciplinary meetings.

- Continuing medical education : show interest in self-directed learning skills by demonstrating knowledge in the evolving concepts in the HI field
- Critical Appraisal of the Literature both medical and non-medical as it applies to HI by demonstrating the ability to research the literature and identify the best available articles as well as identifying field and areas of cutting edge publications in HI
- Scientific interest : demonstrate ability in identifying areas in HI where gaps in knowledge or expertise exists by retrieving the essentials of the literature, summarizing the evidence to date and develop research ideas to fill these gaps while being able to demonstrate the relevance of finding answers to the question at hand.
- Teaching skills : be able to develop teaching tools to facilitate user learning of HI software and should be available to answer questions or discuss common difficulties users experience.

### **Professional**

The fellow should be familiar with medical, legal, and social aspects of HI in day-to-day work as it pertains to applications such as patient data privacy, confidentiality and security. They should approach situations with the highest level of integrity and honesty being able to identify areas of potential conflict of interest. They should show responsibility and reliability in the exercise

of their function and demonstrate awareness of their own limitations and seek advice appropriately. The fellow should more specifically demonstrate professionalism in the following issues:

- Be aware of privacy issues and how to address them with users
- Recognize the limitation HI applications in medical practice in the face security of information
- Recognize areas of conflict of interest in HI

Current version: May 12th<sup>th</sup> 2023