

# McGill Integrated Two Year Spine Fellowship With Focus on Spinal Research

Institution: McGill University Health Centre, Montreal, Quebec, Canada

Department: Integrated Spine Program  
Division of Orthopaedics / Department of General Surgery  
Department of Neurosurgery  
Montreal General Hospital & Montreal Neurological Hospital  
1650 Cedar Avenue, T8-200  
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Program: McGill Integrated Spine Fellowship with focus on Spinal Research

Fellowship Co-Directors: **Jean A. Ouellet, MD, FRCSC**  
**Carlo Santaguida, MD, FRCSC**

Site directors: MGH – Dr Peter Jarzem  
MNH – Dr Carlo Santiguida  
JGH – Dr Jeff Golan  
MCH – Dr Neil Saran

Fellowship Selection Committee: Dr Carlo Santiguida  
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Dr Michael Weber  
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## **Teaching Faculty - Principle:**

**Jean A. Ouellet, MD, FRCSC**  
Pediatric & Adult Orthopaedic Spine Surgeon / Specialization – Scoliosis Surgery

**Ahmed Aoud, MD, FRCSC**

Orthopedic Spine and Oncology Surgeon / Specialization – Sarcoma & Spinal Oncology

**Peter Jarzem, MD, FRCSC**

Orthopedic Spine Surgeon / Specialization – Spinal Degeneration & Motion Sparing

**Rudy Reindl, MD, FRCSC**

Orthopedic Spine Surgeon / Specialization – Spinal Trauma

**Michael Weber, PhD, MD, FRCSC**

Orthopedic Spine Surgeon / Specialization – Adult Spinal Deformity

**Neil Saran, MD, MHSc (Clin. Epi.), FRCSC**

Pediatric Orthopaedic Surgeon / Specialization – Scoliosis, Adolescent Hip Reconstruction

**Carlo Santaguida, MD, FRCSC**

Neurosurgeon / Specialization – Cervical spine & Minimally Invasive Spine Surgery

**Jeff Golan, MD, FRCSC**

Neurosurgeon / Specialization – Endoscopic & Minimally Invasive Spine Surgery

**Teaching Faculty - Associate:**

**Dr Benoit Goulet, MD, FRCSC**

Neurosurgeon / Specialization - Cervical and Lumbar Decompression

**Dr Oliver Lasry**

Neurosurgeon / Specialization - Cervical and Lumbar Decompression

**Dr Salvatore Di Maio**

Neurosurgeon / Specialization - Skull-base and occipitocervical Decompression Open / MIS / Endoscopic

**Institution & Sites:**

McGill University Health Centre / Montreal, Quebec, Canada

- Montreal General Hospital
- Montreal neurological Institute
- Montreal Children Hospital

McGill University Affiliated Hospitals

- Jewish General Hospital

- Shriners Hospital Montreal Canada

### Overview of Program Information:

The McGill Integrated Two year Spine Fellowship With Focus on Spinal Research offers a **two year** (26 periods) fellowship covering all aspects of spinal surgery with additional focus on spinal research. The candidates will spend an equivalent of one year training with the spine surgeons across the integrated spine service at McGill. The candidates will spend a total of 13 periods acquiring general spine surgery training with the spine surgeons across the integrated spine service at McGill. The clinical training is structure by having the fellows rotating on different subspecialty blocks covering the basic spine surgery. The fellows will spend allotted blocks doing 1) Minimal Invasive spine surgery focused at JGH, MNH, MGH 2) Adult Spinal Deformity at the MGH, MNI 3) Paediatric spinal & Scoliosis Surgery at the MCH and Shriners hospital 4) Spinal Trauma and Spinal Oncology at the MGH. The fellow will have an additional 13 periods to concentrate on the acquisition of skill set that defines surgeon scientist. The fellow will acquire the skill set to conduct high quality basic, translational or clinical research. The spine fellow will meet before the beginning of the fellowship with the Co fellowship directors and tailor their spinal research question. Depending on their interest and or needs, fellows will be paired with an academic spine surgeon as a mentor for their research project. They will also be paired with one of our collaborative professors at McGill conducting research in one of the following fields: 1) degenerative spine, 2) peri operative pain, 3) spinal oncology, 4) biomechanics of the spinal ailments.

Training distribution for the 13 periods is expected to be divided and carried out as listed below:

Montreal General Hospital (MGH):	33.3%
Montreal Children Hospital (MCH) / Shriners Hospital:	33.3%
Montreal Neurological Hospital / Jewish General Hospital	33.3 %

Fellows will be expected to remain on the spinal on call roster for the 26 periods allowing them to keep their surgical skills and clinical decision making throughout their two year fellowship

### Fellow Selection:

Fellowship candidates must have met all of McGill undergrad requirements for post graduate studies at McGill. Candidates must have shown interest and proficiency in undertaking research. Once the files have been vetted by the post graduate office, the selection committee will review candidate's applications and rank them to be submitted to the entire group. Final selection will be done by consensus with the entire group. In the advent that a consensus cannot be achieved the Fellowship Director will make the final selection.

### Research activities:

Spine research activities are composed of fundamental basic science research and clinical research. Every fellow is expected to complete and publish at minimum one if not two research projects. The Fellow is also expected to present at the AOSpine North America Fellows Forum as a requirement of the fellowship extramural funding. Fellows will be paired with a Spine Faculty that will supervise and guide the fellows throughout their training to ensure that they can indeed produce their research project. In addition to the spine faculty, the entirety of the research affiliation faculty – described below, are at the disposal of the fellows as the majority of the research is done in a collaborative fashion

#### Research & Clinical affiliations:

Mark Driskol, PhD, Biomechanic Engineer  
Lisbet Haglund, PhD, Cell & Molecular Biologist  
Catherine Ferland, PhD, Anesthesia & Neurophysiology  
Mohan Radhakrishna, MD, Physiatrist  
Jeff Chankowsky, MD, Neuroradiologist  
Fackson Mwale, PhD, Biochemist  
John Antoniou, MD, FRCSC  
Richard Preuss, PT, PhD  
Jake Barralet, PhD, Biomedical Materials Engineer  
Dr Ed Harvey, PhD, Regenerative Medicine and Mineralized Tissues

#### Fellowship Mission

The Spine Fellowship will ensure that the trainees will master, in an incremental fashion over a 26 periods, the fundamental sciences and the clinical and therapeutic knowledge required to treat patients with varying spinal disorders.

In addition, the fellowship will provide the trainee exposure to Good Clinical Practice (GCP) and certification to conduct clinical research and translational research. The trainee if desired will be also exposed and incorporated in our spine research lab either in Biomechanical research team or Biological research teams lead by Prof Driskol or Prof Haglund at McGill respectively. During their fellowship it is understood that the spine fellows are also here to enhance training and supervision for resident rotating on the spinal service. One of the primary roles of the fellow will be to enhance the teaching of residents, both from a didactic point of view and from hands on teaching approach in the OR and an conducting research.

Fellows are responsible for the Wednesday morning Indications & Outcomes rounds, as well as, monthly journal clubs. They will also supplement surgical skills education via daily clinical activities and daily surgery. Research Fellows will also participate to lab meetings of both labs and help coordinate our spinal research rounds.

The fellowship has adopted a tolerance zero to intimidation in all its forms. Fellows that feel they are intimidated must contact the Fellowship Director and or the Neurosurgery / Orthopaedic program director immediately to address the issue. NB. Coercion of fellows to attend one`s OR or clinic is not acceptable.

Academic Facilities

Currently, our clinical activities are sustained and accomplished by a staff of eight spine surgeons, three fellows, one to three designated spine resident at the Montreal General Hospital and the Montreal Neurological Institute, and 3 orthopedic residents rotating on the pediatric orthopedic rotation who cover the Montreal Children’s Hospital and Shriners Hospital. Residents rotate through the Jewish General Hospital as needed.

Activities Schedule and Academic Pursuit Resources

Clinical Activities available for fellows:

<i>OR Days:</i>	Mondays	MCH, MGH, MNH*
	Tuesdays	MCH, MGH, MNH (ortho)
	Wednesdays	Shriners, MNH*
	Thursdays	MCH, MGH, JGH, MNH
	Fridays	MGH( Designated spine trauma time), MNH
<i>Clinics:</i>	Monday	MGH (spine)
	Tuesday	MNH*
	Wednesday	MGH (multidisciplinary spine), Shriners (EOS scoliosis)
	Thursday	MCH (spine), Shriners (scoliosis), MNH*
	Friday	JGH (degenerative), Shriners (scoliosis)

We performed on average 900 Spine cases per year averaging 15 cases per week providing great clinical experience and exposure to both fellows and residents.

Formal rounds and teaching venues

*Indications & Outcomes Rounds*

Wednesdays 7:00 - 8:30

*Orthopaedic Grand Rounds*

Thursdays 7:00 - 8:30

*Academic Half Day Teaching*

4 Thursdays/yr 9:00 – 12:00

Cadaveric Spine Course focused on surgical spine skills i.e. instrumentation

*Basic Science / Clinical Research Meeting*

Wednesday 4:00 - 6:00

Adult meeting

Fridays 7:00 – 9:00

Peds meeting

*Journal Club*

Wednesday 4:00 - 6:00

Once a month

### *Library Access*

Fellows will have full access to the MUHC and McGill University Libraries' journals and online resources.

### *Multimedia*

The Spine Fellowship is funded by AO Spine North America, which is an organization axed on the education and development of spine surgeons. Via the AO Spine website, fellows have access to DVD instruction, surgical techniques, as well as free access to online spine journals.

### *Skills Lab*

Once a year, our local faculty provides a 3-day cadaveric spinal seminar affording fellows a venue for acquisition of new technology in a safe and controlled educational fashion at the McGill University Simulation Centre.

## **Duties and Responsibilities of the Fellow**

### *Outpatient Clinic Responsibilities*

Fellows are responsible to attend clinic in order to gain new knowledge as well as to share their knowledge and experience with staff and residents who are sharing clinical activities.

### *OR Responsibility of the Fellow*

Fellows are responsible to attend OR in order to gain new knowledge as well as to share their knowledge and experience with staff and residents who are sharing OR activities.

### *On Call Responsibilities to Cover Spine Service*

Fellows are expected to take call according to Quebec's recommended call limit of 9 home calls in a 28 day period representing a 1:4.

### *Supervisory Responsibilities*

The fellow will function in a dual role. The fellow will act as junior staff, but will also act as a senior resident responsible for the management of emergency cases, emergency consults, and management of supervised first line screening clinics. The fellows will be responsible with the respective residents on either service to ensure that patients are seen daily and that daily notes and orders are done according to patient`s clinical needs.

### *Rotations at Various Institutions*

The fellowship may be tailored to "explore" a specific field of interest such as minimally invasive surgery or peri-operative pain management with the pain clinic or again scoliosis surgery.

The fellow's schedules and assignments will remain flexible and at the discretion of the fellowship director. All fellow's schedules and assignments will be

coordinated by the program directors of orthopaedics as well as neurosurgery so as to accommodate teaching staff as well as resident's assignments.

Site assignment and protected research time will remain flexible in an effort to respect the needs of the residents, the fellows, as well as the staff.

Guiding principles for fellow's responsibility as to coverage of OR and Clinics, rests on the concept that fellows are adult learners, it is up to them to decide where the best education activity can be provided. Considering the significant clinical activity across all site we expect that certain OR's will not be covered by resident or Fellows and it is up to the treating surgeon to ensure that they can proceed and perform the surgeries without the need of a fellow or resident.

### *Meeting Attendance*

All fellows must attend the annual Fellows Forum where they must present their research project to the balance of the AO Spine Faculty. Fellows are also expected to attend an AO Spine Cadaveric course of their choice.

Additional meetings that fellows are encouraged to attend are the Scoliosis Research Society (SRS) Annual Meeting, the North American Spine Society (NASS) and the Canadian Spine Society (CSS).

### *Research Productivity and Publications*

As stated earlier, all fellows are expected to take part in a research study which results in a publication by the end of their fellowship.

### *Curriculum*

The fellow is expected to perform or be 1<sup>st</sup> assistant in 250 cases. The intended percentage of variety of cases: Adult reconstructive (including adult deformity) = 35%, Paediatric Deformity = 35%, Trauma = 15% and Neoplasia and Infection =15%.

## **McGill Spine Fellowship**

### Objectives of the McGill Spine Fellowship

Trainees should master, in an incremental fashion over a 12 month period, the fundamentals sciences and the clinical and therapeutic knowledge required to treat patients with varying spinal disorders.

By spinal disorders we specifically expect the trainees to be able to initiate conservative

management, assess if treatment is successful, and if not proceed, to surgical management for all the following pathologies:

1. Fractures: Occipital cervical, cervical, thoracic, lumbar, and sacral fracture with or without dislocation
2. Spinal deformities: Acquired or congenital of the scoliotic or kyphotic type: Spondy / lysis / lesthesis / loptosis
3. Degenerative disc disease: Cervical, thoracic, lumbar disc herniations, cervical or lumbar spinal stenosis
4. Spinal infections
5. Spinal tumors

The second role of the trainees is to supplement educational and research endeavors at McGill. This includes teaching the residents basic science and clinical knowledge as well as surgical skills via daily clinical activities, daily OR, weekly spine rounds, and formal quarterly didactic talks. Trainees are expected to complete a research project, either clinical or basic science in our spine lab, which must lead to a publication.

*Basic scientific knowledge to be acquired:*

1. Detailed knowledge of anatomy, embryology and physiology of the spine
2. Congenital, developmental and acquired non-traumatic conditions of the spinal column
3. Musculo-skeletal anatomy of cervical, thoracic and lumbar spine, osseous ligamentous and neural elements including intervertebral disc morphology
4. Biomechanical and functional anatomy of the spine
5. Natural degeneration of the spine
6. Systemic inflammatory illness affecting the spine

*Basic clinical knowledge:*

1. Appreciation of classification (discal, degenerative disorders, mechanical instabilities, spinal deformities)
2. Display knowledge of appropriate investigative techniques
3. Interpretation of advanced investigative techniques:
  - Computerized axial tomography
  - CT myelography
  - Magnetic resonance imaging
4. Display a detailed knowledge of operative approaches to the spinal column

## **Evaluation**

The above factors are judged using a standardized rating system as described below.

A satisfactory rating indicates that the trainee has a good knowledge of clinical sciences and is adept in problem-solving and other aspects of patient care. A low rating indicates



that the trainee lacks adequate knowledge of clinical sciences, problem-solving skills and is unable to apply their knowledge sufficiently.

Consideration of the trainee's knowledge on current scientific literature and their application of this knowledge to case presentation and daily patient management will also be taken into account.

*History & physical examination:*

1. Display clinical competence in the evaluation of spinal disorders:
  - Relevant history taking to all spinal disorders
  - Relevant physical exam assessing for spinal deformity and spinal instability
  - Relevant neurological exam

This factor judges whether or not a trainee takes a complete medical history and performs an adequate physical examination to permit a valid formulation of the patient's problem. The factor should also judge whether or not the information elicited and observed is recorded in an organized and sequential manner which permits a clear definition of the problem and a rational approach to differential diagnosis and management.

*Interpretation and utilization of information:*

The trainee must master:

1. The role of physiotherapy and occupational therapy in the management of spinal disorders - acute and chronic.
2. Display competence in operative and non-operative management of spinal disorders in respect to indications, contraindications and complications related to surgical intervention.

These factors judge whether or not the trainee is able to correctly interpret the information gathered and shows discrimination in identifying the important and less important information that will allow the identification of the problems affecting the health of the patient. The trainee's concern for the cost of unnecessary investigation and sensitivity to the patient's inconvenience and discomfort should also be considered.

*Clinical judgment & decision making:*

1. Display competence in the non-operative management of spinal disorders
2. Display adequate knowledge in advanced non-operative management of spinal disorders, bracing techniques and physiotherapy
3. Appreciate indications for surgery for spinal disorders
4. Understand the principles of fusion levels in spinal deformity with their implication regarding complications and natural history

5. Recognize and manage postoperative complications
6. Recognize and evaluate vertebral sepsis: Osteomyelitis, discitis

These factors judge the trainee's ability to effectively and efficiently establish a program of investigation and management adapted to the patient's condition, all the while recognizing the limits of his/her ability, the hazards of drugs and other therapy and the need to modify therapy when indicated. The trainee should also demonstrate his/her appreciation for the total needs of the patient, recognizing factors that may limit compliance with prescribed therapy, as well as the non-medical (socio-economic and other) factors that may affect the patient's health.

*Technical skills required in the specialty:*

1. Display surgical competence in the following areas:  
Laminectomy; lumbar fusion techniques - anterior versus posterior; discectomy - cervical, thoracic and lumbar; foraminotomy; spinal tumor debulking
2. Display surgical competence in complex spinal instrumentation:  
Transpedicular vertebral fixation; application of spinal hooks;  
Anterior and posterior vertebral instrumentation for the cervical, thoracic and lumbar spine (either with plates, screws, or rods); different pelvic fixations; interbody spacers, as well as vertebral body replacements
3. Display a detailed knowledge of the principles of internal fixation with regards to:
  - Indications
  - Complications
  - Contraindications
  - Limitations

These factors judge if the trainee can carry out professional techniques correctly and efficiently.

**Evaluation of Communication Skills**

*Inter-professional relationships with physicians:*

This factor judges if the trainee can work effectively with other physicians in the healthcare team. It demonstrates if there is consideration respect and tact for junior members of the team.

*Communications with other allied health professionals:*

This factor judges the trainee's ability to communicate and work effectively with the other members of the healthcare team.

*Communications with patients:*

This factor judges if the trainee is able to communicate easily with patients. It also demonstrates whether he/she shows respect for his/her patients and they can gain their patient's cooperation and confidence.

*Communications with families:*

This factor judges if the trainee is able to communicate easily with patient's families. It also demonstrates if he/she shows respect for his/her patient's families and if they can gain the family's cooperation and confidence.

*Written communication and documentation:*

This factor demonstrates if history, physical, diagnostic formulation, progress notes, plans, discharge summaries and consultation reports are complete and accurate with satisfactory organization and assessment.

**Evaluation of Collaboration & Delegation Skills**

*Collaboration skills:*

This factor demonstrates if the trainee interacts and consults effectively with all health professionals by recognizing and acknowledging their roles and expertise.

*Delegation Abilities:*

This factor judges that the trainee delegates effectively to other members of the healthcare team.

**Evaluation of Management Skills**

*Understands and uses information technology:*

This factor judges if the trainee is able to use current information technology in the course of their professional life.

*Uses health care resources cost-effectively:*

This factor judges that the trainee has concern for the cost of unnecessary investigation and is sensitive to patient inconvenience and discomfort in the course of their professional duties.

*Organization of work and time management:*

This factor judges whether or not the trainee effectively organizes his/her work in such a way that priorities are established and that coordination occurs with the other members of the team ensuring total, acute, and continuing care of his/her patients.

**Health advocate**

*Advocates for the patient:*

This factor judges the trainee's ability to advocate for the patient.

*Advocates for the community:*

This factor judges the trainee's ability to advocate for society and the community.

## **Scholar**

### *Motivation to read and learn:*

This factor judges the trainee's knowledge of current scientific literature and his//her application of this knowledge of case presentation and daily patient management.

### *Critically appraises medical literature:*

This factor judges the trainee's ability to critically appraise research methodology and medical literature.

### *Teaching skills:*

This factor judges whether the trainee takes the initiative and develops the ability to teach other health care professionals and/or patients about specific relevant health care issues.

### *Completion of research/project:*

This factor judges that the trainee is able to organize and complete successfully a research study or a project.

## **Professionalism**

### *Integrity & honesty:*

This factor judges whether the trainee is dependable, reliable, honest and forthright in all information and facts.

### *Sensitivity & respect for diversity:*

This factor judges that the trainee is able to understand and be sensitive to issues related to age, gender, culture and ethnicity.

### *Responsible and self-disciplined:*

This factor judges whether the trainee adequately accepts professional responsibilities, placing the needs of the patients before the trainee's own, ensuring that the trainee or his/her replacement are at all times available to the patients, recognizing the limits of competence, and seeking and giving assistance when necessary. The trainee is punctual, and respects local regulations relating to the performance of his/her duties.

### *Communicates with patients with compassion and empathy:*

This factor judges whether the trainee is compassionate and empathetic towards the patient and their family.

### *Recognition of own limitations and seeks advice when needed:*

This factor judges that the trainee is aware of his/her limits of competence, and is able to seek and give assistance when necessary.

### *Understands principles of ethics and applies them to clinical situations:*

This factor judges the trainee's ability to understand the principles and practice of biomedical ethics as it relates to the specific specialty or subspecialty, and to practice medicine in an ethically responsible manner.

### **Global evaluation of competence and progress**

As per the McGill Faculty of Medicine's guidelines, the Fellows must receive a formal [i.e. written] evaluation after 8 weeks (2 blocks) on a rotation. If a Fellow is doing a 4 block rotation, this means the Fellow will receive 2 formal evaluations, each bearing a Global Evaluation. Each evaluation will cover an 8 week period, and each is considered separate for promotions rules. If a Fellow is doing a 3 block rotation, the Fellow will receive 2 formal evaluations – one after 8 weeks, the second after 4 weeks. Each of these evaluations will be considered separate for promotions rules.

#### **Explanation of Ratings:**

The trainees' assessment considers their overall clinical competence using the following ratings:

Superior: Far exceeds reasonable expectations.

Satisfactory: Meets reasonable expectations.

Borderline: Often falls short of reasonable expectations.

Unsatisfactory: Falls far short of reasonable expectations.

"Reasonable expectations": should be appropriate to the level of training of the candidate.

"Could not judge": in the global evaluation of competence and progress: This means that the trainee did not complete the rotation.