



## **Fellowship Program**

### **Musculoskeletal ultrasound and interventions under fluoroscopic guidance**

The Montreal University Physical medicine and rehabilitation program offers a **1 year** fellowship program.

Type of Fellowship: **Musculoskeletal ultrasound and interventions under fluoroscopic guidance**

**Number of fellowship position per year:** 1 per academic year (July 1<sup>st</sup> to June 30<sup>th</sup>)

#### **Admission criteria:**

Any candidate wishing to apply to the fellowship program must hold a diploma or a certificate in physical medicine and rehabilitation.

**Quebec candidates** should take steps for one year extension of training (see procedures for remunerated extensions of training).

<http://medecine.umontreal.ca/etudes/etudes-medicales-postdoctorales/etudiants-actuels/reglements-procedures/formation-complementaire/>

Candidates from **outside of Quebec** must take steps to be assigned in the Contingent Particulier Quota or to get a clinical fellow status (see admission procedures and criteria for admission in the Contingent Particulier Quota or for clinical fellow status).

<http://medecine.umontreal.ca/etudes/etudes-medicales-postdoctorales/admission/diplome-hors-canada-et-etats-unis-dhceu/>

<http://medecine.umontreal.ca/etudes/etudes-medicales-postdoctorales/admission/moniteur-clinique/>

## **Fellowship program in musculoskeletal ultrasound and interventions under fluoroscopic guidance**

The Montreal University Physical medicine and rehabilitation program offers a one year fellowship position. The purpose of this clinical fellowship is to expose the fellow to the diagnosis and treatment of a wide spectrum of musculoskeletal diseases. Emphasis is placed on gaining advanced knowledge in musculoskeletal ultrasound and spinal interventions under fluoroscopic guidance.

This fellowship takes place in the CHUM (Centre Hospitalier de l'Université de Montréal), mainly in the Hotel-Dieu Hospital site. The physiatry clinic at the CHUM is well recognized for its expertise in the evaluation and treatment of the musculoskeletal system diseases. There are 4 physiatrists specialized in diagnostic and interventional musculoskeletal ultrasound and 5 in interventions under fluoroscopic guidance. The candidate will have regular exposure to these evaluation and intervention modalities.

Clinical activities are mainly focused in the physiatry department at the Hotel-Dieu Hospital. However, there are also clinical activities at the Montreal University sport medicine center (CEPSUM).

The candidate will participate in scientific and academic activities of the physiatry department. The completion of at least one publishable research project is expected. Research is mostly clinical, however basic science or biomechanical opportunities are available. Protected time and support services will be awarded to the candidate to facilitate the achievement of the research project.

The Fellow will have call responsibilities. Note that clinical and on call activities are always performed under the supervision of a physiatrist.

## Contacts

For more information in relation to this fellowship program, please contact:

- **Mihaela Tucanu**
  - Secretary of the Montreal University Physical Medicine and Rehabilitation Program
  - Phone: (514) 340-2083
  - Fax: (514) 340-2775
  - Email: mihaela.tucanu.ccsmtl@ssss.gouv.qc.ca
  
- **Mathieu Boudier-Revéret**
  - Physiatrist
- **Claude Bouthillier**
  - Physiatrist
- **Isabelle Denis, M.D.**
  - Physiatrist
  - Head of the CHUM's Physical Medicine and Rehabilitation department
- **Marc Filiatrault, M.D.**
  - Physiatrist
- **Martin Lamontagne, M.D.**
  - Physiatrist
- **Marie-Ève Levasseur, M.D.**
  - Physiatrist
- **Dien Hung Luong, M.D.**
  - Physiatrist
- **Johan Michaud, M.D.**
  - Physiatrist
- **André Roy, M.D.**
  - Physiatrist

## **Specific objectives :**

At the end of the fellowship, the fellow will have acquired the following skills:

### **General clinical skills:**

- Advanced skills in the history taking of patients with musculoskeletal/peripheral nervous system problems
- Knows to make a relevant physical examination, focusing primarily on the evaluation of the musculoskeletal system and, when necessary, the peripheral nervous system
- Expertise in the complete management of patients with musculoskeletal/peripheral nervous system problems

### **Medical Expertise (musculoskeletal ultrasound)**

#### **General objectives:**

- Demonstrates a good knowledge of the musculoskeletal/peripheral nervous system anatomy

#### **Technical aspects:**

- o Knows the basics of ultrasound physics
- o Understands the terms used in musculoskeletal ultrasound (echogenicity, homogeneous, heterogeneous, anisotropy, long-short axis, fibrillar-fascicular-pennate aspects, "in plane", "out of plane" ...)
- o Knows how to choose an appropriate probe
- o Knows how to adjust the settings to get the best possible image
  - Patient Registration
  - Depth of Field
  - Focus height
  - Gain adjustment
  - Using color or power Doppler
  - Knows how to optimize the needle visualization
- o Knows how to handle the probe and masters the following terms:
  - Slide
  - Rotate
  - Tilt
  - Rock

- o Knows the normal and abnormal US appearance of different musculoskeletal structures (muscles, tendons, ligaments, bursa, bone, blood vessels, nerves, ...)
- o Knows the common artifacts found musculoskeletal US
- **Knows the indications, precautions, contraindications, side effects and complications in US-guided interventions**
  - o Local anesthetic
  - o Corticoids
  - o Botulinum toxin
  - o Viscosupplementation
  - o Autologous platelet-rich plasma
  - o Percutaneous needle tenotomy
  - o Aspiration and lavage in calcific tendinosis
  - o Cysts or hematoma aspiration
- Knows the technical limitations of ultrasound-guided injections
- Knows the aseptic measures to be taken during an ultrasound guided infiltration

**Technical Skills:**

**Specific structures:**

**Shoulder:**

- Long head of the biceps
- Subscapularis
- A/C joint
- Supraspinatus
- Infraspinatus-Teres minor
- Subacromial subdeltoid bursa
- Dynamic evaluation

**Masters the following US-guided injections:**

- Subacromial subdeltoid bursa
- Inside the long head of the biceps tendon sheath
- A/C joint
- Gleno-humeral joint
- Aspiration and lavage in calcific tendinosis
- Labral cysts aspiration

## **Elbow:**

### **According to the structures localization:**

- Anterior
- Lateral
- Medial
- Posterior

### **Masters the following ultrasound-guided infiltrations:**

- Lateral epicondyle common extensor tendon
- Medial epicondyle common flexor tendon
- Elbow joint
- Autologous platelet-rich plasma
- Percutaneous needle tenotomy

## **Wrist and Hand:**

### **According to the structures localization:**

- Ventral
- Dorsal
- Radial
- Ulnar

### **Master the following ultrasound-guided infiltrations:**

- De Quervain's tenosynovitis
- 1st carpometacarpal
- Carpal tunnel
- Trigger finger
- Radio-carpal joint
- Cysts aspiration and infiltration
- STT joint
- Distal radio-ulnar joint
- Metacarpophalangeal joint
- Inter-phalangeal joint

## **Hip:**

### **According to the structures localization:**

- Anterior
- Lateral
- Medial
- Posterior

### **Master the following ultrasound-guided infiltrations:**

- Peritrochanteric (especially between the TFL and the gluteus medius lateral tendon)
- Hip joint
- Psoas bursa
- Adductors tendons
- Proximal Hamstring tendons
- Piriformis muscle
- Lateral femorocutaneous nerve

## **Knee:**

### **According to the structures localization:**

- Anterior
- Lateral
- Medial
- Posterior

### **Master the following ultrasound-guided infiltrations:**

- Femorotibial joint
- Around pes anserine tendons
- Aspiration and infiltration of popliteal cyst

## **Ankle and foot:**

### **According to the structures localization:**

- Anterior
- Lateral
- Medial
- Posterior

- Digital
- Interdigital

**Master the following ultrasound-guided infiltrations:**

- Central cord of the plantar fascia
- Posterior tibial tendon
- Peroneal tendons
- Pre Achilles bursa
- Talocrural joint
- Subtalar joint
- Morton's neuroma
- Autologous platelet-rich plasma
- Percutaneous needle tenotomy

**Medical Expertise (interventions under fluoroscopic guidance)**

**General objectives:**

- **Knows the side effects and risks of the medication/agents used during interventions under fluoroscopic guidance**
  - Contrast medium
  - Local anesthetic
  - Glucocorticoid
  - Viscosupplementation
  - Platelet-rich plasma
  - Ozone
- **Knows the principles of radiofrequency thermal neurotomy**
- **Knows the health effects associated with radiation exposure and precautions to be taken**
- **Knows the indications, precautions, contraindications and complications of interventions under fluoroscopic guidance**
  - Cervical, dorsal, lumbar facet blocks
  - Medial branch nerve blocks
  - Sacral lateral branch nerve blocks



- Radiofrequency thermal neurotomy of cervical, dorsal and lumbar medial branches, (zygapophysial joint denervation)
- Radiofrequency thermal neurotomy of sacral lateral branches (sacroiliac joint denervation)
- Caudal epidural
- Foraminal epidural
- Sacroiliac joint injection
- Arthrosynovial facet joint injection and percutaneous rupture
- Percutaneous intradiscal interventions
  - Disc stimulation
  - Annuloplasty
  - Nucleoplasty
  - Ozone
  - PRP

**Technical Skills:**

• **Knows how to do the following:**

- Cervical, dorsal, lumbar facet blocks
- Medial branch nerve blocks
- Sacral lateral branch nerve blocks
- Radiofrequency thermal neurotomy of cervical, dorsal and lumbar medial branches, (zygapophysial joint denervation)
- Radiofrequency thermal neurotomy of sacral lateral branches (sacroiliac joint denervation)
- Caudal epidural
- Foraminal epidural
- Sacroiliac joint injection
- Arthrosynovial facet joint injection and percutaneous rupture
- Percutaneous intradiscal interventions
  - Disc stimulation
  - Annuloplasty
  - Nucleoplasty
  - Ozone
  - PRP