

Orthopaedic Trauma Fellowship

Name of Institution: MUHC

Location: Trauma Division (Orthopedics)
Montreal General Hospital

Type of Fellowship: Trauma Orthopedics

Number of fellowship positions requested: 1

Length: 1 year

Academic affiliation McGill University

Name of hospitals involved in training: McGill University Health Center
Montreal General

• Background

Clinical: The trauma division is a discrete entity with protected operating time and clinic space. Currently there are 6 trauma days per week at the Montreal General Hospital. The trauma faculty also have a subspecialty practice for which they have 1-2 extra operating days per week. Many of these cases are tertiary care level trauma-related reconstructions.

Research: The trauma division has access and relationships with several laboratories on campus and in the MUHC research institute.

• Publications

See Appendix 1 - previous 5 years output

• Mission of the Center

Deliver world-class trauma care to the RUIS of the McGill University Health Center

Objectives for the Fellowship

The education offered by the orthopaedic trauma fellowship should allow the trainee to acquire an advanced level of skill in the management of this population. This may be obtained from faculty-guided experience in:

1. The surgical as well as non-surgical management of musculoskeletal injuries.
2. Algorithmic decision making with respect to timing and sequencing of multiple injury management.
3. Postoperative and outpatient care, including the directing of rehabilitation.
4. Understanding the prophylaxis and/or treatment of the complications and sequelae of musculoskeletal injuries.
5. Injury management decision making, based on age and/or co-morbid medical problems, as seen either in the pediatric or the geriatric population.
6. Developing familiarity with and understanding the historical evolution of the methods available to treat musculoskeletal injuries.
7. The use of advanced technology and instrumentation.
8. Activities that foster the development of skills in teaching as well as laboratory and clinical research related to orthopaedic trauma.
9. Ethical, economic, and legal issues as they pertain to orthopaedic trauma care.

Furthermore, it is expected that individuals completing fellowship training in orthopaedic trauma care will be able to:

1. Organize and administer an orthopaedic trauma service, and coordinate the activities of the service with other administrative units.
2. Establish policies and procedures for the management of orthopaedic trauma patients.
3. Appoint, train, and supervise specialized personnel.
4. Teach the specialized body of knowledge required for the comprehensive management of the orthopaedic trauma patients.
5. Develop and pursue research in various areas of orthopaedic trauma care.

• How intended fellowship will enhance residency training

Refer to Appendix 2 for details on each level of training and the responsibilities of the residents and the fellow. The fellow will aid in the administrative duties of the trauma service of the Montreal General Hospital and greatly decrease the needed time for administration by the residents. This will free them for surgical, clinical or other learning activities.

The fellow –

Will assist senior residents and junior with trauma care on the team

Will act as chief resident when he is not present.

Will supervise elective admission urgent care for all trauma staff.

Be present at all teaching conferences

Organize and present teaching and working conferences for the residents.

To supervise more junior residents education process.

Manage the trauma list.

Name of the Fellowship Program Director
EJ Harvey MD MSc

Names of the Teaching Faculty

Dr GK Berry
Fellowship training: Trauma / Foot and Ankle
Dr Rudy Reindl
Fellowship training: Trauma / Spine
Dr EJ Harvey
Fellowship training: Trauma / Upper Extremity
Dr Max Talbot
Fellowship training: Trauma / Military

Affiliated Trauma Faculty

Dr J Ouellet	Spine
Dr P Jarzem	Spine
Dr P Martineau	Upper Extremity/Sports

Current Research Staff

Dr J Henderson
JTN Wong Labs for Bone Engineering
Dr Letitia Lim- PhD candidate
Dr Shan Gao- PhD candidate

Academic Facilities and Resources

Resources

Clinical: The trauma division is a discrete entity with protected operating time and clinic space. Currently there are 6 trauma days per week at the Montreal General Hospital. 1200-1500 trauma acute cases are operated on per year. The trauma faculty also have a second subspecialty practice for which they have 1-2 extra operating days per week. This represents another 1000 cases per year within the trauma division. Many of these cases are tertiary care level trauma-related reconstructions.

Basic Science: The trauma division has access and relationships with several laboratories on campus and in the MUHC research institute. Thomas Steffen operates the Orthopaedic Research Lab that has an interest in biomechanical

work (spine and trauma) and has technical support and engineering expertise that facilitates biomechanical research.

Examples- Atlantoaxial fusion using anterior transarticular screw fixation of C1-C2: technical innovation and biomechanical study. Eur Spine J. 2005 Jan 25
Anterior trans articular C1-C2 fixation: A biomechanical study. Can J Surg 46 suppl. April 2003
"Proximal Humerus Fixation- Biomechanical Comparison of Techniques"
Submitted to Clinical Biomechanics, 2005.

Drs Harvey and Henderson have a laboratory (JTN Wong Labs for Bone Engineering) on campus in the McGill Genomics center. This research is centered on fracture healing and augmentation. A multidisciplinary team from nanoengineering, cell biologists and mechanical engineers allows a comprehensive approach to fracture healing, implant design and cell modification in order to identify and market novel orthopaedic technology. Access to Instron mechano-hydraulic testing apparatus and micro CT as well as other tools facilitates the research process.

Examples-

"A System To Generate Transverse, Oblique, Butterfly And Comminuted Fractures Of Large Animal Long Bones In Vitro"
"Ideal Cell Culture Lines for Orthopedic Research"
"Novel Animal Models in Fracture Healing"
"Stem Cells and Biologics for Bone Repair"

Clinical outcomes research is performed with a transdisciplinary group.

McGill Skeletal Health Outcomes Group-

Researchers

Suzanne Morin MD
Marie Hudson MD
Ed Harvey MD MSc
Rudy Reindl MD
Greg Berry MD
Thomas Steffen MD PhD MBA

Affiliated group

Richard Kremer MD PhD
Elham Ramie MD
Janet Henderson PhD
Jean Ouellet MD

Projects

Pure Basic Research
Osteoporotic fracture healing models
Osteoporosis ongoing studies

Bench to the Bedside Research
Bone microarchitecture relationship to hip fractures
Endothelial cell involvement in bone disease

Clinical Research
Comparison of Hip Fracture
Comparison of distal radius fracture devices
Osteoporosis studies
Geriatric Spine Outcomes

Translational Research
Prophylactic internal fixation of the hip
Osteoporotic bone model with a novel embalming technique
Proximal humerus fixation in osteoporotic bone

Education
Education processes in orthopedics and trauma are being investigated. Examples- Investigation of a tool to teach biomechanical principles about the hip

Current Multi Centre Projects in Trauma Group

Multicenter Clinical Trials Based in McGill Trauma Group
Distal Radius ORIF versus Ex Fix versus Kapandji Techniques
Trochanteric nail versus DHS for Hip Fractures

Several studies are being carried out under multicenter umbrella of the Canadian Orthopedic Trauma Society

Breakdown of Resources

- o Library access, Multimedia learning materials available
 - Orthopaedic textbooks and multimedia is available in the orthopaedic library (12th Floor)
- o Availability of a skills lab if applicable
 - Access to the McGill Skills Center is possible

Fellow Duties and Responsibilities

See Appendix 2

Call responsibilities 1/3 call
Outpatient clinic responsibilities Trauma Clinics
Describe any support staff available to the fellow: program coordinator, nurse clinician, secretarial
Dedicated Trauma only Research Coordinators:
Fiona Houghton and Mary Amadeo
Secretarial: Silvana DeCrescentis
Data Management: Data base clerk for dbase management

Proposed meetings to be attended by the fellow
OTA Annual Meeting
Research productivity and publications expected by the Fellow
1-3 Research projects to be brought to fruition

Curriculum

Intended case load

Attendance at over 1000 cases will be easily achieved

Intended Percentage of varieties of cases

5% Pelvis, 30-40% Upper extremity, 40-50% Lower extremity, variable percentage of spine cases depending on fellow desires

Regular reading materials provided (if any)

Full access to all current journals and textbooks

Conference weekly schedules

Daily trauma rounds, weekly trauma quality control rounds, weekly general surgery trauma rounds, biweekly grand rounds

Appendix One: Publications- Last 5 years

EJ Harvey

24. "Clinical Outcome of Pediatric Calcaneal Fractures Treated with Open Reduction and Internal Fixation" A Pickle , T Benaroch, P Guy, EJ Harvey Journal of Pediatric Orthopedics, 2004 24(2) March/April, 178-180
25. "Minimally Invasive Dynamic Hip Fixation: Prospective Comparison with Conventional Techniques" A Alobaid , EJ Harvey , G Elder , P Lander, P Guy, R Reindl J Orthop Trauma. 2004 Apr; 18(4): 207-212.
26. "Imaging in musculoskeletal trauma: The value of MRI for traumatic hip dislocations" G Elder , EJ Harvey Cdn J Surgery, 2004 August 47(4), 290-291.
27. "The Locked Flexible Intramedullary Humerus Nail in Pediatric Femur and Tibia Shaft Fractures: A Feasibility Study" P Bienkowski , EJ Harvey , R Reindl, GK Berry, TE Benaroch, JA Ouellet Journal of Pediatric Orthopedics, 2004 Nov-Dec; 24(6):634-7.
28. "All Pubic Ramus Fractures Are Not Created Equal" DK Steinitz , A Passareillo, P Guy, EJ Harvey . Canadian Journal of Surgery, 2004; December 47(6), 422-25.
29. "Sternal Fracture Fixation with Plating" S Bonny , EJ Harvey , EM Lenczner Journal of Trauma. 2004; December 57(6): 1344-1346.
30. "Anatomical Risks of Using Supra-Acetabular Screws in Percutaneous Internal Fixation of the Acetabulum and Pelvis" M Sen , EJ Harvey , D Steinitz, P Guy, R Reindl. American Journal of Orthopaedics, 2005, February 34(2), 94-96.
33. "Reconstructive Procedure for Unstable Radial-Sided Triangular Fibrocartilage Complex Avulsions" P Martineau , S Bergeron , L Beckman, T Steffen, EJ Harvey Journal of Hand Surgery-American, July 2005, 30(4), 727-732.
34. "The Effectiveness Of Orthopaedic Trauma Theatres In Decreasing Morbidity And Mortality: A Study Of 701 Displaced Subcapital Hip Fractures In Two Trauma Centers" G Elder , EJ Harvey , R Vaidya, P Guy, R Meek, M Aebi Injury, September 2005, 36(9), 1060-66.

37. "Anterior reduction for cervical spine dislocation" R Reindl, P Morin, G Berry, EJ Harvey, V Arlet, J Ouellet. *Spine*, 2006 Mar 15; 31 (6): 648-52.
39. "Biomechanical Comparison of a Unique Locking Plate Versus a Standard Plate For Internal Fixation of Proximal Humerus Fractures in a Cadaveric Model" S Walsh , R Reindl, EJ Harvey , GK Berry, L Beckman, T Steffen *Clin Biomech* 2006 Vol 21/10, 1027-1031.
40. "Avascular necrosis of the femoral head: vascular hypotheses" MA Kerachian , EJ Harvey, D Cournoyer, TY Chow, C Séguin. *Endothelium*. 2006 Jul-Aug; 13(4): 237-44.
41. "A Vascularized Technique for Bone-Tissue-Bone Repair in Scapholunate Dissociation" Harvey EJ , Sen MK, Martineau PA. *Tech Hand Up Extrem Surg*. 2006 Sep; 10 (3): 166-72
42. "Multidirectional acromioclavicular joint instability posttrauma" EJ Harvey , R Reindl, GK Berry *Canadian J Surgery*, 49(6) Dec 2006: 434-5.
43. "A New Intramedullary Nail Device for the Treatment of Intertrochanteric Hip Fractures: Perioperative Experience." P Bienkowski , R Reindl, G Berry, E Iakoub, EJ Harvey *J Trauma*. 2006 Dec; 61 (6): 1458-62.
44. "Nonoperative treatment compared with plate fixation of displaced midshaft clavicular fractures. A multicenter randomized clinical trial." The Canadian Orthopedic Trauma Society. *J Bone Joint Surg Am*. 2007 Jan; 89(1): 1-10
45. "Percutaneous Plating of the Proximal Humerus with the Synthes Locking Plate" Smith J , Berry G, Laflamme Y, Blain-Pare E, Reindl R, Harvey EJ . *Injury* Volume 38(2), Feb 2007: 206-211.
46. "Bone-Tissue-Bone Repairs for Scapholunate Dissociation" EJ Harvey , Berger RA, Osterman AL, Fernandez DL, Weiss AP. *J Hand Surg [Am]*. 2007 Feb; 32(2): 256-264.
47. "A Physical Vapor Deposition Method For Controlled Evaluation Of Biological Response To Biomaterial Chemistry And Topography." SA Hacking , M Zuraw, EJ Harvey, M Tanzer, J Krygier, JD Bobyn *J Biomed Material Research Part A*, 2007 Jul; 82(1): 179-87.
48. "Isolation and Characterization of Human Bone-Derived Endothelial Cells" MA Kerachian , EJ Harvey, D Cournoyer, T Chow, WC Aird, C Séguin *Endothelium* 2007 Mar-Apr; 14(2): 115-21.
49. "Plating For Distal Radius Fractures." Martineau PA, Berry GK, Harvey EJ *Orthop Clin North Am*. 2007 Apr; 38(2): 193-201
51. "Fibular fixation as an adjuvant to tibial intramedullary nailing in the treatment of combined distal third tibia and fibula fractures: a biomechanical investigation" P.M. Morin, R. Reindl, E.J. Harvey, L. Beckman, T. Steffen *Canadian J Surgery*, 2008; February 51(1), 45-50.
53. "Percutaneous Humeral Plating of Fractures of the Proximal Humerus: Results of a Prospective Multicenter Clinical Trial. GY Laflamme, DM Rouleau, GK Berry, PH Beaumont, R Reindl, EJ Harvey *J Orthop Trauma*. 2008 Mar; 22(3):153-158.
54. "Minimally Invasive Plate Osteosynthesis of Distal Radius Fractures Using a Pronator Sparing Approach" N Strauss, EJ Harvey, MK Sen *Tech Hand Up Extrem Surg*. 2008 Mar; 12(1): 2-6.

55 The Response Of Mineralizing Culture Systems To Microtextured And Polished Titanium Surfaces SA Hacking , EJ Harvey , P Roughley, M Tanzer, JD Bobyn J Ortho Research, 2008 Oct; 26(10): 1347-54.

56. Non-traumatic necrosis of bone (osteonecrosis) is associated with endothelial cell activation but not thrombophilia Séguin C, Kasssis J, Busque L, Bestawros A, Theodoropoulos J , Alonso ML, Harvey EJ Rheumatology (Oxford). 2008 Aug; 47 (8): 1151-5.

59. "Dedicated orthopaedic trauma theatres: Effect on morbidity and mortality" D Lemos , E Nilssen , B Khatiwada , GM Elder, R Reindl, GK Berry, EJ Harvey Canadian J Surgery, 2009; 52(2): 87-91.

60. Magnesium-sputtered titanium for the formation of bioactive coatings S Ibasco, F Tamimi, R Meszaros, DL Nihouannen, S Vengallatore, EJ Harvey, JE Barralet Acta Biomaterialia 2009 Mar 14. [Epub ahead of print]

61. Effect of High Dose Dexamethasone on Endothelial Haemostatic Gene Expression and Neutrophil Adhesion Kerachian MA, Cournoyer D, Harvey EJ, Chow TY, Neagoe PE, Sirois MG, Séguin C. J Steroid Biochem Mol Biol. 2009 May 12. [Epub ahead of print]

Berry GK

[http://www.ncbi.nlm.nih.gov/sites/entrez?Db=pubmed&Cmd=Search&Term=%22Berry%20GK%22\[Author\]&itool=EntrezSystem2.PEntrez.Pubmed.Pubmed_ResultsPanel.Pubmed_DiscoveryPanel.Pubmed_RVAbstractPlus](http://www.ncbi.nlm.nih.gov/sites/entrez?Db=pubmed&Cmd=Search&Term=%22Berry%20GK%22[Author]&itool=EntrezSystem2.PEntrez.Pubmed.Pubmed_ResultsPanel.Pubmed_DiscoveryPanel.Pubmed_RVAbstractPlus)

Reindl R

[http://www.ncbi.nlm.nih.gov/sites/entrez?Db=pubmed&Cmd=Search&Term=%22Reindl%20R%22\[Author\]&itool=EntrezSystem2.PEntrez.Pubmed.Pubmed_ResultsPanel.Pubmed_DiscoveryPanel.Pubmed_RVAbstractPlus](http://www.ncbi.nlm.nih.gov/sites/entrez?Db=pubmed&Cmd=Search&Term=%22Reindl%20R%22[Author]&itool=EntrezSystem2.PEntrez.Pubmed.Pubmed_ResultsPanel.Pubmed_DiscoveryPanel.Pubmed_RVAbstractPlus)

Talbot M

Talbot M, Tien H Recombinant Factor VIIa in Trauma JAAOS August 2009 (In print)

Talbot M, Zdero R, Schemitsch EH. Cyclic loading of periprosthetic fracture fixation constructs. J Trauma. 2008 May;64(5):1308-12.

Talbot M. Surgical images: musculoskeletal: Sural neurocutaneous cross-leg flap. Can J Surg. 2008 Apr;51(2):150.

Talbot M, Zdero R, Garneau D, Cole PA, Schemitsch EH. Fixation of long bone segmental defects: a biomechanical study. Injury. 2008 Feb;39(2):181-6.

Talbot M, Schemitsch EH. Fat embolism syndrome: history, definition, epidemiology. Injury. 2006 Oct;37 Suppl 4:S3-7.

Talbot M, Steenblock TR, Cole PA. Posterolateral approach for open reduction and internal fixation of trimalleolar ankle fractures. Can J Surg. 2005 Dec;48(6):487-90.

Talbot M, Turcotte RE, Isler M, Normandin D, Iannuzzi D, Downer P. Function and health status in surgically treated bone metastases. Clin Orthop Relat Res. 2005 Sep;438:215-20.

Appendix TWO

Breakdown of Responsibilities

Fellows

Will assist senior residents and junior with trauma care on the team - . Will act as chief resident when he is not present.

Communicate with trauma outcome database coordinator Elena Iakoub, regarding injury and treatment classification on service patients, as well as studies underway.

Will be first staff call when trauma staff is on call and communicate with staff pertinent cases.

Attend all assigned clinics on time and arrange coverage for OR cases when necessary.

To supervise elective admission urgent care for all trauma staff.

Document involvement in case with diagnosis and treatment plan.

Responsible for dictation of operative reports before leaving operating room.

Be present at all teaching conferences

Organize and present teaching and working conferences.

To supervise more junior residents education process.

Manage the trauma list.

Chief Residents

Communicate with trauma outcome database coordinator Elena Iakoub, regarding injury and treatment classification on service patients, as well as studies underway.

Will be responsible for all patient care on their team

Attend all assigned clinics on time and arrange coverage for OR cases when necessary.

To supervise care of all emergency room cases and elective admissions.

Document involvement in case with diagnosis and treatment plan within 24 hours of admission; follow-up notes every 48 hours

Responsible for dictation of operative reports before leaving operating room

Scheduling of all emergent surgical cases with attending staff's approval

Be present at all teaching conferences

ADMINISTRATIVE CHIEF RESIDENTS

Coordinate all fellow, chief, and Junior resident vacations according to MUHC policies

Complete all call schedules 10-20 days before the due date

Schedule junior residents for preoperative H & P's on clinic admits and outpatients

JUNIOR RESIDENTS

Directly responsible for all day to day patient management for all patients and consults on their service

Respond to all pages; respond to the Emergency Room request for your services within 10 minutes.

Responsible for completion of all discharge summaries for patients on service

Work with staff nurses to resolve patient care problems

Document all splinting, casting, traction, halo application, pin placement, and other activities done.

Attend assigned clinics; all residents from each team must attend Clinic on Wednesday am and Friday. If not in clinic on time will receive borderline evaluation on that section.

Perform preoperative H & P's on Thursday during preoperative clinic. Resident assignment to this clinic is adjudicated by the senior resident on service. Failure to attend this clinic will result in borderline assessment for time management.

Update daily census list

Complete undictated discharge summaries left delinquent by their peers if they are off service.

List Of Examples For Typical Surgeries Assigned To Training Level

	Foot	Leg	Pelvis	Shoulder	Arm	Hand
Fellow	Crush salvage	Complex intra-articular fractures	Acetabular fracture / SI screws	Glenoid fracture	Complex intra-articular fractures	ORIF phalynx
Senior	Liszfranc	Complex nails/ simple intra-articular	Ex-fix place/ opening limited exposures	Proximal humerus fractures	Long bone fractures	Open metacarpal repair
Junior	K-wire fixation	Hip fractures/ Simple nails	none	Reduction closed	Radius ORIF pins	Closed reductions

Compiled requirements and documents derived from:

McGill Orthopedic Program

OTA

COA

AAOS