



ORTHOPEDIC TRAUMA INITIATIVE

HARVARD MEDICAL SCHOOL

Harvard Orthopedic Trauma Fellowship
Massachusetts General Hospital/Brigham and Women's Hospital

Introductory Manual

For Interested Orthopedic Surgeons



Mass General Brigham

Program Overview

Our fellowship offers the highest-level educational experience in terms of the clinical breadth of cases, academic instruction, and research opportunities. Our program is under the direction of Dr. Michael Weaver and is a partnership between Massachusetts General Hospital (MGH) and Brigham and Women's Hospital (BWH) in Boston, MA. Both hospitals are major regional and national referral centers, that combined admit more than 4,700 trauma patients annually.

The program offers two one-year fellowships. The Fellow must successfully obtain a for full Massachusetts license and is then credentialed as a junior attending surgeon*.

Each fellow spends 6 months at each core site. Our two fellows average over 650 cases as surgeon/first assistant including 60-70 pelvic/acetabular cases and minimally 30 unions/non-unions during



the academic year. The scope of our fellows' operating experience encompasses the full spectrum of cases expected of an orthopedic traumatologist. Upper extremity cases range from clavicle fractures, proximal humerus fractures and prosthetic reconstruction, humeral shaft and distal humerus fractures, elbow fracture/instability cases, to complex forearm and wrist trauma. Similarly, the lower extremity experience encompasses everything from pelvic and acetabular fractures, hip fractures, periprosthetic fractures, complex knee injuries, intra-articular distal tibia fractures, ankle injuries, as well as complex hind-foot and mid-foot trauma. Fellows are also given an opportunity to learn techniques related to hip reconstruction and revision hip replacements for the treatment of periprosthetic hip fractures.

Our fellowship has a strong academic curriculum with weekly fellow's conferences, a monthly journal club, and is supplemented with supported travel to two national/international educational meetings. Our fellows function as junior attending staff and are provided progressive responsibility based upon skill level. We hold biannual cadaver training labs. Our facilities include state-of-the-art, dedicated trauma operating rooms, clinics, research laboratories and shared electronic medical records

Our graduates work across the US. Approximately half are at academic medical centers. The others have gone into private practice and a small percentage have immediately pursued a second fellowship in a complimentary sub-specialty.

* For information about Massachusetts licenses, please visit: <http://www.mass.gov/massmedboard>.

Educational Goals

1. To create excellent clinicians, who appreciate the integral role of the orthopedist in the management of the multiply injured patient, including the appropriate use of damage control vs. early total care, and the principles of limb-salvage surgery.
2. To educate competent surgeons who are expert in the care of complex periarticular fracture of the upper and lower extremity, and to become proficient in the care of pelvic and acetabular fractures, and the management of non-unions, malunions, and chronic osteomyelitis.
3. To provide a fund of knowledge regarding fracture care, the diagnosis and management of musculoskeletal injury, operative techniques, expected outcomes, and the management of complications. To provide a strong foundation of understanding the scientific literature within the field of orthopedic trauma.
4. To help foster compassionate doctors who care for patients equally without regard of race, ethnicity, socioeconomic status, or religion. Our fellows are expected to provide the highest level of care to all our patients throughout the entirety of their experience from the ED, through the hospital and in follow-up
5. To help train educators who can help teach the next generation of physicians and surgeons. We focus on helping our fellows learn skills to better teach medical students and train residents both in and out of the operating room.
6. To foster a spirit of inquiry and to provide the tools to allow our fellows to participate in and perform clinical research.
7. To welcome our fellows into the greater trauma community. We pride ourselves on our strong alumni base and events at the AAOS, AONA, and OTA meetings. We encourage our fellows to join these societies and participate as faculty. We strive to provide ongoing mentorship to our fellows as they embark upon their careers.

Core Trauma Faculty

Our program has seven full-time core faculty, one part-time faculty member, and three affiliated trauma fellowship trained surgeons. In addition, there are several surgeons in affiliated specialties with subspecialty training that participate in the education of our fellows – both in and out of the operating room.

The faculty across both our core hospitals and our affiliated site actively engage with our fellows in individual meetings and through group programming to provide personalized mentoring in all aspects of their educational/clinical/surgical training, research planning, and professional development.



Michael Weaver, MD

Chief, MGB Orthopedic Trauma

Brigham and Women's Hospital

Program Director, Harvard Orthopaedic Trauma Fellowship



Mitchel B. Harris, MD
Chair, MGB Orthopedic Surgery



Thuan Ly, MD
MGB Orthopedic Inpatient Clinical Operations Vice Chair
Massachusetts General Hospital



Arun Aneja, MD
Massachusetts General Hospital



Megan Audet, MD
Brigham and Women's Hospital



Derek Stenquist, MD
Massachusetts General Hospital



Nishant Suneja, MD
Brigham and Women's Hospital



Arvind von Keudell, MD
Brigham and Women's Hospital (part-time)

Affiliated Faculty



Edward Kenneth Rodriguez, MD, PhD
Chair, Department of Orthopaedic Surgery, Beth Israel Deaconess Medical Center



Jack Wixted, MD,
Chief, Division of Orthopaedic Trauma, Beth Israel Deaconess Medical Center



Paul Appleton, MD
Beth Israel Deaconess Medical Center

Clinical Experience

Our fellowship program is devoted to ensuring that our fellow's education and training is their primary goal by prioritizing their surgical experience, and by providing a multitude of educational opportunities both within our program, and by sending our fellows to outside courses.

Operative Experience: The operative experience is the core of our trauma fellowship. During daily indications conference the fellows serve as junior faculty, helping lead the discussion with the residents. The staff critically reviews the previous day's cases and discusses operative strategies and logistics for the day's cases and assigns cases to the fellow and residents based on the complexity of the cases. For complex cases the fellow operates with the attending either as the surgeon or first assistant depending on the case's complexity and the fellow's ability.



For less complex cases the fellow may be assigned to work with the resident either as the surgeon or as first assistant. The fellows are responsible for formulating and presenting surgical plans for their cases and are expected to be up to date on the current literature and to have a clear understanding of the rationale and indications for surgery based on literature reviews. For complex cases the fellows write out a surgical tactic and plan. For pelvic and acetabular cases this also includes drawing the fracture lines and planned surgical fixation on a whiteboard pelvis which is reviewed again after the case to highlight important points. The faculty review and evaluate all the fellows' cases both preoperatively and postoperatively to provide constructive criticism.



We are acutely aware of the need to train our residents, and we consider the role of surgeon/educator to be an integral part of our fellowship program. Our fellows are expected to be proficient in basic fracture surgery. Thus, basic fracture cases are reserved for the residents under the supervision of the attending or the fellow (junior attending). In the operating room, fellows are expected to take residents through routine fracture cases. The attending staff regularly discuss operating teaching with the fellows and observe them in the operating room to provide guidance and improve their educational skills.



Fellows also operate at BIDMC when there is an interesting case there or one of high educational value such as with pelvic and acetabular cases.

Fellows are responsible for keeping their case logs current and entered on the OTA website in accordance with OTA guidelines

Clinic Experience: At both of our core hospitals the fellow conducts a half or one-day outpatient clinic per week, conducted in conjunction with a faculty member. The outpatient clinics allow the fellows the chance to follow patients they have operated on and to see new patients and devise management plans. With these clinics, the fellows have their “own patients” and are expected to take care of all patient phone calls and related paperwork, but with both administrative support and with backup by the faculty.

Trauma Call: The trauma fellows take one call one weeknight per week and one weekend call every 6 to 8 weeks (same as the attending trauma surgeons). When on-call, fellows are the primary responding surgeon, with backup from faculty as needed. Spine and hand injuries are covered by other services and surgeons.

Inpatient Responsibility: The trauma fellow also helps to manage the inpatient service and round on their patients. The resident and Advanced Practice Provider (APP) teams provide the day-to-day care of the trauma patients under the direction of the faculty and fellows – but fellows are expected to see their post-op patients.

Didactics/Curriculum

The focal point of our educational program centers on critical knowledge modules and skill sets presented through a weekly fellow conference. To augment the weekly conference, we have additional internal and external educational opportunities spread throughout the year.

Weekly Fellows Conference: In addition to our daily fracture conference, we provide a weekly structured fellow-level curriculum. There is a weekly hour-long fellows conference where both fellows meet with our core faculty, affiliated trauma faculty, and faculty from complementary subspecialties. The fellows have assigned readings including book chapters and primary source articles. The schedule covers major topics in trauma care including issues related to poly-trauma, pelvic and acetabular fractures, specific upper and lower extremity fractures, periprosthetic fractures, nonunion/malunion, deformity correction, segmental bone loss, osteomyelitis, soft tissue coverage, and the psychosocial aspects of trauma care.



Pelvic Acetabular Conference: This faculty run conference has the fellows bringing a selection of complicated pelvic and acetabular cases to review. A detailed discussion is held regarding the

indications, careful examination of radiography and CT scans, and tips/tricks to deal with difficult fractures.

Mentoring: The fellows meet regularly with the fellowship director, and with the senior faculty outside of the hospital to foster a lasting relationship and to help guide the fellows through the fellowship year, job searches, and balancing work and personal responsibilities as they start their careers.



Fellow mentorship extends beyond graduation. We maintain contact with our fellows and see them as part of our larger community. We have an annual dinner and recreational event at the OTA for fellowship alumni. All our fellows are invited back to review cases in preparation for their oral boards. We also invite many of our previous fellows back for Grand Rounds to share their experiences post-fellowship.



Biannual Surgical Skills Sessions: Biannually our fellows conduct surgical skills sessions at a local cadaver lab. The format includes lectures followed by cadaver dissections. Sessions include: Pelvic and Acetabular Fractures, and approaches to the upper and lower extremities. There is specific attention placed on management of life-threatening hemorrhage from unstable pelvic fractures and the placement of fluoroscopic guided percutaneous pelvic and acetabular screws.

Outside Education: In addition to our internal curriculum, our fellows participate in several external educational programs. We encourage our fellows to participate in the online learning available through both OTA and AONA. Our fellows each attend one or more of the following meetings:



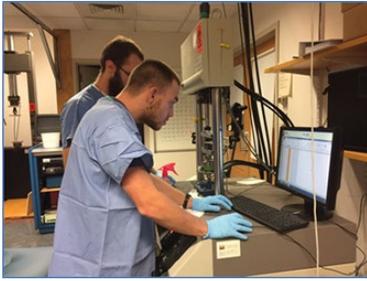
- OTA Annual Meeting (and coding course)
- OTA Fellows Course
- AONA Pelvic Course
- AONA New England Fracture Summit



With the approval from the program director our fellows may attend an additional course outside of a training course to foster a specific area of interest.



Research



Our fellows are expected to participate in research and complete a scholarly project by the end of their year and prepare a manuscript for submission (as is required by the OTA). We have a strong research infrastructure and an active academic community to help facilitate fellows' projects.

Fellows help select a project early in their year. The program has a full-time research project management, 3 research assistants, and access to a statistician to help with projects. We have an in-house registry with over 15 years of data on tens of thousands of fractures, dislocations, major soft tissue injuries and their operative treatments which provides for robust research subject population. We have active partnerships with both basic science and biomechanics labs with clinician-scientists who share a vision for collaboration. The fellows also have access to a multidisciplinary research group dedicated to improving the quality of life of individuals with musculoskeletal conditions by performing basic science and clinical research and by educating younger scientists to excel in this field. Three of our fellows have completed a master's degree in public health either during a portion of their fellowship, or immediately after graduation.



Bimonthly Research Meeting: Our fellows participate in our system-wide research meeting where they contribute as both teachers and students. They are exposed to the research community throughout our program, and to our collaboration with METRC (a national multicenter clinical research group). At each research meeting the fellows give a brief update on their project and any obstacles can be addressed.

Harvard Orthopaedic Trauma Research Day: We host a research day at the end of each academic year. Clinical and basic science research is presented from across our institutions. Our fellows are required to present their project as part of the program. Faculty, residents, and medical students from across our system participate and there is an invited national level keynote speaker.



Evaluation Process

We conduct formal biannual, 360-degree reviews of our fellows by faculty, residents, nursing, surgical techs, and medical assistants that we created in conjunction with our GME office. Fellows are evaluated using a likert-scale and open-ended questions in the following areas: patient care/procedural skills, medical knowledge, practice-based learning, systems-based practice, self-directed learning, interpersonal/communication skills, professionalism, leadership, and teamwork.

The focus is on creating constructive feedback to help guide the growth of our fellows. Responses are blinded and the program director reviews the compiled data with the fellows individually to discuss where the fellow excels and/or needs improvement, and to develop their learning goals.

Informally the fellowship director and senior faculty check in with the fellows at least monthly to discuss the fellow's performance and progress throughout the fellowship year, and to provide support or address any concerns as needed.

Our fellows evaluate our faculty and program biannually and submit an evaluation of the program after each rotation. Feedback is addressed by the Program Director and integrated as appropriate. Our Graduate Medical Education (GME) Office also performs year-end program evaluations.



Support

Office Space: The fellows share an office with one of the faculty at each site. They have their own desk, computer, phone, and workspace.

Administrative: The fellowship itself is supported by a senior project manager to oversee the day-to-day educational program and assist the fellows with administrative and academic issues such as licensure and credentialing.

Administrative Assistants: To assist them with their practice, our fellows have dedicated-hospital-specific administrative support and offices at both institutions. The administrative assistants are responsible for answering the fellow's phones, helping them with paperwork, managing their scheduling/calendar, handling the preparations for the fellow's clinics, and assisting them with miscellaneous non-clinical issues such as travel to courses.

Research: Our program's staff includes three full-time research assistants to work with the fellows on IRB submissions and data collection. Additionally, the fellows have direct access to statisticians to help with data analysis, and our billing managers are available to provide ICD-9 and CPT codes.

Infrastructure and Resources

We have a co-management service with the Department of Geriatrics at both our main sites with embedded geriatricians assisting in the care of our elderly fracture patients. Geriatricians are embedded on the trauma services in a true co-management program. Our Geriatric In-Patient FracTure Service (GIFTS) program is focused on continuous quality improvement and has adapted to the needs of the patients through programs such as medical optimization, protocol-based care, standardized order sets, rehabilitation, improved end-of-life decision making, and communication with families.

Our collaboration with geriatrics has led to clinical protocols focused on reducing delirium, improving pain management, and reducing readmission following fracture surgery. We also have a collaboration with the endocrinology services at both our primary sites to ensure all our geriatric fracture patients are screened and treated for osteoporosis as needed. Our geriatricians actively participate in our educational program with the fellows to directly address frailty, palliative care, pain management in the elder, delirium, and the logistical challenges of creating a co-management service. The focus on geriatric co-management has led to over 10 publications with a focus on geriatric fracture patients in the last five years

Our faculty have always followed the latest technological developments and procedures in the field, and our facilities have high-tech equipment. Most recently we've implemented formal training for the fellows in minimally invasive surgical stabilization for percutaneous pelvic fixation. Our fellows are learning techniques for the use of intra-operative computed tomography (O-arm) for complex pelvis and ankle trauma. They are practicing fine wire external fixation. We are developing a program for osseointegrated prosthetics following amputation and our fellows have had both lab and clinical learning modules related to this technique. We have initiated a specialized cadaver training course for the management of exsanguinating pelvic fracture hemorrhages. Due to the urgency involved in treating exsanguinating hemorrhages we provide this specialized training for orthopedic trauma and general surgery fellows, and surgical staff to practice a coordinated approach to managing this rare but highly problematic diagnosis. In the resuscitation of hemodynamically unstable polytraumatized patients our fellows get exposure to Resuscitative Endovascular Balloon Occlusion of Aorta (REBOA). Additionally, one of our faculty members is actively involved in developing customized 3D plating for surgical patients and has invited the fellows to learn about and participate in the process.

Massachusetts General Hospital

MGH is a level-1 trauma center treating patients with the most critical injuries and is a major referral center in New England. is the first and largest teaching hospital of Harvard Medical School, and is a 999-bed medical center, which offers sophisticated diagnostic and therapeutic care in virtually every specialty and subspecialty of medicine and surgery. Each year, MGH sees nearly 1.6 million patients. Annually MGH has more than 2,500 trauma admissions -

the highest in the state. The Department of Orthopaedic Surgery at MGH treats all orthopedic conditions including hip and knee arthritis, sports injuries, spinal deformities, hand, shoulder and foot disorders, trauma, and musculoskeletal tumors, seeing more than 120,000 patients each year.



Brigham and Women's Hospital



BWH is also a level-1 trauma center and is a major referral center in New England. BWH is the second largest teaching hospital of Harvard Medical School. BWH has 793-bed capacity and averages more than 4 million annual patient visits and over 45,000 inpatient stays. BWH's 1,200 physicians provide expert care in virtually every medical and surgical specialty to patients locally, regionally and around the world. BWH is the first Longwood Medical Area hospital with a helipad capable of accommodating a

U.S. Coast Guard Jayhawk helicopter—a larger, heavier aircraft than traditional medical flight choppers—which the Coast Guard uses to conduct medical evacuations from offshore environments.

Operating Rooms: Each hospital has a dedicated orthopedic trauma room 7 days per week. There is elective time available to each attending surgeon in addition to the trauma room for cold trauma and post-traumatic reconstruction.

Salary, Benefits, and Perks: The Orthopaedic Trauma Fellows salary is commensurate with that of a PGY-6 in our system. The salary for the 2025-2026 academic year is \$99,000.00. Salaries are generally adjusted by 2-3% each year. Benefits include many competitive health, dental, and vision coverage options and two weeks of vacation. There are opportunities for moonlighting – taking additional paid call. Fellows are provided with custom lead or glasses, a whiteboard pelvis, and various Harvard Orthopaedic Trauma logo swag: caps, embroidered jackets, and bags.

Contact information:

Fellowship Director:

Michael J. Weaver, MD
MGB Chief, Division of Orthopaedic Trauma
Stepping Strong Distinguished Chair
Associate Professor, Harvard Medical School
Brigham and Women's Hospital
75 Francis Street
Boston, MA 02115
617-525-8088
mjweaver@bwh.harvard.edu

Senior Project Manager:

Brenda Surowiec
Brigham and Women's Hospital
75 Francis Street
Boston, MA 02115
617-732-5655
Surowiec, Brenda
bsurowiec@bwh.harvard.edu

Research Coordinators:

Thirushan Wignakumar
Brigham and Women's Hospital
twignakumar@bwh.harvard.edu

Thomas Policicchio
Massachusetts General Hospital
tpolicicchio@mgh.harvard.edu

Alumni:

Srino Bharam, MD (2000-01)

Roosevelt/St. Luke's Hospital
New York City, NY

Christopher Breen, MD (2001-02)

Private Practice,
Woonsocket, RI

David Joseph, MD (2003-03)

Elmhurst Hospital
Elmhurst, NY

Tim Bhattacharyya, MD (2003-04)

Ortho Bethesda
Bethesda, MD

John (Jack) J. Wixted MD (2003-04)

Beth Israel Deaconess Medical Center
Boston MA

Charisse Sparks, MD (2004-05)

Private Practice
Longview, TX

Eric Marsh, MD (2005-06)

Rutland Regional Medical Center
Rutland, VT

Roy I. Davidovitch, MD (2006-07)

NYU Hospital for Joint Diseases
New York, NY

Kevin Riché, MD (2006-07)

Private Practice
Baton Rouge, LA

Joaquin Castaneda, MD (2007-08)

Private Practice
Columbus, OH

Trinity Pilkington, MD (2007-08)

Private Practice
Yorktown, VA

Henry Boateng, MD (2008-09)

Penn State Hershey
Hershey, PA

Nimesh Patel, MD (2008-09)

Panorama Orthopaedics,
Golden, CO

Erica Dafford Bayly, MD (2009-10)

South Shore Hospital
Weymouth, MA

Michael J. Weaver, MD (2009-10)

Brigham and Women's Hospital
Boston, MA

Brian Ladner, MD (2010-11)

North Oaks Health System
Hammond, LA

Eugene Toney, MD (2010-11)

Private Practice
Honolulu, HI

Stéphane Bergeron, MD (2011-12)

McGill University
Montreal, Quebec

Trevor Owen, MD (2011-12)

Carilion Clinic
Roanoke, VA

Marilyn Heng, MD (2012-13)

University of Miami
Miami, FL

Michael Sridhar, MD (2012-13)

Steadman Hawkins Clinic of the Carolinas
Greenville, SC

Lauren Crocco, MD (2013-14)

Private Practice, Miami, FL

Colin Heinle, MD (2013-14)

Private Practice
Lancaster PA

George Chaus, MD (2014-15)

Front Range Orthopedics and Spine
Longmont, CO

Kevin Luttrell, MD (2014-15)

East Texas Medical Center
Tyler, TX

Hans Van Lancker, MD (2015-16)

Saint Elizabeth's Hospital
Boston, MA

Amir Khoshbin, MD (2015-16)

University of Toronto
Toronto, Ontario, Canada

John Esposito, MD (2016-17)

Massachusetts General Hospital
Boston, MA

Jeffrey Potter, MD (2016-17)

Vancouver General Hospital
Vancouver, Canada

Andre Shaffer, MD (2017-18)

Christus Spohn Shoreline Hospital
Corpus Christi, TX

Arvind Von Keudell, MD (2017-18)

Brigham and Women's Hospital
Boston, MA

Shawn Boomsma, DO (2018-19)

Jackson Health System
Miami, FL

Nishant Suneja, MD (2018-19)

Brigham and Women's Hospital
Boston, MA

Kyla Huebner, MD, PhD (2019-20)

Health Sciences Centre
St. John's Newfoundland, Canada

Matthew Morin, MD (2019-20)

University Medical Center EMR
Tucson, AZ

Eric Chen, MD, PhD (2020-21)

Private Practice
La Crosse, WI

Tyler Caton, MD (2020-21)

John Peter Smith Hospital
Fort Worth, TX

Christian Pean, MD (2021-22)

Duke University School of Medicine
Durham, NC

Steven Rivero, MD (2021-22)

New York Langone Health
New York, NY

Vinicius Craveiro MD (2022-2023)

SUNY Downstate
New York, NY

Robert Bullock, DO (2022-2023)

St. Mary's Hospital
Deluth, MN

AT 23-24

James Burgess, MD

United States Army

Bill Mei, MD

University of Toronto (Arthroplasty Fellowship)

AY 2024 -2025

Ethan Bernstein, MD

Naval Medical Center San Diego

Ivan Golub, MD

NYC Health + Hospitals/Kings County

AY2025-2026 Current Fellows:

Eric Tischler, DO

Richard Fuld, MD