

Duration	09/01/2013 – 08/31/2015
Principal Investigator	Daniel Herzka, Ph.D.
Role in Project	Co-Investigator (no salary support)
Notes	This proposal aims to make MSK imaging more efficient by shortening overall examination duration without compromising diagnostic value.

ID: N/A	<i>3D Volumetric X-ray Based Imaging for Musculoskeletal Radiology</i>
Source	Carestream Health
Amount	\$144,962
Duration	11/01/2013 – 10/31/2015
Principal Investigator	PI: Shadpour Demehri
Role in Project	10%; Consultant
Notes	This project aims to continue the development of high-performance 3D imaging for musculoskeletal radiology and orthopaedics based upon a dedicated cone-beam CT scanner

ID: 1R21EB014964-01A1	<i>Incorporating prior knowledge of surgical devices in CBCT-guided interventions</i>
Source	NIH/ NIBIB
Amount	\$243,000
Duration	01/01/2014 – 12/31/2014
Principal Investigator	PI: J. Webster Stayman, PhD
Role in Project	Consultant
Notes	Integrate specific knowledge about surgical devices, implants, etc. into tomographic reconstruction to improve the dose-image quality trade-off and to assess delivery with respect to pre-operative plan.

ID: 1R01EB018896-01	<i>Quantitative high-resolution cone beam CT for assessment of bone and joint health</i>
Source	NIH/NIBIB
Amount	\$469,554
Duration	01/09/2014-08/31/2020
Principal Investigator	Wojciech Zbijewski
Role in Project	Consultant
Notes	This project develops an ultra-high-resolution cone-beam CT with spatial resolution and quantitative accuracy sufficient to assess subchondral bone health in-vivo, yielding an innovative technology with major relevance to human health in advancing the studies of OA pathogenesis and treatment

ID: HSS 2014-235	<i>The Association of Pre-operative Radiographic Severity and Total Hip Replacement Outcome.</i>
Source	Weill Cornell CTSC
Amount	\$10,000
Duration	09/22/2014- 09/03/2020
Principal Investigator	Susan Goodman, M.D.
Role in Project	Co-Investigator

Notes	This study aims to determine which x-ray findings are associated with poor 2-year pain and function outcomes after total hip replacement. Using the Legacy registry, this research study will look at multiple aspect of pre-operative x-rays of the operative and non-operative hips and will use multivariate logistic regression to determine which findings are associated with poor outcomes.
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ID: N/A	<i>A Study of Novel Immune Modulating Biomarkers in Patients with Spondyloarthritis with Axial Involvement</i>
Source	Existing Approved Registry
Amount	Non-funded
Duration	05/30/2014 – 05/31/2020
Principal Investigator	Vivian Bykerk, M.D.
Role in Project	Co-Investigator
Notes	MR imaging of SpA

ID: 1UH2AR067691-01R	<i>Molecular Pathways in Treatment Response and Flare in RA</i>
Source	NIH/NIAMS/NIAID
Amount	\$350,000
Duration	09/24/14- 05/31/2020
Principal Investigator	Bykerk, Darnel, Ivashkiv, Pernis
Role in Project	Collaborator
Notes	These studies will provide essential information enabling a more accurate subsetting of RA patients and leading to the development of "cellular/molecular signatures" that can predict the responses of RA patients to therapy and guide personalized therapeutic regimens.

ID: HSS 2014-111	<i>Trends, Complications and Radiographic Analysis of rhBMP-2 Utilization in Orthopedic Surgery</i>
Source	Expedited Retrospective Chart Reviews
Amount	Non-funded
Duration	06/12/2014 – 07/16/2022
Principal Investigator	Darren Lebl, M.D.
Your Role in Project	Co-Investigator, 1%
Notes	Post operative spine imaging appearance of fusion

ID: HSS 2018-1945	<i>MRI Assessment of Sacroiliitis with High Resolution Protocol</i>
Source	(Retrospective Chart Review)
Amount	Non-funded
Duration	10/24/2018 – 10/23/2019
Principal Investigator	John A. Carrino, M.D., M.P.H.
Role in Project	PI (no salary support)
Notes	We will retrospectively be correlating clinical and MRI indices of sacroiliitis activity in order to evaluate the diagnostic utility of MRI spondyloarthropathy

ID: HSS 2019-0310	<i>Eosinophilic Fasciitis Following Nivolumab Therapy in Two Patients</i>
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Source	Expedited Retrospective Chart Review
Amount	Non-funded
Duration	02/25/2019 – 03/03/2022
Principal Investigator	Kamala Chan, M.D.
Role in Project	Co-investigator (no salary support)
Notes	Case report of two patients who develop a rare complication from cancer immunotherapy

ID: HSS 2015-491	<i>Imaging Biomarkers in Crohn's Associated Spondyloarthritis</i>
Source	Clinical & Translational Research Center (CTSC) Pilot Seed Grant
Amount	\$10,000
Duration	09/08/2015 – 01/17/2023
Principal Investigator	Lisa Mandl, M.D.
Role in Project	Co-investigator
Notes	This study is designed to study distribution of spinal inflammatory changes in Crohn's disease patients on whole spine MRI and evaluate the relationship between MRI evidence of axial inflammation in Crohn's patients and patient reported outcomes, such as- BASDAI, SF-12, PROMIS-29 and Harvey-Bradshaw Index (HBI). As secondary outcomes, we will also investigate the relationship between MRI evidence of axial inflammation and pattern of intestinal dysbiosis.

ID: HSS 2018-0715	<i>Investigation of Novel Contrast Enhanced Vascular Suppression Techniques in MR Neurography</i>
Source	International Skeletal Society (ISS)
Amount	\$25,000
Duration	05/07/2018 – 06/06/2021
Principal Investigator	Darryl Sneag, M.D.
Role in Project	Co-Investigator
Notes	The aims of this study are to compare nerve-to-muscle contrast-to-noise ratio, arterial signal suppression, venous signal suppression, and nerve conspicuity between three-dimensional T2-weighted STIR magnetic resonance neurography images of the plexi obtained using: 1) Ferumoxytol (contrast agent) versus flow-saturation preparation pulse (non-contrast technique) in chronic anemia patients. 2) Gadolinium (contrast agent) versus flow-saturation preparation pulse (non-contrast technique) in patients with brachial plexus or lumbosacral plexus conditions.

ID: 2014-111 (HSS)	<i>Trends, Complications and Radiographic Analysis of rhBMP-2 Utilization in Orthopaedic Surgery</i>
Source	Medical Record Chart Review
Amount	Non-funded
Duration	06/12/2014– 07/16/2022
Principal Investigator	Darren Lebl, MD
Role in Project	Co-Investigator

Notes	Retrospective review of 5993 patients who received rhBMP-2 during their surgery at Hospital for Special Surgery (HSS) in the past 5 years [2009-2013].
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ID: 2017-1840 (HSS)	<i>Incidence of Osteoporosis in Patients Being Evaluated for Lumbar Spine Surgery</i>
Source	Medical Record Chart Review
Amount	Non-funded
Duration	01/2/2018 – 12/27/2022
Principal Investigator	Chad Craig, M.D., Linda Russell, M.D.
Role in Project	Co-investigator
Notes	In this study, we aim to 1.) Determine the incidence of osteoporosis in patients undergoing preoperative lumbar CT scans through use of QCT software, and 2.) Evaluate correlations between QCT and DEXA scan scores in the subset of patients who have undergone both DEXA and lumbar CT scans.

ID: 2019-1586 (HSS)	<i>Evaluation of Vertebral Endplate Degenerative Changes and Bone Quality: A Pilot Study</i>
Source	Medical Record Chart Review
Amount	Non-funded
Duration	10/27/2020 – 12/16/2022
Principal Investigator	Alexander Hughes, M.D.
Role in Project	Co-investigator
Notes	<p>Vertebral body endplate damage and pathologic processes such as fibrosis, inflammation, and marrow ischemia are represented by Modic changes (MC) on magnetic resonance imaging (MRI). While MCs are associated with degenerative discs, information about the etiology and pathobiology of MCs is limited. The different MC types represent various phases of the degenerative and bone remodelling process. Hypothetically, MCs could be markers for increased bone density and quality at the micro-structural level. This is a pilot study with the following specific aims to determine how MCs impact bone quality and quantity:</p> <ol style="list-style-type: none"> 1. To analyze the relationship between Modic type 1 and 2 changes and bone quality markers in the lumbar spine, including: <ol style="list-style-type: none"> a. collagen cross-linking b. structural and functional bone measures of the endplate measured using Fourier transform infrared spectroscopic imaging (FTIR) and micro-computed tomography (micro-CT) <p>FTIR is a method to provide a chemical fingerprint that helps characterize the material properties of a sample. FTIR measures the differences in light absorbed in the infrared region (non-visible light) of the electromagnetic spectrum. This study uses FTIR to characterize the collagen properties in bone specimens.</p> <p>Micro-CT is an imaging technique similar to a CT scan that involves x-ray imaging in 3D, but at higher resolution. It allows for visualization and analysis of the internal structure of materials such as bones in a non-destructive manner.</p>

	<p>2. To analyze the relationship between Modic type 1 and 2 changes and bone quantity markers evaluated on other imaging modalities and labs, including:</p> <ul style="list-style-type: none"> a. tissue mineral density and apparent density on micro-CT b. volumetric bone mineral density (vBMD) measured using quantitative computed tomography (QCT) c. bone lab markers, including Vitamin D, parathyroid hormone, N-Telopeptide, creatinine, bone alkaline phosphatase, and inorganic phosphorous d. advanced glycation end products (AGEs)
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Current Research Support:

ID: 2014-084 (HSS)	<i>A Prospective Analysis of Connective Tissue Factors and Outcomes in Lumbar Spinal Fusion</i>
Source	Hospital for Special Surgery Spine Service
Amount	\$ 390,202
Duration	05/12/2014 –12/16/2023
Principal Investigator	Alexander Hughes, M.D.
Role in Project	Co-investigator
Notes	The objective of this clinical study is to evaluate the relationship between collagen and connective tissue factors in patients. This study will also determine if US measurements of dermal layer thickness can be used as a non-invasive modality in the assessment of the aforementioned parameters. Furthermore, the study will determine any relationships in bone and connective tissue parameters that may affect lumbar fusion surgical outcomes.

ID: 1UH2AR067691-01R 2014-317 (HSS)	<i>(Synovial Tissues) Rheumatoid Arthritis (RA) & Early Rheumatoid Arthritis (ERA) tissue study – Recruitment of patients undergoing synovectomy or upper extremity surgery (UES) or synovial biopsies</i>
Source	NIH (NIAMS), HSS
Amount	\$457,467
Duration	09/24/2014 – 03/23/2024
Principal Investigator	Vivian Bykerk, M.D.
Role in Project	Co-investigator
Notes	Patients with early or established RA will be asked to provide their synovial tissue for research acquired from a scheduled synovectomy or a voluntary synovial biopsy. They will also be asked to provide a paired blood sample and complete patient reported outcome (PRO) questionnaires. Patients with ERA or established RA with a sufficiently swollen joint will be invited to undergo an ultrasound guided synovial biopsy performed by a trained radiologist. The tissue obtained will undergo routine histologic examination and scoring for level of inflammation. Any tissue remnants will be processed by the Ivashkiv and Pernis laboratories at HSS. Some will also be sent for further analytics to the Accelerating Medicines Partnership (AMP) collaborating labs at Harvard and Stanford. Tissue and blood will undergo cell

	staining, genetic, and epigenetic/transcriptomic examination using techniques such as Flow cytometry, CyTOF, RNA sequencing, ATACseq, or highly similar technologies. The tissue provided for these studies will be completely de-identified. Results from these procedures are part of preliminary studies examining the utility of novel technologies to understand states of immune activation.
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ID: HSS 2015-237	<i>Predicting Clinical and Patient-Centred Outcomes after Surgery for Degenerative Spondylolisthesis</i>
Source	HSS Spine Service
Amount	\$15,000
Duration	04/17/2020 - 10/26/2025
Principal Investigator	Carol Mancuso, M.D.
Role in Project	Co-investigator
Notes	Lumbar degenerative spondylolisthesis (LDS) is an acquired condition characterized by slippage of vertebrae and possible instability and stenosis of the spinal canal. Patients with LDS can present with back pain, radicular leg pain, neurogenic claudication, and motor and sensory dysfunction. Lateral radiographs are the cornerstone for evaluating LDS and MRI and CT are appropriate for imaging accompanying stenosis. Translation (i.e. movement) of 3 mm or more or angulation (i.e. rotation) of 11 degrees or 8% of the vertebra in dynamic flexion-extension radiographs has been the classic guideline for instability. Patients with this amount of instability on preop radiographs required decompression and fusion. For other patients the disease will have progressed such that ligament thickening and folding, disc collapse and joint enlargement have occurred, and the spine has stabilized and ankylosed; these patients require decompression only. For most patients, however, lack of instability defined by the above criteria may not be confirmed by preop imaging because protective muscle contractions in response to pain may not allow full flexion and extension of the spine. Thus, imaging done under anaesthesia may provide additional information about the amount of instability. For all patients, regardless of the extent of instability, relevant outcomes of surgery are improvement in pain and disability, radiographic evidence of stability, and repeat surgery in those with recurrent symptoms who had compression only (i.e. no fusion).

ID: HSS 2016-0580	<i>Rapid Diagnosis of Joint Infection Via Next Generation Sequencing</i>
Source	Price Family Foundation / Feldstein Medical Foundation / CJRC / ARJR
Amount	\$ 200,000 / \$75,000 / \$50,000 / \$20,000
Duration	07/24/2017 – 07/16/2023
Principal Investigator	Laura Donlin, Ph.D.
Role in Project	Co-investigator
Notes	Researchers at Hospital for Special Surgery are trying to improve the diagnosis and treatment of patients with presumed joint infections. After total joint replacement surgery, infections can arise

	in or around the affected joint. While the occurrence rate is low (<1% of patients) and treatments can have good outcomes, more rapid and specific identification of infectious microbes hold promise in improving treatment. Currently, culture-based assays used to support a diagnosis and treatment strategy, take several days to complete. The purpose of this study is to assess whether recent advances in genetic sequencing techniques can speed up the process of microbial identification and thus improve treatment.
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ID: 2016-0662	<i>Prediction of Poor Bone Quality Prior to Spinal Fusion: A Pilot Study</i>
Source	HSS Chief of Service Grant/Cornell Core Lab Support
Amount	\$40,000
Duration	11/16/2016 – 05/25/2023
Principal Investigator	Emily Stein, M.D.
Role in Project	Co-Investigator
Notes	The goals of this pilot study are to evaluate the utility of different modalities for pre-operative assessment of the bone quality in patients undergoing spinal fusion surgery and to determine the relationship between these measures with intra-operative vertebral strength. In an exploratory analysis we will also relate these measures to 2-year post-operative outcomes.

ID: 2017-0076 (HSS)	<i>The Effects of Epidural Steroid Injections on Bone Metabolism and Skeletal Structure: A Pilot Study</i>
Source	Spine Service (HSS)
Amount	\$22,750
Duration	01/16/217 – 07/26/2023
Principal Investigator	Emily Stein, MD
Role in Project	Co-investigator
Notes	Epidural steroid injections (ESI) are a commonly used and effective treatment for lower back pain and sciatica. While the overall incidence of adverse effects of ESI is low [1], the skeletal complications of this therapy are poorly understood. This study will be the first to assess the acute changes in bone formation and resorption in response to ESI. Further, we will prospectively evaluate changes in skeletal structure over one year after ESI. Skeletal structure will be assessed using DXA measurements of areal BMD (aBMD) and trabecular bone score (TBS), a measure of microarchitectural abnormalities, and CT measurements of volumetric BMD (vBMD) at the spine. We are focusing on postmenopausal women in this study, the group at greatest risk for adverse skeletal consequences of ESI because of underlying bone loss due to estrogenic deficiency and aging.

ID: 2017-1061 (HSS)	<i>Can Body Composition Help Us Better Understand Outcomes in People with Lupus?</i>
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Source	Barbara Voleker Center for Rheumatic Disease Fellowship Award, HSS/Scientist Development Award, Rheumatology Research Foundation
Amount	\$275,000
Duration	07/24/2017 – 07/26/2023
Principal Investigator	Lisa Mandl, M.D., Sara Lieber, M.D.
Role in Project	Co-Investigator
Notes	The aims of this study are to determine the prevalence of frailty in a prospective cohort of patients with SLE, as well as to evaluate the cross-sectional association of frailty with imaging and metabolic biomarkers, PROMs, and sarcopenia (as determined by dual-energy x-ray absorptiometry scan). In addition, this study will determine the longitudinal association of frailty with disease activity, damage, and PROMs. We hypothesize that the prevalence of frailty in this cohort of SLE patients will be comparable to the prevalence of frailty in community-dwelling elderly. We also hypothesize that frailty will be significantly associated with inflammatory and imaging biomarkers, as well as worse disease activity and damage, after controlling for potential confounders, both cross-sectionally and longitudinally.

ID: 2018-0287 (HSS)	<i>Phase II Trial of Abaloparticle vs. Placebo in Post-Menopausal Women Receiving Initial Spinal Fusion Surgery</i>
Source	Radius Pharmaceuticals
Amount	\$600,000
Duration	12/19/2018 – 10/25/2023
Principal Investigator	Emily Stein, M.D.
Role in Project	Co-Investigator
Notes	In this pilot study we will evaluate surgical outcomes at one year (enhanced bone union, reduced pedicle screw loosening, adjacent segment fracture and proximal junctional kyphosis) and compare the impact of 6 months of abaloparatide vs. placebo on surgical success. Secondary outcomes for surgical success will be evidence of pedicle screw loosening, adjacent segment fracture, and proximal junctional kyphosis. These data will be used to determine effect sizes and variance to power the next larger clinical trial.

ID: 2018-0733 (HSS)	<i>Development of a Surface Topography & Spinal Alignment Registry for Assessing Spinal Deformity</i>
Source	Leon Root, M.D. Paediatric Orthopaedic Chair Fund/ Spinal Deformity Registry
Amount	\$240,000/ \$500,000
Duration	01/23/2021 – 01/23/2024
Principal Investigator	Howard Hillstrom, Ph.D.
Role in Project	Co-investigator
Notes	A registry is proposed to collect a comprehensive dataset of 3D topographic imaging files, stereo radiography files, patient reported outcome measures (PROMS), and clinical assessment data from patients with spinal deformity. The goal is to characterize external

	body shape as well as skeletal structure on a large dataset (n~2000 minimum) and conduct robust statistical modelling of scoliotic deformity. Surface imaging will be performed with a full body optical scanner (3dMD) in a variety of clinically relevant poses. Weight bearing skeletal structure will be measured from low dose biplanar EOS radiographs (standard of care) in the form of spinal alignment measures, leg length, and pelvic pose. Additionally, simultaneous with EOS scanning, surface scanning will be performed with optical depth cameras to generate the first ever comprehensive dataset of surface topography and skeletal alignment. Relevant PROMs will also be obtained. Using the data collected in this registry it will be possible to build analysis plans to investigate the epidemiology of scoliosis, find correlations between surface and spine shapes as a non-ionizing radiation alternative for determining spinal alignment, measure clinical outcomes pre and post treatment, assess patient self-image, and an unknown range of future investigations.
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ID: 2018-1059 (HSS)	<i>TCR sequencing and transcriptional profiling in HLA-B27 associated diseases</i>
Source	Regeneron
Amount	\$250,000
Duration	06/25/2020 – 05/23/2023
Principal Investigator	Lisa Mandl, M.D.
Role in Project	Co-investigator
Notes	We propose a cross-sectional study of synovial tissue, enthesial tissue, and peripheral blood of patients with HLA-B27-associated arthritis to help understand the relationship between HLA-B27 status, T cell clonality and the transcriptional profile in HLA-B27 positive subjects. After successful completion of the original proposal, in discussion with the sponsor, we have decided to recruit an additional 5 control patients with osteoarthritis.

ID: 2018-1305 (HSS)	<i>A Prospective Evaluation of the 4WEB Medical Lateral Spine Truss System</i>
Source	4WEB Medical
Amount	\$50,000
Duration	10/07/2020 – 05/04/2023
Principal Investigator	Alexander Hughes, M.D.
Role in Project	Co-investigator
Notes	The objective of this study is to prospectively evaluate the radiological and clinical outcomes of patients undergoing standalone lateral lumbar interbody fusion with the 4WEB® Medical Lateral Lumbar Interbody Fusion Spine Truss System (LSTS, 4WEB® Medical, Frisco, TX). The 3D printed implant has a novel open architecture and surface roughness design that resists subsidence and improves fixation. This is an investigator-initiated, industry funded descriptive study.

ID: 2019-0126 (HSS)	<i>Predicting Failure of Reconstruction of the Stage II Adult-Acquired Flatfoot Deformity based on Preoperative Subtalar Valgus and Subfibular Impingement</i>
Source	HSS Surgeon-in-Chief
Amount	\$10,000
Duration	10/20/2020 – 09/26/2023
Principal Investigator	Scott Ellis, M.D.
Role in Project	Co-investigator
Notes	This study is investigating whether preoperative alignment of the subtalar joint or severity of subfibular impingement on weightbearing CT scans predicts failure of a flatfoot reconstruction as measured by patient-reported clinical outcomes. A secondary goal is to determine whether current adult flatfoot reconstructive techniques correct the abnormal subtalar joint alignment or improve subfibular impingement.

ID: 2019-2313 (HSS) R21 TR003033-01A1	<i>Magnetic resonance and ultrasound imaging as biomarkers for detection and monitoring of Parsonage-Turner Syndrome (PTS)</i>
Source	NIH (NCAT)
Amount	\$275,000
Duration	04/01/2020 – 01/23/2024
Principal Investigator	Darryl Sneag, M.D.
Role in Project	Co-Investigator
Notes	This study aims to understand the natural course of imaging and serologic findings in PTS and to determine if they can serve as reliable, non-invasive markers of motor and overall functional recovery.

ID: 2020-0477 (HSS)	<i>Is Geniculate Artery Embolization an Acceptable Option for Patients with Knee Osteoarthritis?</i>
Source	HSS Surgeon-in-Chief
Amount	\$20,000
Duration	06/01/2020 – 5/31/2023
Principal Investigator	Lisa Mandl, M.D.
Role in Project	Co-investigator
Notes	This is a survey given to patients with painful knee osteoarthritis to see if a novel procedure, called Geniculate Artery Embolization, would be an acceptable option. This treatment is not currently available.

ID: Outside Study	<i>Classification of Axial Spondyloarthritis Inception Cohort Study</i>
Source	Spondyloarthritis Research and Treatment Network
Amount	\$3,200,000.00
Duration	07/2021 – 07/2023
Principal Investigator	Walter Maksymowych, MD
Role in Project	Central Imaging Reviewer
Notes	The ASAS group has developed classification criteria for axial spondyloarthritis (axSpA) that allow the inclusion of patients with

	an early form of disease that is not yet clearly visible on plain radiography ¹ . These criteria include both an imaging ‘arm’, that incorporates either radiographic sacroiliitis or magnetic resonance imaging (MRI) features of active inflammation in the sacroiliac joints (SIJ) plus one clinical feature of spondyloarthritis (SpA), and a clinical ‘arm’ that requires the presence of HLA B27 plus 2 clinical features of SpA. The sensitivity and specificity of these criteria for axSpA were 83% and 84%, respectively, when assessed in a prospective cohort of patients referred to a rheumatologist with undiagnosed chronic back pain and suspicion of SpA.
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ID: 2019-1402 (HSS)	<i>Evaluation of Robotics in Spinal Surgery</i>
Source	Medtronic Research Support
Amount	\$100,000
Duration	12/13/2019 – 12/12/2025
Principal Investigator	Darren R. Lebl, .MD
Role in Project	Co-Investigator
Notes	In this study, Medtronic Mazor X robotic guidance will be integrated in spinal surgeries. Surgical workflow and outcomes will be evaluated when examining the learning curve to measure proficiency of robotics during spine surgery.

ID: R01-EB-029446	<i>Quantitative Bone Radiomics using Ultra-High Resolution CT</i>
Source	NIH – R01
Amount	\$1,698,307
Duration	07/01/2021 - 03/31/2025
Principal Investigator	Wojciech Zbijewski PhD
Role in Project	Co-Investigator
Notes	A high-resolution cone-beam CT (CBCT) system for extremity imaging has been developed using a custom complementary metal-oxide-semiconductor (CMOS) x-ray detector. The system has spatial resolution capability beyond that of recently introduced clinical orthopaedic CBCT. We evaluate performance of this new scanner in quantifying trabecular microstructure in subchondral bone of the knee.

ID: 2015-092	<i>Prospective Evaluation of the Clinical and Economic Outcomes of Total Joint Replacement: The HSS Hip Arthroplasty Cohort</i>
Source	“Legacy” Arthroplasty Registry (ARJR)
Amount	N/A
Duration	3/23/2020 – 12/31/2025
Principal Investigator	Steven Lyman, Ph.D.
Role in Project	Co-investigator
Notes	Legacy analysis of anonymized patient reported outcomes

ID: 2015-093	<i>Prospective Evaluation of the Clinical and Economic Outcomes of Total Joint Replacement: The HSS Knee Arthroplasty Cohort</i>
Source	“Legacy” Arthroplasty Registry (ARJR)

Amount	N/A
Duration	8/11/2020 – 12/21/2023
Principal Investigator	Steven Lyman, Ph.D.
Role in Project	Co-investigator
Notes	Legacy analysis of anonymized patient reported outcomes

ID: 2016-055 (HSS)	<i>Magnetic Resonance Imaging of Nerves Around Metal Implants</i>
Source	Medical Record Chart Review
Amount	Non-funded
Duration	01/13/2016 – 01/17/2023
Principal Investigator	Darryl Sneag, M.D.
Role in Project	Co-Investigator
Notes	The review study features capabilities and limitations of nerve imaging around metal implants in magnetic resonance imaging using metal artifact reduction protocols. Retrospective chart review with subjects obtained from MONTAGE Search & Analytic data mining; correlated with patient history, clinical findings and electrodiagnostic studies.

ID: 2016-0022 (HSS)	<i>The Association of Intra-Operative Synovitis and Clinical Outcomes 2-years after TKR: A Pilot Study</i>
Source	Medical Record Chart Review
Amount	Non-funded
Duration	07/27/2016 – 12/21/2025
Principal Investigator	Lisa Mandl, MD
Role in Project	Co-investigator
Notes	The primary aim of this retrospective study is to review MRIs available at the time of surgery of patients who completed Total Knee Replacements between 2007 and 2012. The patients enrolled are primary unilateral TKR patients from the Legacy Database. Baseline and 2-year legacy self-reported data, pre-operative knee radiographs available for review, and intra-operative histopathologic specimens have been previously obtained under IRB protocol # 2015-135 of the same name. We are currently interested in reviewing MRIs taken at the time of surgery for those patients.

ID: 2016-0658 (HSS)	<i>The Skeletal Effects of Epidural Steroid Injections</i>
Source	Medical Record Chart Review
Amount	N/A
Duration	12/16/2016 – 12/15/2025
Principal Investigator	Emily Stein, M.D.
Role in Project	Co-investigator
Notes	Epidural steroid injections are a very common treatment for back pain. The effects of these injections on bone are not known. This is a question of concern because of the well-established harmful effects of other forms of steroids on the skeleton. In this retrospective study, we aim to investigate whether patients who were treated with epidural steroids have lower bone density

	measured by CT scan than those who were not. We also plan to look at the effects of the total doses that patients received prior to the scan to see whether larger doses are associated with more harm.
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ID: 2016-0751 (HSS)	<i>Assessing Spine Bone Quality Utilizing Quantitative Computed Tomography (QCT)</i>
Source	Medical Record Chart Review
Amount	Non-funded
Duration	12/06/2016 – 02/12/2026
Principal Investigator	Alexander Hughes, M.D.
Role in Project	Co-investigator
Notes	Study investigators will perform a retrospective review of spine patients seen at HSS from 2001 to July 30, 2020 with available CT imaging. Quantitative computed tomography (QCT) will be utilized to examine the occipital region, cervical, thoracic, and lumbar vertebrae as well as the sacral ala to get local and regional bone density measurements. Comparisons to other imaging modalities such as x-ray and MRI may be made as well to assess the utility and value of QCT in comparison. Results will aid stratifying patients by bone quality and aid in surgical considerations.

ID: 2019-2137 (HSS)	<i>MRI Analysis of Spine Musculature</i>
Source	Medical Record Chart Review
Amount	Non-funded
Duration	12/20/2019 – 11/12/2025
Principal Investigator	Alexander Hughes, M.D.
Role in Project	Co-investigator
Notes	The objective of this study is to retrospectively review available MRI measurement methods to evaluate spine musculature quality. Lumbar spine MRIs from 1/1/2008 to 12/31/2020 will be utilized to assess muscle size and fatty infiltration.

ID: 2019-1402-MS2 (HSS)	<i>Evaluation of Robotics in Spinal Surgery: Medtronic Mazor Xrobotic Guidance</i>
Source	Medical Record Chart Review
Amount	Non-funded
Duration	06/01/2019 – 12/12/2025
Principal Investigator	Darren Lebl, MD
Role in Project	Co-investigator
Notes	In this study, Medtronic Mazor X robotic guidance will be integrated in spinal surgeries. Surgical workflow and outcomes will be evaluated when examining the learning curve to measure proficiency of robotics during spine surgery.

ID: 2019-1402-MS2 (HSS)	<i>Evaluation of Robotics in Spinal Surgery: Medtronic Mazor Xrobotic Guidance</i>
Source	Medical Record Chart Review
Amount	Non-funded

Duration	06/01/2019 – 12/12/2025
Principal Investigator	Darren Lebl, MD
Role in Project	Co-investigator
Notes	In this study, Medtronic Mazor X robotic guidance will be integrated in spinal surgeries. Surgical workflow and outcomes will be evaluated when examining the learning curve to measure proficiency of robotics during spine surgery.

J. EXTRAMURAL PROFESSIONAL RESPONSIBILITIES

Activity / Responsibility	Dates
DICOM Standards Committee (American College of Radiology/National Electronics Manufacturing Association)	1996-present
Study Section: RSNA (Radiology Society of North America) Research and Education Foundation	2006, 2007, 2009, 2010, 2011, 2013, 2014, 2015, 2016, 2017
Study Section: SIIM (Society for Imaging Informatics in Medicine Research Grant Review Group	2004, 2005
Advisory Committee: Arthritis Foundation Advisory Board member for Arthritis Foundation Grant, 09/2006-09/2009	2006 – 2009
Advisory Committee: Federal Drug Administration (FDA) Radiological Devices Panel, Computer Aided Diagnosis (CAD) 3/4/08-3/5/08, 11/17/09-11/18/09, 11/17/10-11/18/10 Role: temporary voting member, Special Government Employee (SGE) status	2008, 2009, 2010
System Innovation and Quality Improvement: RSNA Structured Reporting Templates: “Best Practices” (Internet) https://rsna.org/Reporting_Initiative.aspx	2008 – present
Study Section: Italian Ministry of Health (MOH) - in association with NIH Young Investigator Innovation grants 2009	2009
Review Group: Center for Integration of Medicine and Innovative Technology (CIMIT)	2011 – 2012
Editorial Board: Associate Editor (Imaging), Arthritis & Rheumatism, ACR (American College of Rheumatology)	2010 – 2015 r01
Study Section: VA MERIT REVIEW	2012
Lumbar Spinal Stenosis Outcome Study (LSOS) Mamisch N, Brumann M, Hodler J, Held U, Brunner F, Steurer J; Lumbar Spinal Stenosis Outcome Study Working Group Zurich. Radiologic criteria for the diagnosis of spinal stenosis: results of a Delphi survey. Radiology. 2012 Jul;264(1):174-9. doi: 10.1148/radiol.12111930. Epub 2012 May 1. PubMed PMID: 22550311.	2011 – 2012
NIH Pain Consortium; Chronic Low Back Pain (cLBP) Research Task Force	2012 – present
OARSI (Osteoarthritis Research Society International), Ankle Atlas	2013 – present
NASS (North American Spine Society)	2016 – present

RAND Expert Panel on Appropriateness of Manipulation/Mobilization for Chronic Low Back Pain	2017
Editorial Board: Associate Editor, Arthritis and Rheumatology, ACR (American College of Rheumatology)	2020 – 2025
Editorial Board: Deputy Editor, Musculoskeletal Imaging, Radiology, RSNA (Radiological Society of North America)	2020 – present
Advisory Committee: Federal Drug Administration (FDA) Radiological Devices Panel Role: Chairman, Special Government Employee (SGE) status	2022 – 2023

K. INVITATIONS TO SPEAK/PRESENT

1. CME Instruction

- 04/97 The 5th Scientific meeting and exhibition of the international Society for Magnetic Resonance In Medicine, “MR Imaging of the foot and ankle: Bone Marrow Edema patterns” (Lecturer), Vancouver, BC, Canada
- 10/97 University of Texas Health Science Center at San Antonio Center for Distance Learning Medical Informatics Curriculum, “Picture Archiving and Communicating Systems (Lecturer),” San Antonio, TX
- 04/98 University of Texas Health Science Center at San Antonio Center for Distance Learning Medical Informatics Curriculum, “Picture Archiving and Communicating Systems (Lecturer),” San Antonio, TX
- 02/98 The 28th Annual Meeting for Current Concepts in Imaging: Sponsored by the office of the Surgeon General, Coronado Island, “Current concepts in MR Imaging of the Knee” (Lecturer), San Diego, CA
- 05/98 The 4th Annual Armed Forces Institute of Pathology Musculoskeletal Imaging Weekend, “Cases in Musculoskeletal Radiology” (Lecturer), San Antonio, TX
- 03/99 Society of skeletal Radiology 1999 Annual Meeting, “Practical Aspects of picture archiving and communications systems implementation” (Lecturer), Phoenix, AZ
- 04/99 The Annual MGH/BWH Radiology Review Course, “Arthritis Imaging” (Lecturer), Boston, MA
- 09/99 New England Roentgen Ray Society, “An Introduction to picture archiving and communication systems” (Lecturer), Cambridge, MA
- 09/99 DICOM, “Radiology into the 21st Century: The Digital Department” (Lecturer), Cambridge, MA
- 09/99 Radiology into the 21st Century: The Digital Department, “PACS Implementation” (Lecturer), Cambridge, MA
- 10/99 Brigham Women’s Hospital MRI/CT Update, “Foot and Ankle MR Imaging” (Lecturer), “Knee MR Imaging” (Lecturer) Boston, MA
- 03/00 Brigham Women’s Hospital Orthopedic Radiology, “Discography” (Lecturer), Boston, MA
- 04/00 The Annual MGH/BWH Radiology Review Course, “Arthritis Imaging” (Lecturer), Boston, MA
- 05/00 Brigham Women’s Hospital Radiology Management in a New Era, “PACS: Overview” (Lecturer), Boston, MA
- 06/00 The 17th Symposium for Computer Applications in Radiology, “Compression for diagnostic Imaging: Point-Counterpoint” (Lecturer), Philadelphia, PA

- 06/00 The 72nd American Society of Radiology Technologists Annual Conference, “PACS: The New Paradigm” (Lecturer), “Introduction to the DICOM Standard” (Lecturer), Albuquerque, NM
- 10/00 Society for Health Services Research in Radiology 2000 Annual Meeting, “Imaging information management: Impact on workflow and productivity” (Lecturer), Washington, DC
- 02/01 The 5th annual CR & PACS: An Educational forum, Fuji Medical Systems, “Image quality issues in PACS” (Lecturer), Savannah, GA
- 03/01 Joint conference by Johns Hopkins Medicine, the Society of Nuclear Medicine, the office of high-performance computing and communications at the National Library of Medicine and the National Institutes of Health, “DICOM for Dummies (Lecturer),” Bethesda, MD
- 04/01 The 9th Scientific Meeting and Exhibition of the International Society for Magnetic Resonance in Medicine, “MR of Marrow – Miscellaneous” (Lecturer), Glasgow, Scotland, UK
- 05/01 The 18th Symposium for Computer Applications in Radiology, “Image Quality: Overview (Lecturer),” “Clinical Perspectives in Teleradiology (Lecturer),” Salt Lake City, UT
- 05/01 Brigham’s Women’s Hospital Emergency Radiology: Pearls and Perils, “Spine and Musculoskeletal Imaging” (Lecturer), Pinehurst, NC
- 06/01 Brigham Women’s Hospital Radiology Management in a New Era, “PACS” (Lecturer), “Use of Technology to Improve Workflow” (Lecturer), Boston, MA
- 12/01 Emergency Radiology: Pearls and Perils, “Spine and Musculoskeletal Imaging” (Lecturer), New York, NY
- 04/02 Philadelphia Roentgen Ray Society, “Imaging of Degenerative Disc Disease and Related Syndromes (Lecturer),” Philadelphia, PA
- 05/02 International Society for Magnetic Resonance in Medicine 10th Scientific Meeting and Exhibition, “Shoulder Injuries (Lecturer),” “Positional Imaging of the spine (Lecturer),” Honolulu, HI
- 07/02 American Association of Physicists in Medicine 44th Annual Meeting Invited Presenter, “PACS Image Quality – A Gestalt View (Lecturer),” “The Role of a Physicist in PACS (Lecturer),” Montreal, Canada
- 08/02 Emergency Radiology: Pearls and Perils, “Spine and Musculoskeletal Imaging” (Lecturer), Hyannis, MA
- 12/02 The 88th Scientific assembly and annual meeting of the radiological society of North America, “Medical Imaging Displays: CRTs and LCDs” (Lecturer), Chicago, IL
- 02/03 Emergency Radiology: Pearls and Perils, “Spine and Musculoskeletal Imaging” (Lecturer), Maui, HI
- 02/03 MRI Clinical Update and Practical Applications, “Minimally Invasive MSK Interventions” (Lecturer), “MRI Hip” (Lecturer), “MR Imaging of Shoulder Instability” (Lecturer), Maui, HI
- 04/03 The Annual MGH/BWH Radiology Review Course, “The Spectrum of Bone Disease” (Lecturer), Boston, MA
- 06/03 The 18th Symposium for Computer Applications in Radiology, “How NOT to give a Scientific Talk (Lecturer),” “Radiology Lexicon and the Radlex Project (Lecturer),” Boston, MA
- 07/03 The 11th Scientific Meeting and Exhibition of the International Society for magnetic Resonance in Medicine, “Interventional MRI: Percutaneous Procedures (Lecturer),” “Interventional MRI: Clinical Issues (Lecturer),” Toronto Ontario, Canada
- 10/03 Brigham Women’s Hospital MRI/CT Update, “Wrist and Elbow MRI” (Lecturer),

- Boston, MA
- 03/04 Society of Interventional Radiology, “Discography (Lecturer)”
 - 03/04 Brigham Women’s Hospital Practical Applications of New Imaging Techniques, “MR Imaging of the Knee” (Lecturer), “MR Imaging of the Wrist” (Lecturer), Boston, MA
 - 04/04 The Annual MGH/BWH Radiology Review Course, “The Spectrum of Bone Disease” (Lecturer), Boston, MA
 - 04/04 Brigham Women’s Hospital Practical Applications of New Imaging Techniques, “MR Imaging of the Shoulder” (Lecturer), Boston, MA
 - 05/04 The 12th Scientific Meeting and Exhibition of the International Society for Magnetic Resonance in Medicine, “Fat Suppression Techniques in Musculoskeletal MRI (Lecturer),” Kyoto, Japan
 - 06/04 Association for the Advancement of Medical Instrumentation, “Advances in Image-Guided Surgery (Lecturer)”
 - 09/04 International Spinal Injection Society Annual Meeting, “Imaging of the Lumbar Intervertebral Disc (Lecturer),” Maui, HI
 - 10/04 Brigham Women’s Hospital Orthopedic Radiology, “MDCT for the Non-PhD” (Lecturer), “Spine Injection Procedures” (Lecturer), “Open MRI of the Musculoskeletal System” (Lecturer), Boston, MA
 - 10/04 Brigham Women’s Hospital MRI/CT Update, “Diagnostic Approach to Bone Marrow Edema Patterns” (Lecturer), Boston, MA
 - 11/04 Brigham Women’s Hospital Orthopedic Radiology, “MRI for the Clinical Guy” (Lecturer), Boston, MA
 - 02/05 Brigham Women’s Hospital MRI Clinical Update and Practical Applications, “Essential Cartilage Evaluation” (Lecturer), “Sports Medicine Imaging of the Elbow” (Lecturer), “Bone and Soft Tissue Tumors” (Lecturer), “Post Op Knee – MRI Clinical Update and Practical Applications” (Lecturer), Kauai, HI
 - 04/05 The Annual MGH/BWH Radiology Review Course, “Imaging Soft Tissue Pathology” (Lecturer), Boston, MA
 - 04/05 Society of Interventional Radiology, “All that you learned in residency but forgot: Spinal Imaging” (Lecturer), New Orleans, LA
 - 04/05 Practical Applications of New Imaging Techniques, “Musculoskeletal Applications of Multidetector CT Imaging: New Dog, Old Tricks” (Lecturer), “Musculoskeletal Soft Tissue Lesions: The Good, the Bad, and the Ugly” (Lecturer), “Differential Diagnosis of Bone Marrow Edema Patterns: The Contusion Confusion” (Lecturer), Brigham Women’s Hospital, Boston, MA
 - 10/05 Congress of Neurological Surgeons, “Musculoskeletal Imaging: New Technologies for Spine Surgery (Lecturer)”
 - 11/05 Harvard Orthopedic Radiology, “Post-Operative Spine” (Lecturer), “Radiculopathy and Spine Degeneration,” Boston, MA
 - 02/06 NEPA’s 2006 Annual Winter Conference on Pain Management, “Radiologic Imaging for Neck and back Pain” (Lecturer), Woodstock, VT
 - 06/06 Johns Hopkins University Advances in the Diagnosis and Treatment of Rheumatic Diseases, “Advances in Musculoskeletal Imaging” (Lecturer), Baltimore, MD
 - 10/06 Harvard Orthopedic Radiology, “Spine MRI” (Lecturer), “MRI of the Adult Hip” (Lecturer), “CT Update” (Lecturer), Boston, MA
 - 02/07 American Academy of Pain Medicine, “Roentgen's Curse - The Dangers of Exposure to X-Rays in Any Shape or Form” (Lecturer), “Pain Generator - A Radiologist's Input to the Complex Puzzle” (Lecturer), New Orleans, LA
 - 02/07 Johns Hopkins University Hot Topics in MR Imaging for the Technologist, “MR

- Neurography” (Lecturer), “MR Arthrography: Applications” (Lecturer), “MRI of the Knee” (Lecturer), Baltimore, MD
- 02/07 American Society of Spine Radiology, “Socioeconomic Implications of Back Pain” (Lecturer), Marco Island, FL
- 04/07 Harvard Practical Applications of New Imaging Techniques, “MRI Infection and Inflammatory Arthropathies” (Lecturer), “Differential Diagnosis of Bone Marrow Edema Patterns” (Lecturer), “MDCT Musculoskeletal Applications ‘New Dog, Old Tricks’” (Lecturer), Paris, France
- 06/07 The Jefferson Musculoskeletal Imaging Spring Conference, “MR of the Rotator Cuff and Impingement” (Lecturer), “MR Imaging of the Post Operative Cartilage” (Lecturer), June 23-24, 2007
- 07/07 Maryland Society for Rheumatic Diseases Summer Rheumatology Symposium, “Update on Rheumatologic Imaging Modalities” (Lecturer), Cambridge, MD
- 07/07 International Spinal Intervention Society, “State of the Art: Axial Lumbar Pain - Imaging (CT, MRI)” (Lecturer), “State of the Art: Axial Cervical Pain - Imaging (CT, MRI)” (Lecturer), Baltimore, MD
- 10/07 General Electric Healthcare Meeting, “Image Guided Spine Procedures (Lecturer),” Budapest, Hungary
- 10/07 MR-CT Update, “Update on Image Guided Spinal Procedures” (Lecturer), “Vertebral Augmentation: Past, Present and Future” (Lecturer), Boston, MA
- 01/08 NAON (National Association of Orthopaedic Nurses) – Baltimore Chapter, “Shoulder Imaging: Radiography (Lecturer),” Baltimore, MD
- 02/08 Hot Topics in MR Imaging for the Technologist, “MR Neurography” (Lecturer), “MR Arthrography: Applications” (Lecturer), “MRI of the Knee” (Lecturer), Johns Hopkins University, Baltimore, MD
- 03/08 33rd Annual Scientific Meeting of the Society of Interventional Radiology, “Disc Disease Intervention: Epidural Steroids, RF, IDET, Chymopapine and Ozone Therapy” (Lecturer), “Musculoskeletal Interventions: Expanding the Scope of IR” (Lecturer), Washington, D.C.
- 04/08 Radiology Review, “MRI of the Shoulder” (Lecturer), “MRI of the Foot and Ankle” (Lecturer), Harvard Medical School, Boston, MA
- 5/08 6th MAGNETOM World Summit, “MRI in Sports Medicine (Lecturer),” “Orthopaedics with 3T and Open Bore (Lecturer),” Munich, Germany, May 31, 2008
- 07/08 MedChi & Arthritis Foundation, Topics in Clinic Rheumatology, “Musculoskeletal Imaging – Current Concepts” (Lecturer), Baltimore, MD
- 09/08 The 4th Chinese Conference of Minimally Invasive Therapy in Oncology, “MRI-Guided Minimally Invasive Therapy and Its Development (Lecturer),” China, September 21, 2008
- 10/08 7th Annual Symposium on High Field MRI: The Impact on Clinical Practice, “High Field MR of Spinal Disease” (Lecturer), Las Vegas, NV
- 10/08 International Skeletal Society (ISS) Refresher Course, “MR Neurography” (Lecturer), New Delhi, India
- 01/09 NAON (National Association of Orthopaedic Nurses) – Baltimore Chapter, “Shoulder Imaging: MRI (Lecturer),” Baltimore, MD, January 14, 2009
- 02/09 Hot Topics in MR Imaging for the Technologist, “MRI of Joints” (Lecturer), Johns Hopkins University, Baltimore, MD
- 02/09 Harvard MRI Clinical Update and Practical Applications, “MRI of Inflammatory Arthropathies” (Lecturer), “MR techniques for Cartilage Imaging 1.5T versus 3T” (Lecturer), “Hip MRI and Femoroacetabular Impingement” (Lecturer), “High Resolution MRI of the knee and menisci using 3T” (Lecturer), Cancun, Mexico

- 05/09 Johns Hopkins Medicine International Meeting, “Imaging of Musculoskeletal Neoplasms and Tumor-Like Conditions (Lecturer),” Al Ain, United Arab Emirates, May 12, 2009
- 05/09 “Updates in Imaging of the Knee – Primary Care Approach to Treating the Injured Athlete” (Lecturer), Towson Orthopaedic Associates, Towson, MD
- 09/09 International Skeletal Society 36th Annual Imaging Update Courses, “Multichannel coils: Theory and Use in MSK Imaging” (Lecturer), Washington, DC
- 12/09 RSNA 95th Scientific Assembly and Annual Meeting, “Upper extremity nerve entrapment: Brachial plexus and Shoulder” (Lecturer), Chicago, IL
- 01/10 Musculoskeletal Imaging Symposium, “MR Neurography: Introduction and Applications” (Lecturer), “State of the Art Musculoskeletal MRI at 3T” (Lecturer), Jefferson Medical College, Philadelphia, PA, January 23, 2010
- 01/10 Hot Topics in MR Imaging for the Technologist, “MRI of Joints” (Lecturer), “MR Neurography” (Lecturer), Johns Hopkins University, Baltimore, MD
- 02/10 Radiological Society of New Jersey 2010 Musculoskeletal MRI Symposium, “Functional Joint Imaging” (Lecturer), “3T of the Musculoskeletal System” (Lecturer), “MR Neurography” (Lecturer), February 27-28, 2010, Iselin, NJ
- 03/10 Mixing Sun, Sand and Knowledge: Hot Topics and Burning Issues by the Beach, “MSK CT” (Lecturer), “Bone Contusion” (Lecturer), “Functional MSK Imaging” (Lecturer), “Neoplasms” (Lecturer), “3T MRI” (Lecturer), “Spine” (Lecturer), “MR neurography” (Lecturer), March 18-21, 2010
- 05/10 The Second Annual Ben Anderson Lectureship in Radiology, Scott & White, Texas A&M Health Science Center, College of Medicine, “3T MRI of the Musculoskeletal System (Lecturer),” Temple, TX, May 12, 2010
- 05/10 7th MAGNETOM World Summit, “Imaging of menisci and cartilage – 2D versus 3D (Lecturer),” “Imaging of rheumatoid arthritis (Lecturer),” Shenzhen, China, May 27-30, 2010
- 01/11 Hot Topics in MR Imaging for the Technologist, “3T MRI of the MSK System” (Lecturer), “MRI of Rheumatoid Arthritis” (Lecturer), “MR Neurography” (Lecturer), Johns Hopkins University, Baltimore, MD
- 01/12 Hot Topics in MR Imaging for the Technologist, “Update on Cartilage Imaging – Morphological and Biochemical” (Lecturer), “Making the most of 3Tesla MRI for Sports Medicine” (Lecturer), “MRI of Rheumatologic Conditions” (Lecturer), Johns Hopkins University, Baltimore, MD
- 07/12 ISIS 20th Annual Scientific Meeting, (Lecturer), “What MRI Findings are Relevant?” (Lecturer), “Biochemical Imaging” (Lecturer), Las Vegas, NV
- 08/12 6th Annual Joint Course: New Technology for the Treatment of Adult Hip and Knee Disorders, “FAI Imaging Studies: Current State of the Art” (Lecturer), “New Technologies for MRI Evaluation of Metal-on-Metal Hips” (Lecturer), Baltimore MD
- 08/12 21st Annual Current Issues of Magnetic Resonance Imaging in Orthopaedics and Sports Medicine, “Pardon the Interruption” MR Protocol Panel Discussion (Lecturer),” San Francisco, CA, August 28, 2012
- 09/12 International Skeletal Society’s Refresher Course, “Percutaneous intervention using MR guidance” (Lecturer), Rome, Italy
- 10/12 University of Zurich Symposium: Chronic Low Back Pain in People Older than 50, “Interventional Radiology in Patients with Chronic Low Back Pain” (Lecturer), Zurich, Switzerland
- 10/12 Management in Radiology Annual Scientific Meeting, “Radiology in Emergency Cases: How to decide between CT, US and MR (Lecturer),” Milan, Italy, October 12, 2012

- 11/12 International Spine Intervention Society (ISIS) Clinical Anatomy and Imaging (CAI) of the Spine (co-director, lecturer), Cambridge Massachusetts
- 11/12 American College of Rheumatology Annual Meeting State of the Art Symposium, "Musculoskeletal Radiology – A Critical Examination of Key Findings in the Rheumatic Diseases"(Lecturer), Washington, D.C.
- 01/13 Hot Topics in MR Imaging for the Technologist, "Metal Artifact Reduction techniques for MRI" (Lecturer), "Musculoskeletal 3D MRI" (Lecturer), Baltimore, MD
- 01/13 Baseball Medicine Conference: Injury, Treatment and Prevention Techniques, "MRI Shoulder & Elbow Anatomy (Lecturer)," Baltimore, MD, January 4, 2013
- 02/13 International Spine Intervention Society Cervical Procedures Bio-Skills Lab, (Instructor), Long Beach, CA
- 03/13 AAOS Annual Meeting Instructional Course Lecture, "MRI of the Spine: Essentials for the Orthopaedic Surgeon" (Lecturer), Chicago, IL
- 03/13 29th Annual Conference of Indian Radiological & Imaging Association, Karnataka State Chapter, "The Musculoskeletal Manifestations of Cardiothoracic Disorders (Lecturer)," Bangalore, India, March 17, 2013
- 04/13 ISMRM Annual Meeting, Challenges in Musculoskeletal Imaging, "Diagnosing Hip Labral Tear: Impingement & Dysplasia" (Lecturer), Salt Lake City, UT
- 04/13 9th Annual Advances in the Diagnosis and Treatment of the Rheumatic Diseases, "Imaging- MRI and Diagnoses of Rheumatic Diseases" (Lecturer), Baltimore, MD
- 07/14 3rd Heidelberg Summer School, Musculoskeletal Cross-Sectional Imaging 2014, "What a MSK radiologist should know about MR Neurography," Heidelberg, Germany, July 26, 2014
- 05/14 SMRT 23rd Annual Meeting, "Bone Marrow Abnormalities (Lecturer)," "Peripheral Nerve Imaging (Lecturer)," Milan, Italy, May 12, 2014
- 05/14 2014 Musculoskeletal MR meeting in Lugano: Hand and Wrist MRI, "Hand and wrist MR in Rheumatology. The radiologist (Lecturer)," Lugano, Switzerland, May 17, 2014
- 05/14 ISPNI 3rd International Conference and Course on Neuromuscular Ultrasound, "How to perform MR-guided interventions (Lecturer)," Vienna, Austria, May 22-24, 2014
- 07/14 7th International Workshop on Osteoarthritis Imaging (2014 IWOAI), "MRI advances and application in OA assessment (2D vs 3D, high field strength MRI, ultrashort echo (UTE) MRI) (Lecturer)," Reykjavik, Iceland, July 9-12, 2014
- 08/14 North American Spine Society 29th Annual Meeting, Section on Radiology: Imaging of the Spine: Spectrum of Disease and Live/Interactive Case Reviews, "MRI Essentials: Physics and Pulse Sequences (Lecturer)," "Advanced Techniques in Spinal Imaging (Lecturer)," San Francisco, CA, November 11, 2014
- 08/14 North American Spine Society 29th Annual Meeting, Section on Radiology: Controversies in Spine Imaging, "Vertebral Lesions: Benign Hemangiomas versus Malignancy," and "Postoperative Collection: Infection versus Seroma," San Francisco, CA, November 12, 2014
- 09/14 Ploga-Sachsse Lecture, Baystate Medical Center, "Musculoskeletal Multimodality Imaging and the role of Radiography: Yesterday, Today and Tomorrow (Lecturer)," Springfield, MA, September 11, 2014
- 09/14 Pudendal Neuralgia Conference, Universidad Central del Caribe and Pudendal Neuralgia Association, Inc., "Magnetic Resonance Neurography (Lecturer)," Waltham, MA, September 27, 2014

- 10/14 ISIS Lumber Procedures Bio-Skills Lab (Lecturer), Memphis, TN, October 11-12, 2014
- 10/14 ISIS Society Clinical Anatomy & Imaging of the Spine Course (Lecturer), Chicago, IL, October 25-26, 2014
- 10/14 New York Roentgen Society Annual Meeting (Moderator), New York, NY, October 24, 2014
- 10/14 ISMRM 10th Interventional MRI Symposium, “3 Tesla MR-guided interventions in chronic pelvic pain syndromes: Initial clinical experiences (Lecturer),” “3 Tesla MR-guided injections in patient with neurogenic thoracic outlet syndrome: Initial Clinical Experience (Lecturer),” “Technical feasibility of MR-guided vertebral cryoablation: Assessment in a porcine model (Lecturer),” Leipzig, Germany, October 10-11, 2014
- 01/15 ISIS Lumbar Procedures Bio-Skills Lab (Lecturer), Phoenix, AZ, January 9-11, 2015
- 01/15 ISIS, “Evidence-Based Spine Interventions: A Seminar for Residents and Fellows (Lecturer),” San Francisco, CA, January 17-18, 2015
- 02/15 American Society of Spine Radiology (ASSR) 2015 Annual Symposium, “Spine Potpourri: MR Neurography (Lecturer),” Las Vegas, NV, February 5-8, 2015
- 05/15 American College of Radiology, “Primer of Personalized Medicine for Radiology Practices (Lecturer),” Washington, DC, May 21, 2015
- 05/15 International Skeletal Society Regional Outreach Program, Special Musculoskeletal Workshop for Young Radiologists, “Sports-related Injuries of the Spine (Lecturer),” “Benign vs. Malignant Vertebral Compression Fractures (Lecturer),” “Multiparametric MRI of MSK Tumors (Lecturer),” “Imaging Spectrum of Muscle Injuries (Lecturer),” Quito, Ecuador, May 29-30, 2015
- 10/15 ISIS Cervical Procedures Bio-Skills Lab (Lecturer), New Orleans, LA, October 9-11, 2015
- 10/15 SIS CAI, “Imaging Techniques (Lecturer),” “Vertebral Enumeration (Lecturer),” “Sacrum Pathology, Sacroiliac Joint (Lecturer),” “Thoracic Pathology (Lecturer),” Fort Worth, TX, October 24-25, 2015
- 11/15 ASRA 14th Annual Pain Meeting, “Image Overlay Systems to Help Guide Interventional Procedures (Lecturer),” “Can Radiologic Findings Suggest a Pathophysiology of Lumbar Spinal Stenosis and Guide Treatment (Lecturer),” Miami, FL, November 19-21, 2015
- 11/15 ASRA Annual Pain Meeting, “Imaging Safety and Anatomic Correlations: Assimilating the Information and Limiting Patient Risk: Image Overlay Systems to Help Guide Interventional Procedures (Lecturer),” “Imaging Safety and Anatomic Correlations: Panel Discussion and Open Forum (Lecturer),” “Lumbar Spinal Stenosis and Epidural Steroids: Can Radiologic Findings Suggest a Pathophysiology of Lumbar Spinal Stenosis and Guide Treatment? (Lecturer),” “Lumbar Spinal Stenosis and Epidural Steroids: Panel Discussion and Open Forum (Moderator),” Miami, FL, November 21, 2015
- 11/15 RSNA, “Magnetic Resonance Neurography as an Adjunct for Back Pain and Extrapinial Sciatica (Lecturer),” Chicago, IL, November 30, 2015
- 02/16 2016 ASSR Symposium, “MR Neurography including Brachial Plexus (Lecturer),” Bonita Springs, FL, February 18-21, 2016
- 03/16 2016 AAOS Monthly Meeting, “MRI of the Spine, Essentials for the Orthopaedic Surgeon (Moderator),” Orlando, FL, March 1, 2016
- 03/16 SIS Cervical Course, “Anatomy and Imaging Techniques (Instructor),” Amsterdam, Netherlands, March 11-13, 2016
- 04/16 3rd Musculoskeletal MRI Meeting 2016: Shoulder MRI, “MR Imaging of acromioclavicular and sternoclavicular joint (Lecturer),” “MR imaging of shoulder injuries in

- overhead athletes (Lecturer),” Lugano, Switzerland, April 23, 2016
- 04/16 JPR 2016 RSNA, “Patellofemoral Imaging (Lecturer),” “Applying Literature Based Deductions into your Radiology Research (Lecturer),” “MR Neurography (Lecturer),” “CT for Bone Health (Lecturer),” “Radiation Dose and Safety in MSK Imaging (Lecturer),” Sao Paulo, Brazil, April 27 – May 1, 2016
- 05/16 Spine Intervention Society, “Advanced Lumbar (Instructor),” Cumberland, RI, May 13-15, 2016
- 05/16 ASNR Self-Assessment Module Session, “MR Neurography: Plexus and Peripheral Neurography (Lecturer),” Washington, DC, May 25, 2016
- 08/16 26th Annual Baltimore Limb Deformity Pre-Course, Masters of Disaster: Managing Osteomyelitis in the 21st Century, "Best Diagnostic Studies: Evaluation with Radiography, Magnetic Resonance Imaging, and Nuclear Medicine (Lecturer)," Baltimore, MD, August 25, 2016
- 09/16 ISS Annual Meeting, "Proximal Hamstring Attachment Complex Anatomy and Pathology (Lecturer)," Paris, France, September 9, 2016
- 09/16 SIS Cervical Course, “Spinal Imaging (Instructor),” “Cervical Transforaminal (Instructor),” “Transforaminal Epidural (Instructor),” “Case Presentations (Instructor),” Tampa, FL, September 23-24, 2016
- 11/16 Spine Interventional Society (SIS) Advanced Cervical Course, “Didactic Lectures: Contrast Patterns (Instructor),” Long Beach, CA, November 11-12, 2016
- 11/16 American Society of Regional Anesthesia (ASRA), “Basic Neuroimaging (Lecturer),” “Imaging in Pain/Making Rational Choices when Selecting the best Images (Lecturer),” “Ask the Expert: Reading and Interpretation of Spinal Imaging: MRI, CT, SPECT, Myelogram (Lecturer),” “How to Best Choose Your Imaging Test in Patients with Pain (Lecturer),” San Diego, CA, November 18, 2016
- 12/16 2016 RSNA DICOM Session, “Muscle Imaging: Beyond the Basics – Advanced MRI Techniques; Myositis, Myopathy and More (Lecturer),” Chicago, IL, December 1-2, 2016
- 01/17 NANS, "Radiological Findings in Pain of Spinal Origin (Lecturer)," Las Vegas, NV, January 20, 2017
- 01/17 10th French-Israeli Course in Radiology, “What Lumbar MRI findings are relevant? (Lecturer),” Tel Aviv, Israel, January 30, 2017
- 02/17 19th Annual Cleveland Clinic Pain Management Symposium, “Anatomic Imaging for Pain Evaluation (Lecturer),” “Choosing the Best Imaging Study (Lecturer),” “Imaging the Cervical Spine (Lecturer),” Orlando, FL, February 3-6, 2017
- 02/17 ASSR 2017 Annual Symposium, “MRI Guided Spinal Interventions (SAMs), (Lecturer),” San Diego, CA, February 23-24, 2017
- 03/17 NERRS Annual Meeting, “Post-Op Knee and Hip Arthroplasties (Lecturer),” Boston, MA, March 10, 2017
- 03/17 AAOS Annual Meeting, “MRI of the Spine: Essentials of the Orthopaedic Surgeon (Moderator),” San Diego, CA, March 14, 2017
- 03/17 Society of Skeletal Radiology SAMs Course, “Peripheral Nerve Imaging (Lecturer),” Santa Barbara, CA, March 19, 2017
- 04/17 2017 OARSI World Congress on Osteoarthritis, “Imaging (Lecturer),” Las Vegas, NV, April 27-30, 2017
- 05/17 Global Spine Course, “Mismatches between imaging and clinical findings (Lecturer),” “Clinical relevance of degenerative manifestation of the lumbar spine (Lecturer),” Milan, Italy, May 5, 2017

- 05/17 SSSR 4th Annual MRI Meeting: Spine MRI, “Clinical relevance of degenerative manifestation of the lumbar spine (Lecturer),” “Infectious Spine and its Mimics (Lecturer),” Lugano, Switzerland, May 6, 2017
- 06/17 SIS Bio Skills Lecture Course, “Complications Case Review – A Discussion of Correlative Anatomy (Lecturer),” “Imaging of the Cervical Spine (Lecturer),” “Imaging of the Lumbar Spine (Lecturer),” Biddeford, ME, June 2-4, 2017
- 06/17 Annual ORP Meeting, “Sports Injuries of the Spine (Lecturer),” “MRI of Shoulder Injuries in Overhead Athletes (Lecturer),” “Magnetic Resonance Neurography (Lecturer),” Montevideo, Uruguay, June 7-12, 2017
- 11/17 SIS Imaging Anatomy for the Spine Interventionalist, “Basics of Imaging Techniques: MRI (Lecturer),” “A Confounder in the Differential Diagnosis of Lumbar Radicular Pain: Basic Hip Imaging (Lecturer),” “Anatomy: Rib Articulations, Costovertebral and Costotransverse Joints (Lecturer),” “Thoracic Outlet Syndrome and the Brachial Plexus (Lecturer),” “The Lumbosacral Plexus and Piriformis Syndrome (Lecturer),” Washington, DC, November 4-5, 2017
- 11/17 SIS Cervical Procedures Bio-Skills Lab, “Spinal Imaging (Lecturer),” November 11, 2017, Tempe, AZ
- 01/18 NASS Science Care Course, “Fluoroscopic Anatomy and Radiation Safety (Lecturer),” Phoenix, AZ, January 26, 2018
- 02/18 14th Danish Annual Congress of Sports Medicine, “The Use of MRI in Diagnosis of Nerve Impingement in Sports (Lecturer),” Copenhagen, Denmark, February 3, 2018
- 03/18 Carestream OnSight 3d Extremity System – Point of Care CBCT, “Evolution of CBCT (Lecturer),” Vienna, Austria, March 2, 2018
- 04/18 ASRA 2018 World Congress, “Advances in Imaging to Improve Clinical Diagnosis Capabilities”, New York, NY, April 20, 2018
- 04/18 ASRA 2018 World Congress, “Pathologic Findings on Radiographic Imaging”, New York, NY, April 21, 2018
- 04/18 ARRS 2018, “MRI of the Knee”, Washington, DC, April 22, 2018
- 04/18 ARRS 2018, “Peripheral Nerves: Imaging and Interventions”, Washington, DC, April 27, 2018
- 05/18 JPR 48th Annual Meeting, “MR Neurography: State of Art”, Sao Paulo, Brazil, May 3, 2018
- 05/18 JPR 48th Annual Meeting “Imaging in Bone Health”, Sao Paulo, Brazil, May 3, 2018
- 05/18 JPR 48th Annual Meeting “Applying Literature Based Deduction into your Radiology Research”, Sao Paulo, Brazil, May 4, 2018
- 05/18 JPR 48th Annual Meeting, “Spine Pathology: From Infection to Fracture”, May 4, 2018
- 07/18 IWOAI 11th Annual Meeting, “The Role of Extremity CT Imaging in OA (Technical, Clinical, Research), Menton, France, July 6, 2018
- 07/18 AAPM 2018, “Structural and Functional Imaging Techniques Across Body Systems”, Nashville, TN, July 30, 2018
- 09/18 ISS 2018, “MR Neurography of Extra-Spinal Sciatica”, Berlin, Germany, September 28, 2018
- 11/18 SIS Imaging Anatomy for the Spine Interventionalist, “Contrast Media: Safety and Utility”, San Francisco, CA, November 3, 2018
- 11/18 SIS Imaging Anatomy for the Spine Interventionalist, “Basics of Imaging Technique: MRI”, San Francisco, CA, November 3, 2018
- 11/18 SIS Imaging Anatomy for the Spine Interventionalist, “Sacroiliac Joint Anatomy, Function, and Normal Imaging”, San Francisco, CA, November 3, 2018

- 11/18 SIS Imaging Anatomy for the Spine Interventionalist, “Spondyloarthropathies”, San Francisco, CA, November 3, 2018
- 11/18 SIS Imaging Anatomy for the Spine Interventionalist, “Brachial Plexus and Thoracic Outlet Syndrome”, San Francisco, CA, November 4, 2018
- 11/18 SIS Imaging Anatomy for the Spine Interventionalist, “Lumbosacral Plexus and Piriformis Syndrome (Extraspinal Sciatica)”, San Francisco, CA, November 4, 2018
- 11/18 ASRA 17th Annual Pain Medicine Meeting, “Future of Imaging: Ultrasound and MRI in Pain Medicine/MR Neurography: Clinical Applications”, San Antonio, TX, November 17, 2018
- 01/19 SIS Disc Access Bio-Skills Lab, “Disc Anatomy and Imaging”, Long Beach, CA, January 12, 2019
- 01/19 NASS Hands on Course, “Lumbar Spine Injection”, Phoenix, AZ, January 26, 2019
- 03/19 AHRA Spring Conference, “Challenges and Opportunities for Radiology to Prove Value in Alternative Payment Models”, San Antonio, TX, March 8, 2019
- 05/19 SSSR 6th International Musculoskeletal MRI Meeting 2019, “Sterno Clavicular Joint”, Milan, Italy, May 25, 2019
- 05/19 SSSR 6th International Musculoskeletal MRI Meeting 2019, “MRI of the elbow in throwing athletes”, Milan, Italy, May 25, 2019
- 06/19 NASS Injection Course, “Fluoroscopic Anatomy & Radiation Safety”, Burr Ridge, IL, June 21, 2019
- 07/19 AHRA Annual Meeting 2019, "Challenges and Opportunities for Radiology to Prove Value in Alternative Payment Models", Denver, CO, July 21, 2019
- 08/19 SIS Annual Meeting 2019, “Frontiers in Fluoroscopy: Digital 3-D X-ray Imaging”, New York, NY, August 15, 2019
- 08/19 SIS Annual Meeting 2019, “Magnetic Resonance Neurography”, New York, NY, August 17, 2019
- 09/19 International Skeletal Society Annual Meeting 2019, "MRI of Peripheral Nerves: Influence on Medical Decision Making", Vancouver, BC, September 13, 2019
- 07/21 American Society of Spine Radiology, Adult Diagnostic Section, Spine Saturday School. “Basic and Advanced Neurography”. Webinar. July 31, 2021.
- 09/21 Spine Intervention Society Lumbar Procedures Bio Skills Lab. “Spine Imaging” Aurora, Colorado. September 11, 2021.
- 08/21 Musculoskeletal CORE Lecture. New York Presbyterian. “Arthritis”. August 27, 2021.
- 10/21 Spine Intervention Society Lumbar Procedures Bio Skills Lab. “Spine Imaging”. Dallas, Texas. October 23, 2021
- 01/22 Imaging and Anatomy Course instructor. Spine Intervention Society (SIS). Baltimore, Maryland. January 29-30, 2022
- 03/22 Musculoskeletal Diseases: Sport Related Injuries of the Paediatric Musculoskeletal System. 52nd International Diagnostic Course (IDKD). Davos, Switzerland March 27 - 31, 2022.
- 04/22 Cervical Spine: Imaging and Anatomy. Spine Intervention Society (SIS) Phoenix, AZ. April 23-24, 2022.
- 04/22 Synthetic CT; Scientific Session: Imaging. SPARTAN 20th Annual Meeting. Madison, WI. April 29th, 2022
- 06/22 Intensive Anatomy. Spine Intervention Society (SIS). Biddeford, Maine. June 10-11, 2022.
- 08/22 Musculoskeletal CORE Lecture. New York Presbyterian. “Arthritis”. August 22, 2022.

- 09/22 MR Neurography: How to Implement in Clinical Practice. MR neurography-Techniques and Clinical Application. AOCR 2022 & KCR 2022 Annual Conference. Seoul, Korea. September 29, 2022.
- 10/22 Economics of Artificial Intelligence for Radiology. HSS 104 Annual Alumni Association Meeting. New York, NY. October 21, 2022.
- 10/22 Musculoskeletal Radiology. 3rd Annual University of Arizona College of Medicine-Phoenix Virtual Medical Student Radiology Symposium. Virtual. October 22, 2022.
- 11/22 Levin D, **Carrino JA**, Buly R, Christensen A, Ripley B. 3D Printing for Cardiac and Musculoskeletal Applications with Interactive Clinical Perspectives. RSNA 108th Scientific Assembly and Annual Meeting. Chicago, IL. November 28, 2022.
- 11/22 **Carrino JA**, Cotton A, Mandell JC, Omoumi P, Pfirrmann CWA. Spine Degeneration and Inflammation: Misses that Matter. RSNA 108th Scientific Assembly and Annual Meeting. Chicago, IL. November 29, 2022.
- 02/23 'What MRI Findings are Relevant?'. ASSR Annual Meeting. Charleston, SC. February 11, 2023.
- 02/23 Shi G, Quevedo Gonzalez FJ, Breighner RE, **Carrino JA**, Siewerdsen JH, Zbijewski W. Effects of non-stationary blur on texture biomarkers of bone using Ultra-High-Resolution CT. SPIE Medical Imaging Conference 2023. San Diego, California. February 19 - 23, 2023.

2. Grand Rounds

- 04/96 Department of Radiology Resident Conference, "Imaging of osseous and soft tissue Tumours (Lecturer)," Thomas Jefferson Hospital, Philadelphia, PA
- 09/97 University of Texas Health Science Center at San Antonio MRI Visiting Fellowship Curriculum, "MR Imaging of the Shoulder (Lecturer)," "Differential Diagnosis of Marrow Disease (Lecturer)," San Antonio, TX
- 11/97 University of Texas Health Science Center at San Antonio MRI Visiting Fellowship Curriculum, "MR Imaging of the Shoulder (Lecturer)," "Differential Diagnosis of Marrow Disease (Lecturer)," San Antonio, TX
- 02/98 University of Texas Health Science Center at San Antonio MRI Visiting Fellowship Curriculum, "MR Imaging of the Shoulder (Lecturer)," "Differential Diagnosis of Marrow Disease (Lecturer)," San Antonio, TX
- 08/99 Harvard Medical School, Imaging Physics Mini-Course Curriculum, Boston, MA
- 11/00 Department of Radiology, Christiana Hospital, "Arthritis Imaging (Lecturer)," Wilmington, DE
- 11/00 Department of Orthopedics at the Rothman Institute, Thomas Jefferson University Hospital, "Imaging of Degenerative disc disease and related syndromes (Lecturer)," Philadelphia, PA
- 03/01 Thomas Jefferson University Hospital, Department of Rheumatology Clinical Rounds, "Imaging of Degenerative Disc Disease and Related Syndromes (Lecturer)," Philadelphia, PA
- 09/01 Thomas Jefferson University Hospital, Department of Rheumatology Clinical Rounds, "Overview of Arthritis Imaging (Lecturer)," Philadelphia, PA
- 12/01 Thomas Jefferson University Hospital, Department of Radiology, "Spine Injections: Indications and Techniques (Lecturer)," Philadelphia, PA
- 12/01 Thomas Jefferson University Hospital, "Imaging Quality in the Electronic Environment (Lecturer)," Philadelphia, PA
- 01/02 Wilford Hall Medical Center, USAF, Department of Radiology, "Overview of Image Guided Spine Procedures: Indications and Techniques (Lecturer),"

- “MR Imaging of the Wrist: Normal Anatomy and Common Pathological Conditions (Lecturer),” San Antonio, TX
- 01/02 The University of Texas Health Science Center at San Antonio
Musculoskeletal Imaging Curriculum, “MR Imaging of the Wrist, Overview,”
San Antonio, TX
- 03/02 Thomas Jefferson University Hospital Department of Rehabilitation Medicine,
“Musculoskeletal Anatomy (Lecturer),” “Musculoskeletal Procedures
(Lecturer),” Philadelphia, PA
- 03/02 Thomas Jefferson University Hospital, Department of Radiology, “The Use of
Technology to Improve Workflow: The 7 habits of highly effective PACS
(Lecturer),” Philadelphia, PA
- 05/02 Boston University Medical Center Department of Radiology, “Update on
imaging of Degenerative Disc disease (Lecturer),” “MR Imaging of the
shoulder labrum: Normal Anatomy, Variants and Pathology (Lecturer),”
Boston, MA
- 04/03 Cape Cod Hospital Cancer Committee, “Percutaneous Image Guided Bone
Augmentation Procedures (Lecturer),” Hyannis, MA
- 04/03 Boston Medical Center Musculoskeletal Imaging Curriculum, “Differential diagnosis
of lower extremity MR imaging bone marrow edema patterns (Lecturer),” “Upper
Extremity Trauma (Lecturer),” “Lower Extremity Trauma (Lecturer),” “Pelvis
(Lecturer),” “Spine Pain: Beyond the usual suspects (Lecturer),” “Thoracolumbar
Spine Trauma (Lecturer),” Boston, MA
- 06/03 Brigham Women’s Hospital Orthopaedic Radiology, “Sacrum, SI Joints,
Sacral Plexus” (Lecturer), “Imaging of the Post-Operative Spine” (Lecturer),
“Low Back Pain and Radiculopathy” (Lecturer), Boston, MA
- 07/03 Boston Medical Center Musculoskeletal Imaging Curriculum, “Differential
diagnosis of lower extremity MR imaging bone marrow edema patterns
(Lecturer),” “Upper Extremity Trauma (Lecturer),” “Lower Extremity Trauma
(Lecturer),” “Pelvis (Lecturer),” “Spine Pain: Beyond the usual suspects
(Lecturer),” “Thoracolumbar Spine Trauma (Lecturer),” Boston, MA
- 10/03 Boston Medical Center Musculoskeletal Imaging Curriculum, “Differential
diagnosis of lower extremity MR imaging bone marrow edema patterns
(Lecturer),” “Upper Extremity Trauma (Lecturer),” “Lower Extremity Trauma
(Lecturer),” “Pelvis (Lecturer),” “Spine Pain: Beyond the usual suspects
(Lecturer),” “Thoracolumbar Spine Trauma (Lecturer),” Boston, MA
- 12/03 Hospital of St. Raphael Department of Radiology, “Overview of Spine MR
Imaging (Lecturer),” New Haven, CT
- 12/03 Yale New Haven Hospital Department of Radiology, “Musculoskeletal
Radiology Frontiers: Interventional MRI (Lecturer),” New Haven, CT
- 09/04 Baystate Medical Center Grand Rounds, “Vertebral Compression Fracture
Imaging (Lecturer),” “Musculoskeletal Interventional MRI (Lecturer),”
Springfield, MA
- 06/05 Harvard Combined Orthopaedic Training Program, “New Horizons in
Musculoskeletal Imaging (Lecturer),” Boston, MA
- 12/06 Johns Hopkins University Rheumatology Grand Rounds, “Advances in MRI
for Rheumatology,” Baltimore, MD
- 03/07 Georgetown University Radiology Grand Rounds, “New Musculoskeletal
Imaging Techniques (Lecturer),” Washington, DC
- 11/07 Johns Hopkins University Computer Integrated Surgery Whiting School of
Engineering, “Image Guided Therapy (Lecturer),” Baltimore, MD

- 06/08 E.F. Shaw Wilgis Lectureship in Hand Surgery, Union Memorial Hospital, "High Resolution MRI of the Wrist (Lecturer)," Baltimore, MD, June 21, 2008
- 12/08 University of Maryland School of Medicine Department of Diagnostic Radiology and Nuclear Medicine Grand Rounds, "3T Musculoskeletal Imaging (Lecturer)," December 17, 2008
- 03/11 Mallinckrodt Institute of Radiology, University of Washington Grand Rounds, "MR Neurography (Lecturer)," St. Louis, MO, March 2, 2011
- 03/11 Yale Radiology Centennial Anniversary Grand Rounds, "3T MRI of the Musculoskeletal System (Lecturer)," New Haven, CT, March 31, 2011
- 04/11 Hospital of Saint Raphael Grand Rounds, "MR Neurography (Lecturer)," New Haven, CT, April 1, 2011
- 09/12 Johns Hopkins Department of Physical Medicine and Rehabilitation Residency Program, "MSK Radiology with a Focus on Hip and Knee MRI (Lecturer)," Baltimore, MD
- 10/12 University of Basel Visiting Professor, "MR Neurography (Lecturer)," Basel, Switzerland, October 26, 2012
- 01/13 Baptist Health South Radiology Grand Rounds, "Magnetic Resonance Neurography (Lecturer)," Miami, FL, January 14, 2013
- 02/13 George Washington University Resident Rounds, "MR imaging of Rheumatic Conditions (Lecturer)," Washington, DC, February 20, 2013
- 05/13 Johns Hopkins Rheumatology Rounds Case Conference, Baltimore, MD
- 08/13 Baxter Regional Medical Center Radiology Grand Rounds "3T MRI (Lecturer)," Mountain Home, AR, August 10, 2013
- 06/14 Hospital for Special Surgery Metabolic Bone Disease Grand Rounds, "Advanced Computed Tomography Imaging for Bone Health (Lecturer)," New York, NY, June 9, 2014
- 06/15 Hospital for Special Surgery Metabolic Bone Disease Service Grand Rounds Lecture, "What Everyone Should Know About Osteoporosis and How it Affects our Patient Population (Lecturer)," New York, NY, June 12, 2015
- 12/15 Hospital for Special Surgery RCA: Spine InService, "Vertebral Enumeration Variability and Implications for Procedures and Surgeries (Lecturer)," New York, NY, December 10, 2015
- 12/15 Hospital for Special Surgery Spine Research Staff, "Spine Radiology Covering Various Modalities (Lecturer)," New York, NY, December 16, 2015
- 01/16 Hospital for Special Surgery Metabolic Bone Disease Journal Club (Lecturer), New York, NY, January 25, 2016
- 04/16 Hospital for Special Surgery Physiatry Grand Rounds, "Vertebral Enumeration Variability (Lecturer)," New York, NY, April 19, 2016
- 08/16 "Peripheral Nerve Imaging with MRI and US (Lecturer)," Butterworth Hospital, Grand Rapids, MI, August 5, 2016
- 09/16 NYPH Resident Conference, "Metabolic Bone (Lecturer)," New York, NY, September 29, 2016
- 11/16 Brachial Plexus Conference, "Sharon Darko (Instructor)," Hospital for Special Surgery, New York, NY, November 16, 2016
- 04/17 BIDMC Grand Rounds, "Challenges and Opportunities for MSK Radiology to Prove Value in Alternative Payment Models (Lecturer)," Boston, MA, April 7, 2017
- 09/17 Neurology Grand Rounds, "Advanced Neuromuscular Imaging (Lecturer)," Hospital for Special Surgery, New York, NY, September 8, 2017

- 01/18 Rheumatology Fellows' Talk, "MRI Primer for Rheumatologists (Lecturer)," Hospital for Special Surgery, New York, NY, January 24, 2018
- 01/18 Copenhagen University, Bispebjerg and Frederiksberg Hospital, Department of Radiology, "MR Neurography – What a Musculoskeletal Radiologist Should Know (Lecturer)," Copenhagen, Denmark, January 31, 2018
- 02/18 NYPH Resident Conference, "Spine MRI (Lecturer)," New York, NY, February 27, 2018
- 10/20 Diagnosis and Intervention, MSK Radiology, Invited Lecture, Johns Hopkins. October 13, 2020.
- 02/22 Musculoskeletal Grand Rounds. Albert Einstein College of Medicine-Montefiore Medical Center, Jacobi Medical Center. New York, NY. February 8, 2022.
- 03/22 Rheumatology Grand Rounds, Hospital for Special Surgery. New York, NY. March 16, 2022.
- 07/22 Spine Grand Rounds. Hospital for Special Surgery. New York, NY. July 25, 2022.
- 08/22 Athlete Spine Multidisciplinary Journal Club. Hospital for Special Surgery. New York, NY. August 18, 2022.
- 08/22 Spine Grand Rounds. Hospital for Special Surgery. New York, NY. August 22, 2022.
- 09/22 Spine Grand Rounds. Hospital for Special Surgery. New York, NY. September 26, 2022.
- 10/22 Athletes Spine Grand Round. Hospital for Special Surgery. New York, NY. October 17, 2022.
- 10/22 Spine Grand Rounds. Hospital for Special Surgery. New York, NY. October 24, 2022.

L. PROFESSIONAL MEMBERSHIPS

Member/Officer/Fellow/Role	Organization	Dates
Member	American Medical Informatics Association (AMIA)	1987 – present
Member	American Roentgen Ray Society (ARRS) ARRS, Scientific Program Subcommittee,	1991 – present 2006 – 2007
Member	Radiological Society of North American (RSNA) RSNA Scientific Exhibit Committee RSNA RadLex Committee RSNA Research Study Review Section RSNA Template Library Advisory Panel (TLAP)	1991 – present 2004 – 2007 2005 – present 2006 – 2007 2014 – present
Member	Society for Computer Applications (SCAR)/ Society for Imaging Informatics in Medicine (SIIM) Research and Development Committee Board of Directors Scientific Symposium Committee	1992 – present 2001 – 2005 2002 – 2005 2002 – 2005

Member	American Society of Emergency Medicine (ASER)	1995 – 1998
Member	Society of Skeletal Radiology (SSR)	1996 – 2010
Member	International Spinal Intervention Society (ISIS) ISIS Instructor	1996 – present 2003 – present
Member President Secretary	International Society for Magnetic Resonance in Medicine (ISMRM) ISMRM Interventional MRI Study Group ISMRM Musculoskeletal Study Group	1996 – present 2003 – present 2004 – present 2005 – 2006 2006 – 2007
Member	American Society for Bone and Mineral Research (ASBMR)	1997 – 1999
Member	American College of Radiology (ACR) DICOM committee ITIC	1997 – present 1997 – present 2008 – present
Member	American Society of Musculoskeletal Radiology (ASMR)	1998 – 1999
Member	Association of University Radiologist (AUR)	2001 – present
Member	Society for Pain Practice Management Instructor	2002 – present 2006 – present
Member	American Society of Spine Radiology (ASSR)	2003 – present
Member	American Pain Society (APS) Low Back Pain Clinical Algorithm Committee	2005 – present
Member	North American Spine Society (NASS)	2010 – present
Member	Medical Image Perception Society	2013 – present
Member	European Society of Radiology	2014 – present
Member	Quantitative Imaging Biomarkers Association (QIBA)	2016 – present
Member	HANYS HIT Strategy Group	2017 – present
Fellow	American College of Radiology	2022 – present

M. HONORS AND AWARDS

Name of award	Date awarded
Phi Eta Sigma (Undergraduate Freshman Honor Society), George Washington University	1983
Alpha Epsilon Delta (Pre-Medical Honor Society), George Washington University	1985

Phi Beta Kappa (National Honor Society), George Washington University	1985
Omicron Delta Kappa (National Leadership Honor Society), George Washington University	1986
Alpha Omega Alpha (National Medical Honor Society), George Washington University	1989
Kane King Dodek Honor Society (Obstetrics - Gynecology), George Washington University	1990
Wilford Hall Medical Center Service Award (teaching, research, and evolution of a filmless department), USAF	1998
George Marina Teaching Award (Radiology Teacher of the Year), BWH Radiology Department, Harvard Medical School	1999
GE Radiology Research Academic Fellowship (GERRAF) Award (Career Development Grant), AUR/GE	2004
Distinguished Faculty Award (Educational Effectiveness), Society of Interventional Radiology	2005
Best Paper (“Does discography cause accelerated progression of degeneration changes in the lumbar disc: a ten-year matched cohort study”), The International Society for the Study of the Lumbar Spine (ISSLS)	2009
Eyler Editorial Fellowship Award (Radiology/Radiographics Journals), RSNA	2011
Baltimore Magazine Top Doctors	2010
Certificate of Merit, Education Exhibit, “High Resolution Magnetic Resonance Imaging of the Patellar Retinaculum: Normal anatomy, common injury patterns and pathologies” ECR (European Congress of Radiology)	2011
Cum Laude Electronic Poster Award (“MR neurography-guided injection procedures for the diagnosis and treatment of pelvic pain syndromes”), CIRSE (Cardiovascular and Interventional Radiological Society of Europe)	2012
Certificate of Merit, Education Exhibit (“Spectrum of Superficial Nerve Related Tumor and Tumor-like Lesions - MR Imaging Features”), 98th Scientific Assembly and Annual Meeting of the Radiological Society of North America	2012
Patent, Siewerdsen JH, Muhit A, Carrino JA. Integration of Calibration and Imaging for Quantitative CT. Report of Invention, Johns Hopkins University (C11925)	2012
RSNA Honored Educator Award, Radiological Society of North America	2013
Arthroscopy Association of North America/Patellofemoral Foundation 2014 Patellofemoral Surgical Anatomy Excellence Award. "Correlation between Changes in Tibial Tuberosity—Trochlear Groove Distance and Patellar Position during Active Knee Extension on Dynamic Kinematic Computed Tomography Imaging." Tanaka MJ, Elias JJ, Williams AA, Carrino JA, Cosgarea AJ.	2014

RSNA Honored Educator Award, Radiological Society of North America	2015
Outstanding oral presentation, “Does provocative discography cause clinically important injury to the lumbar intervertebral disc? A ten-year matched cohort study”, International Society for the Study of the Lumbar Spine, ISSLS Annual Meeting, San Francisco, CA	2015
“Best Doctors in America 2015-2016 Database”, Best Doctors	2015
“Certificate of Merit” for <i>3D CT Analysis of the Femoral Head and Acetabulum in Hip Impingement Syndromes: What the Surgeon Wants to Know</i> , 101st Scientific Assembly and Annual Meeting of the Radiological Society of North America, November 29-December 4, 2015, McCormick Place, Chicago, Illinois	2015
“Top Doctors,” Castle Connolly	2016
Minnie Award: Best New Radiology Device <i>Onsight 3D extremity imaging CT scanner, Carestream Health</i>	2016
AUR Trainee Prize, 2 nd Place for Scientific Paper, 2016	2016
Moses Greenfield Award for Best Paper, “Cascaded systems analysis of photon counting detectors,” <i>Medical Physics</i> , 41, 101907 (2014), June 2016	2016
Certificate of Merit, “Myositis, Myopathy, and More: Advanced MRI Techniques for Muscle Imaging,” <i>103rd Scientific Assembly and Annual Meeting of the Radiological Society of North America</i>	2017
HIMSS, Stage 7 Institution, Radiology IT Director	2017
“Top Doctors,” Castle Connolly	2017
Best Paper Award, “Dos Lumbar Spine Pathology Affect Bone Mineral Density Measurement by Quantitative Computed Tomography (QCT)?” <i>11th Annual Meeting of the Lumbar Spine Research Society</i> , April 2018	2018
“Top Doctors,” Castle Connolly	2018
“Top Doctors,” Castle Connolly	2019
“Top Doctors,” Castle Connolly	2020
RSNA Trainee Research Prize (Musculoskeletal Category) for “Evaluation of Deep-Learning Reconstructed High-Resolution 3D Lumbar Spine MRI to Improve Image Quality”	2021
Charles Christian Award for Excellence in Musculoskeletal Research for “Evaluation of Deep-Learning Reconstructed High-Resolution 3D Lumbar Spine MRI to Improve Image Quality” at HSS Clinical Fellow Research Day	2021
“Top Doctors” New York Metro Area, Castle Connolly	2021
New York Magazine: Top Doctors	2021
Fellowship, American College of Radiology (FACR)	2022

“Top Doctors” New York Metro Area, Castle Connolly	2022
New York Magazine: Top Doctors	2022
“Top Doctors,” Castle Connolly	2023

N. BIBLIOGRAPHY

Articles in professional peer-reviewed journals

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2. Brenner ML, Morrison WB, **Carrino JA**, Nusser CA, Howard RF, Meier PA. Direct MR Arthrography of the Shoulder: Is Exercise Prior to Imaging Beneficial or Detrimental? *Radiology* 2000 May; 215(2): 491-496.
3. **Carrino JA**, Khorasani R, Hanlon WB, Seltzer SE. Modality interfacing: the impact of a relay station. *Journal of Digital Imaging* 2000 May;13(2 Suppl 1):88-92.
4. **Carrino JA**, Mitchell DB, Chananni VP, Choi-Chinn KA, Deberardino T., Miller, MD. Pectoralis Major Muscle and Tendon Tears: Diagnosis and Grading using Magnetic Resonance Imaging. *Skeletal Radiology* 2000 Jun; 29(6): 305-13
5. **Carrino JA**, Morrison WB, Zou KH, Steffen RT, Snearly WN, Murray PM. Lateral ulnar collateral ligament of the elbow: optimization of evaluation with two-dimensional MR imaging. *Radiology* 2001 Jan; 218:118–125.
6. Morrison WB, **Carrino JA**, Schweitzer ME, Sanders TG, Raiken DP, Johnson CE. Subtendinous Bone Marrow edema Patterns on MR Images of the Ankle: Association with Symptoms and Tendinopathy. *American Journal of Roentgenology* 2001 May;176(5):1149-54.
7. **Carrino JA**, Morrison WB, Zou KH, Steffen RT, Snearly WN, Murray PM. Non-Contrast MR Imaging and MR Arthrography of the Ulnar Collateral Ligament of the Elbow: Prospective Evaluation of 2-D Pulse Sequences of Detection of Complete Tears. *Skeletal Radiology* 2001; 30: 625-632.
8. Zou KH, **Carrino JA**. A Comparison of the Accuracy and Interreader Agreement in Side-by-Side versus Independent Evaluations of MR Imaging of the Medial Collateral Ligament of the Elbow. *Academic Radiology* 2002; 9:520-525.
9. Vaccaro AR, Venger BH, Kelleher PM, Singh K, **Carrino JA**, Albert T, Hilibrand A. Use of a bioabsorbable anterior cervical plate in the treatment of cervical degenerative and traumatic disk disruption. *Orthopedics*. 2002 Oct;25(10 Suppl):s1191-1199; discussion s1199.
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11. Vaccaro AR, **Carrino JA**, Venger BH, Albert T, Kelleher PM, Hilibrand A, Singh K. Use of a bioabsorbable anterior cervical plate in the treatment of cervical degenerative and traumatic disc disruption. *J Neurosurg*. 2002 Nov;97(4 Suppl):473-480.
12. **Carrino JA**, Morrison WB, Parker L, Schweitzer ME, Levin DC. Spinal Injection Procedures: Utilization, Provider Distribution and Reimbursement in United States Medicare Population from 1993 to 1999. *Radiology*. 2002 Dec;225(3).
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- analysis of the impact of digital technologies on productivity. *J Digit Imaging* 2002 Sep;15(3):132-40.
15. Reiner BI, Siegel EL, **Carrino JA**. Workflow optimization: Current Trends and Future Directions. *Journal of Digital Imaging* 2002 Sep;15(3):141-52.
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 17. Solomon DH, Katz JN, **Carrino JA**, Schaffer JL, Bohn RL, Mogun H, Avorn J. Trends in Knee Magnetic Resonance Imaging. *Medical Care* 2003 May; 41(5):687-692.
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