

Radical Views...

from the Department of Radiology

Volume 9, Number 12
JUNE 2017



Beth Israel Deaconess
Medical Center



HARVARD MEDICAL SCHOOL
TEACHING HOSPITAL

RSNA®

Radiology

**Radiology's
1st Annual
MORRIS
SIMON
RESEARCH
DAY
2017**

Getting to the Truth: Challenges for Authors and Reviewers of Biomedical Research Articles

Herbert Y. Kressel, M.D.
Editor, Radiology
Miriam H Stoneman Professor of Radiology
Harvard Medical School



Dr. Etta Pisano and three generations of Simon family members represented by Dan, Josi and Asha Simon.



The first annual **Morris Simon Research Day** was kicked off

on Wednesday, May 17th at the somewhat difficult to find Fenway Room, Longwood Galleria (equidistant between the East and West campuses) but attendees were greeted with a marvelous buffet and great introductory slide shows of Dr. Simon's legacy by Drs. Jonathan Kruskal, Debbie Levine and Morris Simon Lecturer Dr. Herbert Kressel. We were also pleased to have members of Dr. Simon's family present to inaugurate this event moderated by Vice Chair of Research Dr. Etta Pisano. Faculty alumni who knew and worked with Morris Simon were also present [*Below left: Melvin Clouse, Jonathan Kruskal, Norman Joffe, Ferris Hall and Herbert Kressel*].

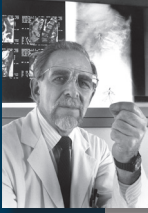
Morris Simon Research Day focuses on celebrating the research efforts of the entire department and Dr. Pisano chose four posters to represent trainee efforts and seven talks by faculty to update us on their current study efforts before guest speaker and BIDMC alumnus Herbert Kressel, current Editor of Radiology, gave the first Morris Simon Research Day Talk.

Research awards which honored the work of BIDMC staff and trainees over the past year were also presented at this event (*see pg 3*).

Congratulations to all!




Interventionalist Seth Berkowitz delivers the first Faculty Research Talk at the first annual Moris Simon Research Day



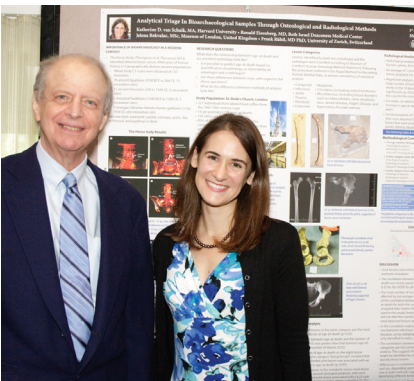
Department of Radiology
Morris Simon Research Day 2017
and the
1st Annual Morris Simon, MD Memorial Lecture:
**Getting to the Truth:
Challenges for Authors, Reviewers
and Readers of Biomedical Journals**

presented by
2017 Distinguished Visiting Professor
Herbert Y. Kressel, MD
Miriam H. Stoneman
Professor of Radiology,
Harvard Medical School
Editor in Chief, Radiology



Faculty Presentations:

- 4:30-4:40 Mobile Devices and Patient Generated Data - Why Should Radiologists Care. **Seth Berkowitz, MD**
- 4:40-4:50 Imaging Perfusion and Metabolism with Hyperpolarized MRI. **Aaron Grant, PhD**
- 4:50-5:00 Contrast Mammography for Breast Cancer Screening. **Jordana Phillips, MD**
- 5:00-5:10 Determining the Value of Imaging and Image-guided Therapy in Healthcare Delivery. **Ammar Sarwar, MD**
- 5:10-5:20 Evaluation of Tumor Microenvironment using 13C MRI. **Leo Tsai, MD, PhD, MSc**
- 5:20-5:30 Novel Imaging Techniques in the Evaluation of Muscle Disorders. **Jim Wu, MD**
- 5:30-5:50 Using Biologic Approaches to Improve Image-Guided Tumor Ablation. **Muneeb Ahmed, MD**



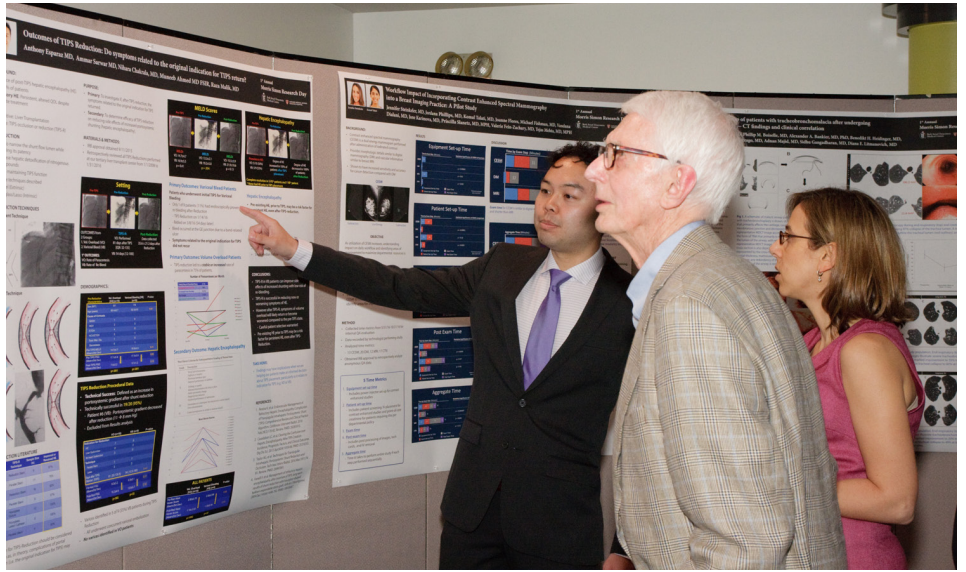
Trainee posters:

- Analytical triage in bioarchaeological samples through osteological and radiological methods. **Katherine D. van Schaik** (Medical Student)
- Outcomes of TIPS reduction: Do symptoms related to the original indication for TIPS return? **Anthony Esparaz, MD** (3rd yr Resident)
- Longitudinal follow-up of patients with tracheobronchomalacia after undergoing tracheobronchoplasty - CT findings and clinical correlation. **Fourie Bezuidenhout, MD** (Cardiothoracic Fellow)
- Workflow Impact of Incorporating Contrast Enhanced Spectral Mammography into a Breast Imaging Practice: A Pilot Study. **Jennifer Steinkeler, MD, Komal Talati, MD** (4th yr Residents)

MORRIS SIMON RESEARCH DAY 2017 (cont'd)



Morris Simon Trainee Award for Innovation - **Thomas Anderson**, 3rd yr resident



Fleischner Young Investigator Award for Research - **Anthony Esparaz**, 3rd yr resident shares his work with Mel Clouse and Jordana Phillips.



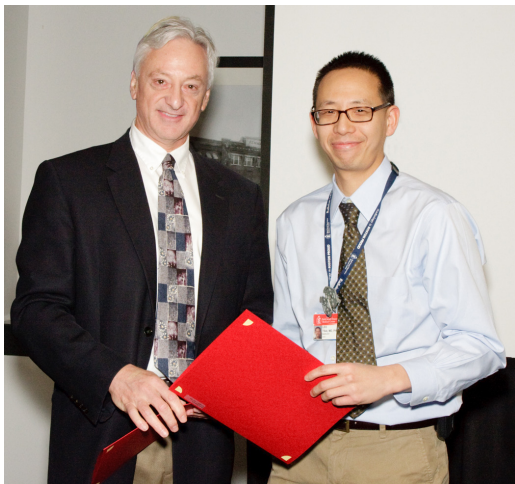
Herbert Kressel Award for Best Trainee Presentation - **Christine Chen**, 4th yr resident



RSNA Resident Research Award - **Patricia Coutinho de Souza**, MRI Research Fellow



Best Fellow Research Award - **Sean Raj**, Breast Imaging Fellow



Morris Simon Award for Research Innovation - **Leo Tsai**, MR Faculty



Morris Simon Award for Clinical Innovation *and* The Morris Simon Research Sabbatical - **Ammar Sarwar**, IR Faculty

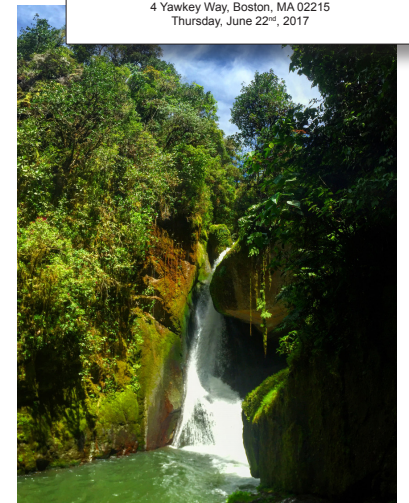
Radiology Calendar JUNE 2017

Check for the most up-to-date schedule at: <https://apps.bidmc.org/departments/radiology/residency/conferences/displayMonth.asp>

Mon	Tues	Wed	Thurs	Fri
Weekly Mon Section Meetings: 3:00-4:00 ED section meeting [ED annex, WCC]		Weekly Wed Section Meetings: 11:00-12:00 MSK clinical conference 12:00-1:00 CardioThoracic, GI/GU Oncology 3:00-4:00 Mammo [TCC-484]	Weekly Thurs Section Meetings: 12:00 - 1:30 Abd [WCC-354] 12:00-1:00 MSK	* Note that as of July 2016, our 12 noon Friday Grand Rounds will now be in the Rabkin Board Room , Shapiro-10, East Campus (<i>except when noted otherwise</i>)
If you missed Vice Chair for Quality Dr. Bettina Siewert's April 14th, 2017 Grand Rounds on Barriers to Safety Event Reporting: Authority Gradients & Other Human Factors , click below for her video: https://vimeo.com/user15366620/review/214061890/74ab259f2c			1 7:30 - 9:00 Rad-Path Concordance and Breast Cases (Neely Hines) 3:00-4:00 West MedRads - Sr. Resident, West Body CT [Clouse]	2 12:00 - 1:00 4th year Scholarly Projects Drs. Komal Talati, Christine Chen, Matt Del Guzzo, Amanda Kappler, Quang Nguyen, Jenny Steinkeler
5 7:30 - 8:15 GU interventions 1 (Olga Brook) 8:15 - 9:00 GU interventions 2 (Jeffrey Weinstein)	6 7:30 - 8:15 Endocrine interventions (Barry Sacks) 8:15 - 9:00 TBD (Sahil Mehta) 12:00-1:00 Neuro call prep (Neuro fellows)	7 7:30 - 9:00 Call Lottery (Chief Residents) 12:00-1:00 Neuro case conference (Neuro fellows)	8 7:30 - 8:15 Venous Interventions (Ammar Sarwar) 8:15 - 9:00 Case review (Jeffrey Weinstein) EVENT: CORE EXAM	9 EVENT: CORE EXAM 12:00-1:00 4th year Scholarly Projects Drs. Komal Talati, Christine Chen, Matt Del Guzzo, Amanda Kappler, Quang Nguyen, Jenny Steinkeler
12 7:30 - 8:15 MSK (TBD) 12:00-1:00 MRI meeting [Ansin 2] EVENT: CORE EXAM	13 7:30 - 8:15 MSK (TBD) 7:30 - 8:15 MSK (TBD) EVENT: CORE EXAM 10:30-11:30 NMMI meeting [GZ-103]	14 7:15-8:00 US meeting [WCC-304A] 7:30 - 8:15 MSK (TBD) 7:30 - 8:15 MSK (TBD) 12:00-1:00 Neuro case conference (Neuro fellows)	15 7:30 - 8:15 MSK (TBD) 7:30 - 8:15 MSK (TBD) 3:00-4:00 West MedRads - Sr. Resident, West Body CT [Clouse]	16 7:30 - 8:15 Psychology Topics In Radiology (Michael Fishman) 12:00 - 1:00 4th year Scholarly Projects. Drs. Drew Colucci, Jawad Hussain, Ning Lu, Hannah Perry
19 7:30 - 9:00 Ovaries (Karen Lee)	20 7:30 - 8:15 Body (TBD) 7:30 - 8:15 Body (TBD) 8:00-9:00 IR Meeting [West Recovery]	21 7:30 - 8:15 Neuro (TBD) 8:15 - 9:00 Neuro (TBD) 12:00-1:00 Neuro case conference (Neuro fellows)	22 7:30 - 8:15 Body (TBD) 7:30 - 8:15 Body (TBD) Fleischner Graduation - EMC Club, Fenway Park 6-10 pm	23 12:00 - 1:00 24th Fleischner Lecture:- Community Radiology - Back to the future of the Academic Department? (Max Rosen) [Sherman Aud]
26	27 10:30-11:30 NMMI meeting [GZ-103]	28 12:00-1:00 Neuro case conference (Neuro fellows)	29 3:00-4:00 West MedRads - Sr. Resident, West Body CT [Clouse]	30

*The Gallery
presents a show by*

Andres Camacho
Costa Rican Native & CT Research Fellow



The Department of Radiology
at Beth Israel Deaconess Medical Center

24th Annual Risa & Felix
Fleischner
Graduation
Dinner

EMC Club, Fenway Park
4 Yawkey Way, Boston, MA 02215
Thursday, June 22nd, 2017

JUNE 2017 GRAND ROUNDS:

12:00 - 1:00 PM • Sherman Auditorium

Friday, June 23, 2017 24th Annual Fleischner Lecture:



Community Radiology - back to the future of the Academic Department?

In the days of Felix Fleischner, the Radiology reading room functioned as the "community center" of the hospital. Then came PACS - and the community crumbled. Can we get the community back?

Max Rosen, MD, MPH, FACR - Chairman of Radiology, UMASS Memorial Medical Center; Professor of Radiology, UMASS Medical Center, Worcester, MA

Welcome Dr. Max Rosen, former Executive Vice Chair and Associate of Community Network Affairs responsible for expanding our community imaging division at BIDMC Radiology. Max joined UMASS as Radiology Chair in 2012 and returns to present the 24th annual Risa & Felix Fleischner lecture on Community Radiology.

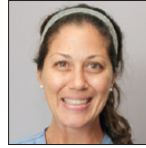
A graduate of Tufts University Medical School, Max completed his radiology residency training at Boston City and University Hospital, a fellowship in Interventional Radiology at MGH, and went on to earn a Masters in Public Health from the Harvard School of Public Health.

Max continues to collaborate with BIDMC faculty & Trainee alumni and most recently published:

Sarwar A, Zhou L, Chakrala N, Brook OR, Weinstein JL, Rosen MP, Ahmed M. The Relevance of Readmissions after Common IR Procedures: Readmission Rates and Association with Early Mortality. *J Vasc Interv Radiol.* 2017 May;28(5):629-636. PMID: 28291716.

DeBenedictis CM, Gauguet JM, Makris J, Brown SD, Rosen MP. Coming Out of the Dark: A Curriculum for Teaching and Evaluating Radiology Residents' Communication Skills Through Simulation. *J Am Coll Radiol.* 2017 Jan;14(1):87-91. PMID: 27914939.

Patient Feedback: Congratulations IR on a job well done!



Courtney Petersen, RN



Ben Delahanty, IR Tech



Ginny Benway, IR Tech



Lindsay Downes, RN



Dr. Ahmed Fadl, VIR Fellow

*Dear Dr. [Muneeb] Ahmed,
On Tuesday, May 16 I was a patient receiving a Port Placement. The team that was responsible for my care were outstanding. Their compassion, friendliness and positivity surprises none. I was made to feel so comfortable and at ease. The team made a very scary situation a lot better. I felt that you should know what an awesome team you have. I am so very grateful. Their names are as follows: Courtney, Ben, Ginny, Lindsay, Dr. Fadl, Celia and Joe. Please thank them for all they do.*

*Gratefully,
[Name withheld per HIPAA regs]
Randolph, MA*



Acelia Pluoise, Patient Care Technician



Joe Aloisi, RN



FROM THE CHIEF
Jonathan B. Kruskal, MD PhD

Congratulations Dr. Etta Pisano, Vice Chair of Research

I am pleased to announce that Dr. Etta Pisano, Vice Chair of Research who came to BIDMC in November 2015 has been appointed as the first ever **Professor in Residence of Radiology** effective April 1, 2017. The title Professor in Residence is used to appoint a small number of senior individuals recruited to the Professorial ranks for a limited period of time. The intended use of this title is to appoint senior scholars who fulfill the

following requirements:

- Fulfill a well-defined but potentially time-limited programmatic or administrative need
- Have the capacity to make significant contributions to the Faculty of Medicine throughout the term of their appointment
- Have had a considerable impact on their field, including demonstrated excellence in research and teaching

Etta has demonstrated her pioneering abilities in her work in DMIST (Digital Mammographic Imaging Screening Trial) and as a representative of medical imaging at the Cancer Moonshot National Summit in 2016. Congratulations Etta!



News

Pisano to Represent Medical Imaging at Cancer Moonshot National Summit

June 13, 2016

ACR member and renowned radiology researcher Etta Pisano, MD, FACR, will represent the medical imaging community at the June 29 National Summit for the National Cancer Moon Shot Initiative in Washington. The daylong conference is intended to galvanize the Obama Administration's push to double the pace of research toward curing cancer through the \$1 billion National Cancer Moonshot Initiative.

The invitation enabling the Academy of Radiology Research (ARR) to send Pisano, who serves on the Academy's executive committee, is considered progress toward expanding the profile of imaging in the Moonshot program, headed by Vice President Joe Biden.

The radiology community, via the ARR, expressed concern regarding the lack of medical imaging expertise on the task force and blue ribbon panel that administer the Moonshot effort. The initiative's ambitious timetable calls for the National Cancer Institute to announce final research recommendations in August.

Pisano is vice-chair of research and a staff radiologist at Beth Israel Deaconess Medical Center. She was primary investigator for the landmark American College of Radiology Imaging Network (ACRIN) Digital Mammographic Imaging Screening Trial (DMIST), which showed that digital mammography was as accurate as film mammography in most women.

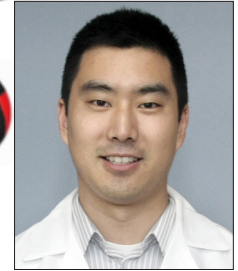
DMIST also showed that digital mammography detected more cancers than screen film in younger women, premenopausal and perimenopausal women, and women with dense breasts.

More Departmental Commemorations:

Celebrating Dr. Raptopoulos's
Years
1992-2017



of preparing
and revising the
weekly schedule



Wednesday, May 24, 2017

Hello Everyone:

The schedule for the week of June 26 is now available in QGenda. This is the last schedule I am preparing and ends 25 years of juggling between clinical, academic and personal needs and commitments. Clotell Forde will continue as schedule coordinator and Dr. Justin Kung has already prepared the July 3rd week. It has been an honor to serve the Department and Staff in preparing and revising the weekly clinical schedule. It has been a dynamic and often challenging experience which brought me closer to each one of you.

Thank you for the opportunity.

- Vassili Rap



Dear All

I just wanted to publically acknowledge the incredible job that Vassili has put into the schedule over the past 25 years. He surely must wake up at night seeing excel

spreadsheets (see right ➤)! Vassili has gone way above and beyond to accommodate the overwhelming majority of your last minute changes and needs, to personalize everybody's priorities and he must be the only person who understands the complexities of the holiday week. Our services have been covered despite a growing number of scattered locations and PACS and RIS systems, and our referring docs have remained really satisfied with our excellent imaging services. I don't think there really is an effective way to thank somebody who has put this enormous time and effort into making everybody else's schedule work, but as a group I wanted to let Rap know that to show our genuine appreciation we have agreed unanimously to give him this coming Monday AND Tuesday (may 29 and 30) off from work! A most well deserved vacation!

Seriously though Vassili, we are all deeply appreciative of your incredible and devoted efforts to keep the peace and to try to make an intrinsically unfair process work as fairly and smoothly as you did. You did a terrific job.

Thank you from all of us.

- Jonny

STAFF WEEKLY ASSIGNMENTS - RADIOLOGY BIDMC

RADIOLOGY KICKS OFF: TALK TO ME

On Friday April 14th Dr Bettina Siewert's Grand Rounds talk, **Barriers to Safety Event Reporting: Authority Gradients & Other Human Factors**, kicked off a department wide initiative called **Talk to Me**. [Click for the video of her presentation: <https://vimeo.com/user15366620/review/214061890/74ab259f2c>]

Suzanne: Bettina please describe the the Talk to Me initiative.

Bettina: Talk to Me is a department wide initiative encouraging staff to commit to speaking up if they have a safety concern and to commit to listening when a safety concern is raised.

Suzanne: What are the most common reasons Radiology staff do not always speak up?

Bettina: High reporting threshold is the most frequent reason meaning staff do not always speak up if they are not 100% sure they are correct or if they only realize after the fact that something is a safety concern. Fear of challenging authority, fear of disrespect and a lack of listening are amongst our top reasons for not always speaking up.

Suzanne: How can we lower the reporting threshold?

Bettina: We have to change our culture and our mindset. Each individual comes to this department with a unique set of skills and experiences that broaden and enhance our department. It is not possible nor should we expect that each of us knows everything there is to know; therefore, we need to be able to rely on each other to speak up even if we are not 100% sure there is a safety concern. Each of us is a vital link in a safety net that protects our patients and our staff from harm. Any hole in this net places all of us in a vulnerable position.

Suzanne: What other cultural changes are needed?

Bettina: We need to create a truly respectful culture. 5 ways to show respect are:

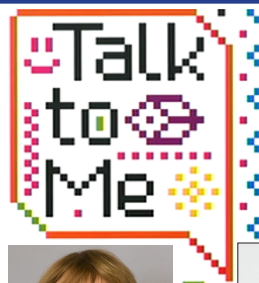
- Listen. I know it sounds easy but listening – truly listening can be one of the hardest skills to master
- Encourage others to express opinions and ideas
- Acknowledge the efforts of others and congratulate a job well done
- Be helpful and supportive
- Say "Thank-You"

Suzanne: What should be reported?

Bettina: Any situation that has potential to cause harm to patient, staff or families.

Suzanne: How should I report a safety concern?

Bettina: An imminent concern for patient or staff safety needs to be called out in the moment. If no patients are present you should say "I have a safety concern". To alert the team of a



Suzanne Swedeen,
RN MSN CNIV, Quality
Improvement Specialist



Bettina Siewert, MD
Executive Vice Chair &
Vice Chair of Quality

safety concern when a patient is present you can say "Can we review the images on the larger screen outside the room?"

Suzanne: How do we report a general safety concern?

Bettina: Staff can use the hospital-wide incident reporting system call **RL 6** or the Radiology online QA database which has been upgraded to include a near miss category. Staff can also email Suzanne Swedeen with

any questions or concerns.

Suzanne: What are the goals of this initiative?

Bettina: Our 1-year goal is that 85% of staff will always speak up if they have a safety concern. Our 5-year goal is to reduce the number and severity of serious adverse events.

Suzanne: One of the big challenges to any new initiative is keeping it going. How do you plan to keep the momentum going for this initiative?

Bettina: Each month Suzanne and I will review all safety concerns called out and while we realize staff do not need incentives to do the right thing, we want staff to know that we are seriously committed to this initiative and therefore the department will reward with a bonus payment. Each month we will highlight in the newsletter the safety concern raised with the biggest impact and award the staff member a bonus.

Suzanne: To get started what are the top 3 things staff should do today?

Bettina:

- 1) Commit to speaking up & lowering your reporting threshold
- 2) Commit to listening and show appreciation by thanking the person for raising the safety concern
- 3) Commit to your role in creating a respectful work environment

Suzanne: Is there anything else you would like staff to know?

Bettina: Over the coming months we will feature more helpful tips for improving our culture of safety.

Special Thanks to our Safety Workgroup who have so generously given of their time and insight into the issue of speaking up:

Leighton Atkins	Trevor Lewis
Robert Beeman	Hazel Malolos
Nicole Caddell	Jennifer Ni Mhuirheartaigh
Meredith Cunningham	Bridget O'Bryan
Maggie Cybulska	Bettina Siewert
Donna Hallett	Suzanne Swedeen
Fritz Honore	Aaron Thurston
Juline Horan	Steven Warren
Alexei Kudla	Jim Wu

RADIOLOGY at the 10th ANNUAL SILVERMAN SYMPOSIUM

Radiology was proud to be part of the 10th Annual Silverman Symposium that showcases process improvement efforts by presenting 11 posters on Shapiro-10. Size limits of this newsletter prevent the reproduction of them all so please click on this link to view them by title: <http://www.bidmc.org/Silverman2017>

1. Barriers To Safety Event Reporting: Authority Gradients And Other Human Factors - Suzanne Swedeen
2. Clinical And Radiologic Predictive Factors Of Septic Shoulder Arthritis - Ning Lu
3. Electronic Kiosks To Learn About The Patient Experience In Radiology - Aideen Snell
4. Quality Assurance In Neuroradiology: Reduction Of Motion Artifacts In Brain MRI Examinations - David Khatami
5. Optimizing MRI Logistics: Prospective Analysis Of Performance, Efficiency And Patient Throughput - Kevin Beker
6. Pelvic Ultrasound: Analysis Of Endometrial Biopsy Recommendations - Amanda Kappler
7. PhotoConsult: Clinical Photography Mobile App - Seth Berkowitz
8. Radiology Resident Idea System: Trainees Engaged In QI At The Institutional Level - Alexai Kudla
9. The Post Procedure Closeout In Radiology - Suzanne Swedeen
10. Time Metrics Of Incorporating Contrast Enhanced Spectral Mammography Into A Breast Imaging Practice - Jennifer Steinkeler
11. Utility Of Core Needle Rebiopsy Of Initially Non-Diagnostic Musculoskeletal Lesions - Jenny Ni Mhuircheartaigh

Barriers to Safety Event Reporting: Authority Gradients and other Human Factors

Introduction/Problem

Communication in health care can be affected by differences in professional status, seniority, expertise and experience of team members also known as authority gradients. The existence of an authority gradient represents a significant potential safety risk. In a survey of over 1,700 health care personnel including nurses, physicians, clinical care staff, and administrators from 13 hospitals across the US, an authority gradient interfered with reporting safety concerns in over 90%. In December 2014 two adverse events occurred in Radiology in which one member of the team had important information that the remainder of the team was unaware of.

Aim/Goal

The purpose of this study:

- To determine the frequency in which employees speak up with safety concerns; to quantify how often employees are unable to speak up and to identify barriers to speaking up

The Team

- Bettina Siewert, MD, Suzanne Swedeen RN, MSN, Mary Hochman, MD, Olga Brook, MD, Ronald L Eisenberg, MD
- The Radiology Safety Workgroup

The Interventions

- To determine the presences of an authority gradient and other human factors that constitute barriers to speaking up, a new survey tool was developed.
 - It was felt that the AHRQ Institutional Culture of Safety survey tool would not meet our needs as it collects data on safety attitudes and contributing factors such as staffing and work hours, but does not look at human factors such as fear of disrespect, challenging authority, lack of listening and uncertainty about one's observation.
 - The survey contained 20 questions and was void of any identifiable information to protect the respondents' anonymity with only gender, length of employment and job classification asked.
- In preparation for the survey we attended monthly staff meetings in every section and in every job classification to discuss the impact of an authority gradient on patient safety and the importance of the upcoming survey.
- The survey was sent out to every Radiology employee in every job classification.

Results/Progress to Date

- 364 of 648 (56%) of employees completed the survey
- 10 barriers to communicating safety events were evaluated
- 50% of employees reported being unable to report 100% of safety events which represents a possible 184-690 unreported safety concerns
- The most common barrier to speaking up differed among staff groups
- Top three reasons for not speaking up were identified as
 - High reporting threshold
 - Not wanting to challenge authority
 - Fear of disrespect



Results: Barriers to Speaking-Up

Barrier	Number of staff reporting barrier*
• Reporting threshold	113 of 163 (69%)
• Challenging authority	112 of 167 (67%)
• Fear of disrespect	88 of 167 (53%)
• Witnessed disrespect	66 of 169 (39%)
• Lack of listening	60 of 169 (35%)
• Fear of retribution	56 of 157 (34%)
• Responsibility in the team	46 of 161 (29%)
• Lack of language training	48 of 163 (29%)
• Toxic captain	47 of 167 (28%)
• Shy personality	40 of 163 (25%)

*Number of staff who did not speak up at all

Lessons Learned

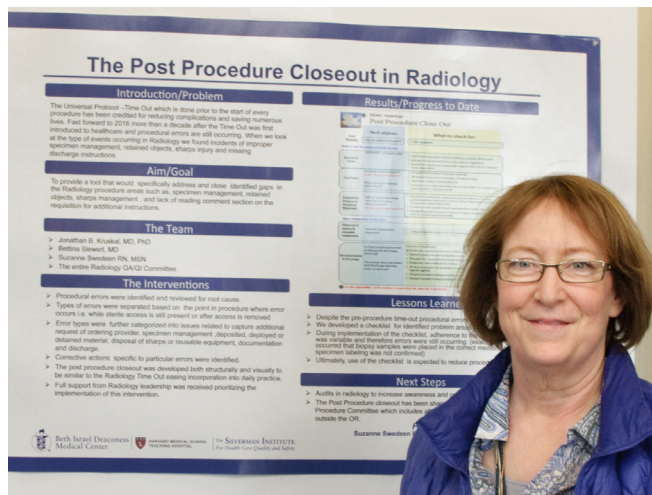
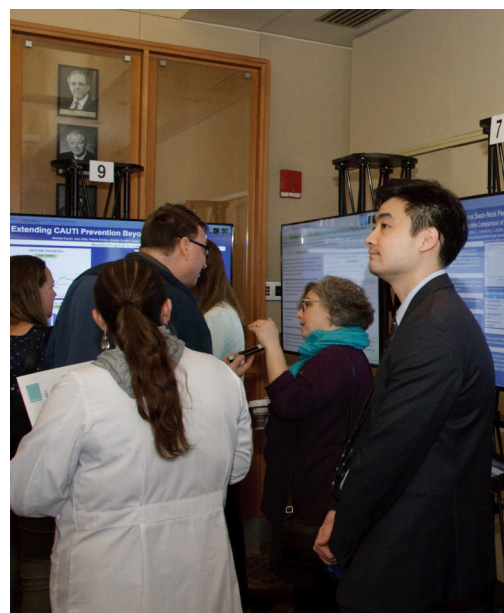
- While significant safety issues can result when staff are unable to always speak up, the act of speaking up is much harder than one might expect.
- 50% of employees in Radiology department reported not being able to speak up about safety concerns 100% of the time. The most common root causes for not speaking up consist of a high reporting threshold, not wanting to challenge authority and fear of disrespect.
- Cultural changes are needed to support staff towards 100% safety event reporting.

Next Steps

- Convene a multidisciplinary workgroup represented by all job classification to better understand the identified barriers to speaking up and to determine targeted interventions to decrease or eliminate barriers.

For more information, contact:

Suzanne Swedeen RN MSN 617-754-2768
 sswedeen@bidmc.harvard.edu



Quality Assurance in Neuroradiology: Reduction of Motion Artifacts in Brain MRI examinations

Technical Challenges, Issues and Limitations in Preprocessing and Motion Correction Techniques

David Khater, Jonathan Kim, Prithvi Malik, Anshu Siddalingappa, Rajeev Bhaskar, Yu-Ming Chang, David Hachey, Robert Rojas

Department of Radiology, Beth Israel Deaconess Medical Center

Introduction/Problem

All our institution approximately 90% of the total MRI examinations are brain MRI examinations, a significant number of which (approximately 10-15%) demonstrate motion artifacts due to multiple causes, such as patient motion, claustrophobia, CSF flow, vascular flow, swallowing and normal respiration. These result in deterioration of image quality, adversely affecting interpretation and diagnosis. In many instances, the images have to be repeated, increasing the total acquisition time and sometimes the examination is cancelled, causing diagnosis. In order to reduce motion artifacts and improve the quality of MRI exams, a two-stage quality algorithm based on potential solutions is presented here.

Aim/Goal

To reduce the number of MRI examinations with motion artifacts.

The Team

David Khater, MD, Jonathan Kim, MD, Prithvi Malik, MD, Anshu Siddalingappa, MD, Rajeev Bhaskar, MD, Yu-Ming Chang, MD, David Hachey, MD, Robert Rojas, MD

The Interventions

Step 1: Image preprocessing reduction of motion artifacts
 Predefined quality of motion artifact include: voluntary/involuntary patient motion (claustrophobia, respiratory motion), physiological motion (CSF flow, arterial pulsation), vascular flow, cardiac and respiratory motion.

Step 2: Image reduction of motion artifacts using Motion Correction Techniques
 Use of faster MRI techniques such as PROPELLER

Results/Progress to Date

For more information, contact David Khater, MD dkhater@bidmc.harvard.edu

Utility of Core Needle Rebiopsy of Initially Non-diagnostic Musculoskeletal Lesions

J Wu, J Ni Mhuircheartaigh, C McMahon, G Lozano Cardenas, J Kung

Beth Israel Deaconess Medical Center | THE SILVERMAN INSTITUTE

Introduction/Problem

Biopsy of musculoskeletal lesions allows for histologic diagnosis, guiding medical and surgical management. Given surgical biopsy is considered the gold standard for diagnosis, however, image guided core needle biopsy (CNB) is often performed first due to its minimally invasive nature, decreased recovery time, lower cost, and lower complication rate.

Although non-diagnostic CNB results can be useful, in cases suspicious for malignancy, a definitive CNB, however, requires a 2nd biopsy. This can be accomplished by a surgical biopsy or a repeat CNB.

Repeat core needle biopsy has been shown to be useful in other body parts including the breast and kidney. It is unclear whether this is true for musculoskeletal lesions.

Aim/Goal

The purpose of this study is to assess the utility of repeat core needle biopsy following an initially non-diagnostic CNB.

The Team

- J Wu, MD, Department of Radiology, Division of Musculoskeletal Radiology
- C McMahon, MD, Department of Radiology, Division of Musculoskeletal Radiology
- G Lozano-Cardenas, Department of Orthopedic Surgery
- J Kung, MD, Department of Radiology, Division of Musculoskeletal Radiology

The Interventions

A retrospective review was conducted in 1302 consecutive core needle biopsy examinations performed on bone or soft tissue lesions at a tertiary academic center between June 2004 and September 2014. Biopsies were performed on indeterminate or equivocal musculoskeletal lesions requested by the referring physician due to non-diagnostic biopsy results. The same lesion was re-biopsied. Exclusion criteria included those cases in which a definitive biopsy was obtained at time of the second image-guided biopsy procedure, as well as pediatric or vertebral body cases as these are not performed by our musculoskeletal radiology service. The retrospective study was approved by our institutional review board with waiver of requirement for informed consent.

Results/Progress to Date

For more information, contact J Ni Mhuircheartaigh, MD, Department of Radiology jni@bidmc.harvard.edu

Pelvic Ultrasound: Analysis of Endometrial Biopsy Recommendations

Amaka Kaptain, MD, Research Assistant, akaptain@bidmc.harvard.edu

Introduction/Problem

Endometrial biopsy (EB) is a common procedure performed to evaluate abnormal uterine bleeding. The aim of this study was to assess the accuracy of endometrial biopsy recommendations in a tertiary academic center. The study was a retrospective analysis of 1000 EBs performed between 2010 and 2014. The study was approved by the Institutional Review Board (IRB) and all patients gave informed consent.

Aim/Goal

To assess the accuracy of endometrial biopsy recommendations in a tertiary academic center.

The Team

Amaka Kaptain, MD, Research Assistant, akaptain@bidmc.harvard.edu

Interventions (continued)

Endometrial biopsy (EB) is a common procedure performed to evaluate abnormal uterine bleeding. The aim of this study was to assess the accuracy of endometrial biopsy recommendations in a tertiary academic center. The study was a retrospective analysis of 1000 EBs performed between 2010 and 2014. The study was approved by the Institutional Review Board (IRB) and all patients gave informed consent.

Results/Progress to Date

Category	Number	Percentage
Normal	1000	100%
Abnormal	1000	100%
Hyperplasia	1000	100%
Polyps	1000	100%
Leiomyomas	1000	100%
Endometrial cancer	1000	100%

Lessons Learned

Endometrial biopsy (EB) is a common procedure performed to evaluate abnormal uterine bleeding. The aim of this study was to assess the accuracy of endometrial biopsy recommendations in a tertiary academic center. The study was a retrospective analysis of 1000 EBs performed between 2010 and 2014. The study was approved by the Institutional Review Board (IRB) and all patients gave informed consent.

Next Steps

Endometrial biopsy (EB) is a common procedure performed to evaluate abnormal uterine bleeding. The aim of this study was to assess the accuracy of endometrial biopsy recommendations in a tertiary academic center. The study was a retrospective analysis of 1000 EBs performed between 2010 and 2014. The study was approved by the Institutional Review Board (IRB) and all patients gave informed consent.

Electronic Kiosks To Learn About the Patient Experience in Radiology

Amaka Kaptain, MD, Research Assistant, akaptain@bidmc.harvard.edu

Introduction/Problem

Many Radiology patients have already spent time in other areas of the department and/or in the waiting area. This program allows patients to learn about the patient experience in radiology.

Aim/Goal

To analyze radiology department Patient Experience surveys to detect patterns of less-than-optimal patient experiences and potential areas of improvement.

The Team

Radiology: Andrew Savel MSN, CPNP, Jonathan Bloom MD, Jimmy Fung MD, Alexander Brook PhD, Ronald L. Eisenberg MD, JD, Olga R. Bross MD

Results/Progress to Date

Out of 6730 surveys, 4028 (59.8%) had less-than-optimal feedback to Radiology, always patients to respond to us in the here-and-now.

Frequency of non-completed survey was significantly higher in kiosks in changing and waiting areas, compared to kiosks next to elevators (88.66%, 30.2% vs. 66.67%, 22.2% vs. 66.67%).

Time of day, day of the week, and location had no significant impact on satisfaction (p > .05, p > .05, p > .05).

The lowest rating per survey showed a strong correlation with overall patient satisfaction (p < .001). There were 1000 ratings across 600 surveys which were the lowest or best for lowest. Clinicians (20/1000, 10%) and radiologists (20/1000, 10%) received lowest ratings most frequently.

There were 278 best best responses in 600 surveys with best time (11/278, 3.1%), and best location (11/278, 3.1%) being most frequent.

Lessons Learned

Proper placement of Patient Experience kiosks is important for survey completion rate. Cleanliness, courtesy of the receptionist, wait time, and patient communication were found to be potential areas of improvement.

Next Steps

Improving receptionist courtesy, wait time, and communication would be most positive effect on patient satisfaction. To provide better communication and a consistent experience to our patients we are implementing Radiology Service Standards for all Radiology employees. Input from our patients emphasizes how important it is to them, how it looks their anxiety, readiness, making the best during every patient and staff interaction so our priority improvements have been made in communicating survey data more promptly throughout the department. The Radiology portal for faster action planning turnaround.

https://pages.bidmc.org/department/radiology/department/feedback/feedback.htm

Radiology Resident Idea System: Trainees Engaged in QI at the Institutional Level

Ronald Mercer MD, Alexei Kudva MD, Tom Anderson MD, Michael Johnson MD, Haniya Puri MD, Jennifer Steiner MD, Christine Chen MD, Thea Lewis MD, Donna Hiest

Beth Israel Deaconess Medical Center, Department of Radiology

Introduction/Problem

Few structured ways exist for residents to communicate with administrators and to engage in departmental operations and improvement.

ACGME Clinical Learning Environment Review (CLER) focuses on how an institution engages trainees in patient safety and quality initiatives.

Aim/Goal

Provide a platform for residents to report problems and propose solutions, receive feedback about ideas, and participate in implementing changes.

Educate residents about the management of an academic department and increase resident participation in quality improvement.

Enable sustainable communication between residents and administrators.

The Team

Senior department administrator
Resident representatives from postgraduate years 2-5, including chief residents

The Interventions

Created an online platform for residents to securely enter improvement ideas, report safety, IT, and other (Figure 1).

Established a standard system for review and implementation (Figure 2).

Results/Progress to Date

Innovation recently published in the Journal of American College of Radiology: Asha E, Shah S, Berkowitz S, et al. JACR. 2017; 14(14): 155-591

For more information, contact Ron Mercer, M.D., Radiology Resident, rmercer@bidmc.harvard.edu

PhotoConsult: Clinical Photography Mobile App

Amaka Kaptain, MD, Research Assistant, akaptain@bidmc.harvard.edu

The Problem

Many clinical consultations rely on visual examination of a patient. Photographic documentation of physical findings in the electronic medical record is important for justifying treatment, assessing response, and communicating findings between providers. Clinicians' personal smartphones with high quality cameras offer a convenient way to capture and share digital photographs. Unfortunately, storage of patient photographs on personal devices is not compliant with HIPAA and puts protected health information at risk of inadvertent data breach; many personal devices synchronize with commercial cloud image sharing services.

Aim/Goal

Create a smartphone application (app) that:

- Is easy to use at the bedside
- Protects patient privacy
- Enables real time, secure transmission and retention of clinical photographs
- Does not store PHI on personal devices
- Uses HIPAA compliant infrastructure for transmission and storage in the electronic health record (EHR)

The Team

Seth Berkowitz, MD - App Developer, Interventional Radiologist
Web Application, Server and Security Teams
Amy Goldman - Project Manager
Norma Chitvanni RHIT CHPS, Director Privacy & Confidentiality
Ambulatory Services Team - Pilot and Production Support

The Results/Progress to Date

The app has been piloted in the departments of Medicine, Dermatology, Surgery, Emergency Medicine, and Interventional Radiology. Feedback has been overwhelmingly positive. The app has been used to capture and track progression of physical exam findings such as cellulitis, angioedema, and ocular findings. The app has improved communication with remote consultants.

Lessons Learned

Smartphones have become an essential tool in modern healthcare. Privacy of the patient and his/her health condition is non-negotiable in the 21st century. Health information is considered among the most sensitive and personal information that individuals possess. Patients must have trust that photos will be securely transmitted and maintained in the medical record. Providers are eager for an easy-to-use tool that helps them quickly, securely, and appropriately capture clinical photographs.

Next Steps/What Should Happen Next

Broaden distribution of PhotoConsult for clinician use. Users must have a supported device (currently limited to iPhone, iPad, and iPod Touch)

FAQ on the Portal: Home > Intranets > Information Systems > IT Strategic Planning Site > BIDMC App and Service FAQs > PhotoConsult FAQ

Download and install app from: <https://photoconsult.bidmc.org>

IN HONOR OF NURSES WEEK May 6-12, 2017: Celebrations & Recognitions



Bridget O'Bryan, RN
Director of
Radiology Nursing

Our Mission:
"To build on a legacy of nursing excellence by caring with compassion, advancing the art and science of nursing, and advocating for the health of patients, families and communities"

I truly believe that I have the best team of nurses at BIDMC. They exemplify nursing excellence every day in some of the most challenging of situations. They continue to embrace departmental changes, remaining supportive of each other with a focus on delivery of patient-centered quality care.

THANK YOU!!!

Congratulations also to **Nadia (Aires) Muscato** on her advancement to CN 111



Featured in Boston Globe Salute to Nurses 2017 Letters

by Zach Gordano May 6, 2017

Nancy Littlehale [Breast Imaging NP]
Beth Israel Deaconess Medical Center

I have been seeing Nancy Littlehale for the past 10 years at Beth Israel's Breast Care Center. As someone who is high risk for breast cancer, it is imperative that I have the best care in terms of prevention, monitoring, and diagnosing this dreaded disease. Nancy is not only a competent clinician, she is also direct, honest, compassionate, and caring. She has a way of connecting with you as a human and not as just another patient on her very busy roster. She always asks about my children and actually remembers how many I have. This is truly appreciated, as my visits are always fraught with fear and anxiety.

Nancy is my go-to person—I always request her whenever I am required to have invasive testing done—and my rock. Thank you, Nancy. I am blessed to have you in my life.

– Nominated by Kelly Papa

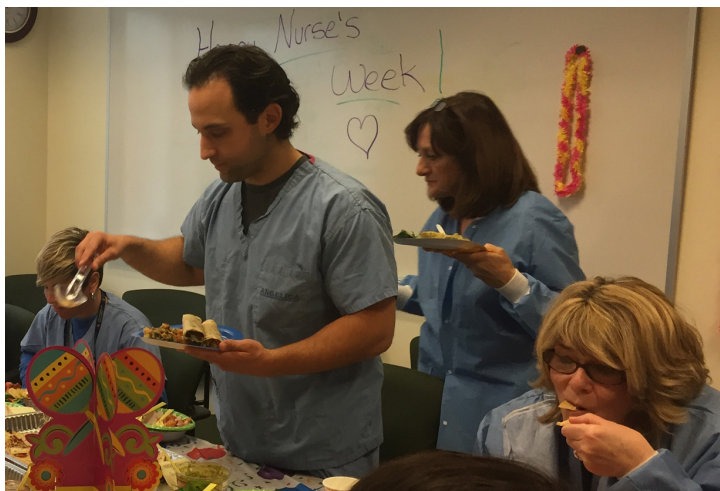


Thanks so much to IR for the amazing spread they provided to honor the efforts of our nursing staff!



And thanks to Marge Guthrie for her great photos!

IN HONOR OF NURSES WEEK May 6-12, 2017: Celebrations & Recognitions (cont'd)



Also please welcome: Jin Park

In a department as large as ours, it's hard to keep track of our new employees.

Please welcome **Yojin (Jin) Park, MPH** who joins Interventional Radiology as a Data Analyst/SAS Programmer working primarily with Dr. Ammar Sarwar on funded research projects. Jin graduated from Boston University School of Public Health in

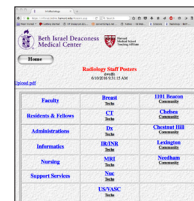
May 2016, and worked at BWH and the Massachusetts Department of Public Health before coming to BIDMC. He enjoys the challenges of data analysis and programming but when he's not working, he enjoys cooking, traveling and playing video/board games. Fluent in English and Korean, Jin can be reached at 4-2783.

REMINDER: Updated Radiology Technologist Rosters & Staff Posters are available on InfoRadiology in pdf format for viewing, downloading, and printing.

Log in to the portal:

<https://portal.bidmc.org/>

If you don't already have InfoRadiology displayed in **My Applications**, click on the **Applications** tab and then under **Clinical**, click on **Inforadiology**. Log into Inforadiology, click on **Staff Posters Tab** to view/download/print the most current Tech Rosters, etc.



Managers: Please contact Michael Larson at mlarson1@bidmc.harvard.edu to update your rosters and staff posters

ANNUAL SERVICE AWARDS FOR RADIOLOGY EMPLOYEES CELEBRATED IN 2017

On Wednesday, May 10th, BIDMC held the annual Employee Service Award Recognition event at Alden Castle to honor employees who reached their 20-50 years of service milestones and we in Radiology had our own breakfast celebration in Shaipro-10 to honor all of our awardees celebrating their anniversaries ranging from 5 to 35 years. Congratulations to all!



5 years

Patrick Averill – US
Lisa Benevides – MRI
Christopher Burgos - Dx
Christopher Clarke - CT (Chestnut Hill)
Emily Dockham - US
Emelia Johnson – MRI
Rashmi Mehta, MD - Br
Koenraad Morteale, MD - MRI
Jordana Phillips, MD - Br
Michael Plum – MRI
Juliah Polito – US
Katrina Roscia – MRI
Elizabeth Silva – MRI
Josmar Silva - Dx

10 years

Ann Marie Baggs - Br/Dx (Chestnut)
Laurie Bucci - Dx
Nicholas Bucci - Dx
Isaac Dube - Dx
Cheryl Egan - Bone Density/Dx (1101 Beacon St)
Karen Gardner - RN
Veronica Gonzales - Nuc
Kenneth Lee – VIR
Diana Litmanovich, MD - Cardio
Hazel Malolos - RN
Tiffany Marino – Dx
Delnise Mendes – Dx
Sheila Nadeau - US
Sue Nagle - MRI
Joanne Picazio - US
Dean Rodman, MD - Nuc [BID-N]
Sara Ross - Dx
Lauren Shanbrun - Nuc
Joaquin Thomas - Dx
Shambhavi Venkataraman, MD - Br
Denis Vigneault - Dx
Kali Wilson - VIR
Alicia Zaske - Dx

15 years

Kathryn Awalt - US
Peggy Carr - Informatics
Jason Chagnon - CT
James Cooney - CT
Saliha Gardner - Support Svcs
Lekisha Hamilton - Dx
Nancy Hermanns - CT
Stephen Kirkpatrick - Dx
Michael Larson – Media Lab
Eddy Louis - Dx
Paul McDonald - MRI
Maryellen O'Rourke - CT
Patricia Peters - CT
Kerin Rogers - RN
Carlos Silva - CT
Danielle Toomey - Dx
Jean Wall - Dx
Stephen Warren - Dx

20 years

Elizabeth Browning - MRI
Jeff English - Nuc
Dana Lagrotteria - US
Tanya Martinez - CT

25 years

Ginny Benway - VIR
Vassilios Raptopoulos, MD - CT

30 years

Ann Marie Cathcart - RN
Brian Deedy - Dx
Peggy Newman - US
Milton Thomas - MRI

35 years

Maryellen Johnson-Devaney - RN
Brian Deedy - Dx
Peggy Newman - US
Norma Estwick - Image Archives

ANNUAL SERVICE AWARDS FOR RADIOLOGY EMPLOYEES CELEBRATED IN 2017

Diagnostic Imaging



Dx Director Betsy Grady and Sr. Operations Director Donna Hallett extend their appreciation to Dx Imaging staff (L to R): Dennis Vigneault, Betsy, Steve Warren, Isaac Dube, Sara Ross, Delnise Mendes, Jean Wall, Nick Bucci, Lekisha Hamilton and Donna.

Computed Tomography



CT Director Kelly Hart and Sr. Operations Director Donna Hallett extend their appreciation to CT staff (L to R): Kelly, Patricia Peters, James Cooney, Carlos Silva, Maryellen O'Rourke and Donna.



MRI Technical Director Ines Cabral-Goncalves and Sr. Operations Director Donna Hallett extend their appreciation to MRI staff (L to R): Ines, Elizabeth Silva, Katrina Roscia Marshall, Michael Plum, Emilia Johnson, Suzanne Nagle and Donna.

Informatics



Informatics Director Phil Purvis and Peggy Carr

Ultrasound



US Manager Bernie Kennedy and Joanne Picazio

1101 Beacon St



1101 Beacon St. Practice Manager Jane Corey and Cheryl Egan

Media Lab



Radiology Chair Jonathan Kruskal and Michael Larson





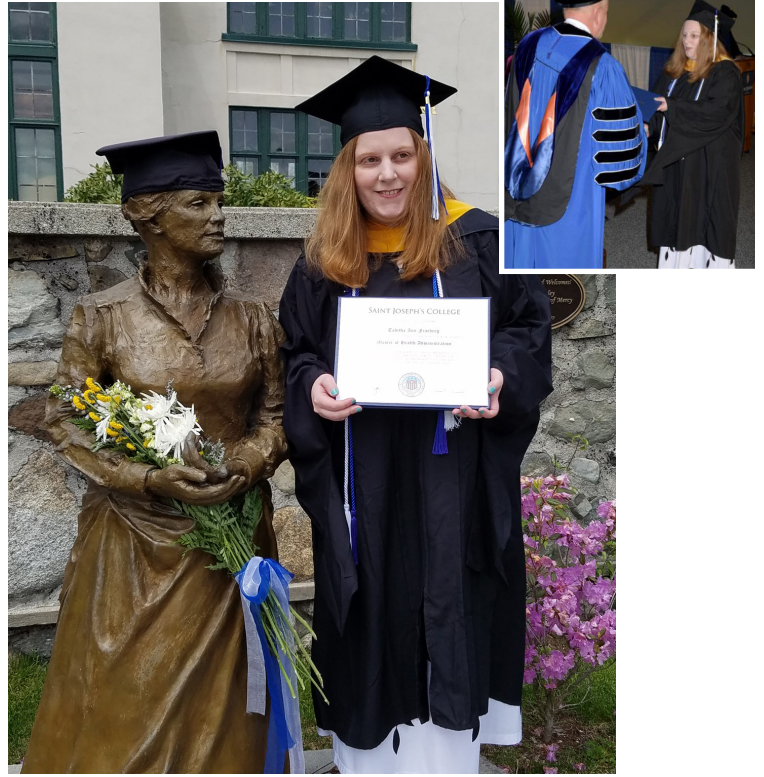
Priscilla J. Slanetz, MD, MPH, FACR, Director

RESIDENCY PROGRAM NEWS

Please join me in congratulating **Tabitha Fineberg** our Education Program Manager who was awarded a Master's in Healthcare Administration from St. Joseph's College of Maine, May 13, 2017. Tabitha joined BIDMC in October 2016 and she was able to go back to school while working fulltime as her program was pursued via an online platform and took less than 1 year (only 50 weeks) to complete. Her thesis, *Creating success and retention through the development of a residency and fellowship program coordinator training manual* was begun when she worked at Boston Medical Center and also led to her presentation at the Association of American Medical Colleges last year (see below). Please see her latest publication on a new residency tool under Pub Callout on pg 17). Tabitha is currently working to mentor other coordinators both here at BIDMC and at the regional level.

In addition to congratulating her on her graduation, I also think this is a good opportunity to note how such an academic background enables her to train other program coordinators beyond BIDMC in the same way that our teaching tips also help other academic physicians to improve their teaching skills.

Currently, Tabitha is working on several projects centered around burnout of program coordinators and residency interview techniques. The latter is coming out soon in Otolaryngology-Head and Neck Surgery entitled, *The interactive candidate assessment tool: A new way to interview residents*. Don't hesitate to contact Tabitha at tfineber@bidmc.harvard.edu if you are interested



Customized learning for MS-4s during electives outside of their chosen specialty

Tabitha Fineberg, BSHA^{1,2}, Jessica Levi, MD¹, Punam Patel, BA¹, and Kenneth Grundfast, MD¹
¹Boston University School of Medicine, Boston, MA - ²Harvard Medical School, Boston, MA

The Challenge

In the latter part of their third year and in their fourth year of medical school, most students have decided on the kind of residency they intend to enter upon graduation. However, elective clerkships do not necessarily provide learning opportunities that correlate well with the future career plans of students.

Our Approach

In an attempt to make a fourth year clinical clerkship most relevant to the chosen career path of students, we tried something new in the Department of Otolaryngology. At the beginning of the clerkship, students were asked to identify three learning objectives that they believe would be most helpful to them to optimally prepare the students for their postgraduate medical education.

Materials & Methods

An attempt was made in Department of Otolaryngology at Boston Medical Center of Boston University School of Medicine (BIDMC) to provide fourth year medical students with a learning experience that correlates with the residency program for which they are applying in the NRP match and the career that they intend to pursue. At the start of their two-week Otolaryngology elective, each MS-4 was given a checklist, known as the Observed Structured Clinical Examination (OSCE) card designed to assess knowledge and skills in addition to prompting active teaching from faculty members. Students received assistance from the Clerkship Coordinator in choosing and describing the customized learning objectives (CLOs). Then, the Clerkship Director and the Chief Resident were informed about the student's CLOs so that they could provide the student with learning opportunities that would enable the student to achieve his or her CLOs. At the end of the two-week elective, the MS-4s met with both the Clerkship Coordinator and the Clerkship Director to assess the extent to which CLOs goals had been achieved.

Summary of Our Experience

From September 2013 to September 2016, there were 104 students who completed the 2-week Otolaryngology elective. The distribution of the chosen career plans for these students is represented in **Table 1**. Column #1 shows the customized learning objectives chosen by students and Column #2 shows examples of customized learning objectives that might be more specific and better correlated with the career paths of the students. Examples of specialty-specific goals are also provided in **Table 1**.

References

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Knowles, Malcolm S., Howard R. Holton III, and Richard A. Swanson. *The adult learner: The definitive classic in adult education and human resource development*. Routledge, 2014.

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Li Su-Ting T, and Ann E. Burke. "Individualized learning plans: basic and beyond?" *Academic Pediatrics* 10(5) (2010): 289.

Examples with Specialty-Specific Goals Created by MS-4s

Specialty	# of Students in 2-week Otolaryngology elective	Column #1 Learning objectives chosen by students	Column #2 Faculty proposed learning objectives
Internal Medicine	17	<ul style="list-style-type: none"> Common Otolaryngology complaints a PCP would evaluate When to evaluate vs. treat in a Primary Care setting How to perform a complete head and neck exam 	<ul style="list-style-type: none"> Evaluation of patient with nasal obstruction Evaluation of patient with neck mass Evaluation of patient with hoarseness Evaluation of patient with dizziness
Pediatrics	14	<ul style="list-style-type: none"> Indications for adenotonsillectomy and placement of tympanostomy tubes Tonal size and Brodsky scale Indications and surgical management of OSA 	<ul style="list-style-type: none"> Learn indications for tonsillectomy, adenotonsillectomy, insertion of tympanostomy tubes Learn how to detect middle ear effusion Learn how to assess child with stridor Learn how to describe tonal size using Brodsky scale
Family Medicine	12	<ul style="list-style-type: none"> Management and treatment of sinusitis and allergies Technical OR skills such as suturing and knot tying How to perform a complete head and neck exam 	<ul style="list-style-type: none"> Learn diagnosis and management of sinusitis Learn how to evaluate patient with neck mass
General Surgery	10	<ul style="list-style-type: none"> How to perform and read an audiogram How to manage allergy emergencies Technical OR skills such as suturing and knot tying Wound closure 	<ul style="list-style-type: none"> Learn how to do otitis media with effusion Learn how to suture Learn how to manage acute upper airway obstruction
Emergency Medicine	9	<ul style="list-style-type: none"> Life-threatening otolaryngologic conditions Emergency consults vs. outpatient management Suturing 	<ul style="list-style-type: none"> Learn how to detect and manage sudden onset unilateral hearing loss Learn how to suture Learn how to manage acute upper airway obstruction
Obstetrics and Gynecology	8	<ul style="list-style-type: none"> How to safely administer medications during pregnancy Common otolaryngology issues in pregnancy First line treatments 	<ul style="list-style-type: none"> Learn which conditions involving the head and neck are exacerbated during pregnancy Learn what medications commonly administered for management of otolaryngologic disorders are contraindicated during pregnancy
Surgical Subspecialties (Urology, Orthopedic Surgery, Ophthalmology, Plastic Surgery)	8	<ul style="list-style-type: none"> Airway and tracheotomy management Indications for a flap Skull base approaches 	<ul style="list-style-type: none"> Improve suturing technique Learn how to work effectively and cooperatively with anesthesiologists
Radiology	8	<ul style="list-style-type: none"> When and why to order imaging Role of imaging in care of an otolaryngologic patient How structures are manipulated in surgery 	<ul style="list-style-type: none"> Learn how to interpret MRI scan of the neck Learn how to interpret CT scan of temporal bones Learn how to use ultrasound to examine thyroid gland
Neurology	5	<ul style="list-style-type: none"> Vertigo and dizziness Facial nerve lesions Ear exam and otoscope usage 	<ul style="list-style-type: none"> Learn how to evaluate patient presenting with dizziness, vertigo Learn how to diagnose and manage facial palsy
Otolaryngology switched from another field	3	<ul style="list-style-type: none"> Basics for H&N surgery for cancer, temporal bone and skull base surgery When to order imaging Suturing 	<ul style="list-style-type: none"> Learn how to suture Learn how to manage acute upper airway obstruction Learn how surgeons should communicate with anesthesiologists
Anesthesiology	3	<ul style="list-style-type: none"> Indications of a surgical airway for an anesthesiologist OR tracheotomy 	<ul style="list-style-type: none"> Learn how to intubate patients Learn about palliative care in patients with advanced head and neck cancer
Child Neurology	2	<ul style="list-style-type: none"> Relationship of tinnitus and migraines Marfanitis 	<ul style="list-style-type: none"> Learn how audiologists can detect functional hearing loss Learn about palliative care in patients with advanced head and neck cancer
Psychiatry	1	<ul style="list-style-type: none"> Physical exam History & physical Scoping 	<ul style="list-style-type: none"> Learn how audiologists can detect functional hearing loss Learn about palliative care in patients with advanced head and neck cancer
Dermatology	1	<ul style="list-style-type: none"> Flap and skin defects Head and neck anatomy Common diseases in Otolaryngology 	<ul style="list-style-type: none"> Learn how reconstruction after Mohs surgery Learn about use of regional and free flaps for reconstructions of defects in the head and neck
Physical Medicine and Rehabilitation	1	<ul style="list-style-type: none"> Skull base approaches Head and neck post-operative care Tracheotomy care 	<ul style="list-style-type: none"> Learn about how to manage functional impairments after major head and neck surgery Learn about routine tracheotomy care
Neurosurgery	1	<ul style="list-style-type: none"> Skull base approaches Common otolaryngologic/surgical approaches Head and neck anatomy 	<ul style="list-style-type: none"> Learn about anterior approach to intracranial tumors such as pituitary, esthesioneuroblastoma
Not Listed	1		

Discussion

Self-directed learning is important for all healthcare professionals as they progress through their careers. The key to successful adult learning is ensuring the learner is engaged in choosing the subject matter to be learned and establishing personally meaningful goals.¹ Individualized learning plans (ILPs) have been reported to be received with high levels of enthusiasm by medical students.^{2,3} Additionally, medical students and residents find that ILPs help them achieve more during their rotations.^{4,5}

Students were able to create and achieve field-specific goals during their two-week elective that were deemed by faculty members to be achievable and appropriate in preparation for the residency program that the student was aiming to enter. However, an important lesson learned as we proceeded with implementation of the CLO approach to customized individual learning experiences was that many students did not yet have the perspective or experience to describe cogent specific CLOs and instead tended to choose general loosely defined CLOs. In comparing the CLOs shown in Column #1 and Column #2 in **Table 1**, it appears that faculty members by virtue of their extensive experience were able to describe discrete CLOs likely to be of maximal benefit to the students in during their residencies. Based on the experience, it seems that the best CLOs can be developed when advice is provided by faculty members who have the experience to know what aspects of Otolaryngology are most applicable to each of the medical and surgical disciplines.

Conclusions

An Otolaryngology clerkship for fourth year medical students can be customized to provide for each student learning opportunities correlated with the career path that the student has chosen. However, even though students were encouraged to choose their own CLOs, after analysis, it appears that the CLOs chosen by faculty CLOs more specific, more achievable and more valuable than the ones the students themselves had chosen because they lacked the experience and perspective to know about the most common ways that they will interface with Otolaryngology as they pursue their careers. The best way to select individualized learning objectives most likely to be maximally helpful to students appears to be having the student get advice from a faculty member in Otolaryngology about the kinds of learning experience that will correlate best with the kinds of conditions and challenges that the students are most likely to encounter in the residency training that they soon will begin to pursue.

Contact
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<http://www.bidmc.org/Media-Education/Departments/Radiology.aspx>
 Phone: (617) 667-3532

Beth Israel Deaconess Medical Center | Harvard Medical School

Teaching Tips: Reflections on the 2017 AUR Annual Meeting



Anu Shenoy-Bhangle,
MD, Assoc. Director

The annual meeting of the Association of University Radiologists offers incredible opportunities for the development of teaching skills, mentoring, and networking. This year, the meeting focused on leading change and adding value. The program offered a wide array of sessions ranging from instilling resiliency in our learners and developing

teaching skills to enhancing leadership skills and expanding research abilities. In addition, the peer observation program was offered to all faculty and the mentoring program was expanded to include an evening of speed mentoring. Finally, there were multiple opportunities for networking.

Reflections from a few of our local attendees include:

"This was my first time attending the AUR meeting, and despite the fact that I was able to attend for just 2 days, I came back with a wealth of knowledge supplemented by excellent networking!"

"Some of the presentations that caught my attention included a talk on including a robust Resident Leadership curriculum during residency whereby residents felt more confident about assuming leadership roles early on in their career. Another group discussed how training interns via an online training module (with a pre and a post-test capability) for improving physician knowledge of radiology ordering as a part of Internship orientation helped educate interns on commonly encountered issues in ordering imaging studies and identify specific areas of knowledge deficiencies with the goal to

reducing ordering errors and decreasing the number of phone calls disrupting daily workflow".

"On a different note, from the ABR update session, here are some numbers to share. For those interested in pursuing IR, currently there are 61 accredited programs in the country for the integrated IR pathway, 9 for the independent pathway and 50 for ESIR with additional pending applications for each of the above described pathways".

"I attend the meeting every year and absolutely love the numerous opportunities to collaborate and network with colleagues passionate about education. This meeting has something for everyone, but I particularly enjoyed the session on resiliency where speakers shared their thoughts on how to become more resilient – optimism, perseverance, and willingness to adapt to change! The highlight of the session for me was when a well-respected leader in our field shared his failures along his path to success, something none of us typically speak about."

"The best part of this meeting is the openness and willingness of all attendees to collaborate on projects and share ideas and best practices. For anyone interested in pursuing a career in medical education, I highly recommend becoming involved."

If you are inspired by the testimony of your colleagues, consider attending next year's meeting to be held on April 9-12, 2018 in Nashville, TN. Depending on your specific interests, you may also want to join ACER, AMSER, RASHR, or RRA, the various alliances of the AUR focused on clinician educators, medical students, and research, respectively".



Left: Vice Chair for Academic Affairs **Debbie Levine** accepted the Chapter Membership Award on behalf of the Massachusetts Radiological Society. This award recognizes and rewards chapters for their advocacy of radiologists at the local level. Points are bestowed for formulating new goals for member support at the chapter level, persistent efforts in retaining existing members, efforts for reaching out to non-members, and communications to all members.

BIDMC staff were also recognized at this year's ACR meeting: Cardiothoracic Imager **Paul Spirn** was inducted as Fellow of the American College of Radiology

Amy K. Patel (joining BIDMC in Breast Imaging, July 2017) was awarded the RADPAC Achievement Award





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The Interactive Candidate Assessment Tool: A New Way to Interview Residents

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No sponsorships or competing interests have been disclosed for this article.

Abstract

The purpose of the residency interview is to determine the extent to which a well-qualified applicant is a good fit with a residency program. However, questions asked during residency interviews tend to be standard and repetitive, and they may not elicit information that best differentiates one applicant from another. The iCAT (interactive Candidate Assessment Tool) is a novel interview instrument that allows both interviewers and interviewees to learn about each other in a meaningful way. The iCAT uses a tablet computer to enable the candidate to select questions from an array of video and nonvideo vignettes. Vignettes include recorded videos regarding some aspect of the program, while other icons include questions within recognizable categories. Postinterview surveys demonstrated advantages over traditional interview methods, with 93% agreeing that it was an innovative and effective tool for conducting residency program interviews. The iCAT for residency interviews is a technological advancement that facilitates in-depth candidate assessment.

Keywords

resident interview; resident education, resident applications

Received November 10, 2016; revised January 10, 2017; accepted February 22, 2017.

The residency candidate interviews are an essential component to a successful match for both applicants and programs. The interview process attempts to measure personal characteristics beyond what can be gleaned from the Electronic Residency Application Service (ERAS) application. However, only 17 of 34 studies found the residency interview to be predictive of subsequent clinical performance in residency.¹

Standard questions asked during both structured and unstructured interviews do not necessarily elicit information that differentiates one applicant from another. When an interview largely comprises commonly asked questions, applicants tend to give predictable prepared answers in a way that reveals little that is

distinguishing about the applicant. While significant resources are committed to the interview process, the extent to which a well-qualified applicant is a good fit with a residency program remains variable.¹ Improvement in the residency interview process is needed to provide a better match between applicants and programs. This project aims to present a novel method for structured residency interviews that allows programs to better differentiate the attitudes and mind-set of prospective residency applicants while introducing them to leaders at the medical center.

Methods

The iCAT (interactive Candidate Assessment Tool) is a tablet-based program that was designed using Prezi software (Prezi, San Francisco, California). During otolaryngology residency interviews, the candidate uses a handheld tablet to navigate among options on a homepage, thus essentially driving the content and pace of his or her own interview. Twenty video clips were prerecorded by key leaders from the medical center, including an emergency medicine physician, chair of the Graduate Medical Education Committee, chief executive officer of the hospital, dean of the medical school, and even a patient. Each video has 2 components: education about a strength of the program and a question pertaining to the speaker's expertise. Twenty static written questions and pictures were in categories such as anatomy, ethics, and Boston trivia (**Figure 1**). Also, there was an

Conclusion

The iCAT is a novel interview platform that allows more in-depth engagement and assessment of interviewees compared with a traditional interview. The use of recorded videos and selected questions standardizes content while providing applicants with additional information about the program. Longer term data on candidate success in residency may demonstrate the additional value of using this technology in the residency interview process.

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Seminars in Radiology
January 2017 Volume 52, Issue 1, p1-62
Imaging of Infection - Part 1
Edited by Ronald Eisenberg

<http://www.seminarsinroentgenology.com/current>



Infections of the Brain and Meninges



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Bacterial Infections

Imaging findings for the various typical bacteria infecting the central nervous system (CNS) are nonspecific and require correlation with laboratory tests to establish a definitive diagnosis. Mycobacterial and spirochetal infections have a clinical presentation and imaging appearance different from those of typical bacteria. Therefore, the following sections first discuss the various stages of pyogenic infections that occur with most bacteria, followed by a description of mycobacterial (tuberculosis) and spirochetal (Lyme disease) infections.

enhancement. If the diagnosis is made at this stage, the patient can be treated effectively with antibiotics.

Late cerebritis develops within 1-2 weeks of infection. On CT, there is now thick, irregular contrast enhancement at the edges of the lesion. On MRI, FLAIR and T2W images demonstrate increased signal centrally within the lesion, which is surrounded by a thick, irregular enhancing rim and vasogenic edema. Diffusion-weighted imaging (DWI) may show increased signal within the center of the lesion. There is no discrete low-signal capsule on T2W images at this stage, unlike the appearance in mature abscesses. Although an infection at this stage also can be treated with antibiotics, surgery is often performed because the imaging appearance of late cerebritis



Seminars in
ROENTGENOLOGY

Imaging of Head and Neck Infections: Diagnostic Considerations, Potential Mimics, and Clinical Management



Jason R. Chalifoux, MD, PhD,^{*} Behroze Vachha, MD, PhD,^{†,‡} and Gul Moonis, MD^{*}

Emergency head and neck imaging studies often elicit a unique apprehension because of the complex anatomy and subtle imaging findings. In this article, we present commonly encountered head and neck infections, with an emphasis on clinical presentation, imaging characteristics, potential mimics of infection, and clinical management.

Most people with sinusitis would not benefit from imaging and they should be treated conservatively. However, if a complication of ABRS (orbital, intracranial, or soft tissue involvement) is suspected or if alternative diagnoses including malignancy are considered as a cause of patient symptoms, contrast-enhanced computed tomography (CECT) should be performed.² Imaging findings of ABRS include sinonasal mucosal thickening, aerosolized secretions, and air-fluid levels (which also can be seen in intubated patients). Magnetic



Pneumonia

Elisa Franquet, MD

Introduction

Pneumonia continues to be a significant global health problem, remaining among the top 10 causes of death globally and in the US,¹ especially among elderly patients.² The diagnosis of pneumonia relies mainly on clinical symptoms and imaging findings. Despite imaging studies playing an important role in early diagnosis, laboratory confirmation can be obtained in only 30%-70% of cases even after a full microbial battery is performed.³ Invasive procedures, such as bronchoscopy with lavage and biopsy, are limited to hospital-associated infections and immunocompromised patients.

Imaging Modalities

Chest radiography (CR) is considered the modality of choice for detecting new infiltrates in clinically suspected pneumonia.^{4,5} This modality provides information about localization, extent, and prognosis, as well as excluding other causes of disease and at times even suggesting an etiologic agent.⁵ However, the specificity of CR is low, and interpretation agreement among

with suspected tuberculosis (TB) and parenchymal abnormalities in up to 50% of neutropenic patients with normal CR and persistent fever refractory to empiric treatment.^{10,13-15} Nevertheless, CR is still the initial diagnostic imaging procedure because of its widespread availability and its low cost and radiation exposure.

The Different Faces of Pneumonia

The classic radiological patterns of pneumonia are lobar consolidation, bronchopneumonia, and interstitial consolidation. The radiological findings on CR and CT and the most common organisms for each pattern are summarized in Table 1.^{10,16,17}

The nodular pattern refers to the presence of multiple rounded opacities (2-10 mm) in a widespread but not necessarily uniform distribution.¹⁸ In an acute clinical setting, centrilobular nodules of soft tissue attenuation are likely due to infection. The most common cause is endobronchial spread of bacterial, mycobacterial, or fungal organisms, and this appearance represents an early manifestation of bronchopneumonia.



Cardiac Infections

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Introduction

Cardiac infections comprise a broad range of clinical and radiologic entities, which can involve the pericardium, myocardium, valves, or endocardium. They can arise in these cardiac structures or result from spread of infection from contiguous structures or implanted material (vascular grafts and prosthetic cardiac valves).

Pericarditis

Pericarditis consists of inflammation of the 2 thin fibrous layers of pericardium that surround the heart. It typically affects men, with the highest incidence between 16 and 65 years of age.¹ Acute pericarditis accounts for 5% of emergency department

(TTE).⁶ If echocardiography is not possible because of a poor echocardiographic window or a suspected traumatic, cross-sectional imaging with computed tomography (CT)⁷ or cardiac magnetic resonance should be considered.⁶ Pericarditis and its complications may be imaged with cardiac CT if echocardiography is nondiagnostic (eg, in emphysema, obesity, or recent cardiac surgery); more commonly, pericarditis may be identified on CT performed for another indication.

The normal pericardium is a thin (1-2 mm) line of soft-tissue attenuation lining the epicardial fat around the heart (Fig. 1).^{6,8} Pericardial thickening (>4 mm) is a nonspecific finding that may be seen in noninfectious pericarditis, after cardiac surgery, and in the setting of pericardial malignancy. Although CT may not clearly distinguish a small pericardial effusion from thickened pericardium because of volume

Imaging of Osteomyelitis of the Extremities



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Introduction

Osteomyelitis is defined as inflammation of bone, which is typically infectious in etiology. Bacteria can seed bone directly from an adjacent ulcer, through direct inoculation by penetrating trauma, or by hematogenous spread of infection from another source.¹ Direct spread usually infects bone with multiple organisms. *Staphylococcus aureus* is most commonly isolated from hematogenous infections of bone.² The infecting agent triggers an inflammatory response consisting of bony hyperemia, edema, and neutrophilic infiltration. The hyperemia causes bone demineralization, seen as a subtle lucency and loss of the cortical contour on radiographs. The neutrophilic infiltrate destroys bony trabeculae, causing osteolysis and replacing the normal fatty marrow to produce the imaging appearance of acute osteomyelitis. If left untreated, the infection progresses and may lead to necrotic bone (seque-

gas. Computed tomography (CT) shows subtle cortical erosions earlier than radiographs and better demonstrates sequestra. Intravenous contrast can be used to outline soft tissue abscesses. In early osteomyelitis, where radiographs and even CT fail to demonstrate osteolysis but osteomyelitis is suspected clinically, magnetic resonance imaging (MRI) is often obtained for diagnosis. MRI accurately evaluates the extent of bone involvement if osteomyelitis already has been diagnosed. The typical MR findings of osteomyelitis include edema and enhancement of bone marrow, along with replacement of bright fatty marrow signal on T1 images with signal closer in intensity to muscle.⁵ T2 marrow hyperintensity and enhancement, as well as T2 hyperintense periosteal edema, may be reactive to adjacent soft tissue infection. Thus, T1 marrow replacement is the most specific sign of marrow infection.⁵ Intravenous contrast is not required for diagnosis but plays a role in evaluating the

Imaging of Musculoskeletal Soft Tissue Infection



Ching-Di Chang, MD,* and Jim S. Wu, MD[†]

Introduction

Musculoskeletal soft tissue infections account for over 2 million emergency department visits in the United States annually, mostly related to cellulitis or soft tissue abscess.¹ Infection of musculoskeletal soft tissues can be classified by the following anatomic structures they involve: (1) skin and subcutaneous tissues (cellulitis and abscess), (2) fascia (necrotizing fasciitis), (3) muscle (infectious myositis and pyomyositis), (4) bursae (infectious bursitis), and (5) tendons and tendon sheaths (suppurative tenosynovitis). It is important to describe the location and appearance of the infection as they have important treatment implications. Some conditions can be treated with antibiotics alone, whereas others require drainage or surgery. This characterization is best achieved with imaging.

tests can show leukocytosis and elevation of C-reactive protein, erythrocyte sedimentation rate, and procalcitonin.⁹

Imaging Modalities

With soft tissue infections, management depends to a large extent on the location and extent of involvement, which can be best assessed on imaging. Radiographs should be the first-line modality. They are relatively inexpensive, quick to perform, and can identify foreign bodies, osseous involvement, soft tissue swelling, and soft tissue gas as in necrotizing fasciitis (Fig. 1A). Ultrasound (US) can demonstrate fluid collections and is helpful in distinguishing between cystic and solid lesions. This can be especially important when searching for an abscess collection.¹⁰ US also can be useful in the assessment of foreign bodies, which can be missed on computed

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