

Radical Views...

from the Department of Radiology

Volume 7, Number 9
APRIL 2015



Beth Israel Deaconess
Medical Center



HARVARD MEDICAL SCHOOL
TEACHING HOSPITAL

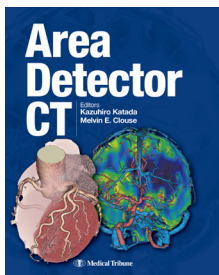


FROM THE CHIEF
Jonathan B. Kruskal, MD PhD

Of note ...



Check out the photo collage on page 2 of young Mel Clouse's days as a trainee in the Solomon Islands with his MGH mentors in 1968!

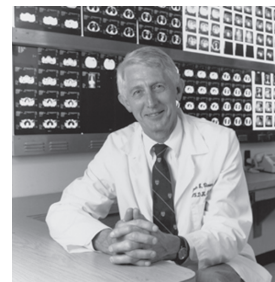


➤ Milestone: Melvin E. Clouse, MD, FACR, FAHA, FSIR, FSCCT Retires

Please join me in wishing the best for Mel Clouse who retired on Tuesday, March 31, 2015 after devoting over 50 years to Radiology at Harvard Medical School (HMS), including 22 years as Chief of Radiology at New England Deaconess Hospital and BIDMC!

Dr. Clouse made significant contributions to cardiovascular and interventional radiology primarily in lymphangiography, hepatobiliary interventions and the treatment of liver tumors using intra-arterial catheter techniques. He was the first to apply ultra-fast CT for diagnosing/imaging coronary atherosclerosis and progressed to establishing diagnostic MDCT to determine which patients needed intervention.

He established a basic liver research program at NEDH and was PI of an NIH RO1 grant to assess and reduce cold storage ischemic effects of the donor liver prior to re-implantation. He also served as Director and PI of an NCI training program in Cancer Radiology Research (1995-2010) that emphasized the importance of molecular imaging and was responsible for creating the Center for Molecular Imaging Diagnosis and Therapy, a radiology-based initiative to develop oncologic interventions at the cellular level as he considers gene therapy to be an emerging field of radiology.



Dr. Clouse also focused on CT for non invasive imaging of the heart, evaluating the use of electron beam CT in clinical trials performing calcium studies of the coronary arteries to compare non-invasive CT arteriography to invasive catheter-based coronary arteriograms to determine sensitivity, specificity, and accuracy. This interest continued with the fast helical scanners using 64-row detectors and has resulted in numerous speaking engagements and publications resulting from collaboration with the Framingham Heart Study.

In 2006 he served as site PI for the CORE 64 study using the 64-row detector MDCT scanner to compare the accuracy of MDCTA to catheter coronary arteriography. With Dr. Clouse's lobbying, this study was responsible for moving the technology from the laboratory to the clinical arena. In 2009, he became site Co-PI for the CORE 320 study comparing CT perfusion imaging to SPECT imaging. These Toshiba-sponsored multi-center studies included Johns Hopkins, Charite (Humboldt University, Berlin), Toronto General Hospital, IWATA in Japan, Heart Institute (InCor) University of Sao Paulo, Brazil, Leiden University, Netherlands and Mount Elizabeth, Singapore and has resulted in the publication of seven papers, five of which were published in 2014-2015! [*See pg 3] Also, his new textbook "Area Detector CT" will be published this month.

Also in 2006, he joined a collaborative effort with a group from the Joslin Clinic and Cardiology from BIDMC and Tufts University, which resulted in the creation of an NIH-funded Specialized Center of Clinically Oriented Research (SCCOR) for Metabolic Syndrome, Inflammation and Vascular Remodeling. As this study finishes in March 2015, Dr. Clouse feels that the time is right for him to "retire" although there is no doubt that he will continue to publish!

JUST THE FACTS



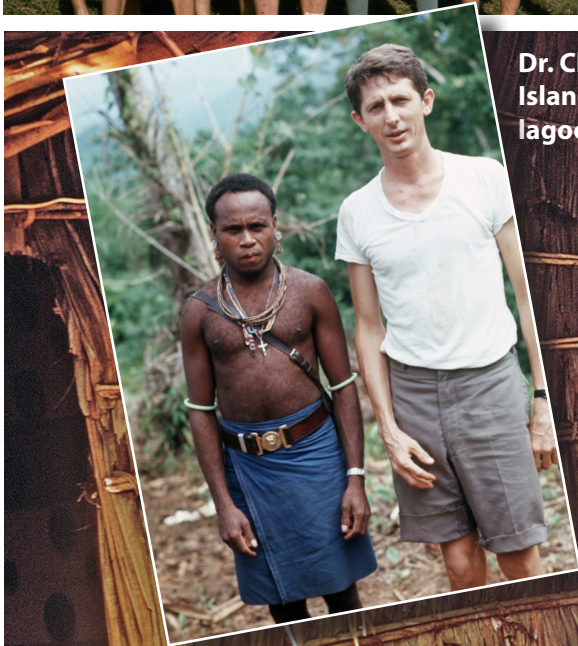
Melvin E. Clouse, MD - Deaconess Professor of Radiology, HMS and *Emeritus* Chairman of Radiology and Director of Radiology Research at BIDMC, began as a radiology technologist in Fort Worth, Texas in 1954. He earned his MD from the University of Texas Medical Branch, Galveston in 1960, completed his radiology residency at Massachusetts General Hospital in 1964, and then a clinical/research fellowship in radiology at the Armed Forces Institute of Pathology, Walter Reed Hospital, Washington, DC, in 1965.

In 1966 he joined MGH as an Assistant in Radiology and came to New England Deaconess Hospital (NEDH) in 1969 as section chief of Vascular & Interventional Radiology. As Chairman of Radiology at NEDH (1975-1996), he established clinical and basic research programs and was promoted to HMS Professor of Radiology in 1987. (He also served as Radiologist-in-Chief at BIDMC, 1998-1999.)

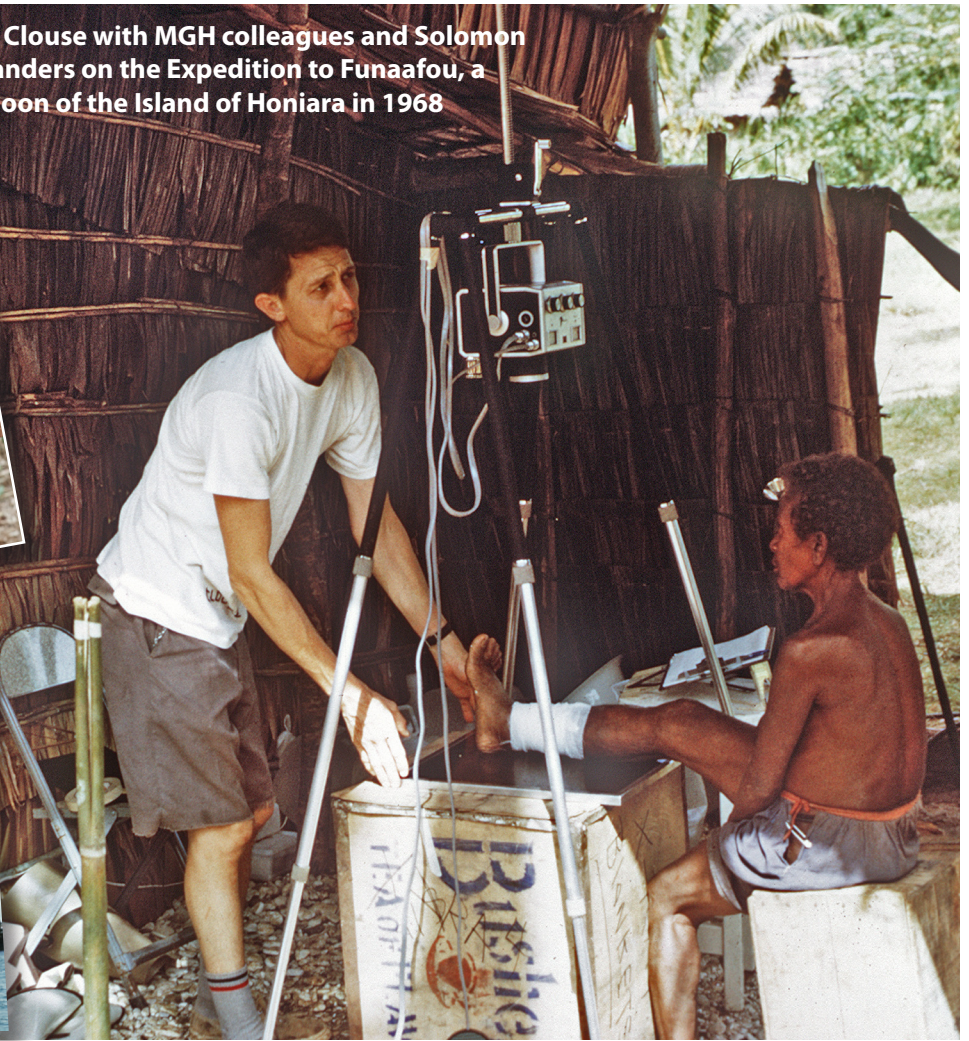
He is a Fellow of: American College of Radiology (FACR), Society of Interventional Radiology (FSIR), American Heart Association (FAHA) and Society of Cardiac Computed Tomography (FSCCT) as well as an Honorary professor of Radiology at the First University Hospital, Xi'an Shaanxi, China.



Dr. Clouse with John Liwicik (left), the son of the High Priest (the Chief, below), who helped him take x-rays.



Dr. Clouse with MGH colleagues and Solomon Islanders on the Expedition to Funaafou, a lagoon of the Island of Honiara in 1968



While an Assistant in Radiology at MGH, Dr. Clouse was asked to go on an expedition to an atoll in the South Pacific for three months where he could only communicate with his young family by letter about every 3 weeks when the post mail boat came from Honiara on Malaita to Funaafou, the small man-made island in the lagoon in the Solomon chain where his team lived. All transportation to the little island was by dugout canoes. Funded by the MGH Radiology Department, the Peabody Museum and Department of Anthropology, Harvard University, the National Institute of General Medical Sciences, and U.S. Public Health Services, he served as the Imaging Core Director and his work resulted in the publication of:

Clouse ME, Damon A. Radiologic survey in the Solomon Islands, 1968: lungs, heart, spleen, scoliosis, bone age, and dental development. *Hum Biol.* 1971 Feb;43(1):22-35. PubMed PMID: 4326246.

*** Dr. Melvin Clouse's Most recent publications:**

George RT, Mehra VC, Chen MY, Kitagawa K, Arbab-Zadeh A, Miller JM, Matheson MB, Vavere AL, Kofoed KF, Rochitte CE, Dewey M, Yaw TS, Niinuma H, Brenner W, Cox C, Clouse ME, Lima JA, Di Carli M. Myocardial CT Perfusion Imaging and SPECT for the Diagnosis of Coronary Artery Disease: A Head-to-Head Comparison from the CORE320 Multicenter Diagnostic Performance Study. *Radiology*. 2015 Feb;274(2):626. PMID: 25625749.

Rybicki FJ, Mather RT, Kumamaru KK, Brinker J, Chen MY, Cox C, Matheson MB, Dewey M, DiCarli MF, Miller JM, Geleijns J, George RT, Paul N, Texter J, Vavere A, Yaw TS, Lima JA, Clouse ME. Comprehensive Assessment of Radiation Dose Estimates for the CORE320 Study. *AJR Am J Roentgenol*. 2015 Jan;204(1):W27-36. PMID: 25539270.

George RT, Mehra VC, Chen MY, Kitagawa K, Arbab-Zadeh A, Miller JM, Matheson MB, Vavere AL, Kofoed KF, Rochitte CE, Dewey M, Yaw TS, Niinuma H, Brenner W, Cox C, Clouse ME, Lima JA, Di Carli M. Myocardial CT Perfusion Imaging and SPECT for the Diagnosis of Coronary Artery Disease: A Head-to-Head Comparison from the CORE320 Multicenter Diagnostic Performance Study. *Radiology*. 2014 Aug;272(2):407-16. PMID: 24865312.

Rochitte CE, George RT, Chen MY, Arbab-Zadeh A, Dewey M, Miller JM, Niinuma H, Yoshioka K, Kitagawa K, Nakamori S, Laham R, Vavere AL, Cerci RJ, Mehra VC, Nomura C, Kofoed KF, Jinzaki M, Kuribayashi S, de Roos A, Laule M, Tan SY, Hoe J, Paul N, Rybicki FJ, Brinker JA, Arai AE, Cox C, Clouse ME, Di Carli MF, Lima JA. Computed tomography angiography and perfusion to assess coronary artery stenosis causing perfusion defects by single photon emission computed tomography: the CORE320 study. *Eur Heart J*. 2014 May;35(17):1120-30. PMID: 24255127.

Tanami Y, Jinzaki M, Kishi S, Matheson M, Vavere AL, Rochitte CE, Dewey M, Chen MY, Clouse ME, Cox C, Kuribayashi S, Lima JA, Arbab-Zadeh A. Lack of Association Between Epicardial Fat Volume and Extent of Coronary Artery Calcification, Severity of Coronary Artery Disease, or Presence of Myocardial Perfusion Abnormalities in a Diverse, Symptomatic Patient Population: Results From the CORE320 Multicenter Study. *Circ Cardiovasc Imaging*. 2015 Mar;8(3):e002676. doi: 10.1161/CIRCIMAGING.114.002676. PMID: 25752899; PMCID: PMC4355954.

See Bibliography for more 2015 pubs

On March 30th, Radiology had the chance to bestow their best wishes on Dr. Clouse in honor of his 45 years of service during lunch in the Kirstein Living Room. Accompanied by his wife Upty and his son Grady, Dr. Clouse acknowledged his appreciation of the department as well as several guests: his first administrative assistant **Anne Ryan**, and **Dennis Monty**, BIDMC Director of Facilities Planning, **Steve Berry**, Director of Academic & Research Computing and **Mary Leupold**, Director of Human Resources.



Dr. and Mrs. Clouse with his last Research fellows in Cardiac CT, Ninad Salastekar and Huzifa Haj-Ibrahim.



Dr. Clouse and Anne Ryan, his first secretary and Dawn Federman, his most recent administrative assistant.



Dr. Clouse and Dennis Monty and Dr. Jonny Kruskal, Chair of Radiology and former research fellow of Dr. Clouse, here presenting Dr. Clouse with a Long Service award for more than 40 years of service.



Steve Berry and Dr. Clouse and Dr. Clouse with Mary Leupold.



Dr. Kruskal and Clouse recall their adventures in research at the New England Deaconess Hospital where they learned how to perform liver transplants in rats. Dr. Clouse also acknowledged his appreciation of staff and co-workers in Radiology as we all wished him the best for his next adventures!

[Due to space limitations, we were unable to show all the photos of this luncheon. Please contact Donna Wolfe for copies.]



Dr. Clouse on his way to Petra after serving as a Visiting Professor at the King Hussein Medical Center in Amman, Jordan in 1994. He is ready for his next adventure in 2015.

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	Friday Grand Rounds: 12 noon Sherman Auditorium, East Campus (unless stated otherwise)
		1 7:30 - 8:15 Breast abscess (Louis Serrano) 8:15 - 9:00 Mammo cases (Louis Serrano)	2 7:30 - 9:00 Mammo (TBD)	3 7:30 - 9:00 Mammo Jeopardy (Priscilla Slanetz and Valerie Fein-Zachary) 12:00-1:00 pm No Grand Rounds
6 7:30 - 9:00 Neuro (TBD)	7 7:30 - 9:00 Neuro (TBD) 5:00-6:30 Mentoring Meeting (Cancelled for April)	8 7:30 - 9:00 Physics (TBD) 7:15-8:00 US meeting [WCC-304A]	9 7:30 - 9:00 Neuro (TBD)	10 12:00-1:00 pm Grand Rounds: Radiation Safety in Breast Imaging (Martha B. Mainiero)
13 7:30 - 8:15 Imaging of gastric bypass (Girish Tyagi) 8:15 - 9:00 Overview of bowel and biliary surgeries (Leo Tsai) 12:00-1:00 MRI Meeting [Ansin 2]	14 7:30 - 8:15 Malignant anorectal conditions (Koenraad Morteale) 8:15 - 9:00 GU cases (Maryellen Sun) 10:30-11:30 NMMI meeting [GZ-103]	15 7:30 - 8:15 CT colonography (Bettina Siewert) 8:15 - 9:00 GI cases (Bettina Siewert)	16 7:30 - 8:15 Scrotal cases (Robert Kane) 8:15 - 9:00 Abdomen and pelvis jeopardy (Koenraad Morteale) 2:00-3:00 West MedRads - Body Senior	17 12:00-1:00 pm NERRS / No Grand Rounds
20 7:30 - 8:15 Patriot's Day / Boston Marathon (No conference)	21 7:30 - 9:00 Nukes (TBD) 8:00-9:00 IR Meeting [West Recovery]	22 7:30 - 9:00 Physics (TBD)	23 7:30 - 9:00 Nukes (TBD)	24 12:00-1:00 pm ARRS / No Grand Rounds
27 7:30 - 9:00 Nukes (TBD)	28 7:30 - 9:00 Nukes (TBD) 10:30-11:30 NMMI meeting [GZ-103]	29 7:30 - 9:00 Nukes (TBD)	30 7:30 - 9:00 Nukes (TBD)	

Save the Dates:

Friday, May 1, 2015 - Sven Paulin Lecture by Joao A. C. Lima, MD, Director, Cardiovascular Imaging at Johns Hopkins Hospital

Friday, May 8, 2015 - Morrison Research Day

MRI: SNOWBOUND CAKE IN 2015 & SAND BOUNCED AT SAR 2015



MRI (Clinical and Research) was proud to celebrate the fact that Boston broke the Snowfall Record on Sunday, March 15, 2015, by logging 108.6 inches in Boston this year!

But rather than bemoan the continuing snowfall, MRI folks eagerly cheered it on...hoping to break the record.

They celebrated with a "Snowbound Cake" depicting the plight of Bostonians with frosting-bound cars, trucks and school buses. There was a round of "3 cheers for Boston" before they devoured the cake. All this proves that MRI people will cheer for anything...if it means having cake!



Thanks to MRI Chief Koenraad Morteale for sharing his enjoyment of the sand at the Society of Abdominal Radiology meeting in San Diego this March. (see pg 24 for more)

APRIL GRAND ROUNDS



Friday, April 10th, 2015
12 noon - 1:00 PM • Sherman Auditorium

Radiation Safety in Breast Imaging

Martha B. Mainiero, MD - Director, Anne C. Pappas Center for Breast Imaging, Rhode Island Hospital; Professor of Diagnostic Imaging, The Alpert Medical School of Brown University, Providence, RI

Please welcome Dr. Martha B. Mainiero, the Director of the Anne C. Pappas Center for Breast Imaging at Rhode Island Hospital in Providence, RI. Dr. Mainiero earned her MD from Tufts University, Boston and completed an internship in Medicine and Surgery at the Newton-Wellesley Hospital (Newton, MA). She went on to Yale-New Haven Hospital (New Haven, CT) for residency training in Diagnostic Radiology and a fellowship in Breast and Chest Imaging before joining the Brown University medical school staff in 1995, serving at Rhode Island Hospital, the Women and Infants Hospital, and the Miriam Hospital in Providence. In 1996, she was appointed Associate Director of the Diagnostic Radiology Residency Program at Rhode Island Hospital, rising to Director in 2001. Her work was recognized nationally by her being appointed Associate Editor for Education at the Journal of the American College of Radiology (AJR) 2006-2012. where she has also served as a Breast Imaging Reviewer since 1996.

DEPARTMENTAL NEWS: Hellos and Goodbyes!



Jim Brophy
Radiology
Informatics Manager

Please Welcome Leo Hannenberg

I am pleased to announce that we have hired a new Radiology Data Analyst in the RIS/PACS/Image Archive division of the department. **Leo Hannenberg**, who some of you may remember from the pre-merger days as an employee of Beth Israel Hospital, has joined our department with the primary responsibility of taking care of the **Fluency For Imaging** (FFI) application. Leo will be training over the next several weeks/months, but I am quite sure that he will become an invaluable resource to all of us when working with this very complex software. Leo has come to us from Massachusetts General Hospital, where he held the position of Technical Analyst along with other roles since 2001. Prior to his work at MGH, Leo worked at the Dana Farber Cancer Institute. Please join me in welcoming Leo to the department, and we will introduce him to staff as we go around the Medical Center and the offsites. I am thrilled he has decided to join us, and I think you will be as well.



Goodbye and Best Wishes Scot Morrison!



Residency Program Coordinator Scot Morrison and Medical Education Programs Manager Katie Armstrong at Fleischer Graduation 2014.

"I know its April 1st but this is not a joke of any kind. I am writing to give you the bittersweet news that I have taken the position as the program coordinator in the Ophthalmology Department as Mass Eye and Ear. This new position will provide me with an opportunity to have my own program and expand my fund of knowledge as a coordinator. I also commute in and out of North Station and will be able to walk to the hospital.

I have truly enjoyed my time here with EVERYONE in the Radiology department. This institution, department, and program have a great mission and values that truly foster world class medical education, and I have felt fortunate to be a part of that for the last couple of year. You all are very brilliant and accomplished physicians which will do wonders for healthcare wherever you go. Thank you for letting me be a part of your journey. My last day will be Wednesday, April 15.

Best of luck to you all!"

~Scot
Program Coordinator
Diagnostic Radiology Residency Program

DEPARTMENTAL NEWS: Hellos and Goodbyes - Farewell Marilyn and Richard Plaistowe & Ian Brennan



Dr. Clouse and Radiology alumnus **Blanche Murphy, RN** toast with **Mary Malolepszy, RN**, guest of honor **Marilyn Plaistowe** and IR Tech **Ben Delahanty**.



L to R: Nurse Mgr. **Bridget O'Bryan Alberts** celebrates with retiring IR technologists and married couple **Richard and Marilyn Plaistowe**. Marilyn leaves as a Senior Technologist with 23 years of experience and Richard with 11 years. Taken together, their 34 years at BIDMC ranks up there with Dr. Clouse's 45 years!



Marilyn shows off her granddaughter Abby with Interventionalist **Jenny Ní Mhuircheartaigh**



Sr IR Tech **Patty MacDonald** shows off her twin grandchildren Parker and Ellie

On Thursday, March 26, Interventional Radiology and friends celebrated the retirement of Marilyn and Richard Plaistowe and said farewell to Dr. Ian Brennan, yet another Irish transplant returning home to Dublin

DEPARTMENTAL NEWS: Hellos and Goodbyes - Farewell Marilyn and Richard Plaistowe & Ian Brennan



Repatriating Irish interventionalist **Ian Brennan** is presented with a departing gift of an overnight bag. L to R: VIR Fellows **Almamooun Justiniah** (with phone) **Pauline Bishop**, and **Seth Berkowitz**. Front row: back of IR PA **Jon Underhill's** head and Sr IR Tech **Breige Kerr**.

Continuing with the tradition established by Interventional Radiologist Dr. Melvin Clouse, the IR Division celebrated with barbecue, this time at Sweet Cheeks, Fenway Park!



RNS **Breige Kerr** and **Mary Ryan** and Dr. **Jenny Ní Mhuircheartaigh**.



Straight from the operating room, IR Chief **Muneeb Ahmed** joins his division at Sweet Cheeks, appropriately dressed for BBQ with fellow interventionalist **Olga Brook** and Sr IR Tech **Patty MacDonald**.



IR Tech **Kalie Wilson**, RN **Mary Malolepszy** and **Marilyn**.



Special thanks to Maxima Baudissin for the photos!

DEPARTMENTAL NEWS:

Radiology Transporters honored at their annual luncheon

Transporters:

Fritz Honore, Supervisor
Angela Favors
Chenaanah Dorsey
Dydir Parisien
Emalee Mahoney
Etsegenet Asamenew
Francisco DoRosario
Hope Lee

Jean Fleury
Joaquin Thomas
Joel Joseph
Joseph Eloi
Joshua Lurier
Leonard Nnaji
Richard LeMaitre
Rodrigue Dorcil
Walson Germain



The Gallery at WCC-304B

Jonathan Kleefeld,
MD *Neuroradiologist & World*
Photographer

The new Gallery show,
Faces of Rajasthan,
features Dr. Kleefeld's vision
of the people that make
India so special!



As always, please contact Donna Wolfe if you, too would like to share your photos, paintings or sculptures: dwolfe@bidmc.harvard.edu or 4-2515

DEPARTMENTAL NEWS: Radiology Action Planning Committee

As we see the light at the end of this long snowy winter, I'd like to shine a spotlight on these amazing individuals who have been working diligently to create a culture that supports the patient experience. The members of the Radiology Action Planning Committee work as ambassadors within their modalities to encourage patient engagement and continuous improvement. Please take the time to recognize the ambassadors in your area and thank them for this additional work they are doing in their commitment to service excellence. As you can see from the photograph, we have representatives from all areas of the department, as well as Caroline Moore, MPH who is the Project Leader, Patient and Family Engagement for the medical center. It's so important for the department to work together and stress the importance of obtaining feedback from our patients and use that feedback to continuously improve the work we do. Remember you can always find our Radiology survey data on the Transparency Page of the public BIDMC website under Quality & Safety, then Patient Experience and Satisfaction at: <http://bidmc.org/Quality-and-Safety/Patient-Experience-and-Satisfaction.aspx>



Radiology Action Planning Committee (Back Row L to R): **Aideen Snell**, Service Excellence Mgr, **Usama Abraham** (CT Supervisor), **ShuangQi (Jim) Zheng** (MRI Supervisor), **Jim Conklin** (NMMI Mgr), **Matt McMahon** (NMMI Tech II), **Macarthur Cherenfant** (Radiology Support Services Supervisor), and **Jae Kim** (Senior CT Tech).

(Front Row L to R): **Meghan Connolly** (Sonographer), **Juanita Cook** (US Supervisor), **Bessie A. Gray** (Image Archive Supervisor), **Caroline Moore** (Program Leader, Patient & Family Engagement), **Lekisha Hamilton** (Senior Dx Tech).

[Right column: **Patty MacDonald** (Senior IR Tech), **Ana Cordero** (Clinical Instructor), **Deb Humphries** (Breast Imaging Tech) and **Jan Hurd** (NMMI Tech II)]

I needed to get copies of my recent CT scan and Pet scan. I called the Radiology Archives department who handled my request expeditiously. A few hours later I was in Shapiro for a scheduled appointment and went to Radiology to pick up my copies. The CDs of both scans were ready and after showing a photo ID, I was handed a package of CDs and instructions. My total elapsed time for phone call and pickup was less than 10 minutes. Now that's what I call service!

- **Howard, a Patient and Family Advisor on our Hospital-Wide Patient and Family Advisory Council**

"Thank you so much for asking!" - **Comment on the Patient Satisfaction Survey**

The satisfaction survey that patients fill out at the kiosks in Radiology are a great tool in obtaining direct patient feedback on our performance. It's vital in helping us deliver and improve upon our "human first" experience.

- **Koenraad Morteale**

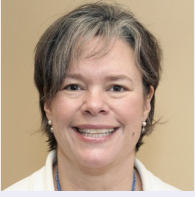
As members of the BIDMC Radiology department, our mission is "to serve our patients compassionately and effectively, and to create a healthy future for them and their families." We strive for this every day, with every patient interaction. The patient satisfaction surveys provide us with feedback for improvement when we fall short of this goal, and brighten our day when we are successful (with patient praises and notes of gratitude). Please remember to encourage patients to complete these short surveys after their visit in our department.

- **Tejas Mehta**

DEPARTMENTAL NEWS: *Introducing our Nurse Practitioners (NP) and Physician's Assistants (PA) in Radiology*

Nurse Practitioners (NPs) and Physician's Assistants (PAs) are integral partners in radiology, facilitating throughput and collaborating with the physicians' practice so efficiently that they are nearly invisible. In this issue, I am pleased to increase their visibility *and our appreciation* by highlighting the role of our NPs/PAs in radiology through Radical Views. First up is our NP in Breast Imaging, Nancy Littlehale. – Donna Wolfe, Editor

Introducing Nancy Littlehale -



Nancy Littlehale, WHNP is the nurse practitioner in Breast Imaging where her primary responsibility is in coordinating and executing preoperative needle localization service for the BIDMC and HVMA surgeons. Her other clinical responsibilities include: performing ultrasound guided breast procedures; tracking pathology and acting as a liaison with referring clinicians with regard to biopsy results and management plan; teaching procedures to residents and planning/presenting the radiology/pathology correlation conference. Together with her breast imaging colleagues, Nancy is involved with an ongoing research project: *Prospective assessment of Vacuum Biopsy for Management of Papillomas* for which she identifies and performs procedures on qualifying patients. With 23 years of experience as a nurse practitioner (15 at BIDMC), she is qualified and sought after to give lectures at the Nurse Practitioner Association for Continuing Education (NPACE). Most recently, the poster below has been accepted for presentation at this year's Silverman Symposium. When not at work Nancy makes pottery, works in her garden and is the mother of three daughters, 19, 18 and 11.

BREAST SURGERY/IMAGING SUSTAINABILITY

Beth Israel Deaconess Medical Center, Boston, MA

Issue: Coordinating Day of Surgery (DOS) for Breast Cancer Patients

Providing an optimal surgical experience for patients newly diagnosed with breast cancer is a priority at BIDMC; feedback from patients highlighted this need for improvement. Up to 70% of breast cancer patients require imaging procedures immediately prior to surgery. Breast care center support staff found it difficult and time consuming to coordinate mammography services (needle localizations), nuclear medicine (lymphoscintigraphy), operating room (OR) time and surgeons' schedules. There was suboptimal utilization of resources (imaging equipment and ORs), delays on the day of surgery (DOS), and overall patient and staff dissatisfaction.

Goals

1. Develop a standardized process that improves the patient experience for breast surgical cases requiring preoperative imaging
2. Have procedures on DOS start and end on time
3. Develop a means to track patient location and flow on DOS

Project Team

Elena G. Canacari, RN, CNOR	Dace Jansons, CNMT	Tejas Mehta, MD, MPH
Kevin Donohoe, MD	April Isaac Jefferson, BA, MBA	Dottie Sarno, RN
Susan Dorion, RN, MSN	Jeff Jankun, MD	Ross W. Simon, BA
Donna Hallett, BS, RT(R)	Katie Kórosy, RN	Michael Wertheimer, MD, FACS
Mary Jane Houlihan, MD	Nancy Littlehale, NP	

Analysis

Value Stream Process Map: Reviewed steps required to schedule a patient for surgery and mapped steps the patient took on DOS. Identified problems encountered with each step and brainstormed ideas for improvement.

Spaghetti Diagram: Physically walked the path the patients take on DOS and created spaghetti diagram illustrating its long, convoluted nature.

Patient Input: Sought out breast surgery patients who volunteered to provide feedback which highlighted the need to reduce delays and improve the transport process.

Impact/Difficulty Grid: Categorized problems, determined level of impact each problem had, and how difficult it was to resolve the problem. This provided a strategy for the order in which problems should be solved.

Demonstrating Sustainability

Before Project

Overall Delays: 61%

Project Completion

Overall Delays: 92%

1.5 Years After

Overall Delays: 91%

Before Working on Project

Surgery Start Time Delays: 39%

At Completion of Project in Feb 2013

Surgery Start Time Delays: 8%

1-1.5 Years After Project Completion

Surgery Start Time Delays: 9%

Before Working on Project

Average Elapsed Time to Book Breast Case Involving Radiology

At Completion of Project in Feb 2013

Average Elapsed Time to Book Breast Case Involving Radiology

1-1.5 Years After Project Completion

Average Elapsed Time to Book Breast Case Involving Radiology

Time to Book Case

Time to Book Case: Before Centralized Scheduling: 25; After Centralized Scheduling: 5; 1-1.5 Years After Project Completion: 11

Problems/Solutions

- 1. SCHEDULING**
PROBLEM: The surgeon's office must call 3 different numbers and locations to schedule appointments for needle localization, lymphoscintigraphy, and OR.
SOLUTION: Created an integrated schedule which allows trained OR schedulers to book all appointments for DOS.
- 2. IMAGING TIME SLOTS/OPENINGS**
PROBLEM: Ample needle localization and lymphoscintigraphy appointments were available but were not coordinated with OR availability increasing patient LOS on DOS. Variability in block release times (select surgeons > 72 hrs, other surgeons 48-72 hrs.) led to underutilization of resources, and equipment (imaging and OR). This was compounded by variability in imaging time by nuclear medicine physicians.
SOLUTION: A new schedule was created pairing needle localization and lymphoscintigraphy appointment times. Nuclear medicine imaging time was limited. Results include:
 - Equal access to imaging appointments by all surgeons.
 - Appointment times were aligned around data validated times of demand.
 - Imaging in nuclear medicine limited to 45 minutes unless clinically indicated by surgeon.
- 3. TRANSPORTATION -TIMELINESS**
PROBLEM: Procedures on DOS performed in different buildings and floors at BIDMC. Hospital transporters and caregivers lacked awareness of the patient path on DOS leading to major delays. There was inability to reliably track the patient by location.
SOLUTION: Discovered that hospital transport considered these patients as 'outpatients' and thus 'less urgent' than 'inpatients'. The transport team was educated to understand the impact of delays to the patients and to the ORs. The Preoperative Breast Patient Tracking Tool was developed and implemented; it's used in audits that help us continuously improve.
- 4. PATIENT CHECK-IN/COMMUNICATION**
PROBLEM: Patient check-in locations varied based on location of appointments resulting in the inability for the OR staff to reliably track progress or patient location. Patients did not have clear directions as to where to go and when to be there.
SOLUTION: All patients are asked to check-in at OR holding area, regardless of which procedure they have first. Outline created for employees and patients.

Lessons Learned

1. Interdepartmental team, facilitator and engaged sponsors are critical to success.
2. Important to communicate and understand what goes on in areas outside of one's own department.
3. Small changes can result in major improvements.

Future Steps

1. Continue to monitor if implemented changes maintain level of impact.
2. Aim for continued increase in imaging utilization rates.
3. Determine if enough OR time can be saved to add additional case(s) in a given day.
4. Objectively measure patient and employee satisfaction with implemented changes.

Silverman Institute for Health Care Quality and Safety Symposium 2015: Congratulations Radiology!

The Silverman Symposium is a fantastic opportunity for us to showcase the work that we are doing throughout the year and we are so thrilled to tell you that Radiology will be very well represented in this year's symposium. The posters submitted by the department represent the thoughtful, meaningful, hard work of dozens and dozens of Radiology staff, in a variety of positions and specialties, as well as the collaborative work done with other services within BIDMC. Our dedication to and innovation towards quality improvement is showcased in the variety of problems, approaches and solutions found in these posters. Many of the IOM dimensions of quality were addressed in these posters such as safety, effectiveness, efficiencies, patient centered, equitable and timely care. In total, 23 posters were submitted by Radiology and accepted for this year's symposium representing 12% of all posters submitted. It is through work like this that makes us here at BIDMC a national leader in the effort to improve the quality and safety of our patients' care.

Congratulations!

- Bettina Siewert, MD
 Suzanne Sweden, RN MSN

The 2015 Silverman Symposium Poster Sessions will be held on Thursday, April 9th, 2015, 10:30 am - 2:30 pm in the Shapiro Building but we also showcase Radiology's contributions in the following pages as 4 hours may not be enough time to appreciate our 23 submissions!



Rashmi Jayadevan, MD
4th Year Resident

Utility of Requesting and Reviewing Prior Outside Imaging for Screening Mammograms performed at BIDMC

The Problem

Our current practice for new BIDMC patients undergoing screening mammography is for them to sign a release form at the time of the imaging study allowing BIDMC to acquire their outside mammograms for comparison. The technologist reflexively faxes this request to the outside institutions prior to radiologist interpretation. The radiologist then interprets the initial study without the comparisons. When prior outside images are obtained, the file room staff downloads and prepares images and reports for review by a radiologist. The study is then re-reviewed by another radiologist and an addendum is added to the initial mammography report. Many radiologists anecdotally observed that when the initial screening mammogram interpretation was negative for malignancy, subsequent comparison with prior outside mammograms did not impact or change the initial interpretation. Our concern is that the process of obtaining prior mammograms for these patients requires additional technical and professional resources that are of uncertain necessity.

Aim/Goal

The purpose of this study was to determine whether comparison mammograms automatically requested for all new BIDMC patients with screening mammograms initially interpreted as negative impacted patient care and management.

The Team

- Rashmi Jayadevan, MD - Radiology Resident, PGY5
- Jordana Phillips, MD - Director of Breast Imaging Education
- Tejas S. Mehta, MD, MPH - Chief of Breast Imaging
- Elena Morozov, Mammography Coordinator
- Olga Augustus, Breast Imaging Manager
- Bessie Gray, Image Archive Supervisor
- All technical and professional staff in the breast imaging department

The Interventions

We collected all cases from December 2014 in which outside mammograms were requested and obtained according to the current practice model. This includes cases initially interpreted as Breast Imaging Reporting and Data System (BI-RADS) codes 1,2, or 0 where:

- BI-RADS 1 = negative : routine screening mammography
- BI-RADS 2 = benign findings : routine screening mammography
- BI-RADS 0 = incomplete assessment, comparison with prior mammograms or additional imaging is requested.

We compared initial and addendum BI-RADS codes interpretation for change in management

The Results/Progress to Date

Initial/ After Comparison Interpretations



Out of 40 cases with outside imaging received for comparison in December 2014:

- 27/40 (68%) were initially coded as BI-RADS 1 or 2 and had no change in management after comparison
- 8/40 (20%) were initially interpreted as BI-RADS 0 and changed to BI-RADS 1 or 2 after comparison, alleviating need for additional work-up.
- 5/40 (12%) were initially interpreted as BI-RADS 0 and still required additional imaging after comparison

Lessons Learned

1. When the initial interpretation was BI-RADS 1 or 2, there was no change in management or outcome for patients after comparison with outside mammograms.
2. When the initial interpretation was BI-RADS 0, comparison was important. Additional work up was prevented for 8/13 (20%), due to comparisons being made available. The other 5/13 (12%) proceeded to warranted additional work up.
3. Changing our department policy to request priors only for BI-RADS 0 cases would decrease time and resources needed for this process by 68%.

Next Steps/What Should Happen Next

We will continue to monitor outcomes of current practice for a total of 3 months. If results remain similar to December 2014, we propose to change current practice to:

- All new patients will continue to sign a release form
- Release will be faxed only for those cases read as BI-RADS 0 by the radiologist.



For more information, contact:
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Hannah Perry, MD MS
2nd Year Resident

The False Negative Rate of Digital Mammography at an American Academic Medical Center

The Problem

The false negative rate of annual digital mammography performed at an American academic medical center has not been previously investigated.

Aim/Goal

The purpose of this quality assurance project is to determine the rate and features of false negative breast cancers diagnosed among our cohort of patients. While these rates have previously been described based largely on European data, this is the first such study to evaluate American women in an annual screening program at an academic medical center using digital mammography. Additionally, we aim to identify the mammographic features of false negative cancers, to help improve the sensitivity of our breast cancer screening program.

The Team

- Hannah Perry, MD, MS, Department of Radiology
- Jordana Phillips, MD, Department of Radiology
- Valerie Fein-Zachary, MD, Department of Radiology
- Alexander Brook, PhD, Department of Radiology
- Shambhavi Venkataraman, MD, Department of Radiology
- Tejas S. Mehta, MD, MPH, Department of Radiology

The Interventions

We investigated 50 consecutive cancer cases diagnosed at BIDMC between January 1, 2012 and September 30, 2012 which had normal screening mammograms (BI-RADS 1 or 2) performed at BIDMC within the preceding 15 months (the "index mammogram").

The negative index mammogram was independently reviewed by three subspecialty breast radiologists, who were blinded to the location of the cancer. Subsequently, the mammogram performed at the time of diagnosis was reviewed by the radiologists. Next, the index mammogram was retrospectively re-reviewed by the radiologists for the presence of findings.

Consensus was defined as agreement of at least two of the three radiologists. Using definitions established in prior European trials, cases were classified as true negative or false negative.

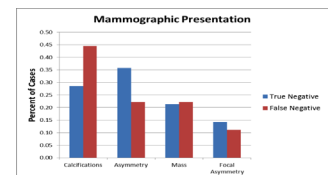
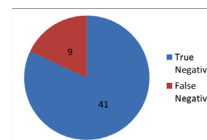
True negative cases included minimal signs, which would not have resulted in a recall, interval cancers, and mammographically occult cancers.

False negative cases included those considered to be secondary to reader error or technical error, or those with minimal signs that would have resulted in a recall.

All true negative and false negative cancers were evaluated for age at diagnosis, mammographic features at diagnosis, size at surgical excision, pathologic subtype, and hormonal status.

The Results/Progress to Date

Of the 50 cases, 41 (82%) were true negative, and 9 (18%) were false negative. Of the true negative cases, 24 (50%) were interval cancers, 14 (34%) had minimal signs, and 3 (7%) were mammographically occult. Of the 14 true negative cases with minimal signs, 4 presented as calcifications, 5 as asymmetry, 3 as a mass, and 2 as focal asymmetry. All 9 of the false negative cases were due to reader error, and of those cases, 4 presented as calcifications, 2 as asymmetries, 1 as a mass, and 2 as focal asymmetries.



Lessons Learned

The rate of false negative cancers at BIDMC was found to be 18% (95% CI: 9-32%), which is similar to the published rate of 20-30%. All false negative cases were due to reader error and no distinguishing mammographic features were associated with this group.

Next Steps

We plan to investigate additional cases to attempt to determine significant differences between the mammographic presentation of true negative and false negative cancers. By better understanding these important differences, we hope to improve the sensitivity of the breast cancer screening program at BIDMC.



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Sham Venkataraman, MD - Breast Imaging Attending

Optimizing Obtaining Consensus in Breast Imaging

The Problem

- Traditional peer review is limited by a delay between initial reporting and review.
- Due to the challenge of getting unbiased opinions in a group setting, the current consensus system impacts the learning environment and participation in the peer review process.

Aim/Goal

- To develop a new Real-time Peer Online Review Tool (RePORT) in which cases are submitted by radiologists for contemporaneous review.
- To provide interpreting radiologists with timely feedback.
- Possibility for earlier identification of potential errors.
- To improve the learning environment and enhance participation by providing overall positive, non-punitive environment where group improvement and learning is the goal rather than individual identification and consequence.

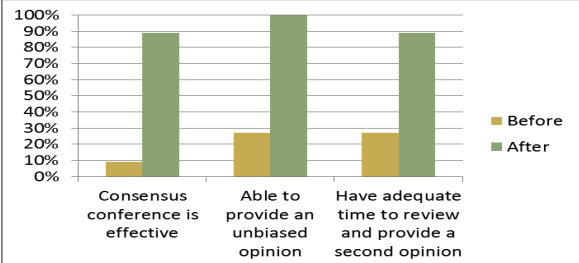
The Team

S. Venkataraman MD, J. Phillips MD, RE. Sharpe MD MBA, VM. Dialani MD, S. Prakash MD, VJ. Fein-Zachary MD, PJ. Slanetz MD, CS. Yam, TS. Mehta MD MPH.

The Interventions

- An initial survey was done to assess utility and efficacy of current consensus practice.
- While 100% of survey respondents agreed that having a consensus conference was worthwhile, majority felt that they did not have enough time and unable to provide an unbiased opinion and that the present system was ineffective.
- An online portal was created within our hospital intranet.
- Submitting radiologist voluntarily enters an anonymous summary of his/her evaluation and recommendations.
- An automated system then sends an email notification to all breast imagers to review submitted cases.
- A post intervention survey was done to assess utility and efficacy of new consensus practice.

The Results/Progress to Date



The Real-time Peer Online Review Tool (RePORT) has multiple benefits:

1. Active cases were reviewed allowing for timely management changes.
2. Changes in management were seen in 6/52 cases (11.5%) resulting in 5 fewer procedures.
3. Cases with 2 reviewers or less were less likely to reach consensus suggesting that more reviewers – as RePORT enables – are beneficial to identify deviations in standard of care.
4. Multiple radiologists benefit by reviewing each exam rather than only the single radiologist involved in that case.
5. Independent interpretation limits potential for bias, which could occur in group discussion.
6. Radiologists from all practice sites have the opportunity to participate.

Lessons Learned

The Real-time Peer Online Review Tool:

- Provides ease with which interpreting radiologists can review cases at any time from any place
- Increases the opportunity to get real-time feedback on active cases
- Improved participation due to the anonymity of submissions

Next Steps/What Should Happen Next

- Sustain improvement achieved.
- Look to spread the process to other modalities.
- Review in 1 year.

For more information, contact:

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Beth Israel Deaconess Medical Center



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Thomas Keimig, MD Abdominal Imaging Fellow

Accuracy of Doppler ultrasound for covered TIPS

The Problem

- Transjugular Intrahepatic Portosystemic Shunts (TIPS) have provided a life altering and life-saving treatment for patients with symptomatic portal hypertension.
- TIPS were first placed with uncovered metal stents, which had high rates of stenosis and occlusion leading to practice of routine ultrasound screening for TIPS malfunction.
- TIPS are now placed with polytetrafluoroethylene (PTFE) covered stents that have significantly higher patency rates compared to uncovered TIPS.
- Ultrasound criteria for TIPS evaluation are based on data from uncovered TIPS.
- The accuracy and need of ultrasound surveillance for covered TIPS have been questioned.
- As an academic and liver transplant center, BIDMC cares for a large population of patients with end stage liver disease (ESLD) and portal hypertension.
- Studying the accuracy of ultrasound in examining for covered TIPS malfunction will assess what role, if any, ultrasound plays in covered TIPS evaluation.
- Such knowledge will lead to more effective care for TIPS patients as well as efficient use of resources.

Aim/Goal

The goal of our study was to assess the predictive value and accuracy of Doppler ultrasound in the evaluation of covered TIPS, to evaluate the role of Doppler ultrasound in covered TIPS management, and to characterize factors contributing to inaccuracy of TIPS ultrasound in evaluating covered TIPS patency.

The Team

- Ultrasound Division – Department of Radiology
- Interventional Radiology

The Interventions

- Patients who underwent TIPS revision or venography from 1/1/2005-12/31/2013 and who had TIPS placed at BIDMC and were evaluated by ultrasound were reviewed.
- Ultrasound results were compared with venography for accuracy regarding TIPS patency, stenosis, and occlusion.

The Results/Progress to Date

Covered TIPS Ultrasound for TIPS Malfunction (n=360)

Sensitivity	Specificity	Accuracy	False Positive	False Negative
85%	98%	97%	6	5

Covered TIPS malfunctions

34

Asymptomatic Covered TIPS malfunctions

16 (47%)

5 of 16 occluded at venography

Lessons Learned

We found ultrasound to be an accurate method to evaluate for covered TIPS malfunction.

We also found surveillance of covered TIPS in asymptomatic patients has a role in patient management due to the discovery of malfunctioning covered TIPS in asymptomatic patients.

Review of the false positive and false negative ultrasound examinations has provided valuable sources of improvement in examination performance and examination interpretation.

Next Steps/What Should Happen Next

- Review the small number of false positive and false negative ultrasound examinations with sonographers and radiologists to attempt to decrease the small number of false positive and false negative ultrasound examinations.
- Ultrasound data should be further analyzed to evaluate if optimal criteria for covered TIPS malfunction differ from previously published uncovered TIPS data.
- Findings to be published in the scientific literature to advance covered TIPS evaluation.



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Suzanne Swedeon, RN, MSN - Quality Improvement Specialist

All Things Contrast

The Problem

The Radiology department uses contrast mediums every day. Although contrast agents are generally well tolerated, a small percentage of individuals can experience adverse or allergic responses to contrast with varying degrees of severity. While it is important that information about a contrast related event be readily available to the patient and to the next care providers to ensure proper clinical triage, there was no standardized process to ensure this occurred.

Aim/Goal

Development of a mechanism for event communication and documentation that is

- Standardized
- Comprehensive
- Timely and readily available to next provider both inside and outside the BIDMC system
- Allows for proper identification of patients at risk for adverse events
- Easy to use

The Team

Bridget O'Bryan-Alberts RN MSN Nurse Manager Radiology
 Suzanne Swedeon RN MSN Quality Improvement Specialist Radiology
 Dr Bettina Siewert MD, Vice Chair for Quality, Safety, and Performance Improvement
 Michelle E. Micale, Project Manager, Health Information Management
 Jane Wandel RN Program Director, Patient and Staff Communications
 Malik Gunjan Senapati MD
 Samir Shah MD
 Radiology QA/QI Committee
 CT Operations Committee
 MRI Operations Committee

The Interventions

- Staff education and coaching surrounding systems limitations and patient education requirements
- Standardized documentation templates developed
- Patient education materials revised
- Revision of departmental guidelines for the treatment of contrast related adverse events

The Results/Progress to Date

Lessons Learned

- Practitioners are not always aware of the interconnectivity limitations of our IT systems
- Patients need to be strong advocates for themselves as they navigate through the complex medical world. They need to know any future implications that a contrast reaction will have in the continuum of their care, how to manage it when they get home.

Next Steps/What Should Happen Next

- Analysis post intervention compliance data.
- Potential for roll out to affiliates.
- Repeat PDSA cycle

For more information, contact:

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Improving Patient Safety When Driving Following a Contrast Reaction

The Problem In September 2014 the National Transportation Safety Board issued Safety Recommendation 1-14-2 calling on healthcare providers to discuss with their patient the effects their medical condition and medications can have on their ability to safely operate a vehicle.

- Patient experiencing a mild to moderate contrast reaction have traditionally be treated with Diphenhydramine (Benadryl), observed and discharged. One of the side effects of Benadryl is a sedative effect.

Aim/Goal

- To improve patient safety while driving following a contrast reaction by providing a non-sedating alternative to a patient that will be operating a vehicle upon leaving Radiology.

The Team

Bridget O'Bryan-Alberts RN MSN Nurse Manager Radiology
 Suzanne Swedeon RN MSN Quality Improvement Specialist Radiology
 Bettina Siewert MD, Vice Chair for Quality, Safety, and Performance Improvement
 May Adra, B.S., Pharm D, BCPS
 Malik Gunjan Senapati MD
 Samir Shah MD
 Radiology QA/QI Committee
 CT Operations Committee
 MRI Operations Committee
 Autumn Guyer MD Allergy
 Anna Kovalszki MD Allergy

The Interventions

Patient's experiencing a mild to moderate contrast reaction will be asked if they will be operating a motor vehicle upon leaving the department. If the patient will be operating a motor vehicle upon leaving, the patient will be treated with Fexofenadine 180mg.

The Results/Progress to Date

- Contrast reactions guidelines for the Care of a Patient Experiencing a Contrast Related Event have be updated to include this change.
- This change has been presented to Nurses and MD throughout the department including Radiology Grand Rounds



Lessons Learned

- When administering or ordering a medication for an outpatient, practitioners should consider the effects the medication may have on the patient's ability to safely operate a vehicle in any mode of transportation and discuss these effects with the patient.
- Simple well thought out changes can markedly improve patient safety.

Next Steps/What Should Happen Next

- Potential for roll out to other affiliates
- Potential for application to other sites of service within BIDMC



For more information, contact: Suzanne Swedeon RN MSN Radiology
sswedeon@bidmc.harvard.edu

Is There an Elephant in the Room: Equipping Nurse Managers with the Knowledge and Tools to Combat Lateral Violence

The Problem

- Lateral violence is an issue that plagues healthcare across the country
- The Joint Commission has promulgated a new Leadership Standard (LD.03.01.01) to address intimidating, disruptive, and inappropriate behaviors known as lateral violence.
- These behaviors result in increased absenteeism, high rates of turnover and can contribute to medical errors due to fear of asking questions or asking for help.
- Nurse Managers however lack any formal education regarding this issue.
- In order to effectively reduce lateral violence in the workplace, Nurse Managers must understand the many facets of this phenomenon and be equipped with the skills to both recognize and deal with manifestation of lateral violence amongst staff.

Aim/Goal

To provide Nursing leaders with education that addresses this Joint Commission standard in order to ensure that our work environment is free of behaviors that undermine a culture of safety.

The Team

Marnie Chaves-Crowley RN MSN
Suzanne Swedeen RN MSN
Brid Walsh-Loughman RN MSN

The Interventions

2 lateral violence educational programs were developed and presented at Nurse Managers Councils.

- Programs included both didactic and simulation activities utilizing mirroring techniques known as cognitive rehearsal (Griffin, 2004) so that Managers would have an improved understanding of the effects of lateral violence and feel better able to recognize and confront these behaviors.



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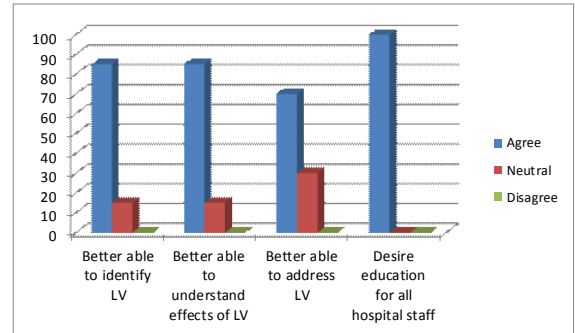
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- Pre and post intervention surveys were done to assess the success of these programs.

The Results/Progress to Date

- 22 Nurse Managers attending the educational program
- Post education survey results:



Lessons Learned

- Novice and experienced Nurse Managers alike feel they are unprepared and lack the necessary tools they need to address lateral violence.
- Mirroring techniques known as cognitive rehearsal is an effective tool in equipping Nurse Managers with the skills to both recognize and address lateral violence amongst staff.

Next Steps/What Should Happen Next

- Presenting education at Nursing Grand Rounds April 2015
- Presenting information on individual units.

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Bridget O'Bryan-Alberts, RN, MSN -
Nurse Manager

Knowledge is Safety: Communication of Contrast Related Events

The Problem

- In Radiology, delays occur when there is incomplete or absent documentation of previous contrast related events.
- Events related to contrast were not being documented in a timely fashion in the patient's allergy profile, and also were not being communicated to patients or to next care providers in a standardized fashion.
- A prior small PDSA to change documentation practices and improve patient education was tried without much success.
- Current state in our institution showed a lack of seamless communication and missing documentation in the Radiology Information System (RIS), Online Medical Record (OMR) and the patient allergy profile.

Aim/Goal

To educate a small cross section of attending staff regarding our system limitations and the need to facilitate safe care across the continuum that included standardized documentation practices and patient education.

The Team

Bridget O'Bryan-Alberts RN MSN Nurse Manager Radiology

The Interventions

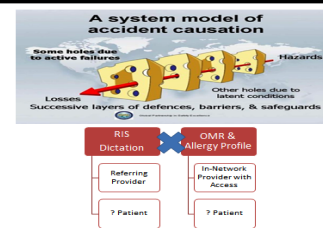
- Education was provided using the National Center for Healthcare Leadership model (NCHL) for analytical thinking to MDs with experience ranging from 5-20 years in areas that administer contrast agents.
- Targeted education was implemented to improve baseline analytical thinking related to contrast events and the need for standardized handoffs to next care providers. Individual learning needs were addressed by utilizing coaching methods and patient educational materials that supported the goals of this initiative.



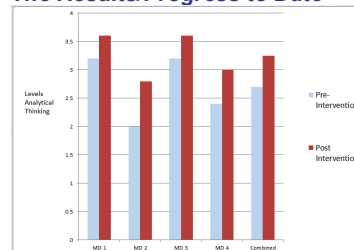
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The Results/Progress to Date



Lessons Learned

- Because of the need to communicate in so many systems we need to make the process as simple as possible.
- It clearly was not a lack of desire to do the right thing for the patient, it was a lack of understanding and a necessity to have the right tools to make a task more comprehensive but, less time consuming.

Next Steps/What Should Happen Next

- Moving ahead we will continue to track our documentation practices.
- Potential for application to other sites of service within BIDMC

For more information, contact:

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Jawad Hussain, MD, MSc
2nd Year Resident

The Radiology Leadership Academy: A Resident-Led Initiative

The Problem

The rapidly changing environment of medicine demands that future physicians possess not only clinical knowledge, but also leadership and management skillsets to navigate complex healthcare enterprises. Non-interpretive skills are now emphasized on board examinations and in training milestones established by the Accreditation Council for Graduate Medical Education (ACGME). However, training for these skills is currently not well incorporated into most post-graduate medical training programs.

Aim/Goal

We founded a Radiology Leadership Academy (RLA) for trainees with the primary goals of introducing lifelong skills and filling professional gaps. The RLA incorporates 5 components beyond the trainee's existing clinical duties: a focused curriculum, centralized resources, leadership experience, networking, and a capstone project.

The Team

Drs. Ann Leylek, Jawad Hussain and Andrew Colucci with the support of the Radiology Department Chair, the Vice Chair of Academic Affairs, Residency Program Directors, and faculty mentor Dr. Ammar Sarwar.

The Interventions

- Establish a curriculum
 - Design a tiered curriculum emphasizing core generalizable skills, in addition to advanced electives offering higher-level content.
- Attract viable mentors
 - Tap into the departmental alumni network to identify mentors who are willing to engage trainees on real-world topics (e.g., practice management).
 - Invite external speakers from academics and private practice to provide unique perspectives.
- Engage trainees
 - Establish an application process whereby trainees self-select based on interest.
 - Incentivize trainee leadership endeavors.
 - Recognize trainees who meet RLA participation requirements at graduation.
- Incorporate experiential learning
 - Offer opportunities to participate in hospital committees, boards, and professional societies.
 - Encourage involvement in organized medicine.
 - Showcase talented trainees in a management capstone project.
- Focus on sustainability
 - Maintain resident leadership to ensure trainee-centered content and continued renewal of interested talent.
 - Design capstone projects to expand or improve durable resources for the RLA.

Lessons Learned

Introducing institutional reform requires a clear vision, organized structure, and satisfaction with incremental gains – it is a process that demands patience and perseverance.

The Progress to Date

- Established topics of core importance
 - Identified potential speakers on central topics.
 - Supplemented with online modules/coursework.
- Centralized resources
 - Creation of an online information repository of high-yield articles, websites, videos, etc. on topics of importance and interest.
- Expanded alumni network
 - Creation of a detailed database covering the entire BIDMC Radiology Alumni network.
 - Updated and modernized the BIDMC Radiology Alumni Website.
 - Solicited alumni mentorship for current trainees.



Next Steps

The pilot class will be enrolled in AY2015-2016 with adjustments made over the course of the year to shape the curriculum in a way that suits the collective learning needs of the trainees.



For more information, contact:
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Seth Berkowitz, MD -
Vascular & Interventional Fellow

Smartphone Interventional Radiology Peer Review System Integrated into Daily Board Rounds

The Problem

- Interventional radiologists already perform peer review as part of daily board rounds. However, existing data capture tools do not fit into the daily workflow.
- Existing diagnostic radiology peer review systems focus on diagnostic accuracy, rather than on procedural technique, and are therefore unable to portray the full spectrum of interventional radiology (IR) practice.

Aim/Goal

- To develop a smartphone-based, IR-tailored, peer review tool that would capture more IR cases compared with a traditional peer review system.

The Team

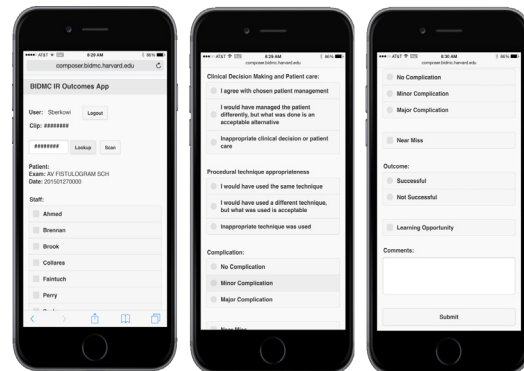
Seth Berkowitz MD Ian Brennan MD
Salomao Faintuch MD Muneeb Ahmed MD
Felipe Collares MD Sam Yam PhD
Ammar Sarwar MD Olga Brook MD

The Interventions

- During daily follow-up conference, a single attending submitted a consensus opinion after case discussion regarding clinical decision making and procedure technique appropriateness were graded on a 3 point scale (agree, acceptable alternative, inappropriate).
- Complications were listed according to the SIR guidelines.
- A near miss category identified cases where a complication was narrowly avoided. Outcome was graded as successful or not.
- A learning opportunity field flagged cases with useful teaching points.
- Free text could also be entered.

The Results

- 200 cases were entered during the first 6 months of implementation.
- 181/200 successful procedures.
- 15 minor and 2 major complications. 1 near miss and 5 learning opportunities.
- 7/76 cases were graded as acceptable alternative for technique and 2/72 cases were graded as acceptable alternative for clinical management.
- During the same time period 1 year ago, 7 IR attending staff entered a total of 101 cases into the department's peer review system with only 13 (13%) representing IR procedures and these were all rated as complete agreement.



Lessons Learned

- The field of interventional radiology lends itself to continuous practice improvement through daily peer review at morning rounds. We built an IR-tailored peer review tool to capture outcomes and clinical practice variation.

Next Steps/What Should Happen Next

- Improved data entry adherence.



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Vascular and Interventional Radiology Fellow



Neda Sedora-Roman, MD
3rd Year Resident

Proposed Biopsy Performance Benchmarks for MRI Based on an Audit of a Large Academic Center

The Problem

- The high sensitivity of MRI makes it an extremely useful modality for evaluation of breast lesions.
- The American College of Radiology (ACR) has established practice guidelines for the performance of breast MRI requiring each facility to establish and maintain a medical outcomes audit program.
- Unlike the well-established benchmarks for screening and diagnostic mammography (MG), the audit requirements for breast MRI have not been fully delineated.
- BIRADS is a system developed by radiologists for reporting breast imaging results which divides findings into 6 categories: 1 and 2 imply a benign finding, 3 is a probably benign finding that warrants short interval follow-up, 4 and 5 require biopsy and 6 implies a biopsy proven cancer.

Aim/Goal

To evaluate breast MRI biopsy performance using established MG benchmarks, from a single academic institution and to review whether these benchmarks could be applied to a breast MRI practice.

The Team

Neda I. Sedora Roman MD; Vandana Dialani MD;
Valerie Fein- Zachary MD; Shambhavi Venkataraman MD;
Priscilla J. Slanetz MD, MPH; Jordana Philips MD; Tejas S. Mehta MD, MPH.

The Interventions

- In order to gather current performance data, a retrospective review was performed looking at all breast MRIs performed at BIDMC between 10/1/2012 through 9/30/13.
- All BI-RADS 4 or 5 studies and their associated core and/or surgical biopsy pathology results were reviewed and tabulated.
- Additionally, all BI-RADS 4 and 5 studies were reviewed based on screening and diagnostic indication.
- The following parameters were evaluated: abnormal interpretation rate, positive predictive value (PPV), cancer detection rate, percentage of minimal cancers and the number of axillary node negative cancers.

The Results/Progress to Date

All consecutive Breast MRIs - One Year

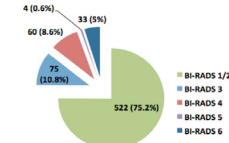
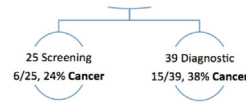


Table 1: Performance measures for breast MRI	RESULTS	ACR DESIRABLE GOALS FOR MG
Abnormal interpretation rate	9.2% (64/54)	<10%
PPV1*	32.8% (21/64)	5-10%
PPV2	32.8% (21/64)	25-40%
PPV3	32.8% (21/64)	>20%

Table 1: Performance measures for breast MRI	RESULTS	ACR DESIRABLE GOALS FOR MG
Cancer detection rate	30/6500 (0.46%)	>10/1000
Percentage of minimal cancers	85.7% (19/21)	>30%
Invasive cancers < 1 cm	76.9% (10/13)	<60%
Nodeal positivity	14.3% (2/14)	<20%

64 BI-RADS 4 and 5 Patients



Lessons Learned

All evaluated parameters surpassed the ACR desirable goals set forth for MG and the expected goals set by ACR in the recent BIRADS 5 lexicon published in late 2014.

Cancer detection rate is higher with MRI as compared to the established ACR desirable goals for MG, given the higher sensitivity of MRI.

Cancer detection rate is higher when a patient is referred for a diagnostic MRI versus a screening MRI.

Auditing a breast MR practice is essential and established national MG benchmarks can be used to audit an MRI practice at least until MRI specific benchmarks are created.

Next Steps/What Should Happen Next

- Screening versus diagnostic indications will be audited separately.
- Performance measurements are currently being analyzed yearly.
- BIDMC will be one of the earliest sites to have a yearly audit program for breast MRI, which may be an ACR mandated requirement in the very near future.



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Rafael Rojas, MD -
Neuroradiology
Attending

Image quality improvement in the visualization of dural venous sinuses by MRI and MRV

The Problem

- Dural venous sinus thrombosis is a common disease in daily practice. This disorder is potentially lethal but treatable. Whenever, clinical suspected, prompt investigation by noninvasive imaging modalities such as Computed Tomography Venography (CTV), and Magnetic Resonance Venography (MRV) is indicated for prompt diagnosis and treatment.
- At our institution, traditionally only Time of Flight (TOF) MRV sequences have been used in the detection of dural venous sinus thrombosis. More recently, we started to use 3D phase-contrast (PC) technique. However, because both these techniques use MR flow phenomena for contrast generation, they are subject to create flow related image artifacts and misregistration of the vascular flow.
- The use of I.V. Gadolinium contrast-enhanced MRV is less likely to be affected by complex flow, and when combined with Magnetization-Prepared Rapid Gradient Echo technique (MPRAGE) sequence, may prove to be superior to TOF or phase contrast MRV techniques, and may offer the most accurate evaluation of the dural venous sinuses using MRI.

Aim/Goal

To demonstrate that the use of MP-RAGE, with intravenous gadolinium based contrast sequence improves the detection of dural venous sinus thrombosis when compared with 2-D and 3-D time of flight (TOF), and phase contrast techniques alone.

The Team

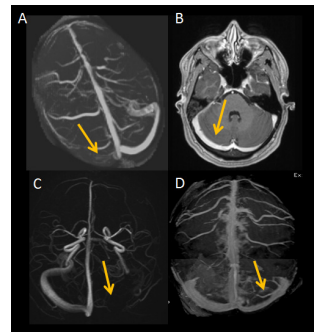
- ✓ Jonathan Kim, MD
- ✓ Rafeeqe Bhadelia, MD
- ✓ David Hackney, MD
- ✓ Rafael Rojas, MD

Radiology Department BIDMC/ Neuroradiology Section

The Interventions

- To update the current MRV protocol for evaluation of dural venous sinus thrombosis.
- To communicate to the referral clinicians about this updated MRV protocol

The Results/Progress to Date



Two representative clinical cases with suspected dural venous sinus thrombosis. Case 1: (A), TOF-MRV shows lack of venous flow in the right transverse sinus, suggesting thrombosis. (B), Axial MPRAGE with gadolinium shows patency of the right transverse sinus. Case 2: (C) Phase contrast MRV shows absence of flow in left transverse sinus. (D), Maximum intensity projection of MPRAGE with gadolinium shows patency of left transverse sinus. Arrows point to the areas of interest.

Lessons Learned

- Gadolinium-enhanced MPRAGE sequence is superior to TOF and phase-contrast MRV techniques for the diagnosis of dural venous sinus thrombosis.
- If there are no clinical contraindications, gadolinium enhanced MPRAGE images should be routine included in the MRI protocol for the diagnosis of dural venous sinus thrombosis.

Next Steps/What Should Happen Next

- Gadolinium-enhanced MPRAGE sequences will be combined with Phase Contrast MRV technique, in evaluation of cases referred with suspicious for dural venous sinus thrombosis.
- The referring physicians will be communicated about this updated protocol, and will be requested to order all the MRV examinations with gadolinium, provided there are no contraindications like pregnancy, or renal failure.



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Quang Nguyen, MD
2nd Year Resident

Thirty-day rates of Emergency Room Visits & Hospitalization after Common Outpatient Image-guided Interventions

The Problem

- Common cross-sectional interventions performed in the radiology department include Ultrasound and CT-guided biopsies, drainages and fiducial marker placement.
- These procedures are typically done on an out-patient basis and patients are discharged after approximately 3 hours of observation.
- Admission of patients and Emergency Department visits within 30 days of discharge is an important healthcare quality metric and not readily known to the procedural radiologist.
- These hospital admissions or ED visit may be non-immediate complications of the procedure.

Aim/Goal

The goal of this study was to establish the standard for post-procedural hospital admission and ED visits for cross sectional interventions performed under moderate sedation. Further analysis was also performed to identify possible preventable causes of post-procedure emergency department visits and hospitalizations.

The Team

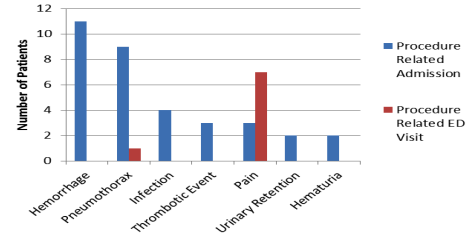
- Olga R Brook, MD; Department of Radiology
- Ammar Sarwar, MD; Department of Radiology
- Muneeb Ahmed, MD; Department of Radiology
- Robert Sheiman, MD; Department of Radiology
- Bettina Siewert, MD; Department of Radiology
- Sahil Mehta, MD; Resident, Department of Radiology
- Quang Nguyen, MD; Resident, Department of Radiology

The Interventions

- Retrospective review from November 2012 to August 2014 of 1657 outpatient radiology procedures performed with moderate sedation.
- Reviewed parameters included procedure date, type of intervention(s), organ system, procedure imaging modality, and any pertinent clinical follow-up and urgent medical care within 30 days of the procedure.
- Clinical outcomes were characterized on whether they were related to the radiology procedure based upon consensus of a radiologist and clinical team providing care for the patient during the ED visit or admission.

The Results/Progress to Date

Total Image-Guided Procedures	1657		Percent of Visit	Percent of Total Procedures
Admission following Procedure		Procedure Related	34	2.1%
		Possible Relation	6	0.4%
Emergency Department Visit following Procedure		Procedure Related	8	0.5%



Lessons Learned

- Outpatient image guided procedures are safe with low rate of procedure-related admissions and ED visits.
- Hemorrhage (0.7% of total procedures, 26.1% of admissions), pneumothorax (0.5%, 21.4%), and infection (0.2%, 9.5%) were the most common procedural complications that required admission with pneumothoraxes common for lung biopsies and hemorrhage common for liver biopsies.

Next Steps/What Should Happen Next

Identify clinical risk factors that may predispose patients to common procedure complications such as pneumothorax, hemorrhage and infection in order to prevent those in the future.

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Karen S. Lee, MD -
Emergency and MRI
Attending

Reducing Emergency Radiology Report Turn-Around-Times

The Problem

- Emergency radiology reports need to be dictated, transcribed, edited, and approved in a timely fashion to appropriately triage patients and aid in clinical management decisions of patients in the ER
- Departmental guidelines indicate a mean report total turn-around-time (TAT) goal of less than 12 hours, however, section mean total TAT within the first 6 months of 2014 exceeded this value (14.9 hrs)
- On weekends in particular, transcription of emergency radiology reports were delayed by several hours due to unavailability of transcription services
- In the ER, cross-sectional radiology exams require a preliminary wet read to be typed into a computer system different than the transcription system. As a result, trainees often delayed dictating and editing reports in order to provide timely wet reads

Aim/Goal

The aim of this project was to reduce emergency radiology report mean total TAT within a 6-month period (7/1/2014-12/31/2014) to below the departmental guidelines of 12 hours when compared to the 6-month period from 1/1/2014-6/30/2014.

The Team: Radiology

- Karen Lee, MD, - Emergency Radiology Attending
- Robin Levenson, MD- Chief, Emergency Radiology
- Elsa Flower, MD - Emergency Radiology Attending
- Sejal Shah, MD - Emergency Radiology Attending

The Interventions

- Implement Fluency Voice Recognition (VR) system to 1) decrease time to dictation through the use of integrated reporting with PACS and standardized templates and 2) completely eliminate transcription time
- Utilizing one streamlined system (VR) to enter wet reads and dictate reports rather than a separate computer system to type in ER wet reads
- Changing emergency radiology practice workflow by urging residents to dictate as they review radiology studies rather than entering wet reads initially and saving final report dictations until the end of shift
- Attending radiologists using VR to immediately sign reports once dictation is completed, thereby decreasing the time to final approval of reports

The Results/Progress to Date

Radiologist	Time to Dictation		Dictation to Transcribed		Transcribed to Approve		Total TAT	
	Pre 7/1	Post 7/1	Pre 7/1	Post 7/1	Pre 7/1	Post 7/1	Pre 7/1	Post 7/1
#1	4.45	2.8	0.59	0	8.8	5.0	13.8	7.9
#2	4.68	2.4	0.69	0	4.5	3.1	9.8	5.5
#3	3.02	1.0	0.75	0	10.7	9.6	14.4	10.6
#4	3.72	1.3	0.66	0	17.3	11.3	21.6	12.6
Section	3.97	2.0	0.67	0	10.3	7.1	14.9	9.1

Values are in hours

Lessons Learned

For all members of the emergency radiology section, VR successfully helped decrease the time for all three stages of radiology report creation: time to dictation, time for dictation to be transcribed, and time for a report to be approved once transcribed. Furthermore, after 7/1/2014, when all interventions were acted upon, the section mean total TAT met the departmental goal value of below 12 hours, and even surpassed the goal (9.1 hours).

Through VR, radiology reports are immediately transcribed, enabling more complete preliminary reports, and not just wet reads, to be viewed by ER and clinical staff in a more rapid fashion, thereby facilitating clinical decision making and patient disposition.

Next Steps/What Should Happen Next

- Time for reports to be approved by the attending once the reports are transcribed can still be improved for all section members and comprises the largest component of the total TAT. Residents will be encouraged to assign reports to attendings once reviewed and dictated, to facilitate faster final attending approval of reports, which can aid in patient discharges from the ER and inpatient service
- ER wet read system is redundant now that preliminary reports are readily available. Will work with ER to improve integration of viewing of preliminary reports on their dashboard system
- Increase template driven reporting among trainees

For more information, contact:
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Maryellen Sun, MD - Abdominal and MRI Attending

It's Alive!!! How to use a simple tissue phantom

to teach liver biopsy, abscess drainage, and percutaneous cholecystostomy procedures

Department of Radiology, Abdominal Imaging/Ultrasound Section: Hannah Perry, MD; Bettina Siewert, MD; Maryellen Sun, MD

The Problem

- Percutaneous liver procedures are commonly performed, and are associated with rare but potentially significant risks
- Trainees are limited in their ability to familiarize themselves with these procedures prior to the patient encounter, particularly for less frequent procedures such as abscess drainage, percutaneous cholecystostomy
- Simulation methods can be helpful in procedural training
- Commercially-available simulation models may be costly and have limitations for repeated percutaneous access

Aim/Goal

- Design a simple and inexpensive method of creating a tissue phantom that simulates hepatic nodules, abscesses and acute cholecystitis
- Implement the model in a program to teach radiology residents to perform liver biopsy, abscess drainage and percutaneous cholecystostomy tube placement procedures

The Intervention

- Two procedure models are constructed from one whole bovine liver, simulating echotexture of human liver
- Latex balloons containing banana-strawberry puree infant food are placed into livers to simulate abscesses
- Olives simulate metastases
- Balloons containing water and infant food sutured to liver, simulate infected gallbladders
- Porcine rib layer is used to simulate sonographic impediments to ultrasound and physical feel of rib spaces

The Results/Progress to Date

- 6 models have been created and used in 3 sessions of resident/fellow teaching of biopsies and drainage procedures
- Teaching sessions led by two abdominal interventionalists :
 - 20 minute didactic lecture
 - 70 min hands-on practice with the models
- In a prior study utilizing only a biopsy model, statistically significant improvements in trainee confidence and procedural knowledge:
 - Sekhar A., Sun MRM, and Siewert B. Academic Radiology 2014 : 21: 902-908



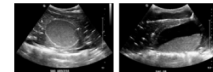
Click images for videos of each step!



Click images for videos of procedures!



Radiology residents performing drainage procedures using the phantoms



Sonographic appearance of "abscess" and "gallbladder"

Lessons Learned

- A tissue phantom can be easily created for teaching percutaneous biopsy and drainage procedures
- Model can be adapted for targeted and non-targeted liver biopsy, liver abscess drainage, and percutaneous cholecystostomy procedures
- Provide trainees with experiential learning in a supervised environment with immediate feedback

Next Steps/What Should Happen Next

- Continue to incorporate teaching sessions into resident education
- Survey based assessment of resident experience of drainage procedures using the models

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Ronald Eisenberg, MD, - Cardiothoracic and MSK Attending

Development of a Uniform System for Reporting the Results of Tracheal CT Studies

The Problem

- Lack of uniformity in tracheal CT reports, with various attending radiologists listing types of information in different ways.
- This caused confusion among referring physicians (primarily pulmonologists and thoracic surgeons) as to the status of their patients, and among radiology residents as to what measurements to make, how to analyze the data, and the best way to structure the official interpretation.

Aim/Goal

To develop a uniform system for evaluating tracheal CT studies that is acceptable to the radiologists and provides the data that referring physicians (primarily pulmonologists and thoracic surgeons) require to optimally treat their patients.

The Team

Attending physicians in:

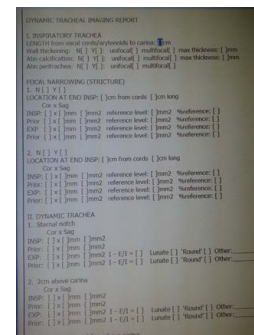
- Chest radiology
- Pulmonology
- Thoracic surgery

The Interventions

After extensive discussions among the radiologists at two departmental meetings, one of the radiologists volunteered to develop a new structured reporting template that would be compatible with the Fluency voice recognition dictating system. This was revised over several weeks until there was complete agreement among the radiologists about the template. An electronic questionnaire was then sent to the pulmonologists and thoracic surgeons, asking for their suggestions and then incorporating them into a revised template, which was then implemented as the standard for interpretation of CT studies of the trachea.

The Results/Progress to Date

In the 4 months since the new structured-reporting template was introduced, there have been 74 CT examinations of the trachea. A review of the official interpretations revealed that there has been 100% compliance with the use of the template, and that all readers had a uniform system for describing, measuring, and displaying the data.



Lessons Learned

Working in a cooperative manner, respectfully taking into consideration the concerns of individual members of the chest section, succeeded in solving the problem of lack of uniformity in interpreting CT examinations of the trachea. Consulting with referring physicians (pulmonologists and thoracic surgeons) enabled us to provide data for their specific patient-care needs.

Next Steps/What Should Happen Next

After 6 months of implementation of the structured reporting system for CT examinations of the trachea, we plan to send another electronic questionnaire to the pulmonologists and thoracic surgeons to assess their satisfaction with the new template, which will be revised to meet any valid concerns.

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ShuangQi (Jim) Zheng,
MS RT - Clinical MRI
Supervisor

MRIs for patients with implanted cardiac devices

The Problem

- All ICDs and the majority of currently implanted pacemakers are considered an absolute contraindication to MRI by the U.S. Food and Drug Administration and by device manufacturers.
- All ICDs and the majority of currently implanted pacemakers are considered an absolute contraindication to MRI by the U.S. Food and Drug Administration and by device manufacturers.
- These patients who are denied access to MRI due to safety concerns often must turn to sub-optimal imaging, or invasive procedures to obtain the answers that an MRI would provide.

Aim/Goal

A close collaboration between Cardiology and Radiology worked to create a policy and procedure that allowed BIDMC to become the first institution in New England to offer safety MRIs to these patients with implanted cardiac devices.

The Team

Bhadelia, Rafeeqe, MD	Director, Neuroradiology
Buxton, Alfred, MD	Director, Clinical Electrophysiology Laboratory
Cabral-Goncalves, Ines	Clinical Manager, MRI
Dunay, William	Clinical Supervisor, MRI
Hallet, Donna	Director, Radiology
Hochman, Mary, MD	Chief, Musculoskeletal imaging
Josephson, Mark, MD	Chief, Cardiology
Kramer, Daniel, MD	Electrophysiology Cardiology
Mortele, Koenraad, MD	Director, MRI imaging
Rojas, Rafael, MD	Neuroradiology
Stormann, Jeremy	Clinical Educator, MRI
Smith, Marty, MD	Abdominal imaging
Zheng, ShuangQi	Clinical Supervisor, MRI
Zimetbaum, Peter, MD	Electrophysiology Cardiology

The Interventions

- Dr. Kramer brought forth extensive literature out of Johns Hopkins on how to safely facilitate the MRI scanning of patients with implanted cardiac devices.
- The MRI Operations committee worked with Dr. Kramer and put together the current policy and procedure by combining elements of the Hopkins protocol and our own existing procedure on FDA-approved, conditional pacemakers.
- Potential patients are evaluated by Dr. Kramer and other Cardiology colleagues

- An attending Radiologist then reviews the case for clinical need, and explores any suitable alternative imaging options.
- MRI Supervisor then coordinates between the patient, EP on call staff, and scanner availability to book an appointment for the patient.
- Day of study, a team from EP evaluates the patient's device and performs any programming needed. EP physicians monitor patient vitals while MRI staff perform the study. The patient is evaluated again after the MRI and sent on their way.

The Results, Progress to Date/Patient Impact

We began scanning in June 2014. We've scanned 12 patients during the first 8 months. There has been a profound impact on these patients. Dr. Kramer has reported patients bursting into tears when told in clinic that we can offer them a MRI.

"I am excited to pioneer with BIDMC and want to emphasize of appreciative I am. I feel that BIDMC truly embodies the 'Human first' mantra."

"We live in NH and were happy to hear that we could come down to Boston for this study, instead of having to plan a trip all the way down to Baltimore."

"I receive all my care at another facility. I was disappointed that they could not offer me a MRI. Your program saved me from a painful CT Myelogram that may not have even answered my surgeon's question."

Lessons Learned

The greatest surprise has been the response of our patients. They have been told for years that they can never have an MRI without first removing the pacemaker. They often have had to undergo alternative diagnostic studies, which can be either invasive, or have radiation consequences if they are being monitored routinely with CTs.

Next Steps/What Should Happen Next

Our goal in for the upcoming year is to increase our efficiency in how we are providing this service.

- Decrease the wait time during the approval and scheduling process.
- Decrease magnet idle time, and EP's time commitment per study.

For more information, contact:

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Ines Cabral-Goncalves,
RT (R), MR - MRI Clinical
Manager

MRI Department Efficiency: Process and Protocol Improvement

The Problem

- Inappropriate time slots for a complicated network of MRI exams.
- Outdated and insufficient distribution of exams across available MRI scanners.
- Unnecessary length of exams.
- Problematic scheduling process.
- Inaccurate and incomplete scheduling questions and instructions.
- Cumbersome ordering system.

- For all adjustments to work appropriately the following needed to be done:
 - POE and OMR needed to be reconfigured to make it more likely the ordering physician will be able to find and order the appropriate exam.
 - Scheduling questions were updated to find safety contraindications up front, preventing those exams from getting scheduled at all. The updated questions also enable schedulers to better find the scanner that works best for the patient.
 - Patient instructions were revised to ensure patients arrive on time with the correct preparation.

Aim/Goal

- To improve the process of ordering, scheduling, and performing a MRI in a busy, academic medical center. Efficiency will be measured by time savings, magnet capacity and availability, potential revenue and cost savings to the hospital.

The Results/Progress to Date

- Updates were made to ordering systems POE and OMR making it easier for referrers to find the type of exam they are looking to order. In turn, having the correct exam ordered allows exams to be placed into the correct time slots by the scheduler.
- The network of MRI exams has been restructured to make it less complicated.
- Available time slots were updated across scanners and the availability for each type of exam was restructured and redistributed across all scanners.
- Image quality has improved and exam length is projected to shorten from an average of 47.8 minutes per exam to 44.3 minutes per exam. This would equal an overall time savings of 253 total hours for the month.
- With the possibility of approximately 257 more exams per month, potential revenue increase may yield almost \$2.5 million yearly (at \$800 net revenue per scan and 75% fill rate).

The Team

Jeremy Stormann, MRI Clinical Instructor; Jeremy O'Brien, MD, Radiologist
Ines Cabral-Goncalves, MRI Manager; Koenraad Mortele, MD, Radiologist
Shuang Qi Zheng, MRI Supervisor; Martin Smith, MD, Radiologist
Donna Hallet, Radiology Director; Mary Hochman, MD, Radiologist
Annamarie Monks, Chief Admin. Officer; Kelli Roche, MRI Technologist

The Interventions

- Reviewed statistics from June 2013; a month demonstrating an average total number of exams for the MRI department. Statistics collected included:
 - Number and type of exams
 - Magnet capacity and availability across all scanners
 - Comparison of allotted exam time to actual time to complete exam
- Each subspecialty section (Neuro, MSK, Body, Breast) identified any problems with exams and proposed protocol updates that included:
 - Parameter adjustments to improve scan time and reproducible quality
 - Subtraction of sequences
 - Reorganizing the order of sequences for optimal workflow
- After reviewing the above data and evaluating the actual gradient time for each exam, each subspecialty section determined the appropriate time slot every exam should fit into and decided to update scheduled time slot increments from 20 minutes to 15 minutes for 15, 30, 45, 60, or 75 minute time slots.



EXAM	Current Time Slot	Proposed Time Slot	Total (June)	Current Time Total	Proposed Time Total
Brain w/o & w/	40	30	289	11560	8670
Lumbar w/o & w/	40	45	90	3600	4050
MRA Brain	40	15	64	2560	960
Liver	40	30	101	4040	3030
MRCP	40	45	114	4560	5130
Knee	40	30	67	2680	2010
Shoulder Arthro	40	45	10	400	450
Breast Screen	40	30	72	2880	2160
Total:	120	90	443	17720	13680
				Time Saved	4040

Lessons Learned

- Focused process improvements in MRI protocols, scheduling and ordering have the potential to significantly increase throughput in the MRI department.
- When properly identified, MRI protocol adjustments can considerably improve image quality and the overall patient experience with shorter exam times and fewer repeats.

Next Steps

- Continue to find ways to improve the efficiency of MRI protocols
- Educate referring physicians to help get the correct order the first time.
- Implement pre-approval processes.
- Run new data and evaluate the effectiveness of the adjustments and check for revenue gain.

For More Information Contact

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Christine Chen, MD
2nd Year Resident

Standardized post procedure observation in Interventional Radiology

The Problem

At our institution, post-procedure observation times have often been variable and attending-dependent. Although there is increasing evidence that a number of interventional radiologic procedures can be performed safely on an outpatient basis, there are no recommended observation times for these cases. In patients undergoing procedures in the interventional radiology department, patients may undergo a longer observation in the radiology care unit (RCU) after a procedure, varying by attending preference. Shorter observation times may be equally as safe while improving timeliness of discharge and convenience for the patient, cost of the encounter, and efficiency of the unit.

Aim/Goal

Our goal was to standardize post-procedural observation times, shorten observation times, and evaluate the safety of decreasing observation times by comparing the complication rates in patients undergoing procedures in the 7 months prior to standardization and 7 months after.

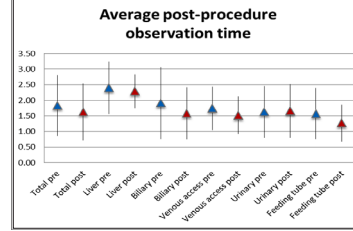
The Team

Christine Chen, MD, Radiology
Bridget O'Bryan, RN, Radiology
Ammar Sarwar, MD, Radiology
Muneeb Ahmed, MD, Radiology
Felipe Collares, MD, Radiology
Salomao Faintuch, MD, Radiology
Jonathan Kruskal, MD, Radiology
Olga R. Brook, MD, Radiology

The Interventions

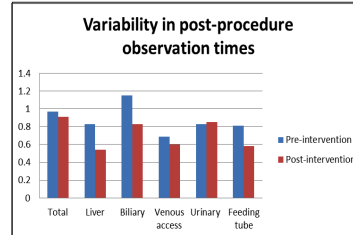
- Developed a standardized protocol for observation times in the RCU after a procedure in the interventional radiology department, implemented in January 2014.
- Identified outpatients undergoing procedures in the interventional radiology department between 1 June 2013 and 21 July 2014.
- Identified ED visits and hospital admissions within 90 days of the procedure, and clinic visits and mortality within 30 days of the procedure.
- Joint review of clinical notes associated with the above encounters by an attending interventional radiologist and radiology resident to determine relevance to the procedure and preventability by longer observation times.
- Comparison of procedure-related and preventable encounters in patients prior to and after intervention.

The Results/Progress to Date



Average post-procedure observation times decreased after standardization.

✓ No significant increase in post-intervention procedure-related ED visits, admissions, or clinic visits



Decreased variability of post-procedure observation times after standardization

Lessons Learned

- Shorter observation times after outpatient interventional radiology procedures are safe, with no significant increase in procedure-related complications resulting in additional healthcare encounters.
- Changing protocols or standard practices is always a difficult transition. Involving all personnel, including nursing staff, in the formulation and follow up of the protocol has helped significantly in implementation.

Next Steps/What Should Happen Next

- Further analyze the effect of observation protocol changes on the cost of the encounter.
- Evaluation of interventional radiologic procedures not within the interventional radiology department, including CT/US and MR.
- Evaluation of interventional radiologic procedures performed with planned overnight admissions.

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Marty Smith, MD, -
MRI & Abdominal
Imaging

Gadolinium-Based Contrast Agents (GBCA) in MRI at BIDMC: Improved safety

Background

Currently there are 9 FDA-approved GBCA in the United States with differing approved usages for MRI, though many are administered off-label widely. Each differs in chemical structure and characteristics, which effect stability and can effect clinical use and safety. Safety profiles of GBCA had been superb until in the mid 2000's when it was discovered that a new disease, nephrogenic systemic fibrosis (NSF), was associated with GBCA administration in patients with renal dysfunction. After collection of data on NSF cases, results of research studies, and guidance from the FDA and American College of Radiology (ACR), the importance of chemical structure and stability of a GBCA is more clear. Policy revisions have improved safety with GBCA administration. Though safer policies have been in place for several years, many in healthcare are not aware.

Problem

- Primary GBCA used at BIDMC had many associated cases of NSF
- GBCA administration policies needed updating for safety and clarity
- Mis-information in non-MRI radiology and wider medical community about GBCA safety
- Patient anxiety about GBCA from what they hear from others and read on the internet
- Belief that allergy to one GBCA means allergic to all GBCA

Goals

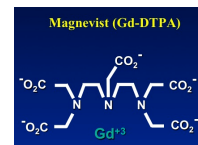
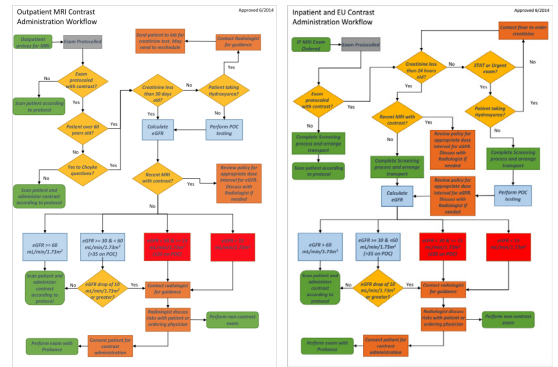
- Switch to safer GBCA for most MRI at BIDMC based on risk categories and study results
- Review and update types of GBCA at BIDMC and clarify uses
- Review and update policies on GBCA administration and create workflow guidance
- Clear the confusion on GBCA safety with providers and patients through education

Team

- MRI Operations Committee
- MRI Safety Committee

Results - Changes

- Changed GBCA for most MRI at BIDMC from Magnevist to Gadavist
- Established updated GBCA administration policy (RAD-57)
- Established updated Outpatient & Inpatient GBCA administration workflow
- Reinforced use of GBCA Prohance in patients with severe renal dysfunction; Prohance can be given safely above eGFR = 15 mL/min/1.73m² in patients with stable chronic renal dysfunction



FDA approved Gadolinium Based Contrast Agents	Molecular structure	Year approved	NSF risk	Thermodynamic stability (log K)	Kinetic stability (dissociation half life)	BIDMC approved use
Dotarem (gadobutrol)	macrocyclic / ionic	2013	Low	25.8	5hr	✓
Gadavist (gadobutrol)	macrocyclic / non-ionic	2011	Low	21.8	5hr	✓
Prohance (gadoteridol)	macrocyclic / non-ionic	1992	Low	23.8	3hr	✓
Ablavar (gadofosveset trisodium)	linear / ionic	2008	medium	22.1	29min	✓
Envist (gadofosveset disodium)	linear / ionic	2008	medium	23.5	✓	✓
Multihance (gadobenate dimeglumine)	linear / ionic	2004	medium	22.6	1-2hr	✓
Magnevist (gadopentate dimeglumine)	linear / ionic	1988	high	22.9	10min	discontinued
Omniscan (gadobutamide)	linear / non-ionic	1992	high	16.9	5hr	✓
Optovist (gadoversetamide)	linear / non-ionic	1998	high	19.9	60-120min	✓

Emanuel Kanal, MD, FACR, FISMRM Contrast-Enhances MRI Safety: Optimizing Patient Management
ACR Manual on Contrast Media - Version 9, 2013
European Medicines Agency: Questions and answers on the review of gadolinium-containing contrast agents, 2010
U.S. Food and Drug Administration, www.fda.gov
Marie-France Bellin, et al., Extracellular gadolinium-based contrast media: An overview, European Journal of Radiology 66(2008): 160-167

Next Steps

- Survey providers about what they would like to know about GBCA administration
- Inform providers directly and through email about GBCA safety in renal dysfunction and that an allergic reaction to 1 GBCA is usually isolated and such patients can receive other GBCA
- Try to have GBCA administration pop-ups on OMR at time of ordering MRI with information

For More Information Contact

Martin P. Smith, MD

Radiologist (MRI/Abdominal Imaging) msmith13@bidmc.harvard.edu





Lauren Ferrara, MD
3rd Year Resident

Utility of Localizer Images on MRI

The Problem

Hip MRIs are one of the most commonly performed studies in musculoskeletal radiology. Localizer images often include portions of the body not evaluated on standard sequences, however are often not carefully scrutinized by radiologists.

- Missed findings on localizer images have been reported for other parts of the body including the heart and abdomen
- Hip MRI localizers include information about the abdomen and pelvis which could potentially require treatment
- Failure to carefully evaluate MRI hip localizers could adversely impact patient care by resulting in a delay in diagnosis

Aim/Goal

To evaluate the spectrum of incidental findings on hip MRI and MR arthrogram localizer images and to determine whether there are findings which could require treatment.

The Team

- Lauren Ferrara, MD Department of Radiology
- Justin Kung, MD Department of Radiology
- Jim Wu, MD Department of Radiology
- Mary Hochman, MD MBA Department of Radiology
- Ronald Eisenberg, MD JD Department of Radiology

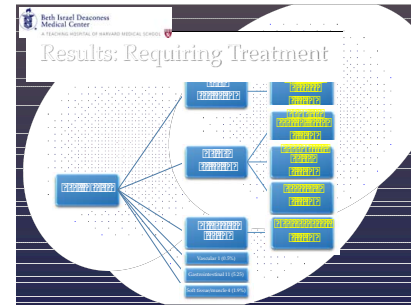
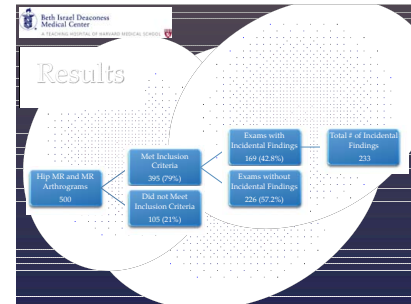
The Interventions

- Conducted retrospective review of 500 hip MRIs and MR arthrograms following IRB approval
- Studies performed between January 2010 to December 2011
- Additional imaging studies and the online medical record were reviewed to confirm the findings and determine whether any findings require treatment

Lessons Learned

- Incidental findings are often present on MRI hip localizer images (42.8% of examinations)
- Careful evaluation of MR localizer images is recommended as they can add important information in conjunction with the remainder of the examination

The Results/Progress to Date

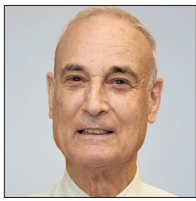


Next Steps/What Should Happen Next

- Consideration should be given to adding a comment on localizer images as a required element of standard reporting templates
- Such action may reduce the percentage of incidental findings missed by radiologists on localizer images



For more information, contact:
Justin Kung, MD Department of Radiology
jkung@bidmc.harvard.edu



Gerald Kolodny, MD, -
Chief, Nuclear Medicine
& Molecular Imaging

Reduction of Dose with our new Siemens 3D PET/CT scanner and MEDRAD dose administrator

The Problem

In order to achieve acceptable imaging results:

- High energy doses of Radiopharmaceuticals administered for a PET/CT scan needed to be manually handled and injected by the technologist.
- One standard dose is given to all patients with a standard higher dose given to obese patients
- This resulted in high doses for some patients and insufficient dose for other patients.
- Technologists were routinely being monitored at the ALARA II level.

Aim/Goal

Using our new Time of Flight 3D PET/CT scanner our goal is to:

- Reduce the patient dose of radiopharmaceuticals injected for PET/CT scans (F-18 FDG)
- Reduce the dose our technologists receive when handling radiopharmaceuticals during patient injection and patient positioning.

The Team

Jeffrey English, Dace Jansons and Gerald Kolodny

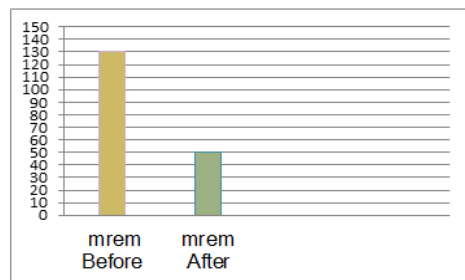
The Interventions

- Using the MEDRAD dose administrator, individualized doses of radiopharmaceuticals were calculated based on the patient's BMI.

The Results/Progress to Date

- A 46% decrease in the dose of radiopharmaceuticals received by patients.
- Even further dose lowering is now possible using our new MEDRAD dose administrator decreasing an average of 30%
- For technologists, the average dose has been dramatically reduced

Technologist average monthly badge readings



Lessons Learned

By applying new technology it is possible to lower patient and technologist radiation dose without sacrificing quality of imaging.

Next Steps/What Should Happen Next

- We intend to further our efforts to lower patient and technologist radiation dose by examining additional factors that bear on radiation burden to patients and technologists.



For more information, contact:
Gerald Kolodny, MD, Radiologist, Radiology
gkolodny@bidmc.harvard.edu

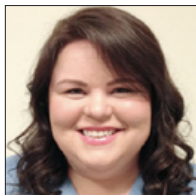
KUDOS - Each month, we share the positive feedback we receive about staff members and ask you to join us in congratulating them; as always, we are especially proud to acknowledge an unprecedented constellation of staff for providing outstanding care and service!

DX

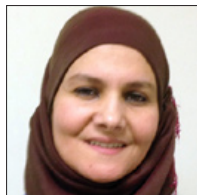
Thanks to



Joshua Peters,



Hillary Philbin,



Rahma Mokdad,



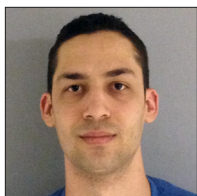
Armand Halilaj,

and **Mishka Jackson** [not shown] for ensuring coverage during our many snow events.

Yasir Abdelbasit earned praise from a patient who wrote: "My getting there in snow had been such an ordeal! He soothed my nerves, moved me right along and got me on over to Podiatry/Farr building and I was only 15 minutes behind time after all that. How grateful I was and could relax and smile the rest of the day. Thank you!"



From an ED visitor:



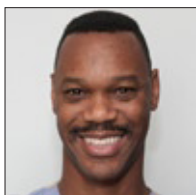
"We had such an extraordinary experience with your marvelous team this morning. Please let me know how to best to share the kudos in a way that maximized our ability to rain love down on the folks who rained love down on my dad...who left your hospital walking just that little bit taller, that little bit stronger, and feeling decidedly more human at the hands of a system that treated him like a person – and not a problem. HUMAN FIRST! First class treatment...a wonderful tech - **Billy Fernandez Firpo**... who took the time to really engage my dad as a person and make him feel welcome and secure."

CT

We continue to hear great feedback from our radiologists, patients and leadership for the outstanding work taking place in CT. **Marc Cadieux** for his efforts in moving a CT patient's appointment to MR so the patient didn't have to come back; **Leighton Atkins** for the time spent with an anxious patient. The patient's own words: "The best CT experience I've ever had!"; **Jim Cooney** and **Kim Fuller** engaging their ED patient and providing the patient information to help them make decisions about their care; **Karen Sherry** [not shown] who as a per diem stepped in and helped out tremendously during many of our snow events; and **Jessica Buttaro** for using 2 identifiers to find a mistake in an inpatient registration.



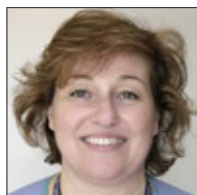
Marc Cadieux



Leighton Atkins



Jim Cooney



Kim Fuller



Jessica Buttaro

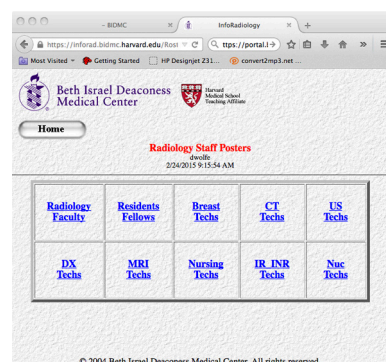
REMINDER: Updated Radiology Technologist Rosters & Staff Posters are available on InfoRadiology in pdf format for viewing, downloading, and printing

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 the **Staff Posters Tab** to view/download/print the most current Tech Rosters, etc.

Managers: please contact Michael Larson mlarson1@bidmc.harvard.edu to update rosters as needed

2015-2016 Staff & Resident/Fellow posters will be available in late July 2015



More KUDOS - for Dr. Mortele's accomplishments at SAR 2015

Hotel del Coronado • Coronado (San Diego), California

SAR
Society of Abdominal Radiology

The Society of Abdominal Radiology

Congratulations!

Cases of the Day Competition

Second Place Winner
Varaha S. Tammisetti, MD

First Place Winners – Tie!
Koenraad Mortele, MD
and
Dejana Radulovic, MD

SAR 2015 ANNUAL SCIENTIFIC MEETING AND EDUCATIONAL COURSE



SAR
Society of Abdominal Radiology

The Society of Abdominal Radiology

Congratulations!

Photo of the Day Winner

Koenraad Mortele

SAR 2015 ANNUAL SCIENTIFIC MEETING AND EDUCATIONAL COURSE



RADIOLOGY IN THE COMMUNITY - BIDMC Radiology in the Boston Marathon & Boston Chamber Symphony

BENEFITING: BIDMC

ORGANIZER: BIDMC

EVENT: 2015 Boston Marathon

EVENT DATE: Apr 20, 2015

2015 BOSTON MARATHON

2015 BOSTON MARATHON

TEAM BIDMC 2015

TEAM BIDMC TREADSTRONG

BENEFITING: BIDMC
ORGANIZER: BIDMC
EVENT: 2015 Boston Marathon
EVENT DATE: APR 20, 2015
DAYS TO GO: 21

THE STORY:
Hi all,
I am very excited to be accepted to the BIDMC Boston Marathon Team in 2015 and will be fundraising for the Beth Israel Deaconess Medical Center Annual Fund! For the past 3 years, I have been working as the Clinical Director of MRI in the Department of Radiology at BIDMC and have been truly amazed by the quality of care that is being offered here. Every day, patients are being evaluated, diagnosed, and treated with the highest standards and I am proud to be a member of this incredible institution and Department. By partaking in the Boston Marathon as a member of the BIDMC Team, I feel comforted that all of the money raised

See More

DONATE TO THIS FUNDRAISER

\$6,117
MONEY RAISED

82% Raised of \$7,500 Goal

Koenraad Mortele	\$100
Lillian Likos, MRI	\$50
Bi-Needham	\$100
Cheryl Bunting	\$100

FUNDRAISE FOR THIS CAMPAIGN

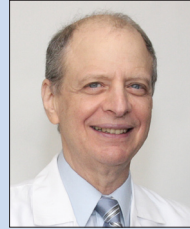
THE TEAM: \$256,975 TOTAL RAISED SO FAR

STEPHANIE HUNT
AMOUNT RAISED: **\$6,315**
126% Raised of \$5,000 Goal

KOENRAAD MORTELE
AMOUNT RAISED: **\$6,117**
82% Raised of \$7,500 Goal

JULIE RYAN
AMOUNT RAISED: **\$5,950**

SUSIE SARKISIAN
AMOUNT RAISED: **\$5,410**
108% Raised of \$5,000 Goal



As Chief Operating Officer of the Boston Chamber Symphony, Dr. Ron Eisenberg is pleased to announce that the Boston Chamber Symphony, conducted by his daughter Avlana Eisenberg, will be performing in concert on

Sunday, April 26, at 4pm. As part of the JP Concerts Series, it takes place at St. John's Episcopal Church, 7 Revere Street (corner of Revere St. and Roanoke Ave) in Jamaica Plain. The concert features Ravel's Le Tombeau de Couperin and Symphony No. 1 of Beethoven.

BIDMC is well-represented in the Boston Chamber Symphony. In May 2014, the Boston Chamber held another concert at St. John's Episcopal which included (below L to R:) then MRI fellow and now staff Dr. Leo Tsai, Dr. Eisenberg's wife Zina Schiff, and former resident Dr. Yiming Gao on violin!



Hey all,

Only THREE (!) more weeks to go until Marathon day! Yesterday, I set out with some friends for the longest run of the training from Hopkinton to the Brookline Reservoir 22 miles (35km) training....and made it to work this morning...J.

I am currently at 82% (THANKS to all!) of my fundraising goal (around Heartbreak Hill if you correlate it with the course!) and, needless to say, I would love to finish it up in the next 3 weeks. Truly appreciate any effort/donation!

Here is the link:

www.crowdfunder.com/TeamBIDMC2015/fundraiser/koenraadmortele

It's really fast, easy, and it supports the hospital we all work in!

To be continued,
Koenraad

TEAM BIDMC TREADSTRONG

Support our marathon team at **TREADSTRONG.ORG**

B.R.A. CHARITY PARTNER

Your gift benefits the following BIDMC programs:
Annual Fund • Kidney Disease Research • Cancer Center
The Klarman Family Neonatal Intensive Care Unit
Bowdoin Street Healthy Champions Program



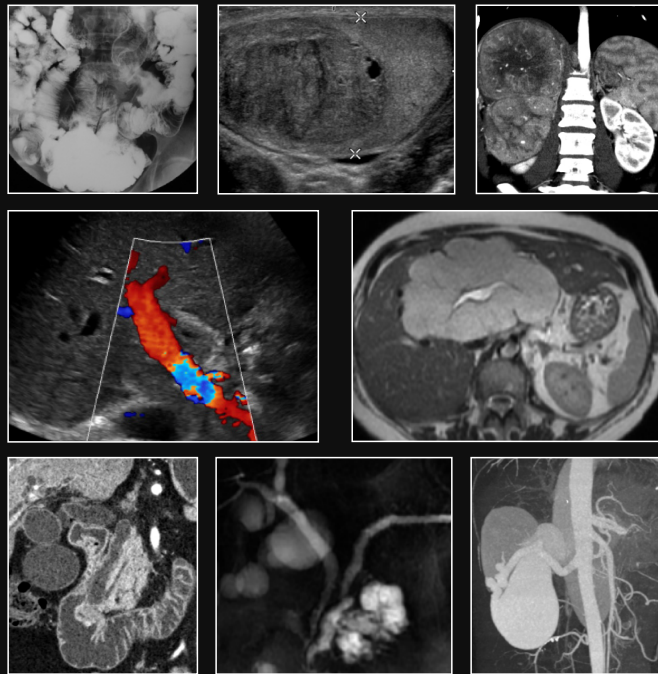
HARVARD
MEDICAL SCHOOL



Beth Israel Deaconess
Medical Center
Department of Radiology

Abdominal & Pelvic Imaging 2015

A Practical Multi-Modality Review Course of GI and GU Radiology



Monday - Wednesday

June 22 - 24, 2015

Boston Marriott Long Wharf
Boston, MA

Note the
reduced rate for
BIDMC Radiology
Alumni:
\$600

Guest Faculty:

Angela Levy • Rendon Nelson • Caroline Reinhold • Dushyant Sahani

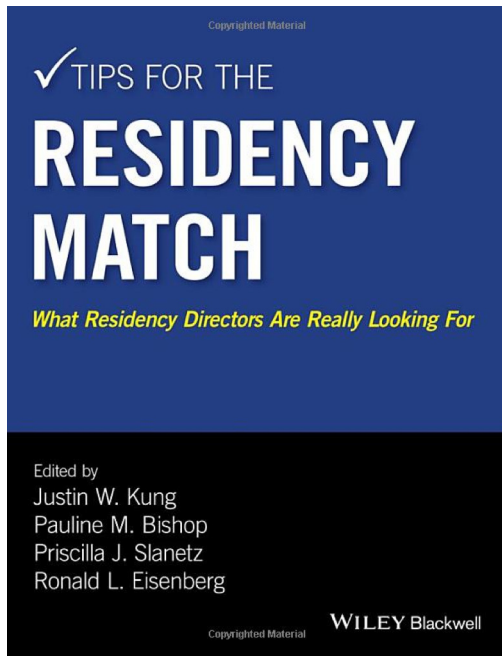
Course Director

Koenraad J Morteel MD

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Abdominal & Pelvic Imaging 2015:
A Practical Multi-Modality Review Course of GI & GU Radiology



Tips for the Residency Match: What Residency Directors Are Really Looking For

Paperback – March 16, 2015

★★★★ on Amazon.com

Tips for the Residency Match is a unique guide for medical students applying for residency positions. Packed with hints, tips, and recommendations from both program directors and current residents, Tips for the Residency Match chronologically covers the key information required to excel during the residency application process - from resume advice and preparing for the interview and beyond. Both insightful and practical, Tips for the Residency Match features a wide spectrum of medical specialties and an extra section for foreign graduates. Tips for the Residency Match is: * Uniquely tailored to the needs of those applying for US residency positions * Written by leading Residency Directors and current residents in the major specialties * Offers unprecedented access to how departmental decisions about the Match are made Boasting expert advice and a wide scope, Tips for the Residency Match is the ideal companion for those applying for residency positions throughout the United States.

Editorial Reviews

From the Back Cover

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Tips for the Residency Match:

- Uniquely tailored to the needs of those applying for US residency positions
- Written by leading Residency Directors and current residents in the major specialties
- Offers unprecedented access to how departmental decisions about the Match are made

Boasting expert advice and a wide scope, Tips for the Residency Match is the ideal companion for those applying for residency positions throughout the United States.

About the Authors:

Justin W. Kung is Associate Program Director, Radiology, and Assistant Professor of Radiology, Beth Israel Deaconess Medical Center, Harvard Medical School, Boston

Pauline M. Bishop is Clinical Fellow in Interventional Radiology, Beth Israel Deaconess Medical Center, Harvard Medical School, Boston

Priscilla J. Slanetz is Program Director, Radiology, and Associate Professor of Radiology, Beth Israel Deaconess Medical Center, Harvard Medical School, Boston

Ronald L. Eisenberg is Associate Program Director, Radiology, and Professor of Radiology, Beth Israel Deaconess Medical Center, Harvard Medical School, Boston

Role of Imaging in Neoadjuvant Therapy for Breast Cancer

Vandana Dialani, MD, Tamuna Chadashvili, MD, PhD, and Priscilla J. Slanetz, MD, MPH, FACP

¹Division of Breast Imaging, Department of Radiology, Beth Israel Deaconess Medical Center and Harvard Medical School, Boston, MA

ABSTRACT Neoadjuvant chemotherapy (NAC) involves administration of chemotherapeutic agents to patients with newly diagnosed breast cancer prior to definitive surgical treatment. Assessment of disease response to chemotherapeutic agents in vivo prior to any surgical intervention is necessary as medical oncologists are commonly tailoring or changing therapy during NAC based on response. It can also maximize the pathologic complete response (pCR) rate, resulting in more women undergoing breast conservation rather than mastectomy. Although some studies show a pCR to NAC in only 13–26 % of women, recent studies have shown higher pCR rates, especially for HER2-positive disease treated with targeted anti-HER2 therapy. Thus, accurate imaging tools for

quantifying disease response are critical in the evaluation and management of patients undergoing NAC. There is currently no standard imaging method for monitoring response to therapy. Response to therapy tends to vary by tumor subtype and can be accurately assessed on imaging. We review the role of imaging before and after neoadjuvant therapy and discuss the advantages and limitations of currently available modalities, including mammography, ultrasonography, magnetic resonance imaging, and nuclear imaging.

Neoadjuvant chemotherapy (NAC) involves administration of chemotherapeutic agents to patients with newly diagnosed breast cancer prior to more definitive surgical treatment. The primary aim of NAC is to achieve pathologic complete response (pCR) prior to surgery, which has shown to confer improved long-term disease-free and overall survival.¹ Although clinical trials comparing patients receiving neoadjuvant and adjuvant chemotherapy have demonstrated no significant difference in overall survival or disease progression, patients with NAC are more likely to undergo breast-conserving therapy.^{2,3} In general, among women undergoing NAC, approximately 70 % show a clinical response but only 13–26 % have a complete pathologic response.^{4,5} More recent studies, however, have shown higher response rates in patients with human epidermal growth factor receptor (HER2) and triple negative disease (does not express genes for estrogen receptor, progesterone receptor, and HER2/neu).⁶ NAC allows assessment of disease response to chemotherapeutic agents in vivo, which is a predictor of the final pathologic response, with potential for modifying therapy to increase the pCR rate, tumor volume reduction, and treatment tolerability. Therefore, accurate imaging tools for quantifying disease response are critical in the evaluation and management of patients undergoing NAC. There is no standard method for monitoring response to therapy, and the varied response to therapy based on tumor subtype makes it even more challenging.

Acknowledgment: This educational review series, “Neoadjuvant Therapy in Breast Cancer” is supported by an educational grant from Genentech, Inc. The Society of Surgical Oncology offers CME/MOC for this educational review series. Visit moc.surgonc.org for additional information.

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This Educational Review Series may include information regarding the use of medications that may be outside the approved labeling for these products. Physicians should consult the current prescribing information for these products. Authors of *Annals of Surgical Oncology* educational reviews are provided at the time of article solicitation with this statement regarding off-label pharmaceutical information and research.

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First Received: 28 August 2014

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Published online: 02 March 2015

Limited added utility of performing follow-up contrast-enhanced CT in patients undergoing initial non-enhanced CT for evaluation of flank pain in the emergency department

Monica D. Agarwal · Robin B. Levenson ·
Bettina Siewert · Marc A. Camacho ·
Vassilios Raptopoulos

Received: 7 March 2014 / Accepted: 21 July 2014 / Published online: 1 August 2014
© American Society of Emergency Radiology 2014

Abstract In our emergency department (ED), patients with flank pain often undergo non-enhanced computed tomography (NECT) to assess for nephroureteral (NU) stone. After immediate image review, decision is made regarding need for subsequent contrast-enhanced CT (CECT) to help assess for other causes of pain. This study aimed to review the experience of a single institution with this protocol and to assess the utility of CECT. Over a 6 month period, we performed a retrospective analysis on ED patients presenting with flank pain undergoing CT for a clinical diagnosis of nephroureterolithiasis. Patients initially underwent abdominopelvic NECT. The interpreting radiologist immediately decided whether to obtain a CECT to evaluate for another etiology of pain. Medical records, CT reports and images, and 7-day ED return were reviewed. CT diagnoses on NECT and CECT were compared. Additional information from CECT and changes in management as documented in the patient's medical record were noted. Three hundred twenty-two patients underwent NECT for obstructing NU stones during the study period. Renal or ureteral calculi were detected in 143/322 (44.4 %). One hundred fifty-four patients (47.8 %) underwent CECT. CECT added information in 17/322 cases (5.3 %) but only changed management in 6/322 patients (1.9 %). In four of these patients with final diagnosis of renal infarct, splenic infarct, pyelonephritis and early acute appendicitis in a thin patient, there was no abnormality on the NECT (4/322 patients, 1.2 %). In the remaining 2 patients, an abnormality was visible on the NECT. In patients presenting with flank pain with a clinical suspicion of nephroureterolithiasis, CECT may not be indicated. While

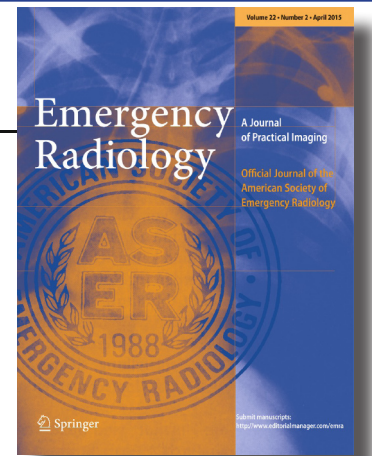
CECT provided better delineation of an abnormality in 5.3 % of cases, changes in management after CECT occurred only in 2 %. This included 1 % of patients in whom a diagnosis of organ infarct, pyelonephritis or acute appendicitis in a thin patient could only be made on CECT.

Keywords Emergency department (ED) · Nephroureteral · Calculi · Nephroureterolithiasis · Stone

Introduction

Non-enhanced computed tomography (NECT) is the test of choice to evaluate suspected renal colic as an etiology of flank pain [1, 2]. NECT is rapid and accurate, allows identification of the stone location and size, facilitates triage of patients, and has a 98–100 % sensitivity and 92–100 % specificity for the detection of renal and ureteral calculi [3–9]. Because flank pain is a nonspecific symptom, with possible alternate diagnoses in the absence of nephroureterolithiasis, in our practice, patients with flank pain often undergo a CECT following abdominopelvic (AP) NECT if no stone is seen on NECT. We adapted this practice in 2002 at the request of the emergency medical and surgical teams to evaluate for alternative causes of flank pain. However, many extra-urinary etiologies of flank pain, such as diverticulitis, adnexal mass, appendicitis or neoplasm, can be identified on NECT [10–12]. Additionally, as attention to radiation dose and increasing concern for radiation induced cancer rises, the necessity of an additional scan should be critically evaluated [13, 14]. The purpose of this study is to review the experience of a single institution with this protocol and to assess the utility of follow-up CECT after initial NECT.

M. D. Agarwal · R. B. Levenson (✉) · B. Siewert ·
M. A. Camacho · V. Raptopoulos
Department of Radiology, Beth Israel Deaconess Medical Center,
330 Brookline Avenue, Boston, MA 02215, USA
e-mail: rlevenso@bidmc.harvard.edu



Departmental News: Updated Policy Notifications



Donna Hallett, BSc
Director of Operations

As we announced in July, the following departmental policies, procedures, guidelines and directives (PPGD) have

been added, edited or reviewed with no change. To ensure that you are up to date on the newest, most current information, please click on the link below to view the specific PPGD:

<https://apps.bidmc.org/cms/dispManuals.asp>

Note that PPGDs are organized by section rather than Policy Number on this webpage

Click here →

- Administration**
- Cell Phone Policy
 - Dress Code Policy - Radiology
 - Employee Licensure/Accreditation, Certification and/or Registration
 - Communication of Critical Test Results
 - Unplanned ET
 - Breast Feeding Patients and the Use of Contrast Agents
 - Change of Shift Communication
 - Room and Equipment Cleaning
 - Radiology Table Weight Limits
 - Inspection and Maintenance of Radiology Equipment
 - Well Read Policy
 - Use of IV Contrast for CT and MR Imaging
 - Off shift staff transportation between the East and West campuses
 - Patient Identification Guidelines
 - Transfers of Outpatients between Campuses
 - Well Read Policy
 - Submission Content for the Radiology Online QA system and the Patient Safety Reporting System
 - Guidelines for Chemotherapy Administration in Radiology
 - CPR/BLS Certification Requirements for Imaging Technologists
 - Radiology Employee Licensure Verification
 - Safe Handling of Patient Valuables and Belongings while in the Radiology Department
 - Practices/Guidelines for Radiology Post-Procedure Ambulatory Patient Disposition/Discharge
 - Care of the Patient Following IV Contrast Extravasation
 - CT/MRI Venous Injection Device Guidelines
 - Code 2 Isolation Portable X-ray Exam Infection Control Guideline
- Breast Imaging**
- CT**
- Neuro Cases To or For Injured Studies
 - Patients on Dialysis and receiving IV contrast injections for CT exams
 - Radiology Protocol Documentation
 - CT IV Hydration Work Flow
 - IV Contrast Premedication Guidelines/PMB
 - Pre-Imaging workup on ED patients
 - Minimizing nephrotoxicity from Iodinated Contrast
 - Use of Iodinated Contrast in "High Risk" patients
 - CT Cardiac Gating protocoling

New / Updated Policies

Guideline #: RAD-14 High Level Disinfection (HLD) Trophon ERP System

Title: Cleaning and Disinfection of Intra-cavitary Ultrasound Probes and Ultrasound Machine

Purpose: To describe the process for HLD of intra-cavitary probes

Revision: Revised PPE requirements

Guideline #: RAD-02

Title: Cleaning and Disinfection of Portable/Stationary Ultrasound Machine and Non-Intra-cavitary Probe

Purpose: To describe the process for cleaning and disinfection of the ultrasound machine and non-intra-cavitary probe.

Revision: Clarified PPE indicated for procedure type and removed camera, added disinfect gel bottle and a avoiding damage to keyboard

2015 BIDMC Radiology Publications - A PubMed search for new BIDMC publications is made each month; however, if we miss your paper, please send the reference to dwolfe@bidmc.harvard.edu. Note that Epub dates are included only in publications where the Epub and paper publication dates occur in different years, i.e., Epub in 2014 and paper publication in 2015.

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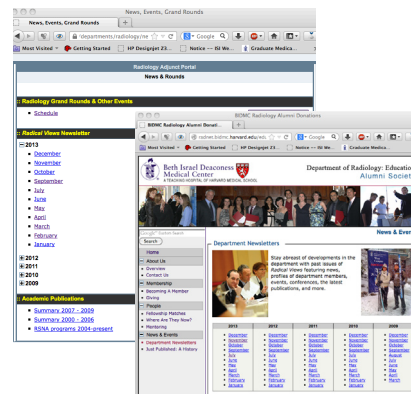
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