

## Radical Views... from the Department of Radiology

OCTOBER 2018 Beth Israel Deaconess Medical Center

Volume 11, Number 3



On Friday October 5<sup>th</sup> we will have a special Grand Rounds to discuss the state of Respect in Radiology. We have invited 11 panelists from different disciplines within the department to discuss the results of the recent survey asking you to list 3 behaviors that made you feel respected and 3 behaviors that made you feel disrespected. This event will kick off our Radiology Respect Initiative which we consider to be an FY19 priority with the aim of embedding respectful treatment and behavior into our culture going forward. As members of our radiology community, we invite as many of you as possible to attend this Grand Rounds discussion.

To quote BIDMC President Pete Healy, "culture eats strategy for breakfast". If we are not treating each other respectfully or if we are unaware that we are being disrespectful it will have a negative result on job satisfaction, patient experience and the overall performance in the department. We hope you will join Grand Rounds and engage in this very important discussion. In the meantime we ask that you become more aware of what respectful behavior means to you. Try the following tips:

- **LISTEN TO UNDERSTAND** means giving others your full attention and assume the best. In stressfull situations, we may struggle to function at peak performance and these are the times when compassion is needed the most.
  - Imagine standing in the other person's shoes when you respond to a request or a query.
  - Ask the person for their perception of what happened or understanding of the given situation. Pause, consider how this could have been handled better by them or the team if possible.
  - Listen and have a discussion; honor the other's perspectives. If you can't honor it, then respect it.
    - Paraphrase colleagues' statements to check for understanding. This will help them understand that you heard them, and ensure their words were absorbed as they intended.
  - Ask questions encourage discussion, encourage others to speak; provide a platform that feels safe, where you can bring up issues. Consider one another's points of view.
  - Talk Less, Listen more. Don't cut people off or talk over them.
  - Be present and don't make assumptions. Get the facts.
  - Try not to get defensive; perhaps consider such interactions as a learning opportunity.
  - Come up with at least three possible rationales for an action and three possible remedies.

Stay tuned for more helpful tips on how to help create a more respectful environment both professionally and personally. We invite you to share a respect situation with the Radiology Respect Committee via our new mailbox: **RespectinRadiology@BIDMC.harvard.edu** 

#### Thank you!

- Department of Radiology RESPECT Committee

Please note that our monthly **Radiology Calendars for Academic Year 2018** are now available at <u>Schedules</u>; just click on Grand Rounds (under General) and Monthly Calendar (under Lectures, etc.) for the most up-to-date listings at: https://apps.bidmc.org/departments/radiology/schedules/schedules.asp



Dr. Thorwarth earned his MD at Geisel School of Medicine at Dartmouth Medical School and completed his residency in radiology at the University of North Carolina Hospitals and an internship in internal medicine at Penn State University. Grand Rounds October 26, 2018 12:00 PM - 1:00 PM Rabkin Bourd Room Shapiro-10 **William T. Thorwarth Jr., MD, FACR** - Chief Executive Officer, American College of Radiology

After 30 years of clinical practice with Catawba Radiological Associates in North Carolina William T. Thorwarth Jr., MD, FACR officially took the reins of the American College of Radiology as CEO in 2014. In his career, Dr. Thorwarth built a secondary expertise in healthcare economics, serving as chair of the ACR Commission on Economics, president of the ACR, member of the Board of Chancellors. In 2010, was honored with the ACR Gold Medal. He has also served as chair

of the American Medical Association Current Procedural Terminology (CPT) Editorial Panel, the first radiologist to hold that position.

His leadership positions in numerous medical organizations include serving as Board of Directors Liaison for RSNA Publications and Communications and RSNA Research and Education Foundation. Thorwarth is also a recognized expert in the field of coding, nomenclature and the relative value scale, and is a recipient of the Silver Medal Award from the North Carolina Radiological Society (NCRS) for extraordinary service to the chapter. Please welcome Dr. Thorwarth.



As RSNA's 104th Scientific and Annual Meeting approaches (November 25-30), consider taking this opportunity to reconnect with alumni and invite them to *stay in touch* with BIDMC Radiology by accessing Radical Views: http://radnet.bidmc.harvard.edu/education/newsletters.asp Strategic planning continues to go on, and I think it will be really exciting for the College to apply that plan to existing and potential new initiatives. Radiologists have faced challenges over the last several decades. That is, how you maintain good, common, patient-centered service, and (at the same time) remain responsive to our referring physicians with the degree of subspecialization that is appropriate in your respective community.

- William Thorwarth Jr., MD, FACR (Paraphrased from Radiology Business July 16, 2014)

Relevant publications include:

Bluth El, Muroff LR, Cernigliaro JG, Moore AV Jr, Smith GG, Flug J, DeStigter KK, Allen B Jr, **Thorwarth WT Jr**, Roberts AC. Forecasting the Effect of the Change in Timing of the ABR Diagnostic Radiology Examinations: Results of the ACR Survey

of Practice Leaders. J Am Coll Radiol. 2015 May;12(5):495-500. PMID: 25737379.

Krishnaraj A, Norbash A, Allen B Jr, Ellenbogen PH, Kazerooni EA, **Thorwarth W Jr**, Weinreb JC. The impact of the Patient Protection and Affordable Care Act on radiology: beyond reimbursement. J Am Coll Radiol. 2015 Jan;12(1):29-33. PMID: 25557569.

**Thorwarth WT Jr.** Your best ROI/cover your assets. J Am Coll Radiol. 2010 Sep;7(9):729-30. PMID: 20816636.

Petrey WB, Allen B Jr, **Thorwarth WT Jr**. Radiology coding, reimbursement, and economics: a practical playbook for housestaff. J Am Coll Radiol. 2009 Sep;6(9):643-8. Review. PMID: 19720360.

**Thorwarth WT Jr.** Is your profession worth 1%? J Am Coll Radiol. 2006 pr;3(4):248-51. Review. PMID: 17412055.

Dodd GD, Fletcher TB, **Thorwarth WT Jr.** The crisis in academic radiology: will we help ourselves? J Am Coll Radiol. 2006 Apr;3(4):243-7. Review. PMID: 17412054.

**Thorwarth WT Jr.** Get paid for what you do: dictation patterns and impact on billing accuracy. J Am Coll Radiol. 2005 Aug;2(8):665-9. PMID: 17411902.

**Thorwarth WT Jr.** Radiology in the era of accountability: perfect storm or new dawn? J Am Coll Radiol. 2004 Dec;1(12):893-6. PMID: 17411727.



#### **Congratulations Ana Cordero!**

I am very pleased to inform you that you have been chosen as one of the Latino/Hispanic Achievement Awards Committee's 2018 "Nuestras Estrellas."

Ana Cordero, Clinical Instructor, Diagnostic Radiology This honor is given each year to nominated **BIDMC staff members in recognition and** with appreciation for their dedication and contributions in advancing the quality and

experience of health care for our Latino/Hispanic patients and our Latino/Hispanic community at BIDMC.

We celebrate you and your achievements! On behalf of the Committee, it gives me great pleasure to invite you to join with us in celebration at the BIDMC Latino/Hispanic Achievement Awards on Thursday, October 18, 12:30-1:30pm in the East Campus, Leventhal Conference Center, Shapiro Clinical Center, 2nd floor.

At the event, we will celebrate you and your fellow Nuestras Estrellas, along with our Latino/Hispanic Achievement Award recipients for 2018. Food and refreshments with a Latino/Hispanic theme will also be served during the event.

I also would like to recognize the "champions" who nominated you, Aideen Snell and Ines Cabral-Goncalves. We hope that you and your "champions" along with your manager and colleagues, will attend.

Muchísimas Felicidades y Muchas Gracias for your wonderful contributions to our Latino/Hispanic Community!

With much appreciation,

Lucero Vega Senior Project Manager **Research & Academic Affairs** Chair, Latino/Hispanic Achievement Award Committee

#### Please join us in wishing Dr. McArdle well in his retirement after 43 years at BIDMC

You are cordially invited to an afternoon tea for Dr. Colin McArdle on Wednesday, October 10th, 3 pm, Rosenberg 352, West Campus (Clouse Conference Rm).



#### CONGRATULATIONS ANA!

A well-deserved award. You've been a wonderful champion for the Latino community – but honestly you don't limit yourself...you provide support to everyone. We are proud and thankful you are a member of our department.

Thank you for all that you do!

BG (Betsy Grady, Director, Diagnostic Imaging





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Check out our **BIDMC** Radiology **Alumni Society** page and access our monthly Radical Views



#### KUDOS – Ancient Greek noun meaning praise & honor received for an achievement

Kudos recognizes staff members for providing outstanding care and service, and for promoting team communication. Please send your positive feedback for anyone deserving this honor to Jillian Augusta (jaugusta@bidmc.harvard.edu). Congratulations to the following:

#### Inés Cabral Goncalves (MRI Technical Director) & Kelly Bergeron (MRI Clinical Manager):

A recent patient safety and patient experience event was called out



as an example of the MR team's extraordinary efforts to screen and schedule patients in an environment of full schedules and ever changing demands from multiple service lines. This call out was very much appreciated by the team involved and is one example of the work that happens on a day-to-day basis under the leadership of Kelly Bergeron and Inés Cabral who support their team in making patient first decisions and keeping the safety of all who enter MR a top priority.

"Hi all, I just wanted to share with various leadership what a great job the MRI technical and managerial team did in helping care for a young breast cancer patient. This patient came in with an aggressive breast cancer. She is non English speaking and needed a breast MRI. At the time of the initial MRI study, the technologist identified appropriately that the patient could not have an MRI due to a stainless steel IUD, a type of IUD that we typically don't see. Most of the IUDs are MRI compatible. Kudos to the technologist for not doing the MRI at that time. The IUD was subsequently removed. An MRI was again urgently requested so that the patient could start neoadjuvant chemotherapy. Coordinating the breast MRI with interpreter services was quite challenging (an understatement). After many, many emails and valiant efforts by Kelly and team of reviewing schedules, exploring options and shifting patients, the MRI team was able to accommodate this patient for a much needed study.

Amazing job (as always!). Thank you both! Warmest Regards Tejas" Thank you Tejas for sharing. I couldn't agree more, the schedules in MRI are very tight and this team always puts the patient first and with excellent customer service skills juggles the impossible and get it done. Thank you Inés and Kelly.

—Donna Hallett



#### Ivie Oyola (IR Tech):

Kudos to Ivie for being a team player and exceeding expectations by volunteering for the hard-to-fill evening shifts while a technologist is on leave. Thank you Ivie!



#### Jake Waldman (IR Tech):

Jacob is being recognized for exceeding expectations. He continues to stay past his shift, saving the on call tech from coming back in, providing continuity of care for the patient, while reducing cost to the Medical Center.

#### Dan Tempesta (Nuc Med Tech III):

Dan has had a very productive first full year as a Nuclear Medicine Tech III. He is one of our section's safe patient handling champions and in addition to his clinical care duties, he has taken on and completed the following projects: he



piloted having the techs make phone calls to PET patients to confirm that they understand the prep for the exam, and know about their appointment, which is now standard practice for the department. He updated/edited/consolidated the section's on-call manual, outlining information on paging protocol, table weight limits, exam prep, opening and closing procedure, and more: he has been very timely in keeping the section's exam protocol library up-to-date as procedures evolve, and he has improved them by weaving links to SNM/EANM/ACR/ASNC practice standards in the protocols, making the methodology behind the protocols easily accessible to staff. He also contributed to editing the front desk procedure manual for accuracy, so that front-line support staff have access to accurate information on our procedures. Additonally, he took on the role of co-AES (Affiliate Education Supervisor), improving our ability to give timely and specific feedback to Regis College on their students who rotate through our section. Dan is an adjunct lecturer in the nuclear medicine program at Regis College, and the Education Chair for the New England Chapter of Society of Nuclear Medicine, Technologist Section, and is a reviewer for the Journal of Nuclear Medicine Technology. It is difficult to imagine what he will accomplish in his second year!



**Mohammed Makhloufi** (US Coordinator): I would like to recognize Mohammed in light of his amazing Spirit and the positive work atmosphere he creates. Mohammed is in a very busy area and maintains such an even attitude in his daily work. He is well known, from other staff in Radiology to those outside

of Ultrasound, to the staff on patient floors. I hear him daily call other coordinators and say; "Hey, it's Mohammed!" and you can tell by his jovial conversation that his calls are pleasant ones. In times of stressful coordinating with floor staff, he always keeps his cool and is always respectful, even if tensions arise due to scheduling or other issues. A big part of our successful day depends on our radiology transporters, who manage moving inpatients to and from our unit from various parts of the medical center. Mohammed has developed personal relationships with most of the transporters, so in urgent situations he's quick to call or page one of his friends in radiology transport to help us out. Having his type of personality just makes people want to help, and this translates into all of us being able to better serve our patients.

#### Community News - New MRI system operational this week at BID-Needham

## We are pleased to announce that this week, the Radiology Department at BID–Needham will begin using a second MRI machine, a Siemens Aera 1.5T MRI system.



This state-of-the-art, wide-bore scanner allows for faster scan times and excellent imaging capability. The system has a larger opening and a shorter system design for a more pleasant and comfortable patient experience. For claustrophobic patients, this MRI system provides them with more room so they feel less "closed-in." In some cases, patients can keep their head outside of the system to look at a lighted ceiling mural, which studies have shown helps to relax patients.

Adding this second MRI system will give our team greater flexibility and availability for patient scheduling. The Department of Radiology at BID–Needham is part of the Beth Israel Deaconess Medical Center Department of Radiology and staffed by Harvard Medical Faculty Physicians. Subspecialty interpretations are provided using the same protocols as BIDMC in breast imaging, neuroradiology, musculoskeletal imaging, and body imaging.

To make an appointment, please call 781-453-3044. BID–Needham is conveniently located at 148 Chestnut Street, Needham with free on-site parking and free valet service.

 Bill Hallett, RTR, CT, director of Radiology at BID–Needham and Justin Kung, MD, Vice Chair of Radiology Network Integration

#### NOTE: CT Newsletters can now be found on the portal

As requested in the CT Ops meeting, the CT Newsletters can now be found on the Portal. Please be sure to review each month as information such as policy review, TJC, Protocols, and new products are all reviewed in the Newsletter. If you have questions, please call Kelly Hart at 667-5706 if you have any questions.

#### Go to Radiology on the Portal -> Schedules-> CT -> Newsletters

Radiology Adjunct Portal					
C	CT CT				
July Patient Surveys	<u>qLab Site</u>				
:: Schedules					
<ul> <li><u>Vacation Calendar</u></li> <li><u>Holiday Rotations</u></li> <li>Staff Meetings: <u>2018</u> 2019</li> </ul>	Administrators: <u>Upload Holiday Schedule</u> <u>Upload Staff Meeting Schedule</u>				
:: Newsletters					
Newsletters <ul> <li>August, 2018</li> <li>September, 2018</li> </ul>	Administrators: <u>Upload newsletter</u>				
:: QA & PM PM Dashboard					

October 2018 Radical Views / 5

#### Congratulations 4th yr resient Geunwon Kim, MD, PhD

In addition to being awarded the Resident Research Grant for her study: "Development and Validation of MRI-based Quantitative Fat and Fluid Volumetrics for Lymphedema Staging and Guidance of Liposuction and Lymphatic Reconstruction in Upper and Lower Extremities" which will be presented at this year's 2018 RSNA –



Geunwon has also been selected by RadioGraphics' RSNA Resident and Fellow subcommittee to join the RadioGraphics' Breast Imaging panel for the RSNA 2018 annual meeting. This was a competitive process and this was given in recognition of her achievements in radiology. The panel review process involves a commitment to review RSNA education exhibits and to attend the RSNA 2018 panel review meeting for Breast Imaging in November.

### RadioGraphics

Dear Dr. Slanetz, Thank you for supporting my application! I'll have to bring whole family to Chicago again! Geunwon

#### Residency Program's Apple Picking Event, September 29, 2018:

Yes! The weather was perfect and we had a group of residents, attendings, families, and children! We picked a variety of apples, Asian pears, peaches, and plums. The peaches seemed to be the favorite, with the bouncy house coming in as a close second. We all gathered on the Belkin Farm Train to enjoy our pickings and explore the orchards. Overall, it was a great team building experience!

- Chris Maxwell Chief Resident for Education





#### MEET OUR TRANSPORTER: Estegenet "Etse" Asamenew



Our Radiology Transport staff keep our patients safe and moving so we can provide timely care, but do you know them?

Fritz Honore Supervisor, DX Transporters Here is a chance to get to know a little bit more about our transporters.

Meet our Transporter, Etsegenet "Etse" Asamenew

#### How long have your been at BIDMC?

12 years! I started in EVS and worked for 4 years at the East Campus in L&D, NICU and Maternity. 8 years ago I joined the Radiology Transport staff.

What do you like about your job? My co-workers, and patients. I care for my patients.

#### Where are you from?

Ethiopia. I arrived in 2002. I won a lottery to come here. I have a lot of cousins in the US who talked to me about here, so I wanted to come. I planned to go to school, and I've taken a few classes (English language) but I haven't finished. I have my family to care for.

#### Who is in your family?

My husband and mother are here. Also one brother in Cambridge. Back in Ethiopia is a sister and brother.

What do you like to do when you're not working? Cook, but when my mother is here she does the cooking. Back in my country women stay home to clean and cook, so she's a good cook. When she is here I get lazy, but I eat well!

#### What's your favorite food?

An Ethiopian chicken cooked in spices "Dor Wat". It is a dish in my country made for a special meal. I love it.

I also like Injera bread dishes. It is a flat bread you eat with different vegetables, raw meat, and chickpeas. You break off a piece of bread and use it like a spoon to eat. In my country you eat with your hands, but here I use a fork.

#### What else do you do when not at work?

I like to watch Ethiopian movies, and romantic movies. Some of my favorites are: Dana, Zemen, Mogachoch.

Oh, I love the tv show "Friends" I love it! They make me laugh! I would like to travel to other states. I've been to NYC, Washington DC, and Seattle WA. I would like to see Texas or go to Las Vegas!

What do you want people to know about you? I like to make people smile!









October 2018 Radical Views / 7

#### **Purpose:**

The BIH Radiology Foundation Pilot Research Minigrants are designed to enable departmental investigators to gain experience in defining objectives and testing hypotheses in preparation for external grant applications and/or manuscript submissions. These awards are intended to support preliminary or pilot phase scientific projects, and are not intended to supplement major funding that has already been secured.

**Amount:** One-year grant of up to \$15,000.

#### **Eligibility Requirements:**

Awards are restricted to full-time faculty, part-time faculty, fellows, residents and research staff employed by the Department of Radiology only. Applicants at the level of Assistant Professor or below require co-signature on the application by a departmental mentor, and early involvement of the mentor in the proposal development is strongly encouraged.

#### **Nature of Projects:**

Any area of basic, clinical, or translational research related to radiology is eligible to apply for support.

#### **Submission Procedures and Deadlines:**

Submissions are reviewed in two annual cycles.

- Submissions received by May 18, 2018 will be considered for funding beginning July 15, 2018.
- Off-cycle applications will be considered based on availability of funds. Up to \$90,000 will be awarded by this program each academic year. Proposals (hardcopy or electronic) should be submitted electronically to Mary Addonizio at maddoniz@bidmc.harvard.edu

#### **Proposal Format:**

The application should consist of two narrative single-spaced pages that include: Specific Aims, Background & Significance, Preliminary Studies (if any), a brief Design and Methods section, a timeline, and a section describing how this grant will lead to preparation of an external grant application and/ or submission of a high-impact manuscript. A separate Budget page with justification must also be submitted. Please note that these grants are not intended for salary support of the applicant or co-investigators, or to cover statistical support.

#### **Questions:**

Please contact Mary Addonizio (maddoniz@bidmc.harvard.edu) if you

have any questions about the application process. For questions about appropriate science, methods or research emphasis, please contact any member of the **Research Steering Committee**.



Mary Addonizio, MBA Radiology Research Program Manager 7-2975 • Ansin-240

#### **Review Process:**

All complete applications will be peer-reviewed by **Research Steering Committee** faculty: Drs. Jonathan Kruskal, Leo Tsai, Muneeb Ahmed, and Alexander Bankier. External ad hoc reviewers may be sought for applications with methods outside the committee members' expertise.

#### **Review Criteria:**

Submitted proposals will be reviewed for their intrinsic merit, synergies with other activities and priorities of the Department, and the likelihood that funding will have a positive impact on completion of the research project. Because these grants are intended for pilot studies, investigators who already have externally funded research projects must clearly indicate why these funds are necessary.

#### **Reports and Presentations:**

Award recipients must present a one-page written report to the Departmental Research Committee within 30 days of project completion. This report should include a section indicating any future plans for the research. In addition, reports should include an appendix with any reprints or preprints of manuscripts, or any request for external funding (i.e., NIH or RSNA submissions) resulting from the study. Please submit the report to Mary Addonizio (see above).

This month we have mounted a list of the **Upcoming Annual Scientific Meetings** (see page 8) which will be updated as new information becomes available.



\*Please contact Medical Editor Donna Wolfe as soon as possible if you would like any assistance in creating/editing your presentations. Also, see our other research resources on pg 9.

Upcoming Annual Scienfic Meetings	Conference Date	Abstract Deadline	
AAPM - American Association of Physicists in Medicine	July 14-18, 2019	ТВА	
ARRS - American Roentgen Ray Society	May 5-10, 2019	August 30, 2018, 5pm ET	
ACNM - American College of Nuclear Medicine	Jan 17-19, 2019	Nov. 7, 2018	
ACR - American College of Radiology (Quality & Safety Conference)	Oct 26-28, 2018	Closed	
ACR - American College of Radiology (Leadership Conference)	May 18-22, 2019	ТВА	
AIUM - The American Institute of Ultrasound in Medicine	Apr 6-10, 2019	Oct. 2, 2018, 8 pm ET	
ASER - American Society of Emergency Radiology	Sept 26-29, 2018	Closed	
ASFNR - American Society of Functional Neuroradiology	Oct. 15-17, 2018	Closed	
ASHNR - American Society of Head & Neck Radiology	Sept. 26-30, 2018	Closed	
ASNR - American Society of Neuroradiology (Boston)	May 18-23, 2019	Nov. 7, 20018, 5pm PT	
AUR - Association of University Radiologists	Apr 9-12, 2019	Sept. 26, 2018	
SBI/ACR - Society of Breast Imaging	Apr 4-7, 2019	12-Nov-18	
ECR/ESR - European Society of Radiology	Feb 27-Mar 3, 2019	October 10, 2018	
ENRS - The Eastern Neurological Radiology Society	ТВА	ТВА	
ESGAR - European Society of Gastrointestinal and Abdominal Radiology	June 5-8, 2019	January 15, 2019	
ESTI - European Society of Thoracic Imaging / Fleischner Joint Meeting	May 9-11, 2019	Jan 2019	
HSPI - Healthcare Systems Process Improvement	Feb 20-22, 2019	Opens September 29, 2018	
ISCT - International Society for Computed Tomography	Sept 14-16, 2018	Closed	
ISMRM - International Society for Magnetic Resonance in Medicine	May 11-16, 2019	Nov. 7, 2018	
ISS - International Skeletal Society	Sept 26-28, 2018	Closed	
NASCI - North American Society for Cardiovascular Imaging	Sept 22-25, 2018	Closed	
RSNA - Radiological Society of North America	Nov 25-30, 2018	Closed	
SAR - Society of Abdominal Radiology	Mar 17-22, 2019	General Paper/poster Oct. 2, 2018 Power Science Dec. 5, 2018	
SCBTMR - Society of Computed Body Tomography	Oct 6-10, 2018	Closed	
SCMR - Society for Cardiovascular Magnetic Resonance	Feb 6-9, 2019	Sept. 18, 2018 11:59 pm EDT	
SFN - Society for Neuroscience	Nov 3-17, 2018	Closed	
SIIM - Society for Imaging Information in Medicine	June 26-28, 2019	Dec. 14, 2018	
SIR - Society of Interventional Radiology	Mar 23-28, 2019	Sept. 27. 2018	
SNIS - Society of Neurointerventional Surgery	July 22-25, 2019	ТВА	
SNMMI - Society of Nuclear Medicine and Molecular Imaging	June 22-25, 2019	ТВА	
SRU - Society of Radiologists in Ultrasound	Oct 5-7, 2018	Closed	
SSR - Society of Skeletal Radiology	Mar 10-13, 2019	Closed	
STR - Society of Thoracic Imaging	Mar 24-27, 2019	October 15, 2018	

#### **RESEARCH RESOURCES**



**Zheng Zhang, PhD** - Assistant Professor in Biostatistics at Brown University is available to BIDMC investigators to help support statistical design needs for research proposals for immediate

or future grant applications.

Please be sure to forward any requests/proposals to use Dr. Zhang's statistical consulting services to Mary Addonizio, Radiology Research Program Manager, at maddoniz@bidmc.harvard.edu

#### **Radiology Research Assistance**

If you are interested in submitting an application for either internal/external research funding or hiring a student, fellow, or other, please contact **Bridget Russo** for assistance.



#### Bridget Russo

Research Administrator Ansin 249 / P: 617-667-7427 bkrusso@bidmc.harvard.edu







## For all those who use or would like to use the services of our inhouse statistician **Alexander Brook, PhD**:

Please involve him in the design of your project as soon as feasible. Allow at least 2 weeks between giving him a reasonably complete

data set and receiving a first substantial report from him. If a short deadline cannot be avoided, please give him a heads-up as early as you are aware of the situation, but at least a month in advance, to allow him to plan his other obligations accordingly.

His services can be booked through this link which contains appointment listings and other information to request work: https://abrook.youcanbook.me/

		Department	of Radiology Research	
Announce Researce (including with ema now avai Inforadio Staff Post Radiolog Trainee & Posters, t be contir updated	ing the new h Staff Roster g current Fellow il hyperlinks) lable on logy under ters. Like y Staff, a Technologist his will huously as needed. rael Deaconess il Center		<image/> <complex-block><table-row><table-row><table-row><table-row><table-row><image/><image/><image/></table-row></table-row></table-row></table-row></table-row></complex-block>	Y War
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	Residents & Fellows	CT Techs	Community	
	Administrations	Dx Techs	Chestnut Hill Community	
	Informatics	IR/INR Techs	Lexington Community	
	Nursing	MRI Techs	Needham Community	
	Support Services	Nuc Techs	Research	
	Image Archives	US/VASC Techs		
	Please contact Michael Lar	son (mlarson1@bidmc.ha	vard.edu) for poster updates	

Log in to the portal: https://inforad.bidmc.harvard.edu/Logon.asp Click on Staff Posters

#### Opinion

#### VIEWPOINT

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Robert J. McDonald, MD, PhD

Division of Neuroradiology, Department of Radiology, Mayo Clinic, Rochester, Minnesota.

Herbert Y. Kressel, MD Department of Radiology, Beth Israel Deaconess Medical Center, Boston, Massachusetts.

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jama.com

#### Gadolinium Retention After Contrast-Enhanced MRI

Gadolinium-based contrast agents (GBCAs) revolutionized magnetic resonance imaging (MRI) examinations by depiction of pathology otherwise undetectable on unenhanced MRI or other imaging modalities. Since initial regulatory approval in 1988, it is estimated that more than 450 million GBCA doses have been administered worldwide. In the United States, it is estimated that approximately 8.8 million MRI procedures involving gadolinium administration were performed in 2016.1 GBCAs have excellent safety profiles with rates of acute adverse reactions (0.07%-2.4%) substantially lower than adverse events observed with iodinated contrast material used during computed tomography or angiography. Most reactions are mild, including injection site pain, headache, nausea, paresthesias, and dizziness. Anaphylactic reactions are rare (0.001%-0.01%).

GBCAs contain the rare earth metal gadolinium chelated to linear or macrocyclic organic ligands that provide a means of safely administering and excreting an otherwise toxic element. GBCA chelates were initially thought to remain largely intact, with most agents being excreted renally and some excreted hepatically. These assumptions were challenged in the late 1990s with the discovery of nephrogenic systemic fibrosis (NSF), a rare condition among patients exposed to GBCAs with severely compromised kidney function, in which patients demonstrate progressive accumulation of gadolinium in skin tissues over time, even in the absence of additional GBCA exposure, suggesting mobilization from tissue reservoirs such as bone.<sup>2</sup> Although the mechanism is incompletely understood, GBCA dechelation (dissociation of the gadolinium from the organic ligand) is thought to play a central role in this disease.

In 2006 the US Food and Drug Administration (FDA) alerted the public about cases of NSF and in 2007 a boxed warning about GBCA was added to product labeling. In 2010 additional details were added regarding screening for acute and chronic kidney disease prior to contrast-enhanced MRI, with particular mention of avoidance of agents associated with greater risk of development of NSF, including Magnevist, Omniscan, and Optimark.<sup>3</sup> Since these changes in practice were implemented new instances of NSF have almost completely been eliminated.

In 2014 a positive correlation was observed among 381 patients undergoing MRI between cumulative GBCA exposure and T1 signal intensity in the dentate nucleus and globus pallidus.<sup>4</sup> Subsequent postmortem studies using inductively coupled plasma mass spectrometry in13 patients exposed to 4 or more GBCA examinations confirmed the presence of retained gadolinium in all patients, compared with no gadolinium in 10 patients without such exposure.<sup>5</sup> It is now recognized that gadolinium is retained in minute amounts throughout the brain parenchyma after contrast-enhanced MR examinations, even in areas without T1 signal intensity changes. In addition, gadolinium has been detected following single-dose intravenous administration of linear and macrocyclic agents.<sup>6</sup> The extent of gadolinium retention correlates with cumulative GBCA dose and GBCA chelate stability/lability, although the chemical forms being retained may differ between the GBCA subclasses.

It is unclear if the tiny amounts of retained gadolinium cause adverse clinical sequelae. In a populationbased study of 246 557 patients, of whom 99 739 (40.5%) received at least 1 dose of gadolinium, rates of parkinsonism were 1.16% among those with noncontrast MRI and 1.17% among those with at least 1 dose of gadolinium, with no significant difference in the rates after adjusting for confounders.<sup>7</sup> However, in 2017 the Medical Imaging Drugs Advisory Committee (MIDAC) of the FDA reported on 132 patients with a variety of clinical manifestations after GBCA exposure, including joint and cognitive symptoms, some of which overlap with symptoms previously reported by patients with NSF.<sup>1</sup>Because these symptoms are relatively acute in onset,<sup>1</sup> often beginning shortly after a single GBCA exposure, the causal association has been questioned because these joint and cognitive symptoms manifested before gadolinium retention would be expected to occur.

In December 2017 the FDA issued a safety communication about GBCA as part of its postmarket monitoring of drug safety, requiring a class-wide warning about gadolinium retention in the labeling of these agents, and additional studies by manufacturers to assess the safety of these agents.<sup>1</sup> At the request of the FDA, the 4 GBCA manufacturers in the United States coauthored a "Dear Health Care Provider" letter in May 2018 to alert prescribers that gadolinium from GBCA may remain in the body for months to years after injection.<sup>8</sup> This letter summarized research findings that retention is highest with linear agents and lowest and similar among the macrocyclic GBCAs. The letter also clarified that neither pathologic nor clinical consequences of GBCA retention in the brain have been proven.<sup>8</sup>

To educate patients, the FDA and the GBCA manufacturers developed a medication guide specific to each GBCA that would be distributed to patients prior to an MRI with GBCA. These guides inform patients that minute amounts of gadolinium are retained, greater retention occurs more with gadolinium chelated to linear ligands, and despite some rare reports, so far no harmful effect has been identified.

#### Limitations of Prior Research on GBCA Retention

Although GBCAs have been in clinical use for more than 30 years, knowledge of their effects on humans is limited. First, animal studies oversimplify the understanding of GBCA pharmacokinetics and biodistribution. In mice, more than 99% of GBCA is excreted primarily through the urinary tract within 24 hours. In humans, however, 73% to 99% of GBCA is excreted within 24 hours, varying with the specific GBCA; this small unexcreted fraction in humans can be retained in multiple tissues including bone, skin, and brain. Second, the in vivo tissue distribution, trafficking between tissues, and chemical identity of these retained gadolinium species remain poorly understood. Third and most important, data on the biological activity and toxicologic potential of these retained gadolinium forms also are limited.

Of particular concern is the need to understand the effects of gadolinium retention in potentially vulnerable populations including (1) patients who undergo frequent MRI examinations with GBCA; (2) fetuses and children exposed to GBCA; and (3) patients with high bone turnover such as those with osteoporosis or renal osteodystrophy who may be at risk due to the storage of gadolinium within bone parenchyma.

Current evidence does not suggest a strong association between GBCA exposure and adverse clinical sequelae. However, existing data largely originate from retrospective sources that were not intended nor sufficiently powered to study subtle or rare clinical effects of gadolinium exposure. Informatics techniques utilizing preexisting clinical databases may identify currently unknown risk factors for gadolinium retention and allow creation of targeted registries incorporating prospective standardized assessment of neurocognition and symptoms. Ongoing studies that assess the normal aging process or even cancer screening protocols such as those for prostate cancer or breast cancer might provide useful data. Institutes of Health (NIH) convened at the NIH campus to discuss knowledge gaps surrounding gadolinium retention and to promote collaborations and support future funding opportunities for such research.<sup>9</sup> Attendees included researchers, experts from industry, and representatives of the FDA. Based on the expert consensus of this group, a prioritized roadmap for future research efforts was generated to better understand the clinical importance of gadolinium retention for patients receiving these contrast agents.<sup>9</sup>

#### Conclusions

Contrast-enhanced MR examinations are a crucial part of the imaging armamentarium for diagnosis and follow-up of many disease processes. As with all imaging examinations, the risks of the test must be weighed against the need for diagnosis and appropriate management. The benefits of contrast-enhanced MR are widely recognized; thus, it is essential to better understand the potential risks.

Collaborative research efforts are needed to address the gaps in knowledge related to the potential adverse effects of gadolinium. Such efforts will help quantify the risk-benefit ratio for GBCAs and determine what clinical risks, if any, are associated with chronic gadolinium exposure in human tissues. As it is likely that the low frequency of adverse effects will challenge the ability to appropriately power prospective studies, the research roadmap developed at the workshop is intended to encourage relevant funding agencies around the world to support and facilitate meaningful large-scale collaborative research efforts that can provide answers to the many questions regarding the clinical importance of gadolinium retention.

#### Research Roadmap Workshop

In February 2018 a meeting cosponsored by the American College of Radiology, Radiological Society of North America, and National

#### **ARTICLE INFORMATION**

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Conflict of Interest Disclosures: All authors have completed and submitted the ICMJE Form for Disclosure of Potential Conflicts of Interest. Dr Levine reported serving as expert witness in a trial regarding the Essure device (Bayer Healthcare). Dr McDonald reported receiving an investigatorinitiated grant and serving as a consultant to GE Healthcare regarding contrast agent development and safety, with all funds going to Mayo Clinic; serving as a consultant to Bracco Diagnostics regarding contrast agent safety, with all funds going to Mayo Clinic; and receiving indirect financial support from Bayer AG in the form of a scholar grant, with all funds going to RSNA. Dr Kressel reported receiving compensation for serving as director of science and communication from the International Society for Strategic Studies in Radiology; and receiving compensation from RSNA for serving as the editor of Radiology, 2008-2017.

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**ORIGINAL RESEARCH • SPECIAL REPORT** 

# **Gadolinium Retention:** A Research Roadmap from the 2018 NIH/ACR/RSNA Workshop on Gadolinium Chelates

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Conflicts of interest are listed at the end of this article.

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Gadolinium-based contrast agents (GBCAs) have revolutionized MRI, enabling physicians to obtain crucial life-saving medical information that often cannot be obtained with other imaging modalities. Since initial approval in 1988, over 450 million intravenous GBCA doses have been administered worldwide, with an extremely favorable pharmacologic safety profile; however, recent information has raised new concerns over the safety of GBCAs. Mounting evidence has shown there is long-term retention of gadolinium in human tissues. Further, a small subset of patients have attributed a constellation of symptoms to GBCA exposure, although the association of these symptoms with GBCA administration or gadolinium retention has not been proven by scientific investigation. Despite evidence that macrocyclic GBCAs show less gadolinium retention than linear GBCAs, the safety implications of gadolinium retention are unknown. The mechanism and chemical forms of gadolinium retention, as well as the biologic activity and clinical importance of these retained gadolinium species, remain poorly understood and underscore the need for additional research. In February 2018, an international meeting was held in Bethesda, Md, at the National Institutes of Health to discuss the current literature and knowledge gaps about gadolinium retention, to prioritize future research initiatives to better understand this phenomenon, and to foster collaborative standardized studies. The greatest priorities are to determine (*a*) if gadolinium retention adversely affects the function of human tissues, (*b*) if retention is causally associated with short- or long-term clinical manifestations of disease, and (*c*) if vulnerable populations, such as children, are at greater risk for experiencing clinical disease. The purpose of the research roadmap is to highlight important information that is not known and to identify and prioritize needed research.

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BIDMC

## Radiology Residents & Fellows MRI Physics Course



National High Magnetic Field Laboratory

2018-2019 Academic Year

#### Purpose:

To provide fellows and residents with a basic understanding of MR physics, with emphasis on practical aspects of image acquisition such as protocol optimization and troubleshooting. A brief overview of fundamentals of nuclear magnetic resonance will provide an introduction to sources of image contrast in MRI. Techniques for image acquisition will be described, followed by an overview of the major families of MR pulse sequences. Topics such as accelerated imaging, fMRI, and diffusion tensor imaging will be discussed.

#### Format:

All sessions will be held on Tuesdays, 5-6 pm at the MRI Learning Lab, Ansin 220, starting July 31<sup>st</sup>.

#### Text and Topics:

The recommended textbook is *"MRI in Practice,"* 4th Edition (2011) by Catherine Westbrook. Supplementary reading from review articles will be recommended for advanced topics.

For more information, contact: Aaron Grant, PhD: 7-3265



## TOPICS

8.

- July 31: The origin of the NMR signal. Nuclear magnetism. Nutation, precession, signal reception. Chemical shift. Relaxation, T1, T2. Spin dephasing, impact of gradients and magnetic field inhomogeneities.
- 2. **August 7:** Sources of contrast in MRI: T1 and T2 weighting, magnetization transfer, diffusion.
- 3. **August 14:** Overview of MR hardware. Image formation part 1. Slice selection, frequency and phase encoding.
- 4. **August 21:** No Lecture.
- 5. **August 28:** Image formation part 2. Basic k-space concepts. Accelerated imaging methods.
- 6. September 4: No Lecture.
- 7. September 11: Signal-to-Noise: Image parameters that govern SNR. Trade-offs in image optimization.



- 9. **September 25:** Effects of flow and diffusion. Flow compensation, time-of-flight, phase contrast, intro to diffusion.
- October 2: Contrast-enhanced MRI. Types of magnetic materials. Relaxivity and image contrast as a function of dose, TR, TE. Dynamic contrast enhanced imaging, angiography. BOLD effect, fMRI.
- 11. **October 9:** Accelerated imaging. Parallel imaging and compressed sensing.
- 12. **October 16:** Diffusion-weighted imaging and DTI in neuro applications.
- 13. **October 23:** Arterial spin labeling in the brain and body.
- 14. October 30: Artifacts and troubleshooting.

![](_page_13_Picture_29.jpeg)

**2018 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 1) Epub dates are included only in publications where the Epub and paper publication dates occur in different years, i.e., Epub in 2017 and paper publication in 2018; and 2) doi addresses are only included until citations are updated with print citations; and 3) <u>Underlined names</u> = relatively current trainees/alumni; **BOLD** names = Faculty/Staff

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Zhou W, Baughman BD, **Soman S**, Wintermark M, Lazzeroni LC, Hitchner E, Bhat J, Rosen A. Volume of subclinical embolic infarct correlates to long-term cognitive changes after carotid revascularization. J Vasc Surg. doi: 10.1016/j. jvs.2016.09.057. Epub 2016 Dec 23. PMID: 28024850.

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