

Radical Views... from the Department of Radiology

Volume 5, Number 5
DECEMBER 2012



Beth Israel Deaconess
Medical Center

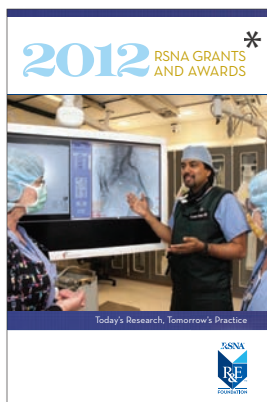


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Harvard Medical School



FROM THE CHIEF

Jonathan B. Kruskal, MD PhD



Priscilla J. Slanetz, MD MPH, & Ronald Eisenberg, MD JD
- RSNA Education Scholar Grant

Muneeb Ahmed, MD
- Silver Anniversary Campaign Pacesetters Research Seed Grant

Leo L. Tsai, MD PhD MSc - Bracco Diagnostics/RSNA Research Resident Grant

Olga R. Brook, MD
- RSNA Trainee Research Prize

ACRONYMS: FYI

➤ RSNA

In addition to our 4 RSNA Research & Education Foundation Awards*, BIDMC Radiology acquitted itself well at the 98th Annual meeting of the Radiological Society of North America in Chicago this year with department members presenting 32 talks and 32 posters, Moderating 10 sessions, and serving as faculty on 12 Refresher Courses. This year's RSNA was particularly successful for our Cardiothoracic Imaging section. Please see pg 4 for details!

➤ Personalizing DDP's in PACS

Recently, I wrote to PACS genius Phil Purvis about how some of us (i.e., me) have no clue how to set our own DDP's (personalized DDP's) on PACS such that they remain and work. As the entire body reading room tried to do this week and failed, I think this is a great opportunity for improving workflow! After speaking with Phil, who agreed with me that this task requires a bit of training, we decided that he would put something together for us and set up meetings and training sessions. So help is on the way!!

➤ M*MODAL: Rolling our Front End Speech Recognition

Speaking of the need for new training, please see page 10 for a welcome and in-depth Introduction of the new Front End Speech Recognition system from our Director of IT Radiology, Dr. Jesse Wei.

➤ Harvard Professors at BIDMC Radiology:



Nov. 13, 2012: Recommencing an old tradition of a black tie event at the Harvard Club to celebrate the appointment of any new professor in our Department. With the recent promotions of Alex Bankier, Ron Eisenberg and Dave Alsop, it was time to have a major celebration! This is an extremely impressive group and it was my pleasure spending the time with all of you. - Jonny

Radiology Calendar December 2012

Mon	Tues	Wed	Thurs	Fri
3 Weekly Mon Section Meetings: 3:00-4:00 ED section meeting (monthly) [ED annex, WCC] call Trish Gardner 4-2506 7:30 - 8:15 MSK - TBA (Jim Wu) 8:15 - 9:00 Guest Lecture & Case Conference (Dr. Wing Chan, Dean, Taipei Medical University) 12:00 - 1:00 Mentoring Meeting #5: HMS Promotions & Your CV (Debbie Levine) [TCC 484]	4 7:30 - 9:00 Adult Education (Program Directors)	5 Weekly Wed Section Meetings: 11:00-12:00 MSK clinical conf 12:00-1:00 CardioThoracic, GI/GU Oncology 3:00-4:00 Mammo [TCC-484] 7:30 - 8:15 Endocrine interventions (Barry Sacks) 8:15 - 9:00 Lymphangiography/case conference (Barry Sacks)	6 Weekly Thurs Section Meetings: 12:00 - 1:30 Abd [WCC-354] 12:00-1:00 MSK 7:30 - 8:15 Congenital Spine (Alice Fisher) 8:15-9:00 Congenital Brain (Peri) 2:00-3:00 West MedRads - Body Senior [TCC 484]	7 12:00-1:00 Chiefs' Rounds [Sherman Auditorium]
10 7:30 - 8:15 Thyroid Imaging (Tony Parker) 8:15-9:00 Thyroid therapy (Tony Parker) 1:00-2:00 Body MRI meeting [Ansin 2]	11 7:30 - 8:15 Brain imaging (Kevin Donohoe) 8:15-9:00 Tagged RBC/GI Imaging (Donohoe) 10:30-11:30 NMMI meeting [GZ-103]	12 7:30 - 8:15 Non-thyroid therapy (Tony Parker) 8:15-9:00 PET/CT (Tony Parker) 7:15 - 8:00 US meeting (WCC-304A Gallery) 5:00-6:00 Best in Practice: MRI Research at BIDMC: An Overview for MR Techs (David Alsop) [TCC-10]	13 7:30 - 8:15 Cardiac SPECT (Thomas Hauser) 8:15-9:00 Cardiac PET (Thomas Hauser)	14 12:00-1:00 Grand Rounds: Imaging Young Patients with Inflammatory Bowel Disease (Michael S. Gee, MGH) [Sherman Auditorium]
17 7:30 - 8:15 Fellow Presentation (Som Mai Lè) 8:15-9:00 Cases (Som Mai Lè)	18 7:30 - 8:15 ICU-Maladies (Paul Spirn) 8:15-9:00 Radiology of the Aorta - II (Diana Litmanovitch) 8:00-9:00 IR Meeting [West Recovery]	19 7:30 - 8:15 Endovenous ablation (Felipe Collares) 8:15 - 9:00 Endovascular management of PE/DVT (Salomao Faintuch)	20 7:30 - 8:15 Sella (Bhadelia) 8:15 - 9:00 Pineal region (Bhadelia) 1:30-2:00 East MedRads - Nukes Senior [TCC 484] 2:00-3:00 West MedRads - Body Senior [TCC 484]	21 No Grand Rounds
24 7:30 - 8:00 No conference 8 am start	25 Christmas 10:30-11:30 No NMMI meeting [GZ-103]	26 7:30 - 8:00 No conference 8 am start	27 7:30 - 8:00 No conference 8 am start 1:30-2:00 East MedRads - Nukes Senior [TCC 484]	28 No Grand Rounds
31 7:30 - 8:00 No conference 8 am start				

Don't miss the monthly mentoring meeting:
HMS Promotions & Your CV
Monday Dec 3
12:00-1:00 pm

*Consult the webpage for the most up-to-date schedule:

<http://home.caregroup.org/departments/radiology/residency/scheduling/conferences/displayMonthNew.asp>

DEPARTMENTAL Grand Rounds

Friday, December 14, 2012

12 noon - 1:00 PM • Sherman Auditorium



Imaging Young Patients with Inflammatory Bowel Disease

Michael S. Gee, MD PhD - Associate Program Director in Radiology, Massachusetts General Hospital; Assistant Professor of Radiology, Harvard Medical School.

Dr. Gee earned his MD in Medicine and PhD in Cell and Molecular Biology at the University of Pennsylvania School of Medicine in Philadelphia in 2003. Coming to Boston for post graduate training, he interned in General Surgery at Boston Medical Center and went on complete residency training in Diagnostic Radiology which included a clinical focused year in abdominal imaging, interventional radiology and pediatric radiology at Massachusetts General Hospital. Following completion of a fellowship in Pediatric Radiology also at MGH, Dr. Gee joined the faculty as an Assistant Radiologist

in 2009. In 2011, he was promoted to his current rank of Assistant Professor of Radiology at Harvard Medical School. Dr. Gee specializes in abdominal imaging and interventional radiology in pediatric patients and has been active in the development of a pediatric PET-MRI program as well as the teaching of case-based learning sessions in pediatric radiology at the HMS CME level. We are honored to have Dr. Gee presenting at Grand Rounds on Dec. 14. His most recent publications and presentations of his topic include:

Gee MS, Nimkin K, Hsu M, Israel EJ, Biller JA, Katz AJ, Mino-Kenudson M, and Harisinghani MG. Prospective Evaluation of MR Enterography as the Primary Imaging Modality for Pediatric Crohn Disease Assessment. *AJR Am J Roentgenol* 2011; 197:224-231.

Gee MS, Quencer KB, Mino-Kenudson M, Harisinghani M, and Nimkin K. Comparison of MR-E and CT-E for assessment of active inflammation and fibrosis in pediatric Crohn's disease. Scientific paper presented at the 2012 Society for Gastrointestinal Radiology meeting, Scottsdale, AZ.

Learning Objectives for Participants: To be able to: 1) understand different IBD imaging modalities and their strengths and weaknesses; 2) understand unique issues related to ionizing radiation exposure to young patients from imaging studies; 3) review the spectrum of inflammatory bowel disease.

DEPARTMENTAL NEWS, AWARDS & HONORS:

RSNA 2012 Scrapbook



Above: Women's Imaging AND CHIEF Fellow **Olga Brook** stands with her fellow Trainee Research Prize winners at RSNA Chicago 2012! Right: **Muneeb Ahmed**, Research Seed prize Winner also had the honor of being on the cover of the RSNA Grants and Awards Guide!

2012 RSNA GRANTS AND AWARDS



Today's Research, Tomorrow's Practice



RSNA 2012 Scrapbook

This year's RSNA was particularly successful for our Cardiothoracic Imaging section. At the conference, we were represented with 4 Refresher Courses, 4 Scientific Presentations, 4 Electronic Posters, 1 Print Poster, and 1 Session Moderation.

In addition, our contributions have received a series of awards:



RG Magna Cum Laude Award + Invitation to submit to RadioGraphics

Litmanovich D, Boiselle PM, Eisenberg RL, Kulkarni N, Nemec SF, Bankier AA
Dose Reduction in Cardiothoracic CT: A Survival Guide (e-poster)



Certificate of Merits (3)

Litmanovich D, Boiselle PM, Eisenberg RL, Nemec SF, Kulkarni N, Bankier AA
"Two-in-one": Safety Considerations for Cardiopulmonary Imaging in Pregnancy (e-poster)

Litmanovich D, Hagberg RC, Burke D, Boiselle PM, Bankier AA, Popma J, Raheem SZ

The Role of Imaging in Transcatheter Aortic Valve Implantation (TAVI): What the Radiologist Needs to Know (e-poster)

Kulkarni N, Petkovska I, Nemec SF, Litmanovich D, Boiselle PM, Bankier AA

To be or not to be ... a Pulmonary Nodule (print poster)

RG **Invitation for submission to RadioGraphics**
Kulkarni N, O'Donnell DH, Boiselle PM, Yildirim A, Ridge CA, Litmanovich D, Bankier AA
Pulmonary Fissures and Their Importance for Novel Respiratory Treatments - An Interactive MDCT Teaching Atlas (e-poster)

Congratulations to all authors and co-authors! Thank you for all the hard work. Finally, I would like to thank all those who stayed home reporting and who have given valuable input along the way, without necessarily being present on the authorship lists – it is your success, too.

Thank you again,
Alex Bankier, Chief, Cardiothoracic Imaging



Beth Israel Deaconess Medical Center

Harvard Medical School

Dose reduction in cardiothoracic CT: a survival guide

DE Litmanovich, MD, Boston, MA; PM Boiselle, MD; RL Eisenberg, MD, JD; N Kulkarni, MD; SF Nemec, MD; A A Bankier, MD (dlitmano@bidmc.harvard.edu)

To be or Not to be... a "Pulmonary Nodule"

Naveen M Kulkarni, MD • Iva Petkovska, MD • Stefan F Nemec, MD • Diana E Litmanovich, MD • Philip M Boiselle, MD • Alexander A Bankier, MD
Beth Israel Deaconess Medical Center • Harvard Medical School, Boston, MA

INTRODUCTION

The current nomenclature for thoracic CT provides a stringent definition of the term "pulmonary nodule". However, in clinical reporting, radiologists can find this definition difficult to apply, which generally results in inconsistent categorization of lesions as "pulmonary nodules". If a lesion is misclassified as a pulmonary nodule, the patient may receive subsequent diagnostic follow-up that may not be warranted. This may result in additional CT examinations, increased patient radiation, patient anxiety, and increased healthcare costs.

The purpose of this article is to provide:

- An analysis of the morphological descriptors for the term "pulmonary nodule" in the current nomenclature for thoracic CT.
- Examples illustrating the accurate use of these morphological descriptors.
- Examples illustrating the inaccurate use of these morphological descriptors, with explanations of why the term does not apply to these lesions.
- Proposed list of alternative descriptors for rounded lesions in the lung.

"This is related to increased scanner resolution, resulting in a substantially larger number of lung lesions being detected than in a substantially lower resolution scan. Knowledge of these lesions is important given that different terms applied to lung lesions can result in very different clinical and radiological follow-up decisions."

TAKE HOME POINTS

- A stringent definition for the term pulmonary nodule is available.
- Only lesions consistent with this definition should be called a pulmonary nodule.
- If available, alternative terminology should be applied to any lesion not consistent with the definition of "pulmonary nodule".

Part I: What is a pulmonary nodule?

According to the classic Fleischner Society Glossary of Terms for Thoracic Imaging (2006), a pulmonary nodule is defined as an **opacity which is relatively well-defined, roughly spherical, surrounded by low attenuation and measuring up to 3 cm in diameter**. The morphologic appearance of a nodule can be solid with homogeneous soft tissue attenuation, **ground glass** (i.e., non-solid nodules) or **part solid** (i.e., some solid consisting of both ground glass and solid soft tissue attenuation components).

Pulmonary nodules are among the most common incidental findings seen in clinical practice. In lung cancer screening trials, pulmonary nodules have been found to be frequently multiple, less than 10 mm (17%) and less than 5 mm (27%), and prevalent in up to 15% of low-dose CT. Although a stringent definition for the term pulmonary nodule exists, radiologists may find this definition hard to apply. This is mainly due to overlapping morphological features, the wide spectrum of these morphological features, and the lack of descriptors for small or uncommon rounded opacities in the lung.

Examples of commonly misnamed pulmonary lesions seen in peripheral or subpleural locations, in which do not conform to spherical or rounded shapes. Other examples include rounded lesions of less than 3 mm in diameter or rounded components of scars, as commonly seen in areas of lung fibrosis. Finally, the group of partly or fully cuffed lesions comprises this spectrum. Incidentally attributing the term pulmonary nodule to these lesions has two major implications. First, the patient is subjected to potentially unnecessary imaging follow-up, ignoring how to do additional studies and for the risk of subsequent invasive follow-up. Second, the term "nodule" might unnecessarily trigger the suspicion of malignancy.

Part II: What is not a pulmonary nodule?

By definition, any lesion that does not comply with the Fleischner Society Glossary of Terms for Thoracic Imaging should not be called a pulmonary nodule.

Examples of such lesions include:

- Triangular opacities
- Polyangular, wedge, fan or tubular opacities
- Fissural opacities
- Perforated opacities
- Pericardial or rounded calcifications
- Laminated or tubular calcifications
- Intrapulmonary lymph nodes

Intrapulmonary lymph nodes have a rounded shape but also display two other characteristics that help in differentiating them from pulmonary nodules: subpleural location and subtle linear connections to the pleural surface and/or interlobar structures. Common pulmonary lymph nodes can change in size on follow-up.

Features of an intrapulmonary lymph node:

- Size: Commonly 5–6 mm
- Location: Within 15 mm of pleural surface
- Shape: Half-moon or coffee bean
- Additional findings: Linear connection to pleural surface

Perforated nodule (PFN)

Perforated nodules are a common finding on CT scans. They are usually triangular or oval in shape and may demonstrate irregular connections. Most of them are stable in size, and if they grow, growth is usually slow. In one CT screening study performed in high-risk patients, Ahn et al reported that perforated nodules occur frequently and can show increased size on follow-up CT. This study found that none of the nodules developed nodular scars. This was confirmed by the Hong et al who observed that perforated nodules, even with growth rates in the range of malignant nodules, did not become malignant. This suggests that the natural potential of these lesions is benign. As a consequence, substantially longer CT follow-up intervals can be used. Hence, the correct naming of PFNs can reduce the number of follow-up examinations.

Subpleural nodules

Subpleural nodules are small CT lesions with a linear connection to the pleural surface.

Part III: How do we follow nodules?

Guidelines for follow-up of incidentally detected solid and sub-solid lung nodules are given below. In general, recommendations should be applied in the light of risk factors and clinical history. However, in the context of this presentation, it must be emphasized that these guidelines apply only to lesions that fulfill the morphological criteria for the pulmonary nodule. Note that none of the lesions described in Part II (if) should be followed using these recommendations.

Fleischner Society Guidelines: Recommendations for follow-up and management of small lung nodules detected incidentally*

Size	Low-risk, no additional findings	High-risk features
≤ 6 mm	Follow-up CT at 6–12 months	Follow-up CT at 3–6 months
7–9 mm	Follow-up CT at 3–6 months	Follow-up CT at 3 months
10–14 mm	Follow-up CT at 3 months	Follow-up CT at 3 months
≥ 15 mm	Follow-up CT at 3 months	Follow-up CT at 3 months

Recommendations for the Management of Subsolid Pulmonary Nodules Detected at CT: A Statement from the Fleischner Society*

Size	Low-risk, no additional findings	High-risk features
≤ 6 mm	Follow-up CT at 6–12 months	Follow-up CT at 3–6 months
7–9 mm	Follow-up CT at 3–6 months	Follow-up CT at 3 months
10–14 mm	Follow-up CT at 3 months	Follow-up CT at 3 months
≥ 15 mm	Follow-up CT at 3 months	Follow-up CT at 3 months

Alternative descriptors for rounded lesions in the lung

Lesion type	Alternative descriptors
Subsolid nodule	Ground glass opacity, less than 3 mm in diameter
Part solid nodule	Consolidation nodule, less than 3 mm in diameter
Perforated nodule	Consolidation nodule, less than 3 mm in diameter, typically seen in small groups
Subpleural nodule	Small opacity within 15 mm of the pleural surface and/or interlobar structures
Perforated nodule	Pulmonary opacity greater than 3 mm in diameter

How do we follow lung lesions which do not fulfill the definition of nodule?

- Currently there are no guidelines for follow-up of these lesions.

SUMMARY

- Stringent criteria exist for defining a pulmonary nodule. These criteria are sometimes difficult to apply in clinical practice due to overlapping morphological features, the wide spectrum of morphological features, and lack of descriptors for small or uncommon lesions.
- Incidentally describing lesions as "pulmonary nodules" can have serious consequences for the patient. Particularly, it can result in unnecessary follow-up imaging and increased radiation exposure. It can also patient anxiety and healthcare costs.
- Only structures consistent with the definition should be called "pulmonary nodules".
- The evidence-based management of rounded lung lesions should take into account the current terminology recommendations and should improve quality of care by correctly applying this terminology.

REFERENCES

- Hansell DM, Bankier AA, MacMahon H, McNeil CC, Müller H, Nishii Y, et al. Fleischner Society Guidelines for the Management of Incidentally Detected Small Lung Nodules. *Am J Respir Crit Care Med*. 2009;180(12):1292–1300.
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- Hong CH, Hong H, Huang CC, Wu YC, Chen YH, Wu CT. Intrapulmonary lymph nodes compared to pulmonary nodules on CT. *Am J Radiol*. 2004;183(4):1077–1081.
- Ahn H, Kim H, Lee H, et al. Perforated nodules seen on CT screening for lung cancer. *Radiology*. 2012;245(3):949–955.
- Bankier AA, Litmanovich D, Eisenberg RL, et al. Pulmonary nodules: a review. *Radiology*. 2012;245(3):949–955.
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- Bankier AA, Litmanovich D, Eisenberg RL, et al. Pulmonary nodules: a review. *Radiology*. 2012;245(3):949–955.
- Bankier AA, Litmanovich D, Eisenberg RL, et al. Pulmonary nodules: a review. *Radiology*. 2012;245(3):949–955.

DEC 2012 Radial Views /4

RSNA 2012 Scrapbook:

In addition to Cardiothoracic Imaging, efforts in Neuroradiology, MRI and MSK were also recognized with the following awards:

CM

Mary G. Hochman, Jim S. Wu
Department of Radiology
Beth Israel Deaconess Medical Center
Harvard Medical School, Boston, MA

"Don't Touch" Musculoskeletal Lesions: The Cross-sectional Edition

CHEST

Abstracts

ABDOMEN/PELVIS

Personal Fatigue

Abstracts

Abstracts

Abstracts

Abstracts

CM

Imaging Evaluation of Orbital Reconstruction with a Clinical Perspective.
Daniel T. Ginat, Suzanne K. Freitag, Mary E. Cunnane, **Gul Moonis**

RG

"Don't Touch" Musculoskeletal Lesions: The Cross-sectional Edition.
Mary G. Hochman, Jim S. Wu

State-of-the-Art MRI for Chronic Pancreatitis: Spectrum of Findings and Proposal of New Noninvasive Scoring System.
Daniel A.T. Souza, **Koenraad J. Mortele**

CM

Finding a Voice: Imaging Features after Phonosurgical Procedures for Vocal Cord Paralysis Rehabilitation. Behroze Vachha, Mary E. Cunnane, Pavan Mallur, **Gul Moonis**

CM

Revised Atlanta Classification of Acute Pancreatitis: Imaging Features, Standardized Reporting Nomenclature, and Potential Complications. Peter E. Humphrey, Steven C. Eberhardt, Scott C. Carter, **Koenraad J. Mortele**

The following posters were also presented at RSNA and are notable for being gender-specific and we include them here for your information and appreciation:

LL-MKE3153

Stress Fractures in Female Athletes

Purpose: To present the clinical hallmarks and reporting imaging findings specifically relevant to musculoskeletal injuries in female athlete triad.

This exhibit:

- Defines female athlete triad, an interrelated spectrum of disordered eating, irregular menstrual cycles, and low bone density
- Discusses the unique physiologic aspects of female athlete triad relating to specific sports injuries, specifically stress fractures
- Demonstrates relevant imaging findings in DEXA scan and MRI that aid in the diagnosis of female athlete triad and associated injury of stress fracture

Summary: Female athlete triad requires a multidisciplinary team for treatment and diagnosis, including but not limited to the sports medicine physician and musculoskeletal radiologist. DEXA and MRI play an important role in the diagnosis of female athlete triad and its related injuries.

World Health Organization criteria for BMD interpretation classify patients as Normal (T-score at or above -1.0), Osteopenic (T-score between -1.0 and -2.5), or Osteoporotic (T-score at or below -2.5).

Fig 1. Female Athlete Triad. The female athlete triad refers to the interrelated relationship of energy availability, menstrual function, and bone health. Athletes can move anywhere along the spectrum depending on their diet and exercise habits. They may not show all clinical conditions simultaneously.

Energy availability refers to the amount of dietary energy remaining for body functions after exercise. An athlete does not need to be diagnosed with an eating disorder to have low energy availability. Athletes may reduce their energy availability by disordered eating such as restricting calories, increasing their exercise energy expenditure, fasting, binge-eating and purging, diet pills, laxatives, diuretics, and enemas. Some athletes have clinical eating disorders such as anorexia nervosa or bulimia nervosa. Athletes at risk are those who participate in sports that emphasize leanness, such as distance running, light-weight rowing, dance, figure skating, and gymnastics. Athletes at risk are those who have low energy availability by causing menstrual dysfunction and directly by suppressing bone forming metabolic hormones.

Menstrual function refers to the range between normal menstrual cycles that occur every 28 days, 7 days (menorrhagia) to the absence of menstrual cycles lasting more than 3 months (amenorrhea). Functional hypothalamic amenorrhea results from low energy availability and a decrease in the hypothalamic-pituitary axis. This disruption in estrogen's restraint on bone resorption can lead to a decrease in bone density. Bone health refers to the accumulation and maintenance of bone, including the quality of bone protein, internal bone mineral structure, and bone mineral density (BMD). Bone is influenced by energy availability, menstrual status, genetics, behavior, and environmental factors. The current method for evaluating bone health is by measuring BMD with dual energy x-ray absorptiometry (DEXA). The International Society for Clinical Densitometry (ISCD) recommends that BMD in children, adolescents, and premenopausal women be expressed as Z-scores to compare age and sex-matched controls. Since athletes in weight-bearing sports typically have higher BMD than non-athletes, the American Academy of Sports Medicine (AASM) recommends that a Z-score of 1.0 be further investigated. The AASM classifies low bone density for age and activity level as a Z-score between -1.0 and -2.0 with secondary risk factors for fracture. Osteoporosis in athletes is defined as a Z-score ≤ -2.0 with secondary clinical risk factors for fracture.

The female athlete triad can significantly impact on athlete's reproductive and musculoskeletal health. These athletes are at increased risk of fractures, injuries, infertility, and depression/anxiety.

Stress Fractures in Female Athletes: Clinical Presentation & the Role of Imaging in Female Athlete Triad

Manjiri M. Didolkar¹, Bridget J. Quinn², Mary G. Hochman¹

¹Dept. of Radiology, Beth Israel Deaconess Medical Center; ²Dept. of Orthopaedics, Beth Israel Deaconess Medical Center; Division of Sports Medicine, Boston Children's Hospital; Harvard Medical School, Boston, MA

Fig 1. Bilateral calf MRI T1W (a) and fat-saturated T2W (b) coronal images as well as right (c) and left (d) sagittal fat-saturated T2W images with foci of low T1 signal and high T2 signal, consistent with bilateral tibia stress reaction (red arrows).

Fig 2. Right tibia and fibula AP radiograph (a) and lateral radiograph (b) demonstrating focal cortical thickening of the lateral proximal fibula diaphysis (red arrows), consistent with a healing stress fracture.

Table 1. Bone Density:

Region	Exam Date	BMD (g/cm ³)	T-Score	FE	Z-Score	AM
PA Spine / L1-L4	07/30/12	0.866	-1.6	83	-1.6	83
Left Hip / Femoral Neck	07/30/12	0.704	-1.3	83	-1.2	86

Fig 3c and Table 1. DEXA study demonstrating increased fracture risk and low bone density for age and activity level in the lumbar spine and the left femoral neck with Z-scores < -1.0 .

Table 2. Bone Density:

Region	Exam Date	BMD (g/cm ³)	T-Score	FE	Z-Score	AM
PA Spine / L1-L4	11/11/11	0.828	-2.0	79	-1.9	80
Left Hip / Femoral Neck	11/11/11	0.778	-0.6	92	-0.6	92

Fig 3e, Table 2. DEXA study demonstrating an increased fracture risk and low bone density for age and activity level in the lumbar spine with a Z-score < -1.0 and no increased fracture risk and normal bone density of the left femoral neck.

Table 3. Bone Density:

Region	Exam Date	BMD (g/cm ³)	T-Score	FE	Z-Score	AM
PA Spine / L1-L4	11/11/11	0.828	-2.0	79	-1.9	80
Left Hip / Femoral Neck	11/11/11	0.778	-0.6	92	-0.6	92

World Health Organization criteria for BMD interpretation classify patients as Normal (T-score at or above -1.0), Osteopenic (T-score between -1.0 and -2.5), or Osteoporotic (T-score at or below -2.5).

Patient 1

History:

- 29 yo F distance runner
- Completed the Boston Marathon in 3:18. Initially decreased mileage after, and then rapidly ramped up mileage from 30 to 60 miles/week
- Presented with right lateral calf pain with running and walking

Nutrition:

- History of restrictive eating patterns in college with weight loss, no history of anorexia or bulimia
- Focused on eating a "healthier" diet by eating less carbs

Menstrual Hx:

- Onset of menses at age 12, occurring ~28 days
- Currently taking OCPs, never missed a cycle for > 3 mos

Bone Hx:

- Prior history of a left tibia stress fracture associated with running

Physical Exam:

- Height 5'11.2 in, Weight 109 lbs, BMI 19.9
- Well-developed, well-nourished, healthy-appearing
- BLE exam: no redness, warmth, swelling, bruising, or bony deformity
- Positive hop test, heel strike, and three-point band test
- Point tender over the proximal aspect of her fibula

Diagnosis:

- Right proximal fibular stress fracture
- Concern for female athlete triad

Treatment:

- 6 weeks of relative rest, avoided impact, was allowed to cycle and swim
- Pain free on FU evaluation and planned on a return to running program and gait analysis under guidance of a sports physical therapist
- Returned to running

Nutrition:

- All labs (hemoglobin/hematocrit, Ca, vit D, PTH, Mg, Phos, albumin, protein levels, TSH/Free T4, chem, coag panel) WNL
- Sports nutrition evaluation, recommended increase protein, also GI evaluation, diagnosed with bacterial overgrowth of small intestine
- Strong emphasis placed on maintaining energy availability

Menstrual Function:

- Continue OCP

Bone:

- BMD - low bone density for age and activity level
- Sports nutritionist counseled on optimizing energy availability and micro-macro nutrients while training

Patient 2

History:

- 25 yo F distance runner
- Increased her running distance from 2-3 miles 3x/week to 4-7 miles 4x/week
- Presented with bilateral calf pain
- Positive recent weight loss

Nutrition:

- Denies restrictive eating
- Denies history of anorexia, bulimia, or purging
- Focused on eating a "healthier" diet by eating less carbs

Menstrual Hx:

- History of irregular cycles, onset of menses at age 11
- Menses after age 18 became sporadic, placed on OCP
- Stopped OCP during increased running period, cycles again became sporadic
- Gone > 3 mos without a cycle, has been amenorrheic in the past

Bone Hx:

- No history of prior fractures

Physical Exam:

- Height 5'11.2 in, Weight 116 lbs, BMI 21.2
- Well-developed, well-nourished, healthy-appearing
- BLE exam: positive hop test, heel strike test, three-point band test
- Point tender over mid anterior-medial tibias

Diagnosis:

- Bilateral tibia stress reaction
- Concern for female athlete triad

Treatment:

- Relative period of rest, allowed to cycle, swim, and ambulate as tolerated
- 6 weeks rest and began a gradual return to running program

Nutrition:

- Sports nutrition evaluation to optimize energy availability
- BMI 21.2 considered healthy, however, counseled on energy availability and concern regarding further weight loss
- All labs (hemoglobin/hematocrit, Ca, vit D, PTH, Mg, Phos, chem, albumin, protein) WNL

Menstrual Function:

- placed on holiday from norethindrone to evaluate menstrual cycle
- Labs (LH, FSH, estradiol, prolactin, TSH/Free T4) WNL
- With decrease in energy expenditure during relative period of rest, patient resumed menses every 28 days

Bone:

- BMD - low bone density for age and activity level in the spine
- Bone density tends to be higher in the hips of runners due to the impact nature of their sport but lower in the spine

Patient 3

History:

- 26 yo F runner
- Increased mileage from 3-4 days/week to 5 days/week training for the San Diego marathon
- Initially diagnosed with proximal hamstring syndrome
- Referred for probable left hip inferior pubic ramus stress fracture which she sustained while training

Nutrition:

- Placed on Calabate after diagnosis of her stress fracture
- Not getting a lot of Ca and vit D
- Admits to calorie restriction and restrictive eating with recent weight loss

Menstrual Hx:

- Onset of menses at age 13-14
- Started OCPs at age 14 due to menstrual irregularity
- Positive hop test on the left
- Pain tenderness the left inferior pubic ramus
- Pain with resistive hamstring and adductor testing

Bone Hx:

- No prior stress fractures
- Prior traumatic fractures to wrist and ankle

Physical Exam:

- Height 5'11.3 in, weight 130 lbs, BMI 23.0
- Well-developed, well-nourished, healthy-appearing
- Positive hop test on the left
- Pain tenderness the left inferior pubic ramus
- Pain with resistive hamstring and adductor testing

Diagnosis:

- Non-displaced left inferior pubic ramus fracture
- Concern for female athlete triad

Treatment:

- Activity modification and relative period of rest with swimming and aquatic running
- Repeat MRI revealed healing stress fracture

Nutrition:

- Nutritionist evaluation due to restrictive eating and lack of food with Ca and vit D
- Serologic evaluation normal thus diagnosis made of functional hypothalamic amenorrhea
- Counseled on optimal energy availability and nutrition
- Received counsel on energy availability

Menstrual Function:

- During relative period of rest, resumption of menses
- Serologic evaluation normal thus diagnosis made of functional hypothalamic amenorrhea
- Counseled on optimal energy availability and nutrition
- Received counsel on energy availability

Bone:

- BMD - Normal for age and activity level

Conclusions:

Summary:

- Female athlete triad (FAT) is syndrome of decreased energy availability, menstrual dysfunction, and/or decreased bone density in the female athlete.
- Female athlete triad causes considerable health risks to the female athlete that may not be reversible.
- Severe undernutrition impairs reproductive and skeletal health; menstrual irregularities and low bone mineral density increase fracture risk.
- A symbiotic relationship between the sports medicine/orthopedic physician and radiologist would best serve the female athlete.
- Initially, a female athlete may seek specialty care for injuries. While female athlete triad may be a consideration, imaging is used first to diagnose the injuries, including stress fractures and fractures.
- This should lead to the investigation of female athlete triad including energy availability, menstrual function, and bone mineral density.

For the radiologist:

- The diagnosis of fractures or stress fractures in these athletes may lead to the initial evaluation of female athlete triad. Of equal importance is the awareness and correct reporting of the Z-scores on DEXA scans in addressing the bone mineral density component of female athlete triad.

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3. International Society for Clinical Densitometry. ISCD Official Position Statement on the Use of DEXA in the Assessment of Bone Density in Children and Adolescents. J Clin Densitom. 2004;7(1):14-16.
4. American Academy of Sports Medicine. Female Athlete Triad. J Am Acad Sports Med. 2007;29(10):187-192.
5. American Academy of Sports Medicine. Female Athlete Triad. J Am Acad Sports Med. 2007;29(10):187-192.

Fig 5. Pelvis MRI coronal T1W (a) and fat-saturated T2W (b) images and axial T1W (c) and fat-saturated T2W (d) images demonstrating linear low T1 and T2 signal in the left inferior pubic ramus with cortical thickening and decreased surrounding high T2 signal, consistent with a healing nondisplaced fracture (red arrows).

RSNA 2012 Scrapbook: Alumni Party

... and then on Tuesday night, it was time to party at the 17th Annual BIDMC Alumni Cocktail Reception at the University Club of Chicago



Special thanks to Sam Yam and Jonny Kruskal for the photos!



Michelle Browne (Fellow 2012), **Carole Ridge** (Fellow 2011), our Chief, and fellow South African **Leon Van Rensburg**, Chair of the Radiological Society of South Africa.

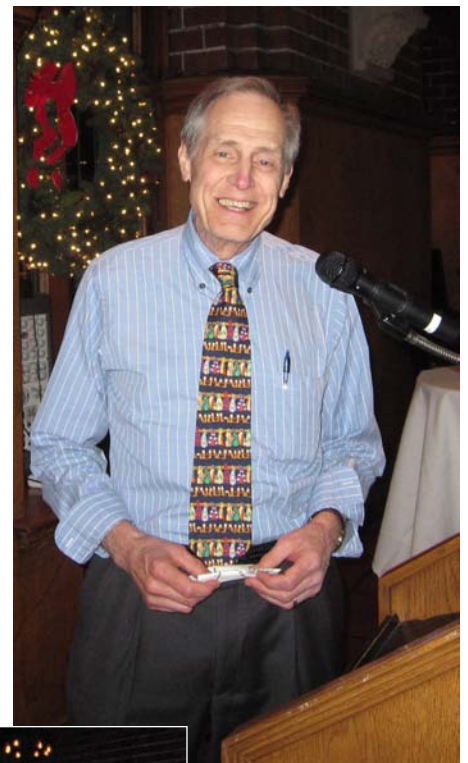


Vice Chair for Community Network Services **Peter Gordon** at his first RSNA with his predecessor **Max Rosen**.

RSNA 2012 Scrapbook: Alumni Party



L to R: **Justin Kung, Moritz Kircher** (Resident 2009), **Bettina Siewert, Muneeb Ahmed** and **Ferris Hall**.



L to R:
Priscilla Slanetz, Ferris Hall, Jeanne Ackman, and Carol Hulka, BIDMC faculty alumnus 2001.



Above and right:
Debbie Levine and **Thomas Vrachliotis** (Fellow 2001)



Current fellow **Jennifer Ni Mhuircheartaigh** with residents **Seth Berkowitz** and **Leo Tsai**. Special thanks to Jenny for volunteering to transport posters back to BIDMC!



Ihab Kamel (Fellow 2000), **Max Rosen** and **Marc Rothenberg**, former BIDMC HMFP Business Mgr.

RSNA 2012 Scrapbook: Alumni Party



Above: **Karen Lee** and **Katie Krajewski** (resident/fellow 2009)

Left: **Vandana Dialani, Shambhavi Venkataraman, Rola Shaheen** (faculty alumnus 2012), and **Karen Lee**.



Koenraad Morteale and **Jonathan Kruskal**.



Diana Litmanovich, Olga Brook, Jacob Sosna (Fellow 2003) and **Liat Applebaum** (Fellow 2005).



L to R: **Ammar Sarwar, Leo Tsai, Colm McMahon** (Faculty alumnus 2011) and **Mai-Lan Ho**.



Mel Couse with **Jim Busch** (resident/fellow 2004)



Priscilla J. Slanetz, MD, MPH
Dir., Radiology Residency
Program & Dir., Breast MRI

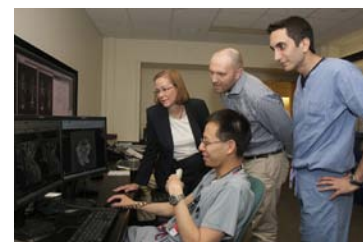
✓ *What's New in Residency Accreditation?* - Priscilla J. Slanetz MD, MPH

As the July 2013 start date for the new accreditation system approaches, the residency leadership would like members of our department to understand the major changes that will soon be in place regarding accreditation of our ACGME residency and fellowship programs. The new accreditation process is comprised of two main components: the CLER visit (clinical learning environment review) and the continuous accreditation process.

During the next 18 months, all Institutions with accredited training programs will undergo a CLER visit. This visit is designed to assess the learning environment on a global scale with particular attention being paid to how trainees are integrated into departmental and hospital-wide processes related to patient safety and quality, supervision, transitions in care, duty hours, and honesty/professionalism. During the CLER visit, site visitors will meet with the hospital CEO, program directors, DIO, and multiple residents and fellows across departments. The goal of this visit is to ensure a effective and safe learning environment in order to maximize the education of future physicians.

The continuous accreditation process consists of several different parts. The hope is that based on an analysis of trends in a training program, programs will innovate and constantly improve the educational experiences of their trainees. Working with the GME and our core departmental faculty, the residency program leadership will be responsible for submitting annual program updates. These annual updates entail reporting on specific performance parameters including:

- Program attrition (residents, fellows, and program leadership)
- Specific program characteristics
- Scholarly activity of trainees and core faculty
- Board pass rate
- Trainee clinical experiences (case logs and annual survey data)
- Faculty survey of the training programs
- Semi-annual trainee evaluation and feedback based on the new radiology milestones



Fortunately for radiology, the ABR milestones committee has created only 12 specific milestones based on the ACGME core competencies:

6 ACGME Core Competencies	12 ABR Milestones
Patient care and technical skills:	Consultant Competence in procedures
Medical knowledge:	Protocol selection and optimization of images Interpretation of examinations
Professionalism:	Professional values and ethics
Interpersonal and communication skills:	Effective communication with patients, families, and care givers Effective communication with members of the health care team
Systems-based practice:	Quality improvement Healthcare economics
Practice-based learning and improvement:	Patient safety (contrast agents, radiation safety, MR safety and sedation) Scholarly activity Self-directed learning

Due to the short duration of most fellowships, there is a plan to condense the milestones for fellows such that they will predominantly focus on medical knowledge and patient care. *As a result of this new approach, faculty should expect to see some changes in our evaluation forms in the next 6 months. We also will be creating a new clinical competency committee which will be responsible for overseeing the submission of the semi-annual report for each trainee to the ACGME. Please let us know if you would be interested in serving on this new committee.*

Finally, every 10 years, the program will be expected to undergo an extensive self-study similar to what medical schools undergo during an LCME visit. At present, BIDMC is currently scheduled for this self-assessment in 2016.

➤ **Ammar Sarwar, 4th yr Resident in the news:**

Ammar Sarwar, was one of two residents nationwide, selected to visit the American College of Radiology (ACR) headquarters in Reston, Virginia as the James Moorefield fellow in Healthcare Policy and Economics in October. He worked with the ACR Economics staff as well as members of the Harvey Neiman Health Policy Institute, learning about issues affecting radiology currently. He also spent time at the Brookings Institution, Center for Medicaid and Medicare Services (CMS) and on Capitol Hill interfacing with thought leaders regarding the implementation of the Affordable Care Act (ACA).

Ammar will continue work started during the fellowship by serving on the Episodes of Care Committee of the ACR Commission on Economics to structure radiologist payments in the accountable care organizations and on the Hospital and Outpatient Prospective Payment System (HOPPS) committee lobbying CMS for appropriate valuation of outpatient radiology reimbursements.



***Ammar** was also quoted in the December issue of Boston Magazine in the article "Boston's Best Doctors: Top Docs 2012":

In many ways, the ground is shifting under the feet of our physicians, forcing them to ask a lot of hard questions. The answers to those questions, 12 of which we explore here, reveal a lot about the kind of healthcare you and your family will receive in the years ahead.

Are med students learning enough?

Doctors in training work fewer hours than ever before, thanks to new regulations, but that's forcing them to adapt to new ways of practicing medicine.

It used to be that medical residents routinely worked 30-hour shifts and 100-hour weeks. A kind of boot-camp ethos prevailed: Only total immersion could produce doctors who were truly ready to serve on medicine's front lines. But the hours took their toll: Residents made mistakes in care, crashed their cars on the way home, and snapped at patients in need of emotional support.

So in 2003, in response to mounting pressure from the Accreditation Council for Graduate Medical Education, hospital duty for residents was capped at 80 hours per week. And in 2011 the state followed the Institute of Medicine's recommendation to restrict single workdays to no more than 16 hours (down from 24).

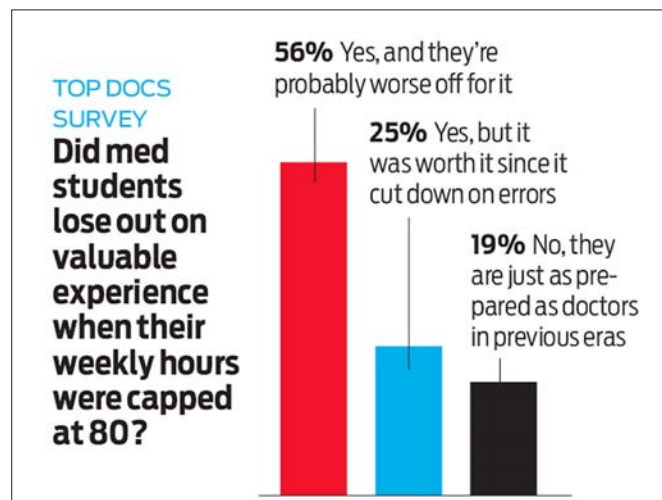
Some doctors and trainees think the pendulum has now swung too far, limiting what residents can learn.

"There was a period of exploitation," says Ammar Sarwar, a radiology resident at Beth Israel Deaconess. He's glad that's over, but Sarwar also thinks medical education has been harmed.

With a 16-hour shift limit, three different residents might wind up in charge of a single patient's care. That's a problem, because it increases the chance that important information isn't shared during patient handoff. It also limits the residents' ability to connect with patients.

However, Russell Phillips, the director of the Center for Primary Care at Harvard Medical School, argues that the handoff is precisely what trainees need to learn. Medicine is moving toward a team-care model, he says, and doctors need to learn to do it better—even if, like their predecessors, they have to learn on the fly.

—Karen Weintraub



Boston

MASSACHUSETTS
75 YEARS

BOSTON DAILY RESTAURANTS FASHION & STYLE BEST OF BOSTON IN THE MAGAZINE

What's On Your Doctor's Mind?

And what does it mean for the future of medicine?

By Casey Lyons (ED)

BOSTON MAGAZINE, DECEMBER 2012

And what does it mean for the future of medicine?

BY CASEY LYONS (ED)

Text Size: A | A | A

BOSTON MAGAZINE, DECEMBER 2012

COMMENT (0) Like 72 Tweet 14 +1 0 Share 14

Medicine is changing fast, especially right here in Massachusetts. As the rest of the nation continues to debate universal healthcare, we're already six years into our own experiment. It's been a great success: Today 98 percent of our residents are insured. But to contain the costs associated with the program, state legislators recently passed a controversial law altering the way medicine is practiced here. And that's just one of the many ways in which the ground is shifting under the feet of our physicians, forcing them to ask a lot of hard questions. The answers to those questions, 12 of which we explore below, reveal a lot about the kind of healthcare you and your family will receive in the years ahead.

Top Docs Survey

Click on a question to find out how Boston's best doctors answered the questions posed here.

1. Am I a fool for becoming a general practitioner?
2. What if I could have fewer patients?
3. Should I tell my patients what I would do in their place?
4. How do I say I'm sorry?
5. Should I worry about what it costs?
6. Am I burned out?
7. Do I need a robot?
8. What can I do to make patients follow my instructions?
9. Can I trust the drug companies?
10. Are med students learning enough?
11. Should I treat only healthy patients?
12. Should I e-mail with my patients?

<http://www.bostonmagazine.com/articles/2012/11/boston-best-doctors-how-doctors-think-top-docs/#answer10>

November is Imaging Month

2012 Deborah J. Walsh Award

We salute the nominees for the Deborah J. Walsh Award who epitomize the commitment to quality care held by our BIDMC imaging technologists.

The 2012 nominees are:

Lauren Fitzgerald R.T. (R)



"Lauren is one of the best techs I've worked with in my many years at BIDMC. This is not just because she takes x-rays that always live up to or exceed our high quality control standards, but because she has that great balance of being professional and personable with her patients. She is always patient with the students and will take the time to work with them in any area she may be working in. She is also always ready and willing to help you in any situation, without any complaining... that's the kind of tech everyone wants to be around."

Tuan Minh Luu R.T. (MR)(CNMT)



"Tuan has been an invaluable member of our MRI department at BIDMC. He is in my opinion one of the most knowledgeable MRI technologist I have ever met and he is highly respected by all his peers and physicians. He is truly a great mentor, teacher and roll model within our modality and profession. Tuan is always eager to help his fellow technologist with problem solving no matter how large or small the task. I have seen Tuan in action on several occasions. He is the perfect patient care imaging provider because of his super professional behavior and caring attitude."

Congratulations Tuan Minh Luu
Debra J. Walsh Award Winner 2012

Sarah Ross R.T. (R)



"Not only is Sara more than willing to teach our incoming students how to perform exams correctly but she is also capable of sharing new and different methods with her colleagues. Sara does so in a way that does not make someone feel uncomfortable or inferior, but rather as an equal to whom she is trying to share her knowledge with."

2012

Marks the 10th Anniversary of the Deborah J. Walsh Award



Deborah J. Walsh, R.T. (R) (CV) (M) (CT), served as a Clinical Instructor for our student programs in radiology and as a MRI technologist until her death in December 2002. Debbie was a caring, compassionate and enthusiastic Radiographer devoted to the teaching aspects of academic radiology. The BIDMC Radiology Department has chosen the *Deborah J. Walsh Award* as a way to remember Debbie by recognizing an Imaging Technologist in the radiologic sciences who has demonstrated professionalism, mentoring, compassion, and a commitment to quality patient care. The Deborah J. Walsh Award is presented annually to an Imaging Technologist in Radiology at BIDMC who demonstrates these qualities.

We feel Debbie acted as an advocate for the profession and she would be proud to acknowledge a fellow imaging professional with this award in her memory.



Introducing ... Baby Nour ("Light")

Research fellow Dr. Marwan Moussa is pleased to announce the birth of his daughter Nour on Saturday, Nov. 24, 2012. At 7.9 lbs (3.5 kg), she is beautiful and healthy. Mom is well but Dad was a bit sleep-deprived. Special thanks to co-author Dr. Muneeb Ahmed who presented Marwan's 2 talks at RSNA this year so that Dad could be there for Nour's arrival!

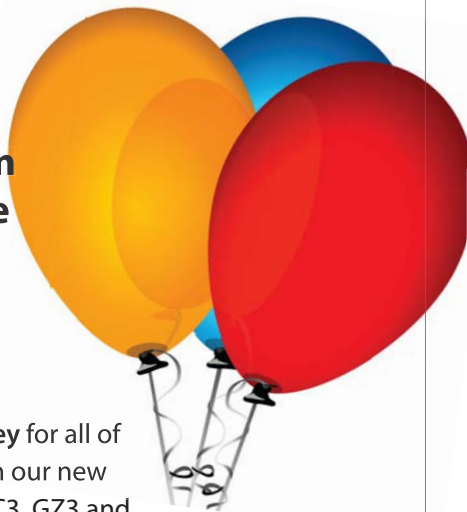


DEPARTMENTAL NEWS, AWARDS & HONORS: Introducing ...



- Aideen Snell, MSW
Service Excellence
Program Manager

Radiology Patient Satisfaction Surveys are up!



The Radiology Patient Satisfaction Survey for all of our outpatients is now up and running on our new touch screen kiosks located on TCC4, WCC3, GZ3 and West MRI Suite. Check them out! When talking to the patients, encourage them to use the kiosk and take the survey on their way out. Let them know how important their feedback is to Radiology and how committed we are to improving the patient experience. ***If they don't tell us, we'll never know!***

Introducing ...



Ghada Almakhaita, MD, our second observer in our International Visiting Observership for Body MR. Ghada is a resident in King Abdulaziz Medical City, Riyadh, Saudi Arabia. She most recently was a Clinical Fellow in Body Imaging at Dalhousie University, Halifax, Canada. After attending our CME course, Practical MR Imaging of the Abdomen and Pelvis at the Marriott Long Wharf Hotel, Ghada became aware of our International Visiting Observership program and immediately enrolled.

We are delighted to have Ghada as an international observer and value her presence in our department. Ghada will be with us from November 20, 2012 until April 30, 2013.

In Radiology we are committed to providing the best possible care for our patients. In order to continuously improve your experience ...

Radiology wants to know “How was your visit?”

Can you spare 2 minutes to answer a few questions?



Please use the kiosk or log on using the barcode or URL to let us know how we are doing:

<http://www.Radiologywants2know.com>

If you don't tell us, how will we know?

New Voice Recognition System Training:



B. James Hamilton
Radiology Information
System (RIS)
Application Specialist

We are currently preparing to implement voice recognition as a department (you may have noticed a 4th monitor at your PACS workstation). In preparation, our support team will be providing group and individual (on-site) training of the new voice recognition software. Individual, training dates and times are provided below:

Monday, December 3, 2012	9:00am – 3:00pm
Tuesday, December 4, 2012	8:30am – 3:00pm
Wednesday, December 5, 2012	9:00am – 3:00pm
Thursday, December 6, 2012	8:30am – 3:00pm
Friday, December 7, 2012	8:30am – 3:00pm

The duration of an individual training is approximately 30 minutes. Please email James Hamilton at bhamilto@caregroup.org as soon as possible to schedule a training date and time that is convenient for you.
Thank You!



Jesse Wei, MD
Physician Director,
IT Radiology

INTRODUCTION

By now you have undoubtedly noticed additional computer monitors and Rad Mics showing up at PACS workstations. Aside from nuclear medicine as well as some community sites, the software and hardware has been deployed throughout the department. These have been installed in conjunction with the impending widespread rollout of “**front-end speech recognition**” (i.e., voice recognition) for transcription of radiology reports. Many questions have been raised in conjunction with the rollout, and I’m writing to introduce the system and answer some of these questions.

As an introduction to the system, our front-end speech recognition solution is based on technology and a speech engine by M*Modal (<http://www.mmodal.com> <<http://www.mmodal.com>>). The M*Modal speech engine is a licensed technology which must be integrated by clients into custom software solutions rather than a pre-built product which is “plugged into” the radiology information system (RIS). This technology was chosen over available stand-alone alternatives because it allows our (BIDMC) programmers to create a solution which fits as closely as possible into our current academic workflow.

The current rollout is a “Phase I” rollout. In this phase, the **front-end voice recognition is serving as a replacement for the RTAS dictaphone and eScript** for **BIDMC (Boston) studies**. The benefits of this phase of rollout include immediate report turnaround for editing as well as **integration with PACS** to reduce the chances of CLIP# mismatches.

The time line for rollout follows:

- First week of December: “Official rollout” begins - formal training sessions will be provided both in a lecture-type setting, as well as in the reading rooms. Training materials will also be distributed at this time.
- December-January: Continued encouragement to use the front-end voice recognition. During this time frame, RTAS will remain as a fall-back as people learn to use the front-end VR, and in case of unanticipated technical problems.
- Middle of February: We will begin to remove RTAS dictaphones from reading areas in order to further encourage migration to the front-end voice recognition. While many or most RTAS machines will be removed, a few will remain in place during the extended transition. As RTAS dictaphones get removed, the support for the Front-end Speech Recognition will transition to 24/7 coverage.
- Extended transition: An extended phase of transition will occur as we ensure high-volume sections can handle the workload using the Front-End Speech Recognition. We recognize that a robust utilization of macros and templates (which only currently have primitive handling) will be needed before some of these sections can fully migrate off of eScript and onto front-end speech recognition. During this extended transition, we will also ensure that potential planned downtimes such as CCC downtimes can also be mitigated.

As this first phase of rollout is happening, we will embark on the next phase of software development. In the Phase II of development, we expect that many of the additional functions which our alpha testers have requested (and are frequently seen features within other products) will be implemented, including:

- More intuitive mechanism to insert templates and use macros.
- Better utilization of buttons on the Rad Mic or addition of customization options for Rad Mic buttons.
- Addition of structured reporting rules (as requested by individual sections).
- Improved robustness of fallover for the scenario of CCC downtime.
- Allowance for use of local transcriptionists to assist in editing of select reports.

The infrastructure to send reports to BIDMC-Needham has not yet been created, and will happen concurrently with Phase II software refinements. This infrastructure will require work and cooperation between BIDMC IS, BID-Needham IS, and Meditech.



Frequently asked questions**Q: Can I use VR?**

A: Yes. Official training starts in December.

Q: What about Needham?

A: The ability to dictate Needham reports is in the roadmap, pending success of the Phase I deployment at BIDMC. This will require coordination between IS at BIDMC, BIDMC-Needham, and Meditech and therefore may take some time to implement.

Q: What is the difference between “Dictate” and “Voice Edit”?

A: In **“Dictate” mode**, you dictated in the same manner as current RTAS dictations. The report will not be transcribed while you dictate, but the recording is being streamed live to the M*Modal servers which is doing the transcription in the background. When you are done with the report, you click the “EOL” button on the Rad Mic, and in a few seconds your transcribed report will appear.

In **“Voice Edit” mode**, the local recognizer engine on your PACS workstation (i.e., the processor on your PACS workstation) is doing the voice recognition, which potentially results in slightly lower accuracy, and slightly slower learning. Words and phrases pop up on the screen as you dictate, in the same manner typically seen when using Powerscribe or Radwhere.

Q: Should I use “Dictate” or “Voice Edit”?

A: We prefer that you use “Dictate” for the reasons above. Learning should be faster using the Dictate mode. You can listen to your own dictation using the Dictate mode.

Q: What is the difference between “Dictate” and “Dictate Minimized”?

A: “Dictate Minimized” reduces the size of the VR window while dictating, in order to reduce distractions of a bright blank screen.

Q: If my dictation is being streamed to a M*Modal server, what happens if the network goes down?

A: There is an automatic fallover to “Voice Edit” mode on your local machine if the connection between BIDMC and M*Modal is lost. However, if there is a CCC downtime, you should fallover to RTAS until this scenario can be handled. Our current speech recognition implementation will not work if there is not a valid CLIP# accessible in the RIS (which is based on CCC).

Q: Does this slow down my dictation?

A: Typically, users do not need to dictate slower than you in normal speech--speed of dictation does not significantly affect accuracy of the speech engine, and in fact the speech engine is optimized for transcribing a normal speech pattern. However, slurring words together or mumbling while dictating (which frequently happens during rapid dictation) will likely reduce accuracy. Once a simple mechanism for using macros and templates is implemented, front-end speech recognition should be at least as fast as traditional dictating.

Q: Is there an idle-timeout period?

A: Yes, your report will timeout if it is inactive for 20 minutes.

Q: Is my report saved in the case of a timeout?

A: Your voice dictation up to timeout is saved. The handling of timeout differs between the “Dictate” mode and the “Voice Edit” mode.

In **“Dictate” mode**: a timeout will occur if there is no use of the Rad Mic over 20 minutes. In this case, there is an Auto-Suspend which saves your voice file. Assuming that you enter the same CLIP# on the same workstation, you will receive the option to Resume your dictation. While you may resume where you left off, you will not be able to rewind to the portion of your dictation which was prior to the Auto-Suspend. However, after finishing the dictation with EOL button, you will still be able to do a Voice Edit of the entire report as if you were not interrupted. You can also force a suspend in the middle of a dictation by clicking on the “Suspend” button.

In **“Voice Edit” mode**: an autosave snapshot occurs every 5 minutes. At worst, 5 minutes of work may be lost if there is a network problem or in an uncontrolled exit from the application (such as if Internet Explorer is manually closed). In the case of a 20-minute timeout, a snapshot is typically taken so edits made to that point are saved. In either of these scenarios, edits to the most recent autosave can be retrieved on re-entering the software (on the same computer).

Q: Can I resume after Auto-Suspend or Auto-Save on another computer?

A: This has not been tested and is not guaranteed to work.

Q: Can I listen to what I've dictated?

A: Yes, you can use the Rewind (left-arrow), Playback (triangle), and Fast-Forward (right arrow) buttons on the dictataphone. Like on RTAS, by default, continued dictation will overwrite where your dictation is stopped ([OVR] button is boxed). Like on RTAS, the behavior can be changed to insert a recording by clicking on the [INS] button.

Q: How to I move between sections (HISTORY, TECHNIQUE, FINDINGS, IMPRESSION, etc)?

A: You just say the section name like in a dictation. E.g., "Impression colon" and it will automatically move to that section. Certain sections have synonyms. For instance, History = History, Indication, Indications, Clinical History, Clinical Indications. Impression = Impression, Impressions, Results, Summary, Conclusion.

Q: What happens if I accidentally deleted a mandatory section header (such as "FINDINGS" or "IMPRESSION")?

A: You can either undo the deletion, or double click on the missing section title in the left column, and that header will reappear.

Q: Is there a list of voice commands?

A: Yes, these will be by the PACS workstations and are on the Department Intranet (under "PACS" in the left column) under "MModal VR Commands"

Q: Can mammograms and breast ultrasounds be dictated on Front-End Speech Recognition.

A: Yes, but as BI-RADS handling has not yet been coded, you will not be able to approve the report directly from the application, and it will need to be saved to RISweb for signing.

Q: The speech recognition usually works very well for me. Why did it suddenly start returning gibberish?

A: The most common cause of this problem is that the gain on your microphone has changed, or you are holding it differently. Try re-running the Gain Wizard (see Part 3) in order to optimize the microphone gain. Just like the radiology image you look at on a PACS workstation has to be properly windowed and leveled to be properly interpreted, the gain level on the microphone has to be properly set so that the speech recognition software can best try to interpret what you're saying. Another thing you might consider is to listen to your dictation (if you used the "Dictate" mode rather than the "Voice Edit" mode) -- if you think that you are speaking clearly and clearly understandable in the recording, but being recognized poorly, please let us know. Email RISWeb Feedback with the clip number and the problem. We can forward these cases to M*Modal to review if we find an unexplainable recurring problem.

Q: Numbers come out wrong. It spells out the numbers when I want it Arabic, it's Arabic when I want it Roman, and it's Roman when I want it spelled out.

A: Numbers are particularly difficult to deal with. We are allowed to set some rules on how numbers are transcribed but there are always exceptions to the rule. Current settings (which apply to the entire department) include:

- Cranial Nerves are currently Arabic (but can be set to be Roman if there is a consensus).
- Numbers at the start of the sentence are currently numeric rather than spelled out.
- Ordinals are abbreviated: 1st, 2nd, etc.

Please send to RISWeb feedback cases where you think the numbers should be done a different way from the way they're being transcribed. Please provide specifics (provide a clip # as well as a description of how it's coming out and how you want it to come out). These will be reviewed and summary feedback provided to M*Modal.

Q: Why is my Speech Recognition always crashing?

A: This is unfortunately a sporadic problem which has not been reliably reproducible. It is unclear to us whether the crashing is with specific machines or users, or if it is a problem with our local implementation or the M*Modal components, or with the deployment process. We're actively working on this problem. Please let us know when your Speech Recognition crashes (please email RISWEB Feedback with: the Clip#, which reading room you're in, the phone# next to your PACS workstation, and what you were doing when it crashed) so we can tell how widespread this problem is.

Q: Why and when are you going to take away RTAS machines?

A: We are currently paying for two transcription services (RTAS/Escription and M*Modal). To encourage the transition to front-end speech recognition, we will (starting in February) gradually decrease the number of RTAS machines available. Once Needham workflow is integrated with this dictation system, and a fallback plan is available for CCC downtimes, the remainder of RTAS machines will be removed (date indeterminate).

Two commonly overlooked features may impact the quality of speech recognition: **Gain Wizard** and **Enrollment**. The Gain Wizard is a 20 second process which adjusts the “volume” dial on your microphone so that the dynamic range picked up by the computer is optimized for speech recognition.

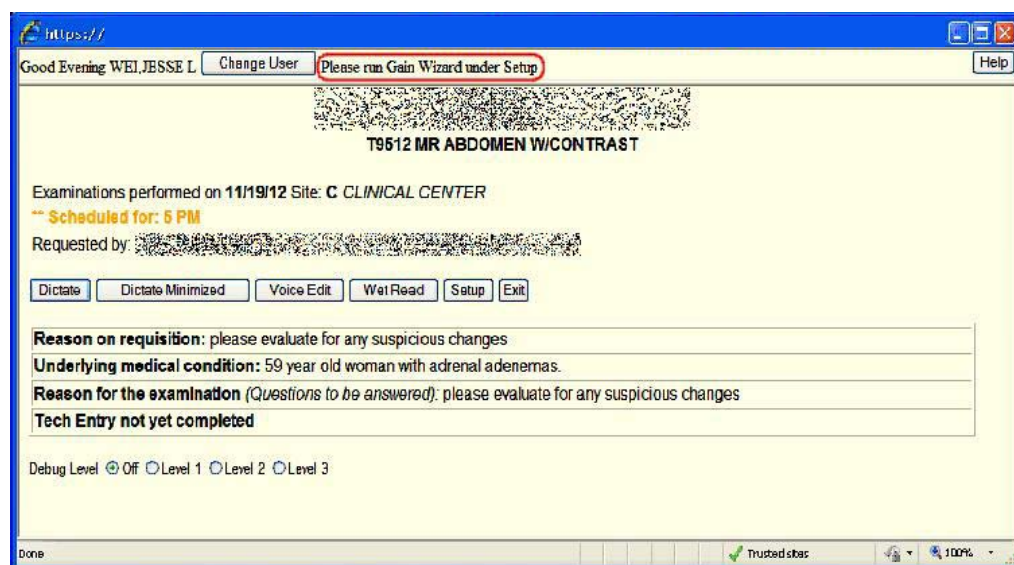
- Gain which is set too low is analogous to a microphone which is left off at a public event: nothing can be heard from the speech recognition software and what is picked up is recognized and transcribed as gibberish.
- Gain which is set too high is analogous to a microphone which is turned too high at a public event and the squeal of feedback is heard: the speech recognition software can not properly recognize areas which are clipping.

In order to provide the most accurate speech recognition, Gain Wizard should be run once per user per machine, or as needed as described below in the “Gain Wizard” section.

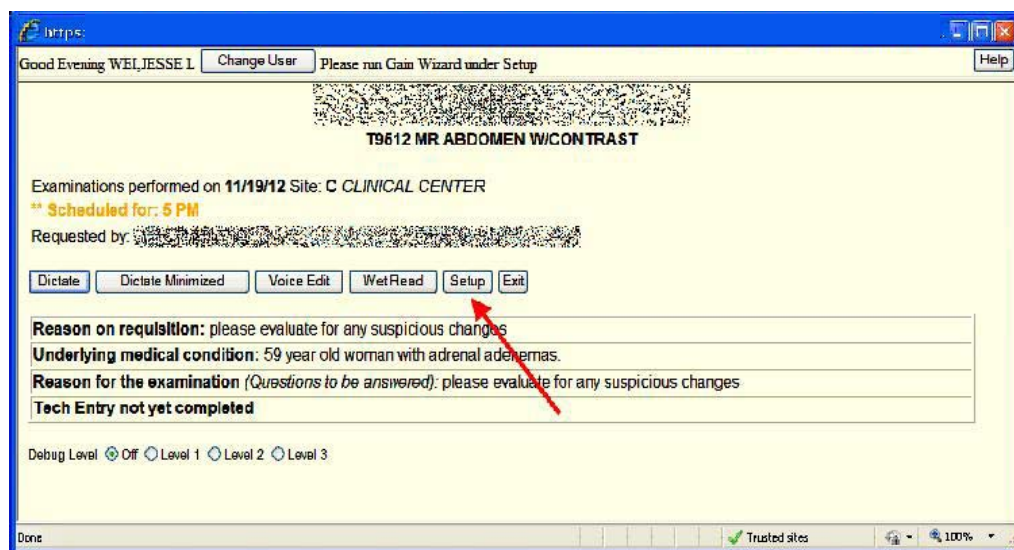
Enrollment is a method of “jump-starting” the speech recognition engine’s accuracy for an individual user, and while it takes a few minutes, **Enrollment only needs to be run one time per user**. If you have not run enrollment since Thursday 11/15/2012, when our speech recognition environment moved to a production server, you may consider running (or re-running) this to help with the recognition accuracy. See the “Enrollment” section below, and **be sure to run the Gain Wizard prior to running Enrollment**.

Gain Wizard:

The first time you log into a machine you will see a warning next to your username: “Please run Gain Wizard under Setup.” Anytime you see this warning, it would be best to run the Gain Wizard.

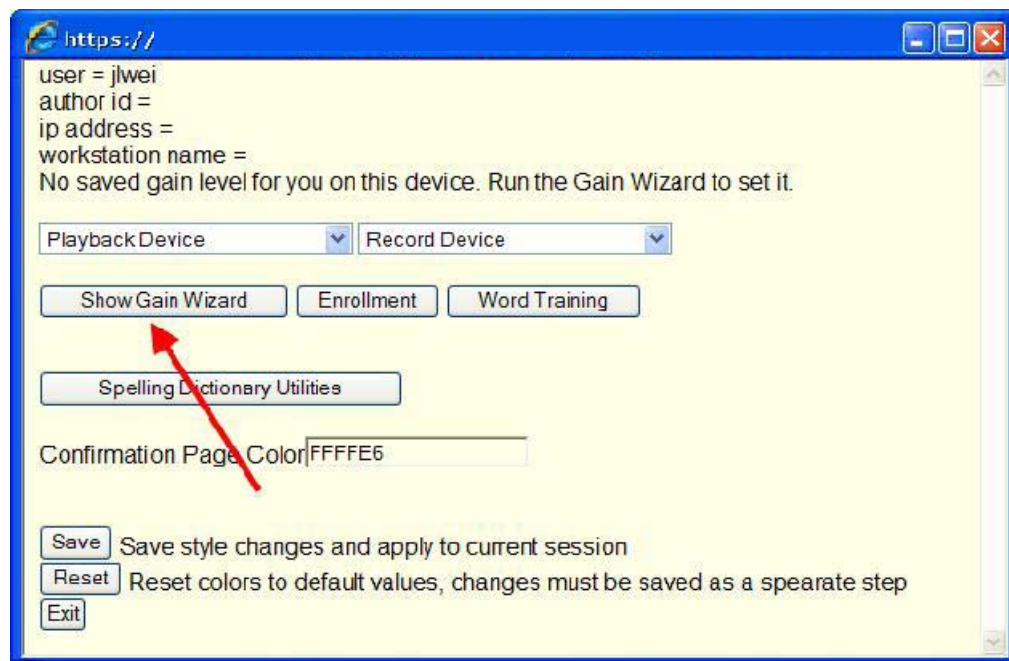


Click on Setup:



Special thanks to Sonographer Practitioner Laurie Sammons for demonstrating the new voice recognition system.

Click on Gain Wizard:



After you run the Gain Wizard you will be prompted to click the Save button and this should save your microphone gain settings on that computer. The Gain Wizard warning illustrated above will then go away.

While dictating, you should see the color bar (below) moving with fluctuations of voice. **It should be dominantly green and going into the yellow zones.**

If the color stays green all the time and never reaches yellow, the gain is too low. Move the microphone closer to your mouth or re-run the gain wizard. If the color frequently goes to red and you get the Clipping message below, the gain is too high. Move the microphone away from your mouth or re-run the gain wizard.

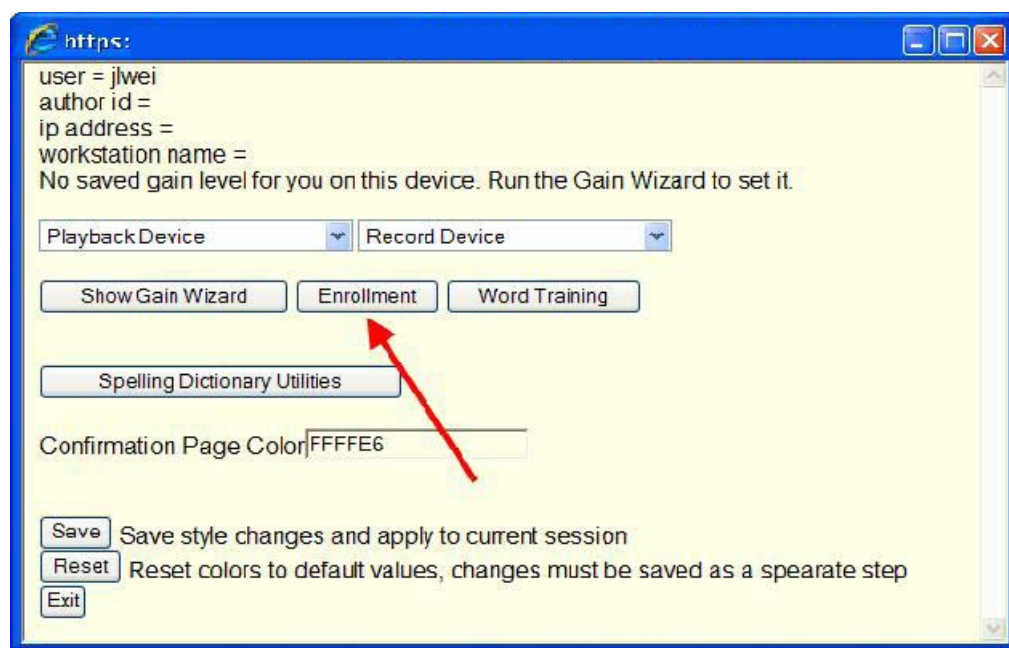


Enrollment:

Enrollment only needs to be performed one time per user (after 11/15/2012) in order to help the speech recognition engine figure out the nuances of an individual user's speech. This may be particularly helpful for those of you who might be accused of having an accent.

Please ensure that you have run Gain Wizard prior to running Enrollment (Garbage in, Garbage out!).

Click on the Setup button as described above, and then click on "Enrollment" and follow the directions:





MRI Case of the Month

Dec 2012

Clinical History: 30 year old male, active recreational soccer player with chronic left groin pain, radiating into the thigh. (**Fig 1**)

MR Case of the Month -
A new educational tool
for technologists:

Background: Monthly
case presentations
highlighting an exam
that has been done
particularly well and/
or illustrates a teaching
point. Exams can be
chosen for a variety of
reasons. It could be an
excellent exam where
the imaging was done
really well; it could be a
new type of exam not
previously performed;
the technologist
altered the exam in
some way to improve
the imaging quality;
or maybe the patient
was difficult and the
technologist pulled
out all the stops to
get the exam done.
These cases have great
learning potential for
all technologists.

*Thanks to MSK Chief
and faculty, Mary
Hochman and Jim Wu,
for contributing this MR
Case of the Month Dec
2012.*

*- Jeremy Stormann
B.S., RT(R) (CT) (MR)
MRI Clinical Instructor*

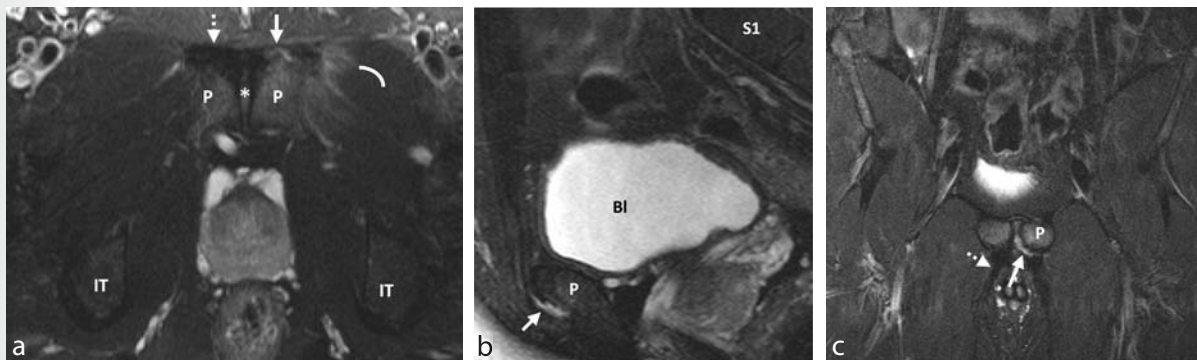


Fig 1. a) Axial Fat Saturated T2. Linear high T2 signal at the left adductor tendon insertion site represents a tear (arrow). Normal right adductor tendon appears black (dotted arrow). Note edema in adductor muscles (curved arrow). Pubic symphysis (asterisk). P, Pubic bone. IT, ischial tuberosity. **b)** Sagittal Fat Saturated T2. Linear high T2 signal at the left adductor tendon insertion site represents a tear (arrow). P, Pubic bone. B, bladder. S1, S1 vertebral body. **c)** Coronal Fat Saturated T2. Linear high T2 signal at the left adductor tendon insertion site represents a tear (arrow). Normal right adductor tendon appears black (dotted arrow). P, Pubic bone.

Discussion:

Sports hernia or athletic pubalgia refers to groin injuries that occur in athletes, typically associated with sudden changes in direction, twisting at the waist, or side-to-side ambulation (e.g. soccer, ice hockey, football, fencing, high jumping and other track and field events, and baseball.) Patients often present with pain in the inguinal region, which may radiate to the adductor muscles of the thigh, the lower abdominal muscles, perineum, and/or scrotum. Symptoms may be unilateral or bilateral, are often insidious in onset, are exacerbated by activity, and can become quite debilitating. The injury occurs most commonly in men under the age of 40.

Despite the name sports hernia, there is no actual hernia. Instead, the injury involves the musculo-tendinous attachments upon the pubic symphysis and adjoining pubic ramus bones, with tendon degeneration or tears and sometimes with bone marrow and muscle edema. The lower abdominal muscles (external and internal oblique, transversus abdominis, and rectus abdominis) insert onto the pubic symphysis from above and the adductor muscles of the thigh (pectineus, gracilis, adductor longus, adductor brevis, and adductor magnus) insert onto the pubic symphysis from below. The rectus abdominis and adductor longus tendon fibers merge to form a common fibrous aponeurosis that courses along the anterior surface of the pubic symphysis to create a single continuous structure (**Fig 2**). In a severe injury, the tendons may be completely avulsed from the pubic bone. As in the shoulder or ankle, tendon degeneration appears high signal on proton density or T1W images and tendon tears appear high signal on T2W and fat saturated T2W or STIR images. Conservative treatment and steroid injection may be attempted, but definitive treatment often requires surgery.

There are many causes of groin pain (**Table 1**). Because the differential diagnosis based on clinical exam can be difficult, MRI plays an important role. While many causes of groin pain can be identified on a routine screening musculoskeletal pelvis or unilateral hip MR study, diagnosis of true “sports hernia” require a specialized MRI examination.

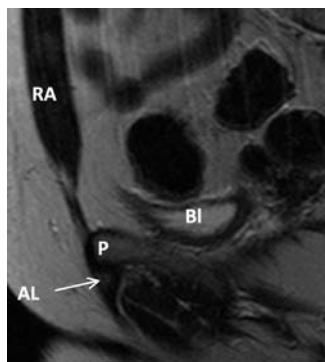


Fig 2. Normal Sagittal Midline Anatomy. Note that the rectus abdominis muscle of the anterior abdomen is confluent with the adductor longus tendon and muscle of the proximal thigh, forming a single fibrous aponeurosis centered on the anterior surface of the pubic bone. **RA**, Rectus Abdominis. **AL**, Adductor Longus. **P**, Pubic bone. **BI**, Bladder.

MR Imaging Technique:

The exam is a multiplanar non-contrast exam, performed using the body array coil. The first part of the exam is comprised of larger field of view (FOV) images that help screen for other kinds of pathology, while the second part of the exam employs smaller FOV images targeted to the area of interest about the pubic symphysis (**Fig 3**). Coil coverage should run from the iliac crest to proximal femoral diaphyses, centered at or just above the pubic symphysis, to ensure good coverage both above and below the pubic symphysis. A specialized oblique axial plane helps to nicely lay out all the muscles and tendons that insert on the anterior pubic rami. To be useful for diagnosis, this plane must be optimally positioned – parallel to the ilio-pubic cortex or arcuate line of the pelvic inlet. If necessary, the radiologist can help to confirm proper positioning. Additional details are provided in the Teaching Points.

Table 1. Clinical Differential Diagnosis of Groin Pain

Sports Hernia

Degeneration or tear involving the Rectus Abdominis–Adductor Longus tendons or their combined aponeurosis

Pubic Symphysis

Pubic Ramus Stress Fracture
Osteitis pubis
Apophysitis (teenager with unfused apophyses)

Hip

Arthritis
Septic Arthritis
Osteonecrosis (AVN or avascular necrosis)
Stress fracture

Inguinal hernia

Scrotum

Epididymitis and orchitis
Testicular Torsion

Referred pain

Lumbar spine sciatica
Knee pain

Nerve Entrapment

Piriformis syndrome (sciatic nerve)
Pudendal, obturator, or femoral nerves

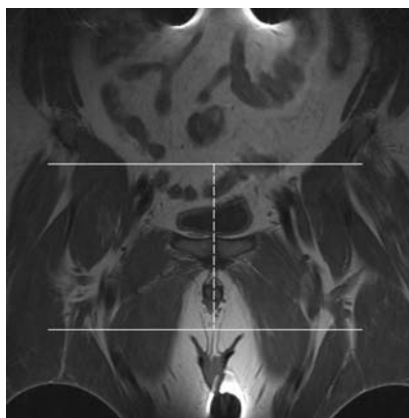


Fig 3a. Localizer for Axial Images. Center right/left on pubic symphysis. Scan from supra-acetabular iliac bone to below the pubic symphysis, along perineal subcutaneous fat.

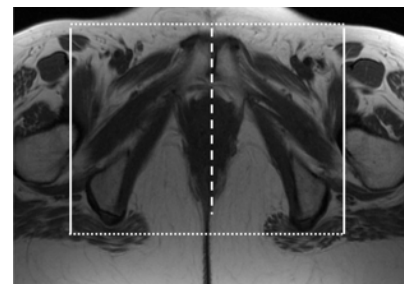


Fig 3b. Localizer for Targeted Images. Center right/left on pubic symphysis. Scan from medial femur to medial femur. FOV should include from fat anterior to pubic symphysis to posterior to ischial tuberosities. Sagittal images should be aligned along the pubic symphysis. Coronal images should be aligned along the anterior surface of the pubic bones.

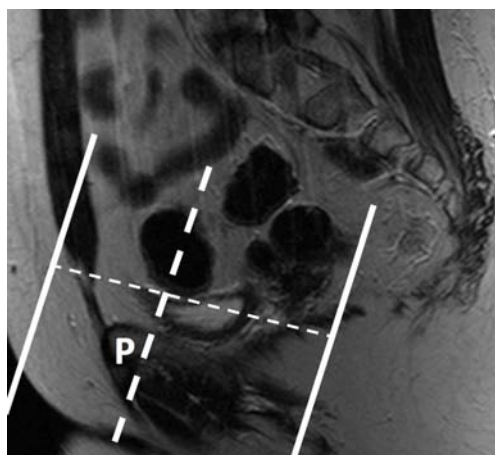


Fig 3c-d. **c.** (midline), **d** (lateral). Localizer for Targeted Oblique Axial Plane. Images are aligned perpendicular to the pubic ramus (midline) and parallel to iliopubic cortex (lateral). Scan from anterosuperior to pubic symphysis through posteroinferior to hip joint.

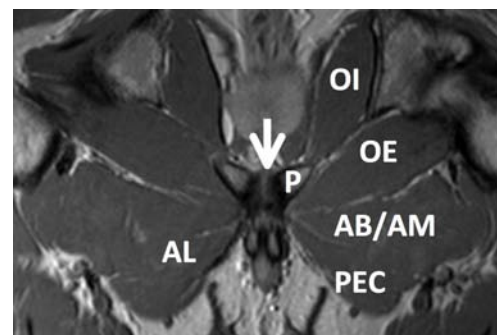
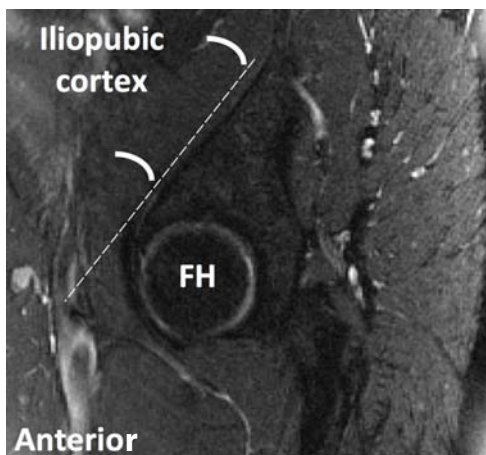


Fig 3e. Resultant oblique axial PDW image shows normal muscles about the pubic symphysis (arrow). **P**, pubic bone. **AB**, adductor brevis. **AM**, adductor magnus. **AL**, adductor longus. **OE**, obdurator externus. **OI**, obdurator internus. **PEC**, pectineus.

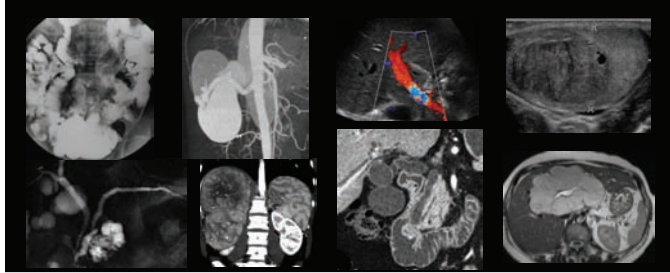
Sports Hernia Teaching Points:

- Sports hernia, also known as athletic pubalgia because there is no actual hernia, refers to an injury of the rectus abdominis-adductor longus tendons and/or their aponeurosis. The aponeurosis is dense fibrous tissue formed by the tendon fibers as they join, attach, and pass over the anterior surface of the pubic symphysis and the adjoining portion of the pubic bones.
- The exam is composed of two parts:
 - i) Relatively routine pelvic images (slightly smaller than normal FOV): Coronal T1, Coronal STIR and axial FS-T2W images
 - ii) Targeted small FOV (20-22 cm) images centered about the pubic symphysis: Sagittal FS-T2W, Oblique Axial T2W, and Oblique Axial PDW images
- The MRI examination is performed as a non-contrast exam using the body array coil. A smaller high quality coil, such as the cardiac coil, could be employed for the targeted portion of the exam, but would require optimal placement and would risk signal loss posteriorly in most patients, unless it could be combined the posterior array.
- The patient should empty his/her bladder prior to the exam to minimize motion artifact. Although the study is usually done with the patient supine, prone positioning – if tolerated -- may help in cases of “belly breathing”.
- Unlike other MSK studies of the hip or pelvis, the targeted images are centered on the pubic symphysis, in both craniocaudad and sagittal planes.
- Good coil placement is very important. The second, targeted part of the exam may require re-positioning of the coil (both anterior and posterior portions of the coil).
- A smaller field of view is employed for the targeted portion of the exam because many tendons are crowded in a small area and the smaller FOV helps to detect small tendon or aponeurotic tears.
- The oblique axial plane is positioned parallel to the ilio-pubic cortex, extending from anterior to the pubic symphysis and overlying tendons posteriorly to include the proximal adductor muscles. It extends parallel to the arcuate line of the pelvic inlet. It nicely lays out all the muscles centered in the area.
- Pathology appears similar to tendon pathology elsewhere: high PD/low T2 signal for tendon degeneration and high PD/high T2 signal for tendon tears.

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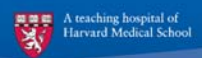
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Wednesday, December 12, 2012

5:00 pm - 6:00 pm

Rabkin Board Rm, Shapiro 10

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Event Coordinator: Lois Gilden, Tel: 7-0299 / lgilden@bidmc.harvard.edu



Kathleen West

HMFP contracts with McKesson for Revenue Cycle Management services including diagnosis coding, claims scrubbing, allowables monitoring, accounts receivable and insurance denial management, compliance and reporting. We offer this column by **Kathleen West**, McKesson's Senior Director of Account Management for Radiology, as an opportunity to keep you informed. During this time of revenue and utilization reductions, compliance scrutiny and increased payer denials, our partnership with McKesson has been vital to our ability to maintain our financial stability. Feel free to contact Kathy.west@mckesson.com should you have any specific questions or concerns related to the Revenue Cycle Management process.

McKesson Corner

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Radiology

Annual CPT Code Updates and Changes

- 2010** - 54 Updates & Changes
- 2011** - 56 Updates & Changes (including creation of Bundled CT Abdomen & Pelvis codes)
- 2012** - 46 Updates & Changes (including creation of Bundled CTA codes)
- 2013** - 41 Updates & Changes

Procedures reported together 75% or more result in bundled procedures

Top 5 Changes for 2013:

- **Aortography & Angiography**
 - o Bundled codes include catheterization, contrast, fluoro, RS&I
- **Intravascular Thrombolysis**
 - o Bundled codes include thrombolytic infusion, RS&I, repeated imaging and catheter exchanges on same day, moderate sedation
- **Thorocentesis**
 - o Bundled codes to include Image Guidance
- **Nuclear Medicine**
 - o Combined single and multiple determinations for thyroid imaging
 - o Single parathyroid imaging code deleted and now broken out into two codes
- **Diagnostic**
 - o Cervical codes revised to list number of views
 - o Several descriptor changes

Annual Medicare Physician Fee Schedule Update:

- **RVU Changes**
 - o Year over year impact (1.5%)
 - o Adjustments to Conversion Factor (2012 = \$34.0376)
 - Subject to SGR (26.5%)
- **GPCI Floor**
 - o Subject to expire on 12/31 unless acted on to extend
- **"Sequestration"**
 - o Covered under the budget control act (BCA of 2011)
 - o All Departments to receive an 8% cut
 - o Medicare payments will be reduced by 2% unless 111th Congress acts



Ho Ho Ho!

Thank you, Sheila Nadeau! At this time of year, anyone who visits the West Campus Clinical Center 3rd floor will notice the holiday-wrapped doors brightening the Ultrasound/Vascular Division, thanks to sonographer **Sheila Nadeau**. Her efforts above and beyond her clinical duties contribute to a cheerful environment for both patients and staff!

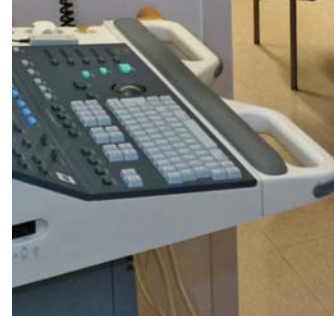


*Best
Wishes for
a Happy
Holiday
Season
to our
Radiology
Community
and
beyond!*



Given by
Lelia E. McGrath, M.S.W.

366B
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2012 BIDMC Radiology Publications [New Citations in Blue*]. We do a monthly PubMed search for new BIDMC publications and may miss those in which your affiliation is not noted. If we miss your paper, please send the reference to dwolfe@bidmc.harvard.edu.

Note that publications do not always appear in Pubmed in the same month they are actually published and publications listing an Epub date may be updated in the new year, thus their paper publication will appear in 2013.

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