Lymphoma in the Integumentary System: Spectrum of Imaging Findings and Differential Diagnosis

All Day Room: MS Community, Learning Center

Participants
Arthur J. Pesch III, MD, Charlottesville, VA (Presenter) Nothing to Disclose
Lucia Flors, MD, Charlottesville, VA (Abstract Co-Author) Nothing to Disclose
Maria d. Leiva-Salinas, MD, PhD, Alicante, Spain (Abstract Co-Author) Nothing to Disclose
Juliana M. Bueno, MD, Chicago, IL (Abstract Co-Author) Nothing to Disclose

TEACHING POINTS
The secondary involvement of the skin and soft tissues by lymphoma is a common form of extranodal involvement. The International Prognostic Index (IPI) for Non-Hodgkin Lymphoma is used as a predictor of outcome and takes into account five risk factors, one of which is “more than one site of extranodal involvement”. Cross sectional imaging is the main imaging method for imaging staging of lymphoma. It is essential for radiologists to be aware of the variety of manifestations of lymphoma involving the soft tissues, as well as the main differential diagnosis of these lesions. After reviewing this exhibit the learner will be able to:
1. Identify the forms of lymphoma that most frequently involve the skin, subcutaneous tissues and muscles, both primarily and secondarily.
2. Recognize the various patterns and imaging appearances of cutaneous lymphoma as seen in cross sectional imaging ordered for staging purposes, mainly: cutaneous nodules and plaques, subcutaneous nodules, diffuse infiltration of the skin and subcutaneous fat, muscle group infiltration.
3. Review the main differential diagnosis.

TABLE OF CONTENTS/OUTLINE
1. Illustration of the integumentary system
2. Radiologic-pathologic correlation and case-based review of the patterns of involvement of the skin, subcutaneous tissues and muscles by lymphoma
3. Differential diagnosis
4. Conclusions
Measurement Methods of the Lesions Size in the Oncologic Patient

All Day Room: MS Community, Learning Center

Participants
Orlando Catalano, MD, Napoli, Italy (Abstract Co-Author) Nothing to Disclose
Antonio Nunziata, MD, Ercolano, Italy (Presenter) Nothing to Disclose
Vincenza Granata, Naples, Italy (Abstract Co-Author) Nothing to Disclose
Roberta Fusco, Naples, Italy (Abstract Co-Author) Nothing to Disclose
Vittoria Nunziata, Ercolano, Italy (Abstract Co-Author) Nothing to Disclose
Antonella Petrillo, MD, Naples, Italy (Abstract Co-Author) Nothing to Disclose

TEACHING POINTS
This exhibit is intended as an illustrated guide to improve the assessment of patients undergoing cancer treatment, with special reference to the knowledge of the RECIST system ver 1.1.

TABLE OF CONTENTS/OUTLINE
Tumor extent influences staging, treatment planning, and prognosis of cancer patient. The measurement of lesions size consequently represents a key moment in cancer imaging. Serial sizing is fundamental in the objective assessment of tumor response to treatment, influencing the oncologist’s decision making. In this exhibit we highlight the relevance of tumor measurement, describe the main modalities of measurement, and highlight the main tips and tricks in the radiological assessment and reporting of measures. We first illustrate the scientific and practical relevance of precise cancer lesions measurement. Secondly, we explain how correct measurements are obtained, with related pitfalls. Serial images from various paradigmatic cases will be shown. Then we compare the various systems of response assessment (WHO, RECIST, RECIST 1.1). Finally we mention the limitation of relying only on lesions’ size and we illustrate the new, non-dimensional possibilities of patient assessment. Correct measurement of cancer lesions and appropriate knowledge of the treatment response assessment systems is mandatory in radiological practice.
A Zoography for the Radiologist: Animal Signs in Radiology

All Day Room: MS Community, Learning Center

Awards
Magna Cum Laude

Participants
Hao Xiang, MBChB, MBBS, Sydney, Australia (Presenter) Nothing to Disclose
Lloyd J. Ridley, MBBS, Concord, Australia (Abstract Co-Author) Nothing to Disclose
William Ridley, Armidale, Australia (Abstract Co-Author) Nothing to Disclose
Jason Y. Han, MBBS, Sydney, Australia (Abstract Co-Author) Nothing to Disclose

TEACHING POINTS

1: We aim to educate and entertain with our list of over 100 animal inspired signs in radiology which is the largest known collection in the literature. 2: We discuss the phenomenon of pareidolia where vague visual stimuli are interpreted by the brain as concrete shapes. This is the basis of seeing animals in radiological signs and is an elegant way for the brain to quickly compartmentalise complex visual data using the visual scaffolding of an already known entity.

TABLE OF CONTENTS/OUTLINE

Website Layout (each section is a hyperlink into its own page)
1: Introduction
2: Pareidolia in Imaging
A discussion on the use of visual metaphors in radiology. A list of other groups of objects used (food signs, mythological signs etc).
3: Honourable Mentions
Several interesting signs that didn't quite make the cut.
4: Quizzes
There will be several sets of questions based on the animal signs. There will be imaging based and "trivia" based sets divided into common and subspecialty categories.
5: Animal Signs
These can be navigated alphabetically or by category (system or animal based indexes). Each sign contains an image, description, short discussion and references.
Radiology Afloat: Radiology Onboard the Navy Hospital Ship USNS Comfort during Continuing Promise 15

All Day Room: MS Community, Learning Center

Participants
James Clark, MD, Portsmouth, VA (Presenter) Nothing to Disclose
Chad J. Baarson, DO, Great Falls, MT (Abstract Co-Author) Nothing to Disclose

TEACHING POINTS
1. Learn about the radiology capabilities and assests onboard the USNS Comfort Navy hospital ship.
2. Learn about the US Navy humanitarian mission Continuing Promise 15.
3. Learn about how Navy radiology used field portable radiology and ultrasound assets to deploy into the austere environment to support medical engagement sites throughout Central and South America and the Caribbean.
4. Learn how this can be translated into mass casualty and disaster response and warfighter support.
5. Review selected interesting cases from the Continuing Promise 15 mission.

TABLE OF CONTENTS/OUTLINE
Overview of Radiology Assets onboard the USNS Comfort hospital ship
Overview of US Navy Continuing Promise 15 humanitarian mission throughout Central and South America and Caribbean
Radiology support at surgical screening and medical engagement sites, using field portable radiologic and ultrasound machines in an austere environment to support the clinicians
Interesting cases from Continuing Promise 15
How this can be translated to disaster relief and warfighter support
Whole-body magnetic resonance imaging (WB-MRI) is particularly useful for examining oncology patients because it provides a comprehensive evaluation of malignant diseases without ionizing radiation. Innovations in hardware and software in last decade have significantly reduced examination time with improved image quality and patient comfort, e.g., the use of 3 Tesla MR scanner or short tunnel MR scanner. However, there are still a lot of limitations and challenges in WB-MRI arising from the MRI scanners, sequences and patient related issues. The purpose of exhibition is through cases, 3D illustrations and pictures to: Understand the indications and modern MRI techniques (eg. diffusion) and protocol optimization enabling effective WB-MRI examination in oncology patients. Highlight the possible means to tackle the challenges and discuss the future development (eg PET/MRI) in WB-MRI in oncology patient.

TEACHING POINTS

Introduction of WB-MRI Indications Hardware considerations 3T verus 1.5T Phase array coil system Protocols with cases illustration of role of MR sequences and contrast agent Understand the challenges of WB-MRI Patient related, eg. uncooperation Scanner related, eg. short tunnel MRI Sequence artifact and optimization Future direction eg multiparametric and PET/MRI
Heart Diseases Affecting the Liver and Liver Diseases Affecting the Heart: Crossing the Diaphragm Wall

All Day Room: MS Community, Learning Center

Awards
Certificate of Merit

Participants
Anne-Lise Hachulla, MD, Geneva, Switzerland (Presenter) Nothing to Disclose
Stephanie Franchi-Abella, MD, Le Kremlin-Bicetre, France (Abstract Co-Author) Nothing to Disclose
Matthieu Lagadec, MD, Clichy, France (Abstract Co-Author) Nothing to Disclose
Judith Bouchardy, Geneva, Switzerland (Abstract Co-Author) Nothing to Disclose
Virginie Lambert, Kremlin-Bicetre, France (Abstract Co-Author) Nothing to Disclose
Frederic Lador, Geneva, Switzerland (Abstract Co-Author) Nothing to Disclose
Jean-Paul M. Vallee, MD, Geneva, Switzerland (Abstract Co-Author) Nothing to Disclose
Maurice Beghetti, Geneva, Switzerland (Abstract Co-Author) Nothing to Disclose
Daniele M. Pariente, MD, Bicetre, France (Abstract Co-Author) Nothing to Disclose
Valerie Vilgrain, MD, Clichy, France (Abstract Co-Author) Nothing to Disclose
Maxime Ronot, MD, Clichy, France (Abstract Co-Author) Nothing to Disclose

TEACHING POINTS
- To describe imaging features of liver involvement in heart diseases, and of heart involvement in liver diseases
- To describe imaging features of diseases affecting both organs
- To describe both pediatric and adult populations

TABLE OF CONTENTS/OUTLINE

1. Anatomy/hemodynamics
2. Imaging
   a. Heart involvement in liver diseases
      Cirrhosis (hepatopulmonary syndrome, portopulmonary hypertension)
      Hereditary hemorrhagic telangiectasia
      Congenital porto-systemic shunts
      Focal lesions (infantile/congenital hemangiomas, liver tumors with venous invasion)
   b. Liver involvement in heart diseases
      Heart failure
      Valvular heart disease
      Congenital heart disease/malformations
      Carcinoid heart disease
      Pericarditis
   c. Diseases affecting both organs
      Hemochromatosis and amyloidosis
      Connective tissue diseases
      Vasculopathy: Alagille

Clinical consequences on patient management

The liver and the heart are close organs, connected by large vessels. As a consequence, the liver can be involved in heart diseases, leading to chronic hepatitis and congestion, fibrosis deposition and cirrhosis. On the other hand, the heart can be affected by liver diseases, leading to high-flow heart failure, and pulmonary hypertension and overload. Finally both organs can be affected by common diseases, mainly metabolic, and vascular.
TEACHING POINTS

1. Postmortem CT (PMCT) can be useful to clarify the cause of death in patients who died of unknown causes. PMCT images must be carefully interpreted as they are often affected by postmortem changes or resuscitation procedures.
2. Agreement between PMCT- and autopsy findings is 85% in trauma-related and 30% in non-trauma-related deaths.
3. Contrast-enhanced PMCT is useful for ruling in or ruling out acute cardiac infarction, acute aortic dissection, and pulmonary thromboembolism.

TABLE OF CONTENTS/OUTLINE

1. Clinical and social significance of PMCT imaging
2. Diseases that can be diagnosed by PMCT
3. Diseases that cannot be diagnosed by PMCT
4. Interpretation of PMCT images
5. Contrast-enhanced PMCT
6. Representative case presentation
MRI Artifacts: Lose Them or Use Them? Artifacts Can Be a Burden and Obscure Important Findings, or the Very Same Artifacts Can Be Utilized to Increase Your Ability to Identify Many Pathologies to Make You a More Effective Radiologist!

All Day Room: MS Community, Learning Center

Participants
Christopher Molloy, MD, Los Angeles, CA (Presenter) Nothing to Disclose
Rex A. Parker III, MD, Los Angeles, CA (Abstract Co-Author) Nothing to Disclose

TEACHING POINTS
Understand how and why common MRI Artifacts occur
Understand how to utilize specific MRI artifacts to better identify pathology on MRI
Learn how to minimize specific MRI artifacts

TABLE OF CONTENTS/OUTLINE
Overview of MRI Artifacts
What are artifacts
Introduction to common artifacts
Physics of MRI Artifacts: why do they happen
Features to consider when encountering new/unusual artifacts
Sequence type
Phase & frequency direction
Tissue composition
Metallic foreign bodies
MRI Artifacts: Which artifacts to USE and which ones to LOSE
Chemical Shift
Chemical Shift of the 1st kind
How to minimize chemical shift of the 1st kind
What pathology can Chemical Shift of the 1st kind reveal
Chemical Shift of the 2nd kind
How to minimize chemical shift of the 2nd kind
What pathology can Chemical Shift of the 2nd kind reveal
Susceptibility
How to minimize Susceptibility
What pathology can Susceptibility uncover
How Susceptibility can be used to your advantage
Parallel Imaging
How to minimize artifacts associated with Parallel Imaging
Wrap
How to minimize Wrap
Gibbs
How to minimize Gibbs
Motion
How to minimize Motion
Summary/Conclusion
Perineural Invasion in Abdominal and Pelvic Malignancies: Anatomy, Evolving Concepts and Imaging Patterns

All Day Room: MS Community, Learning Center

Awards
Cum Laude

Participants
Varaha Tammisetti, MD, Houston, TX (Presenter) Nothing to Disclose
Anil K. Dasyam, MD, Pittsburgh, PA (Abstract Co-Author) Book contract, Reed Elsevier
Venkata S. Katabathina, MD, San Antonio, TX (Abstract Co-Author) Nothing to Disclose
Christine O. Menias, MD, Chicago, IL (Abstract Co-Author) Nothing to Disclose

TEACHING POINTS
1. Illustrate the anatomy of extra-pancreatic neural plexuses and lumbosacral plexuses with emphasis on the pathways of perineural spread/invasion. 2. Understand the evolving concepts and proposed mechanism of perineural spread of select abdominal and pelvic malignancies. 3. Illustrate the imaging appearances of perineural spread of malignancies in abdomen and pelvis.

TABLE OF CONTENTS/OUTLINE
Perineural invasion (PNI) is a marker for aggressive behavior and contributes to early dissemination, increased incidence of recurrence and may explain unusual sites of recurrence.
2. Anatomy of lumbosacral plexus, identification on imaging and corresponding pelvic bone sclerotome map.
3. Review the molecular mechanisms and incidence of perineural invasion in select abdominal and pelvic malignancies including pancreatic cancer, cholangiocarcinoma, prostate cancer, bladder cancer, rectal cancer and cervical cancer.
4. Illustrate and discuss the proposed mechanism of spread/invasion, imaging appearances and significance of abdominal malignancies including pancreatic cancer, prostate cancer, rectal cancer and cervical cancer.
5. Future Directions and Summary.

Honored Educators
Presenters or authors on this event have been recognized as RSNA Honored Educators for participating in multiple qualifying educational activities. Honored Educators are invested in furthering the profession of radiology by delivering high-quality educational content in their field of study. Learn how you can become an honored educator by visiting the website at: https://www.rsna.org/Honored-Educator-Award/

Venkata S. Katabathina, MD - 2012 Honored Educator
Christine O. Menias, MD - 2013 Honored Educator
Christine O. Menias, MD - 2014 Honored Educator
Christine O. Menias, MD - 2015 Honored Educator
Christine O. Menias, MD - 2016 Honored Educator
What Every Radiologist Should Know about Peritoneal Metastases: A Correlation of Radiological, Surgical and Pathological Findings

Awards
Cum Laude

Participants
Javier Miguez Gonzalez, MD, Barcelona, Spain (Presenter) Nothing to Disclose
Francesc Calaf, MD, Barcelona, Spain (Abstract Co-Author) Nothing to Disclose
Laura Pelegri-Martinez, MD, Sant Joan Despi, Spain (Abstract Co-Author) Nothing to Disclose
Pilar Lozano Arranz, MD, Barcelona, Spain (Abstract Co-Author) Nothing to Disclose
Victoria Fuste Chimisana, MD, Barcelona, Spain (Abstract Co-Author) Nothing to Disclose
Maria Isabel Ramos Bernado, MD, Barcelona, Spain (Abstract Co-Author) Nothing to Disclose
Jordi Catala Forteza, MD, Barcelona, Spain (Abstract Co-Author) Nothing to Disclose

TEACHING POINTS
The purpose of this exhibit is: 1. To illustrate the different patterns of presentation of peritoneal metastases on multidetector CT according to the type of primary tumor with surgical and pathological correlation. 2. To discuss the differential diagnosis of peritoneal metastases from primary tumors of the peritoneum and other non-tumoral entities.

TABLE OF CONTENTS/OUTLINE
1. Introduction to Peritoneal Metastases - Etiology, clinical presentation and general imaging features
2. Patterns of Disease on Multidetector CT with Surgical and Pathological Correlation - Peritoneal Carcinomatosis - Mucinous Carcinomatosis - Pseudomyxoma Peritonei - Sarcomatosis - Lymphomatosis
3. Differential Diagnosis - Primary Tumors of the Peritoneum (Mesothelioma, Primary Peritoneal Carcinoma) - Non-tumoral entities (Granulomatous Peritonitis, Inflammatory Pseudotumor, Endometriosis)
4. Limitations of CT in the Assessment of Peritoneal Metastases
5. Summary and Conclusions
**TEACHING POINTS**

1. To recognise the constellation of features seen in von Hippel-Lindau (VHL) disease using a multimodality approach.
2. To learn how different imaging techniques may be used for screening, monitoring and management lesions in disparate body systems. In particular, features of malignancy, warranting early intervention.
3. To understand the different ways interventional radiological techniques can aid in the management of patients with VHL disease.

**TABLE OF CONTENTS/OUTLINE**

Overview Renal lesions Interventional techniques for renal malignant lesions: cryoablation Pancreatic lesions Phaeochromocytomas Epididymal papillary cystadenomas CNS manifestations Interventional techniques for hemangioblastomas: preoperative embolization Take home messages & summary
What’s to Blame for High Blood Pressure? A Review of the Imaging Manifestations of Secondary Hypertension (SH)

All Day Room: MS Community, Learning Center

Participants
Charles Crain, Ft. Sam Houston, TX (Abstract Co-Author) Nothing to Disclose
Christopher J. Lisanti, MD, Schertz, TX (Presenter) Royalties, Wolters Kluwer nv
Ryan B. Schwope, MD, San Antonio, TX (Abstract Co-Author) Nothing to Disclose
Mark True, Ft. Sam Houston, TX (Abstract Co-Author) Nothing to Disclose

TEACHING POINTS
1. 5-10% of patients with hypertension (HTN) have SH. 2. SH is suspected in patients: without risk factors or family history of HTN; <30 years old; refractory to drug therapy; suddenly require more intense therapy; specific clinical presentation. 3. Most SH is hormonal in etiology and can be divided into Primary and Secondary. 4. Primary causes hormonal release directly from an organ while secondary causes another organ to release an abnormal amount of hormone. 5. Renin-angiotensin-aldosterone axis is most common although adrenergic, thyroid, parathyroid, cortisol and growth hormones (GH) also cause SH.

TABLE OF CONTENTS/OUTLINE
1. Review suggestive clinical presentations and pathophysiology.
2. List imaging findings of SH.
4. Adrenergic. 1º: pheochromocytoma; ganglioneuroma. 2º: intracranial HTN.
5. Hypo-/Hyperthyroidism. 1º: thyroid adenoma; chronic thyroiditis. 2º: pituitary adenoma (TSH).
6. Hyperparathyroidism. 1º: parathyroid adenoma.
7. Hypercortisolism. 1º: adrenal adenoma or hyperplasia; ACC. 2º: pituitary adenoma (ACTH).
8. Acromegaly 1º: pituitary adenoma (GH)
Dual Energy CT Applications in Hepatobiliary and Pancreas Evaluation: What Does It Offer to Clinical Practice?

All Day Room: MS Community, Learning Center

Participants
Dimitry Shnayderman, MD, Milwaukee, WI (Presenter) Nothing to Disclose
Parag P. Tolat, MD, Milwaukee, WI (Abstract Co-Author) Nothing to Disclose
Michael O. Griffin Jr, MD, PhD, Milwaukee, WI (Abstract Co-Author) Nothing to Disclose
Stacy D. O'Connor, MD, Milwaukee, WI (Abstract Co-Author) Nothing to Disclose
Joseph J. Budovec, MD, Milwaukee, WI (Abstract Co-Author) Nothing to Disclose
Yu Liu, PhD, Milwaukee, WI (Abstract Co-Author) Nothing to Disclose
W. Dennis Foley, MD, Milwaukee, WI (Abstract Co-Author) Research Consultant, General Electric Company
Naveen Kulkarni, MD, Milwaukee, WI (Abstract Co-Author) Nothing to Disclose

TEACHING POINTS
1. To discuss the technique, protocols and work flow for DECT imaging of the Hepatobiliary and Pancreas.2. To review the clinical applications of DECT with illustrative examples of hepatobiliary and pancreatic pathology.3. To discuss the potential pitfalls, challenges and work flow issues in successful incorporation of DECT imaging into clinical practice.

TABLE OF CONTENTS/OUTLINE
1. Describe technical features and principles of DECT technology from different vendors with focus to hepatobiliary and pancreas imaging. Explain role of different image reconstructions such as material density (Iodine and Water) and monochromatic images.2. Discuss clinical application - characterization of lesions and demonstrating spectrum of benefit from DECT imaging of hepatobiliary system and pancreas. Illustrate examples using Iodine, Water/Virtual unenhanced and monochromatic images.3. Potential pitfalls and challenges in DECT liver and pancreas imaging in clinical practice.4. Impact of DECT on clinical workflow and patient care.
Low keV/kVp Imaging in the Era of Multi-Energy Spectral CT: A Mirage or a Miracle?

All Day Room: MS Community, Learning Center

Awards
Certificate of Merit

Participants
Naveen Kulkarni, MD, Milwaukee, WI (Presenter) Nothing to Disclose
Dimitry Shnayderman, MD, Milwaukee, WI (Abstract Co-Author) Nothing to Disclose
W. Dennis Foley, MD, Milwaukee, WI (Abstract Co-Author) Research Consultant, General Electric Company
Dhiraj Baruah, MD, Milwaukee, WI (Abstract Co-Author) Nothing to Disclose
Stacy D. O’Connor, MD, Boston, MA (Abstract Co-Author) Nothing to Disclose
Kaushik S. Shahir, MD, Milwaukee, WI (Abstract Co-Author) Nothing to Disclose
W. Dennis Foley, MD, Milwaukee, WI (Abstract Co-Author) Research Consultant, General Electric Company
Dhiraj Baruah, MD, Milwaukee, WI (Abstract Co-Author) Nothing to Disclose
Stacy D. O’Connor, MD, Boston, MA (Abstract Co-Author) Nothing to Disclose
Kaushik S. Shahir, MD, Milwaukee, WI (Abstract Co-Author) Nothing to Disclose
Michael O. Griffin Jr, MD, PhD, Milwaukee, WI (Abstract Co-Author) Nothing to Disclose
Yu Liu, PhD, Milwaukee, WI (Abstract Co-Author) Nothing to Disclose
Lawrence R. Goodman, MD, Milwaukee, WI (Abstract Co-Author) Author, Reed Elsevier; Advisory Panel, Jubilant DraxImage Inc;
Parag P. Tolat, MD, Milwaukee, WI (Abstract Co-Author) Nothing to Disclose

TEACHING POINTS

1. Multi-energy spectral CT acquisition can generate low kV images and also synthetic images known as monochromatic (MC) images. 2. Unlike low kV imaging, MC images are selectable over a wide energy range (40keV-140keV) and contrast. 3. MC images are also less prone to beam hardening. Unlike low kV CT which can result in unacceptable images due to artifacts and noise in large patients, MC imaging from spectral CT is feasible even in large patients. This exhibit provides the reader with an insight into various applications possible with low energy MC imaging and attempts to make recommendations for scanning protocols based on indications.

TABLE OF CONTENTS/OUTLINE

1. Principle for using low kilovoltage/keV monochromatic (MC) techniques - k-edge phenomena and Compton effect
   a. Image noise and quality
   b. Complex scanning protocol
2. Discuss challenges of low kV imaging with single energy CT.
   a. Image noise and quality
3. MC imaging with spectral CT - Physics and technique
4. Discuss multi-energy spectral CT acquisition, MC image generation and its advantages over low kV imaging.
5. Various thoracic and abdominal applications of low energy MC images. Lesion detection, Lesion characterization, Vascular applications and others.
6. Recommendations for Protocol Guidance
7. Limitations of using spectral CT MC imaging. Workflow challenges.
Imaging of IgG-4 Related Diseases with Clinicopathologic Correlation

All Day Room: MS Community, Learning Center

Awards

Cum Laude

Participants

Amrita K. Arneja, MD, Congers, NY (Presenter) Nothing to Disclose
Benjamin Navot, MD, Valhalla, NY (Abstract Co-Author) Nothing to Disclose
Sonia Seehra, BA, New York, NY (Abstract Co-Author) Nothing to Disclose
Anthony G. Gilet, MD, New York, NY (Abstract Co-Author) Nothing to Disclose

TEACHING POINTS

1. Review pathophysiology of IgG-4 related sclerosing diseases.
2. Present imaging characteristics with clinicopathologic correlation of IgG-4 related diseases.
3. Evaluate pearls and pitfalls of key aspects of imaging of IgG-4 related disease as well as malignant mimics.

TABLE OF CONTENTS/OUTLINE

We will present cases with clinicopathologic correlation and treatment of the following IgG4 related diseases. This will include potential pitfalls, malignant mimics, and:
1. CNS Lymphocytic hypophysitis
2. Head and neck dacryoadenitis sialadenitis orbital inflammatory pseudotumour
3. Thoracic lung disease inflammatory aortitis thyroiditis
4. Abdominopelvic autoimmune pancreatitis retroperitoneal fibrosis sclerosing cholangitis autoimmune hepatitis tubulo-interstitial nephritis occurring with ulcerative colitis
**Size Matters: Organ Measurements in Ultrasound Examination from Head to Toe. A Review of Normal Organ Measurements in the Most Common Ultrasound Exams**

All Day Room: MS Community, Learning Center

**Participants**
Alvaro Paniagua, MD, Madrid, Spain (Presenter) Nothing to Disclose
Jose L. Crespo San Jose, Madrid, Spain (Abstract Co-Author) Nothing to Disclose
Maria D. Lopez Parra, MD, San Sebastian De Los Reyes, Spain (Abstract Co-Author) Nothing to Disclose
Lain Ibanez, MD, San Sebastian De Los Reyes, Spain (Abstract Co-Author) Nothing to Disclose
Jose C. Albillos Merino, MD, San Sebastian De Los Reyes, Spain (Abstract Co-Author) Nothing to Disclose

**TEACHING POINTS**
To show normal measures and dimensions of some of the most important structures evaluated in ultrasound scans in order to facilitate pathological detection.

**TABLE OF CONTENTS/OUTLINE**
There is a wide spectrum of ultrasound exams and it is quite common to obtain certain measurements to assess normality. However, knowledge of normal values is necessary to detect organomegaly and normal variations due to patients’ age, specially in paediatric population. Moreover, in some usual diseases measurements are important to classify severity, such as thyroid nodules, prostatic hyperplasia and hydronephrosis. We display positioning and other technical features as well as normal measurements reported in literature for thyroid, parathyroid, spleen, gallbladder and biliary tract, adrenal glands, kidney, prostate, ovaries, testes and epididymis, some representative vessels and those which may prove useful for ligament and tendon evaluation, such as Achilles tendon, ankle tendons, plantar fascia and carpal tunnel structures. In summary, knowledge of normal measurements is important for everyday performance of many ultrasound scans. A compilation of the most common diameters obtained for certain organs according to the patient’s age is a useful tool in our routine.
Participants
Karan M. Anandpara, MBBS, Mumbai, India (Presenter) Nothing to Disclose
Akhil S. Halkude, MBBS, Pune, India (Abstract Co-Author) Nothing to Disclose
Smruti Mulani, MD, Mumbai, India (Abstract Co-Author) Nothing to Disclose

TEACHING POINTS
The purpose of this exhibit is: 1. To review the varied radiological imaging features of extra-pulmonary tuberculosis with multidrug resistance, which is a very unusual form of tuberculosis. 2. To assess if there are any significant differences in the imaging appearances of multidrug resistant tuberculosis versus those described for drug sensitive tuberculosis.

TABLE OF CONTENTS/OUTLINE
1. Introduction to multidrug resistant tuberculosis
2. Review of imaging findings of multidrug resistant extrapulmonary tuberculosis:
   - Skeletal tuberculosis
   - Abdominal tuberculosis
   - Nervous system TB
   - Others
3. Comparison of imaging appearances of drug resistant and drug sensitive extra-pulmonary tuberculosis
4. Summary and conclusion
Evaluation of Fibrosis by Body CT and MRI: What the Radiologist and Radiology Technologist Should Know

Participants
Shinya Torii, RT, Tokyo, Japan (Presenter) Nothing to Disclose
Haruhiko Machida, MD, Tokyo, Japan (Abstract Co-Author) Nothing to Disclose
Takuya Ishikawa, Tokyo, Japan (Abstract Co-Author) Nothing to Disclose
Shinya Kojima, Tokyo, Japan (Abstract Co-Author) Nothing to Disclose
Masami Hirata, Tokyo, Japan (Abstract Co-Author) Nothing to Disclose
Isao Tanaka, Tokyo, Japan (Abstract Co-Author) Nothing to Disclose
Rika Fukui, Tokyo, Japan (Abstract Co-Author) Nothing to Disclose
Yuzo Yamamoto, Tokyo, Japan (Abstract Co-Author) Nothing to Disclose
Katsuya Matsuzawa, Tokyo, Japan (Abstract Co-Author) Nothing to Disclose
Yun Shen, PhD, Beijing, China (Abstract Co-Author) Employee, General Electric Company Researcher, General Electric Company
Eiko Ueno, MD, Chiyoda-Ku, Japan (Abstract Co-Author) Nothing to Disclose

TEACHING POINTS
To describe the clinical significance for evaluating fibrosis by body CT & MRI
To illustrate various techniques for evaluating fibrosis by body CT & MRI
To demonstrate the clinical applications of these techniques by presenting various clinical images

TABLE OF CONTENTS/OUTLINE
Clinical significance for evaluating fibrosis
Accurate definitive diagnosis & disease staging
Adequate patient management
Techniques for evaluating fibrosis
Morphological changes on CT & MRI: retraction, volume loss, traction bronchiectasis, honeycombing, bile/pancreatic-duct dilatation (MRCP) T1 & T2 shortening on MRI
Poor/delayed enhancement: CT/dual-energy CT (monochromatic/material decomposition imaging) & (fat suppression/dark-blood) MRI/T1 mapping
MR elastography (MRE)
Clinical applications of these techniques
Morphological changes: pulmonary fibrosis, liver cirrhosis, cholangiocarcinoma, primary sclerosing cholangitis, chronic pancreatitis
T1 & T2 shortening, poor/delayed enhancement: capsule of hepatocellular carcinoma/abscess, central scar in focal nodular hyperplasia, cholangiocarcinoma/pancreatic carcinoma/chronic pancreatitis/myelofibrosis/ovarian fibroma/inflammatory aortic aneurysm/retroperitoneal fibrosis/chronic myocardial infarction/cardomyopathies
MRE: liver fibrosis/cirrhosis
No Kidding: Pediatric Disease Manifesting in Adults
All Day Room: MS Community, Learning Center

Participants
Patrick Craig, DO, Wichita, KS (Presenter) Nothing to Disclose
Akash C. Joshi, MD, Wichita, KS (Abstract Co-Author) Nothing to Disclose
Kelsey S. Bourm, MD, Wichita, KS (Abstract Co-Author) Nothing to Disclose
Mohamad El Hawari, MD, Wichita, KS (Abstract Co-Author) Nothing to Disclose
Thomas Grillot, MD, Wichita, KS (Abstract Co-Author) Nothing to Disclose
Kamran Ali, MD, Wichita, KS (Abstract Co-Author) Nothing to Disclose

TEACHING POINTS
Present a case series of adult patients who are found to have undiagnosed conditions typically presenting in pediatric populations. We will highlight the importance of keeping a wide differential in patients presenting with chronic conditions. Discuss how mischaracterization of these findings could cause delay or be detrimental in management.

TABLE OF CONTENTS/OUTLINE
Introduction Pictorial essay of adult patients found to have various undiagnosed pediatric diseases/disorders Presenting symptoms Differential diagnosis Pathophysiology of each entity and imaging pearls Management and consequences of delayed diagnosis Conclusion Summary: Cases will be presented which demonstrate classic pediatric diseases in adult patients who were previously unaware of their diagnosis. In all the cases, the symptoms are consistent with the disease process. This highlights the importance of recognition of pediatric 'aunt minnies' no matter what the age of the patient. The differential diagnosis and key imaging and clinical findings of each case will be reviewed.
Abdominal and Pelvic Neoplastic Conditions: Role of Imaging and Tumor Markers

All Day Room: MS Community, Learning Center

Participants
Caroline Kato, DO, Chicago, IL (Presenter) Nothing to Disclose
Frank H. Miller, MD, Chicago, IL (Abstract Co-Author) Research Grant, Siemens AG
Courtney A. Coursey Moreno, MD, Suwanee, GA (Abstract Co-Author) Nothing to Disclose
Pardeep K. Mittal, MD, Atlanta, GA (Abstract Co-Author) Nothing to Disclose

TEACHING POINTS
1. Describe commonly used tumor markers for diagnosis of malignant conditions, staging, monitoring treatment and detection of recurrence, in conjunction with corresponding imaging studies.
2. Review practical imaging approach to common malignant conditions according to the result of serum biomarkers.
3. Describe differential diagnosis of elevated tumor markers in non malignant conditions.

TABLE OF CONTENTS/OUTLINE
- Correlation of tumor markers with imaging findings can improve care of oncologic and nononcologic patients.
- Tumor markers are substances which are higher than normal levels in blood, urine and other body tissues of patients with cancer. They play a crucial role in detection of disease and assessment of treatment response.
- Basic knowledge of tumor markers is crucial for radiologists' adequate interpretation of oncologic imaging studies.
- Primary abdomen and pelvic malignancies such as colon, liver, pancreas, prostate, ovarian and metastatic disease for example from breast will be discussed with corresponding tumor markers CEA, AFP, CA 19-9, PSA, CA 125, CA 15-3, beta HCG and Chromogranin A.

Summary: Tumor markers can be used for diagnosis, treatment response, staging and restaging, surveillance, and detection of recurrence. Along with clinical presentation, tumor markers should be utilized while interpreting imaging studies.

Honored Educators

Presenters or authors on this event have been recognized as RSNA Honored Educators for participating in multiple qualifying educational activities. Honored Educators are invested in furthering the profession of radiology by delivering high-quality educational content in their field of study. Learn how you can become an honored educator by visiting the website at: https://www.rsna.org/Honored-Educator-Award/

Frank H. Miller, MD - 2012 Honored Educator
Frank H. Miller, MD - 2014 Honored Educator
Courtney A. Coursey Moreno, MD - 2016 Honored Educator
Pardeep K. Mittal, MD - 2016 Honored Educator
Tumors of hematopoiesis: A Simplified Approach

All Day Room: MS Community, Learning Center

Awards
Certificate of Merit

Participants
Ryo Miyazawa, MD, Tokyo, Japan (Presenter) Nothing to Disclose
Taiki Nozaki, MD, Orange, CA (Abstract Co-Author) Nothing to Disclose
Masaki Matsusako, MD, PhD, Tokyo, Japan (Abstract Co-Author) Nothing to Disclose
Junichi Tsuchiya, MD, Tokyo, Japan (Abstract Co-Author) Nothing to Disclose
Yasuyuki Kurihara, MD, Tokyo, Japan (Abstract Co-Author) Nothing to Disclose
Jay Starkey, MD, Tokyo, Japan (Abstract Co-Author) Nothing to Disclose
Kouhei Yamamoto, Tokyo, Japan (Abstract Co-Author) Nothing to Disclose

TEACHING POINTS
While hematopoietic tumors are common, they are often difficult to diagnose because of their various radiologic appearances. In this exhibit, we aim to:
(1) Teach the pathogenesis of hematopoietic tumors.
(2) Simplify hematopoietic tumors in terms of histology and radiology through illustrations and radiologic images.

TABLE OF CONTENTS/OUTLINE
I. Review of histology and differentiation of hematologic stem cells through illustrations.
II. Review of images associated with hematopoietic tumors with an emphasis on unique differentiating features. Specific cases presented:
- Lymphoid tumors
  - B cell tumors
    - Follicular lymphoma
    - Mantle cell lymphoma
    - Diffuse large B cell lymphoma
    - Intravascular large B cell lymphoma
  - Burkitt lymphoma
  - Plasma cell neoplasms
    - Plasma cell myeloma
    - T/NK cell tumors
    - Adult T cell leukemia/lymphoma
- Extramedullary tumors
  - Nasal type-Hodgkin lymphoma
  - Myeloid tumors
  - Chloroma
  - Histiocytic tumors
  - Langerhans cell histiocytosis
- Extramedullary hematopoiesis
Dynamic MR Imaging of the Pelvic Floor: A Case-based Correlation of Pathological Findings with the Pelvic Floor Distress Inventory (PFDI-20) Questionnaire

All Day Room: MS Community, Learning Center

Participants
Anthony Cullen, MBCh, Dublin, Ireland (Presenter) Nothing to Disclose
Laura Sweeney, MBCh, MRCS, Dublin, Ireland (Abstract Co-Author) Nothing to Disclose
Peter Beddy, MD, FRCR, Dublin, Ireland (Abstract Co-Author) Nothing to Disclose

TEACHING POINTS

- Review the anatomy of the pelvic floor
- Imaging techniques and protocols
-Appearances of common pelvic floor pathologies on dynamic MR imaging
-Review the Pelvic Floor Distress Inventory (PFDI-20) questionnaire and demonstrate correlation with dynamic MR imaging

TABLE OF CONTENTS/OUTLINE

Pelvic floor weakness is debilitating and affects 25-50% of women over the age of 50. Dynamic MR imaging allows accurate, high resolution assessment of all pelvic compartments without the use of ionising radiation. The Pelvic Floor Distress Inventory (PFDI-20) is a questionnaire for women with pelvic floor disorders. Clinicians use it to measure how lower urinary tract, lower gastrointestinal tract and pelvic organ prolapse symptoms affect their quality of life. We have found that the PFDI-20 provides valuable clinical information to assist with image interpretation. We will present a number of pelvic floor disorders and correlate these cases with results from the PFDI-20 questionnaire.

1. Pelvic floor anatomy
2. Overview of the Pelvic Floor Distress Inventory (PFDI-20) and its use in clinical practice
3. Patient evaluation and preparation prior to dynamic MR imaging
4. Imaging techniques and protocols
5. Case-based illustration of common pelvic floor disorders and their correlation with PFDI-20 scores
6. Discussion
Whose Line Is It Anyway? Accurately Identifying Lines and Tubes in the Abdomen

All Day Room: MS Community, Learning Center

Participants
Sakura Noda, MD, Boston, MA (Presenter) Nothing to Disclose
David W. Allen, MD, Boston, MA (Abstract Co-Author) Nothing to Disclose

TEACHING POINTS

The accurate identification of a medical line or tube seen on imaging and the provision of clinically relevant findings related to the device are critical components of a radiology report. As the number of these medical devices used by healthcare providers expands, radiologists must remain knowledgeable about advancements in medical devices to maintain high-value reports. After completing this education exhibit, the participant will be able to:

1) identify a variety of lines and tubes within the abdomen and ways to discriminate between commonly confused devices,
2) understand how the physical appearance and function of the device corresponds to its appearance on imaging,
3) identify appropriate device positioning and the salient imaging findings relevant to clinical care.

TABLE OF CONTENTS/OUTLINE

1) Review of the compartments of the abdomen and relevant anatomic landmarks.
2) Case examples of abdominal lines and tubes including gastric and jejunal tubes, gastric bands, Jackson-Pratt drains, peritoneal dialysis catheters, nephrostomy tubes, nephroureteral stents, double-J stents, and ventriculoperitoneal and lumboperitoneal shunts. Findings on radiographs, CT and MR will be shown, as well as images of the lines and tubes prior to implantation.
Solving the Mystery of Triads: The Beautiful Threesomes of Radiology

All Day Room: MS Community, Learning Center

Participants
Ameya J. Baxi, MBBS, DMRD, San Antonio, TX (Presenter) Nothing to Disclose
Sara M. Koenig, MD, San Antonio, TX (Abstract Co-Author) Nothing to Disclose
Carlos S. Restrepo, MD, San Antonio, TX (Abstract Co-Author) Nothing to Disclose
Vijayanadh Ojili, MD, San Antonio, TX (Abstract Co-Author) Nothing to Disclose
Abhijit Sunnapwar, MD, San Antonio, TX (Abstract Co-Author) Nothing to Disclose
Kedar N. Chintapalli, MD, San Antonio, TX (Abstract Co-Author) Nothing to Disclose
Dhanashree Rajderkar, MD, Gainesville, FL (Abstract Co-Author) Nothing to Disclose

TEACHING POINTS
Several disease processes can present as constellations of clinical, laboratory, & radiological findings - known as triads. The clinical significance of each triad varies. Many times, initial imaging findings may incite further investigation, such as advising CT abdomen contrast study in a patient with pulmonary chondroma to look for gastrointestinal stromal tumors and extra-adrenal paraganglioma. 1. Our goal is to present cases of several classic triads to assist in review of conditions & to sharpen the acuity of the radiologist’s eye to suggest further imaging when needed to aid in diagnosis. 2. We present the materials in an entertaining quiz format

TABLE OF CONTENTS/OUTLINE
Following imaging triads in imaging will be reviewed:

Neuroradiology: Triad in Intracranial hypotension Cushing’s Triad Charcot’s Triad
Cardiothoracic: Beck’s Triad Garland’s Triad Carney’s Triad Bergman’s Triad Mackler’s Triad Capp Triad in spontaneous retropharyngeal hematoma
Body Imaging: Rigler’s Triad Acute cholecystitis triad gallbladder ghost triad Charcot’s Triad Currarino Triad
Musculoskeletal/Vascular: Unhappy Triad Terrible Triad of elbow Phemister Triad in tuberculous arthropathy Virchow’s Triad

Honored Educators
Presenters or authors on this event have been recognized as RSNA Honored Educators for participating in multiple qualifying educational activities. Honored Educators are invested in furthering the profession of radiology by delivering high-quality educational content in their field of study. Learn how you can become an honored educator by visiting the website at:

https://www.rsna.org/Honored-Educator-Award/

Carlos S. Restrepo, MD - 2012 Honored Educator
Carlos S. Restrepo, MD - 2014 Honored Educator
Participants
Dana Haddad, MD, PhD, New York, NY (Presenter) Nothing to Disclose
Yuman Fong, MD, Duarte, CA (Abstract Co-Author) Nothing to Disclose

TEACHING POINTS
1. Oncologic emergencies are potentially life-threatening conditions in a cancer patient that have developed, directly or indirectly, as a result of malignant disease or as a complication of treatment. 2. Select oncologic emergencies demonstrate characteristic pathophysiology and imaging findings. 3. Surgical oncologic emergencies can be categorized as metabolic, hematologic, and structural conditions. Structural conditions can be definitively diagnosed via cross-sectional imaging findings. 4. Functional information from nuclear imaging studies complements the anatomic information obtained with standard cross-sectional modalities. 5. Use of the ACR appropriateness criteria is helpful to guide both physicans and radiologists in utilizing the most useful imaging tools for patients.

TABLE OF CONTENTS/OUTLINE
Eosinophil-associated Diseases: A Review

All Day Room: MS Community, Learning Center

Awards
Certificate of Merit

Participants
Shuji Nagata, MD, Kurume, Japan (Presenter) Nothing to Disclose
Hiroshi Nishimura, MD, Chikushino, Japan (Abstract Co-Author) Nothing to Disclose
Kimberly K. Amrami, MD, Rochester, MN (Abstract Co-Author) Nothing to Disclose
Aiko Sumi, MD, Kurume, Japan (Abstract Co-Author) Nothing to Disclose
Asako Kuhara, Kurume, Japan (Abstract Co-Author) Nothing to Disclose
Tomohiro Ebata, Kurume, Japan (Abstract Co-Author) Nothing to Disclose
Hidetomo Himuro, Kurume, Fukuoka, Japan (Abstract Co-Author) Nothing to Disclose
Kiminori Fujimoto, MD, PhD, Kurume, Japan (Abstract Co-Author) Nothing to Disclose
Toshi Abe, MD, Kurume, Japan (Abstract Co-Author) Nothing to Disclose

TEACHING POINTS
To illustrate mechanisms of an increase in circulating and tissue eosinophilia of eosinophil-associated diseases (EADs). To review clinical presentation, imaging features, and diagnostic criteria of EADs in various organs. To discuss other conditions that mimic EADs in different organs.

TABLE OF CONTENTS/OUTLINE
1. Illustrate pathophysiology focusing on interleukin-5 which plays a major role in activating eosinophils for understanding eosinophil-associated diseases (EADs).
2. Review clinical presentation, imaging features, and diagnostic criteria of EADs in various organs (parasitic infestation, hypereosinophilic syndrome, eosinophilic granulomatosis with polyangiitis, eosinophilic granuloma, eosinophilic gastrointestinal diseases, eosinophilic pancreatitis, eosinophilic fasciitis, Kimura's disease, eosinophilic myocarditis etc.).
3. Discuss other conditions that may mimic EADs in different organs.
4. Evaluate the usefulness of diffusion-weighted MR imaging for approaching characterization of EADs. We emphasize that radiologists need to know clinical history and peripheral eosinophilia are critical clues in diagnosis of EADs.
Imaging Manifestations of Histopathology/Microbiology Proven Tuberculosis - An Imaging Review from Head to Toe

All Day Room: MS Community, Learning Center

Participants
Denver S. Pinto, MBBS, MD, Bangalore, India (Presenter) Nothing to Disclose
Soumya Cicilet, MBBS, MD, Bangalore, India (Abstract Co-Author) Nothing to Disclose
Farha Furrugh, MBBS, DMRD, Bangalore, India (Abstract Co-Author) Nothing to Disclose
Ravi Hoisala, MBBS, MD, Bangalore, India (Abstract Co-Author) Nothing to Disclose

TEACHING POINTS
1. To review the imaging finding of Tuberculosis (TB) involving various organ systems.
2. To review the complications of TB on imaging.

TABLE OF CONTENTS/OUTLINE
1. Pathophysiology of Tuberculosis (TB)
2. Organ Systems involved in TB
   - CNS: Brain: Meningitis, Tuberculoma, Tubercular abscess
   - Spinal: Pott's Spine, Epidural, meningitis, Intramedullary
   - Complications: Hydrocephalus, Vasculitis
   - Head and Neck: Retropharyngeal, Skull base, nodal
   - Chest: Endobronchial, Miliary, Parenchymal, Pleural
   - Oesophageal
   - Pericardial
   - Nodal Complications: Bronchopleural fistula, Rasmussen's aneurysm, Empyema necessitans
   - Abdominal: Peritonitis, Abdominal cocoon, ileo-caecal, Colonic, Gastroduodenal, Solid Organ
   - Nodal Complications: Obstruction, Perforation
   - Genitourinary: Renal, urinary tract
   - Fallopian tube
   - Epididymal, prostatic
   - Urethral
   - Muskuloskeletal: Joints-Central, Peripheral, Osteomyelitis
   - Multisystem Involvement
3. Review of imaging
   - X-ray and CT
   - Ultrasound
   - MRI

Sample cases and mimics: Differentials include malignancy, lymphoma, metastases, sarcoidosis, Crohn's disease, infections like atypical Mycobacteria and Actinomycosis. The importance of accurate diagnosis of TB and its complications in typical cases is stressed upon, along with raising the possibility of TB in atypical cases.
High-pitch CT Angiography; Clinical Applications and Protocol Optimization

All Day Room: MS Community, Learning Center

Participants
Faezeh Sodagari, MD, Chicago, IL (Presenter) Grant, Siemens AG
Yu Hong, MD, Dallas, TX (Abstract Co-Author) Nothing to Disclose
Mrunal L. Shah, MD, Gainesville, FL (Abstract Co-Author) Nothing to Disclose
Atilla Arslanoglu, MD, Chicago, IL (Abstract Co-Author) Grant, Siemens AG
Vahid Yaghmai, MD, Chicago, IL (Abstract Co-Author) Nothing to Disclose

TEACHING POINTS
Dual-source CT scanners have enabled CT scanning at high pitch (up to 3.2) to scan chest, abdomen and pelvis in less than a second in average adults. The main advantage of high-pitch scanning is the high temporal resolution and reducing motion artifacts, which is important in pediatric and cardiac imaging. We can utilize this technique in CT angiography (CTA) to scan at high speed. However, obtaining a good image quality at CTAs mandates careful patient selection, contrast injection, and scanner setting. The aim of this exhibit is to illustrate clinical applications, advantages, pitfalls, and protocol optimization for high-pitch CTA.

TABLE OF CONTENTS/OUTLINE
- Physics and technical aspects of high-pitch CTA- Clinical applications (brain, cardiac, chest, abdominoplevic, trauma)- Advantages High speed Radiation dose reduction Motion artifact reduction Pediatric patients- Pitfalls Limited availability of the scanners Increased noise Increased helical artifacts Tube current limitations of the scanner Potential for non-homogenous contrast enhancement- How to optimize high-pitch CTA Optimizing pitch for each patient: (weight and height, diagnostic task, contrast injection limits) Scanner settings (pitch, trigger, image reconstruction) Optimizing contrast injection (dose, flow rate, and timing of contrast injection)

Honored Educators
Presenters or authors on this event have been recognized as RSNA Honored Educators for participating in multiple qualifying educational activities. Honored Educators are invested in furthering the profession of radiology by delivering high-quality educational content in their field of study. Learn how you can become an honored educator by visiting the website at:
https://www.rsna.org/Honored-Educator-Award/

Vahid Yaghmai, MD - 2012 Honored Educator
Vahid Yaghmai, MD - 2015 Honored Educator
Participants
Faezeh Sodagari, MD, Chicago, IL (Presenter) Grant, Siemens AG
Naziya Samreen, MD, Gainesville, FL (Abstract Co-Author) Nothing to Disclose
Atilla Arslanoglu, MD, Chicago, IL (Abstract Co-Author) Grant, Siemens AG
Tarek A. Hijaz, MD, Chicago, IL (Abstract Co-Author) Nothing to Disclose
Vahid Yaghmai, MD, Chicago, IL (Abstract Co-Author) Nothing to Disclose

TEACHING POINTS
Most centers use low tube potentials (kV) for low dose CT scans. The photon spectrum at lower kVs mostly consists of low-energy photons that cannot pass through the patient. Although these photons do not help creating diagnostic images, they create a significant portion of the radiation to the patient. By using a tin filter over the X-ray tube to selectively pass high energy photons, we can eliminate low-energy photons from the X-ray spectrum. Using this spectral shaping method can produce more efficient X-ray beams with higher mean energies (100kV or 150 kV) to substantially reduce radiation to as low as conventional radiographs while preserving image quality. The aim of this exhibit is to review basic principles, clinical applications and pitfalls of spectral shaping.

TABLE OF CONTENTS/OUTLINE
- Physics and technical aspects of spectral shaping
- Clinical applications Head and neck: dental, PNS Thoracic imaging: lung cancer screening, CT bronchoscopy Abdominal imaging: renal stones, CT colonography Musculoskeletal: trauma imaging Pediatric imaging- Advantages Radiation dose reduction Artifact reduction: motion artifacts, streak artifacts- Pitfalls Limited availability Increased noise Change in tissue density- How to optimize the technique Patient selection Scanner settings Reconstruction

Honored Educators
Presenters or authors on this event have been recognized as RSNA Honored Educators for participating in multiple qualifying educational activities. Honored Educators are invested in furthering the profession of radiology by delivering high-quality educational content in their field of study. Learn how you can become an honored educator by visiting the website at: https://www.rsna.org/Honored-Educator-Award/

Vahid Yaghmai, MD - 2012 Honored Educator
Vahid Yaghmai, MD - 2015 Honored Educator
An Introduction to Robotic Surgery: What the Radiologist Needs to Know

All Day Room: MS Community, Learning Center

Participants
Sarah Bastawrous, DO, Seattle, WA (Presenter) Nothing to Disclose
Amir L. Bastawrous, MD, MBA, Seattle, WA (Abstract Co-Author) Owner, HeartSounds, Inc Stockholder, HeartSounds, Inc Consultant, Intuitive Surgical, Inc Consultant, Salix Pharmaceuticals, Inc

TEACHING POINTS
1. Discuss what is robotic surgery
2. Discuss patient benefits, advantages, disadvantages and clinical outcomes of robotic surgery
3. Discuss current applications for robotic surgery and commonly performed robotic surgical procedures
4. Assist viewer in identifying imaging appearances of normal postoperative anatomy and complications following robotic-assisted surgery

TABLE OF CONTENTS/OUTLINE
1. History and technologic background of robotic surgery
2. Current trends of robotic surgery
3. How is it performed, classification of surgical systems and common surgical applications
4. Intraoperative and post-operative advantages of robotic assisted surgery
5. Limitations of robotic surgery including safety, cost, availability and operator learning curve
6. Imaging appearances of normal postoperative anatomy
7. Multimodality, case based imaging illustrations of postoperative complications following robotic assisted surgery including, acute hemorrhage, vessel injury, postoperative hematoma, ureteral injury, postoperative bowel obstruction, bowel injury, anastomotic leak, postoperative fluid collections and other complications
8. Appropriate follow up imaging techniques for postoperative complications
Adventures and Misadventures in Plastic Surgery and Soft Tissue Implants

All Day Room: MS Community, Learning Center

Awards
Identified for RadioGraphics

Participants
Dana Lin, MD, New York, NY (Presenter) Nothing to Disclose
Tony T. Wong, MD, New York, NY (Abstract Co-Author) Nothing to Disclose
Gina A. Ciavarra, MD, New York, NY (Abstract Co-Author) Nothing to Disclose
Jonathan K. Kazam, MD, New York, NY (Abstract Co-Author) Nothing to Disclose

TEACHING POINTS
By the end of this educational exhibit, the participant should be able to: Recognize the normal postoperative appearance of commonly encountered plastic surgery procedures Develop familiarity with some less commonly encountered implant procedures, cosmetic and non-cosmetic Identify the most common complications that occur following these procedures

TABLE OF CONTENTS/OUTLINE
I. Pre-test
II. Prevalence and patient demographics of plastic surgery procedures
III. Legal issues surrounding plastic surgery procedures in the United States
IV. Types of procedures and examples of normal postoperative appearance Abdominoplasty and liposuction Gluteal augmentation Chest wall and shoulder augmentation Miscellaneous
V. Imaging findings of complications Seroma/hematoma Cellulitis Abscess Migration/displacement Rupture
VI. Differential diagnosis and potential mimickers
VII. Post-test
Recent updates on Cancers of Unknown Primary Sites

All Day Room: MS Community, Learning Center

Participants
Kyung Won Kim, MD, Seoul, Korea, Republic Of (Presenter) Nothing to Disclose
Chong Hyun Suh, MD, Seoul, Korea, Republic Of (Abstract Co-Author) Nothing to Disclose
Atul B. Shinagare, MD, Brookline, MA (Abstract Co-Author) Nothing to Disclose
Katherine M. Krajewski, MD, Boston, MA (Abstract Co-Author) Research Grant, General Electric Company Spouse, Employee, Ironwood Pharmaceuticals, Inc
Nikhil H. Ramaiya, MD, Jamaica Plain, MA (Abstract Co-Author) Nothing to Disclose

TEACHING POINTS
1. Understand the goals and process of stepwise diagnostic approach of cancers of unknown primary sites (CUPs)
2. Understand the role of imaging and immunohistochemistry in management of CUPs
3. Understand multidisciplinary management of patients with CUPs

TABLE OF CONTENTS/OUTLINE
1. Terminology and definition of CUPs
2. Stepwise diagnostic approach to CUPs- Initial work-up - Identifying specific subsets - Focused immunohistochemistry and gene profiling
3. Multidisciplinary management of patients with CUPs- Ultimate goals of management of CUPs- Role of the Radiologist in Cancer of Unknown Primary Site Diagnosis
4. Recent updates and future directions
5. Case discussion
Whole Body MRI: Technical Aspects, Clinical Applications and Daily-Practice Strategies of Interpretation

All Day Room: MS Community, Learning Center

Participants
Alessandro Stecco, MD, Novara, Italy (Presenter) Nothing to Disclose
Francesco Buemi, MD, Novara, Italy (Abstract Co-Author) Nothing to Disclose
Alessandra Ferrari, Novara, Italy (Abstract Co-Author) Nothing to Disclose
Luigi Canalis JR, MD, sassari, Italy (Abstract Co-Author) Nothing to Disclose
Gianmauro Sacchetti, Novara, Italy (Abstract Co-Author) Nothing to Disclose
Alessia Cassara, MD, Santhia, Italy (Abstract Co-Author) Nothing to Disclose
Alessandro Carriero, MD, Novara, Italy (Abstract Co-Author) Nothing to Disclose

TEACHING POINTS
Over the last years, there has been a growing interest about Whole-body diffusion-weighted MRI (WB-DW-MRI) especially for tumor staging and assessment of treatment response. The great advantage of WB-DW-MRI is that it does not expose the patient to ionizing radiation, therefore its development would be of great clinical significance. The major teaching points of this exhibit are: - to discuss strategies to improve and optimize this technique - to understand how to interpret WB-DW-MRI and how to integrate images - to discuss clinical applications - to demonstrate advantage/disadvantages of this technique

TABLE OF CONTENTS/OUTLINE
To illustrate the Whole-body diffusion-weighted MRI (WB-DW-MRI) technique used in our institution - To discuss clinical applications - To discuss the possible role of contrast medium injection - To explain how integration of in-/out-of phase with DWI and contrast medium sequences may help in the context of diffuse bone disease (multiparametric evaluation) - The usefulness of WB-DW-MRI in assessment follow-up and therapeutic management - To discuss the limitations of WB-DW-MRI and future application.
The Calcium Rush: Calcifications in the Thoraco-abdominal Region that Point to the Diagnosis

All Day Room: MS Community, Learning Center

Participants
Ana Carballeira Alvarez, MD, Donostia, Spain (Presenter) Nothing to Disclose
Santiago Correa, MD, Donostia, Spain (Abstract Co-Author) Nothing to Disclose
Amaia Llodio Uribeetxebarria, MD, Donostia, Spain (Abstract Co-Author) Nothing to Disclose
Carmen Biurrun Mancisidor, MD, Donostia, Spain (Abstract Co-Author) Nothing to Disclose
Juan Vega Eraso, San Sebastian, Spain (Abstract Co-Author) Nothing to Disclose
Amaia Goienetxea Murgiondo, MD, Bergara, Spain (Abstract Co-Author) Nothing to Disclose
Virginia Gomez, San Sebastian, Spain (Abstract Co-Author) Nothing to Disclose
Monica Fernandez Martin, San Sebastian, Spain (Abstract Co-Author) Nothing to Disclose

TEACHING POINTS
Review and illustrate by different imaging techniques the common and uncommon clinical entities that primarily manifest with calcifications in thoracic and abdominal regions. Help the radiologist generate a reasonable differential diagnosis based on the characteristics of the calcifications. Show how calcified lesions can be the key feature that points to the proper diagnosis. Recognize the calcification mimickers.

TABLE OF CONTENTS/OUTLINE
Calcifications in the thoraco-abdominal region are very common and can be due to a wide spectrum of causes. They can be characterized according to their location, appearance and accompanying radiological findings, which together with the clinical data will determine their etiology. In general, calcified lesions are well recognizable on plain radiography and they represent an incidental finding. Many of them are non-pathological lesions that do not need any additional study. However, when the diagnosis is not clear on plain radiography, ultrasound or computed tomography should be performed. CT is particularly useful in identification and characterization of small calcifications, improving the differential diagnosis. The radiologist must recognize calcifications in each imaging technique as they can be an essential element in the differential diagnosis that will allow an adequate management of the patient.
**TEACHING POINTS**

Multiple endocrine neoplasia (MEN) syndromes are characterized by tumors involving two or more endocrine glands. Of the four types of MEN, MEN 1 and MEN 2 are common. In the last decade there has been marked expansion in our knowledge of the genetics and clinical aspects of MEN. Early prophylactic total thyroidectomy is recommended for patients with MEN 2. Pheochromocytoma must be excluded prior to thyroid surgery. MTC in MEN type 2B is known to be very aggressive and prophylactic thyroidectomy is recommended by 6 months of age. Neuroendocrine tumors (NETs) of the duodenum, pancreas, thymus, and bronchus in MEN 1 can be fatal and imaging plays a key role in their diagnosis and management. The role of surgery for asymptomatic pancreatic NETs, gastrinomas is controversial as they are frequently multifocal and cure rates are low.

**TABLE OF CONTENTS/OUTLINE**

Genetic mutations associated with different types of MEN, Common and uncommon tumors associated with different types of MEN, Diagnosis of each type of MEN, and recommendations for screening the family members. Characteristic imaging findings of tumors associated with MEN, Emerging concepts in our understanding of MEN syndromes and guidelines for clinical management, Role of imaging in the management of MEN.
Pneumo-anatomy: Anatomical Lessons from Cases of Surgical Emphysema

All Day Room: MS Community, Learning Center

Awards
Certificate of Merit

Participants
Tilak Das, PhD, FRCR, Cambridge, United Kingdom (Presenter) Nothing to Disclose
Katharine Tweed, FRCR, Cambridge, United Kingdom (Abstract Co-Author) Nothing to Disclose
Helen C. Addley, MRCP, FRCR, Montreal, QC (Abstract Co-Author) Nothing to Disclose
Edmund Godfrey, MBBCh, FRCR, Cambridge, United Kingdom (Abstract Co-Author) Nothing to Disclose

TEACHING POINTS

The anatomy of structures and compartments not commonly appreciated on CT imaging can be revealed by the presence of surgical emphysema. Knowledge of anatomical compartments is helpful in understanding routes of spread of infection. Unexplained surgical emphysema should trigger a careful search for a source of an air leak.

TABLE OF CONTENTS/OUTLINE

Surgical emphysema describes the presence of abnormal air within or around tissues, often as a consequence of trauma, infection or following invasive procedures. Within the abdomen, perforation of viscera leads to intraperitoneal air. Air under a degree of pressure is able to insinuate into potential spaces between tissues, dissecting tissue planes without damaging the tissues themselves. This can separate tissue planes that are normally intimately related and invisible on imaging. With air acting as a contrast medium, images of patients with surgical emphysema can be used as an opportunity to visualise and understand fascial planes and compartmental anatomy in any part of the body. This review will focus on: Head and Neck: Relations to intracranial spaces. Superficial and deep fascial planes and compartments. Chest: Chest wall, mediastinum. Abdomen: Intraperitoneal and retroperitoneal fascial planes and compartments.

Honored Educators

Presenters or authors on this event have been recognized as RSNA Honored Educators for participating in multiple qualifying educational activities. Honored Educators are invested in furthering the profession of radiology by delivering high-quality educational content in their field of study. Learn how you can become an honored educator by visiting the website at: https://www.rsna.org/Honored-Educator-Award/

Helen C. Addley, MRCP, FRCR - 2013 Honored Educator
Thoracic Lymphoproliferative Disease: A Complete Radiological Spectrum

Participants
Tassia R. Yamanari, MD, Sao Paulo, Brazil (Presenter) Nothing to Disclose
Hye J. Lee, MD, Sao Paulo, Brazil (Abstract Co-Author) Nothing to Disclose
Ricardo V. Auad, MD, Sao Paulo, Brazil (Abstract Co-Author) Nothing to Disclose
Marcio V. Sawamura, MD, Sao Paulo, Brazil (Abstract Co-Author) Nothing to Disclose
Valter R. Dos Santos Junior, MD, Sao Paulo, Brazil (Abstract Co-Author) Nothing to Disclose
Claudia D. Leite, MD, PhD, Sao Paulo, Brazil (Abstract Co-Author) Research Grant, General Electric Company
Chang k. Chi, MD, Sao Paulo, Brazil (Abstract Co-Author) Nothing to Disclose
Guilherme H. Bachion, MD, Sao Paulo, Brazil (Abstract Co-Author) Nothing to Disclose
Giovanni G. Cerri, MD, PhD, Sao Paulo, Brazil (Abstract Co-Author) Nothing to Disclose

TEACHING POINTS
Large mediastinal adenopathies in the presence or not of pulmonary involvement are findings highly suggestive of lymphoma. The knowledge of other possible presentations of thoracic lymphoma and lymphoproliferative diseases helps to improve the diagnosis, thereby directing to proper treatment.

TABLE OF CONTENTS/OUTLINE
1. Overview the classification of lymphoma and other lymphoproliferative diseases
2. Provide a simplified clinical-radiological algorithm for radiologists to differentiate Hodgkin disease and non-Hodgkin lymphoma
3. Illustrate the imaging spectrum of common and uncommon findings of thoracic lymphoma:- Mediastinal lymph node enlargement- Extranodal involvement: lungs (contiguous invasion of mediastinal lesions, nodules or masses, consolidation, septal thickening), pleura (contiguous invasion or pleural effusion), pericardium and chest wall
4. Describe the imaging findings of other benign or malignant lymphoproliferative diseases: lymphocytic interstitial pneumonia, posttransplantation lymphoproliferative disorder, lymphomatoid granulomatosis.
Role of Imaging in Cancer Screening; Current Trends and Future Perspectives

All Day Room: MS Community, Learning Center

Participants
Khaled M. Elsayes, MD, Ann Arbor, MI (Presenter) Nothing to Disclose
Deepak G. Bedi, MBCh, Houston, TX (Abstract Co-Author) Nothing to Disclose
Myrna C. Godoy, MD, PhD, Houston, TX (Abstract Co-Author) Research Grant, Siemens AG
David J. Vining, MD, Houston, TX (Abstract Co-Author) Royalties, Bracco Group; CEO, VisionSR; Stockholder, VisionSR
Ahmed M. Khalaf, MBCh, Houston, TX (Abstract Co-Author) Nothing to Disclose
Antoun Chahin, Houston, TX (Abstract Co-Author) Nothing to Disclose
Wei T. Yang, MD, Houston, TX (Abstract Co-Author) Researcher, Hologic, Inc

TEACHING POINTS
- Review the current trends for screening of various cancers
- Describe the national and international recommendations/guidelines for screening of various types of cancers
- Discuss the ongoing research trials that predict future perspectives of cancer screening

TABLE OF CONTENTS/OUTLINE
- Overall value of effective cancer prevention methods
- Role of early detection in cancer prevention and mortality reduction
- Criteria for Cancer Screening Program: Current guidelines/recommendations and future perspectives of various types of cancers; including breast, lung, colon, liver and ovarian cancers
- Review of the ongoing clinical trials which predict future establishment of new guidelines of other types of cancers

Summary and conclusion

Honored Educators
Presenters or authors on this event have been recognized as RSNA Honored Educators for participating in multiple qualifying educational activities. Honored Educators are invested in furthering the profession of radiology by delivering high-quality educational content in their field of study. Learn how you can become an honored educator by visiting the website at: https://www.rsna.org/Honored-Educator-Award/

Khaled M. Elsayes, MD - 2014 Honored Educator
Is it Cancer? Mimics of Malignancy in Thoraco-abdominal Imaging

All Day Room: MS Community, Learning Center

Awards
Magna Cum Laude
Identified for RadioGraphics

Participants
Michael P. Hartung, MD, Madison, WI (Abstract Co-Author) Nothing to Disclose
Meghan G. Lubner, MD, Madison, WI (Presenter) Grant, Koninklijke Philips NV; Grant, Johnson & Johnson;
Christine O. Menias, MD, Chicago, IL (Abstract Co-Author) Nothing to Disclose
Vincent M. Mellnick, MD, Saint Louis, MO (Abstract Co-Author) Nothing to Disclose
Sanjeev Bhalla, MD, Saint Louis, MO (Abstract Co-Author) Nothing to Disclose
Perry J. Pickhardt, MD, Madison, WI (Abstract Co-Author) Co-founder, VirtuoCTC, LLC; Stockholder, Cellectar Biosciences, Inc; Stockholder, SHINE Medical Technologies, Inc; Research Grant, Koninklijke Philips NV

TEACHING POINTS
Review spectrum of benign conditions that can mimic malignancy in the chest/abdomen/pelvis including idiopathic fibrosing disorders, exposure related diseases, granulomatous disease, aggressive infections, autoimmune conditions, hypertrophy of normal tissues, hematoma, and endometriosis. Discuss key imaging features of each as well as clinical/epidemiologic data that might be a clue to the diagnosis. Present an approach to diagnosis that incorporates relevant clinical and radiologic data

TABLE OF CONTENTS/OUTLINE
Clinical features, epidemiology, risk factors, key imaging findings of benign conditions that can mimic malignancy
Case-based review with multimodal imaging examples
Idiopathic fibrosing disorders
  Fibrosing mediastinitis, sclerosing mesenteritis, retroperitoneal fibrosis, mesenteric fibromatosis
Exposure related disorders
  Silicosis/PMF
Grainulomatous disease/infection
  Sarcoid, Crohn's, xanthogranulomatous cholecystitis/pyelonephritis,
tuberculosis
Aggressive infection
  Actinomycosis, Nocardia
Autoimmune disorders
  Autoimmune pancreatitis, cholangitis, IgG4 related kidney disease
Foreign body
Hypertrophy/abnormal distribution of normal tissues
  Splenosis, extramedullary hematopoiesis, tumoral and metastatic calcification, leiomyomatosis, endometriosis

Honored Educators
Presenters or authors on this event have been recognized as RSNA Honored Educators for participating in multiple qualifying educational activities. Honored Educators are invested in furthering the profession of radiology by delivering high-quality educational content in their field of study. Learn how you can become an honored educator by visiting the website at: https://www.rsna.org/Honored-Educator-Award/

Meghan G. Lubner, MD - 2014 Honored Educator
Meghan G. Lubner, MD - 2015 Honored Educator
Perry J. Pickhardt, MD - 2014 Honored Educator
Christine O. Menias, MD - 2013 Honored Educator
Christine O. Menias, MD - 2014 Honored Educator
Christine O. Menias, MD - 2015 Honored Educator
Christine O. Menias, MD - 2016 Honored Educator
Sanjeev Bhalla, MD - 2014 Honored Educator
Sanjeev Bhalla, MD - 2016 Honored Educator
Awards
Certificate of Merit
Identified for RadioGraphics

Participants
Dhakshina M. Ganeshan, MBBS, FRCR, Houston, TX (*Presenter*) Nothing to Disclose
Sanjeev Bhalla, MD, Saint Louis, MO (*Abstract Co-Author*) Nothing to Disclose
Kumaresan Sandrasegaran, MD, Carmel, IN (*Abstract Co-Author*) Nothing to Disclose
Perry J. Pickhardt, MD, Madison, WI (*Abstract Co-Author*) Co-founder, VirtuoCTC, LLC; Stockholder, Cellectar Biosciences, Inc; Stockholder, SHINE Medical Technologies, Inc; Research Grant, Koninklijke Philips NV
Meghan G. Lubner, MD, Madison, WI (*Abstract Co-Author*) Grant, Koninklijke Philips NV; Grant, Johnson & Johnson;
Christine O. Menias, MD, Chicago, IL (*Abstract Co-Author*) Nothing to Disclose

TEACHING POINTS
To review the epidemiology, pathogenesis, histopathology and clinical presentation of sarcoidosis To illustrate characteristic multimodality imaging features of sarcoidosis affecting multiple organ systems, from head to toe To review the potential pitfalls in diagnosis and review the latest advances in management of pulmonary and extra-pulmonary sarcoidosis.

TABLE OF CONTENTS/OUTLINE
- Introduction- Epidemiology- Pathophysiology- Clinical Features- Review of multimodality imaging findings of sarcoidosis in multiple organ systems including pulmonary, cardiac, hepatic, splenic, scrotal, musculoskeletal and neurosarcoidosis - Differential diagnoses, Potential pitfalls and Treatment
Summary: Sarcoidosis is a multi-system granulomatous disorder of unclear etiology. Cellular immune system activation by T cells and B cells is believed to play an important role in the pathogenesis. The characteristic histological feature is the presence of non-caseating granulomas. Pulmonary involvement is most common (seen in about 90% patients) but it can affect any organ system. Its clinical manifestations are protean and it is often challenging to make the diagnosis based on clinical features. Multimodality imaging including CT, MRI and PET/CT is very helpful in diagnosis and management of pulmonary and extra-pulmonary sarcoidosis.

Honored Educators
Presenters or authors on this event have been recognized as RSNA Honored Educators for participating in multiple qualifying educational activities. Honored Educators are invested in furthering the profession of radiology by delivering high-quality educational content in their field of study. Learn how you can become an honored educator by visiting the website at: https://www.rsna.org/Honored-Educator-Award/

Christine O. Menias, MD - 2013 Honored Educator
Christine O. Menias, MD - 2014 Honored Educator
Christine O. Menias, MD - 2015 Honored Educator
Sanjeev Bhalla, MD - 2014 Honored Educator
Sanjeev Bhalla, MD - 2016 Honored Educator
Kumaresan Sandrasegaran, MD - 2013 Honored Educator
Kumaresan Sandrasegaran, MD - 2014 Honored Educator
Kumaresan Sandrasegaran, MD - 2016 Honored Educator
Perry J. Pickhardt, MD - 2014 Honored Educator
Meghan G. Lubner, MD - 2014 Honored Educator
Meghan G. Lubner, MD - 2015 Honored Educator
**CT Texture Analysis: Definitions, Applications, Biologic Correlates and Challenges**

All Day Room: MS Community, Learning Center

---

**Awards**  
Identified for RadioGraphics

**Participants**  
Meghan G. Lubner, MD, Madison, WI (Presenter) Grant, Koninklijke Philips NV; Grant, Johnson & Johnson; Andrew D. Smith, MD, PhD, Jackson, MS (Abstract Co-Author) Research Grant, Pfizer Inc; President, Radiostics LLC; President, Liver Nodularity LLC; President, Color Enhanced Detection LLC; President, eMASS LLC; Pending patent, Color Enhanced Detection LLC; Pending patent, eMASS LLC; Kumaresan Sandrasegaran, MD, Carmel, IN (Abstract Co-Author) Nothing to Disclose  
Perry J. Pickhardt, MD, Madison, WI (Abstract Co-Author) Co-founder, VirtuoCTC, LLC; Stockholder, Cellestix Biosciences, Inc; Stockholder, SHINE Medical Technologies, Inc; Research Grant, Koninklijke Philips NV  
Dushyant V. Sahani, MD, Boston, MA (Abstract Co-Author) Research support, General Electric Company; Medical Advisory Board, Alena Pharmaceuticals, Inc

---

**TEACHING POINTS**

CT texture analysis (CTTA) is a tool to quantify tissue heterogeneity by assessing the distribution and relationship of pixel or voxel gray levels in an image. CTTA metrics are myriad and may include entropy, standard deviation, mean, mean of the positive pixels, kurtosis and skewness of the pixel histogram. Tumor heterogeneity may be related to differences in tumor vascularity/angiogenesis, hypoxia, necrosis. CTTA has demonstrated utility in assessment of primary lesions and response to therapy in multiple tumor types. Non oncologic applications of CTTA may include evaluation of hepatic fibrosis. Methodological challenges exist in CTTA, including lack of uniform reporting standards, impact of CT technique, handling of large data sets, statistical issues, 2D vs. 3D analysis, different texture algorithms.

---

**TABLE OF CONTENTS/OUTLINE**

Basics of CT tumor texture analysis  
Methods  
First order assessment of the pixel histogram and advanced CTTA data  
Biologic correlates of CT texture analysis  
Primary tumor assessment  
Lesion classification  
Pre-treatment assessment (CRC, esophageal, H/N, NSCLC, RCC)  
Response to therapy (Esophageal)  
Metastatic disease  
Pretreatment assessment (CRC)  
Response to therapy (Melanoma, RCC, NSCLC)  
Non oncologic applications  
Challenges and Unknowns  
Summary

---

**Honored Educators**

Presenters or authors on this event have been recognized as RSNA Honored Educators for participating in multiple qualifying educational activities. Honored Educators are invested in furthering the profession of radiology by delivering high-quality educational content in their field of study. Learn how you can become an honored educator by visiting the website at:  
https://www.rsna.org/Honored-Educator-Award/

Meghan G. Lubner, MD - 2014 Honored Educator  
Meghan G. Lubner, MD - 2015 Honored Educator  
Kumaresan Sandrasegaran, MD - 2013 Honored Educator  
Kumaresan Sandrasegaran, MD - 2014 Honored Educator  
Kumaresan Sandrasegaran, MD - 2016 Honored Educator  
Perry J. Pickhardt, MD - 2014 Honored Educator  
Dushyant V. Sahani, MD - 2012 Honored Educator  
Dushyant V. Sahani, MD - 2015 Honored Educator  
Dushyant V. Sahani, MD - 2016 Honored Educator
Imaging Characteristics of Cosmetic Implants and Injections and Their Complications

All Day Room: MS Community, Learning Center

Participants
Patrick Mulligan, MD, San Francisco, CA (Presenter) Nothing to Disclose
Antonio C. Westphalen, MD, Mill Valley, CA (Abstract Co-Author) Scientific Advisory Board, 3DBiopsy LLC; Research Grant, Verily Life Sciences LLC

TEACHING POINTS
We will discuss the implant and injection material used in common cosmetic plastic procedures. We will discuss the imaging appearance of common cosmetic implants and injections. We will describe the complications and associated imaging findings of cosmetic implants and injections.

TABLE OF CONTENTS/OUTLINE
The prevalence of cosmetic plastic procedures is described. The typical uses of cosmetic implant and injection material is described with emphasis on their typical imaging appearance. In this section we describe the complications associated with different cosmetic implants and injections, their prevalence, and typical imaging appearance.
Diffusion-weighted TSE-based MRI at 3T Magnets: Body Applications

All Day Room: MS Community, Learning Center

Participants
- Antonio Luna, MD, Jaen, Spain (Presenter) Nothing to Disclose
- Jordi Broncano, MD, Cordoba, Spain (Abstract Co-Author) Nothing to Disclose
- Javier Sanchez, MD, PhD, Madrid, Spain (Abstract Co-Author) Nothing to Disclose
- Paula Montesinos de la Vega, Madrid, Spain (Abstract Co-Author) Employee, Koninklijke Philips NV
- Alvaro Berbis, PhD, Cordoba, Spain (Abstract Co-Author) Nothing to Disclose
- Jorge A. Soto, MD, Boston, MA (Abstract Co-Author) Royalties, Reed Elsevier

TEACHING POINTS
- To highlight the role of DW TSE-based sequence as an alternative to conventional SS EPI DWI for body applications at 3T magnets
- To understand the advantages of this technique to minimize geometric distortion and susceptibility artifacts typical of EPI DW sequences
- To reveal the technical adjustments necessary to perform this approach for specific body organs and whole-body applications
- To enhance the similar performance of both approaches in the detection of oncological lesions in the body

TABLE OF CONTENTS/OUTLINE

DWI is usually performed using a SS EPI sequence for body applications. At 3T magnets, geometric distortion and susceptibility artifacts are common limitations of this approach. The use of a DW TSE-based sequence is attractive to reduce these problems. This exhibit presents a new approach to DWI, using a TSE sequence as an alternative to the classic approach of DWI, with similar clinical results and reduced artifacts using both phased-array and Q-body coils.

Outline
1. Introduction
2. DW TSE-based sequence - adjustments for whole-body applications (Q-body coil) - adjustments for phased-array coils: chest, liver and prostate
3. Clinical applications - comparison of DWIBS and DW TSE-based sequence for whole body applications - comparison of SS EPI DWI vs DW TSE-based sequence: chest, liver and prostate
4. Conclusions

Honored Educators

Presenters or authors on this event have been recognized as RSNA Honored Educators for participating in multiple qualifying educational activities. Honored Educators are invested in furthering the profession of radiology by delivering high-quality educational content in their field of study. Learn how you can become an honored educator by visiting the website at: https://www.rsna.org/Honored-Educator-Award/

Jorge A. Soto, MD - 2013 Honored Educator
Jorge A. Soto, MD - 2014 Honored Educator
Jorge A. Soto, MD - 2015 Honored Educator
Participants
Amaia Llodio Uribeetxebarría, MD, Donostia, Spain (Presenter) Nothing to Disclose
Santiago Correa, MD, Donostia, Spain (Abstract Co-Author) Nothing to Disclose
Ana Carballeira Alvarez, MD, Donostia, Spain (Abstract Co-Author) Nothing to Disclose
Karmele Biurrun Mancisidor, San Sebastian, Spain (Abstract Co-Author) Nothing to Disclose
Maria Teresa Alonso Espinaco, MD, San Sebastian, Spain (Abstract Co-Author) Nothing to Disclose
Monica Fernandez Martin, San Sebastian, Spain (Abstract Co-Author) Nothing to Disclose

TEACHING POINTS
To recognize the imaging appearance associated with drug-induced injuries and to include in the differential diagnosis. To discuss the role of the radiologist and clarify the imaging approach to drug-induced disorders.

TABLE OF CONTENTS/OUTLINE
Drug-induced disorders are common and often underdiagnosed. With the increasing use of a wide variety of therapeutic drugs it is likely that such abnormalities will be seen with increasing frequency. Today, the radiological image is used more and more commonly, and therefore, many of these complications are initially diagnosed at imaging instead of at clinical presentation. Radiologist plays a key role in early diagnosis by raising the possibility, defining the various patterns and ruling out other differential diagnosis. Early recognition can reduce both morbidity and mortality. Drug-induced abnormalities produce a wide range of clinical signs and symptoms and usually non-pathognomonic imaging features, making diagnosis challenging. It is important for the radiologist to review the patient’s medical history to obtain relevant information about drug use and determine whether there is a relationship. The knowledge and the correct interpretation of imaging patterns associated with drug-induced abnormalities are essential for proper clinical management and the radiologist plays a vital role.
**TEACHING POINTS**

CT has a very good sensitivity for the detection of lymph node enlargement and a moderate sensitivity for the detection of extranodal lymphoma. Normal-sized lymph nodes involved with disease are detectable with FDG PET/CT. Hodgkin lymphoma most commonly presents with isolated nodal disease. In non-Hodgkin lymphoma, nodal disease is frequently associated with extranodal disease. Normal lymph nodes, as seen on CT, usually measure less than 1 cm in their short-axis diameter, with variation according to the anatomical region. A short-axis diameter higher than 2 cm is often pathological and likely to represent tumor or granulomatous disease. Lymphomatous masses usually show mild homogeneous enhancement on contrast-enhanced CT. They typically displace adjacent structures, without invading them. In untreated forms, necrosis is rare and calcification is exceptional. CT is able to illustrate a wide spectrum of extranodal involvement in various organs. However, FDG PET/CT performs better than conventional CT in detecting early and subtle extranodal disease.

**TABLE OF CONTENTS/OUTLINE**

- Normal CT appearance of lymph nodes
- CT morphological description of nodal lymphomatous masses
- Specific CT and FDG PET/CT patterns of lymphoma in the most common extranodal sites
- Case examples of less common sites of extranodal involvement
- Summary
Oncologic Emergencies You Don’t Want to Miss!

All Day Room: MS Community, Learning Center

Participants
Vivek Gowdra Halappa, MD, Philadelphia, PA (Presenter) Nothing to Disclose
Justin E. Mackey, MD, Darby, PA (Abstract Co-Author) Nothing to Disclose
Stanley U. Chan, MD, Philadelphia, PA (Abstract Co-Author) Nothing to Disclose
Pouya Ziai, MD, Darby, PA (Abstract Co-Author) Nothing to Disclose
Oleg Teytelboym, MD, Philadelphia, PA (Abstract Co-Author) Nothing to Disclose

TEACHING POINTS
Illustrate and review spectrum of common and uncommon oncologic emergencies. Highlight imaging findings of oncologic emergencies that require urgent intervention. Illustrate common pitfalls in imaging of common oncologic emergencies.

TABLE OF CONTENTS/OUTLINE
This interactive case based exhibit will demonstrate spectrum of oncologic emergencies that require timely diagnosis and urgent intervention: Gastrointestinal/ genitourinary (urinary tract obstruction, intraabdominal hemorrhage, intussusception, bowel perforation, intestinal ischemia, intestinal obstruction) Pulmonary/Cardiovascular (SVC syndrome, pericardial tamponade, pulmonary hemorrhage, pulmonary embolism, boerhaave syndrome, airway obstruction) CNS (Cerebral herniation, cord compression, carcinomatous meningitis, intracranial hemorrhage, dural metastasis, Anton–Babinski syndrome) Pediatric oncology emergencies (Infections/inflammation, renal papillary necrosis, hemorrhagic cystitis) Treatment related imaging findings. Pitfalls in imaging of oncologic emergencies. Practical strategies for handling challenges in distinguishing malignant and benign/post treatment findings.
A New Perspective on Liability: Why Radiologists Should Be Aware Of E-Discovery and Metadata

All Day Room: MS Community, Learning Center

Participants
Amanda L. Steinberger, DO, Darby, PA (Presenter) Nothing to Disclose
Aparna Srinivasa Babu, MD, Darby, PA (Abstract Co-Author) Nothing to Disclose
Eric Reinholt, Darby, PA (Abstract Co-Author) Nothing to Disclose
Michael L. Brooks, MD, JD, Lansdowne, PA (Abstract Co-Author) Nothing to Disclose

TEACHING POINTS
1. Radiologists should understand that metadata underlies all aspects of daily radiology practice.
2. Electronic discovery is a contemporary field that is rapidly changing as our use of electronic health information continues to evolve.
3. Radiologists can reduce legal risk in practice by being aware of how metadata is used.

TABLE OF CONTENTS/OUTLINE
1. Brief review of metadata and illustration of examples of metadata use in daily radiology practice
2. Review of e-discovery process and potentially recoverable data a. Additionally review role of Health Level 73. Mention of federal and example state laws governing electronic data retention and electronic discovery a. Highlight key legal cases/examples of potentially problematic clinical scenarios affecting radiology
4. Practical advice and strategies for minimizing liability in daily practice for radiologists a. Provide sample examples where caution should be taken, such as during structuring quality assurance/quality improvement processes
**Participants**

Marta Braschi Amifarzan, MD, Belmont, MA (Presenter) Nothing to Disclose
Katherine M. Krzewski, MD, Boston, MA (Abstract Co-Author) Research Grant, General Electric Company Spouse, Employee; Ironwood Pharmaceuticals, Inc.
Jyothi Priya Jagannathan, MD, Boston, MA (Abstract Co-Author) Nothing to Disclose
Sreeharsha Tirumani, MBBS, MD, Boston, MA (Abstract Co-Author) Nothing to Disclose
Atul B. Shinagare, MD, Brookline, MA (Abstract Co-Author) Nothing to Disclose
Nikhil H. Ramaiya, MD, Jamaica Plain, MA (Abstract Co-Author) Nothing to Disclose

**TEACHING POINTS**

After viewing this exhibit, participants will be able to:
1. Approach cancer imaging reporting in a critical and standardized way, which follows the acronym iRite (i=indication; R=response; i=impression; t=toxicity; e=emergent findings).
2. Understand the nuances of cancer imaging report in the era of genomic alterations, targeted therapies, atypical patterns of response, drug toxicities and associated complications.
3. "Rite" a meaningful report for the oncologists.

**TABLE OF CONTENTS/OUTLINE**

- **i**= Indication includes pathology, relevant genomics/mutational status, and targeted treatment to alert the radiologist to expected imaging findings and potential pitfalls.
- **R**= Response evaluation in patients treated with novel anticancer agents, using appropriate response criteria, from WHO and RECIST to CHOI, MASS, RANO and irRC. We will briefly review typical and atypical response patterns.
- **i**= Impression reflects a clear, succinct synthesis of imaging findings and relevant clinical data which guides next steps in oncologic management.
- **t**= Toxicities of four classes of novel anticancer agents (antiangiogenic and non-antiangiogenic molecular targeted therapies, immune checkpoint inhibitors and hormonal agents), presented in a checklist format.
- **e**= Emergent disease and drug related complications will be reviewed.

**Honored Educators**

Presenters or authors on this event have been recognized as RSNA Honored Educators for participating in multiple qualifying educational activities. Honored Educators are invested in furthering the profession of radiology by delivering high-quality educational content in their field of study. Learn how you can become an honored educator by visiting the website at: https://www.rsna.org/Honored-Educator-Award/

Sreeharsha Tirumani, MBBS, MD - 2016 Honored Educator
Extra-Articular Synovial Sarcoma: Uncommon Tumor at Uncommon Sites

All Day Room: MS Community, Learning Center

Participants
Kapil K. Shirodkar, DMRD, MBBS, Mapusa, India (Presenter) Nothing to Disclose
Himansu S. Mohanty, MBBS, Bangalore, India (Abstract Co-Author) Nothing to Disclose
Mahendra Bind, MBBS, Bangalore, India (Abstract Co-Author) Nothing to Disclose
CHINKY PATEL, MBBS, MD, Bangalore, India (Abstract Co-Author) Nothing to Disclose
Suprabath HN, Bangalore, India (Abstract Co-Author) Nothing to Disclose
Shrivali Nandikoor, MBBS, Bangalore, India (Abstract Co-Author) Nothing to Disclose
Anuradha Rao, Bangalore, India (Abstract Co-Author) Nothing to Disclose
Aruna R. Patil, MD, FRCR, Bangalore, India (Abstract Co-Author) Nothing to Disclose
Govindarajan J. Mallarajapatna, MBBS, MD, Bangalore, India (Abstract Co-Author) Nothing to Disclose

TEACHING POINTS
The purpose of this exhibit is:
1. To review the pathophysiology of extra-articular synovial sarcoma.
2. To illustrate the various uncommon sites of extra-articular synovial sarcoma encountered in our institution.
3. To discuss the multimodality imaging features of extra-articular synovial sarcoma.
4. To discuss management strategies and follow-up imaging.

TABLE OF CONTENTS/OUTLINE
Pathophysiology of Extra-articular synovial sarcoma
Illustration of various uncommon sites of extra-articular synovial sarcoma
Review of multimodality imaging features of extra-articular synovial sarcoma
Sample cases and mimics
Management and follow-up imaging strategies
Future directions, Summary and "Take home Messages"
**MRI Compatibility of New Cardiovascular Devices**

All Day Room: MS Community, Learning Center

**Participants**
Eliana E. Bonfante, MD, Houston, TX (Abstract Co-Author) Nothing to Disclose
Rajan P. Patel, MD, Houston, TX (Presenter) Nothing to Disclose
Daniel Ocazionez, MD, Houston, TX (Abstract Co-Author) Nothing to Disclose
Octavio D. Arevalo Espejo, MD, Bogota, Colombia (Abstract Co-Author) Nothing to Disclose
Roy Riascos, MD, Houston, TX (Abstract Co-Author) Nothing to Disclose

**TEACHING POINTS**

Implantable cardiovascular devices may be MR safe, MR conditional or MR unsafe. Clearance of implantable devices for MRI represents a challenge for radiologists and technologists. Familiarity with the imaging appearance of implantable devices expedites clearance for MRI and improves patient care.

**TABLE OF CONTENTS/OUTLINE**

I. Introduction
   - Magnetic Resonance Imaging (MRI) is an essential tool for the evaluation and diagnosis of several medical conditions. Implanted medical devices are frequently encountered in patients that require MRIs, and may represent an absolute or relative contraindication for the MRI examination. Many of the patients do not have accurate information about medical devices in their bodies. Inability to clear them on a timely fashion causes denial or delay of the MRI exam, which results in suboptimal medical care.

II. Review of MRI safety categories

III. Imaging appearance and MRI compatibility of new cardiovascular devices
   - Stents
   - Occluders
   - Monitoring devices
   - Post-operative hardware
   - Other

IV. Conclusion

Implantable cardiovascular devices are constantly being added to the armamentarium of treatment and evaluation tools for cardiac and pulmonary conditions. Familiarity with their imaging appearance and MRI compatibility facilitates timely patient care.
Participants
Aparna Srinivasa Babu, MD, Darby, PA (Presenter) Nothing to Disclose
Oleg Teytelboym, MD, Philadelphia, PA (Abstract Co-Author) Nothing to Disclose

TEACHING POINTS
This exhibit will enable readers to Appreciate the wide spectrum of manifestations of Streptococcal infections Identify the possible clinical presentations Recognize the varied imaging appearances of Streptococcal infections Gain insight into diagnosing potential complications on radiological studies Become familiar with the role of a radiologist in guiding treatment

TABLE OF CONTENTS/OUTLINE
Brief microbiology of Streptococci Demographics and epidemiology of Streptococcal infections Risk factors and virulence determinants Spectrum of clinical manifestations and organ involvement Appearances on multimodality imaging Potential complications and their imaging manifestations Overview of interventional treatment options
Texture Analysis: Technique, Clinical Facts and Fictions for Tumor Response to Treatment in Abdomen and Pelvis with Focus on Colorectal Cancer

1. Understand the technique behind obtaining organ or lesion texture analysis
2. Assess clinical applications of texture analysis in the abdomen and pelvis
3. Evaluate treatment response in the abdomen and pelvis with a focus on colorectal cancer

TABLE OF CONTENTS/OUTLINE

• Technique of Texture analysis
• Importance of Texture as an analytic tool and imaging biomarker in initial tumor analysis and prediction of treatment response
• Applications in the abdomen and pelvis with a focus on colorectal cancer
• Statistical analysis tools in texture
  • spatial scale of filter, entropy, mean intensity, kurtosis, skewness, standard-deviation
• Pitfalls and issues of the texture analysis technique and future developments

Honored Educators

Presenters or authors on this event have been recognized as RSNA Honored Educators for participating in multiple qualifying educational activities. Honored Educators are invested in furthering the profession of radiology by delivering high-quality educational content in their field of study. Learn how you can become an honored educator by visiting the website at:
https://www.rsna.org/Honored-Educator-Award/

Chandana G. Lall, MD - 2013 Honored Educator
Opening Session: Digital Revolution in Radiology - the Good and the Bad

Sunday, Nov. 27 8:30AM - 10:15AM Room: Arie Crown Theater

IN OT

AMA PRA Category 1 Credits ™: 1.75
ARRT Category A+ Credit: 1.00

Participants
Richard L. Baron, MD, Chicago, IL (Presenter) Nothing to Disclose
Bruce H. Curran, MEng, Richmond, VA, (Bruce.Curran@vcuhealth.org) (Presenter) Nothing to Disclose
Jonathan B. Strauss, MD, Chicago, IL (Presenter) Nothing to Disclose

Sub-Events

PS10A Presentation of the Outstanding Educator Award

Participants
Kristen K. DeStigter, MD, Burlington, VT (Presenter) Medical Advisory Board, Koninklijke Philips NV; Luminary, McKesson Corporation; Research collaboration, Koninklijke Philips NV;

PS10B Presentation of the Outstanding Researcher Award

Participants
Clifford R. Jack JR, MD, Rochester, MN (Presenter) Stockholder, Johnson & Johnson; Research Consultant, Eli Lilly and Company;

PS10C Dedication of the 2016 RSNA Meeting Program to the Memory of Herbert L. Abrams, MD (1920-2016)

Participants

PS10D President's Address: Beyond Imaging: Ensuring Radiology Impact in Clinical Care and Research

Participants
Richard L. Baron, MD, Chicago, IL (Presenter) Nothing to Disclose
Mitchell E. Tublin, MD, Pittsburgh, PA (Presenter) Nothing to Disclose

Abstract
Radiologists have remarkably impacted radiology and medical care through their participation in developing and advancing the modern day imaging modalities of US, CT, MRI, Nuclear Medicine, and Interventional image-guided therapies. Modern digital advances go beyond the amazing images themselves. The introduction of digital imaging communication and storage systems has enabled timely and impactful distribution of images that has put medical imaging and radiologists at the forefront of clinical care 24 hours a day. At the same time, this rise of information technology in medicine limits personal interactions between radiologists and clinicians, making collaboration between physicians difficult. While technologic imaging innovation continues to advance, the key to continuing radiology’s success will lie in our dedication to delivering the best possible care to every patient. To do so, radiologists must think beyond the images they see in practice and stay abreast of advancing subspecialty medical knowledge and more actively collaborate with referring physicians to improve patient outcomes. Meaningful continuing education and interactive training will be necessary to ensure radiologists are proficient at the subspecialty level required by an ever-increasing subspecialty approach in the medical community at large. We must reach beyond imaging in radiologic research, building truly multidisciplinary teams to develop multicenter, multi-investigator prospective trials that impact outcomes for entire populations. Today’s research will become tomorrow’s clinical practice, requiring radiologists to develop and lead impactful clinical imaging research that will position us as an essential part of clinical care teams. And above all, we must look beyond imaging to gain a broader perspective on the patient experience. We have entered a new era in radiology and healthcare at large driven by changes to reimbursement models and an emphasis on value in patient care delivery. Radiologists must produce examination reports that provide the solutions sought by patients and referring physicians rather than simply describe findings. Ultimately, we should strive to consistently deliver the right examination at the right time by the right radiologist with the quality of the process and the report matching what we would expect for us or our family members. In doing so, we will better serve our patients and our specialty as we navigate an ever-changing healthcare environment.

PS10E When Machines Think: Radiology’s Next Frontier

Participants
Keith J. Dreyer, DO, PhD, Boston, MA (Presenter) Medical Advisory Board, IBM Corporation
Richard L. Baron, MD, Chicago, IL (Presenter) Nothing to Disclose

Abstract
As computers outperform humans at complex cognitive tasks, disruptive innovation will increasingly remap the familiar with waves of creative destruction. And in healthcare, nowhere is this more apparent or imminent than at the crossroads of Radiology and the emerging field of Clinical Data Science. As leaders in our field, we must shepherd the innovations of cognitive computing by defining its role within diagnostic imaging, while first and foremost ensuring the continued safety of our patients. If we are dismissive, defensive or self-motivated – industry, payers and provider entities will innovate around us achieving different forms of disruption, optimized to serve their own needs. To maintain our leadership position, as we enter the era of machine learning, it is essential that we serve our patients by directly managing the use of clinical data science towards the improvement of care—a position which will only strengthen our relevance in the care process as well as in future federal, commercial and accountable care discussions. In this
session, we will explore the state of clinical data science in medical imaging and its potential to improve the quality and relevance of radiology as well as the lives of our patients.

PS10F Hope, Hype, and Harm as Medicine Enters the Digital Age: Lessons From (and For) Radiology

Participants
Robert M. Wachter, MD, San Francisco, CA (Presenter) Scientific Advisory Board, PatientSafe Solutions, Inc; Stock options, PatientSafe Solutions, Inc; Scientific Advisory Board, EarlySense; Stock options, EarlySense; Scientific Advisory Board, QPID Health, Inc; Stock options, QPID Health, Inc; Scientific Advisory Board, Amino Inc; Stock options, Amino Inc; Scientific Advisory Board, Twine Health, Inc; Stock options, Twine Health, Inc; Author with royalties, Wolters Kluwer nv ; Speaker, Wolters Kluwer nv ; Author with royalties, The McGraw-Hill Companies; Speaker, The McGraw-Hill Companies; Author with royalties, John Wiley & Sons, Inc; Speaker, John Wiley & Sons, Inc ; Investor, Smart Patients, Inc; Richard L. Baron, MD, Chicago, IL (Presenter) Nothing to Disclose

Abstract
While radiology went digital nearly two decades ago, the wholesale switch from paper to computer in the rest of healthcare is a relatively recent phenomenon. While computerization has helped improve safety and quality, it has also had unanticipated consequences, many of them quite negative. Studies have shown, for example, that physician burnout has never been higher – and much of this is attributable to the electronic health record. Other studies have documents new types of medical errors, sometimes known as "e-iatrogenesis".

Dr. Robert Wachter spent a year studying the digitization of healthcare in researching his 2015 book, The Digital Doctor: Hope, Hype and Harm at the Dawn of Medicine’s Computer Age. In this talk, he’ll describe what we got right – and wrong – in our journey, and why radiology was, to a large degree, a canary in the digital coal mine. Ultimately, it’s a hopeful story; the experience from other industries tells us that it often takes a decade or more to obtain the promised benefits from automation – and that these improvements emerge only after the technology improves and the work has been reimagined for a digital environment.

Wachter is Professor and Interim Chairman of the Department of Medicine at the University of California, San Francisco, where he also directs the Division of Hospital Medicine. Author of 250 articles and 6 books, he coined the term "hospitalist" in 1996 and is generally considered the "father" of the hospitalist field, the fastest growing specialty in the history of modern medicine. He is past president of the Society of Hospital Medicine and past chair of the American Board of Internal Medicine. In 2015, Modern Healthcare magazine ranked him as the most influential physician-executive in the U.S., his eighth consecutive year in the top 50. The Digital Doctor was a New York Times science bestseller. In its review, the Times said, “Janus is the god of medicine these days, and it is the great strength of Wachter's eloquent new book that it has captured every one of these conflicting emotions, all powerfully felt and intelligently analyzed... Most previous authors have chosen sides, either mourning the old or hailing the new. Wachter is unusual for his equipoise. He is old enough to remember the way things used to work (or fail to work), young enough to be reasonably technology friendly... He is also an exceptionally good, fluent writer.” He is currently heading a national review of IT strategy for England's National Health Service.
**MultiSystem/Special Interest Sunday Poster Discussions**

**Sunday, Nov. 27 12:30PM - 1:00PM Room: MS Community, Learning Center**

**AMA PRA Category 1 Credit ™: .50**

Discussions may include off-label uses.

---

### 'Who Spoiled the Image - Man or the Machine?': Facts of MRI Artifacts

**Station #1**

**Participants**

Krishnakumari A. Modi, MBBS, Hjorring, Denmark (Abstract Co-Author) Nothing to Disclose

Nitish Shekharjka, Aalborg, Denmark (Abstract Co-Author) Nothing to Disclose

Victor V. Iyer, MD, Aalborg, Denmark (Presenter) Nothing to Disclose

Jens Brandom Frokker, MD, PhD, Aalborg, Denmark (Abstract Co-Author) Nothing to Disclose

Rune V. Fisker, MD, Aalborg, Denmark (Abstract Co-Author) Nothing to Disclose

---

**TEACHING POINTS**

The purpose of this exhibit is to summarize the major types of MR artifacts which a radiologist comes across in day to day work, explain the underlying causes/physics and ways to minimise/eliminate the artifacts. Some of the artifacts could mimic pathology while others might make the study suboptimal. So it is important for a radiologist to be familiar with the most common MRI artifacts.

**TABLE OF CONTENTS/OUTLINE**

Each type of MRI artifact will be shown in an image accompanied by 4 answer options in an interactive multiple choice quiz format and after selecting one of the options, the correct answer will be displayed with the explanation. Each artifact will be discussed in 2 slides (total 15 artifacts = 30 slides + 5 slides for basic physics). **List of artifacts:**

- MR hardware related: Herringbone artifact Zipper artifact Central point artifact RF overflow artifact Shading artifact Moire fringes / Zebra stripes
- MR software related: Cross talk artifact
- Physiology related: Ghosting and smearing Entry slice phenomenon
- Tissue heterogeneity and Foreign body related: Black boundary artifact Susceptibility artifact Chemical shift Dielectric effect
- Fourier transformation related: Gibbs/truncation artifact Aliasing/Wrap around artifact

### Successful Integration of Contrast-enhanced Ultrasound (CEUS) into Routine Abdominal Imaging: When and Where Is It Most Useful?

**Station #2**

**Awards**

Identified for RadioGraphics

**Participants**

Hyun-Jung Jang, MD, Toronto, ON (Presenter) Nothing to Disclose

Tae Kyoung Kim, MD, PhD, Toronto, ON (Abstract Co-Author) Nothing to Disclose

Korosh Khalili, MD, Toronto, ON (Abstract Co-Author) Nothing to Disclose

Mostafa Atri, MD, Toronto, ON (Abstract Co-Author) Nothing to Disclose

---

**TEACHING POINTS**

Through best illustrative cases over 15-year experience of successful integration of CEUS into routine clinical practice, readers will learn essential knowledge and requirements for new implementation of CEUS in routine abdominal imaging practice. Major differences and unique advantages of CEUS with explanations of mechanisms as compared to CT/MR Proper indications for CEUS to maximize added benefits to CT/MR for the best patient care. Cautions in multimodality correlation and correct interpretation of discordant cases.

**TABLE OF CONTENTS/OUTLINE**

- Efficient set up and workflow
- Advantages unique to CEUS and their most relevant clinical applications: purely intravascular properties, real-time imaging, disruption-replenishment, non-nephrotoxicity and easy repeatability
- Interactive display of CEUS as a problem solver in various representative clinical scenarios
  - Hepatic: Indeterminate nodules on CT/MR FNH versus adenoma Complex cysts Cirrhosis related nodules Tumor vs bland thrombosis Pre- and post-RFA Nodule localization for biopsy Extrahepatic Complex renal cysts Indeterminate renal lesions on CT/MR Post-RFA for RCC Post-EVAR endoleak Incidental splenic mass Complex ovarian cysts Indeterminate pancreatic or gallbladder lesions Pitfalls in interpretation
Whole-Body MRI in Multiple Myeloma

Station #1

Multisystem/Special Interest Sunday Poster Discussions

Sunday, Nov. 27 1:00PM - 1:30PM Room: MS Community, Learning Center

AMA PRA Category 1 Credit ™: .50

Participants

Sub-Events

MS102-ED-SUB1  Whole-Body MRI in Multiple Myeloma

Awards

Certificate of Merit

Participants

Francesco Mungai, MD, Florence, Italy (Presenter) Nothing to Disclose
Catia Dini, Firenze, Italy (Abstract Co-Author) Nothing to Disclose
Stefano Chili, Firenze, Italy (Abstract Co-Author) Nothing to Disclose
Chiara Nozzoli, Firenze, Italy (Abstract Co-Author) Nothing to Disclose
Michela Staderini, Firenze, Italy (Abstract Co-Author) Nothing to Disclose
Valentina Berti, MD, Florence, Italy (Abstract Co-Author) Nothing to Disclose
Maurizio Bartolucci, Firenze, Italy (Abstract Co-Author) Nothing to Disclose

TEACHING POINTS

In 2014 the International Myeloma Working Group updated the diagnostic criteria for multiple myeloma (MM) and smoldering multiple myeloma (SMM), including MRI findings as possible biomarkers of malignancy. Several works demonstrated the superiority of whole-body (WB) respect to axial skeleton-only MRI in correctly identify the involvement of disease, however implementation and interpretation of WB imaging in MM is often controversial. The aim of this exhibit is: to illustrate the strategies in implementing WB-MR images in clinical practice, including practical tips and tricks to optimize image quality and reduce artifacts; to illustrate the different MRI patterns of involvement of disease and to correlate them with clinical results and other imaging techniques (such as radiographs, CT and FDG-PET); to provide hints for the interpretations of images, showing pitfalls and potential challenges.

TABLE OF CONTENTS/OUTLINE

1. Introduction
2. Criteria for diagnosis of myeloma
3. Implementation of WB-MR imaging
4. MRI patterns of disease and correlation with other imaging techniques
5. MR images processing and interpretation
6. Pitfalls and potential challenges

Imaging and Clinical Features of the Common Endocrine Disorders within the Abdomen

Station #2

Participants

Stephen Cole, MD, Atlanta, GA (Presenter) Nothing to Disclose
Peter J. Park, MD, Atlanta, GA (Abstract Co-Author) Nothing to Disclose
Pardeep K. Mittal, MD, Atlanta, GA (Abstract Co-Author) Nothing to Disclose
Fred B. Murphy, MD, Decatur, GA (Abstract Co-Author) Nothing to Disclose

TEACHING POINTS

1. The learner will review the most common intra-abdominal endocrine tumor disorders.
2. The learner will review each disorder’s unique clinical presentation, pathophysiology, and individual imaging features (primarily CT and MRI) to accurately distinguish each of these entities.
3. The learner will review the Radiologist’s role in characterizing functional and non-functional endocrine tumors.
4. The learner will briefly review the common genetic syndromes associated with these endocrine abnormalities.

TABLE OF CONTENTS/OUTLINE

1. Review primary adrenal tumors of cortical and medullary origin, pancreatic neuroendocrine tumors (pNETs), and gastrointestinal carcinoid tumors.
   • Pathophysiology
   • Clinical presentation
   • Signs and symptoms
   • Biomarkers
   • Imaging features
   • CT & MRI
   • Common locations
   • Non-functional versus functional endocrine tumors
   • Associative genetic syndromes

Honored Educators

Presenters or authors on this event have been recognized as RSNA Honored Educators for participating in multiple qualifying educational activities. Honored Educators are invested in furthering the profession of radiology by delivering high-quality educational content in their field of study. Learn how you can become an honored educator by visiting the website at: https://www.rsna.org/Honored-Educator-Award/

Pardeep K. Mittal, MD - 2016 Honored Educator
Histiocytosis from Head to Toe (In Conjunction with the American Institute for Radiologic Pathology)

Sunday, Nov. 27 2:00PM - 3:30PM Room: N229

Participants
Mark D. Murphey, MD, Silver Spring, MD, (mmurphey@acr.org) (Moderator) Nothing to Disclose
Mark D. Murphey, MD, Silver Spring, MD, (mmurphey@acr.org) (Presenter) Nothing to Disclose
Jeffrey R. Galvin, MD, Baltimore, MD (Presenter) Nothing to Disclose
Kelly K. Koeller, MD, Rochester, MN (Presenter) Nothing to Disclose
Darcy J. Wolfman, MD, Bethesda, MD (Presenter) Nothing to Disclose
Ellen M. Chung, MD, Bethesda, MD (Presenter) Nothing to Disclose

LEARNING OBJECTIVES
1) Describe the typical clinical and pathological features of Langerhans cell histiocytosis. 2) Define the characteristic imaging patterns of Langerhans cell histiocytosis. 3) Understand the pathological basis for the imaging patterns of Langerhans cell histiocytosis.

ABSTRACT
The histiocytoses are a diverse group of diseases that can affect multiple organ systems. These entities included in our discussion are Langerhans cell histiocytosis, Erdheim-Chester disease, juvenile xanthogranuloma and Rosai-Dorfman disease. These diseases often reveal a characteristic appearance on imaging, reflecting their pathology is emphasized in a multiorgan and multimodality approach.

Active Handout: Jeffrey R. Galvin

Honored Educators

Presenters or authors on this event have been recognized as RSNA Honored Educators for participating in multiple qualifying educational activities. Honored Educators are invested in furthering the profession of radiology by delivering high-quality educational content in their field of study. Learn how you can become an honored educator by visiting the website at: https://www.rsna.org/Honored-Educator-Award/

Mark D. Murphey, MD - 2015 Honored Educator
Participants
Alexander Yule, DSc, Cardiff, United Kingdom (Moderator) Nothing to Disclose
Steven P. DeColle, Edmonton, AB (Moderator) Nothing to Disclose

Sub-Events

**MSAS21A**  The Future of Tc-99m Supply

Participants
François Couillard, Ottawa, ON, {fcouillard@camrt.ca} (Presenter) Nothing to Disclose

**LEARNING OBJECTIVES**

1) Understand the Tc-99m supply chain. 2) Assess the short and long-term disruption of supply risks. 3) Assess the potential of technological innovations and advances to create new sources of supply and mitigate risks.

**ABSTRACT**

With the closure of the Canadian NRU reactor in 2016, the world is losing one of the major producers of Mo-99 used in the production of Tc-99m. What will be the short and long-term consequences on the global supply chain? What innovative solutions are being explored? In this talk, François Couillard will rely on his past industry experience and current involvement in Canada’s Multistakeholder Working Group on Radioisotopes to paint a picture of the situation and discuss the implications for nuclear medicine.
Radiological and Nuclear Terrorism: Like It or Not, Radiology Professionals Will Be in the ‘Hot’ Seat

Monday, Nov. 28 8:30AM - 10:00AM Room: S502AB

HP  DT  SQ

AMA PRA Category 1 Credits ™: 1.50
ARRT Category A+ Credits: 1.50

Participants
Donald P. Frush, MD, Durham, NC, (donald.frush@duke.edu) (Moderator) Nothing to Disclose
John Lanza, MD, Pensacola, FL (Presenter) Nothing to Disclose
Nick Dainiak, MD, Oak Ridge, TN, (Nick.dainiak@orau.org) (Presenter) Nothing to Disclose
Brooke R. Buddemeier, Livermore, CA (Presenter) Nothing to Disclose

LEARNING OBJECTIVES
1) To describe the scenarios for a radiological dispersal device (RDD) or improvised nuclear device (IND). 2) To discuss roles of federal, state, and local governments. 3) To review the roles and strategies of hospital teams, including radiology professionals in the setting of an RDD/IND. 4) To provide resources for radiology professionals for response in the setting of RDD/IND. 5) Describe the very large mass casualty scenarios of concern that radiologists might be called to help with. 6) Understand the difference between radiation contamination and exposure. 7) Understand the clinical strategies used to manage contamination and exposure. 8) Identify internet resources physicians can use to inform themselves about preparing for and participating in responses to these types of incidents.

ABSTRACT
**MSE-MOA**

**Multisystem/Special Interest Monday Poster Discussions**

Monday, Nov. 28 12:15PM - 12:45PM Room: MS Community, Learning Center

*AMA PRA Category 1 Credit ™: .50*

---

**Participants**

**Sub-Events**

**MS109-ED-MOA1**

Listening to Stiffness: A Comprehensive Review of Ultrasound Elastography Methods and Clinical Applications

Station #1

Participants

- Rosa Maria Silveira Sigrist, MD, Palo Alto, CA (Presenter) Nothing to Disclose
- Joy Liau, MD, PhD, Palo Alto, CA (Abstract Co-Author) Nothing to Disclose
- Ahmed El Kaffas, PhD, Palo Alto, CA (Abstract Co-Author) Co-founder, Oncoustics
- Maria Cristina Chammas, MD, Sao Paulo, Brazil (Abstract Co-Author) Nothing to Disclose
- Juergen K. Willmann, MD, Stanford, CA (Abstract Co-Author) Research Consultant, Bracco Group; Research Grant, Siemens AG; Research Grant, Koninklijke Philips NV; Research Grant, General Electric Company; Advisory Board, Lantheus Medical Imaging, Inc; Advisory Board, Bracco Group

**TEACHING POINTS**

Review principles and concepts of Ultrasound Elastography (USE), a technique recently cleared by the FDA; Describe different USE techniques offered by various vendors and their limitations; Discuss current and future clinical applications of USE in liver, breast, thyroid, kidney, prostate and lymph nodes.

**TABLE OF CONTENTS/OUTLINE**

Introduction; Principles and Concepts of USE; Elastography Physics; USE Techniques: Strain Imaging (Strain Elastography and Acoustic Radiation Force Impulse Strain Imaging) and Shear Wave Imaging (1D Transient Elastography, Point Shear Wave Elastography and 2D Shear Wave Elastography); Technical Limitations; Clinical Applications: Liver (Diffuse Liver Disease, Portal Hypertension, Focal Liver Lesions); Breast; Thyroid; Kidney (Renal Fibrosis, Renal Focal Masses); Prostate; Lymph Nodes. For each clinical application mentioned, different USE techniques will be discussed as well as their limitations, current and future applications.

Conclusion
**MultiSystem/Special Interest Monday Poster Discussions**

**Renal Sparing CT: How to Dramatically Reduce Iodinated Contrast Dose When Needed**

Station #1

**Participants**

- Nikkole Weber, Rochester, MN (Presenter) Nothing to Disclose
- Terri J. Vrtiska, MD, Rochester, MN (Abstract Co-Author) Nothing to Disclose
- Michael L. Wells, MD, Rochester, MN (Abstract Co-Author) Nothing to Disclose
- Ahmed Halaweish, PhD, Rochester, MN (Abstract Co-Author) Employee, Siemens AG
- Roy Marcus, MD, Rochester, MN (Abstract Co-Author) Institutional research agreement, Siemens AG; Research support, Siemens AG
- Cynthia H. McCollough, PhD, Rochester, MN (Abstract Co-Author) Research Grant, Siemens AG
- Joel G. Fletcher, MD, Rochester, MN (Abstract Co-Author) Grant, Siemens AG
- Eric E. Williamson, MD, Rochester, MN (Abstract Co-Author) Research Grant, General Electric Company

**TEACHING POINTS**

Substantial reduction (≥ 50%) of iodinated contrast dose without altering radiologic diagnosis is important for multiple patient groups and clinical indications. Acquisition options that facilitate diagnostic imaging with reduced IV contrast generally work to increase iodine signal, reduce image noise, and individualize timing of image acquisition to the contrast bolus. Methods for enhancing iodine signal include low kV imaging, dual energy (DE) monoenergetic images, multiphase low-dose scanning, and ultrafast imaging techniques. Employed for IV contrast reduction should depend on the patient, diagnostic task, and CT system.

**TABLE OF CONTENTS/OUTLINE**

- Patient-specific barriers to routine iodine dose
- Common approach (and rationale) for all methods: improved iodine signal (many methods) + iterative reconstruction + bolus-tracking + saline flush CT angiography
- Iodine dose reduction (≤ 50mL)
- Low kV & DE virtual monoenergetic images
- Low-dose multiphase acquisition (adaptive 4D spiral) and novel display methods
- Dual source FLASH mode
- Solid organ cross-sectional imaging
- Low kV or DE acquisition
- Organ-specific bolus tracking delays
- Comparison to full iodine dose exams in same patients
- Task and scanner-specific considerations
- Future directions - injector (multi dose injector technology)
- and improved multi-energy detectors

**Honored Educators**

Presenters or authors on this event have been recognized as RSNA Honored Educators for participating in multiple qualifying educational activities. Honored Educators are invested in furthering the profession of radiology by delivering high-quality educational content in their field of study. Learn how you can become an honored educator by visiting the website at: [https://www.rsna.org/Honored-Educator-Award/](https://www.rsna.org/Honored-Educator-Award/)

Terri J. Vrtiska, MD - 2016 Honored Educator

**Tumors in Von Hippel Lindau Syndrome from Head to Toe: A Comprehensive State-of-the-Art Review**

Station #2

**Participants**

- Dhakshina M. Ganeshan, MBBS, FRCR, Houston, TX (Presenter) Nothing to Disclose
- Sanjeev Bhalla, MD, Saint Louis, MO (Abstract Co-Author) Nothing to Disclose
- Kumaresan Sandrasegaran, MD, Carmel, IN (Abstract Co-Author) Nothing to Disclose
- Perry J. Pickhardt, MD, Madison, WI (Abstract Co-Author) Co-founder, VirtuoCTC, LLC; Stockholder, Cellectar Biosciences, Inc; Stockholder, SHINE Medical Technologies, Inc; Research Grant, Koninklijke Philips NV
- Meghan G. Lubner, MD, Madison, WI (Abstract Co-Author) Grant, Koninklijke Philips NV; Grant, Johnson & Johnson;
- Christine O. Menias, MD, Chicago, IL (Abstract Co-Author) Nothing to Disclose

**TEACHING POINTS**

To review the epidemiology, molecular cytogenetics, histopathology and clinical presentation of Von Hippel Lindau (VHL) Syndrome. To illustrate characteristic multimodality imaging features of tumors in VHL Syndrome affecting multiple organ systems, from head to toe. To review the latest advances in management of VHL Syndrome and discuss current recommendations for surveillance and screening.

**TABLE OF CONTENTS/OUTLINE**

- Introduction
- Epidemiology
- Molecular Cytogenetics
- Histopathology
- Clinical Features
- Illustrate imaging findings of tumors in Von Hippel Lindau Syndrome in multiple organ systems
- Potential pitfalls in diagnosis
- Management of VHL Syndrome

Summary: Von Hippel Lindau Syndrome is an autosomal dominant inherited disorder resulting from germline mutations in the VHL tumor suppressor gene. A wide range of benign and malignant tumors can occur in VHL including retinal & CNS hemangioblastomas, renal cell carcinoma, pheochromocytoma, pancreatic neuroendocrine tumors, endolymphatic sac tumors and papillary cystadenomas of
epididymis. Broadly, VHL can be divided into 2 clinical subtypes based on the absence (Type 1) or presence of pheochromocytoma (Type 2). Given the wide spectrum of multi-system involvement, a multidisciplinary team approach to diagnosis, screening and treatment is needed.

Honored Educators

Presenters or authors on this event have been recognized as RSNA Honored Educators for participating in multiple qualifying educational activities. Honored Educators are invested in furthering the profession of radiology by delivering high-quality educational content in their field of study. Learn how you can become an honored educator by visiting the website at: https://www.rsna.org/Honored-Educator-Award/

Christine O. Menias, MD - 2013 Honored Educator
Christine O. Menias, MD - 2014 Honored Educator
Christine O. Menias, MD - 2015 Honored Educator
Christine O. Menias, MD - 2016 Honored Educator
Sanjeev Bhalla, MD - 2014 Honored Educator
Sanjeev Bhalla, MD - 2016 Honored Educator
Kumaresan Sandrasegaran, MD - 2013 Honored Educator
Kumaresan Sandrasegaran, MD - 2014 Honored Educator
Kumaresan Sandrasegaran, MD - 2016 Honored Educator
Perry J. Pickhardt, MD - 2014 Honored Educator
Meghan G. Lubner, MD - 2014 Honored Educator
Meghan G. Lubner, MD - 2015 Honored Educator
Special Interest Session: A New Model of Patient Care: Value over Volume—a RAD Talk

Monday, Nov. 28 4:30PM - 6:00PM Room: E353B

AMA PRA Category 1 Credits™: 1.50
ARRT Category A+ Credits: 1.50

Participants
Mary C. Mahoney, MD, Cincinnati, OH (Moderator) Nothing to Disclose
Christine Zars, MS, Saint Charles, IL (Presenter) Nothing to Disclose
Jennifer L. Kemp, MD, Denver, CO, (jkemp@divrad.com) (Presenter) Nothing to Disclose
James V. Rawson, MD, Augusta, GA (Presenter) Nothing to Disclose

LEARNING OBJECTIVES
1) To understand the mission and goals of RSNA's Radiology Cares: The Art of Patient-centered Practice and ACR's Imaging 3.0 campaigns. 2) To assess your radiology practice model and realign it to focus on value over volume. 3) To learn tactics to put the concepts of patient-centeredness and value vs. volume into practice. 4) To understand your patients' perspectives as they navigate through the healthcare continuum, especially as it relates to radiology.

ABSTRACT
In many healthcare facilities and institutions, the culture and actual practice of radiology have marginalized the patient. Today the call to practice patient-centered care is one of the primary drivers of change within the radiology community. The benefits include improved patient care, improved communication between radiologists and their patients and referring physicians, and greater awareness of the essential role that radiologists play in patients’ overall healthcare. The RSNA's Radiology Cares and ACR's Imaging 3.0 campaigns were launched to provide tools to move the radiology profession to focus on patient-centeredness and to help transform the way radiology is practiced. This session, presented in the style of a TED Talk, will offer insights into the radiology patient mindset and describe tools to bring the concept of patient-centeredness into practice.

URL
SPSI27

Special Interest Session: Preparing Radiologists to Jump into the “Shark Tank”

Monday, Nov. 28 4:30PM - 6:00PM Room: N228

AMA PRA Category 1 Credits ™: 1.50
ARRT Category A+ Credit: 0

LEARNING OBJECTIVES

1) Identify strategies for bringing a research idea to the marketplace. 2) Present a proposal in a way that elicits interest from potential investors. 3) Take steps to secure investor funding while developing and protecting the intellectual property. 4) Identify ways to generate business value through licensing and collaborations.

Sub-Events

SPSI27A Creating a Forum for Venture Funding Pitches

Participants
Ronald L. Arenson, MD, San Francisco, CA (Presenter) Nothing to Disclose
Renee L. Cruea, MPA, Washington, DC (Presenter) Nothing to Disclose

LEARNING OBJECTIVES

View learning objectives under main course title.

SPSI27B How to Present Your Research to Venture Capitalists & Industry Representatives

Participants
Navid Alipour, Coronado, CA (Presenter) Nothing to Disclose
Thomas R. Mackie, PhD, Madison, WI (Presenter) Stockholder, Asto CT LLC; Stockholder, HealthMyne, Inc

LEARNING OBJECTIVES

View learning objectives under main course title.

SPSI27C Developing and Protecting Your IP to Create Business Value

Participants
Scott A. Penner, JD, San Diego, CA (Presenter) Nothing to Disclose

LEARNING OBJECTIVES

View learning objectives under main course title.
Successfully Transforming Radiology into a Value-based Care Organization: Supported by Siemens Healthineers

Tuesday, Nov. 29 8:30AM - 10:00AM Room: S105D

Participants

PROGRAM INFORMATION

• Moderation: Raghavan Dhandapany, Siemens Healthineers • From volume to value - a practical experience in driving clinical transformation across an enterprise Dr. Mike Modic, Chief Clinical Transformation Officer, Diagnostic Radiology Cleveland Clinic, Cleveland, USA • Population Health Management and Imaging: Value, Perception and Opportunity Robert Taylor, Global Head Population Health, Siemens Healthineers, USA • Ensuring quality of care in tough financial times through long-term partnerships Joe-Anne McCue, Director, Diagnostic Imaging & Laboratory, William Osler Health System, Toronto, Canada Co-presented by Robin Santucci, Director of Strategic Accounts & Enterprise, Services and Solutions, Siemens Healthineers, Canada

We will revisit the status quo in radiology and take a look at tomorrow's trends and challenges in healthcare business. Understanding this we will show how technological innovations have the potential enabling to reduce costs and improve diagnosis, therapy, and care in a transforming healthcare ecosystem. This course does not offer CME.
Participants
David B. Nicholson, Charlottesville, VA (Moderator) Nothing to Disclose
Charlotte Beardmore, MBA, London, United Kingdom (Moderator) Nothing to Disclose

LEARNING OBJECTIVES
1) To understand the changing role of the radiographer in the UK in supporting streamlined patient care. 2) To consider the impact of these changes upon education and training requirements; in relation to higher levels of practice. 3) To consider the importance of impact reporting with changing scope of practice.

Sub-Events
MSAS31A  The Integration of Simulation into the Education and Training of Imaging Technologists

Participants
David B. Nicholson, Charlottesville, VA (Presenter) Nothing to Disclose

LEARNING OBJECTIVES
View learning objectives under main course title.

MSAS31B  Changing Scope of Practice in the UK

Participants
Charlotte Beardmore, MBA, London, United Kingdom (Presenter) Nothing to Disclose

LEARNING OBJECTIVES
View learning objectives under main course title.
Why Do Radiologists Burn out, and What Can We Do About It?

Tuesday, Nov. 29 8:30AM - 10:00AM Room: E353C

LEARNING OBJECTIVES

1) Identify common causes of burnout. 2) Describe techniques for avoiding burnout. 3) Develop strategies to enhance resilience and thriving.

ABSTRACT

Burnout is becoming an increasingly important problem in medicine, with adverse consequences for patients, health care organizations, and physicians themselves. In this course, we explore the causes of burnout in contemporary radiology practice, strategies for preventing and remedying it when it develops, and steps radiologists can take to enhance their professional resiliency and fulfillment.

Sub-Events

RC324A   Causes of Burnout

Participants
Richard B. Gunderman, MD, PhD, Indianapolis, IN (Presenter) Nothing to Disclose

RC324B   Strategies for Avoiding Burnout

Participants
Norman J. Beauchamp JR, MD, Seattle, WA (Presenter) Research Grant, Koninklijke Philips NV

RC324C   Resiliency and Thriving

Participants
David P. Fessell, MD, Ann Arbor, MI (Presenter) Nothing to Disclose

LEARNING OBJECTIVES

ABSTRACT
Multisystem/Special Interest Tuesday Poster Discussions

Tuesday, Nov. 29, 12:15PM - 12:45PM Room: MS Community, Learning Center

AMA PRA Category 1 Credit ™: .50
FDA Discussions may include off-label uses.

Participants

Sub-Events

**MS113-ED-TUA1** Imaging Features of Myeloproliferative Neoplasms

Station #1

Participants
Ian Murphy, MBCh, MRCS, Cambridge, United Kingdom (Presenter) Nothing to Disclose
Emily Mitchell, MD, Cambridge, United Kingdom (Abstract Co-Author) Nothing to Disclose
Anna Godfrey, MD, PhD, Cambridge, United Kingdom (Abstract Co-Author) Nothing to Disclose
Edmund M. Godfrey, MBCh, FRCR, Cambridge, United Kingdom (Abstract Co-Author) Nothing to Disclose

**TEACHING POINTS**

Discuss the clinical and pathological aspects of the heterogeneous group of hematological disorders known as myeloproliferative neoplasms (MPNs).
Recognize typical imaging features suggestive of underlying MPN.
Identify unusual imaging signs that may enable the radiologist to suggest an MPN as a possible underlying cause, particularly splanchnic venous thrombosis.

**TABLE OF CONTENTS/OUTLINE**

Categorization of Myeloproliferative Neoplasms (MPN)Imaging feature, related to:- Thrombosis- Osseous findings- Solid lesions- Other findingsDiscussion on treatment, clinical aspects

**MS150-ED-TUA2** Checking In with Checkpoint Inhibition: Imaging Review of PD1 Inhibitor Immune-Related Adverse Events

Station #2

**Awards**

**Certificate of Merit**

Participants
Matthew Quirk, MD, Los Angeles, CA (Presenter) Nothing to Disclose
Antonio J. Gutierrez, MD, Los Angeles, CA (Abstract Co-Author) Nothing to Disclose
Kathleen Ruchalski, MD, Santa Monica, CA (Abstract Co-Author) Nothing to Disclose
Robert D. Suh, MD, Los Angeles, CA (Abstract Co-Author) Nothing to Disclose
Dean Wallace, MD, Los Angeles, CA (Abstract Co-Author) Nothing to Disclose
Pawan Gupta, Los Angeles, CA (Abstract Co-Author) Nothing to Disclose
Antoni Ribas, Los Angeles, CA (Abstract Co-Author) Nothing to Disclose

**TEACHING POINTS**

1. Discuss the novel role of programmed cell death 1 (PD1) inhibitors in current cancer therapy, and understand their pharmacologic mechanisms.
2. Recognize the imaging manifestations of PD1 inhibitor immune-related adverse events across a variety of organ systems.
3. Case-based approach to PD1 inhibitor immune-related imaging findings.

**TABLE OF CONTENTS/OUTLINE**

PD1 inhibition – novel role in cancer therapy Pharmacologic mechanisms of PD1 inhibition FDA-approved use in cancer subtypes and emerging applications Immune-related adverse events and their treatmentImaging manifestations of PD1 inhibitor immune-related adverse events Hypophysitis – enlargement and abnormal MRI signal with clinical hypopituitarism Thyroiditis – heterogeneous enhancement and atrophy with clinical hypothyroidism Organizing Pneumonia – airspace consolidations and ground-glass attenuation ARDS – diffuse ground-glass attenuation and consolidations Pleuritis – progressive diffuse pleural thickening with pathologic correlation Pancreatitis – diffuse hypermetabolism on FDG PET/CT Nephritis – geographic hypoenhancing renal lesions Mesenteritis – soft tissue masses, lymphadenopathy and fat stranding with pathologic correlation Colitis – colonic wall thickening and fat strandingConclusion Consider immune-related adverse events in patients on PD1 therapy
Multisystem/Special Interest Tuesday Poster Discussions
Tuesday, Nov. 29 12:45PM - 1:15PM Room: MS Community, Learning Center
AMA PRA Category 1 Credit™: .50

Participants

Sub-Events

MS119-ED-TUB1 Revisiting Taxonomy, Classification, and Cross Sectional Imaging Findings in Lymphatic Disorders-A Road Less Travelled

Station #1

Participants
Ameya J. Baxi, MBBS, DMRD, San Antonio, TX (Presenter) Nothing to Disclose
Carlos S. Restrepo, MD, San Antonio, TX (Abstract Co-Author) Nothing to Disclose
Dhanasheer Rajderkar, MD, Gainesville, FL (Abstract Co-Author) Nothing to Disclose
Daniel Vargas, MD, Denver, CO (Abstract Co-Author) Nothing to Disclose

TEACHING POINTS
To define, classify, and discuss taxonomy and etiopathogenesis of various lymphatic disorders (LD)
To review the characteristic multimodality imaging findings of LD
To discuss differential diagnosis and post treatment follow up imaging

TABLE OF CONTENTS/OUTLINE
LD are rare diverse pathologies of the lymphatic system characterized by isolated or widespread involvement of lung, bone, and other tissues. Due to its rarity, occasional case reports are published & limited radiology literature is available in regards to natural history, etiopathogenesis, classification and radiological manifestations. A more accurate and precise terminology term of LD is a need of time and is proposed. Cross sectional imaging MDCT and MRI provides accurate information on location, behavior, aggressiveness, mass effect & severity of disease. Imaging plays a critical role in the patient management and at times eliminates invasive diagnostic or therapeutic procedures. We excluded diseases like lymphoma, lymphadenopathy & lymphangitis carcinomatosa.

Aims/Objectives
Introduction
Taxonomy
Pathology, imaging and proposed classification of LD
Congenital: Lymphangioma
Lymphangiectasis
Lymphangiomatosis
Lymphatic dysplasia syndrome
Acquired: Lymphocele
Miscellaneous: Lymphedema
Differential diagnosis
Review of literature
Conclusion
Teaching points

Honored Educators
Presenters or authors on this event have been recognized as RSNA Honored Educators for participating in multiple qualifying educational activities. Honored Educators are invested in furthering the profession of radiology by delivering high-quality educational content in their field of study. Learn how you can become an honored educator by visiting the website at: https://www.rsna.org/Honored-Educator-Award/
Carlos S. Restrepo, MD - 2012 Honored Educator
Carlos S. Restrepo, MD - 2014 Honored Educator

MS154-ED-TUB2 Multimodality Imaging in Secondary Hypertension: A Comprehensive Review and Pictorial Essay

Station #2

Awards
Certificate of Merit

Participants
Hyungwoo Ahn, MD, Seongnam-si, Korea, Republic Of (Presenter) Nothing to Disclose
Hak Jong Lee, MD, MD, Seongnam-si, Korea, Republic Of (Abstract Co-Author) Nothing to Disclose
Sung Il Hwang, MD, Seongnam-si, Korea, Republic Of (Abstract Co-Author) Nothing to Disclose
Yeo Goon Kim, MD, Seoul, Korea, Republic Of (Abstract Co-Author) Nothing to Disclose
Sang Il Choi, MD, Seongnam-si, Korea, Republic Of (Abstract Co-Author) Nothing to Disclose
Eun Ju Chun, MD, PhD, Seongnam-si, Korea, Republic Of (Abstract Co-Author) Nothing to Disclose

TEACHING POINTS
To list various causes of secondary hypertension. To understand the diagnostic algorithm and appropriate imaging modality for evaluation of each cause of secondary hypertension. To identify specific imaging findings for each cause of secondary hypertension using multimodality imaging technique.

TABLE OF CONTENTS/OUTLINE
Overview of clinical and lab-based approach for patients with hypertension. Various etiologies of secondary hypertension according to categorical classification and diagnostic algorithm. Advantages and limitations of multimodality imaging for evaluation of the
Cancer care—along with imaging—is on the brink of profound change. Over the last quarter century, researchers have been assembling the biological syntax and lexicon that are now starting to shape modern oncology. Shifting public expectations and technological innovations are also intensifying progress toward precision medicine. In the next ten years, radiologists will be able to take advantage of new molecular imaging probes and techniques as well as computer tools for pattern recognition, deep learning and artificial intelligence. These new techniques and tools will put us at the center of the evolving paradigm of precision oncology, giving us an unprecedented opportunity to once again reshape and enhance our specialty.

It is clear that cognitive computing will ultimately transform radiology. Rather than fear the changes it brings, we should understand and seize the opportunities. While cognitive computing may reduce the need for interpretation of today’s routine imaging studies, it will also increase our efficiency and effectiveness, improving standards of care across the board and elevating radiology interpretation into the arena of quantitative science and precision medicine. It will allow us to focus on more complex diagnostic and clinical questions and become even more valuable consultants to patients and referring physicians.

The landscape of radiology is continuously expanding. Molecular imaging is gaining traction as more imaging probes, along with technologies such as hyperpolarized MRI and PET/MRI, enter clinical trials. Post-processing tools are enabling cross-sectional imaging studies to be converted into hundreds or even thousands of quantitative, “radiomics” features that, in combination with other sources of “big data,” can be used to develop decision support. Furthermore, pilot studies have shown that radiogenomics can identify tumor phenotypes and provide prognostic and predictive imaging biomarkers.

The blossoming of all these new tools and approaches will alter and strengthen the roles of imaging. The dream of integrated diagnostics is already a reality, though not yet evenly distributed, and as we enrich our knowledge of disease-relevant molecular information, we will increasingly integrate information from imaging regarding morphology, function and metabolism into diagnostic and clinical decision-making algorithms. Though progress in precision medicine will continue to depend on tissue analysis, it will also depend on interventional radiology enabling precision biopsies based on morphologic and molecular information. In addition, imaging’s role in treatment will continue expanding. Minimally invasive, image-guided treatments are becoming a mainstay of cancer care, and theranostic approaches that combine targeted molecular imaging with targeted therapies for precise treatment selection and treatment monitoring are being adopted.

Radiology is a specialty of technical innovations, and radiologists have always excelled in embracing new technologies. But we are more than technology users; we are key participants in patient-centered care. In the last 50 years, we have gone through a number of transformations, always emerging as more clinically essential than before. In the years ahead, we must and will continue to evolve—becoming not only stewards of the ever-increasing demand for imaging and image-guide therapies, but highly valued clinical consultants and innovators in the era of precision medicine.

Honored Educators

Presenters or authors on this event have been recognized as RSNA Honored Educators for participating in multiple qualifying educational activities. Honored Educators are invested in furthering the profession of radiology by delivering high-quality educational content in their field of study. Learn how you can become an honored educator by visiting the website at: https://www.rsna.org/Honored-Educator-Award/
**Introduction to Ergonomics**

**Participants**
William J. Weadock, MD, Ann Arbor, MI (Moderator) Owner, Weadock Software, LLC

**LEARNING OBJECTIVES**
1) The attendee will learn how the radiology reading room environment can physically affect the radiologist. 2) Learn about repetitive stress injuries and how they may affect radiologists and technologists. 3) Learn about how PACS workstations (including mice, keyboards, screens, etc.); room lighting, sounds and temperature; and room furniture may be optimized to help prevent repetitive stress injuries. 4) Learn how radiologic technologists can also be affected by repetitive stress injuries.

**ABSTRACT**
This presentation will review the features of a reading a study at a PACS, and the interactions of the radiologist with the various devices. This includes desktops/tables height, chairs, keyboard location, monitor position, mouse position (and cleanliness), microphone positioning, room temperature, sound volume, ambient light, and body positioning. Each of these components will be discussed, showing how to prevent future problems with repetitive stress disorders. The goal is to raise awareness of ergonomics for the radiologist.

**Lessons Learned From Our Reading Room of the Future Lab**

**Participants**
Eliot L. Siegel, MD, Baltimore, MD (Presenter) Board of Directors, Brightfield Technologies; Board of Directors, McCoy; Board of Directors, Carestream Health, Inc; Founder, MedPerception, LLC; Founder, Topoderm; Founder, YYESIT, LLC; Medical Advisory Board, Bayer AG; Medical Advisory Board, Bracco Group; Medical Advisory Board, Carestream Health, Inc; Medical Advisory Board, Fovia, Inc; Medical Advisory Board, McKesson Corporation; Medical Advisory Board, Merge Healthcare Incorporated; Medical Advisory Board, Microsoft Corporation; Medical Advisory Board, Koninklijke Philips NV; Medical Advisory Board, Toshiba Corporation; Research Grant, Anatomical Travelogue, Inc; Research Grant, Anthro Corp; Research Grant, Barco nv; Research Grant, Dell Inc; Research Grant, Evolved Technologies Corporation; Research Grant, General Electric Company; Research Grant, Herman Miller, Inc; Research Grant, Intel Corporation; Research Grant, MModal IP LLC; Research Grant, McKesson Corporation; Research Grant, RedRick Technologies Inc; Research Grant, Steelcase, Inc; Research Grant, Virtual Radiology; Research Grant, XYBIX Systems, Inc; Research, TeraRecon, Inc; Researcher, Bracco Group; Researcher, Microsoft Corporation; Speakers Bureau, Bayer AG; Speakers Bureau, Siemens AG;

**No Strain, No Pain: A Guide to Reducing Musculoskeletal Strain and Eye Fatigue Among Radiologists**

**Participants**
Rebecca L. Seidel, MD, Atlanta, GA (Presenter) Nothing to Disclose
Controversy Session: Elementary, My Dear Watson: Will Machines Replace Radiologists?

Wednesday, Nov. 30 7:15AM - 8:15AM Room: E450B

Participants
John Eng, MD, Cockeysville, MD (jeng@jhmi.edu) (Moderator) Nothing to Disclose
Eliot L. Siegel, MD, Baltimore, MD (Presenter) Board of Directors, Brightfield Technologies; Board of Directors, McCoy; Board of Directors, Carestream Health, Inc; Founder, MedPerception, LLC; Founder, Topoderm; Founder, YYESIT, LLC; Medical Advisory Board, Bayer AG; Medical Advisory Board, Bracco Group; Medical Advisory Board, Carestream Health, Inc; Medical Advisory Board, Fovia, Inc; Medical Advisory Board, McKesson Corporation; Medical Advisory Board, Merge Healthcare Incorporated; Medical Advisory Board, Microsoft Corporation; Medical Advisory Board, Koninklijke Philips NV; Medical Advisory Board, Toshiba Corporation; Research Grant, Anatomical Travelogue, Inc; Research Grant, Anthro Corp; Research Grant, Barco nv; Research Grant, Dell Inc; Research Grant, Evolved Technologies Corporation; Research Grant, General Electric Company; Research Grant, Herman Miller, Inc; Research Grant, Intel Corporation; Research Grant, MModal IP LLC; Research Grant, McKesson Corporation; Research Grant, RedRick Technologies Inc; Research Grant, Steelcase, Inc; Research Grant, Virtual Radiology; Research Grant, XYBIX Systems, Inc; Research, TeraRecon, Inc; Researcher, Bracco Group; Researcher, Microsoft Corporation; Speakers Bureau, Bayer AG; Speakers Bureau, Siemens AG; Bradley J. Erickson, MD, PhD, Rochester, MN (Presenter) Stockholder, OneMedNet Corporation; Stockholder, VoiceIt Technologies, LLC; Stockholder, FlowSigm

LEARNING OBJECTIVES
1) Identify the advances in machine learning that may enable computing machines to perform tasks currently performed by a radiologist. 2) Classify the key challenges facing computing machines to perform these tasks. 3) Estimate the probability that computing machines will perform these tasks within the next 20 years.

ABSTRACT
This session will address the role of computer-aided diagnosis and machine learning in the practice of radiology. The debate format will address the question of whether computers will replace radiologists in 20 years. The session will include information on state-of-the-art machine learning methods, computer-aided diagnosis results, and prognostications on these tools. Impediments to computers replacing radiologists will also be described.

URL
Participants
Susan D. John, MD, Houston, TX, (susan.d.john@uth.tmc.edu) (Presenter) Nothing to Disclose

LEARNING OBJECTIVES
1) Define the challenges of promoting a culture of patient-centered care in radiology practices. 2) Understand the value of establishing a multidisciplinary team to enhance patient satisfaction in imaging. 3) Create opportunities to make a positive impact on patients before, during, and after imaging

ABSTRACT
Becoming a Reviewer for the RSNA Journals (Sponsored by the RSNA Publications Council)

Wednesday, Nov. 30 8:30AM - 10:00AM Room: S504AB

OTA PR
AMA PRA Category 1 Credit ™: 1.50
ARRT Category A+ Credits: 1.50

Participants
Herbert Y. Kressel, MD, Boston, MA (Moderator) Stockholder, Pfizer Inc; Stockholder, GlaxoSmithKline plc

LEARNING OBJECTIVES
1) Discuss the similarities and differences in the peer review process for the RSNA journals.
2) Discuss the functions of the reviewer in the peer review process.
3) Enumerate the desired elements for peer review of a manuscript
4) Detail how a reviewer can receive AMA PRA Category 1 CME credit for manuscript review

ABSTRACT
Peer review is, in a major way, responsible for the quality of the manuscripts published in a given journal. In this refresher course, the Editors of both of the peer-reviewed journals published by the RSNA will discuss the peer review processes of their respective journals. The Editors will also emphasize the important functions served by the peer reviewers and will indicate the types of information which they would like the peer reviewers to consider when the peer reviewers review a given manuscript. Benefits and responsibilities of the peer review process will be detailed. There will be ample time for questions and answers.

RCS24A Reviewing for Radiology: Editor's Perspective

Participants
Herbert Y. Kressel, MD, Boston, MA (Presenter) Stockholder, Pfizer Inc; Stockholder, GlaxoSmithKline plc

LEARNING OBJECTIVES
View learning objectives under the main course title.

RCS24B Reviewing for Radiology: How I Do It

Participants
Andrew J. Degnan, MD, MPhil, Pittsburgh, PA, (DegnanAJ@upmc.edu) (Presenter) Nothing to Disclose

LEARNING OBJECTIVES
1) Describe approaches to reading, assessing and critiquing scientific manuscripts submitted to Radiology with an emphasis on critical appraisal.
2) Identify key components of a helpful review that assists editorial board members in deciding upon a manuscript’s outcome.
3) Address challenges faced by reviewers including conflicts of interest, duplicate publication and other concerns.

ABSTRACT
Reviewers are vital to the mission of Radiology to present scientifically-sound and relevant research that advances imaging and medicine. In this talk, strategies to efficiently reading and critically evaluating scientific manuscripts will be explored from the perspective of a reviewer. This presentation will emphasize insights that can be provided from reviewers' clinical and research experience to provide quality reviews that address a manuscript’s scientific merit and suitability for Radiology.

Active Handout: Andrew Joseph Degnan

RCS24C Reviewing for RadioGraphics: Editor's Perspective

Participants
Jeffrey S. Klein, MD, Burlington, VT, (jklein@rsna.org) (Presenter) Nothing to Disclose

LEARNING OBJECTIVES
1) Describe how RadioGraphics identifies and solicits material for potential publication.
2) Detail the peer review process including criteria for acceptance/rejection of submitted papers.
3) List the benefits of becoming a peer reviewer for RadioGraphics, including CME credit for manuscript review, the editor's recognition award, and providing expert commentary for select papers.

ABSTRACT
The RSNA’s journals rely upon the peer review process to identify the highest quality material for the society's journals. In this part of the presentation the editor of RadioGraphics will detail the solicitation and peer review processes for the journal. We will provide information on perquisites that peer reviewing offers the reviewer, including the opportunity to receive CME credits for high quality peer review, the Editor's Recognition Awards, expert commentaries that reviewers are sometimes invited to provide, and the selection of editorial board members for the journal.

RCS24D Reviewing for RadioGraphics: How I Do It
LEARNING OBJECTIVES

1) Determine whether they are an appropriate reviewer for a manuscript and identify specific reasons to accept or decline. 2) Determine whether a manuscript is suited for the targeted audience and message of RadioGraphics. 3) Assess the content of an article for its value, novelty, accuracy, and reader interest. 4) Assess appropriateness of an abstract, introduction, materials and methods, discussion, and conclusion.

ABSTRACT

Reviewing a manuscript can be an overwhelming task to a novice, however, a breakdown approach with a simple list of tasks can make for an efficient and effective reviewer. This presentation will give a step by step approach of how to review a Radiographics manuscript, starting with the decision of whether the manuscript and the reviewer are a good match, followed by a straightforward and repeatable assessment of the manuscript for its content by category.
**Points and Pitfalls for Interpreting Digital Tomosynthesis Radiographs: What the Radiologist Needs to Know**

Station #1

**Participants**

Haruhiko Machida, MD, Tokyo, Japan (Presenter) Nothing to Disclose
Toshiyuki Yuhara, Tokyo, Japan (Abstract Co-Author) Nothing to Disclose
Mieko Tamura, Tokyo, Japan (Abstract Co-Author) Nothing to Disclose
Katelyn Nye, Waukesha, WI (Abstract Co-Author) Employee, General Electric Company
John M. Sabol, PhD, Waukesha, WI (Abstract Co-Author) Employee, General Electric Company
Takuya Ishikawa, Tokyo, Japan (Abstract Co-Author) Nothing to Disclose
Eiko Ueno, MD, Chiyoda-Ku, Japan (Abstract Co-Author) Nothing to Disclose

**TEACHING POINTS**

To describe imaging techniques and artifacts in digital tomosynthesis (DT) radiography. To illustrate points and pitfalls for interpreting DT radiographs by presenting clinical images. To demonstrate various clinical applications of DT radiography.

**TABLE OF CONTENTS/OUTLINE**

- Imaging techniques and artifacts in DT scan: sweep direction/angle/number of projections
- 2D images: scout scan/synthesized views
- Reconstruction: slice interval/sampling factor/FPB/iterative reconstruction/oblique multiplanar reconstruction
- Artifacts: ripple/ghost/metallcity/motion artifacts/limited depth resolution vs. CT
- Points and pitfalls for interpreting DT radiographs
- Evaluation of scout/synthesized images
- Recognition of potential DT artifacts
- Optimization of reconstruction parameters/algorithms
- CT-like image review: Understanding of spatial relationships/continuity in the slice direction
- Sensitive detection of calcified densities vs. conventional radiographs
- Understanding of image differences between DT and CT: patient positioning/imaging techniques/spatial and contrast resolution
- Breast: breast cancer
Multisystem/Special Interest Wednesday Poster Discussions

Wednesday, Nov. 30 12:45PM - 1:15PM Room: MS Community, Learning Center

AMA PRA Category 1 Credit ™: .50

Participants

Sub-Events

MS001-EB-MSE-WEB Cancer Immunotherapy and Pseudoprogression: Spectrum of Imaging Findings

Hardcopy Backboard

Awards

Identified for RadioGraphics

Participants

Participants

Gary X. Wang, MD, PhD, Boston, MA (Presenter) Nothing to Disclose
Vikram Kurra, MD, Cambridge, MA (Abstract Co-Author) Nothing to Disclose
Justin F. Gainor, MD, Boston, MA (Abstract Co-Author) Nothing to Disclose
Ryan J. Sullivan, MD, Boston, MA (Abstract Co-Author) Nothing to Disclose
Keith Flaherty, MD, Boston, MA (Abstract Co-Author) Nothing to Disclose
Susanna I. Lee, MD, PhD, Boston, MA (Abstract Co-Author) Nothing to Disclose
Florian J. Fintelmann, MD, FRCP, Boston, MA (Abstract Co-Author) Consultant, McKesson Corporation

TEACHING POINTS

Immunomodulatory antibodies are fast-evolving cancer immunotherapeutic agents recently approved for advanced melanoma, lung and renal cell cancer, and multiple myeloma. Immunotherapy differs from conventional chemotherapy in action mechanism, treatment response patterns, and treatment-related toxicity. Treatment response may be assessed by the Immune-Related Response Criteria (irRC) or the Response Evaluation Criteria in Solid Tumors (RECIST 1.1). Some patients undergoing immunotherapy can transiently develop new or enlarging lesions in any organ system as part of the treatment response, termed pseudoprogression. Pseudoprogression should be differentiated from true progression as the former indicates treatment response. Immunotherapy can stimulate the immune system to cause autoimmune reactions, called immune-related adverse events (irAE). irAE can affect many organ systems, some with specific imaging findings.

TABLE OF CONTENTS/OUTLINE

General principles of immunomodulatory cancer immunotherapy
Comparison of imaging response criteria
Response Evaluation Criteria in Solid Tumors (RECIST 1.1)
Immune-Related Response Criteria (irRC)
Multi-modality multi-organ system imaging findings of atypical tumor response during immunotherapy aka pseudoprogression
Multi-modality multi-organ system imaging findings of immune-related adverse events

Honored Educators

Presenters or authors on this event have been recognized as RSNA Honored Educators for participating in multiple qualifying educational activities. Honored Educators are invested in furthering the profession of radiology by delivering high-quality educational content in their field of study. Learn how you can become an honored educator by visiting the website at: https://www.rsna.org/Honored-Educator-Award/

Susanna I. Lee, MD, PhD - 2013 Honored Educator
Illicit Uses of Radioactive Materials

Wednesday, Nov. 30 4:30PM - 6:00PM Room: E353B

AMA PRA Category 1 Credits ™: 1.50
ARRT Category A+ Credits: 1.50

Participants
Robert D. Simmons, Chicago, IL (Presenter) Nothing to Disclose
E. Frank Moore, Lemont, IL (Presenter) Nothing to Disclose
Christine Van Horn, Lemont, IL (Presenter) Nothing to Disclose
Joe Adduci, Lemont, IL (Presenter) Nothing to Disclose

LEARNING OBJECTIVES

1) To understand the types of radioactive materials used in patient care that are of concern for theft and how those material may be used for illicit purposes. 2) To gain an understanding of suspicious activities to be aware of in order to protect radioactive material of concern. 3) To understand the reporting process when suspicious activity is observed and how that information is used to assist in the overall investigation process.

ABSTRACT

URL
Forensic Radiology: Preparing Cases for the Court Room (An Interactive Session)

Thursday, Dec. 1 8:30AM - 10:00AM Room: S502AB

AMA PRA Category 1 Credits ™: 1.50
ARRT Category A+ Credits: 1.50

Participants
Angela D. Levy, MD, Washington, DC (Moderator) Nothing to Disclose
Howard T. Harcke, MD, Dover AFB, DE, (howard.harcke@gmail.com) (Presenter) Nothing to Disclose
Barry D. Daly, MD, Baltimore, MD, (bdaly@umm.edu) (Presenter) Nothing to Disclose
David Fowler, MD, Baltimore, MD (Presenter) Nothing to Disclose
Edward L. Mazuchowski, MD, PhD, Dover AFB, DE (Presenter) Nothing to Disclose

LEARNING OBJECTIVES
1) Describe the strengths and limitations of the imaging techniques used in forensic radiology. 2) Explain how the courtroom use of imaging findings assists expert witnesses such as forensic pathologists or radiologists. 3) Compare the role of the radiologist and forensic pathologist in preparing cases for the courtroom. Please bring your charged mobile wireless device (phone, tablet or laptop) to participate.

ABSTRACT
Radiography, CT, CT angiography, and MRI are routinely used in forensic radiology. These are widely accepted imaging techniques that are becoming important diagnostic tools for forensic pathologists. Increasingly, CT and MRI images are being used to provide evidence in the courtroom and the radiologist and pathologist must appreciate how imaging findings may be complementary to or more sensitive than autopsy findings. Imaging findings provide additional objective evidence that can be easily displayed. In some cases, forensic imaging may support evidence from accident or crime scene investigations or may be the sole finding to support a theory for the mechanism and cause of injury or death. Such studies may influence jury members and contribute in securing either a criminal conviction or acquittal where appropriate. In this course, radiologists are paired with a forensic pathologist to discuss cases that they typically encounter in practice. The cases will be presented to the audience in a systematic manner with imaging and autopsy findings to teach the audience how imaging is used in the court to supplement the testimony of the medical examiner or expert radiologist. Examples include the meaning of hyoid fracture in strangulation; assessment of perforating gunshot wounds; the significance of intravascular air; and, the appearance of stillbirth versus live birth in infant death.
Participants
Nicole B. Dhanraj, PhD, RT, Mangilao, GU (Presenter)

LEARNING OBJECTIVES
1) Define the term neglected tropical diseases and provide insight into their societal impact. 2) Discuss neglected tropical diseases affecting the Americas and medical imaging’s role in screening, diagnosis and follow-up evaluation. 3) Describe the radiology community’s need to participate actively in containment and eradication of neglected tropical diseases within the resource-limited communities of the Americas.

ABSTRACT
Neglected tropical diseases are a diverse group of illnesses with distinct characteristics that thrive mainly among the poorest populations. The World Health Organization (WHO) prioritized 17 neglected tropical diseases that are endemic in 149 countries and affect more than 1.4 billion people, costing developing economies billions of dollars every year. Neglected tropical disease rates also are increasing in the U.S. Gulf States; however, many of these diseases are not new to the region. In May 2013, the 66th World Health Assembly adopted resolution WHA66.12, which calls for intensified, integrated measures and planned investments to improve the health and social well-being of affected populations. For many neglected tropical diseases, diagnostic tests are cumbersome or not widely available. Understanding the role that radiology plays in early diagnosis and disease monitoring, as well as radiologic manifestations of neglected tropical diseases, is critical for treating these conditions at the source and preventing further spread.
Beyond Colorectal Carcinoma: Imaging Spectrum of Lynch Syndrome

Station #1

Participants

MS127-ED-THA1

Beyond Colorectal Carcinoma: Imaging Spectrum of Lynch Syndrome

Awards

Certificate of Merit

Identified for Radiographics

Participants

Anas A. Saeed Bamashmos, MBChB, Houston, TX (Abstract Co-Author) Nothing to Disclose
Chaitra M. Muthalgiri, MBBS, Houston, TX (Abstract Co-Author) Nothing to Disclose
Veronica L. Cox, MD, Palo Alto, CA (Abstract Co-Author) Nothing to Disclose
Shiva Gupta, MD, Houston, TX (Abstract Co-Author) Nothing to Disclose
Sireesha Yedururi, MBBS, Sugarland, TX (Abstract Co-Author) Nothing to Disclose
Naveen Garg, MD, Houston, TX (Abstract Co-Author) Consultant, Document Storage Systems, Inc CEO, Gargll LLC
Hyunseon C. Kang, MD, PhD, Houston, TX (Presenter) Nothing to Disclose

TEACHING POINTS

Understand the genetics of Lynch syndrome and associated tumor biology
Review the diagnostic criteria for Lynch syndrome, and characteristics that differentiate it from other hereditary colorectal cancer syndromes
Illustrate the imaging features of cancers associated with Lynch syndrome
Discuss management of patients with Lynch syndrome

TABLE OF CONTENTS/OUTLINE

Introduction to Hereditary Colorectal Cancer Syndromes
Genetics and Pathology of Lynch Syndrome and Associated Tumor Biology
Cancers Associated with Lynch Syndrome - Colon, Endometrium, Ovary, Stomach, Small Bowel, Urinary Tract, Biliary Tree, Pancreas, Others
Imaging Features of Cancers that Suggest an Association with Lynch Syndrome
Management of Patients with Lynch Syndrome
Screening/Surveillance
Treatment - Surgical Resection, Chemotherapy, Immunotherapy
**MSE-THB**

**Multisystem/Special Interest Thursday Poster Discussions**

Thursday, Dec. 1 12:45PM - 1:15PM Room: MS Community, Learning Center

**AMA PRA Category 1 Credit ™:** .50

---

**Participants**

**Sub-Events**

**MS142-ED-THB1**  
**BRCA and Beyond: Comprehensive Image-Rich Review of Hereditary Breast and Gynecologic Cancer Syndromes**

Station #1

**Awards**

**Identified for RadioGraphics**

---

**Participants**

Stephanie N. Histed, MD, Los Angeles, CA (*Presenter*) Nothing to Disclose  
Nina Woldenberg, MD, Los Angeles, CA (*Abstract Co-Author*) Nothing to Disclose  
Rinat Masamed, MD, Los Angeles, CA (*Abstract Co-Author*) Nothing to Disclose  
Melissa M. Joines, MD, Los Angeles, CA (*Abstract Co-Author*) Nothing to Disclose  
Antoinette R. Roth, MD, Sylmar, CA (*Abstract Co-Author*) Nothing to Disclose  
Maitraya K. Patel, MD, Sylmar, CA (*Abstract Co-Author*) Nothing to Disclose

---

**TEACHING POINTS**

Radiologists play a central role in guiding high-risk patients with hereditary breast and gynecologic cancers including patient identification, screening, diagnosis and staging. Familiarity with the associated genetic mutations, pathophysiology, incidence, specific cancer risks and image-based screening guidelines is needed for collaborative high level care of this high-risk patient population. Several hereditary cancer syndromes are associated with increased risk of breast, ovarian, endometrial and cervical cancer as well as other non-breast and gynecologic cancers. Multimodal image based screening may be indicated for these patients. Analyzing the presentation of these high-risk patients appropriately will guide diagnosis and management.

**TABLE OF CONTENTS/OUTLINE**

Image-rich comprehensive review of hereditary breast and gynecologic cancer syndromes, including hereditary breast and ovarian cancer associated with BRCA1/BRCA2 and Lynch syndrome, and less common syndromes including Peutz-Jegher, Gorlin, Li-Fraumeni and Cowden. Associated genetic mutations, pathophysiology, incidence, specific cancer risks and image-based screening guidelines. Discussion of the subtypes of breast, ovarian, endometrial and cervical cancer as well as non-breast and gynecologic cancers in each syndrome.
LEARNING OBJECTIVES

1) Prepare a format- and content-compliant manuscript or Powerpoint™ presentation for possible publication. 2) Use ScholarOne Manuscripts to submit a manuscript for possible publication. 3) Become familiar with the RadioGraphics publication process.

ABSTRACT

The majority of material published in RadioGraphics is derived from solicited education exhibits selected by subspecialty panels at the RSNA annual meeting. This session, conducted by the RadioGraphics peer review and production staff, will review the process of developing a manuscript or Powerpoint presentation (for the Fundamentals and Training section of the online journal) from your solicited exhibit and submitting your material via our online submission and peer review system ScholarOne. The components of a standard RadioGraphics manuscript will be detailed, including the creation of a CME test. There will be ample time for questions to the staff and the editor of RadioGraphics, Dr. Jeffrey Klein.

URL

Handout: Lucinda Foulke

**RC724**

**Communicate for Success**

Thursday, Dec. 1 4:30PM - 6:00PM Room: N226

*AMA PRA Category 1 Credits ™: 1.50*  
*ARRT Category A+ Credits: 1.50*

**Participants**

David P. Fessell, MD, Ann Arbor, MI *(Moderator) Nothing to Disclose*

**LEARNING OBJECTIVES**

1) Compare helpful and unhelpful styles of communication and their impact. 2) Describe ACR 3.0 recommendations regarding communication. 3) Develop strategies for successful communication.

**ABSTRACT**

Radiologists cannot excel unless they communicate effectively, yet communication often does not receive the attention it deserves in medical education. In this course, we explore frequently neglected but vitally important principles of communication, including self-communication, the role of communication in the future of radiology, and the longer-term objectives of excellence in communication.

**Sub-Events**

**RC724A**  **Self-Communication**

Participants

David P. Fessell, MD, Ann Arbor, MI *(Presenter) Nothing to Disclose*

**LEARNING OBJECTIVES**

1) Compare helpful and unhelpful styles of communication and their impact. 2) Describe ACR 3.0 recommendations regarding communication. 3) Develop strategies for successful communication.

**ABSTRACT**

**RC724B**  **Communication 3.0**

Participants

Bibb Allen JR, MD, Birmingham, AL *(Presenter) Nothing to Disclose*

**RC724C**  **Communicate to Connect**

Participants

Richard B. Gunderman, MD, PhD, Indianapolis, IN *(Presenter) Nothing to Disclose*

**ABSTRACT**

Radiologists cannot excel unless they communicate effectively, yet communication often does not receive the attention it deserves in medical education. In this course, we explore frequently neglected but vitally important principles of communication, including self-communication, the role of communication in the future of radiology, and the longer-term objectives of excellence in communication.
The Role of Advanced Imaging in Unraveling the Secrets of Ancient Art and Artifacts

Friday, Dec. 2 8:30AM - 10:00AM Room: E351

AMA PRA Category 1 Credit™: 1.50
ARRT Category A+ Credits: 1.50
FDA

Discussions may include off-label uses.

Participants
Barry D. Daly, MD, Baltimore, MD, (bdaly@umm.edu) (Moderator) Nothing to Disclose
Barry D. Daly, MD, Baltimore, MD, (bdaly@umm.edu) (Presenter) Nothing to Disclose
Vahid Yaghmai, MD, Chicago, IL (Presenter) Nothing to Disclose
Jonathan P. Brown, MS, Chicago, IL (Presenter) Nothing to Disclose

LEARNING OBJECTIVES
1) To describe the novel use of advanced imaging techniques in the non-invasive investigation of historic art treasures. 2) To identify related benefits for both research and educational activities at museums and art institutions.

ABSTRACT
In recent years museums worldwide have sought to partner with radiology departments in the non-invasive investigation of ancient and fragile treasures. Advanced digital imaging and 3D CT have been used to determine the age, authenticity, composition and geographic origin of these artifacts, to investigate their internal contents, and to detect prior structural damage and hidden repairs. The subject material of this course includes a diverse range of significant artifacts such as Egyptian and Peruvian mummies, Mesoamerican and Chinese ceramics, Mesopotamian stucco art, Judaic tabernacles, European medieval religious artifacts, Renaissance paintings, Stradivarius violins and Japanese wood sculptures. Some conservators now have access to 3D imaging software at museums or may conduct remote collaborative analysis of cases with radiologists via cloud-based 3D servers. The speakers include two radiologists with extensive experience in the technical approach to imaging these treasures and a senior conservator at the Field museum who will provide an expert's perspective on the research and educational value of such initiatives.

Honored Educators

Presenters or authors on this event have been recognized as RSNA Honored Educators for participating in multiple qualifying educational activities. Honored Educators are invested in furthering the profession of radiology by delivering high-quality educational content in their field of study. Learn how you can become an honored educator by visiting the website at: https://www.rsna.org/Honored-Educator-Award/

Vahid Yaghmai, MD - 2012 Honored Educator
Vahid Yaghmai, MD - 2015 Honored Educator