AAPM/RSNA Physics Tutorial for Residents: Multi-spectral and Volumetric Imaging

**Special Courses**

**SPPH01**

**AAPM/RSNA Physics Tutorial for Residents: Multi-spectral and Volumetric Imaging**

**Participants**

**Moderator**
Richard J. Massoth PhD : Nothing to Disclose

**LEARNING OBJECTIVES**

1) Describe the underlying physics of multi-spectral volumetric imaging and advanced applications that can increase the effectiveness of this emerging imaging technology. 2) Understand imaging artifacts resulting from hybrid imaging techniques and the limitations of the technology. 3) Describe dual imaging techniques used in diagnostic imaging.

**Sub-Events**

**SPPH01A**

**Physics Overview of Multi-spectral and Volumetric Imaging**

Richard J. Massoth PhD (Presenter): Nothing to Disclose

**LEARNING OBJECTIVES**

View learning objectives under main course title.

**SPPH01B**

**Multi-spectral CT Imaging**

Mark Patrick Supanich PhD (Presenter): Research agreement, Siemens AG

**LEARNING OBJECTIVES**

View learning objectives under main course title.

**SPPH01C**

**Hybrid Imaging in Nuclear Medicine**

Osama R. Mawlawi PhD (Presenter): Research Grant, Siemens AG Research Grant, General Electric Company

**LEARNING OBJECTIVES**

View learning objectives under main course title.

AAPM/RSNA Tutorial on Equipment Selection: Multi-Spectral and Volumetric Imaging

**Special Courses**

**SPPH02**

**AAPM/RSNA Tutorial on Equipment Selection: Multi-Spectral and Volumetric Imaging**

**Participants**

**Moderator**
Jerry A. Thomas MS : Stockholder, General Electric Company Stockholder, Hologic, Inc Stockholder, Stryker Corporation Speaker, Medical Technology Management Institute

**LEARNING OBJECTIVES**

1) Understand the advanced capabilities of multi-spectral volumetric imaging in the major modalities of Ultrasound, MRI, CT and Nuclear Imaging. 2) Appreciate the clinical capabilities of multi-spectral volumetric imaging and approach to utilizing advanced
Sub-Events

SPPH02A  Dual Energy Imaging in Diagnostic Radiology
Jerry A. Thomas  MS (Presenter): Stockholder, General Electric Company Stockholder, Hologic, Inc Stockholder, Stryker Corporation Speaker, Medical Technology Management Institute

LEARNING OBJECTIVES
View learning objectives under main course title.

SPPH02B  Hybrid Imaging in Ultrasound
Evan Boote PhD (Presenter): Nothing to Disclose

LEARNING OBJECTIVES
View learning objectives under main course title.

ABSTRACT
Ultrasound imaging is a relatively inexpensive, low-risk application to patients, ubiquitously available in the health care setting. However, ultrasound presents a challenge to the novice user, particularly with regard to recognition of anatomic landmarks. In some situations, ultrasound imaging is not capable of resolving some structures, either due to spatial and/or contrast resolution limitations; in certain other situations, ultrasound offers a superior approach to visualizing abnormalities or the depiction of blood flow in the body. Hybrid ultrasound may be defined in a number of ways - the most likely definition would be what might be termed 'fusion' imaging, where a set of image data from a second modality is imported into the ultrasound system, anatomical landmarks are established, and a fused image is displayed in real-time. Hence the advantages of the other modalities would be gained during the use of the ultrasound system. Another definition of 'hybrid' may be the use of a device to depict a biopsy needle placement in real-time. A further extension of the word 'hybrid' might be to include real-time simultaneous imaging with another modality, even a non-traditional imaging modality. This presentation will review these variations of 'hybrid' ultrasound that are commercially available and in current clinical practice. However, the presentation will also cover those still in the development stage. The practical applications of these systems will be discussed, as will the limitations and restrictions on their use. Included in this will be an evaluation of cost of the system and a case-study on the use of hybrid imaging in a hospital setting.

SPPH02C  Commercially Available Multi-spectral and Volumetric Imaging Systems
Sarah Eva McKenney PhD (Presenter): Nothing to Disclose

LEARNING OBJECTIVES
View learning objectives under main course title.

ABSTRACT
The price of purchasing and maintaining the latest imaging systems is on the order of millions; tight budgets in health care necessitate the ability to make smart purchases. This work identifies important considerations when purchasing an advanced imaging system, specifically in the context of dual energy and multi-modality volumetric imaging. The roles of imaging stakeholders are examined including: administrators, radiologists, technologists, medical physicists, IT specialists, clinical engineers, and vendors. A general overview of the strengths and weaknesses of volumetric commercially available imaging systems is also provided. Learning Objectives • Identify the needs of the imaging cohort • Evaluate prospective systems for purchase

URL
http://goo.gl/CB3Tgm
**Sub-Events**

**MSAS21A**

ICD-10 for Imaging: Now What

Denise A. Merlino MBA (Presenter): Consultant, IBA Molecular Imaging Consultant, United Pharmacy Partners, Inc Consultant, Bracco Group Spouse, Employee, Pharmalucence, Inc

**LEARNING OBJECTIVES**

1) At the end of the session the participant will understand the important aspects of successful ICD 10 implementation and training tips important for Imaging. 2) The participant will know where to locate important references and resources regarding ICD-10 as it relates to Imaging.

**URL's**

www.merlinohccc.com

**Active Handout**


**MSAS21B**

Health Care Reform: Implications for Health Care Providers

Erika Johnson (Presenter): Nothing to Disclose

**LEARNING OBJECTIVES**

1) Describe a new perspective on population health and efforts to contain health care spending. 2) Describe a new population health taxonomy. 3) Describe different management approaches for each population cohort to improve efficiencies.

**MSAS22**

Think Inside the Box: Combining Strategy and Design to Re-invent Radiology Master Planning (Sponsored by the Associated Sciences Consortium) (An Interactive Session)

**Multisession Courses**

HP

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

Mon, Dec 1 10:30 AM - 12:00 PM  Location: S105AB

**Participants**

Moderator
Morris A. Stein  BArch : Nothing to Disclose
Carlos L. Amato (Presenter): Nothing to Disclose
Katherine Margaret Richman MD (Presenter): Spouse, Employee, Agfa-Gevaert Group
John T. McGarry (Presenter): Nothing to Disclose

**LEARNING OBJECTIVES**

1) Identify strategic master planning initiatives to address ACA impacts as well as innovative future delivery of care models. 2) Describe how technology trends such as mobile health, cloud computing, big data, intelligent patient models, intelligent infrastructure and patient empowerment will affect future physical radiology department designs. 3) Demonstrate the benefits of parametric master planning and why it will radically change the traditional design process commonly used today. 4) Understand parametric planning and simulation modeling to objectively evaluate and compare department functional organizations, staffing models, efficiency and patient throughput.

**ABSTRACT**

Every hospital and outpatient center faces several common and overlapping challenges: limited space, growing demands for efficiency, finite resources and increased patient volume. Master planning for Radiology is more than simply technology change or squeezing more inside existing space. This refresher course will describe how using strategic planning, physical design and functional organization all best contribute for a modern reinvention of master planning. The same clues that large institutions are using globally are valuable for radiology specific planning.

**MSAS23**

Unsolved Dilemmas in a Digital World: Improving Radiologist and Technologist Communication (Sponsored by the Associated Sciences Consortium) (An Interactive Session)

**Multisession Courses**

HP

BR

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

Mon, Dec 1 10:30 AM - 12:00 PM  Location: S105AB
Participants

Moderator
Dana Aragon RT: Nothing to Disclose

Sub-Events

MSAS23A

The Team Approach to Breast Imaging: A Model for All of Radiology

Michael N. Linver MD (Presenter): Nothing to Disclose

LEARNING OBJECTIVES

1) Understand the new clinical role of each member of the breast cancer imaging team in providing total patient care. 2) Discern the importance of appropriate interactions with the other members of the imaging team. 3) Apply the changing paradigm of patient care within the breast imaging model to other areas of diagnostic and interventional radiology.

ABSTRACT

Over the past 15 years, breast imaging as a subspecialty has been transformed from a purely imaging-based modality to a true clinical specialty, requiring a specialized team of individuals sensitized not only to the imaging aspects, but also to the clinical, pathology and treatment aspects of breast cancer care. The role of each team member and the important interactions with other members will be expanded upon, with emphasis on the need to include the patient in all such interactions. Further emphasis will be placed on the changing face of all of radiology toward more direct interactions with patients, and how the breast imaging model can be modified and adapted to the rest of diagnostic and interventional radiology to better serve patient needs, thereby improving patient outcomes.

MSAS23B

Speak To Me! Unsaid Is Risky and Expensive

Patricia Kroken (Presenter): Nothing to Disclose

LEARNING OBJECTIVES

1) Understand the financial and compliance implications of substandard documentation. 2) Identify opportunities to improve communications and documentation. 3) Apply suggestions and/or recommendations given in the presentation.

Handout: Patricia Kroken

http://media.rsna.org/media/abstract/2014/14000886/Speak to Me! RSNA 2014 with ARS Questions.pot

SPPH21

AAPM/RSNA Basic Physics Lecture for the Radiologic Technologist: Radiography: Getting the Information We Need and Doing It Efficiently (An Interactive Session)

Special Courses

AMA PRA Category 1 Credits ™: 1.25

ARRT Category A+ Credits: 1.50

Mon, Dec 1 1:30 PM - 2:45 PM  Location: S402AB

Participants

Moderator
A. Kyle Jones PhD: Nothing to Disclose
Behrang Amini MD, PhD (Presenter): Nothing to Disclose
A. Kyle Jones PhD (Presenter): Nothing to Disclose

LEARNING OBJECTIVES

1) Recognize the types of information that radiologists are seeking in radiographic images. 2) Apply this knowledge to generate radiographs that provide this information, and do so using a reasonable radiation dose. 3) Integrate these skills into your clinical practice.
LEARNING OBJECTIVES

1) To understand radiotherapy as a work system and the requirements and necessity for a safety culture. 2) To understand how humans perform tasks and how they fail. 3) To understand the process of risk analysis. 4) To understand quality management concepts, tools and approaches. 5) To understand how to go from the results of the risk analysis to a quality program. 6) To understand the principles for establishing an incident reporting system and to learn about the national radiotherapy incident reporting and learning systems. 7) To understand the process of root-cause analysis for investigating events. 8) To understand the tools and techniques for quality improvement and managing change.

ABSTRACT

This session will give a brief summary of concepts, procedures and tools for addressing quality health care and patient safety in radiotherapy using systems engineering approaches that have proven effective in other fields of medicine and widely in industry. Establishing quality management procedures takes a risk-analysis approach, beginning with mapping a process, assessing the risks at each step, determining the propagation of failures and addressing potential failures with the most effective tools. The session also considers how to maintain and continually improve quality and safety in a radiotherapy facility through incident reporting, root-cause analysis and quality improvement techniques. Understanding these approaches requires knowledge of safety culture, work systems and how humans succeed and fail, all of which will be covered in this session.

Sub-Events

SPPH22A  Introduction: Work Systems and Safety Culture
Jennifer Lynn Johnson  MSc, MBA (Presenter):  Nothing to Disclose

LEARNING OBJECTIVES

View learning objectives under main course title.

SPPH22B  Errors and Actions
Bruce Robert Thomadsen  PhD (Presenter):  Nothing to Disclose

LEARNING OBJECTIVES

View learning objectives under main course title.

SPPH22C  Risk Assessment
Frank J. Rath (Presenter):  Nothing to Disclose

LEARNING OBJECTIVES

View learning objectives under main course title.

SPPH22D  Quality Management Concepts
Barrett Caldwell (Presenter):  Nothing to Disclose

LEARNING OBJECTIVES

View learning objectives under main course title.

SPPH22E  Quality Management Tools and Approaches
Frank J. Rath (Presenter):  Nothing to Disclose

LEARNING OBJECTIVES

View learning objectives under main course title.

SPPH22F  Quality Management Based on Risk Assessment
Bruce Robert Thomadsen  PhD (Presenter):  Nothing to Disclose

LEARNING OBJECTIVES

View learning objectives under main course title.
MSAS24

A Systematic Approach to Minimizing Radiation Dose (Sponsored by the Associated Sciences Consortium) (An Interactive Session)

Multisession Courses

**MSAS24**

Report Systems
Peter Dunscombe PhD (Presenter): Director, TreatSafely, LLC

Root-Cause Analysis
Barrett Caldwell (Presenter): Nothing to Disclose

Quality Improvement
Peter Dunscombe PhD (Presenter): Director, TreatSafely, LLC

Managing Change
Jennifer Lynn Johnson MSc, MBA (Presenter): Nothing to Disclose

Participants

Moderator
William A. Undie PhD, RT: Nothing to Disclose

Sub-Events

The Roles of Radiographers/Radiological Technologists in Designing Equipment for Effective Dose Reduction
Dianna D. Cody PhD (Presenter): In-kind support, General Electric Company

LEARNING OBJECTIVES

1) Understand the importance of the digital localizer to the tube current modulation process for CT scanners from all manufacturers. 2) Appreciate how the patients' size, shape, and position in the gantry can affect the tube current modulation result. 3) Understand how the consistency of image quality can depend on the tube current modulation function.

ABSTRACT

The lecture will focus on understanding and exploiting the nuances of tube current modulation. Automatic Tube Current Modulation (TCM) is often suggested as appropriate method for reducing radiation dose during clinical CT exams. Because the process is automated, the responsibility for the resulting technical
parameters often seems to fall on the scanner software. However, there are several detailed aspects of all TCM systems that require special attention, and some nuances that are critical to understand in order to achieve the optimal outcome. The role of the technologist in understanding and overseeing TCM application in clinical practice will be explained using specific examples.

Planning Radiation Dose Reduction at the Referral/Ordering Stage

Deb M Scroggins MS, RT (Presenter): Nothing to Disclose

LEARNING OBJECTIVES

1) Understand the importance of discouraging the adjustment of scanning parameters from case to case. 2) Understand why CT dose reduction efforts should be rolled into protocol settings to maintain consistency. 3) Discuss and explain why the role of the Technologist during CT protocol review is critical.

ABSTRACT

The role of the Radiologic Technologist during CT Protocol Review. Regular review of CT protocols is becoming a more widespread practice across the country. Some states have recommended this practice, and it is part of the ACR CT Accreditation program. The role of the technologist during CT protocol review is critical. There are many aspects of the CT exam that only a technologist can adequately describe, and these aspects are required to guide the design and modification of CT protocol parameters. Several case examples of CT technologist participation during CT protocol review will be explained, with the focus on the impact of the technologist’s perspective in helping guide the review process.

Practical, Evidence-based Methods to Reduce Radiation Dose

Patrick C Brennan PhD (Presenter): Nothing to Disclose

LEARNING OBJECTIVES

1) Understand the changes that occur within biological tissue following ionizing radiation exposure. 2) Appreciate why some cells and tissues are more radiosensitive than others. 3) Discuss the differences between stochastic and deterministic changes. 4) Evaluate the risks associated with specific doses of radiation.

ABSTRACT

The lecture will focus on the radiobiological principles to justify radiation protection. Radiation protection is a core activity practiced by all diagnostic imaging personnel, however the principles behind why this is required is not always fully understood at doses delivered in diagnostic radiography. This talk will provide an overview of the processes that occur following biological tissues exposure to radiation and will develop the topic from the atomic to the molecular to the cell, tissue and eventually the whole organism man. The latest data from the ICRP will be presented so that a realistic understanding of the risks propose by radiation levels delivered in diagnostic departments is provided.

Managing Health Care: Imaging Utilization—An International Perspective (Sponsored by the Associated Sciences Consortium) (An Interactive Session)

Multisession Courses

MSAS31

Managing Health Care: Imaging Utilization—An International Perspective (Sponsored by the Associated Sciences Consortium) (An Interactive Session)

Multisession Courses

MSAS32

Imaging Updates—New Technology Practices (Sponsored by the Associated Sciences
**Consortium) (An Interactive Session)**

**Multisession Courses**

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<th>Presenter(s)</th>
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<tr>
<td><strong>NM</strong></td>
<td>Trends in Hybrid Imaging PET/MR</td>
<td>David Walter Jordan PhD</td>
<td>Nothing to Disclose</td>
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<tr>
<td><strong>MR</strong></td>
<td>MRI Safety—Facing the Challenges-PET/MR</td>
<td>Karen E Smith MSc</td>
<td>Nothing to Disclose</td>
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<tr>
<td><strong>MI</strong></td>
<td>Everyone on Board: Creating an Opportunity for Flat Collaboration and Safe Collegiate Working in Molecular Imaging</td>
<td>Marc Griffiths MSc</td>
<td>Nothing to Disclose</td>
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</tbody>
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**Owners**

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

**Location:** S105AB

**Participants**

Moderator
Steven P DeColle : Nothing to Disclose
Cindy R Comeau BS, RT : Nothing to Disclose

**Sub-Events**

**MSAS32A**

Trends in Hybrid Imaging PET/MR

David Walter Jordan PhD (Presenter): Nothing to Disclose

**LEARNING OBJECTIVES**

1) Describe the main features, advantages of simultaneous PET-MRI scanners.
2) Describe the main features, advantages of sequential PET-MRI scanners.
3) Describe current clinical uses of PET-MRI.
4) Describe future PET-MRI applications that are currently under investigation.

**MSAS32B**

MRI Safety—Facing the Challenges-PET/MR

Karen E Smith MSc (Presenter): Nothing to Disclose

**LEARNING OBJECTIVES**

1) Identify the safety challenges of PET/MRI from both a technologist and patient perspective.
2) Describe the technical challenges of PET/MRI compared to PET/CT.
3) Recognize various potential workflow considerations and challenges in PET/MRI.
4) Analyze the difficulties with the implementation of PET/MRI and ways to overcome these.

**MSAS32C**

Everyone on Board: Creating an Opportunity for Flat Collaboration and Safe Collegiate Working in Molecular Imaging

Marc Griffiths MSc (Presenter): Nothing to Disclose

**LEARNING OBJECTIVES**

1) Determine the key health and safety issues for a Nuclear Medicine Technologist working in a PET/MRI unit.
2) Explore how a multi-professional approach to delivering patient care may arise from working within a hybrid imaging environment.
3) What are the opportunities and challenges associated with introducing new automated software platforms within a hybrid imaging environment.
4) What could you learn, in terms of counselling skills, from your nursing colleagues, which may benefit oncology patients within a hybrid imaging environment.

**MSAS33**

Management of Portal Hypertension (Sponsored by the Associated Sciences Consortium) (An Interactive Session)

**Multisession Courses**

<table>
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<tr>
<td><strong>IR</strong></td>
<td>TIPS (Tranjugular Intrahepatic Portal Systemic Shunts)</td>
<td>Harneil Singh Sidhu MD (Presenter)</td>
<td>Nothing to Disclose</td>
</tr>
</tbody>
</table>

**Owners**

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

**Location:** S105AB

**Participants**

Moderator
David Brent Nicholson : Nothing to Disclose
Steven P DeColle : Nothing to Disclose

**Sub-Events**

**MSAS33A**

TIPS (Tranjugular Intrahepatic Portal Systemic Shunts)

Harneil Singh Sidhu MD (Presenter): Nothing to Disclose
LEARNING OBJECTIVES

1) When are indications for a TIPS procedure? 2) Pre-procedure workup for a TIPS procedure? 3) How is a TIPS performed. 4) What are some post procedure issues that occur.

**BRTO/BATO Balloon Occluded Retrograde Transvenous Obliteration of Varicose Veins/Balloon Occluded Antegrade Transvenous Obliteration of Varicose Veins**

Jun Koizumi MD, PhD (Presenter): Nothing to Disclose

LEARNING OBJECTIVES

1) Summarize the pathologic anatomy and hemodynamics associated with gastric and ectopic varices. 2) Describe the varying techniques of portosystemic collateral embolization, and balloon occluded transvenous obliteration (BRTO and BATO) for the management of gastric varices. 3) Identify the skillset and tactics for practice bulding and clinical patient selection. 4) Describe the techniques for transvenous sclerosis of ectopic varices will be described.

**ABSTRACT**

This session will describe the pathologic anatomy and hemodynamics associated with gastric and ectopic varices. The varying techniques of portosystemic collateral embolization and balloon occluded transvenous obliteration (BRTO and BATO) for the management of gastric varices are also reviewed. Practice bulding and clinical patient selection will also be addressed. Advanced techniques for transvenous sclerosis of ectopic varices will be described.

**MSAS33C**

**Portal Hemodynamics - Post Intervention**

Wael E. A. Saad MBCh (Presenter): Research Grant, Siemens AG Research Consultant, Siemens AG Consultant, Boston Scientific Corporation Consultant, Getinge AB Consultant, Merit Medical Systems, Inc

LEARNING OBJECTIVES

1) The attendees will know the various types of percutaneous portal procedures performed. 2) The attendees will understand the hemodynamic definitions and concepts of inflow and outflow. 3) The attendees will understand that increasing antegrade portal venous does not necessarily increase the functional inline portal venous flow to the liver hepatocytes. 4) The attendees will understand what procedures are categorized as procedures that would increase or decrease inline portal venous inflow. 5) The attendees will understand the correlations between nominal portal pressures, pressure gradients and portal flow (velocity, volume and direction).

**ABSTRACT**

Abstract: Portal interventions include: Transjugular Intra hepatic PortoSystemic Shunts (TIPS), portal vein angioplasty / Stenting, Balloon-occluded retrograde Transvenous obliteration (BROTO), hepatic venous interventions for Budd-Chiari, para umbilical vein occlusion and extrahepatic PortoSystemic shunt occlusion. The lecture will discuss the effects of these procedures on nominal portal pressures, pressure gradients and portal flow (velocity, volume and direction) and inline portal blood flow to the functional liver (hepatocytes).

**MSAS34**

**Normalization of Deviance: What Is Happening in Your Department (Sponsored by the Associated Sciences Consortium) (An Interactive Session)**

Multisession Courses

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

Tue, Dec 2 3:30 PM - 5:00 PM  Location: S105AB

Participants

Moderator  
Susan Crowley RT, MEd : Nothing to Disclose

Kathleen Kath : Nothing to Disclose

Andrew P. Woodward MA, RT (Presenter): Educator, Siemens AG

Melissa Jackowski Ed.D, RT(R)(M) (Presenter): Nothing to Disclose

LEARNING OBJECTIVES
1) Define Normalization of Deviance. 2) Discuss the History of Normalization of Deviance as it relates to NASA and health care in general. 3) Reflect on current practice and describe normalization of deviance as it is applied in imaging. 4) List negative consequence of normalization of deviance in imaging. 5) Explain ways that management can combat normalization of deviance in imaging.

**ABSTRACT**

As an imaging professional we are taught to be a patient advocate, to be technically competent and to have a patient safety mindset. Why is it then that often times we see “seasoned” imaging professionals taking shortcuts and exhibiting behaviors that don't necessarily embody those characteristics? This lecture will explore “Normalization of Deviance” as a possible cause of this phenomenon. “Normalization of Deviance breaks the safety culture, substituting a slippery slope of tolerating more and more errors and accepting more and more risk, always in the interest of efficiency and on-time schedules.” (Prielipp, Mago, Morell and Brull, 2010) Simply, we take short cuts and veer from standards in the interest of patient flow and these short cuts become the norm because we don't “see” any extreme negative outcome. Overtime, these new norms push the boundaries more and more. Normalization of Deviance theory has been applied to the Challenger space shuttle accident. Before the space shuttle blew up, O-ring erosion problems were documented numerous times. Over many occurrences and time, the engineers and managers started believing that these flaws were acceptable. This deviance became the new norm UNTIL the space shuttle accident. This lecture will discuss some of the new norms that may be becoming acceptable in imaging and possible negative outcomes. The role of management in combating Normalization of Deviance will be explored. Reference: Prielipp, R. C. (2010-05). The Normalization of Deviance Do We (Un)Knowingly Accept Doing the Wrong Thing?. Anesthesia and analgesia, 110(5), 1499-1502. doi:10.1213/ANE.0b013e3181d5adc5

**MSRT41**

**ASRT®RSNA 2014: Innovation and Translational Research: How to Promote Each within Your Organization**

**Multisession Courses**

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

**Participants**

Bradley J. Erickson MD, PhD (Presenter): Stockholder, Evidentia Health, Inc

**LEARNING OBJECTIVES**

1) Understand the differences and similarities between translational research and innovation. 2) Recognize the types of environments that are optimal for research and for innovation. 3) Understand how to mesh the two environments in your organization.

**ABSTRACT**

Translational research and innovation are often co-mingled because they both involve 'New stuff'. But they are actually very different. Translational research is the process of taking something proven to work in the lab, and making necessary adaptations to make it work 'for real'. Innovation is fundamentally disruptive and often involves the use of a tool designed for one task and adapting it to address a different problem. It is NOT a process where there are multiple, well-defined steps. The two are fundamentally different, and generally are competitive, but potentially complementary. While they are both about ‘new stuff’, Innovation and Translation tend to be in opposition to each other. The fundamental values that guide them are polar opposites. In this session, key aspects of innovation and research will be examined. Ways to encourage both will be reviewed. Some of the threats or challenges of innovation and research will also be identified. At the end of the session, attendees should be able to recognize aspects of their organization that promotes and hinders both innovation and research. They might also identify ways that they can encourage both in their environment.

**MSRT42**

**ASRT®RSNA 2014: Shoulder Imaging**

**Multisession Courses**

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

**Participants**

Ken L. Schreibman PhD, MD (Presenter): Nothing to Disclose

**LEARNING OBJECTIVES**

1) Review the anatomy of the shoulder in 3-dimensions, with attention to the complex anatomy of the scapula. 2) Demonstrate the standard radiographic views of the shoulder, with attention to proper patient positioning. 3) Discuss techniques for optimizing CT of the shoulder, including anatomic reformatting planes. 4) Illustrate the radiographic appearance of shoulder dislocations, with emphasis on posterior dislocations.

**MSRT43**

**ASRT®RSNA 2014: Expanding the Role of the Radiographer in the Quality Assurance Triangle**

**Multisession Courses**

- AMA PRA Category 1 Credits ™: 1.00
- ARRT Category A+ Credit: 1.00
**LEARNING OBJECTIVES**

1) Describe quality measures in radiological imaging. 2) List regulatory, advisory and accrediting bodies monitoring quality performance. 3) Identify the increasing role of the radiologic technologist in quality initiatives.

**ABSTRACT**

Improvement of image quality is an ongoing process within any radiology department. A quality assurance triangle is often used to describe the contributions from the technologist, radiologist and medical physicist. Alone each member of the quality improvement team is not as effective as the collective whole. The radiologic technologist plays a key role in this synergistic process. Preventative maintenance and equipment evaluations may be performed annually but the technologist utilizes the equipment on a daily basis. The technologist is typically the first person to visualize a change in equipment performance. It is imperative that any such changes are reported to ensure quality imaging. Regulatory and accrediting agencies are placing an increased significance on quality improvement initiatives. Improved outcomes will require more active participation of the radiologic technologist.

**MSRT44**

**ASRT®RSNA 2014: The Miracle of Breast MRI**

**Multisession Courses**

| MR | BR | MR | BR |

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

**Participants**

David A. Strahle MD (Presenter): Nothing to Disclose

**LEARNING OBJECTIVES**

1) Explain the role dense fibroglandular tissue plays in hiding breast cancer. 2) List four advantages Screening Breast MRI has over screening mammograms. 3) Discuss how often Screening Breast MRI’s should be obtained on a routine basis in women with dense breast tissue. 4) Discuss the impact a national MRI screening program might have on saving lives and reducing costs. 5) Identify eight financial advantages for insurance carriers who pay for annual Screening Breast MRI’s.

**ABSTRACT**

Mammograms have been the only screening imaging modality accepted for early detection of breast cancer for almost 50 years. Historically, Breast MRI has been used to define the extent of breast cancer only after identification by mammograms. Our research used Breast MRI to determine the presence of occult cancers missed by screening mammograms and the relationship of those cancers to dense breast tissue. In addition, we were able to identify a limited number of MRI sequences that are now being used for annual screening of women who have dense breasts without any other breast abnormalities. For two years, 671 women received a Breast MRI at no cost following a negative screening mammogram. Eighteen parameters were recorded including the density of her fibroglandular tissue and the location of any lesions inside or outside the fibroglandular tissue. Numerous lesions (benign and malignant) missed by mammography were clearly identified by MRI. MRI detected cancer at a rate of 16.3 per 1000 women verses the mammogram detection rate of 2.7 per 1000 women. This correlates to a major shift in time of cancer detection 6 years earlier than screening the same women with mammography. Only 3 different MRI sequences detected all the cancers reducing scan time to only 12 minutes. Further, we were able to reduce unnecessary biopsies significantly below that of mammography. As a result of our research, effective November 18, 2013, the first insurance carrier in the nation began paying for annual Screening Breast MRI’s for all women with dense breast tissue between 40 and 80 years of age. They have estimated significant savings across eight major financial categories. In addition, lives saved due to super-early detection are expected to be high resulting in a major marketing advantage for the insurance industry.

**Active Handout**


**MSRT45**

**ASRT®RSNA 2014: Dual Energy Computed Tomography**

**Multisession Courses**

| CT |

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

**Participants**

Marilyn J. Siegel MD (Presenter): Research Consultant, Siemens AG Speakers Bureau, Siemens AG

**LEARNING OBJECTIVES**

1) Discuss the general principles of dual-energy CT. 2) Describe radiation dose aspects of dual energy CT. 3) Understand clinical applications of dual-energy CT in clinical patient care.

**ABSTRACT**

Dual energy CT; (DECT) refers to the acquisition of CT datasets at two different energy spectra (80/140,100/140, or 70/150).;
The acquisition of CT data at different photon energies enables differences in material composition to be detected based on differences in photon absorption at the two kVp settings. There are two basic approaches to DECT: rapid voltage switching and dual source CT, the latter allowing simultaneous acquisition of data from two x-ray tubes operating at different tube potentials in a single CT acquisition. This presentation will focus on the dual source DECT approach.

The images acquired can be viewed as low and/or high, kVp images and as a mixed or blended dataset which integrates two kVp acquisitions in a single image for immediate clinical evaluation. Image blending can be linear or nonlinear. Linear blending is a continuous function with equal weighting of the noise characteristics of the high-energy scan and the contrast characteristics of the low-energy scan. Nonlinear blending is based on modified sigmoid blending and operates in a voxel-by-voxel fashion.

In addition, virtual unenhanced CT images, iodine maps, color-coded images superimposing iodine distribution on the virtual nonenhanced data, bone-subtraction images for CT angiographic studies, and renal stone content analytic images can be generated using dual-energy post-processing software. Monoenergetic images, in which the density for each voxel is extrapolated to a certain energy (range 50-190 keV) from the two density values at the acquired photon energies, can be performed.

Clinical applications are: CT angiography, assessment of lung perfusion and ventilation, characterization of renal stones, liver, pancreatic, adrenal, and renal masses, assessment of myocardial perfusion. The monoenergetic application allows removal of metal artifacts at higher keVs. The radiation dose from DECT is comparable to that with single energy CT.

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**MSRT46**

**ASRT@RSNA 2014: Tuberous Sclerosis Complex (TSC) as It Relates to Diagnostic Imaging**

**Multisession Courses**

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<th>US</th>
<th>MR</th>
<th>CT</th>
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<th>MR</th>
<th>CT</th>
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AMA PRA Category 1 Credits™: 1.00
ARRT Category A+ Credit: 1.00

**Participants**

Karen Letourneau (Presenter): Nothing to Disclose

**LEARNING OBJECTIVES**

1) Identify the role of diagnostic imaging in the diagnosis and treatment in Tuberous Sclerosis Complex (TSC).
2) Recognize the limitations of various modalities in the diagnosis of specific pathologies.
3) Compare the utility and efficacy of CT, MR, ultrasound and plain films in identification of the common pathologic conditions associated with TSC.
4) Gain understanding of the patient’s and the family perspective in diagnostic imaging departments.

**ABSTRACT**

ABSTRACT We present a case report of a patient with all the typical lesions of tuberous sclerosis complex (TSC); renal angiomyolipoma, renal cysts, cardiac rhabdomyoma cortical tubers and subependymal nodules. Our case also demonstrates atypical findings in TSC; abdominal aortic aneurysm and renal cell carcinoma. A brief overview of the disease will be presented however, we have limited the majority of the discussion to the aspects of this disease in which diagnostic imaging, i.e.; CT, MR, ultrasound and plain films plays a vital role in the diagnosis and treatment planning of this complex disease.

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**MSRT51**

**ASRT@RSNA 2014: Contrast Media - Adverse Reactions and Management**

**Multisession Courses**

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

**Participants**

Gauravi Kaur Sabharwal MD (Presenter): Nothing to Disclose

**LEARNING OBJECTIVES**

1) Know incidence of reactions to contrast media.
2) Understand risk factors that may increase incidence of an adverse reaction to contrast media.
3) Understand pathogenesis of the reactions to contrast media.
4) Know classification of the different contrast reactions.
5) Review management of the different types of contrast reactions.
6) Know about premedications for prevention of contrast reactions.

**ABSTRACT**

Contrast media is the most commonly used pharmacological agent in Radiology. It is associated with multiple adverse reactions. While these reactions are relatively uncommon, some of them can be severe and even fatal. This makes it important to be able to recognize these reactions and appropriately manage them. Patients with known prior reactions to contrast media and with other risk factors should be premedicated prior to the administration of this agent.

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**MSRT52**

**ASRT@RSNA 2014: Stomach Esophageal Pathology**

**Multisession Courses**

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<th>CT</th>
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AMA PRA Category 1 Credits™: 1.00
Participants
Jeffrey Crowley BS, RRA (Presenter): Nothing to Disclose

LEARNING OBJECTIVES
1) The attendee will gain an understanding of the structure and function of the esophagus. 2) The attendee will have an overview of radiographic pathology of many disease processes of the esophagus. 3) The attendee will gain an understanding of the structure and function of the stomach. 4) The attendee will be given an overview of the radiographic pathology of many disease processes of the stomach. 5) The attendee will participate in case studies involving disease processes of the esophagus and stomach.

ABSTRACT
In this course a overview of the structure and function of the stomach and esophagus will be given. Several common disease processes will be discussed using radiographic findings. The final portion will be case studies of some of the disease processes discussed in the lecture.

MSRT53
ASRT@RSNA 2014: Practice Standards and Ethical Considerations in Daily Practice
Multisession Courses
AMA PRA Category 1 Credits ™: 1.00
ARRT Category A+ Credit: 1.00
Thu, Dec 4 10:30 AM - 11:30 AM  Location: N230AB

Participants
Ann Obergfell JD (Presenter): Nothing to Disclose

LEARNING OBJECTIVES
1) Access the Practice Standards for Medical Imaging and Radiation Therapy and the Rules of Ethics. 2) Analyze practice scenarios to determine if the practice meets acceptable professional performance. 3) apply the Rules of Ethics to determine if behavior complies with professional expectation and patient safety guidelines.

ABSTRACT
The changing healthcare environment may produce anxiety among imaging professionals as they navigate new clinical expectations balanced against professional performance guidelines. This presentation will discuss the Practice Standards for Medical Imaging and Radiation Therapy adopted by the ASRT and the Standards of Ethics adopted and enforced by the ARRT and the application and implication of each on daily practice. Specific scenarios related to practice will be analyzed utilizing the Practice Standards to determine the appropriateness of practice and the Standards of Ethics to ascertain professional ethical compliance.

MSRT54
ASRT@RSNA 2014: Advanced Radiographic Practice in Adult Chest Imaging
Multisession Courses
AMA PRA Category 1 Credits ™: 1.00
ARRT Category A+ Credit: 1.00
Thu, Dec 4 11:45 AM - 12:45 PM  Location: N230AB

Participants
Nick Woznita BSC (Presenter): Nothing to Disclose

LEARNING OBJECTIVES
1) Consider the role of the advanced radiographer practitioner in the United Kingdom.
2) Recognise the contribution that advanced radiographer practitioners make to patients, clinicians and radiologists, using anonymised real case scenarios.
3) Review the current evidence base which supports advanced radiographer practice, including radiographer reporting of adult chest x-rays

ABSTRACT
Increasing cost and activity pressures on health systems worldwide has led to advanced radiographer practice models developing internationally. In the United Kingdom, radiographer reporting has evolved from the reporting of trauma skeletal x-rays by trained radiographers to include the interpretation of adult chest x-rays, CT head, MRI knee and lumbar spine, mammography, ultrasound and gastrointestinal examinations.
Advanced radiographer practice encompasses the entire spectrum of imaging, from justification of the referral, obtaining high quality images, initial image review and the provision of a definitive clinical report. The contribution that advanced practitioner radiographers make at patient, departmental and hospital levels will be highlighted. The positive influence on improved patient care and the service provided to referring clinicians will be illustrated through real case scenarios. Departmental and hospital benefits of radiographer role extension will be explored through presentation of a service review.
The Royal College of Radiologists and the College of Radiographers are united in their position that all radiographers who expand their scope of practice must perform at a level comparable to a consultant radiologist. The growing body of evidence supporting adult chest x-ray interpretation by trained radiographers will be explored, including performance at the end of accredited postgraduate training, audit of radiographer chest x-ray reporting in clinical practice and agreement between expert consultant chest radiologists and clinical reports; both radiologist and radiographer.

URL's
http://create.canterbury.ac.uk/12642/

Handout: Nick Woznitza
http://media.rsna.org/media/abstract/2014/14000945/Advanced Radiographic Practice in Adult Chest Imaging.pdf