

2013 RSNA (Filtered Schedule)

Sunday, December 01, 2013

10:30-11:30 AM • **MSRA11** • Room: S402AB • Patient Assessment: Requirements, Reimbursement and Radiology Procedures (An Interactive Session)
11:45-12:45 PM • **MSRA12** • Room: S402AB • Patient Radiation Dose: Reduction and Recording (An Interactive Session)
02:00-03:00 PM • **MSRA13** • Room: S402AB • Abdominal Imaging Clinical Pathways (An Interactive Session)
03:15-04:15 PM • **MSRA14** • Room: S402AB • Imaging the Bariatric Surgery Patient (An Interactive Session)
04:30-05:30 PM • **MSRA15** • Room: S402AB • The Practice of the Radiology Assistant - Full Integration into Rural and Medical Center Settings (An Interact...

Monday, December 02, 2013

08:30-10:00 AM • **MSAS21** • Room: S105AB • Global Health: Radiology in Haiti (Sponsored by the Associated Sciences Consortium) (An Interactive Session)
08:30-10:00 AM • **MSCM21** • Room: S100AB • Case-based Review of Magnetic Resonance: Musculoskeletal (An Interactive Session)
08:30-10:00 AM • **MSCM21** • Room: S406A • Cardiac CT Mentored Case Review: Part I (In Conjunction with the North American Society for Cardiac Imaging) (...
08:30-10:00 AM • **MSMI21** • Room: S406B • Molecular Imaging Symposium: Preparing for Tomorrow: The Application of Novel and Advanced Imaging in Clinical...
08:30-10:00 AM • **MSRO21** • Room: S103AB • BOOST: Head and Neck-Anatomy and Contouring (An Interactive Session)
08:30-10:00 AM • **MSRO24** • Room: S103CD • BOOST: Gynecology-Anatomy and Contouring (An Interactive Session)
10:30-12:00 PM • **MSAS22** • Room: S105AB • Global Health: Dose Reduction is Our Business (Sponsored by the Associated Sciences Consortium) (An Interactiv...
10:30-12:00 PM • **MSCM22** • Room: S100AB • Case-based Review of Magnetic Resonance: Neuroradiology (An Interactive Session)
10:30-12:15 PM • **MSCM22** • Room: S406A • Cardiac CT Mentored Case Review: Part II (In Conjunction with the North American Society for Cardiac Imaging) ...
10:30-12:00 PM • **MSMI22** • Room: S406B • Molecular Imaging Symposium: Radiogenomics - The Next Logical Step in 'Rad-Path' Correlation for Clinical Imag...
10:30-12:00 PM • **MSRO22** • Room: S103AB • BOOST: Head and Neck-Integrated Science and Practice (ISP) Session
10:30-12:00 PM • **MSRO25** • Room: S103CD • BOOST: Gynecology-Integrated Science and Practice (ISP) Session
01:30-03:00 PM • **MSAS23** • Room: S105AB • Reducing CT Dose (Sponsored by the Associated Sciences Consortium) (An Interactive Session)
01:30-03:00 PM • **MSCM23** • Room: S100AB • Case-based Review of Magnetic Resonance: Woman's Imaging (An Interactive Session)
01:30-03:05 PM • **MSCM23** • Room: S406A • Cardiac CT Mentored Case Review: Part III (In Conjunction with the North American Society for Cardiac Imaging)...
01:30-03:00 PM • **MSMI23** • Room: S406B • Molecular Imaging Symposium: Imaging Cellular Subpopulations - Current Progress and Future Directions
03:00-04:15 PM • **MSRO23** • Room: S103AB • BOOST: Head and Neck-Case-based Review (An Interactive Session)
03:00-04:15 PM • **MSRO26** • Room: S103CD • BOOST: Gynecology-Case-based Review (An Interactive Session)
03:30-05:00 PM • **MSAS24** • Room: S105AB • Maximizing Space Planning in an Era of Diminishing Resources (Sponsored by the Associated Sciences Consortium)...
03:30-05:30 PM • **MSCM24** • Room: S100AB • Case-based Review of Magnetic Resonance: Abdomen and Pelvis (An Interactive Session)
03:30-06:00 PM • **MSCM24** • Room: S406A • Cardiac CT Mentored Case Review: Part IV (In Conjunction with the North American Society for Cardiac Imaging) ...
03:30-05:00 PM • **MSMI24** • Room: S406B • Molecular Imaging Symposium: Molecular Brain Imaging: From Research to Clinical Applications
04:45-06:00 PM • **MSRO29** • Room: S104B • BOOST: Head and Neck Hands-on Contouring (In Cooperation with ASTRO)

Tuesday, December 03, 2013

08:30-10:00 AM • **MSAS31** • Room: S105AB • Standards of Ethics in Practice: Evolution, Purpose, Structure, Compliance (Sponsored by the Associated Scienc...
08:30-10:00 AM • **MSCC31** • Room: S406A • Case-based Review of Nuclear Medicine: PET/CT Workshop-Head and Neck Cancers (In Conjunction with SNMMI) (An I...
08:30-10:00 AM • **MSES31** • Room: S100AB • Essentials of Cardiac Imaging
08:30-10:00 AM • **MSQ131** • Room: S406B • Quality Improvement: Safety at Work
08:30-10:00 AM • **MSRO31** • Room: S103AB • BOOST: Gastrointestinal-Anatomy and Contouring (An Interactive Session)
08:30-10:00 AM • **MSRO34** • Room: S103CD • BOOST: Breast-Anatomy and Contouring (An Interactive Session)
10:30-12:00 PM • **MSAS32** • Room: S105AB • Emerging Technology: What's New (Sponsored by the Associated Sciences Consortium) (An Interactive Session)
10:30-12:00 PM • **MSCC32** • Room: S406A • Case-based Review of Nuclear Medicine: PET/CT Workshop-Cancers of the Abdomen and Pelvis (In Conjunction with ...
10:30-12:00 PM • **MSES32** • Room: S100AB • Essentials of Ultrasound
10:30-12:00 PM • **MSQ132** • Room: S406B • Quality Improvement: Keeping our Customers Satisfied
10:30-12:00 PM • **MSRO32** • Room: S103AB • BOOST: Gastrointestinal-Integrated Science and Practice (ISP) Session
10:30-12:00 PM • **MSRO35** • Room: S103CD • BOOST: Breast-Integrated Science and Practice (ISP) Session
01:30-03:00 PM • **MSAS33** • Room: S105AB • Process Engineering to Optimize Work Flow Processes in Radiology: A Case Study Approach (Sponsored by the ASSO...
01:30-03:00 PM • **MSCC33** • Room: S406A • Case-based Review of Nuclear Medicine: PET/CT Workshop-Lymphoma/Melanoma/Sarcoma (In Conjunction with SNMMI) (...
01:30-03:00 PM • **MSES33** • Room: S100AB • Essentials of Pediatric Imaging
01:30-03:00 PM • **MSQ133** • Room: S406B • Quality Improvement: Strategies for Improving Patient Safety: Root Cause Analysis
03:00-04:15 PM • **MSRO33** • Room: S103AB • BOOST: Gastrointestinal-Case-based Review (An Interactive Session)
03:00-04:15 PM • **MSRO36** • Room: S103CD • BOOST: Breast-Case-based Review (An Interactive Session)
03:30-05:00 PM • **MSAS34** • Room: S105AB • Social Media and Medical Imaging Management: What You Do Not Know Can Destroy Your Practice (Sponsored by the ...
03:30-05:00 PM • **MSCC34** • Room: S406A • Case-based Review of Nuclear Medicine: PET/CT Workshop-Cancers of the Thorax (In Conjunction with SNMMI) (An I...
03:30-05:00 PM • **MSES34** • Room: S100AB • Essentials of Trauma Imaging

Wednesday, December 04, 2013

08:30-10:00 AM • **MSAS41** • Room: S105AB • Navigating the Regulatory, Reimbursement, and Compliance Landscape or Land Mines! (Sponsored by the Associated...
08:30-10:00 AM • **MSCS41** • Room: S406A • Case-based Review of Musculoskeletal Radiology (An Interactive Session)
08:30-10:00 AM • **MSES41** • Room: S100AB • Essentials of Neuro Imaging
08:30-10:00 AM • **MSRO41** • Room: S103CD • BOOST: Genitourinary-Anatomy and Contouring (An Interactive Session)
08:30-10:00 AM • **MSSR41** • Room: S402AB • RSNA/ESR Emergency Symposium: General Principles, Pediatric and ENT Emergencies (An Interactive Session)
10:30-12:00 PM • **MSAS42** • Room: S105AB • Clinical Imaging (Image Guided) (Sponsored by the Associated Sciences Consortium) (An Interactive Session)
10:30-12:00 PM • **MSCS42** • Room: S406A • Case-based Review of Musculoskeletal Radiology (An Interactive Session)
10:30-12:00 PM • **MSES42** • Room: S100AB • Essentials of Musculoskeletal Imaging
10:30-12:00 PM • **MSRO42** • Room: S103CD • BOOST: Genitourinary-Integrated Science and Practice (ISP) Session
10:30-12:00 PM • **MSSR42** • Room: S402AB • RSNA/ESR Emergency Symposium: CNS Emergencies (An Interactive Session)
01:00-02:00 PM • **MSRT41** • Room: N230 • ASRT@RSNA 2013: Musculoskeletal Imaging: New Ways to Image the Same Old Bones
01:30-03:00 PM • **MSCU41** • Room: S406A • Case-based Review of US (An Interactive Session)
01:30-03:00 PM • **MSES43** • Room: S100AB • Essentials of Chest Imaging
01:30-03:30 PM • **MSPR41** • Room: E451B • RSNA Resident and Fellow Symposium 2013: Career 101: Planning for Success After Residency (An Interactive Ses...
01:30-03:00 PM • **MSSR43** • Room: S402AB • RSNA/ESR Emergency Symposium: Chest Emergencies (An Interactive Session)
02:20-03:20 PM • **MSRT42** • Room: N230 • ASRT@RSNA 2013: Pediatric CT/CTA: Techniques and Applications
03:00-04:15 PM • **MSRO43** • Room: S103CD • BOOST: Genitourinary-Case-based Review (An Interactive Session)
03:30-05:00 PM • **MSCU42** • Room: S406A • Case-based Review of US (An Interactive Session)
03:30-05:00 PM • **MSES44** • Room: S100AB • Essentials of Breast Imaging
03:30-05:00 PM • **MSSR44** • Room: S402AB • RSNA/ESR Emergency Symposium: Abdominal Emergencies (An Interactive Session)
03:40-04:40 PM • **MSRT43** • Room: N230 • ASRT@RSNA 2013: The Role of the Radiologic Technologist in Patient Safety (HCIAC)
04:00-05:45 PM • **MSPR43** • Room: E451B • RSNA Resident and Fellow Symposium 2013: Career 102: Survival Skills for Your Job (An Interactive Session)
04:45-06:00 PM • **MSRO49** • Room: S104B • BOOST: Genitourinary Hands-on Contouring (In Cooperation with ASTRO)
05:00-06:00 PM • **MSRT44** • Room: N230 • ASRT@RSNA 2013: The Patient Experience - Our Shared Journey

Thursday, December 05, 2013

08:00-09:00 AM • **MSRT51** • Room: N230 • ASRT@RSNA 2013: Moving Towards Best Practice: Developing National Guidelines through a Collaborative Approach
08:30-10:00 AM • **MSCN51** • Room: S100AB • Case-based Review of Neuroradiology: Brain (An Interactive Session)
08:30-10:00 AM • **MSCP51** • Room: S406A • Case-based Review of Pediatric Radiology: Pediatric Thoracic Imaging (An Interactive Session)
08:30-10:00 AM • **MSES51** • Room: S406B • Essentials of Gastrointestinal Imaging
09:20-10:20 AM • **MSRT52** • Room: N230 • ASRT@RSNA 2013: Mastering Digital Radiography: CR and DR Exposures, Techniques and Doses
10:30-12:00 PM • **MSCN52** • Room: S100AB • Case-based Review of Neuroradiology: Spine (An Interactive Session)
10:30-12:00 PM • **MSCP52** • Room: S406A • Case-based Review of Pediatric Radiology: Pediatric MSK Imaging (An Interactive Session)
10:30-12:00 PM • **MSES52** • Room: S406B • Essentials of Genitourinary Imaging
10:40-11:40 AM • **MSRT53** • Room: N230 • ASRT@RSNA 2013: Elbow and Forearm Trauma: Mechanisms of Injury and Patterns of Fractures
01:00-02:00 PM • **MSRT54** • Room: N230 • ASRT@RSNA 2013: Normalization of Deviance and Radiology

01:30-03:00 PM • [MSCN53](#) • Room: S100AB • Case-based Review of Neuroradiology: Head and Neck (An Interactive Session)
01:30-03:00 PM • [MSCP53](#) • Room: S406A • Case-based Review of Pediatric Radiology: Pediatric Abdominal Imaging (An Interactive Session)
02:20-03:20 PM • [MSRT55](#) • Room: N230 • ASRT@RSNA 2013: How Do We Make Care Patient-Centered?
03:30-05:00 PM • [MSCN54](#) • Room: S100AB • Case-based Review of Neuroradiology: Interventional Image-based Diagnosis (An Interactive Session)
03:30-05:00 PM • [MSCP54](#) • Room: S406A • Case-based Review of Pediatric Radiology: Pediatric Pelvis Imaging (An Interactive Session)
03:40-04:40 PM • [MSRT56](#) • Room: N230 • ASRT@RSNA 2013: Improving Practice in Pediatric Skeletal Radiography

Patient Assessment: Requirements, Reimbursement and Radiology Procedures (An Interactive Session)

Sunday, 10:30 AM - 11:30 AM • S402AB

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MSRA11 • AMA PRA Category 1 Credit™:1 • ARRT Category A+ Credit:1
Joy J Renner, MA, RT(R) *

LEARNING OBJECTIVES

This course will review the organizations and agencies who play a role in determining patient assessment requirements. The link between reimbursement and documented assessment will be addressed in various patient scenarios. The last segment of this session will review and highlight the focused patient assessments most common to radiology procedures.

Patient Radiation Dose: Reduction and Recording (An Interactive Session)

Sunday, 11:45 AM - 12:45 PM • S402AB

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MSRA12 • AMA PRA Category 1 Credit™:1 • ARRT Category A+ Credit:1
Douglas E Pfeiffer, MS *

LEARNING OBJECTIVES

This session will include a discussion of current methods and trends toward reducing patient radiation dose with highlights of areas where there is particular concern or new data. The remainder of the session will include the ethical, legal, and policy-driven practices related to recording patient radiation dose.

Abdominal Imaging Clinical Pathways (An Interactive Session)

Sunday, 02:00 PM - 03:00 PM • S402AB

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MSRA13 • AMA PRA Category 1 Credit™:1 • ARRT Category A+ Credit:1
Julia R Fielding, MD

LEARNING OBJECTIVES

With the growing concerns related to radiation safety and cost containment, the need for accurate imaging procedure selection to best fit the patient and the clinical presentation is more and more critical. This session will provide clinical scenarios with patient presentation information and a discussion of the choices of imaging pertinent to that clinical presentation. Where there are multiple imaging pathways, the decision will be discussed in light of radiation safety and cost containment guidelines.

Imaging the Bariatric Surgery Patient (An Interactive Session)

Sunday, 03:15 PM - 04:15 PM • S402AB

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MSRA14 • AMA PRA Category 1 Credit™:1 • ARRT Category A+ Credit:1
Daniel T Myers, MD

LEARNING OBJECTIVES

Radiology plays an important role in the assessment of our bariatric surgery patients. It is vital for the radiologist assistant to understand the gastrointestinal anatomy and surgical procedures and specific patient issues associated with bariatric surgery. This session will include review of normal anatomy vs altered anatomy post-bariatric surgery with an emphasis on the identification of post-surgical complications.

The Practice of the Radiology Assistant - Full Integration into Rural and Medical Center Settings (An Interactive Session)

Sunday, 04:30 PM - 05:30 PM • S402AB

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MSRA15 • AMA PRA Category 1 Credit™:1 • ARRT Category A+ Credit:1
Jason Barrett, BS, ARRT

LEARNING OBJECTIVES

This session will discuss the current practice environment for the radiologist assistant. In addition, the presentation will include how a variety of practice types utilize radiologists assistants to improve the efficiency and effectiveness of the practice.

Global Health: Radiology in Haiti (Sponsored by the Associated Sciences Consortium) (An Interactive Session)

Monday, 08:30 AM - 10:00 AM • S105AB

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MSAS21 • AMA PRA Category 1 Credit™:1.5 • ARRT Category A+ Credit:1.5
Moderator
Michael D Ward, PhD

MSAS21A • Radiology in Haiti: Challenges and Rewards in a Third World Country

Barbara A Tomasini RT(R) (Presenter)

LEARNING OBJECTIVES

1) Participants of this lecture will learn that Radiology technology is obtainable in underdeveloped countries. How to achieve sustainability of a successful radiology program is discussed and key points are outlined.; How to obtain technology to meet the infrastructure of an underdeveloped country for long-term sustainability are presented. 2) The importance of Radiology technology in underdeveloped countries is shown and how it enhances the healthcare delivery system of the underdeveloped country once implemented. 3) Critical thinking skills with a passion to help in underdeveloped countries is a positive option for radiographers. Ongoing education in these countries is necessary to optimize the high standard of care radiographers deliver in their own work environments.

MSAS21B • Radiology in Haiti: Disaster Victim Identification in Post-Earthquake Haiti

James B Temme RT (Presenter)

LEARNING OBJECTIVES

1) Describe the purpose of a Disaster Mortuary Operational Response Team (DMORT) during the aftermath of a National Disaster. 2) Identify and discuss the general roles of the key individuals that participate in a DMORT facility. 3) Identify and describe the specific duties of a Forensic Radiographer and the radiographic equipment utilized in a DMORT facility. 4) Describe the problems of obtaining radiographic images of victim remains after a natural catastrophic disaster.

ABSTRACT

The 2010 earthquake devastated the city of Port au Prince, Haiti, leaving at least 230,000 dead, 200,000 injured and 1 million homeless. The aftermath overwhelmed the Haitian government of this third world country. Massive aid poured into Haiti from many countries, including the USA. Many of the dead were United States citizens who needed to be recovered and identified. To help in the process of recovering the remains of American citizens, DMORT, a unit of the National Disaster Medical System (NDMS) was deployed. DMORT's role in Haiti, the interdisciplinary team members and their responsibilities with specific emphasis on the role of the Radiographer will be discussed. The difficulties poised in performing this type of US government operation in a foreign country in the immediate aftermath of a natural disaster are presented.

Case-based Review of Magnetic Resonance: Musculoskeletal (An Interactive Session)

Monday, 08:30 AM - 10:00 AM • S100AB

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MSCM21 • AMA PRA Category 1 Credit™:1.5 • ARRT Category A+ Credit:1.5

Director

John R Leyendecker, MD

MSCM21A • Sports Injuries

William B Morrison MD (Presenter) *

LEARNING OBJECTIVES

1) Better recognize common sports injury patterns in high performance athletes. 2) Have an improved understanding of the significance of various sports injuries. 3) Have improved knowledge of implications of sports injuries in the adolescent population.

ABSTRACT

To view presentation go to www.bone.tju.edu

MSCM21B • Wrist/Hand

Leon Lenchik MD (Presenter)

LEARNING OBJECTIVES

1) To review normal anatomy on hand and wrist MR. 2) To show bone and soft tissue injuries on hand and wrist MR 3) To describe pitfalls in hand and wrist MR interpretation.

ABSTRACT

MSCM21C • Musculoskeletal MR Imaging In Children

Tal Laor MD (Presenter)

LEARNING OBJECTIVES

1) To recognize changes in the musculoskeletal system that occur with growth. 2) To identify injuries of the musculoskeletal system that are unique to growing children. 3) To become familiar with various non-traumatic musculoskeletal disorders that affect children.

ABSTRACT

Cardiac CT Mentored Case Review: Part I (In Conjunction with the North American Society for Cardiac Imaging) (An Interactive Session)

Monday, 08:30 AM - 10:00 AM • S406A

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MSMC21 • AMA PRA Category 1 Credit™:1.5 • ARRT Category A+ Credit:1.5

Moderator

Pamela K Woodard, MD *

Moderator

David A Bluemke, MD, PhD *

LEARNING OBJECTIVES

MSMC21A • Normal Coronary Anatomy

Shawn D Teague MD (Presenter) *

LEARNING OBJECTIVES

1) Recognize normal anatomy and common variants of the coronary arteries. 2) Understand the unique advantages and disadvantages of CT for coronary artery evaluation. 3) Describe the current State-of-the-Art capabilities for CT in coronary artery evaluation.

ABSTRACT

MSMC21B • Coronary Artery Anomalies

Cylen Javidan-Nejad MD (Presenter)

LEARNING OBJECTIVES

1) Using Coronary Artery CT cases to review anomalous origins of the coronary arteries.

Molecular Imaging Symposium: Preparing for Tomorrow: The Application of Novel and Advanced Imaging in Clinical Oncology

Monday, 08:30 AM - 10:00 AM • S406B

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MSMI21 • AMA PRA Category 1 Credit™:1.5 • ARRT Category A+ Credit:1.5

Moderator

Ronald L Korn, MD, PhD

MSMI21A • Fluorescence and Optoacoustic Imaging Heads to the Clinics

Vasilis Ntziachristos PhD (Presenter) *

LEARNING OBJECTIVES

1) Learn the technology basics and assess the current state of the art in fluorescence and optoacoustic imaging. 2) Understand the imaging performance achieved and major improvements over past approaches. 3) Learn on how this new-generation imaging performance offers a paradigm shift in optical and clinical imaging. 4) Link the developments described to unique contrast generation in clinical and pre-clinical applications. 5) Gain insights into current clinical pilot studies using these approaches.

MSMI21B • CT Biomarkers and How to Use Them

Kenneth Miles (Presenter) *

LEARNING OBJECTIVES

1) Describe the oncological imaging biomarkers available from CT. 2) Demonstrate knowledge of the processes required for qualification of CT biomarkers in oncological drug development and clinical practice. 3) Compare the applications of CT biomarkers for prognosis, response prediction and response assessment.

ABSTRACT

By measuring size and attenuation with or without contrast material, CT can provide a range of oncological biomarkers including T-stage, RECIST, enhancement, CT perfusion and CT texture analysis. Implementation of these biomarkers requires prior assessments of technical/biological performance and establishment of biomarker performance characteristics. For clinical applications, assessments of therapeutic and health impact are also required. Technical/biological validation includes assessments of test-retest performance and identification of relevant biological correlates. Evaluations of biomarker performance should report cross-validated diagnostic/prognostic thresholds, hazard ratio and biomarker prevalence. Based on these parameters, modelling studies can evaluate the potential therapeutic and health impacts that would result from clinical deployment. Current evidence supporting the use of CT biomarkers in drug development and clinical practice are summarised.

MSMI21C • The Use of Novel PET Tracers. What is in the Pipeline for Approval

Jonathan E McConathy MD, PhD (Presenter) *

LEARNING OBJECTIVES

1) Describe the PET tracers in late phase clinical trials for oncologic imaging in terms of their molecular targets and potential clinical indications. 2) Identify the major regulatory and financial challenges encountered during the translation of PET tracers into widespread clinical use. 3) Compare the properties, strengths, and weaknesses of PET tracers for prostate cancer imaging as case studies.

ABSTRACT

Positron emission tomography (PET) with the glucose analogue 2-deoxy-2-[F-18]fluoro-D-glucose (FDG) combined with computed tomography (CT) is currently the workhorse for clinical molecular imaging in oncology. While very successful, FDG-PET/CT has limitations in certain cancers and provides a readout of only one aspect of cancer biology. Novel PET tracers have great promise to improve diagnostic imaging, and a wide range of small molecule, peptide, antibody, and nanoparticle-based PET tracers are in development for oncologic imaging. This presentation will provide an overview of PET tracers in late phase clinical development with an emphasis on mechanism of action and potential clinical indications. Additionally, some of the key challenges to the widespread clinical use of PET tracers including regulatory and financial issues will be reviewed. Finally, several classes of PET tracers for prostate cancer imaging will be discussed in greater depth to illustrate key points.

MSMI21D • Systems Diagnostics - The Future of Diagnostic Medicine?

Michael D Kuo MD (Presenter) *

LEARNING OBJECTIVES

1) To understand systems diagnostics as a new diagnostics paradigm. 2) To explore clinical applications and future directions of systems diagnostics.

BOOST: Head and Neck-Anatomy and Contouring (An Interactive Session)

Monday, 08:30 AM - 10:00 AM • S103AB

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MSRO21 • AMA PRA Category 1 Credit™:1.5 • ARRT Category A+ Credit:1.5

Co-Director
Fergus V Coakley, MD
Co-Director
Bruce G Haffty, MD

MSRO21A • Anatomy of the Lymph Nodes

Suresh K Mukherji MD (Presenter)

LEARNING OBJECTIVES

1) Review the normal anatomy of the lymph nodes of the neck. 2) Review the radiological anatomy and landmarks for identifying lymph node groups. 3) Review the primary eschelon drainage patterns of various head and neck subsites.

ABSTRACT

1. Review the normal anatomy of the lymph nodes of the neck
2. Review the radiological anatomy and landmarks for identifying lymph node groups
3. Review the primary eschelon drainage patterns of various head and neck subsites

MSRO21B • Current Concepts and Controversies in Contouring and Treatment of Lymph Nodes

Sung Kim MD (Presenter)

LEARNING OBJECTIVES

1) Learn and discuss what lymph node levels are appropriate to target depending on primary site. 2) Discuss the appropriate dose and margins for lymph node coverage.

MSRO21C • Anatomy and Staging of the Brachial Plexus

Suresh K Mukherji MD (Presenter)

LEARNING OBJECTIVES

1) Review the normal anatomy of the brachial plexus. 2) Review the pertinent radiologic landmarks that permits accurate contouring of the brachial plexus. 3) Review the common inoplastic processes of the brachial plexus.

ABSTRACT

This session will be a detailed review normal anatomy of the brachial plexus and focus on the landmarks that help permit accurate contouring of the plexus

MSRO21D • Current Concepts and Controversies in Contouring the Brachial Plexus

Sung Kim MD (Presenter)

LEARNING OBJECTIVES

1) Discuss a reproducible method for contouring brachial plexus.

BOOST: Gynecology-Anatomy and Contouring (An Interactive Session)

Monday, 08:30 AM - 10:00 AM • S103CD

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MSRO24 • AMA PRA Category 1 Credit™:1.5 • ARRT Category A+ Credit:1.5

Co-Director
Fergus V Coakley, MD
Co-Director
Bruce G Haffty, MD
Beth A Erickson, MD
Paul M Knechtges, MD *
Mark D Hohenwalter, MD

LEARNING OBJECTIVES

1) Review the radiologic features of female gynecologic cancers for both intact and post-operative presentations. 2) Review the radiologic features of female gynecologic cancers before, during and after external beam irradiation and brachytherapy. 3) Review the recommended external beam and brachytherapy contouring guidelines for intact and post operative gynecologic cancer presentations.

ABSTRACT

The treatment of gynecologic cancers with radiation as a component of treatment requires a clear understanding of the imaging characteristics of disease before and after radiation. Knowledge of the patterns of cancer spread, both locally and regionally, is important in designing radiation treatment plans which may include external beam and/or brachytherapy. Proper contouring of radiation targets and organs at risk is essential in developing treatment plans which maximize

the benefits and minimize the risks of radiation, both for external beam and brachytherapy. The subsequent follow up of patients with imaging after radiation is also important in helping to identify recurrent disease and complications. Radiation oncologists and radiologists working in collaboration can enhance the care of these patients before, during and after treatment.

Global Health: Dose Reduction is Our Business (Sponsored by the Associated Sciences Consortium) (An Interactive Session)

Monday, 10:30 AM - 12:00 PM • S105AB

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QA

MSAS22 • AMA PRA Category 1 Credit™: 1.5 • ARRT Category A+ Credit: 1.5

Moderator
Michael D Ward, PhD

MSAS22A • Promoting a Radiation Safety Culture in Europe: The Role of European Union Projects

Graciano N Paulo MSC, RT (Presenter)

LEARNING OBJECTIVES

1) To comprehend the importance of European Union (EU) Projects for promoting a Radiation Protection safety culture. 2) To understand the structure of the European Radiation Protection Organizations. 3) To critically analyze the results of some of the EU projects. 4) To know the Role and structure of European Federation of Radiographer Societies (EFRS). 5) To understand the contribution of EFRS in EU projects.

ABSTRACT

In the past years there have been several European Union (EU) projects dedicated to Radiation Protection area, mostly promoted by the Directorate General of Energy (DG ENER) from the European Commission (EC). The majority of these projects were related to topics from the EURATOM 97/43 Directive (known as the MED), that constitutes a European Law that all Member States are obliged to transpose to their National legislation system. During this presentation a special focus will be given to: (a) Clinical Audit Guidelines (a tool developed to facilitate the implementation of clinical audit programs in medical imaging and radiotherapy departments); (b) EMAN (European Medical ALARA Network - dedicated to optimization in medical field); (c) MEDRAPET (Medical Radiation Protection Education and Training - dedicated to develop guidelines for E&T in RP for Health Professionals); (d) DOSEDATAMED II (dedicated to collect dose distributions from medical radiodiagnostic procedures from EU member states); One of the main relevant point of all these EU projects is the fact that they were made on a multi stakeholders model, based on the contribution of Organizations representing EU regulators, Radiologists, Radiographers, Medical Physicists, Research Centers, amongst others. In conclusion this presentation will give an overview of all these projects, the respective results and the importance that they have in promoting a Radiation Protection Culture in Europe.

MSAS22B • Promoting Radiation Safety in Imaging Worldwide

Donna E Newman (Presenter)

LEARNING OBJECTIVES

1) You will learn about the ISRRT involvement in global initiatives that promote best radiography practice, education and standards in developing countries. We will review several Partnerships with WHO, PAHO and Local associations that helped facilitate dose reduction this past year at workshop and conferences. 2) You will learn how the ISRRT involvement in global initiatives and international standards serves as the voice for technologists internationally.; The ISRRT cooperates and communicates with international organization that address medical imaging, health care, patient safety, radiation protection. 3) You will learn how the ISRRT participates as a member state in projects relating to radiological protection in medical exposure for the IAEA and WH.

ABSTRACT

Promoting Radiation Safety in the Imaging Worldwide You will learn about the ISRRT involvement in global initiatives help facilitate global dose reduction through the use of Workshops and conferences in developing countries. Also about the ISRRT's Campaign for safe use of radiation in developing countries through the use of workshops You will learn how the ISRRT promotes radiography practice, education and standards in developing countries to help ensure dose reduction with the use of workshops and conferences. We will review several Partnerships with WHO, PAHO and Local associations that helped facilitate dose reduction in various areas of radiology this past year :Caribbean/ Jamaica/mammography partnership with PAHO, Cameroon/ Partnership with French Local Organization ,Lithuanian partnership with EFRS European organization Malawi/ QA and Pattern Recognition and Zambia/Image interpretation. You will learn how the ISRRT involvement in global initiative and international standards help promote radiation reduction by acting as a stakeholder and the voice for technologists internationally. ISRRT cooperates and communicates with international organization that address medical imaging, health care, patient safety, radiation protection for example, Smart Card/Smart RAD Track and the IAEA WHO/IRQN Referral Guidelines project. You will learn how the ISRRT participates as a member state in projects relating to radiological protection of patient and protection in medical exposure for the IAEA and WHO. We will discuss several of the project and documents that have been developed and review by our organization. Several example of this are the WHO/Radiation risk communication in pediatric imaging IAEA's Training material on Radiation protection in diagnostic and interventional radiology , digital Radiology Annals Reports of the ICRP, Basic Safety Standards Review and Safety guides and Justification of medical exposures IAEA Technical meeting.

Case-based Review of Magnetic Resonance: Neuroradiology (An Interactive Session)

Monday, 10:30 AM - 12:00 PM • S100AB

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MR NR HN

MSCM22 • AMA PRA Category 1 Credit™: 1.5 • ARRT Category A+ Credit: 1.5

Director
John R Leyendecker, MD

MSCM22A • Brain

Jonathan H Burdette MD (Presenter)

LEARNING OBJECTIVES

1) Understand the latest brain imaging techniques and how they can be used in routine clinical practice. 2) Generate appropriate differential diagnoses based on imaging findings and clinical presentation. 3) Recognize imaging features of various brain pathologic entities, such as neoplastic, infectious, inflammatory, and vascular diseases. 4) Help guide clinical colleagues along the path to the appropriate diagnosis.

ABSTRACT

Magnetic Resonance Imaging continues to be the workhorse technique in brain imaging. The brain imaging capabilities of MRI continue to make MRI a more sensitive and specific diagnostic tool compared with CT for most clinical entities. The past 15 years has ushered in the era of Physiologic MRI techniques, such as diffusion-weighted imaging, diffusion tensor imaging, gadolinium-based and arterial spin labeled perfusion imaging, spectroscopy, functional MRI (fMRI), and, most recently, connectivity/network-based imaging. This presentation will cover the MR imaging features of several brain pathologic entities, and some of the latest brain MR imaging techniques will be introduced.

MSCM22B • Head and Neck

Iiona M Schmalfluss MD (Presenter) *

LEARNING OBJECTIVES

1) Generate appropriate differential diagnoses based on imaging findings and patient's clinical presentation. 2) Demonstrate understanding of pertinent anatomy and imaging findings relevant to commonly overlooked disease processes in the head and neck area. 3) Recognize imaging features of different head and neck malignancies and apply this knowledge to cancer staging and treatment plan. 4) Practice interpretation of new imaging techniques.

ABSTRACT

Learning objectives: 1. Generate appropriate differential diagnoses based on imaging findings and patient's clinical presentation 2. Demonstrate understanding of pertinent anatomy and imaging findings relevant to commonly overlooked disease processes in the head and neck area 3. Recognize imaging features of different head and neck malignancies and apply this knowledge to cancer staging and treatment plan 4. Practice interpretation of new imaging techniques

MSCM22C • Peds Neuro

A. James Barkovich MD (Presenter) *

LEARNING OBJECTIVES

1) Determine the appropriate imaging study based upon the clinical history supplied. 2) Generate appropriate differential diagnoses of Pediatric Brain Imaging

studies based upon the clinical presentation and the imaging findings. 3) Recognize imaging features of malformations, neurocutaneous disorders, metabolic disorders, and brain injuries that cause neurologic dysfunction in childhood. 4) Guide clinical colleagues in their pursuit of diagnosis.

ABSTRACT

Imaging of children with neurological dysfunction is difficult for most radiologists. The immature child's brain looks different from the adult brain because, especially in young children, development is not complete: sulcation has not completely finished, myelination is ongoing, the cerebellum is still immature. This presentation will explain features of normal development, discuss the best imaging strategies in immature and mature pediatric brains, and show examples of some of the most common and important disorders that are seen in children with perinatal and postnatal brain injury, developmental delay, epilepsy, and new neurological impairment. In addition to normal brain development as assessed by imaging, this talk will cover perinatal and postnatal brain injury, common malformations, and causes of epilepsy including neurocutaneous disorders. Some new concepts will be discussed that make these disorders easier to understand.

Cardiac CT Mentored Case Review: Part II (In Conjunction with the North American Society for Cardiac Imaging) (An Interactive Session)

Monday, 10:30 AM - 12:15 PM • S406A



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MSMC22 • AMA PRA Category 1 Credit™:1.75 • ARRT Category A+ Credit:2

Moderator

Geoffrey D Rubin, MD *

Moderator

Vincent B Ho, MD, MBA *

LEARNING OBJECTIVES

1) Understand how to interact with 4D cardiac CTA data for proper interpretation. 2) Compare methods for characterizing coronary stenoses and learn what is most appropriate in various situations.

MSMC22A • Coronary Artery Disease I: Native Vessel Disease

Geoffrey D Rubin MD (Presenter) *

LEARNING OBJECTIVES

View learning objectives under main course title.

MSMC22B • Coronary Artery Disease II: Native Vessel Disease

Smita Patel MBBS (Presenter)

LEARNING OBJECTIVES

View learning objectives under main course title.

ABSTRACT

MSMC22C • Valves and Cardiac Function

Andrew J Bierhals MD (Presenter)

LEARNING OBJECTIVES

View learning objectives under main course title.

ABSTRACT

Cardiac CT can provide information on valves and function when retrospective ECG gating is used in the acquisition. These studies require extensive image post-processing to accurately depict the moving structures. This presentation will highlight basic image acquisition as well as the evaluation of normal and abnormal patients.

Molecular Imaging Symposium: Radiogenomics - The Next Logical Step in 'Rad-Path' Correlation for Clinical Imaging?

Monday, 10:30 AM - 12:00 PM • S406B



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MSMI22 • AMA PRA Category 1 Credit™:1.5 • ARRT Category A+ Credit:1.5

Moderator

King C Li, MD

MSMI22A • Radiogenomics: Merging Molecular Diagnostics and Clinical Imaging in Cancer

Michael D Kuo MD (Presenter) *

LEARNING OBJECTIVES

1) To understand the fundamental concepts behind radiogenomics. 2) To explore the current and evolving landscape of radiogenomics. 3) To understand how radiogenomics can be implemented in current clinical practice.

MSMI22B • Linking Molecular and Imaging Data in Lung Cancer

Olivier Gevaert PhD (Presenter)

LEARNING OBJECTIVES

1) Learn how image features are defined and extracted from non small cell lung cancer CT and PET images. 2) Learn the complexity and dimensionality reduction of gene expression data. 3) Learn how to correlate image features with gene expression data and establishing a radiogenomics map.

ABSTRACT

Radiogenomics is an emerging field that attempts to correlate and integrate radiological information from medical images and molecular data from tissue. Typically medical image features are extracted from a wide range of imaging modalities such as MRI, CT or PET images. Similarly, recent developments in molecular technologies have unleashed a myriad of technologies to produce diverse biological data types such as gene expression, microRNA expression, DNA methylation, and DNA mutation data. Radiogenomics is defined as the integration of these two developments. We demonstrate our approach on non-small cell lung carcinoma patients for whom CT, PET/CT and gene expression data were obtained. We extracted 149 computational features, 30 semantic features and PET-SUV from the imaging data. The microarray data was processed using an advanced clustering algorithm and 56 high quality clusters were represented using metagenes. We found several though provoking associations between imaging features and metagenes. 115 of 180 image features were predicted by a sparse regression on 56 metagenes with an accuracy of 65-86%. After mapping the predicted image features to a public gene expression dataset, we found 26 image features were significantly associated with recurrence-free survival and 22 with overall survival. A multivariate survival analysis identified prognostic image features independent of clinical covariates. Our results show that we have developed a method that can be used as a non-invasive way for rapid prognostic assessment of imaging. This motivates investing in larger studies that collect and store medical images and tissue of the same patients in NSCLC and other diseases such that our method can be used to assess immediately the prognostic relationship of new imaging biomarkers or technologies without the need for follow-up data. Our bioinformatics strategy for identifying imaging biomarkers may be most relevant to the clinical evaluation of emerging and evolving

MSMI22C • A Radiogenomic Analysis of the TCGA Glioma Data Set

David Gutman MD, PhD (Presenter)

LEARNING OBJECTIVES

1) Understand how to access large public data sets with imaging, genomics, and clinical data available. 2) Learn the steps involved in generating a controlled vocabulary to describe and annotate imaging data sets. 3) Review of current findings in associating MRI features with patient outcome and genomic profile. 4) Become familiar with 2-D and 3-D volumetric methods to extract quantitative features to describe tumors.

**MSRO22** • AMA PRA Category 1 Credit™:1.5 • ARRT Category A+ Credit:1.5

Co-Director
Fergus V Coakley, MD
Co-Director
Bruce G Haffty, MD
Moderator
Sung Kim, MD
Moderator
Simon S Lo, MD

MSRO22-01 • Invited Speaker:
John C Grecula MD (Presenter) ***MSRO22-02 • Induction Chemotherapy Plus Intensity Modulated Radiation Therapy for Locally-advanced Oropharyngeal Cancer: Prognostic Value of PTV****Carlo Furlan** (Presenter)**ABSTRACT**

Purpose: To assess the prognostic value of the PTV dimension in patients affected by locally advanced oropharyngeal carcinoma (OPC) treated with induction chemotherapy (CT) followed by radical IMRT.
 Patients and methods: 38 consecutive stage III-IV OPC patients who underwent induction CT followed by SIB-IMRT were analyzed. CT consisted of TPF (docetaxel, platinum and 5-FU) delivered for 3 cycles before radiotherapy in all patients.
 The maximum radiation dose, consisting of 66 Gy-70.95 Gy in 30-33 fractions, was prescribed to the PTV70, that included the initial extent of disease (pre-CT GTV plus 0.5-0.8 mm margin). The node-negative neck received a total dose of 54-62.70 Gy in 30-33 fractions. Patients were divided into two groups according to the PTV70 dimensions: 97.5cc.
 Kaplan-Meier analysis was used to calculate disease free survival (DFS) and overall survival (OS). Log-rank test was to test potential risk factors including PTV70 volume.
 Results: The median follow-up was of 28 months (range, 6-141 months). The median age was of 59 years (range, 36-80 years), and 24 patients (63%) were male. Eight patients were stage III (21%), and 30 (79%) stage IV. All patients were staged with CT-scan and/or MR. Twenty-nine patients (76%) were staged with FDG-PET/CT.
 The median PTV70 dimension was of 95,7 ml (range, 45 ml-512 ml). Eighteen patients (47%) had a PTV70 < 97.5 ml (mean volume 78,2 ml), and 20 (53%) patients had a PTV70 > 97.5 ml (mean volume 341,6 ml).
 After induction CT, 11 patients had CR (29%), 24 PR (63%), and 2 SD (5%); one experienced locoregional progression of disease.
 The actuarial rates of DFS and OS were 71% and 88% at 3 years, respectively.
 At the univariate analysis PTV70 dimension does not correlate with DFS and OS (p = 0,77).
 Conclusions: Treatment with 3 cycles of induction TPF followed by SIB-IMRT is not influenced by PTV70 volume in terms of DFS and OS in locally-advanced OPC.

MSRO22-03 • Radioprotection of Murine Salivary Glands by Botulinum Toxin**Youssef Zeidan** MD, PhD (Presenter) ; **Nan Xiao** PhD ; **Hongbin Cao** ; **Christina Kong** MD ; **Davud Sirjani** MD ; **Quynh-Thu X Le** MD**PURPOSE**

Xerostomia is the most common chronic radiation toxicity affecting the quality of life of head and neck cancer (HNC) patients. Botulinum toxins (BTX) have been successfully used in treating sialorrhea in pediatric patients and radiation-induced cystitis, proctitis, fibrosis and facial pain. This study evaluates the effect of BTX on radiation-induced salivary gland damage.

METHOD AND MATERIALS

Submandibular glands (SMGs) of male C5BL6 mice (10-12 wks) were directly injected with saline or botulinum toxin via an open procedure. After 72 hrs, a focal submandibular field was irradiated on a kilovoltage machine to a total dose of 15 Gy. Pilocarpine-induced saliva flow was measured at 3, 7 and 28 days post irradiation. At different time points, submandibular glands were collected for weight, immunofluorescence and Western blotting analysis. Myeloperoxidase staining was used to study neutrophil infiltration. TUNEL staining was used to evaluate cell death. A cytokine array, consisting of 40 different mouse cytokines was used to evaluate cytokine profiles after radiation treatment.

RESULTS

Histologically, BOT pretreated glands showed relative preservation of acinar volume post irradiation and less periductal fibrosis compared to saline control. At 3 days post irradiation, saline-injected mice showed a 50% reduction in basal saliva flow. However, mice preinjected with botulinum toxin maintained 75% of initial saliva flow (p

CONCLUSION

Taken together, these data indicate that BTX intraglandular injection reduces radiation-induced salivary dysfunction through modulation of neutrophil infiltration and CXCL5 levels. Our findings have important implications for future targeting of xerostomia in HNC patients.

CLINICAL RELEVANCE/APPLICATION

This work uncovers a novel mechanism for radiation-induced salivary gland damage.

MSRO22-04 • Radiation Therapy in Tri-modality Treatment for Esthesioneuroblastoma
Jonathan Wallach (Presenter)**MSRO22-05 • Percutaneous Computed Tomography-guided Permanent I125 Implantation for Treating Recurrent Head and Neck Cancer****Suqing Tian** (Presenter)**ABSTRACT****Abstract**

Background: To investigate the therapeutic efficacy of computed tomography (CT)-guided permanent percutaneous implantation of iodine-125(¹²⁵I) for treating recurrent head and neck cancers.

Methods: Thirteen patients with recurrent head and neck cancer (previously treated with a total cumulative dose exceeding 100 Gy) were included in this study. ¹²⁵I seeds were implanted into recurrent head and neck lesions by CT-guided needle puncture. Treatment responses were evaluated during follow-up by contrast-enhanced CT. Survival was analyzed using the Kaplan-Meier method.

Results: The tumor response rate was 84.0%. The overall median control time was 24.0 months. The local control rate was 57.8% and 34.5% at 1 and 2 years, respectively. The overall 1- and 2-year survival rates were 61.9% and 38.1%, respectively. No serious complications were observed postoperatively and during the follow-up period.

Conclusion: Ultrasound-guided brachytherapy using ¹²⁵I seed implantation is safe and effective for treating recurrent head and neck cancer.

MSRO22-06 • Development of a Standardized Method for Contouring the Larynx and Its Substructures**Mehee Choi** MD (Presenter) ; **Tamer Refaat Abdelrhman** MD,PhD ; **Ian Bacchus** PhD ; **Malisa S Lester** MD ; **Alfred W Rademaker** PhD ; **Bharat B Mittal** MD ***PURPOSE**

Limiting radiation dose to the larynx can diminish effects of laryngeal dysfunction. However, no clear guidelines exist for defining the larynx and its substructures consistently on cross-sectional imaging. This study presents computed tomography (CT)- and magnetic resonance imaging (MRI)-based guidelines for contouring laryngeal organs-at-risk (OARs).

METHOD AND MATERIALS

Using published anatomic information and radiologic data, standardized guidelines for delineating the larynx and its substructure organs at risk (OARs) on 3-mm axial CT images were devised. Based on the guidelines, the OARs were delineated on CT and MRI for five consecutive patients with non-laryngeal head and neck cancer. Volumetric comparisons between CT and MRI contours were performed to validate that the guidelines can be applied consistently to radiotherapy-planning CT scans as well as MRI scans in a reproducible manner. The guidelines were then used to delineate the OARs on radiotherapy-planning CT scans of 44 additional patients treated with chemoradiation for head and neck cancer. Further volumetric comparisons were made to establish the consistency of guideline-based contours.

RESULTS

The larynx and its substructures were successfully created on CT and MRI datasets for five patients, using the proposed guidelines. Differences in OAR volumes

were not statistically different between CT and MRI. Comparisons of 44 additional CT-based contours with the five initial CT-based contours and MRI-based contours showed no significant differences in OAR volumes.

CONCLUSION

The contouring guidelines developed provide a precise, reproducible method for delineating the larynx and its substructures on treatment-planning CT scans. Similar guidelines could be used for MRI-based planning. Clinical implementation of the guidelines should reduce observer variability, leading to an improved understanding of the relationship between radiation dose volume effects on laryngeal substructures and toxicity outcomes.

CLINICAL RELEVANCE/APPLICATION

This study presents guidelines for contouring the larynx and its substructures on axial CT and MR images for use in future investigations of radiation dose-volume effects on larynx dysfunction.

MSRO22-07 • Single Fraction Spine Stereotactic Body Radiation Therapy for Treatment of Chordoma

Edward W Jung MD (Presenter)

ABSTRACT

Purpose/Objective(s):

Chordoma is a rare, slow growing locally aggressive bone tumor arising from embryologic notochord that affects 300 new patients each year in the United States. Only 10% to 20% of tumors arise in the cervical, thoracic, or lumbar spine. Because chordomas are radioresistant, involvement of the spine presents a therapeutic challenge due to the high doses of radiation needed for local control along with proximity to the spinal cord, a dose-limiting organ. There are currently no published reports in the literature exclusively looking at outcomes of spine Stereotactic Body Radiation Therapy (sSBRT) treatment of chordoma. The purpose of this study is to determine the efficacy and safety of treatment with single fraction sSBRT for chordoma of the spine.

Materials/Methods:

A retrospective review of our IRB approved registry from 2007 to 2012 identified 6 patients with chordoma of the spine who were treated with sSBRT for a total of 9 treatments. Five of six patients were treated with curative intent. Surgical resection was performed in 5 of 9 cases. All patients were treated on a Novalis Radiosurgery unit with coplanar beams. A thermoplastic head mask or a vacuum-form body immobilization device (BodyFix) was used depending on tumor location. Cone beam CT or ExacTracTM image guidance systems were used for positioning and localization. The treatment volume was defined by the bony vertebral level of the lesion along with soft tissue extension appreciated on MRI scans (T1 and STIR sequences) as per RTOG 0631 guidelines. Post treatment MRI scans were assessed for local control, recurrence, and disease progression. Individual patient records were reviewed to assess for symptomatic relief and failure. Treatment toxicity was evaluated using the Common Terminology Criteria for Adverse Events v4.0.

Results:

Median age was 58 years (22 - 83). Median KPS was 70 (40 - 90). Median target volume was 19 cm³ (1 - 304). Median prescription dose was 16 Gy (11 - 16). Median conformality index was 1.35 (1.15 - 3.21). Median homogeneity was 1.12 (1.05 - 1.19). Median follow-up time was 10 months (0.5 - 34). Local control at 12 months was 88.8% with one local failure. All patients presented with spinal pain, and pain was improved in 50% of patients treated. One patient developed limited cord myelopathy that resolved with steroids. There were no other treatment toxicities from sSBRT.

Conclusion:

Spine SBRT can be safely and effectively delivered to treat chordoma of the spine with the potential to improve pain symptoms. Single fraction sSBRT compares favorably with other treatment platforms and techniques based on this early data. Longer follow-up with more patients is necessary to determine the exact role of sSBRT in the treatment of chordomas of the spine.

MSRO22-08 • Re-irradiation of the Head and Neck Using Highly Conformal Tomotherapy IMRT

Daniel A Jones MD (Presenter)

ABSTRACT

Purpose/Objective(s): There is no standard of care regarding re-irradiation of the head and neck. The difficulty of balancing the benefit of tumor control with that of increased normal tissue toxicity may be partially negated with proper patient selection and highly conformal radiation therapy. The purpose of this study was to analyze the outcomes of patients with a second primary and/or recurrent head and neck cancer treated with re-irradiation and to identify patients who are most likely to benefit.

Materials/Methods: We retrospectively reviewed 24 patients treated with re-irradiation to the head and neck, between March 2008 and July 2012. There were 17 patients with recurrent tumors, 5 with second primaries, and 2 with both second primaries and recurrences. Tumor factors included volume of recurrence (median 12.5 cm³, range 1.5-400,) and recurrence location (local only (12,) neck only (5,) local + neck (3,) and local + distant (3.) Patient factors included age, median 62 (27-77,) and performance status, (20 with ECOG 0-1, 4 with ECOG 2-3.) Three patients were unresectable and underwent biopsy only. Four underwent subtotal resection or debulking. Seventeen underwent gross total resection, thirteen with positive margins, and four with negative margins. All but two patients were treated with conventionally fractionated tomotherapy IMRT. Fourteen underwent concurrent chemoradiation, typically with platinum based regimens.

Results: Patients were followed for a median of 10 months, minimum of 8 months among survivors. Patients were treated with a median dose of 60 Gy (44-70.) Kaplan-Meier estimates for 1 year local control, recurrence free survival, and overall survival was 58% (95% CI 36-75,) 40% (95% CI 20-59,) and 68% (95% CI 44-83.) Kaplan-Meier estimates for 2 year local control, recurrence free survival, and overall survival was 41% (95% CI 17-64,) 20% (95% CI 6-41,) and 25% (95% CI 8-46.) Median survival was 15 months (95% CI 10-20.) There were 3 long term survivors, at 24, 24, and 32 months, all of which are disease free. Toxicity was significant with twelve patients permanently dependent on a feeding tube and two dying of carotid artery bleeds.

Conclusions: In our series, patients were mostly treated with highly conformal conventionally fractionated Tomotherapy IMRT. Outcomes are similar to those achieved in other published series. Local control at one and two years was encouraging at 58% and 41%, and re-irradiation likely reduced morbidity associated with local progression. The heterogeneity and the small sample size limit generalizability of the study results to future patient management. Likely, treatment with highly conformal techniques such as with Tomotherapy IMRT, improve the ability to control disease and reduce toxicity.

MSRO22-09 • Metastatic Carcinoma of Unknown Primary to Cervical Lymph Nodes: Treatment Patterns, Outcomes, and Patterns of Failure

Varun K Chowdhry MD (Presenter) ; Michael Farris MD ; Seung S Hahn MD ; Jack M Hsu MD ; Michael A Lacombe MD

ABSTRACT

Purpose/Objective: Metastatic squamous carcinoma of unknown primary origin to the cervical lymph nodes poses a complicated diagnostic and therapeutic challenge. Due to rare nature of the disease, treatment is based on retrospective data.

Materials/Methods: Thirty-four patients with head and neck cancer of unknown primary were treated at Upstate Medical University between 2000-2012. The charts were retrospectively reviewed for treatment patterns, toxicity, outcomes, and patterns of failure. The volume and dose for each patient was at the discretion of the treating physician based on patient factors, pathology, location of disease, and clinical stage.

Results: The median age of patients in this series was 57.5 (range, 41-89). Sixteen patients (47%) had a neck-dissection prior to radiotherapy. Eleven patients (32.4%) were treated with either 2D or 3D planning and 23 patients (67.6%) were treated with Intensity Modulated Radiotherapy (IMRT). The median dose to gross disease 6600 cGy (range 3000-7200). The median dose to high risk mucosal sites was 5800 cGy (range, 0-6500 cGy), and median dose to uninvolved cervical chains was 6000 cGy.

Two patients were treated to the neck only (5.9%), 3 patients (5.9%) were treated to the oropharynx only, 9 patients were treated to oropharynx and nasopharynx (26.5%) using laryngeal sparing IMRT, and 15 patients were treated to the oropharynx, nasopharynx, hypopharynx and larynx. Dosimetric analysis of patients treated with a laryngeal sparing technique was performed and it estimated that the dose to the larynx and hypopharynx was approximately 4000 cGy.

Four patients (13%) developed distant metastatic disease. Four patients (13%) recurred loco-regionally in the neck, and 3 of these (9%) were neck only recurrences. One patient (2%) had a primary surfaced after definitive therapy, and the primary was found to be in the oral cavity. There was no statistically significant difference between sites treated and incidence distant disease (p=.203). Seven patients (20.5%) had a neck dissection after definitive radiotherapy or chemoradiotherapy, and one patient (14.2%) was found to have residual disease at the time of neck dissection. Median survival calculated using Kaplan-Meier method 2509 days, 95% CI (2067,2950) days. Median follow-up was 22 months.

Conclusions: We report overall low rates of treatment failures, which were noted to be primarily in neck and distant. We noted only one primary site local failure in the oral cavity, a site not traditionally treated in patients with unknown primary head and neck cancer. We did not note increased local, loco-regional or distant failures in patients treated with laryngeal sparing IMRT, oropharynx only, or neck only. However, proper patient selection is critical in determining which patients can be treated with limited volumes.

BOOST: Gynecology-Integrated Science and Practice (ISP) Session

Monday, 10:30 AM - 12:00 PM • S103CD

MSRO25 • AMA PRA Category 1 Credit™:1.5 • ARRT Category A+ Credit:1.5

Co-Director
Fergus V Coakley, MD
Co-Director
Bruce G Haffty, MD
Moderator
Nina A Mayr, MD
Moderator
Manjeet Chadha, MD

MSRO25-01 • Invited Speaker:
Susan A Higgins MD (Presenter)

MSRO25-02 • A First Report on GYN Permanent Seed Implant with CS-131
Wei Luo (Presenter); Janelle A Molloy PhD; Prakash Aryal; Marcus E Randall MD

MSRO25-03 • Serum MicroRNA Expression as Predictive Biomarker of Outcome in Patients with Locally Advanced Cervical Cancer after Chemoradiotherapy

Yoko Harima MD, PhD (Presenter); Koshi Ikeda MD, PhD; Keita Utsunomiya MD, PhD; Atsushi Komemushi MD, PhD; Shohei Kanno MD; Toshiko Shiga; Noboru Tanigawa MD

PURPOSE

To identify microRNAs (miRNAs) that correlate with clinical outcome in patients with locally advanced cervical cancer after chemoradiotherapy.

METHOD AND MATERIALS

This study included a total of 81 patients with locally advanced squamous cell cervical cancer who underwent definitive chemoradiotherapy between February 2006 and September 2011. We compared the expression level of miRNAs in 45 no evidence of disease [NED] and 36 cancer-caused death [CD] patient's serum before treatment using miRCURY LNA™ Universal RT microRNA PCR. The amplification was performed in a LightCycler 480 Real-Time PCR System (Roche) in 384 well plates. The raw data was extracted from the LightCycler 480 software. Data was internally calibrated by UniSp3 IPC using GenEx software (ver.5). The significance of the expression differences between the NED group and the CD group was evaluated using t-test. The endpoint was correlation between patient characteristics and disease-free and overall survival rates determined by multivariate Cox proportional-hazard model analysis.

RESULTS

Among 384 miRNAs analyzed, miR-214* was most significantly overexpressed in the NED group than in the CD group ($p=0.03$), whereas miR-493* was most significantly overexpressed in the CD group than in the NED group ($p=0.03$). The results of multivariate analysis showed that miR-214* is a significant predictor of disease-free survival [RR=2.01, $p=0.03$], while miR-493* is a significant predictor of poor overall survival [RR=1.32, $p=0.02$].

CONCLUSION

Two miRNAs identified in this study, miR-214* and miR-439* can be used as prognostic biomarker to improve clinical strategies for treatment of locally advanced cervical cancer after chemoradiotherapy.

CLINICAL RELEVANCE/APPLICATION

Two miRNAs identified in this study, miR-214* and miR-439* can be used as prognostic biomarker to improve clinical strategies for treatment of advanced cervical cancer after chemoradiotherapy.

MSRO25-04 • Stepwise Implementation of Imaging Changes for Cervical Cancer Brachytherapy Planning Using Existing Infrastructure: A Multidisciplinary Approach to Advancing Patient Care

Theodora A Koulis MD (Presenter); Derek W Brown; Deepak Bhayana MD; Laurel Traptow; Karen Long; Maree Patrick; Gregg Nelson; Peter Craighead; Corinne Doll; Tien Phan MD

ABSTRACT

Purpose/Objective(s): In 2005 the GEC-ESTRO group published recommendations on 3D planning for cervical cancer brachytherapy (BT) using MR image guidance as the new standard of care. There are many resource and infrastructure constraints that can hinder the mainstream implementation of new technologies. The objectives of this report are to describe the process of transition from 2D to 3D-based planning for cervical cancer BT at our centre, to highlight some of the challenges we encountered, and to describe the solutions and process maps that we developed.

Materials/Methods: A step-wise method was devised to transition from orthogonal x-ray (2D) planning to 3D-based planning of cervical cancer BT using existing infrastructure. First we identified the departments and personnel that would be affected by this change in practice and formed a working group consisting of radiation oncologists, gynaecologic oncologists, medical physicists, RT treatment planners, nursing staff, a radiologist, RT manager, and simulator staff. Possible challenges and strategies were mapped out in a CT-HDR Prospective Risk Analysis. After review and approval from all members of the group, an in-house, ethics-approved protocol was developed: both 2D images and CT images were acquired with the BT apparatus in situ. Feedback was monitored and updates were made to the process map to improve safety and efficiency. An MR-HDR Prospective Risk Analysis was then developed focusing on the logistics of patient transfer from the OR to MR department and subsequent BT treatment. Phantom studies were performed to ensure equipment safety and appropriateness of scanning protocols.

Results: Starting in April 2009, 5 patients were treated on the study protocol. Subsequent patients were planned with CT, but concurrent x-ray images provided verification for dose calculations. Since November 2010, CT-based planning has been used exclusively. Transition to MR-based planning began in February 2012. In August 2012, a "dry-run" of the MRI process map was undertaken before proceeding with our first MRI-guided BT patient in September 2012. Currently a combination of MRI and CT images are used for planning.

Conclusions: Using a stepwise approach it is possible to implement a 3D-based cervical cancer BT planning program utilizing resources of existing infrastructure. Achieving the recommended guidelines requires a multidisciplinary approach, and appropriate prospective risk analysis. Our program is still under development, but our experiences thus far may serve as a reference tool for other centres that are considering a switch to 3D-based planning of cervical cancer BT.

MSRO25-05 • Does "A" of Point A Mean to Be Avoided in Image Guided Brachytherapy?

Zhanrong Gao; Yana Goldberg (Presenter); James R Wong MD; Mei Li MS; J. Emmolo; Paul Heller; D. Tobias; N. Tchabo; B. Slomovitz

MSRO25-06 • A Preliminary Data on Image Based Intracavitary Brachytherapy for Cervical Cancer: Point A Plan and CTV Based Plan

Joanna Athel Embestro-Rodriguez MD (Presenter); Jake John Galingana MSc; Anthony Albert Abad MD; Lilian B Rodriguez MSc; Miriam Joy Calaguas; Teodoro Ramos RT

ABSTRACT

Purpose/Objective(s):

The main objectives of this study are to determine the three dimensional dose volume parameters for a Point A plan and a CTV-based plan and to compare these values using statistical tools.

Materials/Methods:

A total of 22 cases of cervical cancer who were subjected to CT-based Intracavitary Brachytherapy were enrolled in this retrospective study. After the DICOM files were loaded, the critical organs (i.e. bladder and rectum) and target volume were delineated. Treatment planning was undertaken using 2 methods: (1) Manchester of Patterson and Parker and (2) optimization of radiation dose to assigned calculation points which highly depends on the target volume. A prescribed dose of 7 Gy was used for the two methods. 44 plans were generated using the Oncentra version 4 treatment planning system. Patients were divided according to the total volume of the CTV. Patients with CTV less than or equal to 100 cm³ were assigned as Group 1, those with more than 100 cm³ were assigned as Group 2. The following 3D dose volume parameters were determined using relative and absolute values from graph of the plotted DVH: Coverage Index, V100 of the CTV, D90 of the CTV and D2cc of the bladder and rectum.

Results:

With regards to the dose volume parameters evaluated in this study, all mean values generated from all cases were higher when CTV based planning was done rather than Point A based planning. But the results generated were only significant for those that belong in Group 2 or those having a large CTV (> 100cm³). This shows a better coverage of the target volume in terms of the D90, V100 and Coverage Index which can be correlated with an increase in terms of the success of treatment outcome for the CTV based planning. But for the organs at risk, namely the bladder and rectum, having higher radiation doses can result to increase risk of early and late complications

Conclusions: The evidence of this study showed that CTV based treatment planning has more advantage compared to Point A planning if implemented in a CT-based brachytherapy because the method depends highly on the anatomy of the patient (i.e. patient specific). But the organs at risk must be considered in the evaluation of the plan because of the tendency of over dosing the bladder and rectum specially when dealing with a large cervix (> 100cm³). Thus, the dose to the target volume and organs at risk must be noted and be optimized to be able to meet the goals of brachytherapy treatment.

MSRO25-07 • Treatment Outcome and Prognostic Factors of Concurrent Chemoradiotherapy with Nedaplatin for FIGO Stage IB-IVA Carcinoma of the Cervix Uteri

Fujiwara Masateru MD (Presenter); Isohashi Fumiaki; Yoshioka Yasuo; Mabuchi Seiji; Kimura Tadashi; Ogawa Kazuhiko

PURPOSE

Concurrent chemoradiotherapy (CCRT) with cisplatin is, at present, a common method of treatments for carcinoma of the cervix uteri, but CCRT with nedaplatin is uncommon. The purpose of this retrospective study was to evaluate the efficacy and safety of CCRT with nedaplatin and analyze prognostic factors for survival among patients with FIGO stage IB-IVA carcinoma of the cervix uteri.

METHOD AND MATERIALS

We retrospectively reviewed the medical records of 55 patients with FIGO stage IB-IVA carcinoma of the cervix uteri treated with CCRT using nedaplatin 35 mg / m² weekly from 2000 and 2009. The treatment consisted of external beam radiotherapy 46.5-66 Gy (in 24-33 fractions) followed by 13.6-28.8 Gy (in 2-4 fractions) of high-dose-rate intracavitary brachytherapy (ICBT) or 34-35 Gy (in 4 fractions) of medium-dose-rate ICBT. Overall survival (OS) and progression-free survival (PFS) were estimated by the Kaplan-Meier method. The Cox proportional hazard model was used for multivariate analysis. Acute and late toxicities were evaluated by CTCAE ver.4.

RESULTS

The median follow-up was 48 months (range 3-121 months). The median age was 62 years old (range 25-73 years old). The 5-year OS and PFS were 78.9 and 55.6 %, respectively. The 5-year local control was 71.6 %. Multivariate analysis showed that histologic type (adenoma / squamous cell carcinoma), regional lymph node metastases, maximum diameter of the tumor and pretreatment hemoglobin level were independent risk factors for PFS, (hazard ratio (HR) 3.40, 95% confidence interval (95%CI) 1.03-9.81), (HR 2.89, 95%CI 1.12-7.72), (HR 1.42, 95%CI 1.11-1.79) and (HR 0.63, 95%CI 0.46-0.85), respectively. In terms of adverse effects, 27 patients (49.1 %) had acute grade 3-4 leukopenia. Seven patients (12.7 %) had late grade 3 intestinal complications. There was no renal toxicity during CCRT.

CONCLUSION

Our data showed that the CCRT with nedaplatin for FIGO stage IB-IVA carcinoma of the cervix uteri was efficacious and safe, especially in view of less renal toxicity. Histologic type, lymph node metastases, maximum diameter of tumor and pretreatment hemoglobin level were statistically significant prognostic factors.

CLINICAL RELEVANCE/APPLICATION

Chemoradiotherapy with nedaplatin for carcinoma of the cervix uteri was efficacious and safe, especially in view of less renal toxicity.

MSRO25-08 • Single vs. Individual Vaginal Cuff Brachytherapy Planning. Rectal Dose Results from a Rigid/Deformable Registration

Sebastia Sabater (Presenter) ; **Ignacio Andres** ; **Sevillano M Mar** ; **Roberto Berenguer** ; **Santiago Machin-Hamalainen** ; **Meritxell Arenas**

ABSTRACT

Purpose: Debate exists about the need of a CT plan for every fraction vs. the use only the first fraction plan for the overall treatment. Our aim was to investigate the relevance of individual CT-based planning for high-dose rate vaginal cylinder brachytherapy vs. a single fraction CT-based planning using rigid/deformable registration and dose warping.

Materials and methods: Ten patients underwent 5 CT-studies, before each vaginal cylinder brachytherapy fraction. All images were re-segmented and re-planned under the same parameters. Rigid and bspline registration were carried out using the first CT-study as the fixed set, and doses were warped. Three dose accumulation scenarios were studied: (1) multiplying the treatment plan metrics and the number of fractions; (2) summing the first dose fraction with the rigid warped doses; (3) summing the first dose fraction with the deformed doses. Each scenario was evaluated for 3 and 5 fractions. Dose volume histogram (DVH) metrics (mean dose, D0.1cc, D1cc, D2cc and D5cc) of rectum were collected and compared according to the dose accumulation scenario. To study if the number of fractions could have an impact the DVH metrics were re-scaled to maximum dose and normalized to the overall treatment dose. Paired non-parametrical tests were performed (Friedman and Wilcoxon signed-rank test).

Results: Median values and the variation percentage related to the multiplying scenario are shown in table 1a. Dose metric values and median percentage variation were small (table 1a). Non significant differences were seen according to the number of fractions and type of registration, after normalization to the overall dose (table 1b).

A						B		Normalized doses (%)	
		Median				%		Rigid	Deformable
		Multiply	Rigid	Deformable	Rigid	Deformable		Rigid	Deformable
3fx	DMean	0,81	0,85	0,77	6,51	7,70		5,64	5,12
	D0.1	5,12	5,50	5,16	-4,48	0,35		36,63	34,37
	D1	4,13	4,17	4,16	-2,05	0,68		27,77	27,70
	D2	3,74	3,69	3,71	-1,80	0,80		24,57	24,70
	D5	3,02	2,96	3,025	-0,66	2,00		19,70	20,17
5fx	DMean	1,34	1,42	1,43	2,35	7,05		5,66	5,70
	D0.1	8,53	9,45	8,94	13,26	-0,11		37,78	35,74
	D1	6,88	7,11	7,29	-6,69	2,45		28,42	29,14
	D2	6,23	6,45	6,48	-4,26	2,64		25,80	25,90
	D5	5,03	4,82	5,08	-1,77	1,41		19,26	20,30

Conclusions: Data show small and non significant differences on rectal DVH metrics using rigid/deformable registration and dose warp compared to the simple dose multiplication; nevertheless they could be irrelevant from a clinical point of view.

Reducing CT Dose (Sponsored by the Associated Sciences Consortium) (An Interactive Session)

Monday, 01:30 PM - 03:00 PM • S105AB



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MSAS23 • AMA PRA Category 1 Credit™: 1.5 • ARRT Category A+ Credit: 1.5

Moderator
Ellen Lipman, MS, RT

MSAS23A • Going Beyond the Protocol: A Comprehensive Approach to Optimizing CT Dose and Quality

Phuong-Anh T Duong MD (Presenter)

LEARNING OBJECTIVES

1) Understand how to develop a process for radiation dose and image quality optimization. 2) Briefly review common techniques for reducing CT radiation dose including. 3) Learn ways to monitor quality and dose. 4) Discuss ways to improve compliance with imaging protocols.

ABSTRACT

As radiation dose in CT continues to be a concern, many radiology practices are in the process of revising their CT protocols to optimize radiation dose and quality. Optimizing CT radiation dose and quality is a challenging task requiring knowledge to implement complex technology and collaboration between

radiologist and technologist. It is not enough to change imaging protocols alone; monitoring and training are necessary to ensure consistent quality. This course focuses on the development of processes for dose reduction and continuous quality improvement drawing on the experience of an academic healthcare system as a case study. Methodologies for evaluating current imaging protocols, reducing radiation dose, monitoring exam quality and dose, assessing changes in protocols, and improving protocol compliance will be discussed.

MSAS23B • A Case Study Using the American College of Radiology Dose Index Registry

Brent Little MD (Presenter)

LEARNING OBJECTIVES

1) The learner will become familiar with an approach to baseline CT radiation dose measurement and ongoing dose monitoring using the American College of Radiology Dose Index Registry. 2) The learner will be able to identify and avoid pitfalls in radiation dose tracking and dose analysis. 3) The learner will be able to identify common causes of dose outliers and develop a plan for standardizing and reducing doses based on a root cause analysis. 4) The learner will become familiar with practical considerations of dose reduction implementation using a variety of techniques.

ABSTRACT

Radiation dose reduction and standardization are essential components of quality assurance and quality improvement in CT imaging. This course will highlight a departmental initiative to decrease and standardize CT radiation dose at a large academic medical center. The practical aspects of measuring baseline doses, implementing dose reduction strategies, and measuring results will be emphasized. Our use of the American College of Radiology dose index registry to identify average dose and dose outliers will be described. Root cause analysis of variation in doses across sites, scanners, and exams will be discussed. An approach to planning, implementation, and continuous evaluation of dose reduction measures will be presented.

Case-based Review of Magnetic Resonance: Woman's Imaging (An Interactive Session)

Monday, 01:30 PM - 03:00 PM • S100AB

MR **OB** **GU** **BR**

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MSCM23 • AMA PRA Category 1 Credit™:1.5 • ARRT Category A+ Credit:1.5

Director

John R Leyendecker, MD

MSCM23A • Breast

Constance D Lehman MD, PhD (Presenter) *

LEARNING OBJECTIVES

1) Improve approach to image interpretation of challenging breast MRIs. 2) Improve approach to management of patients with abnormal MRIs. 3) Interpret a variety of MR lesions using the new BI-RADS lexicon.

ABSTRACT

MSCM23B • Fetal/Placental MRI

Keyanoosh Hosseinzadeh MD (Presenter) *

LEARNING OBJECTIVES

1) To describe common indications for referral for fetal MRI of the central nervous system, neck and oral cavity. 2) To describe MRI technique and algorithmic approach for the above indications. 3) To describe the MRI appearance of the placenta, with emphasis on abnormal placentation.

MSCM23C • Malignancies of the Female Pelvis

John A Spencer MD (Presenter)

LEARNING OBJECTIVES

Ovarian cancer continues to present at advanced stage of disease.

1) Typical imaging features of ovarian cancer at presentation. 2) Mimics of disseminated ovarian cancer. 3) The role of image guided biopsy in management. Endometrial cancer, now the most common female genital tract malignancy, usually presents in the post-menopausal woman with vaginal bleeding. 4) How to establish deep myometrial invasion and cervical involvement which may modify the surgical approach. Cervical cancer is reducing in incidence in the developed world but still a major killer of young women in the developing world. 5) How to use MR imaging as a staging examination that replaces examination under anaesthetic (EUA). 6) The emerging role of CT-PET in management.

ABSTRACT

Ovarian cancer continues to present at advanced stage of disease with peritoneal carcinomatosis (PC). The role of imaging is in determining the cause of PC. If this is felt to result from ovarian cancer the next question is if the extent and sites of disseminated tumour preclude effective cytoreductive surgery. For women beyond this scope or unfit for surgery the management is with primary (neoadjuvant) chemotherapy and the key is to obtain a histological diagnosis. We will first cover: 1. typical imaging features of ovarian cancer at presentation 2. mimics of disseminated ovarian cancer 3. the role of image guided biopsy in management. Endometrial cancer, now the most common female genital tract malignancy, usually presents in the post-menopausal woman with vaginal bleeding. Its incidence has increased with obesity in the Western world and to a lesser extent from oestrogenic medications including tamoxifen therapy for breast cancer. Because of the worrying nature of this bleeding most women present early with superficial disease cured by hysterectomy. Deep myometrial invasion increases the risk of lymph node metastases and indicates the need for lymphadenectomy. We will cover: 4. how to establish deep myometrial invasion and cervical involvement which may modify the surgical approach. Cervical cancer is reducing in incidence in the developed world but still a major killer of young women in the developing world. Until 2009 the FIGO staging did not include information from MR imaging. Nowadays MR imaging provides the primary staging information with CT-PET considered for all tumours of stage IB2 and above i.e. those confined to the cervix of > 4 cm size and those having breached the cervix. We will cover: 5. how to use MR imaging as a staging examination that replaces examination under anaesthetic (EUA). 6. the emerging role of CT-PET in management. A case-based teaching approach will be used.

Cardiac CT Mentored Case Review: Part III (In Conjunction with the North American Society for Cardiac Imaging) (An Interactive Session)

Monday, 01:30 PM - 03:05 PM • S406A

CT **VA** **CA**

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MSMC23 • AMA PRA Category 1 Credit™:1.5 • ARRT Category A+ Credit:1.5

Moderator

James P Earls, MD *

Moderator

U. Joseph Schoepf, MD *

MSMC23A • Pulmonary Veins and Pericardium

Jacobo Kirsch MD (Presenter)

LEARNING OBJECTIVES

1) Describe normal versus anomalous pulmonary venous anatomy. 2) Understand the imaging findings of complications of ablation for atrial fibrillation. 3) Describe abnormalities of the pulmonary veins identifiable on routine CT. 4) Identify the most common pericardial abnormalities evaluated with CT.

MSMC23B • Coronary Artery Disease III: Native Vessel Disease

Elliot K Fishman MD (Presenter) *

LEARNING OBJECTIVES

1) Understand pathology of the native coronary arteries beyond simple plaque disease. Topics will include coronary artery aneurysms, anomalies, and fistulae. 2) How to optimize the study performance and interpretation will be addressed as well.

ABSTRACT

The goal of this session is to learn how to interpret pathology involving the coronary arteries beyond the detection of coronary artery stenosis. Focus on exam acquisition protocols, study interpretation protocols, and minimizing radiation dose are addressed. Specific topics addressed will also include coronary artery aneurysm, myocardial bridging, anomalous coronary arteries as well as vasculitis. Potential pitfalls will be addressed and pearls for study optimization will also

Molecular Imaging Symposium: Imaging Cellular Subpopulations - Current Progress and Future Directions

Monday, 01:30 PM - 03:00 PM • S406B

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MSMI23 • AMA PRA Category 1 Credit™:1.5 • ARRT Category A+ Credit:1.5

Moderator
Michael D Kuo, MD *

MSMI23A • Using Imaging to Track the In Vivo Contribution of Lgr5 Stem Cells in GI Cancer

Nick Barker PhD (Presenter)

LEARNING OBJECTIVES

1) To learn about in vivo lineage tracing as a technique to document endogenous stem cell activity.

ABSTRACT

Lgr5 Stem Cells in Epithelial Self-Renewal and Cancer Nick Barker: Institute of Medical Biology, 8A Biomedical Grove, 06-06 Immunos, Singapore 138648 The intestinal epithelium is subjected to a constant barrage of mechanical and chemical assault, imposing a requirement for regular self-renewal. This renewal is driven by a small population of adult stem cells residing in epithelial pockets known as crypts of Leiberkuhn. Lgr5 is a Tcf/?-catenin (Wnt) target gene specifically expressed on crypt-base columnar cells located at the base of the intestinal crypts. Employing in vivo lineage tracing we have proven these cells to be the stem cells of the small intestine and colon. The same rapid turnover of the intestinal epithelium also makes it particularly susceptible to cancer-forming mutation. Using Lgr5-CreERT2 mice to selectively induce deletion of the APC tumor suppressor gene in the intestinal stem cells, we recently proved that these Lgr5+ve stem cells are the cell-of-origin of colon cancer. This work also revealed the presence of a minor population of Lgr5+ve cells within intestinal tumors. Multicolor lineage tracing from these tumor-resident Lgr5+ve cells has demonstrated these to be cancer stem cells contributing to tumor growth in vivo.

MSMI23B • CLARITY and Beyond: Towards Complete Structural and Molecular Investigation of Large-Scale Intact Biological Systems

Kwanghun Chung PhD (Presenter)

LEARNING OBJECTIVES

1) To understand the limitations of current imaging-based approaches in understanding disease processes. 2) To understand how CLARITY overcomes these limitations and allows cellular and subcellular imaging/molecular phenotyping while maintaining a whole system-wide perspective. 3) To explore potential clinical applications and future directions of CLARITY.

MSMI23C • Imaging Immune Cell Subsets Using ImmunoPET

Anna M Wu PhD (Presenter) *

LEARNING OBJECTIVES

1) To delineate the advantages and disadvantages of using an antibody-based imaging approach for cell tracking. 3) To identify appropriate combinations of antibody formats and radionuclides for specific immunoPET applications.

ABSTRACT

Antibodies are attractive candidates as imaging agents due to their exquisite specificity. Recent advances in protein engineering have enabled optimization of antibodies for noninvasive imaging applications such as immunoPET, through reduction of immunogenicity, acceleration of clearance to enable rapid, same-day imaging, and provision of site-specific radioconjugation. Broader availability of non-standard PET radionuclides, including Cu-64, Zr-89, and I-124 and others, has expanded the range of biological targets and processes that can be imaged. The cell-surface CD markers provide a well-characterized set of targets that can be used to distinguish lineage, differentiation, and activation state of hematopoietic and immune cells. Corresponding antibodies can readily be converted into engineered fragments for PET imaging, and can be used to profile immune responses such as expansion, trafficking, homing, and activation of immune cell subsets. Examples of profiling immune cells and responses in mouse models will be presented, as well as the potential for clinical translation.

MSMI23D • New Strategies for Using Smart MRI Contrast Agents for Monitoring Cell Therapy

Michael T McMahon PhD (Presenter)

LEARNING OBJECTIVES

1) Describe the Chemical Exchange Saturation Transfer (CEST) MRI contrast mechanism and how to modify an imaging sequence to obtain this contrast. 2) List the properties that make a compound a successful CEST MRI contrast agent. 3) Describe the various methods to employ CEST MRI contrast for monitoring cell therapy.

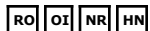
ABSTRACT

Hydrogels have facilitated cell therapies by protecting therapeutic cells from immune responses and providing a physical cue to support the grafts. A non-invasive imaging technique that allows the monitoring of engrafted cell viability is needed as these therapies move into the clinic. Chemical Exchange Saturation Transfer (CEST) imaging is sensitive to changes in pH and ion concentrations, and as a result is well suited as a tool to obtain information on the status of these cells. We have incorporated organic CEST contrast agents into alginate hydrogels for this purpose and have developed a magnetization transfer image collection scheme suitable for obtaining high quality CEST contrast maps in the abdomen. The in vivo results upon transplanting these hydrogels into mice will be discussed.

BOOST: Head and Neck-Case-based Review (An Interactive Session)

Monday, 03:00 PM - 04:15 PM • S103AB

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MSRO23 • AMA PRA Category 1 Credit™:1.25 • ARRT Category A+ Credit:1.5

Co-Director
Fergus V Coakley, MD
Co-Director
Bruce G Haffty, MD
Suresh K Mukherji, MD
Sung Kim, MD
Carol R Bradford, MD
Ezra Cohen, MD *

LEARNING OBJECTIVES

1) Review common tumors of the head and neck. 2) Review imaging findings in head and neck malignancies that specifically change staging. 3) Review the value of imaging in directly affecting management and treatment.

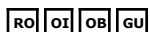
ABSTRACT

This session will be tumor board that includes a head and neck radiologist, head and neck surgeon, medical oncologist and radiation oncologist. We will discuss a variety of head and neck cancer cases and illustrate the value-added benefits and highlight of imaging affects staging, treatment and management.

BOOST: Gynecology-Case-based Review (An Interactive Session)

Monday, 03:00 PM - 04:15 PM • S103CD

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MSRO26 • AMA PRA Category 1 Credit™:1.25 • ARRT Category A+ Credit:1.5

Co-Director
Fergus V Coakley, MD
Co-Director
Bruce G Haffty, MD
Moderator
Beth A Erickson, MD

William Small , MD
Julian C Schink , MD
Susan A Higgins , MD
Daniel Cornfeld , MD
Joseph H Yacoub , MD *

LEARNING OBJECTIVES

1) Present the multidisciplinary management of gynecologic cancers including surgery, radiation and chemotherapy. 2) Highlight the importance of diagnostic imaging before, during and after treatment. 3) Highlight the importance of imaging in the planning and delivery of radiation.

ABSTRACT

The care of patients with gynecologic cancers requires the collaboration of imaging specialists as well as gynecologic and radiation oncologists. Patterns of disease spread and recurrence have tremendous impact on the management of these patients, and diagnostic imaging is key in defining disease at diagnosis and following patients for detection of recurrence after treatment. Image-guided radiation is considered the standard of care for both the planning of external beam and brachytherapy and is key in maximizing the benefits of radiation while minimizing the risks. Case examples of the pivotal impact of imaging and its importance in multidisciplinary care will be highlighted in this session.

Maximizing Space Planning in an Era of Diminishing Resources (Sponsored by the Associated Sciences Consortium) (An Interactive Session)

Monday, 03:30 PM - 05:00 PM • S105AB

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HP

MSAS24 • AMA PRA Category 1 Credit™:1.5 • ARRT Category A+ Credit:1.5

Moderator

Morris A Stein , BArch
Morris A Stein , BArch
Bill Rostenberg *
Steven C Horii , MD *

LEARNING OBJECTIVES

1) Learn how to balance rising space demands with work flow and performance improvement expectations. 2) Review examples of how hospitals and outpatient providers have delivered increased imaging needs while limiting increased space and new construction. 3) Understand the growing interventional nature of Radiology and what it means for project design teams. 4) Learn how to implement reading and information strategies that work.

ABSTRACT

Planning today's healthcare environment continues to face significant, yet often conflicting determinants. These include providing new technology or expanded use, the need to accommodate greater levels of patient care quality, rising numbers of exams, all within a context of limited new space, inappropriate space, and funding restraints. When new projects are proposed, they are often simply larger collections of the same thing.

This refresher course will discuss how to plan for rapid change within the context limited physical and financial resources, considering operational improvement and process implementation where flow matches function. Let's look at how to get the most out of what we have.

Speakers will cover these three specific topics: 1. Balancing rising space demands with work flow and performance improvement. 2. The growing interventional nature of Radiology and what it means for project design teams. 3. State of the art reading and information strategies that work.

Case-based Review of Magnetic Resonance: Abdomen and Pelvis (An Interactive Session)

Monday, 03:30 PM - 05:30 PM • S100AB

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MR GU GI

MSCM24 • AMA PRA Category 1 Credit™:2 • ARRT Category A+ Credit:2

Director

John R Leyendecker , MD

MSCM24A • Liver

Jeffrey C Weinreb MD (Presenter) *

LEARNING OBJECTIVES

1) Accurately assess and avoid pitfalls on hepatic MRI exams. 2) Identify common conditions despite atypical appearances on imaging. 3) Differentiate a variety of benign and malignant hepatic tumors on MRI.

MSCM24B • Abdomen MRI (Excluding Liver)

Elmar M Merkle MD (Presenter) *

LEARNING OBJECTIVES

1) To illustrate a variety of abdominal pathologies by presenting MR cases from clinical practice.

ABSTRACT

MSCM24C • Prostate

Katarzyna J Macura MD, PhD (Presenter) *

LEARNING OBJECTIVES

1) To review multiparametric MRI of the prostate. 2) To discuss challenges in interpretation of imaging findings.

Cardiac CT Mentored Case Review: Part IV (In Conjunction with the North American Society for Cardiac Imaging) (An Interactive Session)

Monday, 03:30 PM - 06:00 PM • S406A

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CT VA CA

MSMC24 • AMA PRA Category 1 Credit™:2.5 • ARRT Category A+ Credit:3

Moderator

Arthur E Stillman , MD, PhD

Moderator

Frank J Rybicki , MD, PhD *

LEARNING OBJECTIVES

1) To understand the clinical indications for retrospective ECG gated cardiac CT. 2) To illustrate methods to assess myocardial function from cine cardiac CT images. 3) To illustrate methods to assess normal and abnormal valvular function from cine cardiac CT images.

ABSTRACT

The mentored case review provides the opportunity for the attendees to learn the image acquisition, post-processing, and diagnosis for a wide variety of cardiac diseases commonly encountered in CT.

MSMC24A • Coronary Artery Disease and Incidental Noncardiac Findings

Jill E Jacobs MD (Presenter)

LEARNING OBJECTIVES

1) Identify and evaluate coronary plaques and stenosis. 2) Identify and characterize common incidental extracardiac findings on coronary CT angiography.

MSMC24B • Adult Congenital Heart Disease

S. Bruce Greenberg MD (Presenter)

LEARNING OBJECTIVES

1) Understand the increasing incidence and morbidity of congenital heart disease in adults. 2) Understand the long term complications of treated and untreated congenital heart disease. 3) Describe CT techniques for imaging adults with congenital heart disease. 4) Demonstrate morphologic changes in the heart and great vessels in untreated, palliated and corrected congenital heart disease.

MSMC24C • Coronary Artery Disease IV: Native Vessel Disease and Arterial and Venous Bypass Grafts

Harold I Litt MD, PhD (Presenter) *

LEARNING OBJECTIVES

1) Identify focal areas of stenosis in the coronary arteries on CT. 2) Understand how to minimize artifacts to improve accuracy on coronary CT. 3) Describe common extracardiac incidental findings on coronary CT.

ABSTRACT

Molecular Imaging Symposium: Molecular Brain Imaging: From Research to Clinical Applications

Monday, 03:30 PM - 05:00 PM • S406B

MI **BQ** **NR**

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MSMI24 • AMA PRA Category 1 Credit™:1.5 • ARRT Category A+ Credit:1.5

Moderator

Satoshi Minoshima, MD, PhD *

LEARNING OBJECTIVES

1) To discuss molecular brain imaging technologies that have been translated from research developments to clinical applications.

ABSTRACT

MSMI24A • Amyloid Imaging: Translational Research to Clinical Applications

Alexander Drzezga MD (Presenter) *

LEARNING OBJECTIVES

1) Pathophysiological background: Role of amyloid-aggregation in the development of Alzheimer's disease. Concept of modern anti-amyloid therapy options. Time course of amyloid-aggregation as compared to the appearance of clinical symptoms. Value of amyloid-imaging as compared to other biomarkers of Alzheimer's disease. 2) Methodological principles of amyloid imaging: Development, mechanism, available tracers. Proof of concept, in vivo versus ex vivo histopathological confirmation. 3) Clinical value and interpretation of amyloid-imaging results, pitfalls and artefacts, value of amyloid-imaging with regard to early diagnosis, differential diagnosis and therapy monitoring. 4) Amyloid imaging in comparison to other imaging biomarkers (MRI, FDG-PET), value of multioimodal imaging.

MSMI24B • How Molecular Imaging Contributes to Movement Disorders? Current and Future

Kirk A Frey MD, PhD (Presenter) *

LEARNING OBJECTIVES

View learning objectives under main course title.

MSMI24C • Quantitative Analysis and Interpretation of Molecular Brain Imaging

Satoshi Minoshima MD, PhD (Presenter) *

LEARNING OBJECTIVES

1) To explain various quantification methods applied in the field of molecular brain imaging. 2) To discuss how such quantification methods can be used in clinic.

MSMI24D • Making Molecular Brain Imaging Available in the Clinic: FDA and CMS

Peter Herscovitch MD (Presenter)

LEARNING OBJECTIVES

1) To discuss new molecular brain imaging techniques that are available in the clinic. 2) To explain how basic research has been translated to clinical applications. 3) To discuss approval processes that are necessary to establish clinical molecular brain imaging.

BOOST: Head and Neck Hands-on Contouring (In Cooperation with ASTRO)

Monday, 04:45 PM - 06:00 PM • S104B

RO **OI** **NR** **HN**

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MSRO29 • AMA PRA Category 1 Credit™:1.25 • ARRT Category A+ Credit:1.5

Co-Director

Fergus V Coakley, MD

Co-Director

Bruce G Haffty, MD

Suresh K Mukherji, MD

Sung Kim, MD

LEARNING OBJECTIVES

The intent of this course is to provide direct hands-on education regarding contouring of head and neck cancer. Participants will be given the opportunity to contour head and tumor of the nasopharynx and larynx. Their contours will be compared to contours drawn by experts in head and radiation oncology and radiology. The session will emphasize various techniques approaches that enhance the participants ability to accurately contour tumor and prevent geographic misses. The session will also discuss important anatomic landmarks and patterns of spread for cancers at these sites.

ABSTRACT

The inten of this course is to provide a hands-on contouring session for head adn neck cancer. This session will be presented by a radioligist and radiation oncologist.

Standards of Ethics in Practice: Evolution, Purpose, Structure, Compliance (Sponsored by the Associated Sciences Consortium) (An Interactive Session)

Tuesday, 08:30 AM - 10:00 AM • S105AB

PR

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MSAS31 • AMA PRA Category 1 Credit™:1.5 • ARRT Category A+ Credit:1.5

Moderator

Claudia A Murray

Richard Duszak, MD

Ann Obergfell, JD

LEARNING OBJECTIVES

1) Recognize the need for ethics that promote appropriate patient treatment, acceptable standards of care and adherence to regulatory compliance. 2) Develop a framework for continually improving a practice's clinical and business operations. 3) Understand concepts fundamental to radiology coding and reimbursement. 4) Institute simple steps to ethically balance needs of patients with those of other parties.

Case-based Review of Nuclear Medicine: PET/CT Workshop-Head and Neck Cancers (In Conjunction with SNMMI) (An Interactive Session)



MSCC31 • AMA PRA Category 1 Credit™:1.5 • ARRT Category A+ Credit:1.5

Director

John A Parker, MD, PhD
Rathan M Subramaniam, MD, PhD *

LEARNING OBJECTIVES

1) To understand what the surgeon, radiation oncologist and oncologist want from a head and neck PET/CT. 2) To understand the normal variant FDG uptake in Head and Neck. 3) To understand the neck spaces, tumor spread and value of PET/CT in staging. 4) To understand the value of PET/CT in post therapy assessment of head and neck oncology.

ABSTRACT

This lecture will cover the essential information that allows a surgeon, radiation oncologist and oncologist to care for head and neck cancer patients in a multidisciplinary settings. It will emphasise the PET/CT clinical paradigms, normal variants of FDG uptake, neck spaces and tumor spread, and value and pitfalls of PET/CT in therapy assessment and follow up of head and neck cancer patients.

Essentials of Cardiac Imaging

Tuesday, 08:30 AM - 10:00 AM • S100AB



MSES31 • AMA PRA Category 1 Credit™:1.5 • ARRT Category A+ Credit:1.5

MSES31A • Evaluation of Coronary Artery Bypass Grafts

Smita Patel MBBS (Presenter)

LEARNING OBJECTIVES

1) To discuss CTA technique for coronary artery bypass graft (CABG) imaging. 2) To review the surgical anatomy of conduits used for CABG and their CT appearance. 3) To review post CABG complications.

MSES31B • Quantification of Coronary Stenosis by CTA - Accuracy, Difficulties, and Functional Significance

John W Hoe MD (Presenter) *

LEARNING OBJECTIVES

1) To understand the difference between diagnostic accuracy of coronary CTA for detection of coronary artery stenosis compared to invasive coronary angiography and quantification of coronary stenosis by coronary CTA compared to invasive angiography. 2) To understand the different methods available to quantify coronary stenosis by CTA and also that stenosis can be quantified by diameter stenosis as well as area stenosis. 3) To understand that coronary CTA cannot accurately grade stenosis severity with wide limits of agreement and reasons for this. 4) How to report stenosis seen on coronary CTA and what constitutes significant or severe stenosis. 5) To understand why prediction of myocardial ischemia coronary CTA is limited and what methods are available to try to overcome these limitations.

ABSTRACT

The accuracy of coronary CTA to detect significant coronary artery stenosis (=>50%) compared to invasive angiography, has been well established. In clinical practice, quantification of degree of the stenosis of the coronary artery is expected from referring physicians. Coronary CTA does not perform as well when compared to quantitative coronary angiography (QCA), which is usually used as the gold standard. This is due to difference in spatial resolution. Other factors affecting accuracy of quantification include presence of positive remodeling and interobserver variation in assessing stenosis at invasive angiography or when compared to QCA. Coronary CTA, even if performed with latest generation scanners, currently can only quantify stenosis in 90%-95% of patients to an accuracy of ±25%. Methods of reporting degree of stenosis should follow the broad categories recommended by the SCCT and will influence further management of the patient. Methods of quantifying stenosis include visual estimation, manual quantification using workstation tools as well as automated software that can quantify stenosis (QCCTA) and how to use these methods and their accuracy will be discussed. Assessment of stenosis is usually based on estimating % diameter stenosis (%DS), after comparison with a reference diameter proximal or distal to the lesion. Use of minimal luminal area (mm²) or percent area stenosis is another technique, which can also be used to help quantify coronary stenosis and may be more reproducible. The accuracy of coronary CTA to assess for presence of myocardial ischemia compared to myocardial perfusion imaging is limited using current criterion of => 50% stenosis but is improved using criterion of >70%. New methods to improve prediction of functional significance of stenosis such as using contrast gradient measurements and computational fluid dynamics (CT-FFR) but these are still under investigation.

MSES31C • Cardiac Masses (CT/MRI)

Ruth P Lim MBBS, MMed (Presenter)

LEARNING OBJECTIVES

1) To review the pros and cons of CT and MRI in the work up of cardiac masses. 2) To discuss optimization of image quality including appropriate patient preparation, and potential challenges including arrhythmia. 3) To review potential mimics of cardiac masses including review of basic anatomy. 4) To review neoplastic and non-neoplastic masses and their appearance at cross-sectional imaging.

ABSTRACT

Cardiac CT and MRI are now firmly within the clinical domain for a number of indications, including mass evaluation. This session aims to discuss the somewhat complementary role of these modalities for this indication. CT offers advantages of speed and relatively high spatial resolution, with clear depiction of macroscopic fat or calcification. MRI is particularly helpful when functional as well as anatomic evaluation is desirable, and offers superior soft tissue contrast without exposure to ionizing radiation. Patient factors may also influence the choice of the most appropriate modality. Sound knowledge of the principles of CT and MRI imaging are necessary to obtain diagnostic quality imaging, and cardiac-specific issues will be discussed, including the limitations that heart rate, rhythm and breath-holding capability may place on imaging parameters. Technical tips for MRI and factors influencing radiation dose for CT will be briefly discussed. Finally, pearls and pitfalls for interpretation will be discussed. Cardiac anatomy will be reviewed, with examples of potential mass mimics and don't-touch lesions, where CT and MRI may play a problem-solving role. Some of the more common and distinctive non-neoplastic masses, and neoplasms will be reviewed, with discussion of imaging features that may help to suggest a benign or malignant etiology.

Quality Improvement: Safety at Work

Tuesday, 08:30 AM - 10:00 AM • S406B



MSQI31 • AMA PRA Category 1 Credit™:1.5 • ARRT Category A+ Credit:1.5

Co-Director

Jonathan B Kruskal, MD, PhD *

Co-Director

James V Rawson, MD

Moderator

Lane F Donnelly, MD *

LEARNING OBJECTIVES

1) To understand multiple aspects of safety in radiology including the importance of an effective daily management system, staff safety, and risk management.

ABSTRACT

Ever increasing attention has been placed on safety in radiology departments with increasing expectations by the public, certifying organizations, licensing organizations, and payers. Areas of attention include both specific areas such as radiation safety and MRI safety as well as error reduction in general. Several aspects of safety in the radiology department will be addressed in this forum including the importance of creating a well-functioning daily management system to rapidly identify abnormal states and apply countermeasures, staff safety, and risk management. Understanding these areas will potentially help attendees improve safety in their institutions.

MSQI31A • The Daily Management Huddle - A Paradigm for Safe Practice

Lane F Donnelly MD (Presenter) *

LEARNING OBJECTIVES

1) To understand the importance of a Daily Management System to optimize rapid identification of issues and implementation of solutions to improve patient safety.

ABSTRACT

Have an effective Daily Management System (DMS) is seen as an important component of achieving a patient safety and continuous improvement culture. Many would argue that culture is the result of the management system in place. Effective DMS enables front line associates to be empowered to fix problems and helps identify and escalate issues rapidly when more resources are needed. An effective DMS typically has a number of components: tiered huddles, leadership standard work, and effective visual boards. This portion of the presentation will review the concepts and examples of success related to effective DMS.

MSQI31B • Staff Safety in the Radiology Department - What Dangers Lurk?

Olga R Brook MD (Presenter) *

LEARNING OBJECTIVES

1) Identify common staff safety risk sources in radiology department. 2) Apply and implement strategies and use tools to mitigate and prevent such risks. 3) Demonstrate understanding of policies and guidelines on staff and environmental safety.

ABSTRACT

Employees in a radiology department are exposed to multiple risks, including injuries due to radiation exposure, poor ergonomics, or repetitive stress; those caused by wearing lead aprons or moving heavy equipment for portable studies; and needle sticks resulting in exposure to body fluids. Strategies to mitigate or prevent such risks include ergonomics initiatives for radiologists and technologists, appointment of a radiation safety officer to ensure compliance with radiation dose guidelines and policies, and use of equipment that prevents exposure to body fluids. In addition, there are regulations and guidelines from various government bodies on occupational radiation dose limits, handling of isotopes and chemotherapy agents, contact with patients with airborne infections, and needle stick injuries. A comprehensive staff safety program was developed for a clinical radiology department to provide a framework for staff injury prevention. The important parts of a staff safety program are observational safety audits and walkabouts and a safety reporting tool for employees. Faculty education about workplace environmental risks and their consequences, compliance with policies and guidelines on environmental safety, and development of a culture that encourages surveillance, reporting, and prompt action will go a long way toward improving overall safety for all workers in a radiology department.

MSQI31C • Risk Management 101 for Radiologists

Ronald L Eisenberg MD, JD (Presenter)

LEARNING OBJECTIVES

1) To master the basic elements of risk management in order to protect patients and yourself.

ABSTRACT

Risk management has been defined as encompassing 'clinical and administrative activities that [health care organizations] undertake to identify, evaluate, and reduce the risk of injury and loss to patients, personnel, visitors, and [the organization] itself.' A successful risk management must be both reactive (to incidents that have already occurred) and proactive (to prevent future occurrences). In essence, risk management deals with 'identification of legal risk, prioritization of identified risk, determination of proper organizational response to risk, management of reconigned risk causes with the goal of minimizing risk (risk control), establishment of effective risk prevention, and maintenance of adequate risk financing.' This segment will discuss the various aspects of risk management so that you are better prepared to protect your patients, your imaging department, and yourself.

BOOST: Gastrointestinal-Anatomy and Contouring (An Interactive Session)

Tuesday, 08:30 AM - 10:00 AM • S103AB

RO **OI** **GI**

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MSRO31 •AMA PRA Category 1 Credit™:1.5 •ARRT Category A+ Credit:1.5

Co-Director

Fergus V Coakley, MD

Co-Director

Bruce G Haffty, MD

Theodore S Hong, MD

Mukesh G Harisinghani, MD

LEARNING OBJECTIVES

1) Achieve a basic understanding of the anatomy pertinent to the anorectal region and imaging appearance of ano-rectal tumors. 2) Understand strengths and limitations of imaging techniques, including MRI, PET-CT and CT, as they are used in delineating primary tumor and staging involved regional nodes. 3) Identify common sites of recurrence for anorectal tumors and recognize the imaging appearances of these recurrences. 4) Improve radiation therapy delivery through understanding the contouring recommendations for the gross tumor volume (GTV) and clinical target volumes (CTV) for anorectal tumors, both in the locally advanced and postoperative setting.

ABSTRACT

ABSTRACT: In this course MRI will be used to contour normal anorectal anatomy as well as tumors involving this anatomical region. Also patterns of spread of pathological lymph nodes will be shown, and MRI will be used to contour the regional nodal lesions. Cases will be presented and the participants will be stimulated to do the contouring themselves, and will have feed-back on their results

BOOST: Breast-Anatomy and Contouring (An Interactive Session)

Tuesday, 08:30 AM - 10:00 AM • S103CD

RO **OI** **BR**

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MSRO34 •AMA PRA Category 1 Credit™:1.5 •ARRT Category A+ Credit:1.5

Co-Director

Fergus V Coakley, MD

Co-Director

Bruce G Haffty, MD

Reni S Butler, MD

Nina A Mayr, MD

LEARNING OBJECTIVES

1) Gain an understanding of the staging of breast cancer and appropriate imaging and diagnostic studies used in the staging of breast cancer focusing on nodal evaluation. 2) Gain an understanding of the various breast imaging techniques, controversies, emerging technologies and future directions in the imaging of breast cancer, focusing on nodal evaluation. 3) Gain an understanding and appreciation of identifying and contouring nodal target volumes and radiation management of regional nodes. 4) Gain an understanding of the controversies regarding nodal evaluation and management in the current era of neoadjuvant systemic therapy and sentinel nodal evaluation.

ABSTRACT

The management of breast cancer has undergone rapid evolution with the increased utilization of neoadjuvant systemic chemotherapy and hormonal therapy, and increased utilization of sentinel nodal evaluation. These issues have impacted on both the imaging and radiotherapeutic management of breast cancer, particularly with respect to the evaluation and management of the regional lymphatics. During this 90-minute session a diagnostic radiologist and radiation oncologist will provide an overview of the principles of staging, radiographic imaging and radiotherapeutic contouring and considerations in the management of breast cancer, focusing on nodal evaluation and management. The speakers will review AJCC staging, controversies regarding imaging and staging studies in the evaluation of patients with breast cancer, and provide an overview of contouring of target and normal tissue structures and radiation field considerations in the management of breast cancer with special attention to imaging, contouring and management of the regional lymphatics in the setting of primary management, evaluation after neoadjuvant therapy, and in the setting of local-regional relapse. In this session, special attention will be given to current and evolving approaches to regional nodal evaluation and management.

Emerging Technology: What's New (Sponsored by the Associated Sciences Consortium) (An Interactive Session)

Tuesday, 10:30 AM - 12:00 PM • S105AB

MR

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Moderator
Cindy R Comeau, BS, RT

MSAS32A • PET/MR-Should You Add One To Your Practice

David A Bluemke MD, PhD (Presenter) *

LEARNING OBJECTIVES

1) Describe the components of an integrated MRI-PET scanner. 2) Describe the potential applications of an MRI-PET scanner.

ABSTRACT

There are many conditions for which both MRI and PET data are required for patient triage and diagnosis. There are several strategies for integrating this information in a single examination. Most recently, an integrated MRI-PET unit has been developed and is commercially implemented. Potential advantages of MRI-PET include time savings for the patient, reduced radiation dose and improved registration of the MRI-PET data. In addition, simultaneous acquisition of MRI and PET data could potentially be used to assess molecular receptors in combination with functional stimuli. This lecture will discuss the current state of the art for MRI-PET scanning, potential applications as well as current limitations of the technique.

MSAS32B • MR Elastography

Richard L Ehman MD (Presenter) *

LEARNING OBJECTIVES

1) Describe in simple terms the technology underlying MR Elastography. 2) Discuss the indications for MR Elastography of the liver. 3) Describe the findings of hepatic fibrosis as observed with MR Elastography.

ABSTRACT

Many diseases markedly affect the mechanical properties of tissues. This accounts for the efficacy of palpation, a centuries-old technique of clinical medicine. MR Elastography (MRE) is an MRI-based technique for quantitatively assessing the mechanical properties of tissue. The most important current application of MRE is for diagnosing hepatic fibrosis. Chronic liver disease is a serious worldwide problem, and hepatic fibrosis is the most important consequence, which if not detected and treated, eventually leads to cirrhosis which is irreversible and associated with high mortality. MRE can be readily implemented on a standard MRI system. The technology is available as an FDA-approved option from several manufacturers of MRI systems. A drum-like **passive** acoustic driver is used to generate vibrations in the abdomen. The resulting mechanical waves are imaged with a special MRI pulse sequence. Imaging time is approximately 15 seconds, using parallel acquisition techniques and is done during suspended respiration. The MRE data are automatically processed by the MRI scanner to generate quantitative images showing the stiffness of the liver and other tissues in the upper abdomen. Multiple published studies have established that MRE is an accurate method for diagnosing hepatic fibrosis. MRE-measured hepatic stiffness increases systematically with fibrosis stage. Importantly, hepatic stiffness is not systematically influenced by the presence of steatosis. For many patients, MRE offers a more comfortable, safer, and less expensive alternative to biopsy for assessment of hepatic fibrosis.

MSAS32C • Silent MR

Frank R Korosec PhD (Presenter) *

LEARNING OBJECTIVES

1) Understand why MRI scanners make sound while scanning. 2) Describe some of the potential benefits of scanning without sound. 3) Identify differences in images acquired with sound-producing versus early-stage silent MR scans.

ABSTRACT

Since MRI was developed, the scanners have made sound while scanning due to activation and de-activation of the magnetic field gradients. As the gradients have become stronger and faster, the sound has become louder. There are a number of implications of the loud scans, including reports of transient hearing loss by patients (which can be ameliorated by providing hearing protection to the patients), patient anxiety, difficulty communicating with the patients, difficulty keeping infants asleep during scans, interference with measurements of brain activity when performing fMRI scans, as well as a host of other inconveniences. Recently, methods have been developed that allow MR scans to be performed without producing sound. Silent MR scanning will be described during this session. A variety of sequences (designed for different applications) will be summarized, and images obtained with these sequences will be compared with images obtained using standard sequences.

Case-based Review of Nuclear Medicine: PET/CT Workshop-Cancers of the Abdomen and Pelvis (In Conjunction with SNMMI) (An Interactive Session)

Tuesday, 10:30 AM - 12:00 PM • S406A



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MSCC32 • AMA PRA Category 1 Credit™:1.5 • ARRT Category A+ Credit:1.5

Director

John A Parker, MD, PhD
Jacqueline C Brunetti, MD

LEARNING OBJECTIVES

1) Demonstrate an understanding of normal distribution of FDG PET in the abdomen and pelvis and possible pitfalls in interpretation of PET/CT scans of the abdomen and pelvis. 2) Understand the variability of FDG PET metabolic activity in specific abdominal and pelvic malignancies and apply this knowledge to optimally utilize this modality for the most efficient and accurate patient care. 3) Understand the current accepted indications of FDG PET/CT in diagnosis, staging and restaging in neoplasms of the abdomen and pelvis.

ABSTRACT

FDG PET/CT has evolved into a routine tool in the diagnosis, staging and restaging of cancer patients. The accuracy and clinical benefit of the technique, however, are dependent on the glycolytic activity of the specific neoplasm, the background activity and the pattern of spread of metastatic disease. As the healthcare system is increasingly stressed by decreasing reimbursements and increasing regulations, it is critical for the Radiologist to have a clear concept of the value of FDG PET/CT for each tumor type. Acting in the role as consultant, the Radiologist can steer the referring physician to the most cost efficient approach that will yield the most beneficial and appropriate treatment choice. This course will present a case-based review of abdominal and pelvic malignancies, highlighting the benefits, pitfalls and best indications for FDG PET/CT in tumors of the hepatic, gastrointestinal, gynecologic and urologic neoplasms.

Essentials of Ultrasound

Tuesday, 10:30 AM - 12:00 PM • S100AB



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MSES32 • AMA PRA Category 1 Credit™:1.5 • ARRT Category A+ Credit:1.5

MSES32A • US Evaluation of the Aorta

Leslie M Scoutt MD (Presenter) *

LEARNING OBJECTIVES

1) Describe the role of ultrasound in screening for abdominal aortic aneurysms. 2) Discuss the role of ultrasound in the follow up of patients s/p endovascular aortic repair (EVAR). 3) Demonstrate examples of other common and uncommon aortic pathology on ultrasound.

ABSTRACT

This lecture is part of the essentials of radiology series and will focus on reviewing the role of ultrasound in screening for abdominal aortic aneurysms and in the follow up of patients who have undergone endovascular aortic repair (EVAR). The ultrasound appearance of endoleaks will be presented and the ultrasound findings in a range of aortic pathology will be discussed including aortic dissection and rupture.

MSES32B • US of Multiple Gestations

Peter M Doubilet MD, PhD (Presenter)

LEARNING OBJECTIVES

1) Understand the limitations of determining pregnancy number (singleton, twin, triplet, etc.) in the early first trimester. 2) Understand how to determine chorionicity and amnionicity of twins. 3) Diagnose twin-twin transfusion syndrome and other complications of multiple gestations.

ABSTRACT

I. Assessment of Fetal Number (Singleton, Twin, ...)

Pregnancy number before 6 weeks gestational age is determined by counting gestational sacs and yolk sacs. After 6 weeks, pregnancy number is determined by counting embryos/fetuses in the uterus. Pregnancy number diagnosed on the initial ultrasound in the early first trimester may change on subsequent scans, due to two phenomena: 'vanishing twin' and 'appearing twin'. II. Measurements:

1. Gestational age (GA) assignment

(i) Initial sonogram: If the two GA's (determined from measurements as per singleton GA determination) are concordant, assign GA as the average of these two values. If the two GA's are discordant, assign GA as the greater of the two values, and consider the possibility that the smaller twin is abnormal.

(ii) On all subsequent sonograms, GA is assigned as the sum of the GA by first sonogram plus the number of intervening weeks

2. Fetal weight estimation and comparison (=24 weeks): Compute an estimated weight and weight percentile for each fetus, and compare the fetal weights by computing the relative weight difference (difference in estimated weights divided by larger twin's estimated weight). Findings suggesting abnormal growth include: either twin's weight is 1. Chorionicity is determined by membrane thickness, number of placentas, and fetal sex concordance/discordance.

2. Amnionity: diamniotic if intertwin membrane seen; monoamniotic if no membrane visible and cords are intermingled IV. Complications

1. preterm delivery

2. low birth weight

3. twin-twin transfusion syndrome (if monochorionic)

4. acardiac twin (if monochorionic)

5. conjoinment

MSSES32C • US of the Gallbladder and Biliary Tract

Helen Bungay MBBCh (Presenter)

LEARNING OBJECTIVES

1) To be familiar with the normal ultrasound appearances of the gall bladder and biliary tract, including normal variants. 2) To know the wide differential of causes of abnormalities of the gall bladder wall. 3) To recognize the variety of appearances of common benign and malignant processes involving the gall bladder and biliary tract, especially adenomyomatosis, polyps and carcinoma. 4) To be able to use specific features to aid in the differential diagnosis of abnormalities of the gall bladder. 5) To have a management strategy for gall bladder polyps. 6) To know the ultrasound appearances of acute cholecystitis and the important signs and complications to look for, including perforation, abscess formation, emphysematous cholecystitis, and Mirizzi's syndrome.

ABSTRACT

Ultrasound remains the first line modality for imaging the gall bladder and biliary tract. It is of utmost importance in guiding the clinician in the investigation of jaundice and obstructive liver function tests. Whilst having limitations in demonstrating some causes of biliary obstruction, the presence or absence, and level of obstruction, of dilated ducts dictates further imaging and management choices. With its high spatial resolution, and real time multiplanar capabilities, ultrasound is ideal for examining the gall bladder. This session will review the multiple causes of abnormalities of the gall bladder wall, and clinical and imaging features useful in the differential diagnosis. The imaging appearances of acute cholecystitis, and especially features of particular clinical import, such as emphysematous change, perforation, abscess and Mirizzi's syndrome, will be reviewed. Patients presenting less acutely with abnormalities of the gall bladder wall can be a diagnostic challenge. The typical features of adenomyomatosis and carcinoma will be examined, together with features aiding the differential diagnosis. Gall bladder polyps are common and a management dilemma. Their significance and a strategy for management will be discussed. Apart from the presence or absence of biliary dilatation, the use of ultrasound in evaluation of the bile ducts is limited, with other modalities, such as magnetic resonance cholangiography and endoscopic retrograde cholangiography, presiding. However, the ducts can actually be well seen in patients of appropriate physique. Changes seen in primary sclerosing cholangitis, cholangiocarcinoma, intrahepatic duct calculi, and some unusual and rarer conditions will be demonstrated.

Quality Improvement: Keeping our Customers Satisfied

Tuesday, 10:30 AM - 12:00 PM • S406B

QA

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MSQI32 • AMA PRA Category 1 Credit™:1.5 • ARRT Category A+ Credit:1.5

Co-Director

Jonathan B Kruskal, MD, PhD *

Co-Director

James V Rawson, MD

Moderator

Jonathan B Kruskal, MD, PhD *

MSQI32A • Creating a Comprehensive Customer Service Program in Radiology

Alex Towbin MD (Presenter) *

LEARNING OBJECTIVES

1) Describe the needs of the different types of customers a radiology department serves. 2) Describe a customer service program that meets the needs of the different customers a radiology department serves. 3) Describe metrics used to evaluate the quality of customer service.

MSQI32B • Achieving Almost Perfect Service Excellence: The Specifics

Ella A Kazerooni MD (Presenter)

MSQI32C • Branding and Marketing Your Imaging Services

Giles W Boland MD (Presenter)

BOOST: Gastrointestinal-Integrated Science and Practice (ISP) Session

Tuesday, 10:30 AM - 12:00 PM • S103AB

RO OI GI

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MSRO32 • AMA PRA Category 1 Credit™:1.5 • ARRT Category A+ Credit:1.5

Co-Director

Fergus V Coakley, MD

Co-Director

Bruce G Haffty, MD

Moderator

Albert C Koong, MD, PhD

Moderator

Thomas Brunner, PhD

MSRO32-01 • Invited Speaker:

Edward Y Kim MD (Presenter)

MSRO32-02 • Does Neoadjuvant Therapy Increase the Risk of Post-operative Complications after Definitive Rectal Cancer Surgery?

Sarah A Milgrom MD (Presenter)

MSRO32-03 • Intensity Modulated Radiation Therapy Is a Reasonable Technique for Cervical or Upper Thoracic Esophageal Carcinoma

Tingting Zhuang (Presenter)

MSRO32-04 • Esophageal Stenosis Following Radiotherapy for Superficial Carcinoma of Esophagus

Gentaro Togasaki (Presenter)

ABSTRACT

Purpose/Objective(s):

To evaluate the frequency of esophageal stenosis after radiotherapy for superficial esophageal carcinoma and its association with patient or treatment related factors.

Materials/Methods:

We retrospectively reviewed 25 patients with superficial esophageal carcinoma treated by radiotherapy with curative intent at Chiba University Hospital between January 2002 and December 2012. The age of the patients ranged from 55 to 85 years old (median age 72 years). There were 23 men and 2 women. All tumors were classified according to the UICC 7th TNM staging system: 5 patients had T1a tumor and 20 patients had T1b tumor. All tumors had squamous

cell carcinoma histology. Location of the lesion were as follows: cervical esophagus in 2 patients, upper thoracic in 3, lower thoracic in 7, lower thoracic in 11, abdominal esophagus in 2. Total dose of radiotherapy ranged from 60 to 66 Gy at daily 2 Gy per fraction. Prior to radiotherapy, 8 patients had received endoscopic submucosal dissection or endoscopic mucosal resection. Six patients were treated with radiotherapy alone, while other 19 patients were treated with concurrent chemotherapy. Upper gastrointestinal endoscopy or esophagography was performed for all patients before treatment and within 3 months after completion of the radiotherapy. Post-treatment esophagographs were reviewed to calculate the stenotic ratio. The calculated stenotic ratio was then classified into the four levels: stenosis level 1, stenotic ratio of 0-25%; 2, 25-50%; 3, 50-75%; 4, 75-100%. Patients with stenosis level 2 and higher or the presence of passage disturbance were deemed to have esophageal stenosis.

Results:

The median follow-up period for surviving patients was 12.3 months (range: 1.7-76.4 months). Twenty patients obtained complete response, while 4 had stable disease and another resulted in disease progression.

Esophageal stenosis occurred in 8 patients (32%), causing passage disturbance in 3 patients. The number and percentage of patients at each stenosis level were as follows: level 1: n = 17 (68%); level 2: n = 5 (20%); level 3: n = 3 (12%); level 4: n = 0 (0%). The occurrence of grade 3-4 acute esophagitis during treatment were significantly associated with the frequency of esophageal stenosis (p=0.024). Tumor location, stage, preceding endoscopic surgery, use of chemotherapy, radiotherapy dose, and treatment response were not associated with the frequency of stenosis.

Conclusions:

Significant proportion of patients experience esophageal stenosis after radiotherapy for superficial esophageal carcinoma. The occurrence of grade 3-4 acute esophagitis during treatment may predict post-treatment esophageal stenosis.

MSRO32-05 • Impact of Medications to Control Inflammation, Cholesterol and Blood Sugar on Survival in Esophageal Cancer Patients

Nicholas Figura BS (Presenter)

MSRO32-06 • The Role of Proton Therapy in Postoperative Radiotherapy for Gastric Cancer: A Dosimetric Analysis

Nicholas Lukens (Presenter)

MSRO32-07 • Assessing Effectiveness of Proton Stereotactic Radiotherapy (PSRT) for Liver Metastasis with MRI

Surabhi Bajpai MBBS, DMRD (Presenter) ; Sheela Agarwal MD, MS ; Theodore S Hong MD ; Andrew X Zhu MD, PhD ; Dushyant V Sahani MD

PURPOSE

We investigated the imaging manifestations and treatment effect in liver metastasis following Proton Stereotactic Radiotherapy (PSRT).

METHOD AND MATERIALS

In this ongoing study, 17 patients (10M: 7F, mean-66 yrs) with liver limited metastasis (CRC-9, gastric-1, pancreatic-4, neuroendocrine-2) treated with PSRT were included. The patients underwent CE-MRI (Magnevist, n=12; Eovist, n=22) at baseline and 4-8 weeks after treatment. MR images (n=34) at baseline and after PSRT were evaluated for size on post contrast T1 images, signal on T1, T2 and DWI and enhancement characteristics on post contrast images. Treatment response was classified as local response according to RECIST criteria and long term outcome based on development of new hepatic metastases and extrahepatic disease.

RESULTS

Seventeen patients with 31 metastatic lesions (solitary, n=12, multiple, n=5 and size-2.6±1.8cm) were included in the final analysis. Out of 17 patients, 12 (70.5%) demonstrated local treatment response (Pre- 2.83 ±2.1cm, post: 1.8±1.7cm, p

CONCLUSION

MR is an accurate method for monitoring treatment response to proton beam radiation in patients with metastatic liver disease.

CLINICAL RELEVANCE/APPLICATION

CE-MRI is often a preferred modality for pre and post treatment evaluation and therefore it is essential to familiarize with the expected and unexpected MR features following PSRT.

MSRO32-08 • Retreatment of Hepatic Malignancies with Yttrium-90 Resin Microspheres

Jim Zhong (Presenter) ; Tony J Wang MD ; David Horowitz MD

ABSTRACT

Purpose/Objectives: The use of yttrium-90 resin microspheres in hepatic radioembolization (RE) is well established in the management of primary and metastatic malignancies of the liver. However, few data have been reported on the safety and efficacy of retreatment with yttrium-90 RE. We present data on patients treated with multiple courses of RE.

Materials/Methods: Using an institutional review board approved protocol, all patients treated with multiple courses of yttrium-90 RE from 2009-2012 for primary or metastatic malignancies of the liver were reviewed retrospectively. Baseline demographic, laboratory and pathologic information were recorded, as well as dosimetric factors related to all courses of RE. Acute treatment toxicity was recorded using common terminology criteria for adverse events (CTCAE), version 4.0. Response to treatment was measured using RECIST criteria. Overall and progression-free survival were calculated using the method of Kaplan and Meier. Statistical analyses were conducted with SPSS, version 20.

Results: 70 patients were treated with RE and were evaluated for inclusion. With a median follow up of 17 months (range 3-22 months), 8 patients, all male, were treated with multiple courses of yttrium-90 RE. 6 patients (75%) were treated with 2 courses of RE, and 2 patients (25%) were treated with 3 courses of RE, a total of 18 courses of RE and 10 retreatments. Median patient age was 62 years (range 33-78). 4 patients (50%) had hepatocellular carcinoma, and 4 patients (50%) had metastatic liver tumors. 7 patients (87.5%) were Child-Pugh class A and 1 was class B. 7 patients (87.5%) had disease that was limited to the liver. 6 patients (75%) had tumors associated with portal vein thrombosis. Mean time between first and second RE was 3.5 months (range 1-17 months). Cumulative median total liver dose was 58.37 Gy (range 28.93-80.71 Gy), and cumulative median total lung dose was 5.22 Gy (range 1.82-17.2 Gy). One patient had grade 3 gastrointestinal toxicity after a second course of RE; no grade 4 or greater toxicity was seen. For all repeat treatments with RE, analysis with RECIST criteria showed partial responses in seven retreatments (70%). For patients receiving first retreatment, analysis with RECIST criteria showed five patients (62.5%) with partial responses, one patient (12.5%) with stable disease and two patients (25%) with progressive disease. Two patients had a third RE course and both showed partial responses (100%). Median overall survival from date of first RE was 17 months (95% CI = 11.87-22.13). From time of second RE, median progression free survival was 10.5 months (95% CI = 0.96-19.97) and median overall survival was 10.7 months (95% CI not calculable). Conclusion: For selected patients, retreatment with yttrium-90 RE for primary and metastatic liver malignancies can be performed with acceptable acute toxicity, with high rates of radiographic response.

MSRO32-09 • CT Guided Fiducial Placement for Targeted Image Guided Radiation Therapy in Hepatic Malignancies

Avinash R Kambadakone MD, FRCR (Presenter) ; Selim R Butros MD ; Theodore S Hong MD ; Debra A Gervais MD * ; Ronald S Arellano MD

PURPOSE

The purpose of our study was to evaluate the safety and efficacy of CT guided fiducial placement for targeted image guided stereotactic radiation therapy in hepatic malignancies.

METHOD AND MATERIALS

In this retrospective study, we included 108 patients (73M: 35 F, mean age 70 yrs, age range-30-94 yrs) who underwent image guided fiducial placement prior to image guided stereotactic radiation therapy. The fiducial placement was performed under CT guidance with the 'push' technique and with conscious sedation. The fiducial location was determined based on anatomic location of the tumor. The electronic medical records and the imaging studies in these patients were retrospectively evaluated to record the indications for fiducial placement, CT technique, procedure details and complications. The technical success rate and impact of the fiducial placement on treatment planning was evaluated.

RESULTS

A total of 215 fiducials were placed around 124 hepatic tumors in 108 patients under CT guidance. The technical success rate was 98% for placement of liver fiducials. The co-axial push CT technique performed with 19 gauge Chiba needle provided optimal results. The procedure related complications were seen in 6/108 patients (5.5%) which included hematoma, pseudoaneurysm and fiducial migration. The fiducial location around the tumor combined with surrounding anatomic landmarks in the liver were successfully used for stereotactic radiation treatment planning.

CONCLUSION

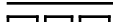
CT guided fiducial placement is a safe and effective technique with low complication rate for tumor bracketing of hepatic malignancies for performance of image guided stereotactic radiation therapy.

CLINICAL RELEVANCE/APPLICATION

With the increasing use of targeted radiation therapies for treatment of hepatic malignancies, CT guided fiducial placement is a safe and effective for treatment localization.

BOOST: Breast-Integrated Science and Practice (ISP) Session

Tuesday, 10:30 AM - 12:00 PM • S103CD



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MSRO35 • AMA PRA Category 1 Credit™: 1.5 • ARRT Category A+ Credit: 1.5

Co-Director

Fergus V Coakley, MD

Co-Director

Bruce G Haffty, MD

Moderator

Katherine L Griem, MD *

Moderator

Anna Shapiro, MD

MSRO35-01 • Invited Speaker:

Steven J Chmura MD, PhD (Presenter)

MSRO35-02 • Volume-based Parameters of 18F-fluorodeoxyglucose Positron Emission Tomography/Computed Tomography Improve Disease Recurrence Prediction in Postmastectomy Breast Cancer Patients with 1 to 3 Positive Axillary Lymph Nodes without Adjuvant Radiotherapy

Naomi Nakajima (Presenter); Masaaki Kataoka MD; Takashi Ochi MD; Yoshifumi Sugawara MD; Masao Miyagawa MD, PhD; Teruhito Mochizuki MD

PURPOSE

The indication for postmastectomy radiotherapy (PMRT) in patients with 1 to 3 positive axillary nodes have been controversial. In the current study, we focused our study on volume-based parameters of pretreatment 18F-fluorodeoxyglucose positron emission tomography/computed tomography (FDG-PET/CT), with the aim of investigating a measurement that could help identify high-risk populations for recurrence in breast cancer patients treated with mastectomy without adjuvant radiotherapy.

METHOD AND MATERIALS

We retrospectively analyzed 88 patients with 1-3 positive axillary nodes after modified mastectomy, who were studied with FDG-PET/CT within 30 days before surgery. We evaluated the relationship between PET parameters including the maximum standardized uptake value (SUVmax), metabolic tumor volume (MTV) and total lesion glycolysis (TLG) and clinical outcomes.

RESULTS

CONCLUSION

Volume-based parameters on pretreatment FDG-PET/CT improve recurrence prediction in postmastectomy breast cancer patients with 1-3 positive nodes. The addition of MTV to ER status or TN could identify a subgroup of patients at higher risk for recurrence.

CLINICAL RELEVANCE/APPLICATION

Patients with high pretreatment MTV or TLG values should be monitored closely or considered for more aggressive treatments including adjuvant radiotherapy or systemic therapy.

MSRO35-03 • Axillary Lymph Node Dose with Whole Breast Radiation Using 3D Conformal and Intensity-modulated Radiation Therapy

Matthew Janko BS (Presenter); Shirin Sioshansi MD; Patrick J Bonavitaola; Paul S Rava MD, PhD; Thomas J Fitzgerald MD

PURPOSE

Intensity-modulated radiotherapy (IMRT) for whole breast irradiation has been shown to decrease acute radiodermatitis in the axilla. Although beneficial from a toxicity perspective this raises the concern of less incidental radiation to the axilla. As the extent of axillary surgery decreases, the radiation dose and distribution within the axilla become increasingly important. Here, we report a dosimetric comparison of incidental dose delivered to axillary level I-III lymph node volumes using CT-based three-dimensional conformal radiation therapy (3DCRT) and hybrid intensity-modulated radiation therapy (IMRT) techniques.

METHOD AND MATERIALS

58 women treated with whole breast irradiation (WBI) at our institution in 2011-2012 were identified. Patients with bilateral disease, regional nodal disease, or deliberate targeting of the axilla were excluded. All patients underwent CT-based planning. Breast tissue and tumor bed contouring was performed on all patients at the discretion of the treating radiation oncologist and treatment planning was performed to encompass the entire breast parenchyma. Axillary lymph node (ALN) level I, II and III volumes were retrospectively contoured according to the RTOG contouring atlas. The mean dose as well as the volume of each level receiving 50% (V50%), 90% (V90%) and 95% (V95%) of the prescription dose were calculated from treatment plans. Independent samples t-tests and univariate analyses were used to compare baseline characteristics and observed incidental doses.

RESULTS

Mean volumes of breasts, tumor beds and axillary levels did not differ significantly between WBI techniques. Mean doses to the ipsilateral breast, tumor beds and ALN levels I, II and III were similar between WBI techniques. No significant difference was seen in V50%, V90% and V95% for the same levels.

CONCLUSION

We report essentially identical incidental dose to axillary levels I, II and III using IMRT and 3DCRT for standard tangential whole breast irradiation.

CLINICAL RELEVANCE/APPLICATION

WBI with IMRT results in less acute desquamation and better quality of life. In the era of less axillary surgery, our results are reassuring that IMRT does not give less incidental dose than 3DCRT.

MSRO35-04 • Patterns of Care in Ductal Carcinoma in Situ of the Breast: An Institutional Practice Quality Improvement Initiative

Parima Daroui MD, PhD (Presenter); Jeffrey V Kuo MD; Nilam S Ramsinghani MD

ABSTRACT

Purpose/Objective(s):

Mastectomy has historically been the standard treatment for Ductal carcinoma in situ (DCIS) of the breast with excellent local control. However to spare patients from possible overtreatment and the morbidity of radical surgery, the treatment paradigm has shifted to an increased use of breast conserving surgery (BCS). In addition, several large randomized trials have demonstrated that the addition of adjuvant radiation treatment (RT) after BCS reduces breast recurrences by 50% to 60%, comparable to results with mastectomy. Although the role of RT in DCIS is strongly supported by randomized data, there are also data that support the possible omission of adjuvant RT in certain low risk subgroups, in attempts to further optimize the risk-benefit ratio in patients with DCIS. The purpose of our study is to determine the pattern of care and utilization of BCS+RT in patients with DCIS treated at our institution, as a quality of care improvement initiative.

Materials/Methods:

A retrospective analysis of data from patients with a first diagnosis of DCIS of the breast from 2008-2010 was performed. Predictors for the use of RT, in addition to the relative frequencies of mastectomy, BCS, and BCS+RT were evaluated to determine the pattern of care for DCIS at our institution in the specified interval.

Results:

A total of 37 patients with DCIS were treated for their disease. Of these patients 78% (n=29) received BCS, and 22% (n=8) received mastectomy as initial treatment. Of the 29 patients receiving BCS, 8 patients received mastectomy after BCS for persistent positive margins. Of the remaining 21 patients receiving BCS, nearly all patients (n=20) were given adjuvant RT after BCS, with the exception of one patient who refused RT. Among the patients who received mastectomy as an initial treatment (n=8), the choice of mastectomy as primary surgery was based on the presence of extensive or multifocal disease in 50% (n=4), patient choice in 25% (n=2) and was unknown in 25% (n=2). In addition, of the 8 patients undergoing mastectomy, 2 patients had residual close margins and one of the two was offered RT after mastectomy.

Conclusions:

In contrast to published data that report an under-utilization of RT after BCS in patients with DCIS, utilization of BCS+RT in patients treated at our institution was within the expectation of current standard of care. The majority of patients with DCIS had BCS as their initial surgical treatment (75%, n=29), and mastectomy was only used as a primary modality in patients with extensive disease, or based on patient preference. Of patients eligible for RT after BCS (n=21), nearly all (n=20) completed RT as per current standard of care guidelines. The implementation of practice quality improvement initiatives such as this can be helpful to gauge practice patterns and identify areas of variance from evidence-based guidelines.

MSRO35-05 • Assessment of Lung Dose during Breast-respiratory-Gated Irradiation Using a 4-dimensional Breast Phantom Moving to Simulate Respiratory Motion

Shimizu Arisa (Presenter); Toshie Horibe; Yukihiko Oshima; Toshiki Kawamura; Masaru Nakamura; Tsuneo Ishiguchi MD

ABSTRACT

Purpose/Objective(s):

In standard radiotherapy after breast-conserving therapy, a portion of the lung is included in the irradiation field due to

shifting of the thorax from respiratory motion, and may be a cause of radiation pneumonitis post-therapy. To reduce the lung dose, using a 4-dimensional breast phantom simulating respiratory motion the lung dose was compared between the presence and absence of irradiation during respiratory gating.

Materials/Methods:

Phantoms resembling breast and lung tissues were prepared, and a 4-dimensional breast phantom was prepared by placing the breast phantom on the lung phantom and moving it up and down to simulate respiratory motion. The breast and lung phantoms were divided into two from top to bottom, and a film to assess the radiation dose was interposed between them. Then, the irradiation field margin was set on the lung portion 5mm from the breast lower margin, and irradiation administered with 4MV LINAC (Mitsubishi EXL-15DP). Irradiation was administered while the respiratory motion of the phantom was stopped during the expiratory phase (irradiation during expiratory phase breath-holding), while the respiratory motion of the phantom was continuous (irradiation during spontaneous respiration), or only in the expiratory phase while the respiratory motion of the phantom was continuous (irradiation during respiratory gating). After irradiation, the films were scanned, and using analytical software the respective lung doses were determined.

Results:

Lung dose increased in the order of expiratory phase breath-holding irradiation, irradiation during respiratory gating, and irradiation during spontaneous respiration. In the comparison of expiratory phase breath-holding and spontaneous respiration, lung dose was lower during the former ($p=0.001$), while in that of irradiation during respiratory gating and spontaneous respiration, it was lower with respiratory-gating ($p=0.024$). No significant difference was noted in lung dose between expiratory phase breath-holding and respiratory-gating ($p=0.38$).

Conclusions:

In standard radiotherapy of breast-conserving therapy, irradiation during respiratory gating as compared to irradiation during spontaneous respiration significantly reduced the lung dose, and so may help to prevent the occurrence of radiation pneumonitis when clinically applied.

MSRO35-06 • Comparison of the Volume and Localization of Lumpectomy Cavity Delineated by Clips and Seroma Based on 4DCT Scan for External-beam Partial Breast Irradiation after Breast Conserving Surgery Yun Ding (Presenter)

MSRO35-07 • Breast Conserving Treatment: External Beam or Intraoperative Boost? A Matched Pair Analysis

Elena Sperk (Presenter) ; Daniela Astor ; Grit Welzel ; Axel Gerhardt MD ; Marc Sutterlin MD ; Frederik Wenz *

ABSTRACT

Purpose/Objective(s): In the context of breast conserving treatment, radiotherapy leads to a better overall survival and in addition to whole breast radiotherapy (WBRT) a boost to the tumor bed leads to a better local control. The tumor bed boost is usually added after WBRT or can be done intraoperatively (IORT). Positive effects, an antitumoral effect and modulation of microenvironment after IORT with 50kV x-rays were already described by Belletti et al. (Clin Cancer Res., 2008). During the San Antonio Breast Cancer Symposium data from the randomized TARGIT A trial were presented (n = >3400 patients) showing a trend towards a better overall survival in patients treated with IORT immediately after tumor removal. For this report a matched pair analysis was performed to investigate the impact of IORT boost on overall survival compared to standard external beam boost.

Materials/Methods: In general 370 patients were treated for breast cancer with WBRT + boost (external beam (EBRT) boost n = 146, IORT boost n = 224) between the year 2002 to 2009. A matched pair analysis (1:1 propensity score matching for age, TNM, grading, hormonal treatment and chemotherapy) for overall survival and local recurrence free survival could be done for 53 pairs. All patients underwent breast conserving surgery and WBRT with 46-50Gy. 53 patients received an EBRT boost with 16Gy (2Gy/fraction, dedicated linear accelerator) and 53 patients received an IORT boost with 20Gy (INTRABEAM system, 50kV x-rays). Median follow-up was 6 months (range, 1-77 months) for the EBRT boost patients and 56 months (range, 2-97 months) for IORT boost patients. Kaplan Meier estimates were performed for overall survival and local recurrence free survival.

Results: Due to a special follow-up program for IORT boost patients, the IORT group had a longer follow-up than the EBRT boost patients. Despite the difference in follow-up times, there was a strong trend towards better overall survival after IORT boost (90.2% vs. 62.3%, $p = 0.375$) in our cohort. One local recurrence was present in each group (EBRT boost after 15 months, local recurrence free survival 95%; IORT boost after 12 months, local recurrence free survival 98.1%).

Conclusion: IORT given as a boost seems to have a positive impact on overall survival in breast cancer patients after breast conserving surgery. To identify such an effect a prospective randomized trial should be conducted. Secondly, a good local control can be achieved by applying a boost after breast conserving surgery.

MSRO35-08 • Clinical Research of 3D-CRT Accelerated Partial-breast Irradiation (APBI) for the Selected Chinese Patients with Early-stage Breast Cancer after Breast-conserving Surgery

Min Xu (Presenter)

ABSTRACT

Purpose/Objective(s): To explore the feasibility, efficacy and cosmetic effect of three-dimensional conformal external (3D-CRT) beam partial breast irradiation after breast-conserving surgery for the selected Chinese patients with early-stage breast cancer.

Materials/Methods: From June 2003 to December 2010, Forty four Chinese patients with early-stage breast cancer undertaken three-dimensional conformal external beam partial breast irradiation (EB-PBI) after breast-conserving surgery in Shandong Cancer Hospital. Twenty patients undertaken computed tomography (CT) simulation scan in the state of moderate deep inspiration breathing hold (mDIBH) assisted by active breathing control (ABC) system, and twenty-four patients received CT simulation scan during free breathing (FB). The surgical cavity marked by silver clips was defined and delineated as gross tumor volume (GTV), and planning target volume (PTV) was defined as the area encompassed GTV with extended margin of 15 mm for the patients treated in the state of mDIBH or 20 mm for the patients treated in the state of FB. EB-PBI was planned and carried out by 3D-CRT with four non-coplanar fields powered by 6 MV X-ray, the total prescribed dosage was 34 Gy delivered in 3.4 Gy per fractions in thirty nine patients and 38.5Gy delivered in 3.85 Gy per fractions in five patients, twice per day at intervals of at least six hours, in five consecutive days.

Results: All patients was followed up for nine to ninety four months with a median follow-up of fifty four months. Grade 1 of acute radiation-induced dermatitis was observed in 38.6% (17/44) of all the patients. No equal or more than grade 2 of radiation-induced dermatitis was observed, and no any grade of acute radiation-induced pneumonitis was observed. Cosmesis scored basing on Harris criteria was good or excellent in all cases at the time of six months after radiotherapy and in 94.9% cases at the time of two years after radiotherapy. The 2-, 3- and 5-year local control rates were 100% (39/39), 98.8% (30/31) and 93.8% (15/16), respectively. The 2-, 3-, and 5-year survival rates were all 100% and no metastases occurred.

Conclusions: EB-PBI delivered by 3DCRT is feasible for the selected Chinese patients with early stage breast cancer after breast-conserving surgery, satisfactory cosmetic effect, local control rate and long-term survival rate are obtained, meanwhile, acute radiation response rate is lower

MSRO35-09 • Variability in Delineation of the Whole Breast Target Volume by Different Methods after Breast-conserving Surgery Min Xu (Presenter)

Process Engineering to Optimize Work Flow Processes in Radiology: A Case Study Approach (Sponsored by the Associated Sciences Consortium) (An Interactive Session)

Tuesday, 01:30 PM - 03:00 PM • S105AB



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MSAS33 • AMA PRA Category 1 Credit™:1.5 • ARRT Category A+ Credit:1.5

Moderator
William A Undie, PhD, RT

MSAS33A • Improving Patient Experience Through Technology

Carolyn C Meltzer MD (Presenter) * ; Habib Tannir MS (Presenter)

LEARNING OBJECTIVES

1) How to produce patient education videos. 2) How to deploy them in a patient care setting. 3) How to measure the impact on patient satisfaction.

MSAS33B • Designing a New Imaging Center: The Production Preparation Process (3P) - An Innovative Lean Approach

Kristina R Givens BS (Presenter)

LEARNING OBJECTIVES

1) Gain an understanding of the Production Preparation Process, its basic elements and tools. 2) Explore a successful Imaging Center Case Study. 3) Review the benefits, challenges and lessons learned by LandM.

ABSTRACT

The focus of this session will be on the successful design of Lawrence and Memorial Hospital's new Imaging Center. Given the massive capital investment required in healthcare facility construction, hospitals must develop innovative approaches to contain costs while also maintaining organizational and project goals. Over the next 5 years LandM Hospital is embarking on a number of strategic initiatives that are geared toward growth, updating the physical plant, improving our inpatient/outpatient care models, implementing electronic health records, and preserving the overall financial health of the organization. Many of these initiatives require the re-design of existing facilities or the building of new facilities. While the need for capital increases, access to capital continues to become more of a challenge. In order for LandM to achieve its strategic goals within planned timelines and budgets, the hospital has integrated the Production Preparation Process (3P) into the design phase of new and renovation facility projects. The 3P methodology incorporates Lean principles and demands interdepartmental collaboration and transparency at the earliest stages of the design phase. The focus is on rapidly designing or retrofitting facilities, services, and care models that support, and are not in contradiction with, Lean concepts of efficiency, optimal flow, and waste reduction. The overall goal is to implement a high-quality design process that is scalable in size and scope, while ensuring project managers meet timeline requirements at the lowest possible cost. Our key objectives are to create an ideal patient experience, integrate best-practice standards in process and clinical care, maximize space utilization to accommodate current and future volumes, and gain efficiencies in the 7 flows of medicine.

Case-based Review of Nuclear Medicine: PET/CT Workshop-Lymphoma/Melanoma/Sarcoma (In Conjunction with SNMMI) (An Interactive Session)

Tuesday, 01:30 PM - 03:00 PM • S406A



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MSCC33 • AMA PRA Category 1 Credit™:1.5 • ARRT Category A+ Credit:1.5

Director

John A Parker, MD, PhD
Heather Jacene, MD

LEARNING OBJECTIVES

1) To understand the role of PET/CT in the management of patients with lymphoma, melanoma and sarcoma.

Essentials of Pediatric Imaging

Tuesday, 01:30 PM - 03:00 PM • S100AB



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MSES33 • AMA PRA Category 1 Credit™:1.5 • ARRT Category A+ Credit:1.5

MSES33A • Pediatric Airway Emergencies

Jonathan O Swanson MD (Presenter)

LEARNING OBJECTIVES

1) Identify the radiographic appearance of common causes of stridor and wheezing in the pediatric population. 2) List common radiographic approaches to evaluate pediatric foreign body aspiration. 3) Define radiographic-apparent causes of chest pain in the pediatric population.

MSES33B • Imaging of Osteomyelitis in Children

Diego Jaramillo MD, MPH (Presenter)

LEARNING OBJECTIVES

1) Recognize that there have been epidemiological changes with significant implications for imaging of musculoskeletal infections in children, particularly with Staphylococcal infections increasingly presenting with subperiosteal and soft tissue abscesses, multifocal disease and deep venous thrombosis. 2) Recognize the imaging findings in pediatric osteomyelitis and the important differential diagnostic considerations. 3) Be aware of the contribution of the different imaging modalities in the evaluation of pediatric musculoskeletal infections. 4) Be familiar with imaging algorithms for the different types and scenarios of children with musculoskeletal infections.

ABSTRACT

Acute hematogenous osteomyelitis is the most common musculoskeletal infection in children. More than half of osteomyelitis affect children below five years of age with 70% involvement of the lower extremities. During the past few years, the incidence of methicillin-resistant Staphylococcus aureus (MRSA) has increased and now accounts for nearly 30% of the cases in children. Multifocal infections, subperiosteal and soft tissue abscess, and deep venous thrombosis are now very prevalent. Hematogenous osteomyelitis usually arises in the metaphysis of long bones or the metaphyseal equivalents of the flat and round bones. Metaphyseal-equivalents are areas adjacent to cartilage that have similar vascularity to that of the metaphyses of long bones. Plain radiographs are primarily used to exclude other pathologies. Ultrasound is important in the detection of subperiosteal and soft tissue abscess. MRI has become the predominant modality for evaluation of osteomyelitis. Gadolinium-enhanced imaging is important in the evaluation of spinal osteomyelitis to exclude epidural and paraspinal collections, in pelvic osteomyelitis to diagnose the abscesses which are prevalent in this infection, and in epiphyseal cartilage infections which may only be visible after contrast administration. Otherwise, contrast material is mainly helpful in increasing the confidence of a diagnosis of a drainable collection. CT scanning is not used routinely but may help in complex cases of chronic osteomyelitis. PET/CT is useful in determining whether a chronic infection is active. The role of bone scintigraphy has declined as evaluation of extra-skeletal findings has become more important, but it is still useful in younger children where the focus of infection is not clinically localizable and in patients who cannot be sedated for MRI.

MSES33C • Cardiac CT in Children Beyond the Coronaries: Why, How, and When?

Catherine M Owens MD (Presenter)

LEARNING OBJECTIVES

1) To understand the role of Cardiac CT in children, with particular emphasis on the conditions where CT has a synergistic role e.g. when there is important associated tracheobronchial and pulmonary parenchymal pathology. 2) To illustrate specific conditions where CT has a major role in diagnosis and follow up. 3) To describe the techniques for acquisition of cardiothoracic CT images which are 'fit for purpose' and acquired at low radiation dose. 4) To discuss the various types of acquisition and compare image quality versus effective radiation dose.

ABSTRACT

Quality Improvement: Strategies for Improving Patient Safety: Root Cause Analysis

Tuesday, 01:30 PM - 03:00 PM • S406B



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MSQI33 • AMA PRA Category 1 Credit™:1.5 • ARRT Category A+ Credit:1.5

Co-Director

Jonathan B Kruskal, MD, PhD *

Co-Director

James V Rawson, MD

Moderator

James V Rawson, MD

LEARNING OBJECTIVES

1) Understand the role of the root cause analysis in process improvement. 2) Learn techniques to improve patient safety.

MSQI33A • Root Cause Analysis - Getting to the Root(s) of Your Problem

Sumir S Patel MD (Presenter)

LEARNING OBJECTIVES

View learning objectives under main course title.

MSQI33B • A Mock Root Cause Analysis

James V Rawson MD (Presenter) ; **Sumir S Patel** MD (Presenter) ; **Norman B Thomson** MD (Presenter) ; **Layne Mitchell** RT (Presenter)

LEARNING OBJECTIVES

View learning objectives under main course title.

MSQI33C • Using Lessons Learned to Improve Patient Safety

Norman B Thomson MD (Presenter) ; **Layne Mitchell** RT (Presenter)

LEARNING OBJECTIVES

View learning objectives under main course title.

BOOST: Gastrointestinal-Case-based Review (An Interactive Session)

Tuesday, 03:00 PM - 04:15 PM • S103AB

RO **OI** **GI**

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MSR033 •AMA PRA Category 1 Credit™:1.25 •ARRT Category A+ Credit:1.5

Co-Director

Fergus V Coakley , MD

Co-Director

Bruce G Haffty , MD

Theodore S Hong , MD

Lawrence Blaszekowsky , MD

LEARNING OBJECTIVES

1) Understand critical clinical issues that govern therapy of tumors in the anorectal region. 2) Understand how imaging techniques, including MRI, PET-CT and CT, provide useful information for deciding therapy of anorectal tumors. 3) Identify common sites of recurrence for anorectal tumors and recognize the imaging appearances of these recurrences.

BOOST: Breast-Case-based Review (An Interactive Session)

Tuesday, 03:00 PM - 04:15 PM • S103CD

RO **OI** **BR**

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MSR036 •AMA PRA Category 1 Credit™:1.25 •ARRT Category A+ Credit:1.5

Co-Director

Fergus V Coakley , MD

Co-Director

Bruce G Haffty , MD

Moderator

Bruce G Haffty , MD

Sharad Goyal , MD

Liane E Philpotts , MD *

Brigid Killelea , MD

LEARNING OBJECTIVES

1) To present diagnostic imaging, radiation oncology and surgical issues in the workup and selection of breast cancer patients being considered for breast cancer treatment, focusing on nodal management issues. 2) To understand the surgical approach in the primary and neoadjuvant setting in patients being considered for sentinel node biopsy or axillary dissection, and how this affects the radiotherapy approach. 3) To improve knowledge and understanding of appropriate imaging evaluation of the regional lymphatics in these various clinical scenarios. 4) To apply these principles in the surgical, imaging, and radiotherapeutic management of several practical cases of patients being considered for breast cancer treatment, focusing on the regional nodal evaluation and management.

ABSTRACT

Regional nodal evaluation and management is undergoing rapid change due to implementation of neoadjuvant systemic therapy and sentinel node sampling, and evolving evidence regarding the benefit of regional nodal irradiation. There remain controversies regarding the appropriate management of patients, imaging issues, surgical issues and radiotherapeutic approach in the evaluation and management of the regional lymphatics, both in the primary treatment of breast cancer, in the neoadjuvant therapy setting, and in the setting of local-regional recurrence. In this panel a surgeon, diagnostic radiologist and radiation oncologist will discuss several cases being considered for regional nodal evaluation and management. Appropriate workup, surgical approach and radiation approach for each case will be discussed. The panelists will present the most recent information on controversies in the surgery, diagnostic imaging and radiation therapy in managing the regional lymphatics in patients with breast cancer.

Social Media and Medical Imaging Management: What You Do Not Know Can Destroy Your Practice (Sponsored by the Associated Sciences Consortium) (An Interactive Session)

Tuesday, 03:30 PM - 05:00 PM • S105AB

IN **GN**

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MSAS34 •AMA PRA Category 1 Credit™:1.5 •ARRT Category A+ Credit:1.5

Moderator

Cindy R Comeau , BS, RT

Abraham Seidmann , PhD

LEARNING OBJECTIVES

Participants at this session will learn several cutting-edge analytical techniques for leveraging Social Media as an effective tool for monitoring the performance of their medical imaging facility. We are going to discuss the best use of ♦social networks♦, ♦professional networks♦, and mobile applications in that context. The session will also teach several effective strategies for promoting the medical imaging services in an increasingly competitive market place.

ABSTRACT

♦ Today, a single customer complaint from someone with highly connected social influence, can have more impact on your practice reputation than your best marketing efforts all combined. ♦ Given the rapid rise in the business impact of Social Media, we are going to discuss how effective social strategies improve off-line social failures for individuals and how in return ask these individuals to perform tasks that are beneficial to the service company. To understand what makes for an effective social strategy, we are going to examine a number of unsuccessful and successful ways of engaging users in medically related applications. Special attention will be given to the emerging role of social media in the medical imaging market place.

Case-based Review of Nuclear Medicine: PET/CT Workshop-Cancers of the Thorax (In Conjunction with SNMMI) (An Interactive Session)

Tuesday, 03:30 PM - 05:00 PM • S406A

OI **NM** **CT** **CH**

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MSCC34 •AMA PRA Category 1 Credit™:1.5 •ARRT Category A+ Credit:1.5

Director

John A Parker , MD, PhD

Terence Z Wong , MD, PhD *

LEARNING OBJECTIVES

1) Understand the role that PET/CT can play in managing thoracic malignancies. 2) Describe the major pitfalls in interpreting thoracic PET/CT. 3) Discuss strategies for maximizing diagnostic accuracy in evaluating thoracic malignancy.

ABSTRACT

FDG-PET/CT has proven diagnostic value for evaluating primary malignancy and metastatic disease within the thorax, and can have a significant impact on patient management. Malignancies that are frequently evaluated in the thorax include primary lung cancer, esophageal cancer, lymphoma, and pleural disease.

Interpretation of thoracic FDG-PET/CT scans may be complicated by the presence of benign conditions that can have high metabolic activity simulating malignancy; examples include "brown fat", sarcoidosis, granulomatous disease, post-therapeutic changes, infection, and reactive inflammation. On the other hand, some malignant disease may exhibit only modest FDG accumulation; factors include tumor histology, partial volume averaging effects, and respiratory motion. Hence, factors other than intensity of FDG uptake are often essential to distinguish benign from malignant disease. Patient history and details of prior therapy are important. Additional helpful information includes patient history, lesion distribution and symmetry, and CT imaging characteristics of the lesions. Using a case-based approach, examples of FDG-PET/CT imaging will be presented for evaluating a variety of thoracic malignancies. The approach to interpretation and strategies for distinguishing malignant from benign processes will be highlighted.

Essentials of Trauma Imaging

Tuesday, 03:30 PM - 05:00 PM • S100AB

ER **CT** **GU** **GI**

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MSES34 • AMA PRA Category 1 Credit™:1.5 • ARRT Category A+ Credit:1.5

MSES34A • MDCT Techniques in Trauma Imaging

Stephan W Anderson MD (Presenter)

LEARNING OBJECTIVES

1) To discuss the appropriate use of oral and intravenous contrast in trauma imaging using CT. 2) To discuss the applications of multi-phasic imaging in trauma using CT. 3) To delineate methods to limit radiation in trauma imaging with MDCT. 4) To illustrate relevant imaging findings for a range of clinically relevant traumatic injuries using MDCT.

MSES34B • Liver, Spleen, and GU Trauma

Brian C Lucey MBBCh (Presenter)

LEARNING OBJECTIVES

1) The findings of liver, spleen and GU trauma will be described. These are mostly widely known and appreciated. 2) The importance of direct vascular injury in these organs will be shown. 3) Injury resulting in potential mortality versus potential morbidity will be addressed. 4) The value of specific imaging technique on identifying and characterizing injury to these organs will be discussed. 5) The limitations of conventional grading systems in these organs will be exposed. 6) A proposed management algorithm for each organ will be described based upon the severity of the injury.

ABSTRACT

Blunt abdominal trauma is all too common and frequently results in significant morbidity, and in many cases, mortality. Early recognition of injury with potential to result in death is preferable. Imaging that may predict significant morbidity is also useful to enable prompt early treatment to limit morbidity. Conventional grading systems for abdominal organ injury, although useful in their day, are now outdated and do not take into account the progress made in imaging since these systems were devised. Injury to vessels resulting in prolonged bleeding is the cause of mortality and this may be established with dedicated vascular imaging now available and we no longer rely on the size of laceration to predict outcome even in the solid parenchymal organs of the abdomen. Morbidity may also be predicted based on imaging and early treatment instituted where appropriate. The purpose of this talk will be to outline the imaging techniques required to optimize injury detection and characterization, classify injuries according to modern imaging techniques and put forward an proposed management plan for all types of injury to the liver, spleen and GU tract.

MSES34C • Bowel, Mesentery, and Pancreatic Trauma

Jorge A Soto MD (Presenter) *

LEARNING OBJECTIVES

1) Review CT findings associated with bowel, mesenteric and pancreatic trauma. 2) Explain concepts of CT technique that are relevant to evaluation of patients with bowel and pancreatic trauma. 3) Apply CT findings for adequate therapy for patients with blunt pancreatic and bowel injuries.

ABSTRACT

Although injuries to the pancreas, hollow viscera and mesentery are rare, they are important because delays in diagnosis as short as 8 to 12 hours increase the morbidity and mortality from peritonitis and sepsis. Thus, radiologists need to be aware of the often subtle CT signs that are found in these injuries. Signs of bowel injury include focal wall discontinuity, extraluminal gas or oral contrast material (on the rare occasions when it is administered), focal wall thickening and abnormal bowel wall enhancement. Signs of mesenteric trauma include focal mesenteric hematoma, peritoneal extravasation of intravenous contrast-enhanced blood, abrupt termination of a mesenteric vessel and ill-defined increased attenuation (stranding) of the mesentery. The importance of each individual finding varies: the more specific signs are not highly sensitive, and the more sensitive signs are not highly specific. Although free intraperitoneal fluid occurs in both both and mesenteric injuries, this finding in isolation (i.e., without other suspicious signs) lacks specificity. The amount of fluid present, the mean attenuation and the location of the fluid collections are helpful when making management decisions. Pancreatic trauma usually occurs in association with injuries to the liver, spleen or bowel. The diagnosis of pancreatic injuries on CT relies on the identification of direct signs, such as contusions or lacerations, and indirect signs, such as fluid in the peripancreatic fat or in the plane separating the pancreas from the splenic vein and thickening of the left anterior renal fascia. In problematic cases, MR with MRCP may provide additional clues to help in the diagnosis.

Navigating the Regulatory, Reimbursement, and Compliance Landscape or Land Mines! (Sponsored by the Associated Sciences Consortium) (An Interactive Session)

Wednesday, 08:30 AM - 10:00 AM • S105AB

HP

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MSAS41 • AMA PRA Category 1 Credit™:1.5 • ARRT Category A+ Credit:1.5

Moderator

Claudia A Murray
Thomas W Greeson, JD
Melody W Mulaik *
Barbara Rubel, MBA *

LEARNING OBJECTIVES

1) Analyze key regulatory and legislative issues that will impact radiologists in 2014. 2) Describe actions radiologists can take to prepare for ICD-10 implementation. 3) Articulate 2014 changes to CPT. 4) Describe trends and issues with audits in radiology and imaging including RAC and CERT audits. 5) Discuss regulatory requirements for global billing and out-of-state enrollment for interpretation services in wake of CMS's guidance on Place of Service billing.

Case-based Review of Musculoskeletal Radiology (An Interactive Session)

Wednesday, 08:30 AM - 10:00 AM • S406A

CT **MK**

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MSCS41 • AMA PRA Category 1 Credit™:1.5 • ARRT Category A+ Credit:1.5

Director

Lynne S Steinbach, MD

MSCS41A • CT

Kenneth A Buckwalter MD (Presenter)

LEARNING OBJECTIVES

1) Discuss appropriate indications for musculoskeletal CT imaging. 2) Understand how and why to perform CT arthrography. 3) Apply advances in CT technology to musculoskeletal imaging. 4) List technical factors to improve imaging of patients with orthopedic hardware.

ABSTRACT

This case based course will illustrate how CT can be used effectively in diagnosing musculoskeletal conditions.

MSCS41B • Ankle and Foot

Zehava S Rosenberg MD (Presenter)

LEARNING OBJECTIVES

1) To familiarize the attendees with key topics in ankle and foot pathology. 2) To comprehend, apply and analyze the imaging characteristics of osseous abnormalities, tendon disorders, ligament injuries and miscellaneous diseases of the foot and ankle.

ABSTRACT

This case based presentation will afford the radiologist with tools for interpreting common pathologic conditions in the foot and ankle.

MSCS41C • Knee

David A Rubin MD (Presenter) *

LEARNING OBJECTIVES

1) Identify the application of basic anatomic, pathologic, and physiologic principles to specific disease processes that affect the knee. 2) Illustrate using case examples several important disease processes that affect the knee, using several imaging methods and emphasizing the value of each. 3) Present the major teaching points and differential diagnostic considerations for each of the chosen cases and, when appropriate, clarify the importance of early accurate diagnosis.

ABSTRACT

Accurate diagnosis of many disorders that affect the knee can be accomplished with basic or advanced imaging methods, or both. A series of cases will be used to illustrate a few of these disorders, with attention to the most appropriate imaging protocol, the salient imaging findings, the anatomic and pathophysiologic factors that explain the findings, and the important differential diagnostic considerations. Conventional radiography, CT scanning, and MR imaging will be emphasized throughout.

Essentials of Neuro Imaging

Wednesday, 08:30 AM - 10:00 AM • S100AB



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MSES41 • AMA PRA Category 1 Credit™:1.5 • ARRT Category A+ Credit:1.5

MSES41A • Imaging Strategies in Acute Stroke

Paul M Parizel MD, PhD (Presenter) *

LEARNING OBJECTIVES

1) To understand the etiology and pathophysiology of stroke. 2) To recognize different types of stroke. 3) To become familiar with the early signs of stroke on imaging studies. 4) To understand the advantages, disadvantages and limitations of CT and MR in the initial work-up of stroke patients. 5) To identify quantitative imaging biomarkers that can help to predict prognosis and outcome in stroke patients.

ABSTRACT

Neuroimaging studies play a crucial role in the diagnosis, management, and outcome prediction of patients with acute stroke. Patient history and clinical neurologic examination cannot reliably identify the involved vascular territory, nor the etiology, extent or type of stroke. With the arrival of promising new therapies aimed at re-establishing blood flow, reducing the size of the infarction and protecting the surrounding brain at risk (penumbra), the traditional role of neuroimaging has changed. Thanks to multiparametric CT and MRI techniques, our understanding of the pathophysiology of stroke, in terms of cerebral blood flow, cerebral blood volume and cell metabolism, has greatly improved. Identification of the ischemic penumbra with MRI and/or CT has entered routine clinical practice. A patient suspected of having suffered an acute stroke should be cleared for thrombolytic therapy, by excluding intracranial hemorrhage and non-stroke causes of the patient's symptoms. The critical 3 to 6 hour time window for thrombolytic therapy necessitates rapid and accurate diagnosis. The fundamental goals of neuroimaging in the patient presenting with an acute stroke are therefore: 1/ To rule out intracranial hemorrhage, e.g. by CT or MRI; 2/ To show ischemic brain tissue, e.g. by DW-MRI; 3/ To show tissue blood flow and identify the penumbra, e.g. by perfusion CT or MRI; 4/ To assess vessel patency, e.g. by performing CTA or MRA; 5/ To select suitable candidates for treatment and perform the procedures. The purpose of this presentation is to present a comprehensive imaging strategy for patients with suspected stroke, to discuss advantages, disadvantages and limitations of CT and MR in the initial work-up of acute stroke patients, to illustrate imaging patterns, and to identify quantitative imaging biomarkers that can help to predict prognosis and outcome in acute stroke patients.

MSES41B • Navigating the Sella and Central Skull Base

Christopher P Hess MD, PhD (Presenter) *

LEARNING OBJECTIVES

1) Review the normal anatomy of the sella and surrounding structures. 2) Recognize MRI features of common sellar and parasellar lesions and important pitfalls. 3) Understand the implications of MRI findings on clinical management.

MSES41C • Understanding Transverse Myelitis

Girish M Fatterpekar MBBS (Presenter) *

LEARNING OBJECTIVES

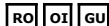
1) To provide an approach toward evaluation of a patient with transverse myelitis. 2) To provide distinguishing features of neuromyelitis optica from multiple sclerosis and other infectious, inflammatory, metabolic and nutritional causes of transverse myelitis. 3) To provide evidence-based guidelines toward evaluation and treatment of transverse myelitis.

ABSTRACT

Transverse myelitis describes a heterogeneous group of disorders characterized by acute or subacute motor, sensory and autonomic spinal cord dysfunction, usually with a discrete sensory level and increased signal on T2-weighted images. It is absolutely mandatory to exclude compressive, radiation-induced, vascular and traumatic causes before considering the usage of the term 'transverse myelitis'. On CSF evaluation, transverse myelitis is characterized by CSF pleocytosis or elevated IgG index. Numerous etiologies have been described for transverse myelitis. The presentation will evaluate neuromyelitis optica in detail including its imaging features, pathogenesis, and diagnostic criteria. Distinguishing features from other causes of transverse myelitis in particular, multiple sclerosis will be highlighted and discussed. Illustrative cases utilizing imaging features to aid in the diagnosis of other causes of transverse myelitis including metabolic causes such as Vitamin B12 deficiency, infectious causes such as HTLV myelopathy and paraneoplastic myelopathy will be discussed. The presentation will also provide evidence-based guidelines toward evaluation and treatment of transverse myelitis.

BOOST: Genitourinary-Anatomy and Contouring (An Interactive Session)

Wednesday, 08:30 AM - 10:00 AM • S103CD



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MSRO41 • AMA PRA Category 1 Credit™:1.5 • ARRT Category A+ Credit:1.5

Co-Director

Fergus V Coakley, MD

Co-Director

Bruce G Haffty, MD

Jelle O Barentsz, MD, PhD

Mark K Buyyounouski, MD *

LEARNING OBJECTIVES

1) Introduce imaging anatomy relevant to prostate cancer and review imaging issues for contouring primary tumors, nodal regions, and adjacent critical structures. 2) Review how the integration of different imaging modalities can affect tumor delineation. 3) How to choose appropriate imaging methods for specific purposes and to discuss the significance of certain imaging findings.

RSNA/ESR Emergency Symposium: General Principles, Pediatric and ENT Emergencies (An Interactive Session)

Wednesday, 08:30 AM - 10:00 AM • S402AB



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MSSR41A • General Principles

Ulrich Linsenmaier MD (Presenter)

LEARNING OBJECTIVES

1) Demonstrate general principles of diagnostic imaging in Emergency Radiology in traumatic and non-traumatic emergencies. 2) Analyze ethiology, background and management of common radiological emergencies. 3) Identify the role, indications and protocols for US, CR, MDCT in modern emergency radiology.

ABSTRACT

MSSR41B • Challenges of Imaging Pediatric Abdominal Emergencies

Susan D John MD (Presenter)

LEARNING OBJECTIVES

1) Plan safe and effective imaging strategies to evaluate abdominal pain in infants and children. 2) Understand the common and unusual causes of abdominal pain in different pediatric age groups. 3) Recognize potentially confusing variations in the appearance of these conditions with imaging.

ABSTRACT

MSSR41C • Imaging in ENT Emergencies

Diego B Nunez MD, MPH (Presenter)

LEARNING OBJECTIVES

1) Analyze imaging findings in patients presenting with acute head and neck conditions using a systematic spatial approach. 2) Demonstrate understanding of the role and indications of CT and MR in acute non-traumatic ENT case management. 3) Identify the extent of disease and recognize specific complications of cervicofacial infections.

ABSTRACT

Clinical Imaging (Image Guided) (Sponsored by the Associated Sciences Consortium) (An Interactive Session)

Wednesday, 10:30 AM - 12:00 PM • S105AB



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**Moderator
Richard Evans**

MSAS42A • Ultrasound Guidance in Musculo-Skeletal Intervention

Alison Hall MSc (Presenter)

LEARNING OBJECTIVES

1) Improve basic knowledge in the practical use of ultrasound guidance in the delivery of therapeutic injections to the most common sites in rheumatology. 2) Appraise the most recent research articles on the subject of ultrasound guidance in musculoskeletal intervention. 3) Recognise the advantages and disadvantages of a multidisciplinary team approach for the provision of an ultrasound guided intervention service. 4) Evaluate the implementation of a training programme for a multidisciplinary team to learn ultrasound guided intervention including competency assessments, ongoing review and broadening of skills.

ABSTRACT

Corticosteroid joint injection therapy is still of great importance in the management of musculoskeletal disease and has been common in rheumatology and orthopaedic practice for the last 50 years.

Most injections are delivered blind using clinical skills and anatomical landmarks to determine the correct site but in recent years the use of imaging techniques has been proven to increase the accuracy of needle placement over clinical guidance.

Ultrasonography is now recognised as one of the most useful imaging modalities for this, being radiation free and relatively inexpensive, but there is still conflicting evidence around expected improvements in patient outcomes following ultrasound guided injections in clinical practice.

The variable accuracy reported in available studies may reflect the differences in the individual injectors' skills in using ultrasound to locate the correct injection site and deliver the injectate accurately. Ultrasound is renowned for its operator dependence and appropriate training is essential to provide a safe and effective service.

However, with the supervision of an experienced ultrasound practitioner, it is possible to introduce ultrasound guidance to an established nurse led joint injection service and to train appropriate health care professionals in focused techniques. This presentation will demonstrate some of the more common techniques used in this emerging field and aims to explore current evidence for and against the use of ultrasound to guide joint injections.

The development of a Sonographer led ultrasound guided interventional service will be discussed, to include training, accreditation and on going competency assessment.

MSAS42B • Image Guided Intervention: A Radiologist Assistant Perspective

Cindy A Petree BS (Presenter)

LEARNING OBJECTIVES

1) Discuss radiologist assistant role in ultrasound guided procedures including paracentesis, thoracentesis, peripherally inserted central catheters, and central lines. 2) Discuss fluoroscopy guided procedures including lumbar punctures and arthrography. 3) Review procedural techniques/ indications/contraindications for procedures. 4) Recognize advantages of utilizing RA's in this capacity.

ABSTRACT

Radiologist assistants are advanced level technologists who serve as radiologist extenders in the diagnostic and interventional radiology departments. RA's can obtain history and physicals and obtain consents. RA's can also perform noninvasive and minimally invasive procedures while radiologists are performing more invasive interventional procedures or interpreting images. Ultrasound guided procedures such as thoracentesis, paracentesis, PICCs, and central lines have become 'bread and butter' exams for many radiology departments. With proper training and supervision radiologist assistants can competently perform these exams to lessen the burden on radiologists. Proper patient positioning, anatomy and physiology, and lab evaluation are important steps to the procedure. Lumbar punctures are performed for CSF analysis, CSF pressure measurement, therapeutic purposes, and injection of intrathecal chemotherapy. Fluoroscopy guided joint injections of gadolinium, ionic contrast, or steroids have become another common radiologic procedure. Conventional arthrograms have mostly been replaced by MRI arthrograms.

Case-based Review of Musculoskeletal Radiology (An Interactive Session)

Wednesday, 10:30 AM - 12:00 PM • S406A



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**Director
Lynne S Steinbach , MD**

MSCS42A • Shoulder

Jon A Jacobson MD (Presenter) *

LEARNING OBJECTIVES

1) Describe the imaging features of rotator cuff tears. 2) Recognize common shoulder pathology at imaging. 3) Understand the advantages and disadvantages of various types of shoulder imaging, such as radiography, CT, ultrasound, and MRI.

MSCS42B • Hip**Donna G Blankenbaker MD (Presenter)**

LEARNING OBJECTIVES

1) To describe and review key topics in the patient with the painful hip. 2) Understand and describe the imaging appearance for different conditions affecting the hip. 3) To understand the treatment for specific hip conditions.

MSCS42C • Postoperative Imaging: Shoulder and Hip**Christine B Chung MD (Presenter)**

LEARNING OBJECTIVES

1) Identify appropriate screening studies for evaluation of common post-operative conditions in the shoulder and hip. 2) Emphasize diagnostic criteria for commonly encountered complications in the post-operative shoulder and hip. 3) To review MR techniques that allow reduction of artifact in the post-operative state, particularly around orthopedic hardware.

ABSTRACT

Essentials of Musculoskeletal Imaging**Wednesday, 10:30 AM - 12:00 PM • S100AB**[Back to Top](#)**MSES42 • AMA PRA Category 1 Credit™:1.5 • ARRT Category A+ Credit:1.5****MSES42A • Essentials of Elbow MRI****Michael J Tuite MD (Presenter)**

LEARNING OBJECTIVES

1) Identify the normal anatomy of the elbow on MR images. 2) Analyze the commonly injured structures of the elbow, and identify injuries of the bones, tendons and ligaments. 3) Demonstrate understanding of the nerves around the elbow and the MR appearance of abnormalities.

ABSTRACT

MSES42B • Imaging Muscle Injury and It's Complications**Philip Robinson MBChB (Presenter)**

LEARNING OBJECTIVES

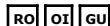
1) Identify the application of basic anatomy, pathology, and physiology principles of muscle anatomy and function in relation to the patterns of injury seen. 2) Understand the physical principles and relative limitations of MRI and ultrasound in relation to imaging normal and injured muscle. 3) Describe the commonest muscle injury patterns that occur and understand the pathophysiology of subsequent complication development.

MSES42C • Characterizing Soft Tissue Tumors at MRI: What Is Realistically Possible?**David M Panicek MD (Presenter)**

LEARNING OBJECTIVES

1) Describe how various features of a soft tissue mass may contribute to a more specific diagnosis at MRI. 2) Identify characteristic MRI features of certain soft tissue tumors. 3) Recognize strengths and limitations of MRI in characterizing soft tissue tumors.

ABSTRACT

BOOST: Genitourinary-Integrated Science and Practice (ISP) Session**Wednesday, 10:30 AM - 12:00 PM • S103CD**[Back to Top](#)**MSRO42 • AMA PRA Category 1 Credit™:1.5 • ARRT Category A+ Credit:1.5****Co-Director****Fergus V Coakley, MD****Co-Director****Bruce G Haffty, MD****Moderator****Phuoc T Tran, MD, PhD *****Moderator****Martin Colman, MD****MSRO42-01 • Invited Speaker:****Ashesh B Jani MD (Presenter)****MSRO42-02 • Improved Dosimetry in Prostate Brachytherapy Using High Resolution Contrast Enhanced Magnetic Resonance Imaging**

Karen Buch MD (Presenter); Tye Morancy; Irving Kaplan MD; Mustafa Qureshi; Ariel E Hirsch MD; Neil M Rofsky MD; Edward J Holupka PhD; Renee Oismueller; Robert Hawliczek; Thomas H Helbich MD*; Boris N Bloch MD

PURPOSE

Postbrachytherapy prostate dosimetry data is generally derived from computed tomography (CT), however, studies have demonstrated superior delineation of prostatic and periprostatic structures on magnetic resonance imaging (MRI). The purpose of this study was to evaluate dosimetry data from postbrachytherapy CT versus high resolution, contrast-enhanced MRI (HR-HR-CEMRI).

METHOD AND MATERIALS

Following institutional review board approval, 11 postbrachytherapy prostate cancer patients underwent HR-CEMRI and CT imaging. CT and HR-CEMRI images were randomized and 2 independent, expert readers created contours of prostate, intra- and peri-prostatic structures. Dosimetry data including V100, D90 and D100 was calculated based on these contours. Mixed-effect models were used to test for differences between the two modalities.

RESULTS

Mean (\pm standard deviation, SD) V100 values from CT and HR-CEMRI contours were as follows: prostate (98.5% \pm 1.5 and 96.2% \pm 3.6, P=0.003), urethra (81.0% \pm 6.6 and 88.7% \pm 7.8, P=0.027), anterior rectal wall (ARW) (8.9% \pm 5.8 and 2.8% \pm 1.7, P

CONCLUSION

Statistically significant differences in prostate, intra- and peri-prostatic dosimetry were seen between CT and HR-CEMRI. These differences suggest volume overestimation of CT derived contours compared to HR-CEMRI. Superior MRI soft tissue contrast enables improved delineation of prostatic and peri-prostatic structures and seems to be superior for dosimetry analysis.

CLINICAL RELEVANCE/APPLICATION

HR-CEMRI likely is superior to CT for prostate postbrachytherapy dosimetry with a more accurate assessment of clinically and functionally relevant prostatic structures for improved clinical outcomes.

MSRO42-03 • Toward Contouring Guidelines for Prostate Cancer Focal Therapy Planning on MRI: Characterization of Tumor Boundary Contrast via Accurate Pathology Fusion

Eli Gibson MSc (Presenter); Mena Gaed MD; Jose A Gomez; Madeleine Moussa; Cesare Romagnoli MD; Suha Ghouli MBBS, MSc; Derek W Cool MD, PhD*; Matthew Bastian-Jordan MBBS, BSc; Jonathan Mandel MD, FRCPC; Stephen E Pautler MD; Joseph Chin MD; Cathie Crukley; Glenn S Bauman MD*; Aaron Fenster PhD*; Aaron D Ward PhD

PURPOSE

Multi-parametric magnetic resonance imaging (MPMRI) is useful for detection and staging of prostate cancer (PCa); however, intra-prostatic lesion (GTV) focused therapy (e.g. radiation boost or ablative focal therapy) requires precise tumor delineation on T2-weighted (T2W) MRI. Our purpose was to measure the detectability (measured as intensity contrast with non-cancerous contralateral/non-neighboring tissue) and boundary localizability (intensity contrast with non-cancerous neighboring tissue) of Gleason score (GS) 7 tumors in the peripheral zone (PZ), contoured by a pathologist on prostatectomy specimens and deformably registered to T2W MRI with high accuracy.

METHOD AND MATERIALS

We acquired endorectal T2W MRI (3T GE Discovery MR750, FSE, TR=5434, TE=159) and histology from 6 subjects. Histology grading and contouring were approved by a genitourinary pathologist, identifying 7 PZ PCa foci with GS 7. To mitigate the bias toward high-contrast tumor boundaries inherent in qualitative consensus mapping of histology contours onto MRI, we used a histology-MRI deformable registration, blinded to the tumor locations, comprising a fiducial-based 3D histology reconstruction to *ex vivo* MRI followed by a deformable registration to *in vivo* MRI. For each focus mapped from histology to T2W MRI, we took 3 mean intensity measurements: T (tumor tissue), N (non-cancerous PZ tissue < 5 mm from the tumor), and C (non-cancerous contralateral PZ tissue). We characterized detectability as $D = (T - C)/C$ and localizability as $L = (T - N)/N$; values < 0 denote tumor hypointensity and 0 indicates no contrast.

RESULTS

Detectability: All foci were hypointense relative to contralateral tissue ($-0.53 < D < -0.15$). Localizability: 3 of 7 foci had clear boundaries ($L < -0.19$); 4 had more poorly defined margins ($-0.12 < L < 0.08$). The mean target registration error was 2 mm.

CONCLUSION

Accurate deformable registration of pathology-defined GS 7 PZ tumors to T2W MRI shows tumor hypointensity but low boundary contrast, challenging accurate tumor boundary delineation for PCa treatment planning. Our preliminary results motivate further study to measure the performance of T2W MRI for tumor boundary delineation or augment it with MPMRI.

CLINICAL RELEVANCE/APPLICATION

Low tumor boundary contrast on T2W MRI for Gleason 7 peripheral zone prostate cancers suggests further assessment of T2W MRI is needed for contouring guidelines for focal/boosted therapy planning.

MSRO42-04 • MR Imaging of Ex Vivo Prostate Specimens for Predicting Resection Margins in Prostate Cancer: A Pilot Study

Martijn Hoogenboom MSc (Presenter) ; **Iringo Kovacs** ; **Isabell Steinseifer** ; **Andor Veltien** ; **Iris Nagtegaal** PhD ; **Michiël Sedelaar** MD, PhD ; **Fred Witjes** MD, PhD ; **Jurgen J Futterer** MD, PhD ; **Jelle O Barentsz** MD, PhD ; **Arend Heerschap** PhD ; **Christina A Hulsbergen-Van De Kaa** MD, PhD

PURPOSE

This study has been designed to explore if ex-vivo 7T MR imaging can be used for identification of potential positive resection margins in radical prostatectomy specimens.

METHOD AND MATERIALS

Fresh radical prostatectomy specimens (n=6) underwent MR imaging immediately after surgery. Tubes filled with saline both in the urethra and next to the prostate were used as markers. The prostate was doped in gadolinium to highlight the surgical margins. All specimens were emerged in oil (fomblin) to eliminate susceptibility artifacts. High resolution T2-weighted (T2W) and diffusion weighted images (DWI) were acquired. After evaluation of the *in vivo* MRI, the tumor and position of possible positive resection margins were determined at the *ex vivo* images (T2, DWI). Histopathology slices, every 4mm, were made according to the *ex vivo* images in transversal direction. The *ex-vivo* images were correlated with the histopathology.

RESULTS

In T2W MR images of *ex-vivo* prostate zonal distinction (peripheral vs. transition) is less clear than in MRI of the prostate *in vivo*. In all patients the tumor was visible on the DWI images, however also benign lesions showed reduced ADC and high signal intensity on the b1200 images. The resection margin was free of tumor in all patients with a high intense border at T2W images and a border of high ADC values between tumor and the outside of the prostate. Two patients showed a positive resection margin at the MR images, which correlated with the histopathology. However, in two patients a positive resection margin seemed to be visible based on the MR images, while the histopathology showed a negative resection margin. Therefore in these cases a histopathology confirmation is needed (frozen section).

CONCLUSION

Ex-vivo MRI has the potential to identify benign and malignant structures and to predict resection margins. However, further optimization of the MR imaging protocol is required guided by information from fast frozen histopathology sections to confirm the presence or absence of positive regions.

CLINICAL RELEVANCE/APPLICATION

A fast method is necessary to determine the resection margins after radical prostatectomy for direct extended resection or brachytherapy, *ex-vivo* MR might be a solution.

MSRO42-05 • Evaluation of Artifacts Reduction Using Spectral CT Imaging after CT Guided Radioactive Seed 125I Implantation

Rui Gang Huang (Presenter) ; **Alai Zhan** ; **Qinglong Shen**

PURPOSE

To explore the clinical value of puncture needle artifacts reduction using Spectral CT Imaging after CT guided radioactive seed 125I implantation in treatment of liver cancer

METHOD AND MATERIALS

6 patients referred to CT guided radioactive seed 125I implantation in liver underwent GSI examinations using Discovery CT750 HD scanner. During the process of implantation, traditional CT scans were performed for comparison. All data were transferred to Workstation (AW4.5, GE Healthcare) to obtain one set of 140 kVp images (QC) and 11 sets of monochromatic images (40-140keV, interval of 10keV). Artifact was significant around particles and puncture needle. The CT value and variations were measured in the area with and without the most significant artifact while the background noise was measured in abdominal subcutaneous adipose tissue. The artifact index (AI) of the regions of interest is defined as the square root of the squared noise difference between the region with and without artifact of the same tissue. All the measurements were recorded and statistically compared.

RESULTS

CONCLUSION

Monochromatic images obtained from spectral CT imaging can substantially reduce metal artifacts caused by radioactive seed 125I and provide more accurate CT images for estimating the efficacy of the treatment.

CLINICAL RELEVANCE/APPLICATION

Spectral CT showed its potential applications in monitoring disease progressions after 125I radioactive particles implantation.

MSRO42-06 • Evaluation of Two Automatic Deformable Contouring Methods for Prostate Image-guided Adaptive Radiation Therapy (IGART) in Terms of Delivered Dose Values

Zhilei Shen ; **Sara Pirozzi** BS (Presenter) * ; **Jon W Piper** BEng * ; **Aaron S Nelson** MD *

PURPOSE

Two deformable contouring methods for prostate CBCT, Adaptive and Multi-Adaptive, previously demonstrated good accuracy in terms of Dice coefficients. Now these methods are evaluated by comparing their delivered dose values with those from manual contouring.

METHOD AND MATERIALS

Twenty CBCTs were selected from 4 patients with prostate cancer. Prostate, bladder, rectum, left and right hip contours were manually defined on all the CBCTs. Adaptive contours were created by deforming manually defined Day 1 CBCT contours to subsequent CBCTs, for a total of 16 contour sets. Multi-Adaptive contours were generated by deforming the other 4 CBCTs to the remaining CBCT and combining contours using Majority Vote for a total of 20 contour sets. The daily dose values were measured from the deformed and manual contours. Bland-Altman analysis was used to analyze the 95% confidence limits of agreement (LOA) between manual and deformable contouring.

RESULTS

The mean±SD percentage differences and 95% LOA for Manual vs. Multi-Adaptive were: CTV Mean (-0.6±2.8%) [-0.12,0.09], D25 Bladder (-1.8±25.3%) [-0.54,0.46], D50 Bladder (-4.1±22.8%) [-0.39,0.31], D20 Rectum (0.3±8.3%) [-0.24,0.24], D40 Rectum (0.9±10.3%) [-0.21,0.22], D20 Left Hip (-0.1±0.7%) [-0.01,0.01], and D20 Right Hip (0.1±1.0%) [-0.02,0.02]. For Manual vs. Adaptive the results were: CTV Mean (-0.6±3.9%) [-0.16,0.13], D25 Bladder (-1.2±28%) [-0.71,0.45], D50 Bladder (-15.5±25.2%) [-0.75,0.36], D20 Rectum (1.0±9%) [-0.25,0.28], D40 Rectum (4.8±10.9%) [-0.18,0.29], D20 Left Hip (-0.1±0.6%) [-0.01,0.01], and D20 Right Hip (0.2±1.1%) [-0.02,0.02].

CONCLUSION

Multi-Adaptive showed increased agreement and decreased bias compared to Adaptive. The 95% LOA showed that there were no clinically significant

differences for CTV Mean, Left Hip, and Right Hip indicating the deformable methods were as good as manual in delineating these structures. Although the 95% LOA were larger for the other structures, the rectum may fall within clinical tolerances.

CLINICAL RELEVANCE/APPLICATION

Tracking dose using deformable contouring of CBCTs has the potential to identify deviations from the planned treatment. Deformable methods have the potential to reduce the burden for contouring.

MSRO42-07 • Neurovascular Bundle Sparing Technique in Prostate Brachytherapy, and the Utility of Intraoperative Ultrasound Fusion with Day 30 CT

Daniel A Jones MD (Presenter)

ABSTRACT

Purpose/Objective(s): Reducing dose to the cavernous neurovascular bundles may be important in maintaining sexual potency after prostate brachytherapy. Last year, we reported the feasibility of the nerve sparing technique, and a significant 28% reduction of mean dose to the NVB associated with the non-cancerous lobe. Dose calculations in the initial study were based on intraoperative assessments. The purpose of this study was to report longer follow up of the cohort, and to integrate a novel fusion technique of the intraoperative ultrasound images, with that of the day 30 CT scan.

Materials/Methods: Of the previously reported cohort of fourteen patients in which intraoperative contouring of NVB was performed, six had bilateral NVB contoured, and were thus available for comparison. All were categorized as having unilateral prostate cancer. The non-cancerous lobe was implanted with the NVB sparing technique, placing no radioactive seeds within a 5 mm radius of the NVB. Implant standards for V100 and D90 were maintained. Sexual function was measured with the IIEF questionnaire. Intraoperative assessment and contouring of the cavernous NVB location was based on anatomical correlation with ultrasound and doppler flow. Patients were brought back for day 30 CT scan to assess the implant and to confirm good dosimetry. The intraoperative ultrasound was fused to the day 30 CT scan by matching the prostate posterior border and the urethra contours. The intraoperative NVB contours were imported into the day 30 CT scan for dose assessment.

Results: Median follow up for the cohort approaches 24 months. All patients are in PSA remission. Four of the six are sexually potent, both with and without the aid of a phosphodiesterase (PDE) inhibitor. The mean dose to the spared NVB was 114 Gy, while mean dose to the non-spared NVB was 145 Gy. The mean per-patient dose reduction to the NVB was 16.7% ($p=.27$) and therefore was no longer significant.

Conclusions: The NVB sparing brachytherapy technique remains feasible, and does not appear to compromise oncologic outcomes. The dose reduction to the spared NVB was no longer significant with the adjusted fusion technique of day 30 imaging, while previously dose reduction of 27.9% was significant with regards to real time intraoperative ultrasound calculations. The size and shape of the prostate gland may change immensely compared to the fused day 30 CT images, limiting the ability to accurately determine the location of the cavernous NVB. Fusion may be aided with deformable imaging software or reimaging with ultrasound and/or MRI at day 30 to confirm NVB location. Intraoperative assessment of dose to the NVB is probably more accurate compared to the new fusion technique and remains our preferred method at this time. Limitations include small number of patients and short follow up.

MSRO42-08 • DVH-based Comparison Analyses of PTV-coverage and Doses to Organs at Risk (OARs) between Localized Cancers of Large and Regular Volume Prostate Treated with High Dose Rate Brachytherapy (HDR-BT)

Kaidu Motoki (Presenter) ; Ayukawa Fumio ; Kensuke Tanaka ; Mika Obinata ; Hiraku Sato MD ; Nobuko Yamana ; Gen Kawaguchi ; Atushi Oota ; Eisuke Abe ; Ryuta Sasamoto ; Hidefumi Aoyama MD, PhD

MSRO42-09 • Practice Patterns in the Prescription of Elective Nodal Irradiation in Prostate Cancer

David Greene MD (Presenter)

RSNA/ESR Emergency Symposium: CNS Emergencies (An Interactive Session)

Wednesday, 10:30 AM - 12:00 PM • S402AB



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MSSR42 • AMA PRA Category 1 Credit™:1.5 • ARRT Category A+ Credit:1.5

MSSR42A • CNS Trauma and Neurovascular Injury

Howard A Rowley MD (Presenter) *

LEARNING OBJECTIVES

1) To be familiar with traumatic brain injury demographics and classification schemes. 2) Be able to apply appropriateness criteria for head trauma imaging in children and adults. 3) Identify key imaging patterns and pitfalls in the evaluation of brain and neurovascular trauma.

ABSTRACT

This lecture on **Acute Head Trauma** is divided into 4 parts: Part 1 will briefly review TBI demographics. Part 2 will discuss the current imaging approach to acute TBI in today's clinical practice. Part 3 will briefly describe the most common TBI classification schemes. Part 4 will illustrate the imaging manifestations of the different injuries located in the *extra-axial* space (e.g., scalp and skull injury; epidural, subdural, subarachnoid and intraventricular collections), and the *intra-axial* space (e.g., dysautoregulation, contusion, hematoma, penetrating TBI, axonal injury, fat emboli). Note that a common theme throughout the lecture will be **Lessons I've Learned Since Neuroradiology Fellowship** ;-)

MSSR42B • CNS Non-Traumatic Emergencies

Marion Smits MD, PhD (Presenter)

LEARNING OBJECTIVES

1) To know the modalities (CT/MRI) and protocols for non-traumatic neurological emergencies. 2) To know and diagnose the main non-traumatic neurological vascular and non-vascular emergencies. 3) To be aware of the pitfalls and limitations of clinical presentation and imaging findings in non-traumatic neurological emergencies.

ABSTRACT

Neurological emergencies are often associated with high morbidity and mortality, and thus require prompt diagnostic and therapeutic action. Non-traumatic emergencies may however have a subacute onset, and radiological signs may be subtle, which can lead to delay in diagnosis.

MSSR42C • Interactive Case Discussion

Howard A Rowley MD (Presenter) * ; Marion Smits MD, PhD (Presenter)

LEARNING OBJECTIVES

1) To review traumatic brain injury (TBI) and non-traumatic neurological emergencies. 2) To describe imaging manifestations of TBI and non-traumatic neurological emergencies. 3) To understand the clinical implications of radiological imaging findings in TBI and non-traumatic neurological emergencies. 4) To know the state-of-the-art radiological imaging options for the assessment of acute TBI and non-traumatic neurological emergencies.

ABSTRACT

This interactive case discussion builds on the two previous lectures in this session, on traumatic and non-traumatic neurological emergencies respectively. Both lecturers will take the audience through several clinical cases, highlighting and emphasizing important issues from their lectures, such that the previously presented theory is placed in a clinical context. Preferably, the participants will have attended the two prior lectures, to optimally benefit from and participate in this interactive case discussion.

ASRT@RSNA 2013: Musculoskeletal Imaging: New Ways to Image the Same Old Bones

Wednesday, 01:00 PM - 02:00 PM • N230



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MSRT41 • AMA PRA Category 1 Credit™:1 • ARRT Category A+ Credit:1

Jordan B Renner, MD

LEARNING OBJECTIVES

At the end of this presentation, participants should have a better appreciation of challenges facing conventional radiography. They should also understand new approaches to image orthopaedic implants using computed tomography and magnetic resonance imaging. They will also appreciate the importance of newer approaches to the evaluation of articular cartilage.

ABSTRACT

Since the discovery of the x-ray almost 120 years ago, musculoskeletal imaging, like all of radiology, has evolved. As new technologies were introduced and their roles delineated, most imaging modalities were employed in musculoskeletal imaging, at least temporarily. Many of the currently-popular and important

technologies are of relatively recent origin, whereas others have been important in musculoskeletal imaging since the beginning of radiology, and still others have been abandoned. Because of its central importance in musculoskeletal imaging, the role of conventional radiography and some of the challenges it faces will be presented. Recent and ongoing work has focused on the cross sectional imaging of orthopaedic implants and on decreasing imaging artifacts arising from these implants. Efforts to improve imaging of these implants with both CT and MRI will be discussed. This presentation will also focus on the imaging of articular cartilage and on efforts to apply information about the health of articular cartilage in ongoing research in osteoarthritis.

Case-based Review of US (An Interactive Session)

Wednesday, 01:30 PM - 03:00 PM • S406A

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US GI

MSCU41 • AMA PRA Category 1 Credit™:1.5 • ARRT Category A+ Credit:1.5

Director
Sharlene A Teefey, MD

MSCU41A • Contrast-enhanced Ultrasound of the Liver

Stephanie R Wilson MD (Presenter) *

LEARNING OBJECTIVES

Attendees will recognize the importance of washout and the timing washout oncontrast enhanced ultrasound of the liver allowing for the differentiation of malignant and benign liver masses and differentiation of hepatocyte based malignancy from others.

MSCU41B • Transplant Ultrasound of the Liver, Pancreas and Kidney

Myron A Pozniak MD (Presenter) *

LEARNING OBJECTIVES

1) Several challenging cases of transplant dysfunction will be presented. They will focus on the role of Doppler Ultrasound in making a quick confident diagnosis.

MSCU41C • Peripheral Vascular Ultrasound

Laurence Needleman MD (Presenter)

LEARNING OBJECTIVES

1) Apply the natural history of abdominal aortic aneurysms to proper reporting of AAA size. 2) Apply the hemodynamics of stenosis to minimizing false positive results. 3) Analyze duplex Doppler of venous disease and apply this knowledge to protocol development, patient management/safety, and cost. 4) Identify the application of pathologic, and physiologic principles to plaque characterization and thrombus aging and clinical significance. 5) Analyze the surgical procedures for common vascular processes to protocol development and interpretation of mapping and post procedural examinations.

ABSTRACT

Duplex Doppler of the peripheral vascular system requires an understanding of how the hemodynamics of normal circulations and of abnormal conditions appear. Duplex interpretation requires integration of gray scale sonography, color Doppler and spectral (waveform) analysis. Some examinations requires more or less of one modality (e.g. lower extremity venous exams are mostly gray scale noncompression and compression scans) while some are more equal (e.g. carotid or upper extremity scans). Understanding the hemodynamics of obstruction is necessary when describing and interpreting arterial and venous exams. For arterial stenosis, there are three spectral images that are generally obtained: waveforms before the stenosis, in the stenosis and beyond the stenosis. Pitfalls may occur when all the typical waveform shapes do not occur or when the gray scale, spectral and color images are discordant. Some arterial circulations use absolute velocity to diagnose conditions while others use ratios. Postoperative conditions such as bypass grafts and stents require specific criteria. Venous thrombosis remains a major disease despite more widespread prophylaxis in hospitalized patients. Protocols to determine safe and effective ways to diagnoses DVT use complete (whole leg) compression ultrasound as well as more limited scan. Differentiating acute, residual and recurrent venous thrombosis are necessary as more patients present with history of venous thromboses in the past.

Essentials of Chest Imaging

Wednesday, 01:30 PM - 03:00 PM • S100AB

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CT CH

MSES43 • AMA PRA Category 1 Credit™:1.5 • ARRT Category A+ Credit:1.5

MSES43A • Pitfalls in CT Pulmonary Angiography

Andetta R Hunsaker MD (Presenter)

LEARNING OBJECTIVES

1) Identify common pitfalls which cause the indeterminate CT Pulmonary angiogram studies including technical, physiologic and anatomic etiologies. 2) Identify pitfalls due to errors in diagnosis of filling defects in the pulmonary arteries. 3) Avoid the pitfall of satisfaction of search. 4) Identify pitfalls with dual energy CT imaging for acute PE. 5) Understand ways to either solve or get around these pitfalls.

ABSTRACT

MSES43B • Imaging Pulmonary Edema: Elucidate Heart Lung Interaction

Diana Litmanovich MD (Presenter)

LEARNING OBJECTIVES

1) Identify typical radiological features of pulmonary edema on conventional imaging (chest radiographs and chest CT) in correlation with related pathophysiologic changes cardiac and pulmonary changes. 2) Become familiar with atypical radiologic features of pulmonary edema. 3) Become familiar with cardiac and non-cardiac causes of pulmonary edema identifiable on chest radiographs, chest CT or MRI and their influence on lung parenchyma and airways. 4) Become familiar with etiologies mimicking pulmonary edema and tools available to differentiate between those. 5) Become familiar with post-treatment appearance of pulmonary edema.

MSES43C • Imaging of Airway Diseases: A Non-Thoracic Radiologist's Guide

Sujal R Desai MBBS (Presenter)

LEARNING OBJECTIVES

1) Have a working knowledge of key airway anatomy relevant to radiologists. 2) Understand the principal features of airways disease on HRCT and the pathophysiologic processes underlying these signs. 3) Appreciate the characteristic features of specific disease entities in which airway pathology is a dominant process.

ABSTRACT

Diseases of the airways are common in clinical practice and imaging tests have an role in evaluation. Whilst plain chest radiography is the standard investigation, there are significant limitations because of problems including anatomical superimposition and poor contrast resolution. By contrast high-resolution CT (HRCT) has significant advantages. For ease of description the bronchial tree is divided into the large (bronchi) and small (bronchioles) airways; this traditional distinction is based on airway calibre and the possession (or otherwise) of cartilage in the wall: airways greater than 1mm diameter which are reinforced by cartilage, are called bronchi whereas those of greater calibre and without cartilage are termed bronchioles. The pattern of bronchial and bronchiolar branching is ideally suited to serving the two prime functions of the respiratory tract: transport of air and gas exchange. From the radiologist's perspective, the common reason for imaging the large airways is when a diagnosis of bronchiectasis is suspected. As the reader will be aware, the term bronchiectasis refers to an irreversible dilatation of the airways usually associated with inflammation in the bronchial wall. HRCT is now the investigation of choice in patients with bronchiectasis and, for the radiologist, the cardinal feature is airway dilatation with or without of the bronchial wall thickening. Obliteration of the small airways is surprisingly common and occurs in diverse clinical settings. The cross-sectional area of individual peripheral airways is small but because of their number, the effective cross-sectional area is large. The implication is that considerable 'silent' damage will occur before symptoms of functional deficit will manifest. In reality, the two commonest patterns of small airways disease on HRCT are mosaic attenuation and a tree-in-bud pattern. These will be discussed in greater detail in the presentation.



MSRP41 • AMA PRA Category 1 Credit™:2

Moderator
Aparna Annam, DO

LEARNING OBJECTIVES

1) To prepare residents and fellows for the current job market and how to make the most of your first career steps.

ABSTRACT

MSRP41A • Future of the Radiology Job Market-Progress or Panic?

Aparna Annam DO (Presenter) ; **Edward I Bluth** MD (Presenter)

LEARNING OBJECTIVES

1) Understand the 2012 and 2013 ACR Workforce Survey Results. 2) Understand the types of practices and geographic locations where jobs appear to be potentially available in 2014 and 2016. 3) Understand the number and types of radiology subspecialists and generalists which employers appear to be interested hiring in 2014 and 2016.

MSRP41B • Negotiating a Tight Job Market-The Do's and Don'ts of Finding a Job

Anthony C Brown MD (Presenter) ; **James P Borgstede** MD (Presenter)

LEARNING OBJECTIVES

1) Assess the current job opportunities. 2) Analyze important metrics and demographics for job satisfaction. 3) Identify key questions which must be answered before signing a contract.

MSRP41C • Your First Job Isn't Your Last Job

Monique A Meyer MD (Presenter) ; **Etta D Pisano** MD (Presenter) *

LEARNING OBJECTIVES

1) To understand the impetus for job change across the career of radiologists in practice and academia. 2) To learn about nontraditional and traditional career opportunities open to radiologists. 3) To learn about the challenges, both professional and personal, of pursuing career path changes.

MSRP41D • Panel Discussion

LEARNING OBJECTIVES

View learning objectives under main course title.

RSNA/ESR Emergency Symposium: Chest Emergencies (An Interactive Session)



MSSR43 • AMA PRA Category 1 Credit™:1.5 • ARRT Category A+ Credit:1.5

MSSR43A • Thoracic Injuries

Stuart E Mirvis MD (Presenter)

LEARNING OBJECTIVES

1) The learner will be able to differentiate traumatic aortic injuries from congenital variants that mimic injury, to distinguish minor from major aortic injuries and to understand how injury classification can influence management. 2) The participant will recognize the various CT appearances suggesting and verifying major airway injury. 3) The participant will understand the various CT appearances of blood/bleeding in the chest and how the location, quantity of blood/bleeding and patient clinical status determine initial treatment. 4) The learner will appreciate the spectrum of cardiac injuries that can be diagnosed on admission contrast-enhanced CT and those that require urgent intervention.

ABSTRACT

MSSR43B • Non-Traumatic Thoracic Emergencies

Cornelia M Schaefer-Prokop MD (Presenter) *

LEARNING OBJECTIVES

1) To get familiar with protocols and diagnostic performance of comprehensive cardiothoracic CT examinations to determine the presence of vascular life threatening events such as aortic dissection, acute coronary disease and pulmonary embolism. 2) To illustrate typical but also less classic CXR and CT findings of patients with pulmonary or mediastinal diseases causing acute dyspnoea and / or requiring immediate treatment and to learn about key imaging findings in these patients allowing for a fast differential diagnosis. 3) To learn how to adapt CT protocols to CXR findings and to integrate imaging findings with lab findings, patient history and clinical information for making the diagnosis.

ABSTRACT

Pulmonary symptoms such as chest pain, shortness of breath or wheezing are common non-traumatic symptoms prompting ER visits. Because clinical symptoms are very non-specific, imaging plays a major role in differentiating life threatening from less severe diseases and forming a diagnosis. The chest radiograph remains the first imaging despite its limited sensitivity for certain diseases and being prone to inter-observer variability. Comprehensive cardiothoracic CT examinations using most modern CT equipment are well evaluated in their diagnostic accuracy to determine the presence of vascular life threatening events such as aortic dissection, acute coronary disease and pulmonary embolism. Protocols, literature evidence and appropriate examples will be discussed. In addition the course will highlight nonvascular emergencies such as mediastinal diseases (e.g., esophageal perforation, mediastinitis or pericarditis) and pulmonary emergencies (e.g., pneumonia, edema, pneumothorax, exacerbation of diffuse lung diseases) for which a more comprehensive consideration of imaging findings, lab findings, patient history and clinical information is needed for making the diagnosis.

MSSR43C • Interactive Case Discussion

Stuart E Mirvis MD (Presenter) ; **Cornelia M Schaefer-Prokop** MD (Presenter) *

ASRT@RSNA 2013: Pediatric CT/CTA: Techniques and Applications



MSRT42 • AMA PRA Category 1 Credit™:1 • ARRT Category A+ Credit:1

Marilyn J Siegel, MD *

LEARNING OBJECTIVES

1) Describe the optimal techniques in performing CT/CTA in children. 2) Identify the applications of CT/CTA in children. 3) State the CT/CTA findings of common diseases in children.

ABSTRACT

PURPOSE To review the technique modifications that can optimize the CT images and the common applications in pediatric computed tomography (CT) and CT angiography.

CONTENT ORGANIZATION

1. Basic Imaging techniques and protocols in pediatric populations (chest and abdomen CT and CT angiography). 2. Effective use of oral and intravenous contrast medium. 3. Indications for multiplanar and 3D reformations. 4. Clinical applications of CT and CTA. **SUMMARY**
CT data acquisition using current technology CT systems enables fast volume coverage with less motion artifacts, less sedation and radiation dose reduction.

This presentation will review the basic steps and best imaging protocols for performing CT and CTA in children. The indications for post-processing multiplanar and volume rendered reconstructions will be reviewed. The common indications for performing CT and CTA along with examples of clinical cases will be presented. At the conclusion of this presentation, the technologists should have a basic understanding of how to perform CT and CTA in a pediatric population.

BOOST: Genitourinary-Case-based Review (An Interactive Session)

Wednesday, 03:00 PM - 04:15 PM • S103CD

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RO **OI** **GU**

MSRO43 • AMA PRA Category 1 Credit™:1.25 • ARRT Category A+ Credit:1.5

Co-Director
Fergus V Coakley, MD
Co-Director
Bruce G Haffty, MD
Fergus V Coakley, MD
Deborah A Kuban, MD
Colleen A Lawton, MD *

LEARNING OBJECTIVES

1) State the modalities, rationale, and indications for imaging local and distant spread of prostate cancer. 2) Describe the evidence-basis for imaging approaches to prostate cancer. 3) List the emerging modalities for prostate cancer imaging. 4) State the appropriate therapy(s) for low intermediate and high risk prostate cancer treatment.

ABSTRACT

This course will be a case based review of all aspects of the treatment of prostate cancer from early stage disease through metastatic disease. We will focus on radiation aspects of treatment in particular and imaging as appropriate for all stages of disease.

URL's

<http://www.radiology.ucsf.edu/research/meetings/rsna>

Case-based Review of US (An Interactive Session)

Wednesday, 03:30 PM - 05:00 PM • S406A

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US

MSCU42 • AMA PRA Category 1 Credit™:1.5 • ARRT Category A+ Credit:1.5

Director
Sharlene A Teefey, MD

MSCU42A • Ultrasound of Adnexal Pathology

Deborah J Rubens MD (Presenter)

LEARNING OBJECTIVES

1) Review the common causes of acute ovarian pathology including hemorrhagic cysts and their differential diagnoses. 2) Underscore the various features of ovarian torsion including grayscale and Doppler findings and pitfalls. 3) Identify those gynecologic lesions which require surgery vs. clinical or imaging follow-up, either with sequential ultrasound or with another modality.

ABSTRACT

As the medical community is encouraged to rely more upon ultrasound in the diagnosis of pelvic pain, many more women are encountered first for pelvic ultrasound, rather than CT. Frequently, ultrasound can answer the clinical question, saving time, money and radiation to the patient. Common causes of pain in premenopausal women include hemorrhagic cysts. Cysts measuring 5cm or less and meeting classic criteria of either a fishnet/lacelike appearance or with a retractile clot do not require any follow-up. Atypical cysts or suspected endometriomas of any size, or classic hemorrhagic cysts greater than 5 cm should undergo short term interval follow-up with ultrasound (6-12 weeks). Lesions larger than 7cm usually require alternate imaging based on their size, as ultrasound may not evaluate them in sufficient detail. MRI is usually the next consideration. Torsion, while an uncommon cause of pelvic pain, does represent a surgical emergency. The most reliable signs of torsion are those identified with grayscale imaging: an enlarged, abnormal ovary (>5cm in diameter) and/or an ovary in abnormal midline position either above or below the uterus. Doppler imaging is less reliable, as arterial and/or venous flow may be present even in the setting of torsion. Other Doppler features including a twisted pedicle or a tarvus/parvus waveform may aid in the diagnosis. A third group of patients are those who have ovarian mass lesions suggestive of neoplasm. These patients may present acutely as well, sometimes due to torsion, other times due to rupture or pain or pressure. Features which are concerning for neoplasm; include thick septations and nodules. Lesion vascularity is especially concerning for malignancy. These patients usually are referred for surgical evaluation rather than imaging follow-up. However if the mass is indeterminate and malignant features are absent, short term ultrasound follow-up and/or alternative imaging with CT or MR; may be helpful for diagnosis and management

MSCU42B • Musculoskeletal US

Nirvikar Dahiya MD (Presenter)

LEARNING OBJECTIVES

1) Learn to identify normal Sonographic anatomy of the musculoskeletal system. 2) Learn to recognize the abnormal sonographic appearance of the musculoskeletal system in disease. 3) Learn the correct Sonographic technique and pitfalls for optimal scan results.

ABSTRACT

Cases have been chosen for this refresher course keeping in mind their instructive and educational value. The discussion will include diseases associated with the rotator cuff, wrist joint, Hip, knee and ankle. Ultrasound images and cine clips will be used to highlight the salient features of musculoskeletal disorders. Examples will be shown to demonstrate the advantage of using dynamic evaluation as a problem solving aspect of musculoskeletal sonography.

MSCU42C • Ultrasound of Thyroid

Sharlene A Teefey MD (Presenter)

LEARNING OBJECTIVES

1) Discuss the incidence, different histologic subtypes of thyroid carcinoma. 2) Review the sonographic features of the different subtypes of thyroid carcinoma and the sonographic appearance of benign nodules and how to differentiate the two. 3) Discuss thyroid lymphoma including subtypes and sonographic features. 4) To discuss other thyroid pathologies including thyroiditis, and Grave's disease.

ABSTRACT

Thyroid carcinoma has an incidence between 9.2 and 13%. There are several subtypes of carcinoma including papillary carcinoma that accounts for 75-80% of the cases. Less common types include follicular carcinoma, medullary carcinoma and anaplastic carcinoma. Grey scale sonographic features that are suggestive of papillary carcinoma include a solid, very hypoechoic lesion with micro or eggshell calcifications, lobulation, and a focal bulge. Follicular lesions are solid and iso/hyperechoic with a thin hypoechoic halo and central cystic spaces. Most of these lesions are adenomas though ultrasound cannot differentiate between a follicular carcinoma and adenoma. Carcinomas tend to occur in older males and are solid hypoechoic lesions. Benign thyroid nodules, in particular nodular hyperplasia have a spongy appearance and inspissated colloid. Anaplastic carcinoma is rare but very aggressive locally invading structures in the neck. Distant metastases are present in 20-50% of patients at presentation. At ultrasound, anaplastic carcinomas are solid and hypoechoic but may contain cystic spaces and amorphous calcification. Lymphoma of the thyroid is rare and may be aggressive or indolent (MALT lymphoma). It is typically heterogeneous and can invade surrounding tissues. Thyroiditis can be acute, subacute, and chronic. Subacute thyroiditis is a post viral disorder. At ultrasound, focal hypoechoic area(s) may be seen that are ill defined and have little if any vascularity. Hashimoto's thyroiditis is an autoimmune disorder causing gland enlargement with characteristic hypoechoic micronodules and echogenic septae. Vascularity may be increased, normal, or decreased. Grave's disease is also an autoimmune disease. Ultrasound shows a heterogeneously enlarged gland and diffuse increased vascularity and increased PSV in the thyroidal arteries.

Essentials of Breast Imaging

Wednesday, 03:30 PM - 05:00 PM • S100AB

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BR

MSSES44 • AMA PRA Category 1 Credit™:1.5 • ARRT Category A+ Credit:1.5

MSSES44A • How to Get the Most Out of Breast Ultrasound

Paula B Gordon MD (Presenter) *

LEARNING OBJECTIVES

This course will cover the technical aspects of performing breast ultrasound. The quality of the examination depends on the choice of the optimal transducer for the task at hand, adjusting scan parameters such as gain and focal zones, and the proper use of compound imaging and harmonics. The addition of Doppler, extended field of view, 3D, elastography and automated breast ultrasound will be discussed.

MSES44B • How to Find Breast Cancer When It Is Still Small

Laszlo Tabar MD (Presenter) *

LEARNING OBJECTIVES

1) Learn the skills necessary for reading the mammograms of asymptomatic women. 2) Be familiar with the varying appearances of a normal mammogram. 3) Increase confidence in reading large numbers of full field digital mammograms at lower call-back rates. 4) Minimize call-back rates without missing cancers. 5) Improve skills in detecting early phase breast cancer at digital mammography screening. 6) Be able to guide the diagnostic workup using mammography, ultrasound and interventional methods.

ABSTRACT

Population-based mammography screening has brought about a paradigm shift in our approach to the diagnosis and treatment of breast cancer, since the spectrum of the disease has shifted from primarily palpable, advanced cancer to mainly impalpable tumors that have exceedingly good prognosis. Early detection of breast cancer with high quality mammography screening and treatment at an early stage has succeeded in lowering the death rate from breast cancer by nearly 50% among women who have attended screening regularly. The challenge of successful screening should be met with a commitment to master the complexities of image production, the variations in normal breast anatomy, the heterogeneity of breast diseases, and the progressive nature of breast cancer. Comparison of the imaging findings with large section and subgross histologic images facilitates understanding of the underlying pathophysiologic processes leading to the findings. These comparisons will enable the radiologist to better differentiate normal from pathologic, improving both the sensitivity and specificity of mammographic interpretation. The predominance of early-stage disease has created a revolutionary new era for those involved in the diagnosis and treatment of breast cancer patients. Early detection of breast cancer challenges current standards of care.

MSES44C • Probably Benign - Rules of the Game

Jay A Baker MD (Presenter) *

LEARNING OBJECTIVES

1) Review features of mammographic, sonographic, and MRI lesions that can be closely followed rather biopsied. 2) Review protocol and timing for imaging at follow-up. 3) Review findings that should not be labeled Probably Benign.

ABSTRACT

This presentation will cover the topic of using BI-RADS 3 final assessment category Probably Benign in breast imaging. Appropriate use of Probably Benign will be discussed for lesions seen on mammography, ultrasound, and breast MRI. Evidence from the medical literature supporting use of Probably Benign will be covered, and the circumstances that lack sufficient evidence will also be discussed.

RSNA/ESR Emergency Symposium: Abdominal Emergencies (An Interactive Session)

Wednesday, 03:30 PM - 05:00 PM • S402AB

ER **GU** **GI**

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MSSR44 • AMA PRA Category 1 Credit™:1.5 • ARRT Category A+ Credit:1.5

MSSR44A • Abdominal Injuries

Andras Palko MD, PhD (Presenter) *

LEARNING OBJECTIVES

1) To explain the significance of injury mechanism and its role in the formation of consequent abdominal lesions and their complications. 2) To outline the role of proper imaging technique and diagnostic algorithm in the sufficiently fast diagnosis of abdominal injuries. 3) To learn more about the typical and unusual findings of various abdominal traumatic conditions.

ABSTRACT

Abdominal injuries require a timely and reliable diagnosis in order to prevent the potentially lethal outcome. The armory of clinical tools (physical examination, lab tests) does not fulfill these criteria, since they are either not fast, or not reliable. Imaging diagnostic modalities help the clinician to acquire the necessary amount of information to initiate focused and effective treatment. However, the selection of the appropriate imaging algorithm, modality and technique, as well as the precise detection and interpretation of essential imaging findings are frequently challenging, especially because the circumstances, under which these examinations are performed (open wounds, bandages, non-removable life-supporting equipment, lack of patient cooperation, etc.), are frequently less than optimal. Knowledge of critical imaging signs, symptoms and the role they play in the evaluation of the patient's condition, but also fast decision-making and ability to closely cooperate with the clinicians are skills of key importance for radiologist members of the trauma team.

MSSR44B • The Enemy Within, Non-Traumatic Abdominal Emergencies

Ronald J Zagoria MD (Presenter)

LEARNING OBJECTIVES

1) Attendees will be able to better analyze CT scans for non-traumatic causes of abdominal pain. 2) Attendees will learn the CT signs and causes of bowel ischemia. 3) Attendees will learn the CT findings of common causes of an 'acute' abdomen. 4) Attendees will learn the imaging findings of acute, nontraumatic urinary tract and GI tract emergencies.

ABSTRACT

This segment of the course will go over the optimal imaging approach for patients presenting with acute abdominal pain. CT findings will be emphasized. Key imaging findings of nontraumatic causes of acute abdominal pain including gastrointestinal tract and urinary tract pathology will be explained. A systematic approach for the imaging evaluation of patients with abdominal emergencies will be illustrated and explained including proper scan protocols and analysis of imaging findings. Imaging diagnosis of urinary tract obstruction, infection, bowel obstruction, and ischemia will be emphasized.

MSSR44C • Interactive Case Discussion

Andras Palko MD, PhD (Presenter) * ; Ronald J Zagoria MD (Presenter)

LEARNING OBJECTIVES

1) Attendees will be able to better analyze CT scans for traumatic and non-traumatic causes of abdominal pain. 2) Attendees will learn the CT signs and causes of bowel ischemia and injuries. 3) Attendees will learn the CT findings of common causes of a traumatic and non-traumatic 'acute' abdomen. 4) Attendees will learn the imaging findings of acute, traumatic and nontraumatic urinary tract and GI tract emergencies.

ABSTRACT

Using cases and an audience response system, this segment of the course will go over the optimal imaging approach for patients presenting with acute abdominal pain and abdominal injuries. CT findings will be emphasized. Key imaging findings of traumatic and nontraumatic causes of acute abdominal pain including gastrointestinal tract and urinary tract pathology will be explained. A systematic approach for the imaging evaluation of patients with abdominal emergencies will be illustrated and explained including proper scan protocols and analysis of imaging findings. Imaging diagnosis of blunt and penetrating abdominal injuries, urinary tract obstruction, infection, bowel obstruction, and ischemia will be emphasized.

ASRT@RSNA 2013: The Role of the Radiologic Technologist in Patient Safety (HCIAC)

Wednesday, 03:40 PM - 04:40 PM • N230

QA

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MSRT43 • AMA PRA Category 1 Credit™:1 • ARRT Category A+ Credit:1

Kim M Mullan *
Lynn Bordlee-Rupp *

Donna L Long , RT
Liana M Watson , RT

LEARNING OBJECTIVES

1) Understand the need for and development of the white papers. 2) Appreciate the need for appropriate workplace staffing. 3) Comprehend the need for a workplace culture that improves the process of reporting errors and near misses. 4) Embraces a personal skills assessment and opportunities for continuous learning. 5) Recognize the value of collaborative applications training environment. 6) Develop processes from the recommendations and actions of the white paper.

ABSTRACT

Radiologic technologists are at the forefront of patient safety and quality. The tremendous growth in medical imaging has improved patient care in the United States and around the world. However, some risks and drawbacks have accompanied that growth. As researchers and regulatory, advocacy and clinical organizations continue to explore the issue of safety in medical imaging, they consider the delicate balance of effective diagnosis and treatment of disease with the required exposure to radiation or other potential hazards. Among strategies to improve radiation safety are justification, education and optimization of images and technique. The American Society of Radiologic Technologists and its partners recognize the critical role of the radiologic technologist in all aspects of medical imaging patient safety. This presentation will provide an overview of recommendations from the ASRT Foundation's Health Care Industry Advisory Council's Subcommittee on Patient Safety and Quality Medical Imaging with the primary focus on quality and safety in CT, computed radiography/digital radiography, along with all medical imaging specialties. Specific topics addressed will include the current state of medical imaging as well as challenges associated with providing consistently high-quality care and education on equipment and new and emerging technologies. The panel will also discuss the desired state for radiologic technologist workplaces to ensure consistent quality in patient care and to maximize education and understanding of equipment and new technology.

RSNA Resident and Fellow Symposium 2013: Career 102: Survival Skills for Your Job (An Interactive Session)

Wednesday, 04:00 PM - 05:45 PM • E451B

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ED

MSRP42 •AMA PRA Category 1 Credit™:1.75

Moderator

Aparna Annam , DO

LEARNING OBJECTIVES

1) To help recently graduated physicians make positive decisions to extend the scope and longevity of their individual careers as well as their professional communities.

ABSTRACT

MSRP42A • Fight for Your Right-The Importance of Advocacy

Aparna Annam DO (Presenter) ; **James H Thrall** MD (Presenter) *

LEARNING OBJECTIVES

View learning objectives under main course title.

MSRP42B • Stayin' Alive-Making Yourself Indispensable to Your Job

Richard E Sharpe MD, MBA (Presenter) ; **Norman J Beauchamp** MD (Presenter) *

LEARNING OBJECTIVES

View learning objectives under main course title.

MSRP42C • How To Dictate A Radiology Report-Is It What You Say or Don't Say?

Christina M Cinelli MD (Presenter) ; **George S Bisset** MD (Presenter)

LEARNING OBJECTIVES

View learning objectives under main course title.

MSRP42D • Panel Discussion

LEARNING OBJECTIVES

View learning objectives under main course title.

BOOST: Genitourinary Hands-on Contouring (In Cooperation with ASTRO)

Wednesday, 04:45 PM - 06:00 PM • S104B

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RO **OI** **GU**

MSRO49 •AMA PRA Category 1 Credit™:1.25 •ARRT Category A+ Credit:1.5

Co-Director

Fergus V Coakley , MD

Co-Director

Bruce G Haffty , MD

Mark K Buyyounouski , MD *

Jelle O Barentsz , MD, PhD

LEARNING OBJECTIVES

1) To use MRI in contouring local prostate cancer as well as pelvic lymph nodes.

ASRT@RSNA 2013: The Patient Experience - Our Shared Journey

Wednesday, 05:00 PM - 06:00 PM • N230

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QA **GN**

MSRT44 •AMA PRA Category 1 Credit™:1 •ARRT Category A+ Credit:1

Kevin Rush

LEARNING OBJECTIVES

1) Discussion of the six I♦s: A. Setting the goal B. Building the process through the six I♦s: a. Intentional b. Individual c. Interactive d. Interpret e. Inspirational f. Institute. 2) The Patient Profile a. Gathering the information b. Understanding the goal c. Assuming our role 3) On-Stage, Off-stage a. Barriers to implementation b. Remembering our role and our goal. 4) The Patient♦s Story a. Each individual has a story b. Journeys made.

ABSTRACT

It is assumed by most people that those individuals providing healthcare services do so because they have a desire to care for others. The vast majority of us in imaging and radiation therapy joined the field for that very reason. While that is our goal, many of us are often lost amidst the maze of technology and advanced techniques. We have aspirations of doing more for our patients and their families but we are somewhat stifled as to how we can provide care in a more personal or meaningful way. We seek to provide an atmosphere of technical excellence as well as caring and support. Each of us recognizes and understands that our patients do not make their journey through our departments alone. This presentation will discuss this journey and provide the methods we can implement to serve as our patients♦ guides through the system.

ASRT@RSNA 2013: Moving Towards Best Practice: Developing National Guidelines through a Collaborative Approach

Thursday, 08:00 AM - 09:00 AM • N230

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QA **LM** **HP**

MSRT51 • AMA PRA Category 1 Credit™:1 • ARRT Category A+ Credit:1
Mark Given, MRT, RT

LEARNING OBJECTIVES

1) An overview of best practice for medical radiation technologists in Canada. 2) A detailed overview of the processes used to develop the evidenced-based recommendations within each guideline. 3) An understanding of the collaborative approach used to vet the recommendations. 4) A brief tutorial on how to use the guidelines. 5) Discuss how the guidelines are being used to change practice.

ABSTRACT

Guidelines provide a tool to help individuals enhance their professional lives and keep up with changes in their field. The opportunity to develop best practice documentation for medical radiation technologists in Canada was identified as an important strategic step for the profession and a key component of the push to gain greater recognition. In 2010, the Canadian Association of Medical Radiation Technologists (CAMRT) assembled a multidisciplinary committee from across Canada to develop Best Practice Guidelines. Since that time, the group has been identifying and developing new guidelines for MRT professionals across Canada to use in their daily practice. The process of working with this diverse group and developing an interactive Best Practice Guidelines website has been an evolution from start to finish. It provides many lessons and innovations to share with those who wish to pursue this path in the future.

Case-based Review of Neuroradiology: Brain (An Interactive Session)

Thursday, 08:30 AM - 10:00 AM • S100AB

PD **NR**

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MSCN51 • AMA PRA Category 1 Credit™:1.5 • ARRT Category A+ Credit:1.5

Director

Pina C Sanelli, MD

LEARNING OBJECTIVES

1) Provide a review of imaging findings in adult brain pathologies highlighting key diagnostic features. 2) Review pertinent differential diagnostic considerations. 3) Provide important diagnostic imaging pearls and pitfalls.

MSCN51A • Adult Brain

Pina C Sanelli MD (Presenter)

LEARNING OBJECTIVES

View learning objectives under main course title.

MSCN51B • Pediatric Brain

Tina Y Poussaint MD (Presenter)

LEARNING OBJECTIVES

View learning objectives under main course title.

MSCN51C • Common Misdiagnoses

Pamela W Schaefer MD (Presenter)

LEARNING OBJECTIVES

View learning objectives under main course title.

Case-based Review of Pediatric Radiology: Pediatric Thoracic Imaging (An Interactive Session)

Thursday, 08:30 AM - 10:00 AM • S406A

PD **CH**

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MSCP51 • AMA PRA Category 1 Credit™:1.5 • ARRT Category A+ Credit:1.5

Director

Edward Y Lee, MD, MPH

MSCP51A • Congenital and Acquired Thoracic Vascular Disorders in Children

Lorna Browne MD, FRCR (Presenter)

LEARNING OBJECTIVES

1) Discuss 'segmental' approach to aid diagnosis of congenital cardiovascular anomalies. 2) Review imaging techniques. 3) Review clinical aspects and characteristic imaging findings of commonly encountered congenital and acquired cardiovascular diseases in children. 4) Review the common congenital heart disease surgical repairs and their most frequent complications.

MSCP51B • Thoracic Infections in Infants and Pediatric Patients

Ricardo Restrepo MD (Presenter)

LEARNING OBJECTIVES

1) Discuss the different imaging approach of tuberculosis in pediatric patients at different ages and the differential diagnosis. 2) Discuss parenchymal lung infections that present as cavitating lesions in children and their differential diagnosis. 3) Show several examples of unusual thoracic fungal infections in children. 4) Discuss differential diagnosis of chest wall infections in children and imaging approach. 5) Discuss round pneumonia, imaging findings, work up and differential diagnosis.

MSCP51C • Diffuse Lung Disease in Pediatric Population

Edward Y Lee MD, MPH (Presenter)

LEARNING OBJECTIVES

1) Discuss a new classification system of diffuse lung disease in pediatric population. 2) Review helpful clinical aspects and imaging findings of diffuse lung disease in children. 3) Learn characteristic HRCT imaging findings to narrow the differential diagnoses of diffuse lung disease in pediatric patients.

Essentials of Gastrointestinal Imaging

Thursday, 08:30 AM - 10:00 AM • S406B

GI

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MSES51 • AMA PRA Category 1 Credit™:1.5 • ARRT Category A+ Credit:1.5

MSES51A • Imaging of Inflammatory Bowel Disease

David J Grand MD (Presenter)

LEARNING OBJECTIVES

1) Understanding the role of enterography for imaging of inflammatory bowel disease. 2) Understand how to protocol and perform CT and MR Enterography examinations. 3) Understand the considerations involved in choosing which exam to perform. 4) Identify the findings and complications of inflammatory bowel disease on CT and MR Enterography.

ABSTRACT

CT and MR Enterography have become the most common imaging modalities used to evaluate inflammatory bowel disease. This presentation will discuss technical aspects of how to perform each exam as well as when to perform which exam. It will also demonstrate a simple, yet comprehensive approach to each study with special attention to common findings and complications of inflammatory bowel disease.

MSES51B • Multimodality Imaging and Management of Cystic Pancreatic Lesions

Koenraad J Morteale MD (Presenter)

LEARNING OBJECTIVES

1) To review the spectrum of cystic pancreatic tumors of the pancreas. 2) To review the multi-modality imaging pearls and perils to diagnose and differentiate cystic pancreatic tumors. 3) To review management guidelines for cystic pancreatic tumors.

ABSTRACT

Cystic pancreatic neoplasms are a diverse group of tumors which vary in aggressiveness from benign to dysplastic or pre-malignant to frankly invasive cancers. The true prevalence of pancreatic cystic lesions is unknown but has been previously reported to be between 2.4% and 25%. At the author's institution, Lee reported the prevalence of incidental pancreatic cystic lesions detected on MRI to be 13.5% and showed that both prevalence and cyst size increased with age. Since most cystic pancreatic lesions are neoplastic, accurate diagnosis via a combination of clinical information, imaging, and endoscopic ultrasound (EUS) with cyst fluid analysis is of utmost importance. The primary purpose of this review is to highlight the key imaging findings for a vast array of cystic pancreatic neoplasms. These include the relatively common ones: intraductal papillary mucinous neoplasm (IPMN), serous microcystic adenoma, and mucinous cystic neoplasm (MCN). Secondly, the radiological features of more rare ones, including cystic endocrine tumors, solid pseudopapillary tumor (SPT), cystic metastases, and lymphangiomas, will also be discussed. Finally, this article also provides a comprehensive management algorithm based on lesion size and patient's symptoms, with recommendations when to reimagine patients with those lesions.

MSES51C • Abdominal CT: Technical Advances for Improving Patient Safety

Sebastian T Schindera MD (Presenter) *

LEARNING OBJECTIVES

1) Understand how to optimize the radiation dose of abdominal CT protocols applying technical advances. 2) Understand how to optimize the contrast media injection protocol for different abdominal CT protocols. 3) Understand how to optimize abdominal CT protocols in obese patients.

ABSTRACT

Although CT is a powerful tool that has transformed the practice of medicine, the benefits are accompanied by important risks. Radiologists must understand these risks and the strategies available to minimize them as well as the risks associated with contrast medium delivery in abdominal CT. This presentation will address many of the issues that are related to ensuring patient benefit in abdominal CT, balancing the use of ionizing radiation and iodinated contrast media.

ASRT@RSNA 2013: Mastering Digital Radiography: CR and DR Exposures, Techniques and Doses

Thursday, 09:20 AM - 10:20 AM • N230

PH

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MSRT52 • AMA PRA Category 1 Credit™:1 • ARRT Category A+ Credit:1

Dennis Bowman *

LEARNING OBJECTIVES

1) Understand that hand images taken with both CR and DR equipment from 50-100 kV are all passable. 2) Describe the differences between film/screen and digital radiography. 3) Demonstrate understanding of the Exposure Index (EI) numbers and ranges of these numbers. 4) Identify what factors are needed to corrupt; an Exposure Index (EI) number. 5) Describe 3 different ways to critique a digital image. 6) Understand how Automatic Rescaling allows up to 100 times too much mAs to be used. 7) Explain the legal implications of changing algorithms and post processing collimation. 8) Recognize how much radiation dose can be saved using higher kV and lower mAs. 9) Analyze the new CR and DR Universal Technique Charts.

ABSTRACT

One of the main focuses of this talk will be to prove without a doubt that the Dose Index (DI) numbers that come up with both CR and DR are extremely reliable almost all the time. In fact they can barely be corrupted more than 75% regardless of the centering and collimation.

I will also cover the new high kV/low mAs techniques that should be used with all digital equipment. This means doing a minimum of the 15% Rule over what was used with f/s systems. Since dropping the radiation dose is one of the major topics, I will prove by increasing kV and dropping the mAs you can always decrease the radiation dose. We will also discuss my Universal Digital Technique Charts for both CR and DR systems as well as finding out if your facility is using the proper DI ranges according to your radiologists.

Additionally, there will be a section on the three ways to properly critique a digital image. Following that I will show how different brands of CR and DR react when too much mAs is used in an exposure. Also discussed will be the legal issues that concern radiographers, including reprocessing images with different algorithms and shuttering (post process collimation).

My goal is for you to be able to take this information back to your facility and immediately make changes in the way you expose and critique your images.

Case-based Review of Neuroradiology: Spine (An Interactive Session)

Thursday, 10:30 AM - 12:00 PM • S100AB

PD NR

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MSCN52 • AMA PRA Category 1 Credit™:1.5 • ARRT Category A+ Credit:1.5

Director

Pina C Sanelli, MD

MSCN52A • Adult Spine

Suresh K Mukherji MD (Presenter)

LEARNING OBJECTIVES

1) Review the common infectious processes of the adult spine. 2) Review the common inflammatory processes of the adult spine. 3) Review the common neoplastic processes of the adult spine.

ABSTRACT

1. Review the common infectious processes of the adult spine
2. Review the common inflammatory processes of the adult spine
3. Review the common neoplastic processes of the adult spine

MSCN52B • Pediatric Spine

Erin S Schwartz MD (Presenter)

LEARNING OBJECTIVES

1) Identify the key imaging features of various common pediatric spine diseases. 2) Identify the basic anatomic, physiologic and pathologic features of diseases affecting the pediatric spine. 3) Highlight primary imaging techniques used for assessment, clinical practice, problem-solving and patient management.

MSCN52C • Common Misdiagnoses

Gordon K Sze MD (Presenter)

LEARNING OBJECTIVES

1) To recognize common patterns for spine and spinal cord pathology and to organize these patterns into categories of diseases processes. 2) To be aware of subtle findings that can lead one to favor one category of disease over another. 3) To be able to differentiate MR artifacts from true pathology in the spine and spinal cord.

Case-based Review of Pediatric Radiology: Pediatric MSK Imaging (An Interactive Session)

Thursday, 10:30 AM - 12:00 PM • S406A

PD MK

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MSCP52 • AMA PRA Category 1 Credit™:1.5 • ARRT Category A+ Credit:1.5
Director
Edward Y Lee, MD, MPH

MSCP52A • Sport-related Injuries in Pediatric Population

Kirsten Ecklund MD (Presenter)

LEARNING OBJECTIVES

1) Attendees will learn to recognize common sports related injuries to the pediatric musculoskeleton. 2) Physical injury will be emphasized. Attendees will learn to distinguish normal physiologic physical appearance from pathology. 3) Practical aspects of pediatric musculoskeletal imaging will be discussed. Attendees will learn tips for efficient, high quality MR protocols for MSK trauma.

MSCP52B • Pediatric Musculoskeletal Benign and Malignant Neoplasms

Andrea S Doria MD (Presenter) *

LEARNING OBJECTIVES

1) Review the classification system of musculoskeletal pediatric masses (by tissue type). 2) Describe clinical aspects, imaging characteristics and differential diagnosis of pediatric benign and malignant masses according to histologic tissue. 3) Discuss imaging-pathologic correlation of pediatric masses according to histologic tissue.

ABSTRACT

A wide range of musculoskeletal tumors occurs in the pediatric population. Radiologists should be aware of the clinical and conventional imaging manifestations of these tumors in order to provide timely specialist referrals so that early diagnosis and treatment can be achieved. Improvements in clinical-imaging diagnosis and treatment have increased the survival of many children with malignant musculoskeletal tumors in the last decade. Recognizing specific imaging characteristics of benign and malignant masses is paramount for prompt narrowing of differential diagnoses. Imaging-pathologic correlation of neoplasms according to histologic type facilitates the understanding of the complexity, diversity and in vivo behaviour of several musculoskeletal tumors.

MSCP52C • Skeletal Dysplasia in Pediatric Patients

Teresa Victoria MD, PhD (Presenter)

LEARNING OBJECTIVES

1) To discuss available tools in the imaging armamentarium in order to evaluate the fetus with a presumed diagnosis of skeletal dysplasia. 2) To discuss a systematic approach to evaluate postnatal imaging findings of skeletal dysplasias. 3) To assess and interpret postnatal imaging findings with the goal of constructing a differential diagnosis.

Essentials of Genitourinary Imaging

Thursday, 10:30 AM - 12:00 PM • S406B

OB **GU**

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MSES52 • AMA PRA Category 1 Credit™:1.5 • ARRT Category A+ Credit:1.5

MSES52A • Incidentalomas of the Female Pelvis: How to Avoid Overdiagnosis Without Missing Cancer

Susanna I Lee MD, PhD (Presenter)

LEARNING OBJECTIVES

1) Assess the likelihood that an incidentally detected pelvic mass is cancer based on imaging features and clinical presentation. 2) Effectively and safely evaluate incidental adnexal masses with US, MRI and FDG-PET. 3) Identify and triage endometrial lesions that warrant further workup. 4) Recognize which ♦enlarged fibroid uterus♦ may be harboring a cancer.

ABSTRACT

MSES52B • Imaging of Non-Traumatic Abdominal Pain in the Pregnant Patient

Keyanoosh Hosseinzadeh MD (Presenter) *

LEARNING OBJECTIVES

1) Detail safety issues of US, CT and MR during pregnancy with discussion of the risks and benefits of the individual modalities. 2) Discuss imaging algorithm for the common non-obstetric and non-traumatic etiologies of abdominal pain in the pregnant patient with a focus on gastrointestinal, genitourinary and hepatobiliary disorders.

MSES52C • MR Imaging of GU Emergencies

John A Spencer MD (Presenter)

LEARNING OBJECTIVES

1) Unremitting maternal loin pain in pregnancy. 2) Assessment of indeterminate adnexal masses discovered on acute abdominal imaging.

ABSTRACT

Loin pain in pregnancy is not uncommon and may result from urinary tract infection or from hydronephrosis. Usually hydronephrosis results from 'physiological' causes and is almost universal in the third trimester, more pronounced on the right side. This not a true ureteric obstruction and differs from that due to obstruction from say a ureteric calculus. MR imaging allows confident distinction between these alternative diagnoses. With physiological hydronephrosis the ureter is extrinsically compressed between the psoas muscle and the gravid uterus. No renal oedema is present nor perinephric fluid as are present with genuine obstruction. Fast MR imaging using heavily T2 weighted 'water' sequences identifies the level of calibre change in the ureter and focussed high resolution T2 weighted imaging through this level defines the cause. T2 weighted or diffusion weighted imaging shows differential renal hydration. An obstructed kidney loses its normal corticomedullary pattern and shows cortical oedema. Calculi are shown as filling defects. Evaluation of painful hydronephrosis in pregnancy: magnetic resonance urographic patterns in physiological dilatation versus calculous obstruction. Spencer JA et al. J Urol 2004; 171: 256-260. As US is increasing bypassed in the imaging work up of the acute abdomen so an increasing number of young women with acute gynaecological conditions are found to have indeterminate pelvic findings on CT. Adnexal emergencies may produce challenging US findings and TVUS is often declined or poorly tolerated by women with pelvic peritonitis. Adnexal torsion and cyst accident (rupture or bleeding) have characteristic MR features. Acute pelvic bleeding may produce confusing features. Adnexal torsion: a multimodality imaging review. Wilkinson C & Sanderson A. Clin Radiol 2012; 67: 476-483. We will review these MR findings using a case based approach.

ASRT@RSNA 2013: Elbow and Forearm Trauma: Mechanisms of Injury and Patterns of Fractures

Thursday, 10:40 AM - 11:40 AM • N230

ER **MK**

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MSRT53 • AMA PRA Category 1 Credit™:1 • ARRT Category A+ Credit:1

Ken L Schreiber MD, PhD

LEARNING OBJECTIVES

1) Review the anatomy of the elbow joint in three dimensions. 2) Demonstrate the standard radiographic views of the elbow. 3) Discuss techniques for performing CT of the elbow. 4) Illustrate that the forearm is a ring, and show how specific mechanism of injuries yield specific fracture patterns. 5) Teach the four keys to looking at elbow radiographs.

ABSTRACT

Designed for non-radiologists and radiologists alike, this course explores elbow and forearm trauma, using multicolored 3-D images as well as dynamic illustrations. After reviewing the anatomy of the elbow joint, the presentation will show how this anatomy can be optimally imaged, both radiographically and with CT. Using a model of the forearm as a ring, the lecture will demonstrate how one common mechanism, the ♦Fall on Palm Heel♦ (FOPH), can cause a variety of fracture patterns, depending on how the forces travel up the forearm. This model will be used to illustrate and differentiate the classic forearm fractures, including both bone forearm fracture, Monteggia, Galeazzi and Essex-Lopresti. The presentation also will focus on the elbow joint, illustrating the radiographic appearance of common elbow injuries in adults and children, including non-displaced radial head supracondylar, lateral condylar, and medial epicondylar fractures. The ♦4 Keys♦ to assessing elbow radiographs are emphasized throughout the talk:

- 1) The radial head always points to the capitellum.
- 2) Fat pads are your friends.
- 3) The anterior humeral line passes through the middle third of the capitellum.
- 4) When in doubt, get the other side.

ASRT@RSNA 2013: Normalization of Deviance and Radiology

Thursday, 01:00 PM - 02:00 PM • N230

GN

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MSRT54 • AMA PRA Category 1 Credit™:1 • ARRT Category A+ Credit:1

Andrew P Woodward, MA, RT *
Melissa Jackowski, Ed.D, RT(R)(M)

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.

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.

Case-based Review of Neuroradiology: Head and Neck (An Interactive Session)

Thursday, 01:30 PM - 03:00 PM • S100AB

PD NR HN

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MSCN53 • AMA PRA Category 1 Credit™:1.5 • ARRT Category A+ Credit:1.5

Director
Pina C Sanelli, MD

MSCN53A • Adult Head and Neck

Laurie A Loevner MD (Presenter)

LEARNING OBJECTIVES

1) Emphasize pertinent anatomy in the adult neck as it pertains to image interpretation through well selected cases. 2) Generate succinct, well thought out differential diagnoses for a spectrum of head and neck lesions. 3) Identify important imaging findings that allow the radiologist to be specific about establishing 'the' diagnosis. 4) Avoid the common adult radiologic diagnostic pitfalls.

ABSTRACT

This session will evaluate a spectrum of pathologies encountered in the adult head and neck. The session will emphasize critical analysis of image findings which allow the radiologist to generate a succinct, short differential diagnosis, and in many instances, the correct diagnosis. There will be emphasis on correct anatomic localization of pathology in the head and neck, patterns of radiologic pathology, as well as management decisions that may include additional imaging studies, or clinical interventional.

MSCN53B • Pediatric Head and Neck

Nafi Aygun MD (Presenter)

LEARNING OBJECTIVES

1) Provide a short differential diagnosis for neck tumors in children in varying ages. 2) Recognize various congenital anomalies in the neck. 3) Manage neck emergencies effectively.

ABSTRACT

A review of various developmental, infectious and neoplastic conditions in the neck and skull base in children will be provided with a case-based approach with emphasis on key imaging findings that help in differential diagnosis.

MSCN53C • Common Misdiagnoses

Hugh D Curtin MD (Presenter)

LEARNING OBJECTIVES

1) Identify the most common areas where abnormalities are overlooked and will be able to identify subtle abnormalities at those locations. 2) Identify areas to search for additional diagnoses that must not be overlooked once a primary diagnosis is established.

Case-based Review of Pediatric Radiology: Pediatric Abdominal Imaging (An Interactive Session)

Thursday, 01:30 PM - 03:00 PM • S406A

PD GU GI

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MSCP53 • AMA PRA Category 1 Credit™:1.5 • ARRT Category A+ Credit:1.5

Director
Edward Y Lee, MD, MPH

MSCP53A • Congenital and Acquired Abdominal Masses in Pediatric Patients

Bernard F Laya DO (Presenter)

LEARNING OBJECTIVES

1) Discuss a systematic approach in the imaging evaluation of abdominal masses in children. 2) Review the typical imaging appearance of selected congenital and acquired abdominal masses in the pediatric population. 3) Discuss pitfalls in the diagnostic imaging of abdominal masses in children.

MSCP53B • Abdominal Vascular Anomalies and Abnormalities in Children

Arnold C Merrow MD (Presenter) *

LEARNING OBJECTIVES

1) Discuss the basic classification scheme of pediatric vascular anomalies, including vascular neoplasms and congenital vascular malformations. 2) Review helpful clinical features and imaging findings of vascular anomalies in children. 3) Discuss other abnormalities of pediatric abdominal vessels, including thrombosis, stenosis, and aneurysms.

ABSTRACT

MSCP53C • Abdominal Trauma in Children

Peter J Strouse MD (Presenter)

LEARNING OBJECTIVES

1) Describe mechanisms of abdominal trauma in children. 2) Discuss proper imaging algorithms for pediatric trauma patients. 3) Identify optimal CT protocols for abdominal trauma in pediatric patients. 4) Describe imaging findings in pediatric abdominal trauma.

ABSTRACT

The etiology of abdominal trauma in children includes, but is not limited to motor vehicle collisions, bicycle collisions, falls, sports injury and assault (child abuse). Although ultrasound may play a role in quick evaluation of the unstable patient for intraperitoneal hemorrhage, computed tomography (CT) remains the chief mode of evaluation of the hemodynamically stable child with suspected abdominal injury. CT for abdominal trauma is performed with intravenous contrast, but without an oral contrast preparation. Use of a multi-detector CT with very thin source images allows for near isotropic images with high quality sagittal and coronal reformatted images. 3D images, including dedicated pelvic reformats for pelvic fracture, are readily created. Systematic review of abdominal CTs performed for trauma increases sensitivity. Injuries to the liver, spleen, kidneys, pancreas and adrenal glands may occur. Severity of injury and/or the identification of active extravasation may alter management. Injuries to the gastrointestinal tract are uncommon, but may bear significant morbidity if not properly diagnosed. While free intraperitoneal gas may be seen with bowel injury, it is not uniformly seen and may rarely be caused by an alternative etiology. Children are more prone than adults to hypoperfusion complex. Gut hypoperfusion complex may be an indicator of tenuous patient stability. Injuries to the renal collecting system and bladder are rare, but when present require specific treatment. Diaphragm injury is rare. Large vessel vascular injury due to blunt abdominal trauma is uncommon in children, but may occur. Careful review of a trauma CT is not complete without a careful review of bone window images for skeletal fracture. Seatbelt injuries are more common in children than adults. Seatbelt injuries produce predictable but varied injuries to multiple structures. Younger children and infants may be the victim of child abuse. With child abuse, injury to any organ may occur.

ASRT@RSNA 2013: How Do We Make Care Patient-Centered?

Thursday, 02:20 PM - 03:20 PM • N230

LM GN

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MSRT55 • AMA PRA Category 1 Credit™:1 • ARRT Category A+ Credit:1
Brenda A Battle, RN, MBA

LEARNING OBJECTIVES

1) To provide the learner with an understanding of patient-centered care and examples of how integrating patient-centered care practices into the provision of care will enhance the patient experience. 2) To enable the learner to demonstrate practical skills in enhancing the patient experience. 3) To provide learner with an overview of the implications of patient-centered care on value-based care delivery.

ABSTRACT

Patient-centered care considers that patient care is not only focused on improving the overall quality of care, but more importantly places the focus of care on the patient. Determining what matters to the patient is the first step in a patient-centered approach to care delivery. Increasingly, attention is placed on the patient's judgement of the care received. Emphasis is also being placed on reimbursing care based on the patient's judgement of the delivery of care. The patient-provider relationship or encounter may be the determinant of the patient's perceptin of the treatment and the outcome of care. Patients want to communicate effectively with their provider. When good communication with the provider exists, patients report better outcomes. Providers who are not engaged in patient-centered care risk being judged adversely by patients. Providers should understand the tenets of patient-centered care delivery and the implications for the lack thereof.

Case-based Review of Neuroradiology: Interventional Image-based Diagnosis (An Interactive Session)

Thursday, 03:30 PM - 05:00 PM • S100AB

IR NR

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MSCN54 • AMA PRA Category 1 Credit™:1.5 • ARRT Category A+ Credit:1.5
Director
Pina C Sanelli, MD

MSCN54A • Spine Interventional

A. Orlando Ortiz MD, MBA (Presenter) *

LEARNING OBJECTIVES

1) A comfortable handle on the approach to the typical spine patient. 2) An understanding of the commonly present variations that can affect diagnostic or treatment outcome.

MSCN54B • Neurovascular Interventional

Michele H Johnson MD (Presenter) *

LEARNING OBJECTIVES

1) An understanding of the variety of endovascular interventions. 2) Comprehension of how diagnostic neuro-imaging affects intervention. 3) Knowledge of the common variations that can affect diagnostic or treatment outcome.

Case-based Review of Pediatric Radiology: Pediatric Pelvis Imaging (An Interactive Session)

Thursday, 03:30 PM - 05:00 PM • S406A

PD GU GI

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MSCP54 • AMA PRA Category 1 Credit™:1.5 • ARRT Category A+ Credit:1.5
Director
Edward Y Lee, MD, MPH

MSCP54A • Congenital and Acquired Scrotal Lesions in Children

Angelisa M Paladin MD (Presenter)

LEARNING OBJECTIVES

1) Review helpful clinical aspects and imaging characteristics of congenital and acquired scrotal lesions in children. 2) Learn characteristic imaging findings to narrow the differential of scrotal tumors.

MSCP54B • Adnexal Masses in Pediatric Patients

Mary R Wyers MD (Presenter)

LEARNING OBJECTIVES

1) Discuss imaging modality choices for evaluating the pediatric female pelvis. 2) Review characteristic imaging findings of adnexal masses in children and discuss differential diagnoses of various lesions which will be presented. 3) Discuss work up and management of adnexal masses in children.

MSCP54C • Bowel Disorders in Pediatric Population

Michael S Gee MD, PhD (Presenter)

LEARNING OBJECTIVES

1) Review the pathophysiology and characteristic imaging features of pediatric bowel disorders. 2) Discuss the pros and cons of different imaging modalities for evaluating bowel disorders in young patients.

ASRT@RSNA 2013: Improving Practice in Pediatric Skeletal Radiography

Thursday, 03:40 PM - 04:40 PM • N230

PD MK

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MSRT56 • AMA PRA Category 1 Credit™:1 • ARRT Category A+ Credit:1

LEARNING OBJECTIVES

1) Understand the main features of skeletal growth and development in childhood. 2) Understand how skeletal growth and development can result in predictable pathological appearances on radiographs that may inform image acquisition techniques. 3) Appreciate how normal variations in the juvenile skeleton can mask or mimic common pathologies and influence the interpretation of radiographic images. 4) Examine, through the use of case studies, the appropriateness of diagnostic radiography image acquisition techniques and image quality assessment criteria.

ABSTRACT

Children are an important patient group accounting for an estimated 20% of imaging examinations. Many published papers and authors have stated that imaging children requires a unique set of skills and knowledge as children are not little adults. Much of this literature explores psychosocial development in children, communication and interaction. However, radiographers working with children also need to have a good understanding of anatomical growth and development to improve image acquisition techniques and appreciation of the distinctive radiographic appearances associated with the juvenile skeleton. Using case studies from clinical practice, this presentation will explore how knowledge of skeletal development during childhood can prevent the misapplication of image acquisition techniques and quality assessment criteria and the misinterpretation of normal developmental variations.

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