

103rd Scientific Assembly and Annual Meeting

November 26 to December 1
McCormick Place, Chicago



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SPPH01

AAPM Medical Physics Tutorial Session 1

Saturday, Nov. 25 12:00PM - 2:00PM Room: E351

BR PH

AMA PRA Category 1 Credits™: 2.00
ARRT Category A+ Credits: 2.25

FDA Discussions may include off-label uses.

Participants

Thaddeus A. Wilson, PhD, Memphis, TN (*Moderator*) Nothing to Disclose

LEARNING OBJECTIVES

1) Present a coherent set of talks covering major women's imaging practices and technology with a look both at current practice as well as state of the art. 2) Present the information in a forum that includes a diverse audience of students, physicians, physicists and other imaging professionals. 3) Eventually translate this information if appropriate to enduring materials such as those found in the RSNA Radiographics journal under the Physics Tutorial series.

Sub-Events

SPPH01A Digital Breast Tomosynthesis

Participants

Andrew D. Maidment, PhD, Philadelphia, PA (*Presenter*) Research support, Hologic, Inc; Research support, Barco nv; Research support, Analogic Corporation; Spouse, Employee, Real-Time Tomography, LLC; Spouse, Stockholder, Real-Time Tomography, LLC; Scientific Advisory Board, Real-Time Tomography, LLC; Scientific Advisory Board, Gamma Medica, Inc

For information about this presentation, contact:

Andrew.Maidment@uphs.upenn.edu

LEARNING OBJECTIVES

1) Understand the fundamental principles behind tomosynthesis. 2) Analyze the differences between tomosynthesis, projection imaging, and computed tomography. 3) Explore the determinants of image quality. 4) Explain the factors that affect radiation dose. 5) Examine future trends in tomosynthesis.

ABSTRACT

Digital Breast Tomosynthesis (DBT) is rapidly becoming the standard of care for breast cancer screening and diagnosis. DBT is a form of computed tomography, in which a limited set of projection images are acquired over a small angular range and reconstructed into tomographic data. It is equally valid to treat DBT as the digital equivalent of classical tomography. DBT shares many common features with classical tomography, including the radiographic appearance, dose, and image quality considerations. In this lecture, we will contrast DBT to projection radiography, linear tomography, and CT in order to gain a better understanding of DBT as it is practiced today, and forecast how it might evolve in the future.

Active Handout: Andrew D.A. Maidment

http://abstract.rsna.org/uploads/2017/17001138/Active_SPPH01A.pdf

SPPH01B CT Breast Imaging

Participants

John M. Boone, PhD, Sacramento, CA (*Presenter*) Patent agreement, Isotropic Imaging Corporation; Consultant, RadSite;

LEARNING OBJECTIVES

1) To demonstrate the pendent geometry and scanner design for cone beam breast CT. 2) Show mathematical metrics comparing breast CT images with mammography and breast tomosynthesis. 3) Show observer performance comparisons, both computer and human, comparing breast CT with projection imaging of the breast.

SPPH01C TMIST Update

Participants

Martin J. Yaffe, PhD, Toronto, ON (*Presenter*) Research collaboration, General Electric Company; Founder, VOLPARA Technologies; Shareholder, VOLPARA Technologies; Co-founder, Mammographic Physics Inc

For information about this presentation, contact:

martin.yaffe@sri.utoronto.ca

LEARNING OBJECTIVES

1) The primary and secondary goals of the TMIST Trial. 2) How TMIST will be conducted. 3) The design of the Physics QC Program.

4) The specific QC tests, standards and approaches to problems.

SPPH01D Stereotactic Breast Biopsy

Participants

Ingrid Reiser, PhD, Chicago, IL (*Presenter*) Nothing to Disclose

For information about this presentation, contact:

ireiser@uchicago.edu

LEARNING OBJECTIVES

1) Understand the clinical role of stereotactic breast biopsy. 2) Understand the physical principle of conventional two-view stereotactic breast biopsy systems. 3) Understand the advantages and drawbacks of different system configurations. 4) Understand the principles of tomosynthesis-guided breast biopsy.

ABSTRACT

Breast core needle biopsy is a minimally invasive procedure used in the diagnosis of breast lesions. It is an established diagnostic breast imaging procedure, which can be performed in an outpatient setting and results in minimal trauma and no disfiguration of the breast, in comparison with open surgical biopsy. Stereotactic breast biopsy is mostly performed to assess lesions associated with microcalcifications, that are not visible on ultrasound. This tutorial describes the current clinical use of stereotactic breast biopsy, reviews conventional clinical systems and system configurations. It also describes the principles of tomosynthesis-guided breast biopsy.

SPGW01

NIH Grantsmanship Workshop

Saturday, Nov. 25 1:00PM - 5:00PM Room: E253AB

RS

ARRT Category A+ Credit: 0
AMA PRA Category 1 Credits™: 3.75

LEARNING OBJECTIVES

1) Gain greater understanding of the NIH grants process: a. Understand the process for preparing a research or training grant application. b. Learn the elements of a competitive grant application. 2) Gain insight into the new features of the NIH review process. 3) View the review process in action through a mock study section.

Sub-Events

SPGW01A Welcome and Introductory Remarks

Participants

Gayle E. Woloschak, PhD, Chicago, IL (*Moderator*) Nothing to Disclose

LEARNING OBJECTIVES

View Learning Objectives under main course title

SPGW01B Preparing an R01 Research Application

Participants

Maryellen L. Giger, PhD, Chicago, IL (*Presenter*) Stockholder, Hologic, Inc; Stockholder, Quantitative Insights, Inc; Shareholder, QView Medical, Inc; Co-founder, Quantitative Insights, Inc; Royalties, Hologic, Inc; Royalties, General Electric Company; Royalties, MEDIAN Technologies; Royalties, Riverain Technologies, LLC; Royalties, Mitsubishi Corporation; Royalties, Toshiba Medical Systems Corporation

LEARNING OBJECTIVES

View Learning Objectives under main course title

SPGW01C Preparing K Awards

Participants

Ruth C. Carlos, MD, MS, Ann Arbor, MI (*Presenter*) Nothing to Disclose

For information about this presentation, contact:

rcarlos@umich.edu

LEARNING OBJECTIVES

View Learning Objectives under main course title

Honored Educators

Presenters or authors on this event have been recognized as RSNA Honored Educators for participating in multiple qualifying educational activities. Honored Educators are invested in furthering the profession of radiology by delivering high-quality educational content in their field of study. Learn how you can become an honored educator by visiting the website at: <https://www.rsna.org/Honored-Educator-Award/> Ruth C. Carlos, MD, MS - 2015 Honored Educator

SPGW01D Clinical Trials in Applications

Participants

Michael W. Vannier, MD, Chicago, IL (*Presenter*) Nothing to Disclose

LEARNING OBJECTIVES

View Learning Objectives under main course title

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SPGW01E Program Perspectives

Participants

David George, PhD, Bethesda, MD (*Presenter*) Nothing to Disclose

LEARNING OBJECTIVES

View Learning Objectives under main course title

Active Handout:David George

http://abstract.rsna.org/uploads/2017/17002352/Active_SPGW01E.pdf

SPGW01F The Process of Review

Participants

Gayle E. Woloschak, PhD, Chicago, IL (*Presenter*) Nothing to Disclose

LEARNING OBJECTIVES

View Learning Objectives under main course title

SPGW01G Mock Study Section

Participants

Gayle E. Woloschak, PhD, Chicago, IL (*Presenter*) Nothing to Disclose

Maryellen L. Giger, PhD, Chicago, IL (*Presenter*) Stockholder, Hologic, Inc; Stockholder, Quantitative Insights, Inc; Shareholder, QView Medical, Inc; Co-founder, Quantitative Insights, Inc; Royalties, Hologic, Inc; Royalties, General Electric Company; Royalties, MEDIAN Technologies; Royalties, Riverain Technologies, LLC; Royalties, Mitsubishi Corporation; Royalties, Toshiba Medical Systems Corporation

Ruth C. Carlos, MD, MS, Ann Arbor, MI (*Presenter*) Nothing to Disclose

Michael W. Vannier, MD, Chicago, IL (*Presenter*) Nothing to Disclose

Elizabeth A. Krupinski, PhD, Atlanta, GA (*Presenter*) Nothing to Disclose

For information about this presentation, contact:

ekrupin@emory.edu

rcarlos@umich.edu

LEARNING OBJECTIVES

1) Understand how an NIH review session takes place.

ABSTRACT

To understand how an NIH review session takes place.

Honored Educators

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<https://www.rsna.org/Honored-Educator-Award/> Ruth C. Carlos, MD, MS - 2015 Honored Educator
Michael W. Vannier, MD - 2015 Honored Educator
Elizabeth A. Krupinski, PhD - 2017 Honored Educator

SPGW01H Questions to the Faculty

Participants

Gayle E. Woloschak, PhD, Chicago, IL (*Presenter*) Nothing to Disclose

LEARNING OBJECTIVES

View Learning Objectives under main course title

SPGW01I Summary

Participants

Gayle E. Woloschak, PhD, Chicago, IL (*Presenter*) Nothing to Disclose

LEARNING OBJECTIVES

View Learning Objectives under main course title

SPPH02

AAPM Medical Physics Tutorial Session 2

Saturday, Nov. 25 2:15PM - 4:15PM Room: E351

BR PH

AMA PRA Category 1 Credits™: 2.00
ARRT Category A+ Credits: 2.25

Participants

Thaddeus A. Wilson, PhD, Memphis, TN (*Moderator*) Nothing to Disclose

LEARNING OBJECTIVES

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Sub-Events

SPPH02A Ultrasound Breast Imaging

Participants

Wendie A. Berg, MD, PhD, Pittsburgh, PA (*Presenter*) Nothing to Disclose

For information about this presentation, contact:

wendieberg@gmail.com

LEARNING OBJECTIVES

1) Review technical aspects of breast ultrasound including harmonic imaging. 2) Discuss clinical uses of breast ultrasound in diagnostic breast imaging including evaluation of lumps, nipple discharge, and pain. 3) Consider approaches to use of ultrasound to screen for breast cancer, including whole breast ultrasound.

SPPH02B MRI Breast Imaging

Participants

Donna M. Reeve, MS, Houston, TX (*Presenter*) Nothing to Disclose

For information about this presentation, contact:

dmreeve@mdanderson.org

LEARNING OBJECTIVES

1) Understand breast MR imaging objectives, challenges and technical requirements. 2) Review breast MRI protocols, acquisition criteria and protocol optimization. 3) Describe common image quality problems, including artifacts.

SPPH02C Contrast Enhanced Mammography

Participants

John M. Lewin, MD, Denver, CO (*Presenter*) Consultant, Hologic, Inc; Consultant, Novian Health Inc

For information about this presentation, contact:

lewinjz@gmail.com

LEARNING OBJECTIVES

1) Explain the rationale behind the use of dual-energy subtraction for contrast-enhanced mammography. 2) Explain the physical principles underlying dual-energy subtraction for contrast-enhanced mammography and how to obtain optimal images. 3) Discuss the clinical studies comparing contrast-enhanced mammography to MRI and other modalities.

ABSTRACT

Contrast-enhanced digital/spectral mammography (CEDM, CESM) is an FDA approved, clinically utilized modality for breast cancer detection. The technique utilizes an intravenous injection of a standard FDA approved iodinated contrast agent combined with dual-energy subtraction mammography. The dual-energy subtraction greatly increases the visibility of the contrast agent by subtracting out the 'structured noise' of the image (i.e., the equalizing the density of the fibroglandular tissue and the fat). CEDM/CESM has been shown to have diagnostic performance superior to standard digital mammography and approximately equal in performance to contrast-enhanced breast MRI when tested on subjects with a known breast cancer. Other small studies have shown usefulness for diagnostic (problem solving) applications and evaluating treatment effect in neoadjuvant chemotherapy. Studies testing the technique for other applications, such as high-risk screening, are in progress.

SPPH02D Molecular Breast Imaging

Participants

Michael K. O'Connor, PhD, Rochester, MN (*Presenter*) Royalties, Gamma Medica, Inc

For information about this presentation, contact:

mkoconnor@mayo.edu

LEARNING OBJECTIVES

1) Understand the technical aspects of molecular breast imaging. 2) Compare the strengths and weakness of molecular breast imaging with other breast imaging modalities. 3) Understand the potential applications for molecular breast imaging in the diagnostic and screening environments.