Opening Session
Sunday, Nov. 29 8:30AM - 10:15AM Location: Arie Crown Theater

OT
AMA PRA Category 1 Credits ™: 1.75
ARRT Category A+ Credits: 1.50

Participants
Ronald L. Arenson, MD, San Francisco, CA (Presenter) Nothing to Disclose
John M. Boone, PhD, Sacramento, CA (Presenter) Research Grant, Siemens AG Research Grant, Hologic, Inc Consultant, Varian Medical Systems, Inc
Kenneth L. Pierce, MD, Oak Lawn, IL (Presenter) Nothing to Disclose

Sub-Events

PS10A Presentation of the Outstanding Educator Award
Participants
Kay H. Vydareny, MD, Tucson, AZ (Presenter) Nothing to Disclose

PS10B Presentation of the Outstanding Researcher Award
Participants
G. Scott Gazelle, MD, PhD, Boston, MA (Presenter) Consultant, General Electric Company Consultant, Marval Biosciences Inc

PS10C President’s Address: Going Boldly into Radiology’s Technological Future: Why Our Profession Must Embrace Innovation
Participants
Ronald L. Arenson, MD, San Francisco, CA (Presenter) Nothing to Disclose
William P. Dillon, MD, San Francisco, CA (Presenter) Nothing to Disclose

Abstract
With growing populations of patients in need of care and rapid increases in recent years in the availability and utilization of imaging, health systems around the world are turning more and more to radiology as a key component of the services they deliver. Coupled with growth in demand is stunning technological innovation in radiology. With radiologists now busy as ever and working on the cusp of one of the most exciting eras ever in the development of information technology, we must ask ourselves: Are we harnessing our capacity for innovation and technology development in the right ways? As health systems look to us increasingly for answers, what will our profession deliver to them? From PACS to advanced image processing to reduce radiation dose, information technology (IT) has been critical to the advance of radiology. Now we are experiencing new developments in IT, including clinical decision support, computer aided radiology and advanced systems for improved workflow and efficiency. Soon, resources we once thought of as “futuristic” will appear, including expanded artificial intelligence, sophisticated extraction of information (data mining) from the medical record and dramatic improvements in image quality and usage. Exciting new concepts in radiology, such as hyperpolarized carbon 13, steerable catheters and the use of intraluminal filters, will radically change the way we view our work. All the promise of medicine as practiced in “Star Trek” seems headed our way. The potential positive impact of all of this on patients is immense, but achieving it means embracing innovation in new ways, and working as a profession to ensure that technological change is managed effectively.

PS10D Dedication of the Special Lecture to the Memory of Joseph N. Gitlin, DPH (1927-2014)
Participants

PS10E Special Lecture: Radiology, Medicine, and Healthcare: Will Inaction or Innovation Determine Our Future?
Participants
Darrell G. Kirch, MD, Washington, DC (Presenter) Nothing to Disclose
Ronald L. Arenson, MD, San Francisco, CA (Presenter) Nothing to Disclose

Abstract
Today’s political, economic, and health realities present significant opportunity to shape the United States health care system so it achieves the triple aim-providing better care for individuals and populations at reasonable cost. The U.S. health care system has entered a period of massive transformation, and national approaches to patient care, education, and research will need to adapt to the changing health care landscape. This plenary session will highlight the political and economic realities facing U.S. health care, including shifts away from fee-for-service toward population-based payments in health care financing, reductions in clinical revenue, stagnant research funding, and a demand for new approaches in medical education. In a time of enormous change in health care, physicians are challenged to provide sufficient leadership to manage changing practices. Unfortunately, many physicians today are embedded in a traditional culture of medicine—one that is hierarchical, autonomous, competitive, individualistic, and expert-centric. Evidence is beginning to demonstrate that this culture, which conflicts directly with the health care desires of patients in the 21st century, can have negative outcomes for patient care. Unless a major cultural shift can occur, this traditional approach will have serious repercussions for the future of health care. Successful transformation will require both innovation and a new kind of leader. This plenary session will highlight the critical success factors for health care leaders in this transformative
Clinical care in the 21st century requires new leaders who will foster a culture that is collaborative, team-based, service-based, mutually accountable, and patient-centered. Tomorrow's physicians will need to adapt to-and even create-disruptive innovations in operating models, clinical care, education, and technology. Whether in independent group practice or as part of a large health system, radiologists, other health care providers, and their institutions will need to develop innovative and forward-thinking operating models for cost and quality performance to ensure long-term sustainability. Physicians of tomorrow must accept that they are stewards and leaders of this transformation.
Participants
Ronald L. Arenson, MD, San Francisco, CA (Presenter) Nothing to Disclose

Sub-Events

PS12A  Report of the RSNA Research and Education Foundation

Participants
Burton P. Drayer, MD, New York, NY (Presenter) Advisor, Hologic, Inc

Abstract
The RandE Foundation - Our Future is Now This year marks the 100th anniversary of the RSNA’s founding. As radiology looks toward the future, one wonders what the next 100 years will look like for our specialty and whether the central role of radiologists in healthcare will be sustained. Analogous to our clinical radiology mantra, if we are not at the radiology research table we will be on the menu. As a leading global force in radiology, the RSNA is poised to lead the specialty into the next century and exceed the incredible success of the past 100 years. The RandE Foundation will play a key role in radiology’s future by continuing its support of inspiring investigators and those pursuing innovative approaches to education. To meet these research and education needs head-on, the Foundation launched Inspire-Innovate-Invest, The Campaign for Funding Radiology's Future® at last year's annual meeting. This bold campaign seeks to raise $17.5 million to fund grants in radiologic research and education, bridging the gaps in funding for promising investigators and educators. To date our campaign has been a success with individuals, private practice and corporate donors generously pushing us to the mid-way point in our goal. There is still a long way to go. The future of our specialty depends on the commitment and generosity of each of us, the members of the imaging community. This year, the Foundation will fund 92 grants totaling $3.6 million. The RandE is funding 25% of our ever increasing number of excellent grant applications. While pleased with these achievements, imagine what the RandE Foundation could fund with additional support from all of us as radiology colleagues? During the meeting week, please take time to visit the RandE Foundation Booth, located on Level 3 of Lakeside Center to learn more about how you can be a part of the campaign and support the RandE Foundation and the future robustness of our specialty.

PS12B  Image Interpretation Session

Participants
Jonathan B. Kruskal, MD, PhD, Boston, MA (Presenter) Author, UpToDate, Inc
Donald P. Frush, MD, Durham, NC (Presenter) Nothing to Disclose
Bruce B. Forster, MD, Vancouver, BC (Presenter) Travel support, Siemens AG; Travel support, Toshiba Corporation;
Christine M. Glastonbury, MBBS, San Francisco, CA (Presenter) Author with royalties, Reed Elsevier
Michelle M. McNicholas, MD, Dublin, Ireland (Presenter) Nothing to Disclose
Melissa L. Rosado De Christenson, MD, Kansas City, MO (Presenter) Author, Thieme Medical Publishers, Inc; Author, Reed Elsevier; Author, American Registry of Pathology; Author, Oxford University Press; ; ;
Jorge A. Soto, MD, Boston, MA (Presenter) Nothing to Disclose

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/

Melissa L. Rosado De Christenson, MD - 2012 Honored Educator
Jorge A. Soto, MD - 2013 Honored Educator
Jorge A. Soto, MD - 2014 Honored Educator
Jorge A. Soto, MD - 2015 Honored Educator
Jonathan B. Kruskal, MD, PhD - 2012 Honored Educator
Abstract

For the last hundred years innovation has been synonymous with technological advancements. In the healthcare space we saw innovation in the creation of the first x-ray machine, first multi-slice CT scanner and first silent MRI. Yet as the world becomes increasingly interconnected, innovation has begun to mean different things and seemingly simple things such as a low cost infant warmer have become the future of innovation.

As we look towards the future, how will innovation change? We must be thoughtful about our investments and move away from creating technology just because we can. This is why it is critical for companies to work together with customers, governments, communities and NGOs, to innovate around what is needed to improve the health of millions around the world. GE and GE Healthcare are invested partners with our customers, working to innovate and drive the outcomes necessary for the future of healthcare. Together, we will continue to innovate and create the right technology that advances Radiology and healthcare for the next 100 years.
**PS30A** Presentation of the Gold Medal of the Radiological Society of North America

**Participants**
Ronald L. Arenson, MD, San Francisco, CA (*Presenter*) Nothing to Disclose

**Sub-Events**

**PS30B** Dedication of the Annual Oration in Diagnostic Radiology to the Memory of Byron Gilliam Brogdon, MD (1925-2014)

**Participants**
Hedvig Hricak, MD, PhD, New York, NY (*Presenter*) Nothing to Disclose
Robert A. Novelline, MD, Boston, MA (*Presenter*) Nothing to Disclose
Steven E. Seltzer, MD, Boston, MA (*Presenter*) Nothing to Disclose

**PS30C** Annual Oration in Diagnostic Radiology: Trends and Developments Shaping the Future of Radiology

**Participants**
James H. Thrall, MD, Boston, MA (*Presenter*) Board Member, Mobile Aspects, Inc; Board Member, WorldCare International Inc; Consultant, WorldCare International Inc; Shareholder, Antares Pharma, Inc; Shareholder, iBio, Inc; Shareholder, Peregrine Pharmaceuticals, Inc
Jon A. Jacobson, MD, Ann Arbor, MI (*Presenter*) Consultant, BioClinica, Inc; Royalties, Reed Elsevier

**Abstract**

Three categories of innovation will shape future directions in radiology: continued development of imaging technologies, parallel developments in infrastructure, most importantly in computer analytics, and information and communications systems and the development and application of the imaging correlates of precision medicine. Continued substantial improvements in the spatial and temporal resolution of existing imaging methods coupled with more efficient detector technologies and analytical capabilities will support the increased use of parametric imaging—the imaging of function, the use of imaging to detect and portray physiology and cellular and molecular events. These attributes will result in new applications and in wider use of imaging methods clinically. They will also make imaging methods more valuable and relevant in basic research and imaging methods will be ever more widely adopted by scientists outside of traditional radiology research domains. Improvements in x-ray based imaging will result in reductions in radiation exposure to the point that radiation dose will no longer be a topic of concern or controversy. Phase contrast imaging with x-rays is likely to be the next entirely new imaging method in clinical practice and has the potential to reduce radiation doses by 10-to-100 fold or more. In the era of "big data," no discipline in medicine will have opportunities that rival or surpass those we will have in radiology. We will use computer data mining and analysis techniques to turn "dumb" data into knowledge that can be delivered in real time at the point of care—just-in-time — for both radiologists and referring physicians. Data will inform development of better appropriateness criteria which will be immediately available to ordering providers and their patients. Borders will blur between concepts of information and communications systems and strong analytic and image processing capabilities will be incorporated directly into diagnostic work stations for key stroke access to advanced functions. The term "teleradiology" will become obsolete because of ubiquitous wide area networking capabilities worldwide. Advances in the foregoing areas will underpin radiology’s participation in the era of precision medicine, also called personalized medicine. The fundamental principle of precision medicine is definition of ever smaller more precise sub groups of patients with similar characteristics who are likely to benefit from the same therapies and have similar prognoses. Imaging phenotypes—i.e. systems for scoring, categorizing or classifying disease presence and severity—based on imaging biomarkers will help define these "precise" subpopulations. Linkages between patient genotype and imaging phenotypes will also be important for surveillance of disease manifestation, assessment of disease extent and discovery of genetic polymorphisms. Positive consequences of future developments in imaging include new applications with higher medical value, reduced radiation doses, more appropriate utilization and more efficient use of health care resources. Challenging consequences of future developments include vastly increased complexity in radiology practice with associated increased educational requirements especially in parametric imaging. There will be unremitting competition for "ownership" of imaging methods between specialties in clinical practice and in research.

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Jon A. Jacobson, MD - 2012 Honored Educator
Announcement of Education Exhibit Awards

Participants
Ronald L. Arenson, MD, San Francisco, CA (Presenter) Nothing to Disclose

Annual Oration in Radiation Oncology: NRG Oncology and the National Cancer Institute’s National Clinical Trials Network: A Case Study for Innovation in Multi-Disciplinary Cancer Research

Participants
Walter J. Curran JR, MD, Atlanta, GA (Presenter) Committee member, Bristol-Myers Squibb Company; Committee member, AstraZeneca PLC
Nina A. Mayr, MD, Seattle, WA (Presenter) Nothing to Disclose

Abstract
The National Cancer Institute (NCI) modified its publicly funded cancer research program from a system of ten groups with cooperative agreements, some of which dated back to the 1950's, to a network of five groups beginning in March 2014. The new network, known as the National Clinical Trials Network (NCTN), builds on the decades of practice-defining success of the cooperative groups and also seeks to be responsive to issues raised by the Institute of Medicine (IOM) in 2010. The IOM raised concerns that the cooperative groups were too slow to respond to new scientific discoveries, too cumbersome as an infrastructure, and too underfunded. The IOM also praised the groups for their remarkable accomplishments despite these obstacles. NRG Oncology is one of the five new NCTN groups and arose from the cooperation between three legacy cooperative groups: the National Surgical Adjuvant Breast and Bowel Project (NSABP), the Radiation Therapy Oncology Group (RTOG), and the Gynecologic Oncology Group (GOG). NRG Oncology focuses its clinical and translational research efforts on patients afflicted with malignancies in one of these seven cancer disease site categories: brain tumors, head and neck cancers, lung cancers, breast cancers, gastrointestinal cancers, and genitourinary cancers, and gynecologic cancers. The means by which NRG Oncology develops and executes practice-defining research for such patients on a global basis will be discussed.
Participants

Sub-Events

**PSS0A** RSNA/AAPM Symposium: PET/MR Imaging: Translation to Practice

Participants
Paul E. Kinahan, PhD, Seattle, WA (Moderator) Research Grant, General Electric Company; Co-founder, PET/X LLC

**LEARNING OBJECTIVES**

1) Describe the motivations underlying dual-modality PET/MR imaging systems. 2) Describe the role of PET/MR imaging in clinical practice and research studies. 3) List the challenges and potential solutions of advanced PET/MR imaging.

**PSS0B** PET/MR Imaging in Practice: A Clinical Perspective

Participants
Jonathan E. McConathy, MD, PhD, Saint Louis, MO (Presenter) Research Consultant, Eli Lilly and Company; Research Consultant, Blue Earth Diagnostics Ltd; Research Consultant, Siemens AG; Research support, GlaxoSmithKline plc

**LEARNING OBJECTIVES**

View learning objectives under main course title.

The advent of integrated PET/MRI systems suitable for clinical use represents a major technological advance and a new frontier in multi-modality imaging. Advantages of integrated PET/MRI include reduced radiation exposure, high soft tissue contrast, motion correction, and advanced MR techniques coupled with the power of molecular imaging with PET acquired in a single session. These characteristics of PET/MRI are well suited to a range of applications in oncologic, neurologic, and cardiovascular imaging. However, important issues including cost versus patient benefit, added complexity, quantitative accuracy, and physician training need to be addressed before PET/MRI becomes widely used for routine clinical imaging. This presentation will provide an update and overview of the current as well as potential future uses of clinical PET/MRI with a focus on oncology. Promising applications for oncologic imaging including pediatric populations, neuro-oncology, lymphoma, colorectal cancer, cervical cancer, prostate cancer, and multiple myeloma will be discussed. Key aspects of imaging protocols, study interpretation, limitations, and future directions based on our clinical experience as well as results from other centers will be emphasized.

**PSS0C** PET/MR Imaging in Practice: A Research Perspective

Participants
Bruce R. Rosen, MD, PhD, Charlestown, MA (Presenter) Research Consultant, Siemens AG

**LEARNING OBJECTIVES**

View learning objectives under main course title.

**Abstract**

The field of molecular imaging has grown at a rapid rate in recent years, as imaging technologies enable ever-finer examination of the human brain and other organs, and as clinicians and researchers alike seek to understand the mechanisms that underlie conditions such as cancer, heart disease, brain disorders and diabetes. Early detection of disease and monitoring of potential therapeutic interventions requires technology sensitive to the subtle changes that occur at the cellular and molecular level. PET and MRI are widely used in vivo for both clinical and research applications. Used with novel MR, nuclear, and multimodal probes, these imaging modalities have begun to revolutionize the types of questions that can be asked in vivo, permitting examination of physiological and pathological functions in living cells, tissues, and organs at their most basic level. Used in combination, the individual strengths of MRI and PET can inform one another to yield new insights that expand the types of physiological information that can be gained through in vivo imaging and thus also expand the impact of human health imaging by enlarging the window of anatomical size, time scales, resolution, sensitivity, and specificity of detection for which imaging is currently used. Combined MR-PET imaging technology allows investigators to employ the benefits of MRI such as phased array coils for high speed, high resolution functional imaging, while simultaneously acquiring quantitative metabolic or receptor-specific neurochemical data. Simultaneous MR-PET imaging has the distinct advantage of spatial co-registration of biochemical function with anatomical structure. Perhaps more importantly, MR-PET allows researchers to temporally co-register physiological data using PET and functional MRI (fMRI), such that the hemodynamic information from fMRI may be used to feed quantitative analysis of PET data. Using this information, researchers can understand the interplay between blood flow, receptor occupancy, and metabolism as well as the contributions of each in disease and therapy response. As such, combined MR-PET has significant clinical potential to impact not only all aspects of patient care, from screening to disease assessment and therapy monitoring, but also to lead to new dual-modality MR-PET probes that can provide complementary information for precise quantitative assessment of biological function not obtainable in other ways.