‘Our promise, our future,’ Ted DeWeese, MD, FASTRO, delivers Presidential Address

The world is aging rapidly. In the United States, 25% of the population will be older than 65 within 25 years. After noting that cancer is a disease of aging, Dr. DeWeese introduced the talented, multidimensional doctor Lewis Thomas, MD. Dr. Thomas developed a paradigm for effectively treating disease at a lower cost, and Dr. DeWeese argued medicine – and radiation oncology specifically – would do well to learn from and more widely implement this model.

Highlighting the groundbreaking work of several colleagues, Dr. DeWeese said that next generation treatment can be faster and more effective – and it is possible that such treatment can also be cheaper. Radiation therapy is 9% of the U.S. cancer spend this year. The total global cancer spend for the year will be a staggering $1 trillion. So a terribly important question remains: How can we better serve patients in the most efficient way possible?

Dr. DeWeese offered helpful suggestions for a path forward, including working with ASTRO’s sister organizations, fostering diversity, meeting patients where they are and continuing to question best practices and the particular outcomes we want as a field. “It requires innovation and collaboration to get there,” Dr. DeWeese said. “This is what’s possible when we collaborate, we can move forward and cure the incurable.”

The final day of the ASTRO Annual Meeting will feature an inspirational closing session, Cancer Breakthroughs, the result of collaboration with four of the major oncology associations to share their key science from meetings throughout 2019. This session will highlight the most important breakthroughs in cancer research and the potential breakthroughs on the horizon. Join us Wednesday, September 18, from 9:15 a.m. to 11:00 a.m., in Room W375A/B/C/D.

Moderated by Lisa Kachnic, MD, FASTRO, and Theodore DeWeese, MD, FASTRO, the session gets under way at 9:15 a.m. with scientific reviews from ASCO, featuring Lori Pierce, MD (9:20 a.m.), AACR, featuring Robert Den, MD (9:45 a.m.), AAPM, featuring Kristy Brock, PhD (10:10 a.m.), and RRS, featuring David Kirsch, MD, PhD, FASTRO (10:35 a.m.).

Some of the topics include a Phase III trial of premenopausal HR+/HER2- advanced breast cancer patients treated with endocrine therapy; a dose escalation trial of the Wee1 inhibitor AZD1775; multiparametric breast MRI radiomics; and FLASH radiation therapy.

Attendees can earn up to 1.75 AMA PRA Category 1 Credits™ for attending this session. Watch for Thursday’s digital daily email for a detailed recap of the breakthroughs highlighted during this session.

Learn more at the AstraZeneca booth

ASTRO Daily News 2019 Issue Number 2 | Tuesday/Wednesday Edition

Press Highlights

SUNDAY NEWS BRIEFING

Nanoinvasive radiation treatment offers long-term benefits to patients with high-risk heart arrhythmias

Clifford Robinson, MD, Washington University School of Medicine in St. Louis, et al.

Treating high-risk heart patients with a single, high dose of radiation therapy can dramatically reduce episodes of rapid, abnormal heartbeats for more than two years, according to a study by Clifford Robinson, MD, and colleagues.

In collaboration with Phillip Cuschill, MD, associate professor of cardiology and radiation oncology at the Washington University School of Medicine in St. Louis, Dr. Robinson and his team developed a nanoinvasive, outpatient procedure for treating ventricular tachycardia VT called EP-guided nanoinvasive cardiac radioablation (ENCORE). This novel therapy fuses electrical and imaging data to pinpoint scar tissue in the patient’s heart responsible for arrhythmias, then targets it with a single dose of stereotactic body radiation therapy. ENCORE requires no general anesthesia and allows patients to go home immediately after treatment.

PACIFIC survival rates explained

Andreas Remmele, MD, Memorial Sloan Kettering Cancer Center, et al.

A new analysis of survival data for the randomized, Phase III PACIFIC trial finds adding the immunotherapy drug durvalumab to radiation and chemotherapy significantly decreased the recurrence of lung cancer, both in the chest area and in distant sites outside the chest. The update provides greater insight into the landmark study that changed the standard of care for patients with stage 3 uncontrolled non-small-cell lung cancer (NSCLC).

In an independent evaluation of the patterns of disease progression for 731 patients randomized to durvalumab (n=367) or placebo (n=364) after completing 24 cycles of chemotherapy, 11.5% of patients in the placebo group experienced progression of disease in the chest area versus 6.8% of patients in the durvalumab group. Among patients with distant disease outside the chest, 11.5% of placebo patients experienced progression of disease compared with 7.3% of patients treated with durvalumab.

In both the chest and distant sites, the rate of progression was 52% lower in the durvalumab group compared with placebo. The benefit was large across all patient subgroups, including patients with good performance status and high-volume distant disease.

For more information, visit pacific-trial.com.
chemoradiation, researchers found the immunotherapy drug greatly reduced the spread of cancer to other parts of the body.

AI can predict radiation treatment side effects for patients with head and neck cancer.

Jay Reddy, MD, PhD, The University of Texas MD Anderson Cancer Center, at.al.

For the first time, a machine-learning algorithm predicted side effects for head and neck cancer. The model had an accuracy of 0.62.

This precision oncology approach has the potential to better identify patients who might benefit from chemoradiation that may help prevent significant weight loss after treatment or reduce the need for feeding tube placement.

The model fell short of predicting unplanned hospitalizations with sufficient clinical validity (0.46) but predicted 95% of significant weight loss (AUC = 0.751) and need for feeding tube placement (AUC = 0.755) with a high degree of accuracy.

This study highlighted how machine learning can be used for more personalized approaches to cancer treatment.

Women's health clinic closures associated with higher cervical cancer mortality and lower screening rates.

Amar, Varun, MD, MPH, Washington University School of Medicine in St. Louis, et.al.

Following the closure of nearly 100 women's health clinics across the United States from 2010 to 2013, more women were diagnosed with advanced stages of cervical cancer, mortality rates rose, and fewer women were screened for the highly treatable disease, according to findings from a new analysis that combined several nationwide datasets. Researchers found an increase in early-stage diagnoses among 18-24-year-old women in states in which clinics had closed, but a decrease in early-stage diagnoses for this same age group in states in which clinics had closed. In states with closures, 13% fewer women were diagnosed in the early stages of cervical cancer as opposed to states without closures. Correspondingly, there was a trend toward increased late-stage diagnoses in this age group, with 8% more women being diagnosed with late-stage disease in states with clinic closures.

This just in: ASTRO submits official RO Model for CMS.

ASTRO submitted an official comment letter yesterday on Medicare’s proposal to require more than 1,000 radiation oncology practices to participate in the new alternative payment model. See the letter at www.astro.org/remodelcomments.

Keynote address: Artificial intelligence and deep learning in medicine.

By Sabrina Joseph, PhD, ASTRO Scientific Affairs

Sara Ailon, MD, PhD, MPH, opened the Keynote Address with a welcome that highlighted that health system applications are evolving in tandem with AI. The data, where much of the relevant information is extracting what the human brain can process, are increasingly relying on machine learning to process the abundant information.

Current applications exist on three levels that can benefit the provider, patient and health system as a whole. However, the advantages of AI and machine learning are balanced with real limitations, both of which were addressed by the two Keynote speakers, Suchi Saria, Sara, and David Magnus, PhD.

Dr. Saria initially shared that discussions of AI’s potential are pervasive, with advances in machine learning excelling changes linked to novel shifts in computer and algorithm development. Through machine learning, humans can design algorithms that can uncover rules discovered from data. In the absence of a gold standard, every data can be transformed and combined with superhuman learning to create a new data stream. However, to trust the data we must incorporate validating procedures to ensure that the capabilities are reliable. As new applications are on the way to augment practice, the challenges are numerous: that rapidly releasing information might lead to physician fatigue and create more noise, and algorithm development can be susceptible to errors, for example. As health care and medicine are undergoing rapid transformation from software playing a limited role to data serving as a first-class asset, we will see numerous software interventions to improve clinical outcomes and reduce financial burden. Provided that we are responsible, thoughtful, and careful in our approach, we can see great advancement in the field.

Dr. Magnus then expanded upon the unexpected issues associated with implementing AI. One: patient care. The goal for real-world how data analyses can become embedded with the values and interests of either the algorithm developers or end users, who could value different outcomes. Biases and limitations in the data algorithms may learn from missing data of a different proportion and can lead to self-fulfilling predictions. Consequently, the predictive abilities are limited, and the system will then be indifferent with these existing biases.

There is also a need to ensure that AI and machine learning tools are used in the appropriate circumstance with the important understanding of their limitations. Physicians and health systems may be unaware of data limitations and may value decisions embedded in an algorithm that can be applied to populations where it is not predictive. In the future, if we move forward, it will be likely to be a broader trend toward population analytics versus the current focus in medicine that is grounded in the dyadic relationship between physician and patient. Data stewardship will need to be carefully considered and potentially revamped. The current mechanisms of ensuring that the data are appropriate and not collected and disseminated in a manner that might lead to different data likely won’t work in the long run. During the subsequent Q&A with Theodore DeWeese, MD, FASTRO, it was emphasized that we will need to carefully consider how to frame not only the data, but the research methods as well as the patients’ needs. For successful use of information needed to strengthen populations that are part of a learning health system and there must be transparency to foster a trusting relationship. For progress within the field, physicians will have to learn how to embrace and open the “black box” to educate patients about both the limitations and advantages of AI and deep learning.

STREET TALK

What has been the highlight of the Annual Meeting for you so far?

“Definitely the debate this morning between Dr. Gutman and Dr. Timmerman. I appreciated the fact that they toyed their gloves off and made for a very entertaining, and amusing session, and educational as well. So, I knew that they were trying a new format for the Presidential Symposium this year and it seemed to work quite well for the large sessions.”

Ang Zeng, MD
University of Washington Hospital, VA Member

“The Presidential Symposium was really nice. It was very different from any Japanese styled scientific discussion. The debate was really exciting! The audience’s conclusion is a position based on the arguments made. In fact, I think we would like to do more of that and make it more like the Japanese style. If you say this, people would be transparency to foster a trusting relationship. For progress within the field, physicians will have to learn how to embrace and open the “black box” to educate patients about both the limitations and advantages of AI and deep learning.”

“Getting together and seeing everybody from different departments because there’s such a strong specialty.”

Benjamin Casta, MD
University of Colorado
from ASCO showed abnormalities on EKG and on echocardiogram with global longitudinal strain in 27% and 50% of patients, respectively. Technical limitations prevented direct dosimetric correlation, but a trend was seen in left main disease on CAC CT among patients with left-vascular disease. Overall, these results highlight the significant burden of late cardiac disease present in breast cancer survivors. The multimorbidity nature of the study is the first of its kind, providing a comprehensive assessment and baseline for future investigations. The elevated rates of subclinical cardiac disease compared to historical controls suggest a broad approach to patient evaluation may be warranted to prevent cardiovascular disease.

CXCR1 Expressing Macrophages Infiltrate the Tumor Microenvironment and Promote Radiation Resistance in a Mouse Model of Lung Cancer, presented by Yuri Amit, MD, MPH (Session 192A – Sunday, 1:30 p.m. – 2:35 p.m.)

By Christian A. Knoll, MD

Urs Amit, MD, PhD, MPH, and researchers from Sheba Medical Center, the largest cancer research and treatment institution investigating mouse models for lung cancer. They investigated the role of CXCR1 expressing macrophages in the chemokine receptor CXCR1; these macrophages were linked to enhanced therapeutic response for macrophage hostselective and effector functions. Dr. Amit found that in the irradiated tumors with lung cancer with 5 Gy, mice depleted with CXCR1 were also observed to have reduced tumor growth. This early research proposes a potential strategy to improve radiation sensitivity, via targeting CXCR1 expressing macrophages within the tumor microenvironment. “I am very excited to attend ASTRO this year and present our research from around the world,” said Dr. Amit. He added, “Although the combination of radiotherapy and immunotherapies targeting T lymphocytes is being extensively studied, there are still gaps of knowledge in our understanding of the potential role of other immune cells in the irradiated tumor microenvironment. Using genetically engineered mouse models, we identified a subset of macrophages which contribute to the tumor’s radiation resistance in mice. These results got us very excited and we hope this may translate in the future to novel immunotherapies specifically aimed at the irradiated tumor microenvironment.”

Financial Toxicity in Lung Cancer: An Assessment of Magnitude, Perception and Impact on Quality of Life, Presented by Sarah Harrel, MD (Session 39 – Monday, 3:10 p.m. – 4:20 p.m.)

By Christian Oyeki, MD

With increasing costs of medical care, Harrel et al. performed a prospective study to assess the impact of financial distress on quality of life among patients with newly diagnosed stage IV lung cancer. Patients were enrolled within five weeks of the initial consultation. “It was assessed via validated financial toxicity and quality of life questionnaires. At baseline, many patients (39%) indicated they were ‘just getting on’ or ‘struggling financially,’ while 60% of non-retired patients noted a change in their income since their cancer diagnosis. Risk factors for financial toxicity included baseline financial reserves and the ability to afford basic necessities.

With these early data, investigators believe there are subsets of financially distressed patients, including those with poor baseline financial reserves and others who have poor health care literacy, within systems that lack price transparency. Future work will be focused on analyzing timepoints to assess how financial toxicity changes throughout treatment. Additionally, these outcomes may improve screening for financial distress and inform financial planning to improve patient understanding of their financial situation and explore available resources."

Prospective Phase II Dose Escalation Study for Neoadjuvant Radiosurgery for Large Brain Metastases, Presented by Erin Murphy, MD (Session 20 – Saturday, 1:25 p.m. – 2:35 p.m.)

By Miriam A. Knoll, MD

Erin Murphy, MD, and colleagues from the Cleveland Clinic, performed neoadjuvant radiosurgery prior to surgical resection of 27 patients with brain metastases with a dose-escalation approach for tumor sizes ≥ 3.0 – 5.0 cm SRS dose will go up to 24 Gy, for tumor size ≥ 5.0 cm up to 18 Gy. After a mean follow-up of 15 months, 12.6% of patients had disease control. At baseline, median overall survival was 54.9% in one patient developed leptomeningeal disease and only one patient has received whole brain radiotherapy. The maximum tolerated dose was not yet reached. Dr. Murphy shared, “The study is continuing to test the patients to the Phase II component to determine the maximum tolerated SRS dose level. Patients will be followed for up to three years to assess for survival, recurrence, radionecrosis and other possible late effects of neoadjuvant SRS followed by surgical resection. Patients with cancer are living longer thanks to immunotherapeutic and targeted cancer drugs, therefore it makes sense to use an aggresive local cancer approach for their brain metastases.”

Quality of Life Based Total Cost Function (TCF) to Guide Treatment Plan Optimization for Head and Neck Cancer, Presented by Hans Paul van der Laan, PhD (Session 197 – Saturday, 4:55 p.m. – 5:05 p.m.)

By Christian Okoye, MD

To integrate NTCP models and quality of life (QOLs) into individual patient treatment planning, van der Laan et al. present their work in developing a QOL-based total cost function (TCF) to guide treatment optimization among patients with head and neck cancers. “This model is a definitive radiotherapy. To accomplish this, they reviewed 11 prospectively recorded patient and physician-rated toxicities at multiple time points (between 2 and 26 months after treatment) as predictors for QOL. In the analysis, the impact of toxicity on QOL differed based on how toxicity evaluated and the time point reviewed. Ultimately, these results were combined with NTCP models to estimate the overall predicted quality of life, based on organ-risk doses and their expected toxicities within an individual treatment plan. With this model in place, investigators hope to move away from multiple organ-specific dose constraints to a single quality of life endpoint to optimize and/or compare plans. Future goals include external validation, formal integration with treatment planning software, and eventually prospective clinical validation.

Our heartfelt congratulations on a well-deserved honor.

Our own Dr. Silvia Formenti is awarded the ASTRO Gold Medal

NewYork-Presbyterian Hospital is proud and thankful to have Dr. Silvia Formenti as a colleague, a leader, and an inspiration. Dr. Formenti, Radiation Oncologist in Chief at NewYork-Presbyterian/Weill Cornell Medical Center, Chairman of the Department of Radiation Oncology at Weill Cornell Medicine, and Associate Director of the Meyer Cancer Center at Weill Cornell Medicine, is recognized around the world as an expert in the use of radiation therapy for cancer treatment. Her work demonstrating the efficacy of combining radiotherapy with immunotherapy has opened an entirely new field of application for radiation as an adjuvant immunotherapy. Contributions by pioneers like Dr. Formenti have helped put NewYork-Presbyterian Hospital at the forefront of cancer innovation.

Powered by the work of doctors at Columbia University Vagelos College of Physicians and Surgeons, Weill Cornell Medicine, we are one of the nation’s leading centers for cancer research and care. The physicians and medical professionals at Columbia University Vagelos College of Physicians and Surgeons, Weill Cornell Medicine are dedicated to providing their patients with the latest advances available in oncology treatment and care.

Learn more about our innovations in oncology at nyp.org/advances-oncology
As the role of radiation therapy is expanding beyond local tumor control and palliation of metastatic disease symptoms, the Presidential Symposium sought to drive conversations around the central question of “Can we routinely cure metastatic cancer with radiation therapy?” ASTRO President Theodore DeWsiere, MD, FASTRO, introduced the new more collaborative and provocative format, which included three panel setting tables, a debate and 13 Expanded Learning Sessions. Felix Feng, MD, noted that this topic was ideal for debate and discussion, as treatment of oligometastatic disease with radiation is not only an area with emerging data, but also controversial and representative of a path for great expansion in the field.

During the first round table-style presentation, Ashan Weeraratna, PhD, described “Contemporary evidence for the ‘abscopal effect,’ where irradiation of tumor cells can modify immune responses and lead to regression of metastatic cancer at distant sites outside the radiation field. However, reports of this are rare. The ability of RT to lead to systemic immune responses against tumor cells is complicated by established immune modulating strategies that prevent responses such as the upregulation of immune checkpoint molecules on tumor cells as PD-L1, the infiltration of T regulatory cells (Treg), or persistent antigen exposure in the tumor microenvironment leading to T cell tolerance. One benefit of radiation therapy to the treatment of oligometastatic disease is that it may destroy the tumor antigens, thereby alleviating persistent antigen exposure and potential T cell tolerance. Conversely, there is also evidence suggesting that radiation leads not only to a higher number of Tregs but that they are more effective at suppressing T cell responses. Potentially, one way to improve the effectiveness of RT is to consider targeting Tregs. There is growing consensus that immunotherapy in combination with radiotherapy can help boost the apoptotic effect. Reports of either improved survival with RT as a monotherapy or RT as chemoradiation, can affect the way cells metastasize. Through mechanisms such as the secretion of exosomes or induction of cellular senescence, radiation and chemotherapeutic agents may help create an environment for tumor cells to migrate, she explained. In closing she encouraged everyone to think about the methods affected during treatment, how to measure these effects and how by treating one thing we actually may be making it worse.

Next Karyn Goodman, MD, reviewed “The Role of Local Therapies in the Management of Patients with Metastatic Disease.” She outlined the historical spectrum of theories of metastatic disease treatment, from addressing the contiguous orderly spread hypothesis to use of systemic therapies like chemotherapy and, more recently, the concept of curing metastatic disease with RT. Hellman and Watkins defined the oligometastatic state in 1995 as a transitional phase between localized and widespread metastatic disease where there is limited metastatic burden. Dr. Goodman reviewed the supporting clinical evidence demonstrating the benefits of surgical resection, systemic ablative radiotherapy (SABR) or local consolidative therapy to the primary site for progression-free and overall survival in a subset of disease sites. While the potential for cure with local therapy in oligometastatic remains controversial, the role of local therapies for the subgroup of oligometastatic disease is being further refined with prospective trials and better molecular markers of disease status. She closed with an optimistic perspective, that one day we are in the cup of the cancer hypothesis and that metastatic disease to better individualize therapy options. As a result, when communicating with patients we may be able to provide more hope about the goals of therapy. As the late actor Christopher Reeve once said, “Once we choose hope, anything is possible.” Charles Drake, MD, PhD, concluded the session by describing the immunology of radiation and how it can be used to treat, and cure, patients with oligometastatic disease. There is supporting evidence for the ‘abscopal effect,’ where irradiation of tumor cells can modify immune responses and lead to regression of metastatic cancer at distant sites outside the radiation field. However, reports of this are rare. The ability of RT to lead to systemic immune responses against tumor cells is complicated by established immune modulating strategies that prevent responses such as the upregulation of immune checkpoint molecules on tumor cells such as PD-L1, the infiltration of T regulatory cells (Treg), or persistent antigen exposure in the tumor microenvironment leading to T cell tolerance. One benefit of radiation therapy to the treatment of oligometastatic disease is that it may destroy the tumor antigens, thereby alleviating persistent antigen exposure and potential T cell tolerance. Conversely, there is also evidence suggesting that radiation leads not only to a higher number of Tregs but that they are more effective at suppressing T cell responses. Potentially, one way to improve the effectiveness of RT is to consider targeting Tregs. There is growing consensus that immunotherapy in combination with radiotherapy can help boost the apoptotic effect. Reports of either improved survival with RT as a monotherapy or RT as chemoradiation, can affect the way cells metastasize. Through mechanisms such as the secretion of exosomes

Three experts delve into the topic ‘Curing metastatic disease with radiotherapy: Myth or reality?’

By Sabrina Joseph, PhD, ASTRO Scientific Affairs

By Ann Kitess, MD, PhD, and John Buatti, MD

Enthusiastic response to debut Theranostics Workshop

By Ana Kresse, MD, PhD, and John Buatti, MD

Latest Phase II and III trial results showcased at Plenary sessions

By Sabrina Joseph, PhD, ASTRO Scientific Affairs, and Lisa Braverman, MD, ASTRO Journal

Monday’s Plenary session kicked the auditorium and featured the most recent, late-breaking results from four clinical trials. The session, always a scientific highlight of the meeting, was moderated by Lisa Kazchik, MD, FASTRO, and Andrea Ng, MD, MPH. Each presentation was followed by a discussion from a panelist, who described the strengths and limitations of the study and challenged the audience to consider how to integrate these results in their clinical practice.

The session kicked off with updates from a secondary endpoint analysis from the RTOG 9601 trial, which investigated the consequences of long-term hormone therapy in men receiving salvage radiotherapy for prostate cancer. Daniel Spratt, MD, presented the analyses of this randomized, Phase III trial. The analyses focused on distant metastases and other-cause mortality in two study arms. Patients had been stratified by entry serum prostate-specific antigen (PSA) levels and randomized to undergo either salvage radiation therapy (SRT), plus a nonsteroidal androgen therapy or placebo tablets for two years. The primary end point was the rate of overall survival. The data showed that neither short nor long-term hormone therapy improved overall survival for patients with PSA ≥0.6 ng/mL. Paul Nguyen served as a discussant.

The second study (RTOG 0631), presented by Samuel Ryu, MD, compared pain relief between radiotherapy (SRS) and stereotactic body radiation therapy (SBRT) and conventional external beam radiation therapy (EBRT) for patients with one to three sites of spine metastases. Pain control was defined as a three-point improvement on the Numerical Rating Pain Scale at one, three, or six months post-treatment at the treated spine segment. There was no difference in pain response between SRS/SBRT and EBRT at three and six months. Arjun Sahgal, MD, served as a discussant for this presentation.

Radium oncologists are certified to deliver those RPTs, but many lack specific knowledge and training and therefore underutilize them. The Theranostics Workshop, designed to update ASTRO members on the RPTs that are now approved and discuss the many others that are emerging for treatment of prostate cancer, neuroendocrine cancers and other cancers. As experts in the field, we take the opportunity to provide personalized dose optimization for each patient, for our patients and for the field as a whole. The ASTRO Tumor Imaging Metrics Core at the Dana-Farber Cancer Institute. “If you can measure it, you can target it.”

Cancer patients are the ones to whom radiation oncologists are responsible, not only to take care of their cancer, but also to leave as little trace of our treatment as possible. As RPTs will be increasingly used in the treatment of cancer, it is essential to understand the potential of this emerging therapeutic option. Radiation oncologists and their patients are making an important role in play in optimizing RPTs. “No one dose fits all,” said Annick van den Abbeele, MD, co-director, Tumor Imaging Metrics Core at the Dana-Farber Cancer Institute. “If you can measure it, you can really tailor it.”
Images of ASTRO 2019
RSARY

IS TREATED WITH CURATIVE INTENT,1,2

Treatment with concurrent CRT is given to patients with curative intent and offers patients additional treatment options in the unresectable Stage 3 NSCLC setting.1,3

Rates of 5-year survival with concurrent CRT have doubled over the past 10 years:

2010
Concurrent CRT shows survival benefit compared with sequential CRT.4

≈15%

2017
Concurrent CRT with standard-dose radiation.5

≈32%

More can be done for these patients after CRT

Concurrent CRT is given to patients with curative intent and offers patients additional treatment options in the unresectable Stage 3 NSCLC setting.1,3

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For your patients who complete concurrent CRT, consolidation immunotherapy may be an option.3 Discover the role of immunotherapy in Stage 3 NSCLC, including recommendations from leading guidelines.

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References:

CRT: chemoradiation therapy; NSCLC: non-small cell lung cancer.

*This meta-analysis of survival in patients with unresectable Stage III NSCLC was based on 6 trials with 1205 patients and 1068 deaths.4

†Compared with high dose radiation in patients with Stage III NSCLC.6

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Immuno-Oncology Information
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Inaugural Aspiring Scientists and Physicians program introduces the next generation to the field

By Ashley Albert, MD, Vice-chair, ARRO Executive Committee

This year, ASTRO launched the first Aspiring Scientists and Physicians (ASP) program through collaboration with colleagues from the University of Chicago and University of Illinois. This pilot program is designed to introduce underrepresented minority students from communities local to ASTRO to Annual Meeting to the field of radiation oncology by promoting radiation oncology as a career option at this early stage in their education. The ASP program seeks to increase the students’ exposure to and awareness of radiation biology, physics and clinical radiation oncology. Through these efforts, we strive to increase diversity and inclusion among the next generation of researchers and professional in cancer patient care. The ASP was co-founded by post baccalaureate and medical students from underrepresented minority groups attended this highly interactive session. During this half-day program, students heard perspectives from two panels: one featuring physicians and medical physics faculty and a second panel featuring a clinical fellow, a resident and a medical student who participated in ASTRO’s Minority Summer Fellowship. Additionally, the panels spoke about the role of innovation in the field, the importance of health equity in cancer care and the opportunity to make a difference in their communities. The sessions were followed by a break-out group tour to exhibit hall, experiencing the various technologies first-hand, and viewing posters for further insight into radiation oncology research.

Based on the success of this pilot program, ASTRO anticipates continuing the program next year at its Annual Meeting in Miami. For more information on the field and to stay connected with ASTRO, students that are aspiring scientists and physicians are encouraged to email asp@astro.org.

ARRO Annual Seminar focuses on building community and serving residents

By Ashley Albert, MD, Vice-chair, ARRO Executive Committee

The Association of Residents in Radiation Oncology (ARRO) Annual Seminar was a fun, informative and inspiring event. As I approached the planning process, I wanted to incorporate some thoughts and ideas from author Priya Parker. In her book “The Art of Asking: How to Ask, Why to Ask, and a Touch of Magic: Meet and Why it Matters,” Parker suggests we should not meet for the sake of meeting, but rather for the sake of sharing information and insights. What is the value of this event for residents this year? Parker suggests we should not meet just for the sake of meeting, but rather capitalize on making gatherings truly influential. I wanted the ARRO Annual Seminar to be just that: an influential and inspiring event that served residents. With the help of very talented speakers and dedicated residents, we were able to experience a day focused on developing a sense of belonging to a larger radiation oncology community and moving the field of radiation oncology forward in ways that matter for residents.

We started the day with an overview of the topics that influenced what the ARRO Executive Committee has been putting their efforts toward, as well as outlining the access available for residents. Dr. Ophrys Balogun was awarded the Global Health Faculty Award, and Dr. Sheikia Ellis continued on her work in Zambia as a Global Health Scholar. Dr. Cora Huang, a current resident at the University of Wisconsin, shared the personal and touching story about how a culture of camaraderie led her career path and her work related to health disparities. Dr. Lisa Kuchin led a session on applying for jobs and allowed residents to ask questions about the job application process. Panelists included Dr. Clayton Smith, Dr. Lindsay Puckett, Dr. Scott Butman, and Dr. Simon Brown. Dr. Rachel Jemison then spoke about resident wellness and burnout and provided practical solutions. Next, panelists from stakeholder organizations participated in a panel to discuss factors affecting the radiation oncology workforce and residency expansions. The session was moderated by Dr. Trevor Royce and panelists included Dr. W. Robert Lee, Dr. Neha Vapiwala, Dr. Michael Steinberg, and Dr. Benjamin Falit. The day concluded with the annual practice entry survey results presented by Dr. Terry Wall.

I was honored to have had the opportunity to plan this year’s seminar, and I am confident we truly made the most of our gathering together. We are so thankful to all the speakers and residents for making this happen. The ARRO Executive Committee hopes to use the outcomes to continue to advocate on behalf of residents this year.

Journal Editors Give Tips and Discuss Scholarly Publishing at Editor Roundtables

By Lisa Braverman, MA, ASTRO Journals

Armed with her Ph.D. and 15 years of experience in medical publishing, Lisa Braverman joined ASTRO editors in the Innovation Hub Sunday and Monday for Editor Roundtables. Su Yum, MD, PhD, MAS, led engaging discussions Sunday about the ideal characteristics of Red Journal article types and how to respond to revision requests. Four roundtables were held Monday: the ASTRO editorial office began the day with a session about getting more involved with the Society’s journals, W. Robert Lee, MD, MS, MED, FASTRO, followed by how to review a scientific paper, Anthony Zamudio, MD, FASTRO, discussed the evolving world of scientific publishing; and members of the Advances in Radiation Oncology editorial team brought answers to the increasingly important topic of data discoverability for reproducible science.

The roundtables are an informal opportunity for editors to share their insights about day-to-day journal operations and broader issues facing the research community. Don’t miss the last two roundtables today starting at 11:45 a.m. and 2:30 p.m.

ASTRO DAILY NEWS | Tuesday/Wednesday

Winners of the ROI Tenth Annual 5K are ....

By Janet Hedrick and Emily Connelly, ROI

The 10th annual Running Strong 5K Run for the Future to Benefit the Radiation Oncology Institute (ROI) was held on Monday morning with more than 450 participants, a new record for participation. The group gathered at the Chicago-Fallon Firefighter and Paramedic Memorial on the Lakefront Trail to run or walk the 5K course along the scenic path by Lake Michigan.

Local undergraduate, post baccalaureate and medical students from underrepresented minority groups attended this highly interactive session. During this half-day program, students heard perspectives from two panels: one featuring physicians and medical physics faculty and a second panel featuring a clinical fellow, a resident and a medical student who participated in ASTRO’s Minority Summer Fellowship. Additionally, the panels spoke about the role of innovation in the field, the importance of health equity in cancer care and the opportunity to make a difference in their communities. The sessions were followed by a break-out group tour to exhibit hall, experiencing the various technologies first-hand, and viewing posters for further insight into radiation oncology research.

Based on the success of this pilot program, ASTRO anticipates continuing the program next year at its Annual Meeting in Miami. For more information on the field and to stay connected with ASTRO, students that are aspiring scientists and physicians are encouraged to email asp@astro.org.

A record number of academic teams participated in the Academic Challenges this year. Team Mayo won the competition and secured a $1,000 donation for the institution’s scholarship fund. Many companies participated for the first time this year. CDR Systems in its first year in the race won the friendly but fierce rivalry among the corporate group of participants and took home the trophy.

Radiation Business Solutions (RBS), host of the race for the 10th year, established the Running Strong 5K Run for the Future to Benefit the ROI a decade ago to support the important research and education programs funded by the ROI. Companies not only participate in the race, but also generously sponsor the annual event. In addition to RBS, this year’s sponsors included Elekta and Varian at the Hope Sponsor Level ($10,000), and Accuracy at the Discovery Sponsor Level ($2,500).

“The event brings together industry, academic institutions and ASTRO members to support groundbreaking research in a fun and unique way,” said ROI Vice President, Colleen A.F. Lawton, MD, FASTRO. “We are so grateful to RBS for hosting this event each year and to the companies that help sponsor it.”

RBS covers the event’s expenses and all dollars from sponsorships, donations and registration fees from the 5K go directly to the ROI to fund radiation oncology research.

The results for the race are posted at the RBS booth (#4232) in the Innovation and Solution Showcase and are available on www.rswc.com. You also can join in the effort online by visiting the ROI and making your 2019 donation to the ROI. Be sure and stop by Booth 808 in the Innovation and Solution Showcase to make your 2019 donation to the ROI.

TUESDAY, SEPTEMBER 17
11:45 a.m. | What to do when you receive a transfer recommendation
Robert Miller, MD, MBA, FASTRO
2:30 p.m. | Gender and diversity in academic research and publishing: Mentoring the next generation
Isabel L. Jackson, PhD, and Sue Yom, MD, PhD, MAS

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Radiation’s vital role in viral associated cancers

For the first time, ASTRO is partnering with industry partners AstraZeneca and Varian for new Research Training Fellowship program

The Red Journal editors are delighted to announce that in 2020 we will have a special edition looking at the new science connecting radiation therapy and the immune response. We feel that this subject is very timely and of critical importance for the future of our specialty, and are calling for original scientific studies, clinical trials, review articles and opinion pieces in many areas. This interaction between radiation and the immune response is one that we know can be either beneficial or immunosuppressive. It is one that involves the entire spectrum of cancer and is relevant to both primary disease and to metastases. We have a broad call for papers that includes the following categories:

- The role of the immune system in cancer surveillance and control.
- The interaction between radiation- and immune-therapies at a biological level.
- Immunologic effects on the tumor microenvironment.
- The interaction between radiation- and immune-therapies at a clinical level.
- Radiation effects on immune cell populations and their function.
- Prognostic models for interactions of radiation with the immune system.
- Characterization of the adverse effect and anti-cancer immunity.
- Radiation techniques to minimize immune suppression.

For the first time, ASTRO is partnering with industry partners AstraZeneca and Varian for new Research Training Fellowship program. Radiation oncologists already partner with industry to conduct research, but few have an opportunity to work within the industry directly. These programs provide a resident one full year to work directly within an industry research setting.

The ASTRO-Varian and the ASTRO-AstraZeneca Radiation Oncology Research Training fellowships are a joint effort to advance the field of radiation oncology in a novel way by providing an opportunity to partner with industry in a real-world setting. The aim of the program is to support the next generation of researchers and significantly improve outcomes and quality of life for cancer patients by:

- Providing key research opportunities for residents in training.
- Opening new avenues to partner with industries that specialize in radiation oncology.
- Expanding a participant’s understanding of and research portfolio.

UT Southwestern, Radiation Oncology
Come see us at ASTRO, Booth #4828!

The Department of Radiation Oncology, accredited by the American College of Radiology and part of UT Southwestern’s Harold C. Simmons Comprehensive Cancer Center, is committed to developing and advancing educational programs to train the next generation of medical professionals so they will be capable of providing exceptional care to cancer patients.

Our training programs include:

- Stereotactic Body Radiotherapy (SBRT) Program
- CyberKnife Training Program
- Gamma Knife Training Program
- Residency programs for both AC GME-accredited clinical radiation oncology and the specialty as a whole.
- Radiology, immunotherapy, applications of AI to radiation oncology, information systems, treatment planning, imaging and interventional and hardware for treatment delivery systems.
- University of California San Diego, will describe the recent work from his group studying the role of immune checkpoint inhibitors in the fight against cervical, gastric and head and neck cancers. Finally, Melvin Chua, MD, PhD, senior consultant in the Division of Radiation Oncology at the National Cancer Centre Singapore, will discuss the role of immunotherapy in EBR related cancers.

This session should be of interest to clinicians who treat patients with viral associated cancers such as cervical, gastric or head and neck cancers and to radiation and cancer biologists interested in learning about the latest advances in the field.

ASTRO partners with AstraZeneca and Varian for new Research Training Fellowship program

UT Southwestern, Comprehensive Cancer Center

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- Characterization of the adverse effect and anti-cancer immunity.
- Radiation techniques to minimize immune suppression.
- Imaging of immune function at preclinical and clinical level.
- Clinical trials of immunologic stimulation incorporating radiation therapy.
- Quantitative, big data and population-based approaches to immunobiological effects.

Our deadline for manuscript submission is January 15, 2020. Please select "Special Issue – RT and the Immune Response" as the article type. If past evidence is a good guide, we anticipate an excellent response. Thanks in advance to all of you who submit manuscripts, and we are looking forward to an excellent special edition of the journal.


designed to be more dynamic. Special attention will be given to physician wellness and the requisite tools for maintaining a healthy work-life balance.

The Presidential Address will serve as a state-of-the-union vehicle, covering the most significant nasopharyngeal carcinomas, skin cancers, lymphomas, gastric cancers, and thyroid cancers. Radiation oncology plays a crucial role in the management of these cancers, and an enhanced understanding of viral oncoimmunology has helped inform recent advances in our therapeutic approach. Wednesday’s 11:15 a.m. session, “Innovative Approaches to Transform the Care of Viral Associated Cancers,” will focus on the promise that has been made in treatment of these cancers over the last several years. The session will review the mechanistic basis by which viruses cause cancer and focus on how

Infections are estimated to cause up to 20% of cancers worldwide. Viruses alone are responsible for the majority of cervical cancers, a growing proportion of oropharyngeal cancers, and the most significant nasopharyngeal carcinomas, skin cancers, lymphomas, gastric cancers, and thyroid cancers. Radiation oncology plays a crucial role in the management of these cancers, and an enhanced understanding of viral oncoimmunology has helped inform recent advances in our therapeutic approach. Wednesday’s 11:15 a.m. session, “Innovative Approaches to Transform the Care of Viral Associated Cancers,” will focus on the promise that has been made in treatment of these cancers over the last several years. The session will review the mechanistic basis by which viruses cause cancer and focus on how

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- Expanding a participant’s understanding of and research portfolio.

Our training programs include:

- Residency programs for both AC GME-accredited clinical radiation oncology and CAMPEP-accredited medical physics radiation oncology.
- Biomedical Engineering Graduate Program
- Molecular Radiation Biology Graduate Program
- Post-doctoral Medical Physics Certificate Program
- Radiation Therapy Training Program
- SBRT Fellowship (approved by the Texas Medical Board)
- Clinical, Medical, Physician, and Student Observerships
- Introduction to Radiation Oncology
- Radiation Oncology Elective

We also offer short-term training workshops and CME programs to professionals, including medical students and residents.

For more information, please visit utsouthwestern.edu/radi-onc-education.
Congratulations to Walter J. Curran Jr, MD, Silvia C. Formenti, MD, FASTRO, and Thomas R. Mackie, PhD, for receiving the 2019 ASTRO Gold Medal, the highest honor presented to revered members who have made outstanding contributions to the field of radiation oncology.

“The 2019 Gold Medal recipients are truly exceptional visionaries whose contributions have significantly impacted the discipline of radiation oncology,” said ASTRO Board of Directors Chair Paul Harari, MD, FASTRO. “The career work of these three individuals in advancing radiation oncology research, innovation and cancer care has forever changed the landscape of our field.”

The 2019 awardees join an elite class of 87 Gold Medal recipients over the decades from the Society’s more than 10,000 members. The Gold Medals will be awarded today during the Awards Ceremony, at 10:31 a.m., in Boston, MA, U.S.

Walter J. Curran Jr, MD, is an internationally known expert in lung cancer and brain tumors and currently serves as executive director at Winship Cancer Institute of Emory University and as a group chairman and principal investigator of NRG Oncology, the largest of the five National Cancer Institute (NCI)-funded clinical trials network groups. He has dedicated his career to the education of future radiation oncologists and to advancing the field of radiation oncology. He is currently the only radiation oncologist to serve as director of an NCI-designated cancer center. “This role is important to the extent that it educates the broader world,” said Dr. Curran. “Seeing radiation oncologists succeed in these leadership roles has a positive impact on the specialty.”

Dr. Curran is a graduate of the Medical College of Georgia and joined his father’s medical and research faculty at the University of Pennsylvania, while also practicing at Fox Chase Cancer Center in Philadelphia. It was there that he was first introduced to the NCI through the Radiation Therapeutics Oncology Group (RTOG). He then served as chairman of the Radiation Oncology Department at 13 years at Thomas Jefferson University. At the same time, Dr. Curran became a leader within RTOG and oversaw the tremendous growth and successful renewal of NCI grants. He was instrumental in the merging of RTOG and the Gynecologic Oncology Group and the National Surgical-Adjuvant Breast and Bowel Project, now known as NRG Oncology, creating one of the largest NCI research network groups.

Perhaps one of his greatest impacts to the field is leading and engaging some of the best and brightest minds in radiation oncology in RTOG and NRG. “Working in groups like these requires a lot of compromise and volunteer effort above and beyond everyone’s day job. But by working together as a group, we’re able to research and change practice in a way,” said Dr. Curran.

Looking to the future, Dr. Curran plans to continue his translational research, stating, “When we bring disparate teams of investigators together, what great things can come.”

Dr. Curran attributes many of his successes to the opportunity to work with many great people who share a common passion. “ASTRO has been my core organization throughout my whole career,” said Dr. Curran. “Winning the Gold Medal means an extraordinary amount.”

Silvia C. Formenti, MD, FASTRO, is an internationally renowned radiation oncologist and trailblazer in radiation and immunotherapy. Dr. Formenti is chair of the Department of Radiation Oncology at Weill Cornell Medical College at Cornell University and radiation oncologist-in-chief at New York Presbyterian Hospital. She has devoted her career to translating novel, preclinical information to the clinic, leading peer-reviewed articles and reviews to cancer. “I have always been interested in what takes life, what are the mechanics and mortality of cancer,” said Dr. Formenti. These questions helped formulate her research — conducted well ahead of its time — in combining radiation therapy and immunotherapy treatments. The concepts and approaches are widely adopted in clinical use today and have led to more than 100 clinical trials.

In addition to her presence in the lab, her leadership has greatly impacted the specialty. Earlier in Dr. Formenti’s career, she served as the first female chair of the Department of Radiation Oncology at NYU School of Medicine — one of just a few female chairs across the country at the time. Her influence and drive continue to be felt throughout the field, from the PhD students she has mentored to the researchers she works with.

When thinking of the Gold Medal recognition, Dr. Formenti said, “It means a lot because it is also recognition of my team and the work we’ve done together over the years, both my research and clinical teams. We introduced something that was a little disruptive, not conventional thinking, and it brings satisfaction that our Society is acknowledging this work. It is truly an honor.”

Thomas R. Mackie, PhD, can be categorized under many names: medical physicist, researcher, mentor, entrepreneur, professor, visionary. While he has been all of these and more throughout his extensive and impressive career, there is a distinct thread that united him through his successes, and sometimes admitted failures, in his career. “I wanted to see my research and my vision activated into patient care. Some might call that stubborn, we’ll call it visionary,” said Dr. Mackie.

Dr. Mackie began his career as a health physicist in uranium mining in Saskatchewan and always held an interest in radiation science. A family member’s cancer diagnosis and later radiation treatment further sparked his interest in the field. He later moved to the University of Wisconsin, where he spent the majority of his career, and is currently emeritus professor of medical physics and engineering. It is there where he excelled as a remarkable inventor, innovator and entrepreneur.

Driven by necessity and the resolve to turn discovery into clinical application, Dr. Mackie started his first company, Geometrics Corporation. In 1983, Dr. Mackie helped write the treatment planning software dominated radiation treatment planning over a span of 20 years. The street name for this company combined with parallel work in Tomotherapy, another company started by Dr. Mackie, which he later sold to Accuray Corporation. There are nearly 750 TomoTherapy treatment units in clinical operation today. His invention and contributions to the field of radiation oncology have impacted hundreds of thousands of cancer patients worldwide. Over the course of his career, Dr. Mackie has written more than 184 journal articles, with some of the most highly cited papers in the field and holds nearly 50 U.S. patents. In addition to his many research and clinical roles, Dr. Mackie is most proud of his students and his mentorship. “I am proud of the graduates I have trained — more than 40 PhDs were awarded under my supervision — and the technology I have brought into the marketplace,” said Dr. Mackie. “Most importantly, I couldn’t have done what I’ve done without the support and work of so many good scientists and smart people around me. This Gold Medal is the highest honor of my career and the greatest honor bestowed on me.”
ASTRO'S 62ND ANNUAL MEETING
October 25-28, 2020
Miami Beach Convention Center
Miami Beach, Florida

Call for abstracts opens December 18!

ASTRO has selected 26 members to receive the ASTRO Fellow (FASTRO) designation. The 2019 class of Fellows will be inducted during today’s Awards Ceremony at 10:15 a.m. in Room W373 a/b/c/d.

“These 26 new Fellows have contributed to ASTRO, to the field of radiation oncology, and to cancer care in many wonderful ways,” said Francine Hallberg, MD, FASTRO, and chair of the Fellows Selection Committee. “I am thrilled to honor them today as they receive their Fellows designation.”

The Fellows program commenced in 2006 and continues today to honor those that have been an Active, International or Emeritus member of ASTRO, have given significant service to ASTRO and have made contributions to the field of radiation oncology in the areas of research, education, patient care or service and leadership.

Congratulations to the 2019 Fellows:
- Ron R. Allison, MD, Federal Medical Center, Butner, North Carolina
- Daniel A. Low, PhD, University of California, Los Angeles
- David G. Kirsch, MD, PhD, Duke University Medical Center, Durham, North Carolina
- Larry L. Kerin, MD, Michigan Healthcare Professionals, Farmington Hills, Michigan
- Deepak Khuntia, MD, Precision Cancer Specialists and Varian Medical Systems, Palo Alto, California
- Sunil Krishnan, MD, Mayo Clinic, Jacksonville, Florida
- Fei-Fei Liu, MD, Princess Margaret Cancer Center/University Health Network, Toronto
- Eric Mellon, MD, PhD, Duke Medical Center, Durham, North Carolina
- Michelle H. Aebly, MD, Houston Methodist Hospital, Houston, Texas
- Jennifer A. Alberts, MD, MPH, University of California, Los Angeles
- Deepak Khuntia, MD, Precision Cancer Specialists and Varian Medical Systems, Palo Alto, California
- Thomson J. Yock, MD, MCH, Massachusetts General Hospital, Boston
- Michelle H. Aebly, MD, Houston Methodist Hospital, Houston, Texas
- Jennifer A. Alberts, MD, MPH, University of California, Los Angeles
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- Eric Mellon, MD, PhD, Duke Medical Center, Durham, North Carolina
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- Fei-Fei Liu, MD, Princess Margaret Cancer Center/University Health Network, Toronto
- Thomson J. Yock, MD, MCH, Massachusetts General Hospital, Boston

Corey J. Langer, MD, professor of medicine in the Division of Radiation Oncology at the University of Pennsylvania in Philadelphia, where he serves as chair of Thoracic Oncology, has been chosen as the 2019 ASTRO Honor Member. He will be recognized during today’s Awards Ceremony, 10:15 a.m. to 11:30 a.m., in room W373 a/b/c/d.

This award is the highest honor that ASTRO bestows upon cancer physicians and researchers who do not qualify for Active ASTRO membership but have made significant contributions in those disciplines other than radiation oncology, radiobiology or medical physics.

Dr. Langer received his medical degree from Boston University in 1981 and completed his internship and residency at the Graduate Hospital of the University of Pennsylvania in Philadelphia in 1984. His postgraduate training included a fellowship in Hematology/Oncology at the Penn Presbyterian Medical Center and a fellowship in Thoracic Oncology at the American Oncology Hospital/Penn Chase Cancer Center. He served there from 1986 until 2008, leading its Thoracic Oncology Program for the final 14 years of his tenure before moving in June 2008 to the University of Pennsylvania, where he currently heads the Inter-disciplinary Thoracic Oncology Program. A Fellow of the American Society of Clinical Oncology, Dr. Langer is also a member of the American Society of Clinical Oncology, the American Society for Cancer Research, the International Association for the Study of Lung Cancer, and the American College of Physicians. He has served as vice-chair of the Radiation Therapy Oncology Group (RTOG, now NRG) and co-chairs its Medical Oncology Committee. He is a frequent contributor to OncLive, an online forum of oncologists and allied health professionals worldwide who communicate and collaborate to solve unmet challenges in cancer treatment.

Dr. Langer has contributed more than 200 articles and abstracts to the medical literature. His work has appeared in numerous medical journals, and he has presented at national meetings of leading medical organizations. He currently serves on the editorial boards of Clinical Lung Cancer and Cancer Care Without Borders. He currently serves on the editorial boards of Clinical Lung Cancer and Cancer Care Without Borders.

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**INDUSTRY-EXPERT THEATERS**

**Tuesday, September 17**

**Theater 1, Innovation Hub**

**Light and Imaging: Training Patients With Non-metastatic Cerebral Resistant Prostate Cancer**

10:15 a.m. – 11:15 a.m.

Company: Janssen Biotech

**Theater 2, Innovation Hub**

**Indicators for the Radiation Oncologist**

10:15 a.m. – 11:15 a.m.

Company: Novocure

**Theater 2, Innovation Hub**

**Optimizing D7D: Personalizing Approaches to Locoregional Recurrence in Invasive Breast Cancer and OCS**

12:00 p.m. – 1:00 p.m.

Company: Genomic Health

**Theater 2, Innovation Hub**

**Come (Un)Mask a System: Treatment Option for Patients with Advanced CSCC**

12:00 p.m. – 1:00 p.m.

Company: Sanofi Genzyme

**INDUSTRY SATELLITE SYMPOSIA**

**TUESDAY, SEPTEMBER 17, 2019**

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<tr>
<th>Time</th>
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<tr>
<td>12:00 p.m. – 1:00 p.m.</td>
<td>Symposium: Challenges, Controversies and Opportunities in the Management of EGFR-mutant Lung Cancer with Central/Nervous System Metastases: Working Together to Improve Patient Outcomes</td>
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**Venue Location:** Hyatt Regency McCormick Place, Regency Ballroom - Dinner will be provided.

**Accreditation:** This activity will be planned and implemented in accordance with the accreditation requirements and policies of the Accreditation Council for Continuing Education (ACCME) through the joint providership of Medical Learning Institute Inc. and PVI, PeerView Institute for Medical Education. The Medical Learning Institute Inc. is accredited by the ACCME to provide continuing medical education for physicians.

**CME Credits:** The Medical Learning Institute Inc. designates this live activity for a maximum of 1.5 AMA PRA Category 1 Credits™. Physicians should claim only the credit commensurate with the extent of their participation in the activity.

To register or for more information, please visit www.PeerView.com/radEGFR19

**ASTRO 2019 Annual Meeting Promotional Sponsors**

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- Currents from 100uA to 1000uA (or higher) depending on the particle beam are available on all BCS cyclotrons
- Best 20u to 25 and 30u to 35 are fully upgradeable on site

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<thead>
<tr>
<th>Cyclotron</th>
<th>Energy (MeV)</th>
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<tr>
<td>Best 15</td>
<td>15</td>
<td>18F, 89Zr, 86Y, 110In, 68Ga, 111In, 111I, 111mIn, 124I, 124I, 19F, 103Pd</td>
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<tr>
<td>Best 20u/25</td>
<td>20, 25–15</td>
<td>Best 15 + 18F, 111In, 68Ge</td>
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<td>Best 35</td>
<td>35–15</td>
<td>Greater production of Best 15, 20u/25 isotopes plus 64Cu, 68Ga</td>
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<td>82Sr, 82Rb, 82Rb, 18F, 18F, 111In, 68Ga, 68Ga, 82Rb, 82Rb, 68Ga, 68Ga, 82Rb</td>
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The BG-75 Biomarker Generator is a revolutionary development in radio-pharmaceutical production that delivers a single or batch dose of 18F-FDG, and additional advanced 18F biomarkers on demand.

The system provides integration of all components needed to produce and qualify PET biomarkers into a single, self-contained system that occupies a fraction of the space required by conventional solutions, simplifying the implementation of PET.

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400 MeV Rapid Cycling Medical Synchrotron for Proton-to-Carbon Heavy Ion Therapy:

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- Small beam sizes – small magnets, light gantries – smaller footprint
- Highly efficient single turn extraction
- Efficient extraction – less shielding
- Flexibility – heavy ion beam therapy (protons and/or carbon), beam delivery modalities

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• Resources for health care professionals
• The Merck Access Program
• KEY+YOU Patient Support Program