

WINTER 2017

ASTRO news

LOOKING TO THE FUTURE

Taking stock of the
radiation oncology workforce

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The Changing Face of the Radiation Oncology Workforce

*The findings from the 2017 ASTRO
Workforce Study*

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Women Leaders in Radiation Oncology

*Improving gender diversity to improve our field
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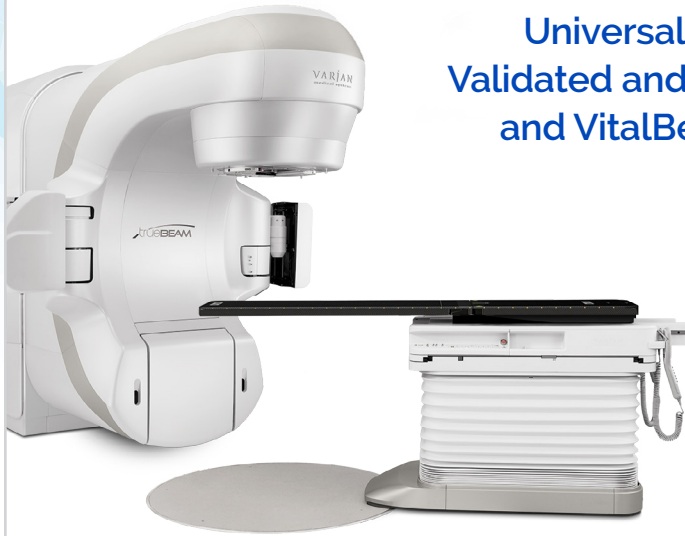
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VOLUME 20 • NUMBER 4

ASTRO news

AMERICAN SOCIETY FOR RADIATION ONCOLOGY

ASTROnews (ISSN 1523-4185) is published quarterly at 251 18th Street South, 8th Floor, Arlington, VA 22202. Dues for individual membership in the American Society for Radiation Oncology are \$580 (U.S.), which includes \$38 for an *ASTROnews* subscription. Periodicals Postage Paid at Arlington, 22210-9998 and at additional mailing offices.

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POSTMASTER: Send address changes to *ASTROnews*, 251 18th Street South, 8th Floor, Arlington, VA 22202. Telephone: 703-502-1550; Fax: 703-502-7852; Website: www.astro.org/astronews
Printed in the U.S.A., by Quad Graphics in Midland, MI

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EDITOR'S *notes*

BY NAJEEB MOHIDEEN, MD, FASTRO
SENIOR EDITOR, ASTRONEWS

PAST, PRESENT AND FUTURE

I WRITE TO YOU FROM THE
INCREASINGLY FRIGID
CONFINES OF CHICAGO,
FRESH FROM YET
ANOTHER ENTHRALLING

ASTRO ANNUAL MEETING IN SUNNY SAN DIEGO.

On the penultimate day, I was at the educational session on the ASTRO 2017 Radiation Oncologist Workforce Study: Past, Present and Future, which offers sharp insight into where members in our field stand on issues that impact us most directly. We have a summary of the top findings in this issue.

In the Workforce Study, more than half the respondents were concerned about an oversupply of radiation oncologists. The data tends to support this. A study by Hubert Pan et al¹ estimates a 19 percent increase in demand for radiation therapy from 2015 to 2025, coupled with a 27 percent rise in FTE practicing radiation oncologists. Moreover, comparison of radiation utilization rates in 2003-2005 and 2010-2012 for breast and prostate cancer demonstrated relative decreases of 6 percent and 16 percent, in that order.

As always, many factors will influence this balance between demand and utilization. Currently, the top three disease sites and dollar spends (in the Medicare database) for patients receiving radiotherapy are prostate, breast and lung cancer. With more men with prostate cancer and women with favorable post-lumpectomy characteristics not requiring radiation therapy, we will see less patients. With the increasing use of hypofractionation, one can anticipate further declines in radiation utilization. However, many patients who should get radiation are not getting it. In a study² evaluating women in the National Cancer Database diagnosed with N2 or N3 breast cancer between 1998 and 2011, only 65 percent were getting the recommended radiation therapy after mastectomy.

As Trevor Royce puts it in his piece on the resident's perspective, the perception of oversupply is also fueled by the doubling of radiation oncology residency positions, from 93 in 2001 to 200 in 2015. But workforce issues are not within the purview of the Accreditation Council for Graduate Medical Education

(ACGME) or the American Board of Radiology (ABR)—see Paul Wallner's "From the ABR" column on page 33 for more on this.

Should market forces or future needs dictate residency expansion, or are more drastic steps needed? Are all accredited training programs providing high quality basic science and clinical training (especially brachytherapy), or should the bar be raised?

An overlapping area of uncertainty is payment reform. While cancer care costs have risen all around, chemotherapy drug prices have increased the most. If a bundled cancer care payment model does not reflect this reality, it will put a greater squeeze on costs in other areas including radiation oncology. Our interests are best served in a radiation oncology-specific bundle (like the RO-APM proposed by ASTRO). The Center for Medicare and Medicaid Innovation (CMMI) has just released its report to Congress on an Episodic Alternative Payment Model for Radiation Therapy Services. This now gives us the opportunity to expeditiously engage with them in order to create a fair system that allows us to focus on patient care and not be affected by fluctuations in fractionation, rising chemotherapy and other costs we have no control over. Being open to change is essential for keeping the economic side of our specialty stable.

Yet perceptions can sometimes be wrong. The just-published 2017 Radiology Workforce survey might offer some instruction.³ Between 2013 and 2015, the field dropped off the list of the top 20 sought-after specialties amid the threat of teleradiology, practice consolidation and, more recently, artificial intelligence. This contributed to a perception that the need for physicians was declining. However, the Radiology Workforce Survey shows that, since last year, there has been a 14.1 percent increase in the projected number of radiologists that will be hired and 90 percent of them are now taken on because of subspecialty expertise. These skills are particularly needed in underserved rural communities. The radiation oncology workforce is predominantly urban and suburban, with only 13 percent in rural areas. But 21 percent of this country's

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CHAIR'S Update

BY BRIAN D. KAVANAGH, MD, MPH, FASTRO
CHAIR, BOARD OF DIRECTORS
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ARE WE READY FOR THE SELF-DRIVING CAR?

How technology will continue to shape the radiation oncology workforce

MAJOR AUTO MANUFACTURERS ARE WAGING A FURIOUS ARMS RACE or, more accurately, a race to having no need for arms (or hands) to drive cars. The goal is to reduce operator error in much the same way that commercial airplanes are no longer piloted by former military airwomen or airmen but, instead, by integrated circuits on silicon wafers that can outthink all of the Air Force personnel in the world put together.

Anyone who missed it should take the time to watch Dr. Richard Zane's keynote address from the recent ASTRO Annual Meeting in San Diego, "Can Innovation and the Digital Revolution Save Health Care?" You can access it as part of ASTRO's Virtual Meeting preview at www.astro.org/17vmpreview.

The talk is funny, forward-thinking and maybe just a little bit frightening. He presents numerous self-driving car equivalents that are rapidly entering the world of health care, from wearable technology that monitors blood glucose in diabetics to on-demand interactive videoconferencing with doctors (or are they robot doctors?) available in your neighborhood drug store. The fabric of patient-primary care physician relationships is liable to evolve to a very different state in the next decade. The subtext for the audience of radiation oncology team members is this question: what are we going to do in our field to keep pace with the new world order of health care delivery all around us?

We are understandably somewhat unnerved by the prospect of catching up to the airline or auto industries in their relentless pursuit of operational safety. It is a natural reflex: all of us are reluctant to cede control to any form of artificial intelligence that might make us


feel less smart. And therein lies the irony.

Our field has been inventing and embracing new technology ever since the days of Marie Curie (see more on her on page 22) and Wilhelm Röntgen. We would not have achieved so many gains in clinical outcomes for our patients if we had not been willing to allow computers to process and fuse images; to determine the ideal cross-sectional beam intensity profile to match internal target contours and minimize dose to normal structures; and to control the motion of delicate strips of tungsten back and forth inside the mouth of a linac as it whispers photons toward the patient.

The natural next steps in our technological evolution will include enhanced autocontouring of tumors and normal tissues, improved remote patient safety monitoring, centralized high-speed planning and automated interactive health records that instantaneously

generate guideline-based treatment regimens tailored to a patient's TNM stage, comorbidities, tumor genetics and performance status.

Think of how much we gain in that future vision. We will improve patient outcomes with standardization. We can provide greater access in remote locations. And we will free ourselves of some of the more tedious chores of our profession so that we can have more time to spend talking with our patients and knowing their stories and supporting them in ways that robots will never be able to do.

Most importantly, if we don't have to do so much driving, we can spend more time dreaming. And that is where real progress begins. 

"Most importantly,
if we don't have to do so much driving,
we can spend more time dreaming.
And that is where real progress begins."



SPECIALreport

BY LAURA I. THEVENOT,
ASTRO CHIEF EXECUTIVE OFFICER

RESPONDING TO MEMBER NEEDS: ASTRO'S 2017 YEAR IN REVIEW

OVER THE COURSE OF THE YEAR, ASTRO HAS BEEN ACTIVELY MONITORING AND RESPONDING TO OUR MEMBERS' NEEDS. The new map to chart our future course is the ASTRO strategic plan, which was unveiled last spring by Immediate Past Chair David C. Beyer, MD, FASTRO. In developing the goals of the strategic plan, we held focus groups with different segments of membership to gauge their top priorities. We also sought feedback on the Member Survey to ensure we were on the right track (see page 25 for the results).

The resulting plan includes four areas on which ASTRO is focusing in order to achieve the vision of radiation oncology as the recognized leader in quality, innovation and value in multidisciplinary cancer care. Read more on the plan at www.astro.org/strategicplan.

Last year in this column, we announced a collaboration with the American Society of Clinical Oncology (ASCO) on the CancerLinQ (CLQ) initiative. ASTRO is a founding member of the CLQ Oncology Leadership Council (OLC), a body of thought leaders and oncology-affiliated experts that advise the CancerLinQ Board of Governors. ASTRO's Government Relations Council Chair Sameer Keole, MD, is chairing the OLC and has the responsibility to ensure that all partners' perspectives, including those in radiation oncology, are heard.

According to Dr. Keole, the CancerLinQ collaboration will help ASTRO members better care for their patients. "Over time, CancerLinQ analytics will produce insights into practice patterns, outcomes, cost effectiveness and safety issues," he says. "To date, more than 110 health systems and about 2,500 oncologists are involved in the network, and it now includes a rapidly growing database of nearly 600,000 patients with a primary or secondary diagnosis of cancer. By combining ASTRO's domain-specific knowledge with CancerLinQ's broad reach, we can help

physicians and their patients be more informed as they navigate complex treatment decisions."

Another ASCO collaboration took shape this year in the form of a QCDR—a qualified clinical data registry. The QOPI Reporting Registry is a QCDR, which means that it is a Centers for Medicare and Medicaid Services (CMS)-approved entity that collects clinical data and acts as a submission mechanism for the CMS's Merit-based Incentive Payment System (MIPS) program.

By partnering with ASCO on this QCDR, we leverage combined resources and data to help our members on several fronts—to satisfy CMS reporting requirements, to provide benchmarking and practice trend information and to identify gaps for improvement. For more on this new initiative and how to enroll your practice, see page 11.

Beginning in the spring, our quality improvement team rolled out several new resources to help ASTRO members understand the reporting requirements for MIPS. After a webinar in December 2016 that outlined an overview of the 2017 CMS reporting requirements, ASTRO debuted four MIPS Toolkits aimed at distilling CMS guidance for MIPS and focusing it for a radiation oncology audience. View these educational resources online at www.astro.org/mips.

Over the summer, the fifth annual ASTRO Science Workshop, which focused on immunotherapy, was held on the National Institutes of Health campus in Bethesda, Maryland. Held immediately after the workshop, ASTRO hosted the first-ever Letter of Intent Workshop. Participants, from residents in training to full professors, learned the perspectives of both the National Cancer Institute and the FDA on what data are needed to start a clinical trial and what data will help lead to a successful investigational new drug application. The Science Council will host another workshop this summer on the tumor

Continued on next page

microenvironment.

Blossoming partnerships are beginning with the Prostate Cancer Foundation and Breast Cancer Research Foundation. In the new year, we will be working with these two groups to create collaborative grants for research in these respective disease sites. Teaming up with these foundations will allow us to broaden our reach and increase the amount of grants we can offer.


The Annual Meeting brought us to San Diego in September. This year's meeting saw a few changes, which we undertook in response to member feedback. We debuted the ASTRO Connect networking areas, which were a popular addition to the Innovation and Solution Showcase—our new name for the Exhibit Hall. The Meet the Expert sessions at each of the ASTRO Connect hubs were well-attended and the new Science Highlights sessions, which presented the meeting's top science each morning, were standing room only.

We solicited member feedback at the Annual Meeting through the "Million Gray Question," which asked attendees what they thought the most important research question facing our specialty is over the next three to five years. More than 550 entries were received

and we are using that input to inform our future research priorities. Read more on this at www.astro.org/astroblogmilliongray.

Another fruitful relationship was formed when ASTRO partnered with the American Cancer Society to provide assistance to radiation oncology clinics and cancer patients in Puerto Rico following Hurricane Maria. Through public service announcements and social media, important information was disseminated to cancer patients. ASTRO worked with Congress and the Department of Health and Human Services to get aid to practices in Puerto Rico.

Through our advocacy efforts, ASTRO is working on a radiation oncology alternative payment model (RO-APM). Our chair, Brian D. Kavanagh, MD, MPH, FASTRO, testified to Congress in November on the RO-APM, the result of several meetings with CMS and Center for Medicare and Medicaid Innovation (CMMI) officials, which brought together a broad cross-section of stakeholders that could be affected by a new APM.

In 2018, we have many more projects in the works that will help us to help you—and help you better care for your patients. How can we better serve you? Please let us know your thoughts at astronews@astro.org. 


EDITOR'S NOTES *Continued from page 5*

population resides in rural areas, a maldistribution that could worsen as a larger proportion of the radiation oncologists in rural areas plan to retire or move to part time, according to the Workforce Study story on page 13.

As Brian Kavanagh puts it eloquently in his Chair's Update, embracing change and adapting to it will show the way forward. Carol Hahn's compendium of women leaders in radiation oncology is very much part of this future. Five top women in the field tell their stories and offer us their vision of things to come, inspiring the many following in their wake. We also celebrate the 150th birth anniversary of one of the world's greatest scientists, Marie Curie, who won two Nobel prizes, one in physics (1903) and the other in chemistry (1911).

The SCAROP Financial Survey on page 24 reports that the pay gap between male and female radiation oncologists in academic settings is closing. While pay is just one aspect of a multitude of issues related to gender inequity, this is certainly a step in the right direction. Incidentally, *ASTROnews* is planning an issue devoted to diversity later next year.

Let me finish where I started, at the ASTRO

Annual Meeting. On display was the amazing talent in our field that is opening up new horizons with translational research, technological advances, predictive and prognostic biomarkers and novel combinations of immunotherapy and radiation leading to innovative clinical trials, both in primary and metastatic disease. All of this could lead to hitherto unforeseen enhancements in our roles that will need an augmentation of radiation oncology's ranks. Science does not exist in a vacuum—it occurs in the real world. We went from Röntgen to Becquerel to Curie to Coutard (and fractionation) and the field has expanded beyond anything they possibly imagined. The evolving science and research—some of which was featured at the Annual Meeting—very likely holds the seeds of the future of our changing field. 

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SOCIETY NEWS

SPECIAL *tribute*

BY LUTHER W. BRADY, MD, FASTRO

SEYMOUR H. LEVITT, MD, DSC, FASTRO



PROFESSOR SEYMOUR "SEY" H. LEVITT, MD, DSC, FASTRO, died in Thousand Oaks, California, on September 30, 2017, from metastatic cancer. He was an internationally outstanding expert in holistic approaches to patient management, as well as in the management of patients with cancers of the breast and prostate and lymphomas.

He received his undergraduate degree from the University of Colorado in Denver, graduating cum laude as a member of Phi Beta Kappa. Subsequently he attended the University of Colorado School of Medicine, graduating with Alpha Omega Alpha honors and in the top of his class.

His internship in medicine was at the Philadelphia General Hospital in Philadelphia. Subsequent to his tour in the army stationed in Stuttgart, Germany, he returned to do a residency in medicine and radiology at the

University of California San Francisco, where he was mentored by Dr. Franz Buschke, to pursue a career in radiation oncology. Following that, he spent a year each at the University of Michigan and then the University of Rochester Medical Center before taking on the responsibility for the department of radiation oncology at the University of Oklahoma Medical Center in Oklahoma City.


From there, he assumed the position as chair in radiation oncology at the Medical College of Virginia in Richmond. It was there that I first met him and went on to work with him closely in many national and international organizations. He became chairman of the department of therapeutic radiology at the University of Minnesota Hospital beginning in 1970.

He became emeritus professor in the department of therapeutic radiology at the University of Minnesota in 1999 and was appointed foreign adjunct professor at the Radiumhemmet, Karolinska Institutet, in Stockholm, Sweden, in 2002. Both positions he held until his death.

He was an outstanding teacher, a precise investigator and one who made significant and important contributions in the management of cancers of the breast, prostate

and lymphomas. His evaluation of publications in meta-analyses in breast cancer stand as hallmarks in the need for scientific integrity and appropriate proper statistical analysis of results.

He was president of ASTRO, the American Radium Society (ARS), the Radiological Society of North America (RSNA), and the Society of Chairs of Academic Radiation Oncology Programs. He was also a Chancellor of the American College of Radiology (ACR) and a Trustee of the American Board of Radiology. He received gold medals of ASTRO, ARS, RSNA, ACR and many other prestigious awards.

Dr. Levitt's position in radiation oncology represents the best of our specialty for his leadership, emphasis on scientific integrity and contributions to science—all of which will have longstanding impact on our specialty. Gone, but not forgotten. 



FROM LEFT TO RIGHT: LUTHER BRADY, MD, FASTRO; SEYMOUR LEVITT, MD, DSC, FASTRO; AND HARRY BARTELINK, MD, PHD, RT.

ASTRO Minority Summer Fellowship awardee Jean-Claude Rwigema shares his experiences

Applications now being accepted for 2018 program



THE ASTRO MINORITY SUMMER FELLOWSHIP AWARD

introduces medical students from backgrounds that are underrepresented in medicine to the discipline of radiation oncology early in their medical education. To promote radiation oncology as a career choice, the fellowship provides medical

students with an experience designed to expose students to clinical, basic and translational research questions in radiation oncology. Jean-Claude Rwigema, MD, was a 2010 Minority Summer Fellowship Clinical Awardee and tells us about his experience with the first cohort of awardees.

“I was fortunate to be selected in 2010 as one of the first recipients of the ASTRO Minority Summer Fellowship as a third-year medical student at the University of Pittsburgh School of Medicine, under the mentorship of Dwight E. Heron, MD, MBA,

at the University of Pittsburgh Cancer Institute. As part of my fellowship experience, I participated in clinical research projects including a study investigating clinical outcomes of stereotactic radiosurgery to the resection cavity of brain metastases. Upon completion of the research project, I was invited to present the study findings at the 53rd ASTRO Annual Meeting in Miami Beach, held in October 2011. Aside from involvement in clinical research, I shadowed my mentor in the clinic and gained invaluable insight into the practice of radiation oncology, which solidified my interest in radiation oncology.

“The award was a stepping stone that allowed me to

explore my interest in radiation oncology as a medical student. The experience then served as a springboard to additional research opportunities, leading to a number of publications and research grants.

“Consequently, I was able to have a successful match to my desired radiation oncology residency program at the UCLA Department of Radiation Oncology at the David Geffen School of Medicine. Throughout medical residency, the skills I had developed in clinical investigation were instrumental to my continued training and motivated me for a career in academic radiation oncology.


“Following residency, I completed a proton therapy fellowship year at the University of Pennsylvania Abramson Cancer Center. During the fellowship, I

received clinical training focused on the treatment of central nervous system, head and neck, genitourinary, thoracic and gastrointestinal malignancies.

“Upon completion of the proton therapy fellowship, I joined the faculty at Mayo Clinic

Radiation Oncology in Phoenix, where I currently specialize in treating head and neck and genitourinary malignancies. I am grateful to have participated in the ASTRO Minority Summer Fellowship, a training experience that steered me into an exciting career where I now practice as a clinician with a commitment for lifelong learning, teaching and patient advocacy.”

“The award was a stepping stone that allowed me to explore my interest in radiation oncology as a medical student.”

Do you know any medical students who might be interested in applying for the 2018 Minority Summer Fellowship? ASTRO is now accepting applications. For more information, visit www.astro.org/minoritysummerfellowship. 

Go electronic in 2018

MIPS quality reporting via a qualified clinical data registry

BY RANDI KUDNER, QUALITY IMPROVEMENT MANAGER, RANDI.KUDNER@ASTRO.ORG

TO HELP ASTRO MEMBERS MEET THE NEW MERIT-BASED INCENTIVE PAYMENT SYSTEM (MIPS) REPORTING REQUIREMENTS, ASTRO is partnering with the American Society of Clinical Oncology (ASCO) to provide the Quality Oncology Practice Initiative (QOPI)[®] Reporting Registry, a qualified clinical data registry (QCDR) that can capture and report data to CMS for all performance categories in MIPS (Quality, Improvement Activities and Advancing Care Information).

Increased reporting requirements for MIPS means eligible practices must look to electronic data capture tools for quality measure reporting. This marks a change from the 2017 MIPS program, in which physicians are able to choose their participation level, which can allow for minimal data entry. For 2017, within the Quality performance category, a clinician or group can submit one measure for one patient to avoid the penalty or choose to report on 90 days or up to a full year of data for 50 percent of applicable patients to achieve a small positive payment adjustment. This spectrum of participation allowed a lot of flexibility for practices as they learned the new payment program.

However, the 2018 MIPS Quality performance category requires a full year of data collection for 60 percent of applicable patients to achieve the positive payment adjustment. Practices are now looking for a way to ease the overall administrative burden that this requirement creates to avoid the reimbursement penalty. Eligible clinicians must satisfactorily participate in 2018 MIPS or face a negative 5 percent payment adjustment in 2020.

By using the System Integrated (SI) connection, the QCDR provides a way to continuously aggregate data and calculate performance on quality measures directly from a practice's electronic health record (EHR). Practices can access the QCDR portal to review the data on a dashboard and view monthly reports. Constant performance measurement can help practices monitor trends, compare results to benchmarks and

identify gaps for quality improvement while satisfying annual Centers for Medicare and Medicaid Services (CMS) requirements.

The QCDR SI connection links directly to a practice's EHR, allowing data relevant to the quality measures to be extracted and transmitted in real time directly into the QCDR. Currently, the QOPI Reporting Registry has been tested with ARIA and MOSAIQ radiation oncology EHRs. FIGmd, the technology platform provider, and local practice information technology staff will work together to tailor the data extraction formula to accommodate unique data collection methods. Each setup is specific and therefore requires a unique setup period. The QOPI Reporting Registry SI approach will support CMS's data requirements while easing reporting burden on practices.

For the 2018 program, ASTRO and ASCO submitted 28 measures for CMS approval, and a decision from CMS is expected in early 2018. Of the 28 measures, 16 are reportable by radiation oncologists. Only six quality measures are required for full MIPS participation. For a complete list of the measures available visit www.astro.org/qcdr. Additionally, ASTRO and ASCO are working together to develop more measures for future MIPS program years and thereby provide radiation oncologists with more measure options.

We are excited to announce that any practice with at least one active ASCO or ASTRO member can now sign up to participate in the 2018 QOPI Reporting Registry. The cost for 2018 is \$495 per physician and includes the system integration mapping, the dashboard, monthly reports and data submission to CMS. To sign up, please visit www.astro.org/qopisignup.

For more information on the QCDR, visit www.astro.org/qcdr or email qcdr@astro.org. To learn more about MIPS, visit www.astro.org/mips. 

practical radiation oncology

pro


Peer-reviewed publication on RO-ILS data

THE RADIATION ONCOLOGY HEALTHCARE ADVISORY COUNCIL (RO-HAC), the analysis arm of RO-ILS: Radiation Oncology Incident Learning System®, has published “Common error pathways seen in the RO-ILS data that demonstrate opportunities for improving treatment safety” in *Practical Radiation Oncology* (PRO). The article presents faults trees for three frequent error types: problematic plan approved for treatment, wrong shift instructions given to therapists and wrong shift performed at treatment. To read the publication, visit www.astro.org/proroils.

This article adds to the existing body of knowledge

based on RO-ILS data, including twelve quarterly reports. All RO-ILS education, some of which offer CME, is available to the public at www.astro.org/roilsreports.

The RO-ILS mission is to facilitate safer and higher quality care in radiation oncology by providing a mechanism for shared learning in a secure and nonpunitive environment. To join the more than 350 enrolled RO-ILS facilities, email roils@astro.org.

ASTRO, with support from Varian, Elekta and AAPM, offers the RO-ILS program at no cost to facilities. 

In Memoriam

ASTRO has learned that the following members have passed away. Our thoughts go out to their family and friends.

Nestor R. Canoy, MD, Columbia, Missouri

Lawrence M. Cibula, Jr., MD, McAlester, Oklahoma

Seymour H. Levitt, MD, DSc, FASTRO, Minneapolis

Daniel Patrick Murphy, MD, Muskogee, Oklahoma

Carolyn I. Sartor, MD, Chapel Hill, North Carolina

Charles E. Smith, MD, Twin Falls, Idaho

The Radiation Oncology Institute (ROI) graciously accepts gifts in memory of or in tribute to individuals. For more information, call 1-800-962-7876 or visit www.roinstitute.org.



Submit your news to ASTRO

Periodically, ASTRO reports [People in the News](#), featuring updates about your colleagues' awards, promotions, media coverage and other announcements. We encourage ASTRO members to submit items of interest to communications@astro.org for inclusion in the online feature.





The *Changing Face* of the **Radiation Oncology** **W O R K F O R C E**

Top findings from the ASTRO Workforce Subcommittee's 2017 Workforce Study

BY CLAIRE FUNG, MD, CHAIR, ASTRO WORKFORCE SUBCOMMITTEE

THE ASTRO WORKFORCE SUBCOMMITTEE EMBARKED THIS PAST SPRING on a study of the radiation oncology workforce to examine demographics, economic conditions and practice trends. The study—the first since 2012—is one element of ASTRO's broader initiative to gain timely and deeper insight into the workforce landscape to inform projections of radiation oncologist supply and demand and impact on access to cancer care in the United States.

The 2017 Workforce Study is a collaboration between ASTRO and affiliate organizations, including the Society of Chairs of Academic Radiation Oncology Programs (SCAROP), Association for Directors of Radiation Oncology Programs (ADROP) and the Association of Residents in Radiation Oncology (ARRO).

The web-based survey focused on radiation oncologists actively practicing in the United States. Building upon the 2012 survey, the 2017 Workforce Study inquired about demographics, workload, vacancy and job search issues and technology utilization. The 2017 study additionally explored new topics,

such as allocation of time at work, utilization of hypofractionation and employment and compensation models, with an eye toward gaining insight into the effects of the changing health care landscape on the radiation oncology workforce.

The study launched in February 2017 and was in the field for eight weeks. An email containing a link to the web-based survey was sent to all Active and Affiliate radiation oncologist members of ASTRO, followed by email reminders. Of 1,187 total responses, 1,174 fit criteria for analysis, yielding a 31 percent response rate. Face-validity testing confirmed the sample was representative of the ASTRO membership at large. Data analysis employed descriptive statistics and bivariate analysis with SPSS software version 22. Results were compared with 2012 survey findings where appropriate.

Findings fall into four major areas: radiation oncologist demographics, supply and demand, technology and practice patterns and employment and compensation models. Here are some of the highlights from the 2017 ASTRO Workforce Study.

Continued on next page

Demographics

- Compared with 2012, white representation has dropped from 80 percent to 69 percent of the radiation oncologist workforce. Asians account for 20 percent, blacks account for 2.5 percent and Hispanics account for 3.7 percent.
- The male to female ratio is 2.46 to 1, slightly lower than the 2012 ratio of 2.85 to 1.
- The workforce is predominantly based in urban and suburban locations, with only 13 percent in rural areas. This contrasts to the distribution of the population in the United States, 21 percent of which reside in rural areas.

Supply and demand


- A larger proportion of radiation oncologists in rural areas plan to retire or go to part-time in the next five years, compared with their urban and suburban counterparts.
- The number of respondents reporting vacancies in their practices has trended downward from 2012.
- Among respondents who have actively searched for employment, a larger proportion compared with 2012 note difficulty finding a position, citing lack of positions in desired areas and lack of practice opportunities.
- One in eight respondents are concerned about a future shortage of radiation oncologists, while more than half are concerned with a future oversupply.

Technology and practice patterns

- From 2012 to 2017, there was an increase in the utilization of magnetic resonance/positron emission tomography fusion, cone beam computerized tomography (CT) and stereotactic body radiation therapy. There was a reported decrease in the utilization of low-dose-rate brachytherapy.
- 4-D CT simulation, volumetric arc therapy, deep inspiration breath hold and high-dose-rate brachytherapy are widely utilized.
- Private solo practitioners utilize hypofractionation less commonly than their counterparts in other practice environments.
- About half of respondents work at multiple facilities.
- Radiation oncologists are allocating a smaller proportion of their time to direct patient care and a larger proportion to electronic health record management compared with the 2012 survey.

Employment and compensation models

- Radiation oncologists are employed by academic/university systems, private practice and nonacademic hospitals in a 2 to 2 to 1 ratio, respectively.
- One in five respondents have changed employers in the past three years. Top reasons for change were practice merger/buyout, personal reasons and increase in job stability.
- Compared with 2012, the workforce has shifted away from private practice into academic/university and nonacademic hospital systems.
- The most common compensation model is fixed salary, followed by productivity-based.
- Nearly 40 percent of respondents reported a change in their compensation plan in the past three years. The changes are predominantly due to practice reorganization and shifts in practice financial position, and carry rather disparate effects on income level among practitioners of different employment settings.

For more in-depth results and analyses, please keep an eye out for publications by the ASTRO Workforce Subcommittee in 2018. In the meantime, the Subcommittee continues its work, alongside ASTRO as a whole, to further enhance the membership experience and elevate the field of radiation oncology. 



Tales from the Trail

A resident's perspective on the radiation oncology job market

BY TREVOR J. ROYCE, MD, MS, MPH

THE "INTERVIEW TRAIL" FOR GRADUATING RADIATION ONCOLOGY RESIDENTS traditionally starts during the ASTRO Annual Meeting, where informal "meet-and-greets" require minimal time and resource investment from both interviewers and interviewees. This marks the beginning of a tortuous road, filled with on-site interviews, second looks, offer letters, negotiations and awkward employer-dictated deadlines for decisions that must be made with imperfect information. The resident hopes the journey ends with gainful employment.

Indeed, no stakeholder is as invested in the state of the job market as the graduating resident, whose livelihood literally depends on it. The stakes are high for graduating American trainees who have dedicated a minimum of 13 years to higher education and training (often more, as almost 25 percent of radiation oncology trainees now have a PhD) and, with the rising costs of higher education, have potentially accumulated hundreds of thousands of dollars in student loan debt.¹ So the anxiety felt by my colleagues in the quiet months preceding the Annual Meeting is understandable.

Potentiating this angst, which would be natural in any job market, is the current majority perception that there is a looming oversupply of radiation oncologists. In the 2017 ASTRO Workforce Study, 53 percent of respondents were concerned about a future oversupply of radiation oncologists;² the prevalence of this sentiment is likely higher among residents. This perception is fueled by the rapid rise in the number of radiation oncology residency positions, going from a nadir of 93 in 2001 to 200 in 2015, and workforce projections cautioning that supply is outpacing demand.^{3,4}

Those frustrated with the steady rise in the number of training positions wonder: What can (or should) be done? This story is not unique to contemporary radiation oncology in the United States and one can look elsewhere for guidance. An imbalance of supply and demand has been characterized across the spectrum of medical specialties, from primary care to plastic surgery. These imbalances have also been characterized in other nations' radiation oncology workforces, such as Canada and Australia. In fact, the specialty of radiation oncology in the United States has grappled with supply and demand for more than three decades, with the pendulum swinging from perceived oversupply to undersupply and back.²



TREVOR J. ROYCE, MD, MS, MPH


A challenge with implementing policy to optimize the workforce is the incredible complexity of the physician supply-and-demand relationship,⁴ as recently illustrated in *JAMA: the Journal of the American Medical Association*, when two editorials came to contradictory conclusions as to whether the United States has enough physicians.^{5,6} One example of this complexity is the unknowns of health care reform and its impact on specialty supply and demand. A second example is that physicians may be "maldistributed," or concentrated in urban environments. So while there may be a perceived oversupply in densely populated metropolitan areas,⁷ there can be a concomitant undersupply in rural areas. To address this, primary care has had some success implementing workforce incentives to drive providers into areas with poor access to care.⁸

Another reality is that collaborative workforce self-regulation by accrediting bodies is prohibited by antitrust and fair-trade law.⁴ The implementation of indirect stopgaps, such as fellowship training that

delays workforce entry, that are enabled by supply- and-demand issues as opposed to a true need for further specialization is disingenuous and could retard our young professionals. In the months preceding the ASTRO Annual Meeting, many residents anxiously noted an increase in the number of fellowship postings on the ASTRO Career Center, a fear rooted in reality with data now demonstrating a rise in the number of radiation oncology fellowships.⁹

A cruder path is the laissez-faire “market-based” approach, where medical students avoid radiation oncology entirely due to poor employment prospects, eventually producing a supply and demand balance.^{4,8} This correction may be occurring already and updated match metrics from the next cycle of the National Resident Matching Program will provide clarity. At the least, disgruntled residents are actively discouraging medical students on the major online trainee forum from joining our specialty due to perceived grim employment prospects.¹⁰

Admittedly, while the projections and anecdotes are compelling, the objective data regarding the market for current graduates is largely limited to intermittent, independent surveys administered by ASTRO, the Association of Residents in Radiation Oncology and also individuals.^{2,4,11–13} Prospective, longitudinal data collected collaboratively on graduate workforce trends could help inform policy. An organizational challenge is the inherently transient nature of the primary stakeholder: the resident.

Personally, I was fortunate to end my journey on “the trail” around the same time as the Annual Meeting when I eagerly “signed on the dotted line” for a new position. It was a great relief—finally with a guaranteed future salary after 15 years of higher education/training, I had a concrete path to eliminate that daunting student loan burden. I hope my resident colleagues can soon say the same. 

Trevor J. Royce, MS, MD, MPH, is chief resident at the Harvard Radiation Oncology Program at Harvard Medical School in Boston. He's Immediate Past Vice-chair, ARRO Executive Committee. He will be joining the radiation oncology department at the University of North Carolina at Chapel Hill upon completing his residency this spring.

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WOMEN LEADERS

IN
RADIATION ONCOLOGY

Improving diversity to improve our field and better serve our patients

BY CAROL HAHN, MD, FASTRO

AT ASTRO'S 2017 ANNUAL MEETING, I was privileged to join a group of women radiation oncologists at a dinner in San Diego. We convened by connecting on a Facebook group of women physicians of various medical specialties that is more than 70,000 members strong. This group has formed a community to share professional questions, including issues in clinical care and research, along with personal and professional challenges and triumphs. As this group is private, it creates a safe space to seek opinions and comments on topics that range from challenging clinical cases to potty training. It was wonderful to spend time with some of this group's members who are in radiation oncology and share this community of fabulous, talented women. Following this gathering, a new social media group was born specifically of Women Radiation Oncology Physicians, a closed group on Facebook—search for it and request to join if you'd like.

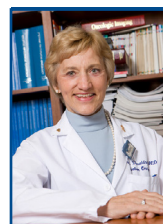
In parallel, unfortunately, during the meeting there was much discussion of gender-based salary disparities in our field and troubling reports of decreasing numbers of female residents in radiation oncology. As a senior female physician in an academic medical center and mother of a daughter who is an undergraduate premedical student, I find this troubling.

How do we move forward toward greater balance, diversity and equity in our field? Following the meeting, I reached out to gain the collective wisdom of the group. Comments were made questioning how “family friendly” our specialty is perceived. Do our practices consider options to optimize work-life balance and are pay scales equitable within a group?

Most prominently mentioned, however, was the role of mentorship and role models. Positive female role models in our field play a major role in paving the way for the next generation of leaders in our field. Our medical students, residents and junior faculty need to

be supported to achieve their professional goals while respecting their personal goals and roles outside of the clinic as partners, spouses, mothers and caregivers.

In this issue of *ASTROnews*, we celebrate the work of Marie Curie on the 150th anniversary of her birth. Dr. Curie was a pioneer in science and paved the way for modern radiotherapy. It is only fitting, therefore, that we take time to recognize the pivotal role of female leaders in radiation oncology in developing and leading our field. Many thanks to my women radiation oncology friends. I hope we can meet again next year. If you'd like to join us, you can follow me on Twitter [@CancerDocNC](https://twitter.com/CancerDocNC).



Sarah S. Donaldson, MD, FASTRO

*Catherine and Howard Avery Professor,
Department of Radiation Oncology,
Stanford University School of Medicine*

BRIEF BIO: My professional journey began at Stanford in 1969, 49 years ago, with my residency training. Having an academic career in a clinical department at an institution such as Stanford has largely dictated my journey, which has been focused on excellence in clinical care, clinical/translational research and education. Early in my career, I developed an interest in cancers in children, thus pediatric radiation oncology evolved to become my major professional focus. However, early on it became clear to me that management and cures in pediatric malignancy require multidisciplinary management, largely advanced through prospective clinical trials, with attention to sequelae and late effects of the disease and its treatment. I have been involved in multi-institutional

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clinical research, cooperative group studies and late effects research for the entirety of my career.

WHY RADIATION ONCOLOGY: Having trained in the late 1960s to early 1970s, prior to the official recognition of the field of pediatric oncology, children with malignancy were largely cared for by surgeons and radiation therapists (now termed radiation oncologists). As a Stanford radiation therapy resident, I saw some memorable pediatric patients that stimulated my interest in wanting to pursue this field. My department chair, Dr. Henry Kaplan, and his successor, Dr. Malcolm Bagshaw, wisely counseled me that if I wanted to care for children with cancer, I needed to learn to think like a pediatrician. Hence, I spent a year in France under the mentorship of Dr. Odile Schweisguth, who was the grand matriarch of childhood cancer in Western Europe. After a year seeing many children with malignancy and studying the natural history of their diseases and learning the management and treatment of the disease at the time, I was invited to return to Stanford to help set up a pediatric oncology program. I can say that I truly have been in this field since the very beginning.

CAREER MOTIVATIONS: The drive to cure childhood cancer and do so without the side effects has pushed me at every step. When we were able to arrest the disease and even cure some children with cancer using aggressive multimodal therapy, we then learned from those early survivors of the “price of cure.” The challenge of “the cure is not enough,” a phrase coined by Dr. Giulio D’Angio, became my personal challenge.

A secondary motivator, perhaps of equal importance, has been the desire to serve as a role model and to influence others to follow along in this new field. Thus, the education and training of young people entering the field, and mentoring them along the way, has been an immense source of gratification for me.

ADVICE FOR EARLY-CAREER PHYSICIANS: It is important for all young trainees—students, residents, fellows and junior faculty—to find a mentor, one whom you greatly admire, and then follow the guidance, direction and advice of your mentor as you determine the important steps along your own professional journey.

VISION FOR THE FUTURE: This is a most important and exciting time in cancer investigation and treatment. There are numerous opportunities with so many new

therapies and ways of using them to augment the management and treatment we now know is effective. Radiotherapy is an exceptionally effective modality, and we are continually learning new and better ways of using it as sole therapy or, more commonly, in combination with other local therapy and with systemic therapy. Understanding the genetic risks associated with malignant disease, and the ways to modulate one’s own immune system to work effectively in keeping all systems in order, is an exciting challenge. Personalizing the therapy as appropriate for each individual works for some patients, and must be continued as we learn how to apply these tools to a large cohort of those afflicted. This is a wonderful time to enter the field of cancer biology and investigation; radiation oncology is and will continue to be a mainstay of research and effective therapy for a large majority of cancer victims.



Patricia J. Eifel, MD, FASTRO

Professor of radiation oncology, the University of Texas, MD Anderson Cancer Center, Houston

BRIEF BIO: Most of my research, teaching and clinical practice has focused on the multidisciplinary care of women with gynecologic malignancies. During 30 years on the faculty at MD Anderson, I have treated or been involved in the care of more than 10,000 patients with gynecologic cancers. The size of our practice, which involves treatment of patients with relatively uncommon and complex clinical problems, has afforded unique opportunities to study the treatment and outcomes of these patients. The goal of my prospective, retrospective, outcomes and translational studies has always been to clarify the role of radiation therapy in the care of gynecologic cancer patients and to teach and assist physicians who, for demographic reasons, see these patients much less frequently. I have also found a great deal of fulfillment as a volunteer leader in the field, particularly through my roles as President and Chair of the Board of ASTRO.

WHY RADIATION ONCOLOGY: Although I did a rotation in radiation oncology during my time at Stanford Medical School, my first thought was to be a pediatrician. However, halfway through my internship in pediatrics, I realized that it was not a good fit. At the time, I had a close friend who was a radiation

oncologist and, after some thought, determined that the variety and multidisciplinary nature of radiation oncology practice, the ability to cure many patients with a dreaded disease and the clinical and laboratory research opportunities drew me to the field. I also had the benefit of a number of outstanding role models who were practicing at Stanford at that time, including Henry Kaplan, Martin Brown, Sarah Donaldson, Alvaro Martinez, Rich Hoppe and others—the enthusiasm demonstrated by these giants was compelling.

As for my subspecialty interest, I was initially torn between pediatric and gynecologic radiation oncology, the first because I retained an interest in pediatric oncology and the second, because I had, at the suggestion of mentors and in collaboration with several brilliant, creative pathologists, performed a clinic-pathologic review of patients treated for endometrial cancer. That study, which revealed the clinical importance of histological variants of endometrial cancer, began my special interest in gynecologic cancers. More importantly, I think of the intense collaboration that led to these findings as one of the most fulfilling intellectual experiences of my career. It led me to search for more aha! moments and, ultimately, to a career devoted to the study of gynecologic cancers.

CAREER MOTIVATIONS: I enjoy my relationships with patients and the sense that I can make a difference in their lives. I certainly am driven to have the aha! moments described above. And I love to teach. Ultimately, I believe that the only bit of immortality we can achieve is from the influence—hopefully positive influence—that we can have on the overall body of work and on future generations of innovators.

ADVICE FOR EARLY-CAREER PHYSICIANS: Listen. In particular, listen to your patients and be open to their concerns. Develop strong, mutually supportive relationships with colleagues. Know the limits of your understanding and experience and don't hesitate to seek out advice when needed. Maintain what I call "parallel priorities." Decide what is essential to your sense of well-being and do not let any one priority ever become so dominant that you lose contact with these other parts of your life.

VISION FOR THE FUTURE: Our field has been enormously enriched by the influx of extremely talented young people who have chosen careers in radiation oncology. This talent makes me extremely optimistic

about our field. I still don't think that information technology has met its potential in terms of information transfer, knowledge sharing and education. I am convinced that the kind of innovations discussed in Richard Zane's ASTRO 2017 Keynote Address can, and will, be transformative for radiation therapy and for multidisciplinary oncology in general. [Editor's note: See Chair's Update on page 6 for more on Dr. Zane's address and how to access it online.]



Mary Gospodarowicz, MD, FASTRO

Medical Director, Princess Margaret Cancer Centre, University of Toronto

BRIEF BIO: Currently, I am the Medical Director at the Princess Margaret Cancer Centre, University of Toronto, where I have an active practice in radiation oncology treating patients with lymphomas and genitourinary cancers. I am also the Regional Vice-president of Cancer Care Ontario for Toronto Central South region. My early research interests focused on clinical trials investigating the role of radiotherapy in oncology, cancer staging and prognostic factors. Later, my interest turned to image-guided radiotherapy, and, more recently, to global health, specifically global cancer and equitable global access to radiotherapy.

WHY RADIATION ONCOLOGY: I was specializing in internal medicine and had a broad range of interests when I was enticed to radiation oncology by a senior colleague. I finished the internal medicine residency, trained in oncology and subsequently obtained board certifications in internal medicine, medical oncology and radiation oncology.

CAREER MOTIVATIONS: Caring for cancer patients is a great privilege afforded to us. Being able to help and support patients when they are at their most vulnerable is a great motivator for research to try and constantly improve on our ability to control cancer. My main motivator in research was curiosity.

ADVICE FOR EARLY-CAREER PHYSICIANS: Be positive. Be curious. Always try to improve. And, above all, enjoy your work and have fun. Embrace teamwork and multiprofessional practice. Become leaders and

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advocates for your patients. Engage in the broader issue of cancer control and global cancer. Be an advocate for all patients; address the equity gaps.

VISION FOR THE FUTURE: Radiation oncology planning and delivery will become more and more automated. Patient care, however, will not. We must not abandon patient care but meanwhile embrace new technologies, including artificial intelligence, to make them work for us and for our patients.

With progress in other disciplines, such as image-guided therapeutics, minimally invasive surgery, targeted therapies and immunotherapy, we must redefine the role of radiation therapy in the context of other modalities to improve patient outcomes.



Nancy Mendenhall, MD, FASTRO

Associate Chair of Department of Radiation Oncology, Medical Director of University of Florida Health Proton Therapy Institute. Professor, University of Florida

BRIEF BIO: I went on staff in 1984 at the University of Florida (UF). My areas of interest were breast, lymphomas and pediatric cancers. Eight years later, in 1992, I was named chair of the department at UF. I was the first female chair of a department in the College of Medicine at the university. There were not a lot of senior women, especially in the South. It was a very interesting path. As chair, it became my responsibility to look to the future. I wasn't responsible just for my own career or patients anymore. I had to be concerned about the viability of the department. One of the things I became convinced of was there was going to be better outcomes with proton therapy. We started that project in 1998. We opened the proton facility in 2006. Having put the better part of my academic life toward proton therapy, I made the decision in 2006 to step down as chair to run the proton facility. I became focused more on trying to create an environment where we could successfully treat and investigate whether there was a place for this modality in radiation therapy. I have continued with breast and lymphoma. In addition, I've been involved in prostate cancer in recent years.

WHY RADIATION ONCOLOGY: As a medical student, I really enjoyed surgery. I loved the anatomy and how things worked. I liked working with my hands.

I had done a lot of sewing and artwork. One of the disease processes that interested me was cancer. I spent some time in the orthopedic department. I had great exposure to bone and soft tissue sarcomas. One thing even more rare than females in radiation oncology was females in orthopedics and oncologic orthopedics, especially. Dr. Rodney Million, who was director of the radiotherapy division of the radiology department at the University of Florida, encouraged me to spend some time in pathology. He also encouraged me to do an elective in radiation oncology. Within a week, I knew that's what I had to do. There was all of the focus of anatomy; it was a localized problem that you can identify, as opposed to a metabolic or lifestyle problem. This was a real, tangible problem that could be fixed with the right intervention. I liked the geometry involved. Then it had something additional, and that was seeing the patient every day for six to eight weeks. I liked the interaction with the patients.

At that time, the department was already requiring all of their residents to do clinical outcomes assessments. Dr. Million taught us clinical and also research skills. He was an incredible teacher and mentor. He felt that we had to be as good at physical exams as any of our counterparts—as good at doing a breast exam as a gynecologist. I've never imagined doing anything else.

CAREER MOTIVATIONS: I think it's always, for me, been about the patient. I connect with my patients and I care deeply about what happens to them. It's devastating when the treatments don't work. For me, it's always about doing the best treatment I can for each patient.

ADVICE FOR EARLY-CAREER PHYSICIANS: One thing is to have an attitude of curiosity about everything you deal with. Be incredibly curious about everything that is going on with your patients and everything that happens to them. Listen to them, both before you plan their treatment and then listen to them after their treatment. Be open to the possibility that maybe there is a better way of doing things. Maybe a patient is better treated with surgery or systemic treatment—be open to that. Have the courage and conviction in the value of radiation. Be a full participant in the conversation about how to treat the patient. You have an expertise that you carry with you. You must use it to advocate for your patient.

If you have curiosity and courage, they will serve you in the research arena, too. You have to always be on the

lookout for what's new or what you can improve. Along with the courage, don't let obstacles stop you. If you see the path you need to take and there are obstacles in your way—you need to find another way around. Don't allow yourself to be stopped by biases that you may confront.

VISION FOR THE FUTURE: I have a very positive outlook for radiation oncology for the coming years. I think there will be a role for localized therapy for a long, long time. Radiation will always have the advantage of sparing normal tissues compared with surgery. Our ability to understand what needs to be treated has improved dramatically, with new developments and the imaging tools we have and are developing. With onboard imaging and sophisticated treatment system planning, our ability to target has improved. We have an incredibly large role to play in cancer management for the coming decades. The challenge for us is going to be to harness these new technologies and to do clinical research that proves the



Nancy J. Tarbell, MD, FASTRO

Dean for Academic and Clinical Affairs, Harvard Medical School, and CC Wang Professor of Radiation Oncology, Massachusetts General Hospital

importance of what we do.


BRIEF BIO: I'm a pediatric radiation oncologist with expertise in pediatric brain tumors. I was the first director of the Office for Women's Careers at Massachusetts General Hospital (MGH) and then the founding Director of the Office of Faculty Development, also at MGH. In 2008, I accepted a position at Harvard Medical School (HMS) as the Dean for Academic and Clinical Affairs to help with the promotion process and improve the centralized Faculty Development efforts. I was the first woman to be hired as a senior academic dean at HMS.

WHY RADIATION ONCOLOGY: As a medical student, I fell in love with radiation oncology—we saw a young patient who was a long-term survivor of a kidney cancer; she had a Wilms tumor. This woman, a cancer survivor, came in with her young child. The idea that you could cure cancer if you worked hard enough was so exciting. I remember thinking, "You can treat hypertension; you can treat diabetes. You can CURE cancer."

CAREER MOTIVATIONS: When you're treating the patient in an academic environment, you are motivated in part to make things better for tomorrow's patient. That's a huge motivator. The bottom line is you've got to work with a great team. If you can't join one, build one. The families you meet are inspirational. Luckily, the majority of patients do survive. The greatest honor is treating children with cancer. Knowing that we're doing a great job offering families complete care, not just the radiation portion. I feel very proud of the care we give. That's the number one motivator for me in becoming a doctor. Mentoring women and helping the next generation has also been very satisfying.

ADVICE FOR EARLY-CAREER PHYSICIANS: Find your passion. People will tell you what this field is but be sure to look through your own lens. I remember when I was asking advice about what to specialize in: everyone told me to specialize in the care of patients with breast cancer. People said the management of patients with pediatric cancer is so uncommon that it would be hard to make a difference. So seek advice, but ultimately follow your passion, wherever that path takes you.

We have so many choices—you can work full-time or part-time; you can be an academic or in private practice. There are so many options. You can get creative and build a network. The best help I ever got was networking with my colleagues in the same field. You can build a peer-to-peer network. Seek multiple mentors, some of whom are your peers.

VISION FOR THE FUTURE: We are designing personalized treatment with our oncology colleagues. Radiation therapy is the ultimate personalized treatment. The next step is understanding how radiation can be used with other modalities—how you can change radiation and integrate it with other therapies, such as immunotherapy. That is the future: combination therapy that increases the efficacy and reduces the side effects. I think those changes are coming. 



Carol A. Hahn, MD, FASTRO, is Vice-chair of the department of Radiation Oncology at Duke Cancer Center Wake County. She is also a Professor of Radiation Oncology at Duke University Medical Center in Durham, North Carolina.

MARIE CURIE'S LEGACY



Celebrating the 150th birthday of the female trailblazer in radiation research

BY MAGDALENA STOEVA, PHD, AND
GEOFFREY IBBOTT, PHD

THE INTERNATIONAL DAY OF MEDICAL PHYSICS

is celebrated each year on November 7, the birthday of Marie Sklodowska Curie. November 7, 2017, is the 150th anniversary of her birth in 1867 and is an opportunity to celebrate the contributions made by women to medical physics and radiation oncology.

Marie Sklodowska Curie, a brilliant chemist and exceptional physicist famous for her pioneering work on radioactivity, was the first female professor at the Sorbonne, the first woman to be entombed in the Paris Panthéon for her own achievements and the first person to be awarded two Nobel Prizes (in two different areas: chemistry and physics). Marie Sklodowska began school in Poland at a time when women were denied higher education. She sought to educate herself through a clandestine organization of intellectuals and political activists, and learned chemistry this way. At 24, she moved to Paris to live with her sister and attend the University, and after two years, in 1893, she obtained her bachelor of science in physics.

She became interested in the study of magnetic properties of various minerals, but needed a laboratory to conduct her measurements. A friend put her in contact with the Chief of Laboratories at the Industrial School of Physics and Chemistry, Professor Pierre Curie. He, with his brother, Jacques, had already invented the electroscope, which would later be of importance in Marie's work. Marie and Pierre were married in July of 1895.

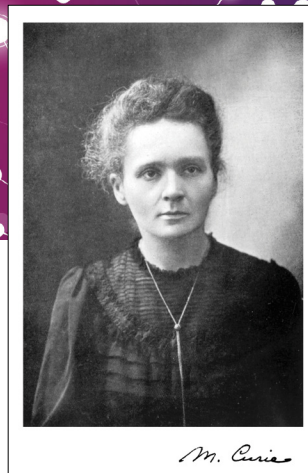
By this point, Marie had learned of Henri Becquerel's discovery of emanations from uranium that fogged photographic film in the way Röntgen's X-rays did. For her doctoral thesis, using the Curie brothers' electroscope, Marie demonstrated that the radiant energy emitted by a variety of compounds was directly related to the amount of uranium present in the mixture, regardless of its physical state. She was also

able to isolate thorium from uraninite and torbernite and demonstrate that it was more active than uranium. The radiant activity of thorium had already been described by Gerard Schmidt in Berlin, but Marie observed that both uranium and thorium were heavy elements and postulated that this radiant energy was an atomic property.

In a report to the Academie des Sciences in 1898, she suggested that other elements having the property she called radioactivity would be discovered. Marie and Pierre joined forces to characterize other elements having this property and reported again to the Academie des Sciences that they had diluted away the uranium and thorium from a sample of uraninite, leaving a new element they proposed to name polonium, after Marie's native country.

In December of 1898, the Curies identified an even more radioactive element that they named radium. However, it took four years of laborious processing of massive amounts of ore to extract a tenth of a gram of radium. As they produced larger amounts of radium, they began to detect and then evaluate the biophysical effects. Pierre Curie applied radium to his arm and described the appearance of moist desquamation and his recovery. He began animal studies himself, and also captured the radon gas emanating from the decaying radium to give to clinicians who carried out human trials.

In 1903, Marie Curie presented her thesis and received her PhD in physics. In November of that year, the Swedish Academy of Science announced that the Nobel Prize for Physics had been awarded to Henri Becquerel for the discovery of natural radioactivity, and




Continued on next page

to the Curies “for their work on radiation phenomena.”

The next year, the University of Paris created a chair of physics and awarded it to Pierre Curie, and appointed Marie the Chief of Laboratories. In 1906, Pierre was killed in a tragic accident with a horse-drawn wagon. When Marie emerged from mourning, the University of Paris offered her the chair left vacant by her husband’s death, which allowed her to continue work on the mathematics of radioactivity. In 1911, Marie was awarded a second Nobel, this time for Chemistry, for the discovery of radium. Also in 1911, and after several years of work and increasing recognition of her accomplishments, the university

together with the Pasteur Institute created the Institut du Radium.

Marie Curie spent the remainder of her life living and working in her laboratory in Paris. In 1931, the Chancellors of the American College of Radiology traveled to Paris to present Madame Curie with the Gold Medal of the College. Madame Curie died in 1934 of aplastic anemia, which likely resulted from her lengthy exposure to radiation. 

Note: A major source of information for this article was the book “Radiological Physicists” by J. Del Regato and the special issue of IOMP Medical Physics World vol. 32(8) dedicated to Marie Curie and women in medical physics.

CORPORATE AMBASSADORS

ASTRO PROUDLY RECOGNIZES THE ONGOING COMMITMENT OF OUR CORPORATE AMBASSADORS FOR THEIR OUTSTANDING YEAR-ROUND LEADERSHIP AND PROMOTIONAL SPONSORSHIP OF RADIATION ONCOLOGY.

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GENDER PAY GAP NARROWS AMONG SOME ACADEMIC RADIATION ONCOLOGISTS



BY TIM SANDERS, RESEARCH ANALYST, TIM.SANDERS@ASTRO.ORG

RESULTS FROM THE 2016 SOCIETY OF CHAIRS OF ACADEMIC RADIATION ONCOLOGY PROGRAMS (SCAROP) FINANCIAL SURVEY indicate that the compensation gap between male and female radiation oncologists in academic settings may be closing.

Every two years, ASTRO conducts a financial survey among medical school programs/departments that are included in SCAROP. The survey addresses three primary areas—benchmarks for department administration, faculty and administration personnel compensation and funding resources. For the 2016 reporting year, 58 programs representing more than 1,600 faculty members completed the survey.

According to the survey, compensation differences between men and women who hold certain leadership positions decreased considerably in the past two years. The gaps for directors of radiation oncology residency programs, however, did not vary substantially from 2014 to 2016, as the salary differential was minimal in the last survey.

In 2014, male department chairs earned an average of \$63,000 more than women with the same title. In 2016, that difference dropped to \$1,000. Similarly, in 2014, male section/division chiefs earned an average of \$38,000 more than their female counterparts. In 2016, women in that position averaged \$5,000 more than men.

By comparison, a 2016 JAMA study of more than 10,000 physicians found that male doctors received an average of more than \$51,000 more than female doctors.¹ While that study did not look specifically at radiation oncologists, the male-female differential was \$53,684 among hematologists/oncologists and \$863 among radiologists.

“Across the spectrum of higher education, including the

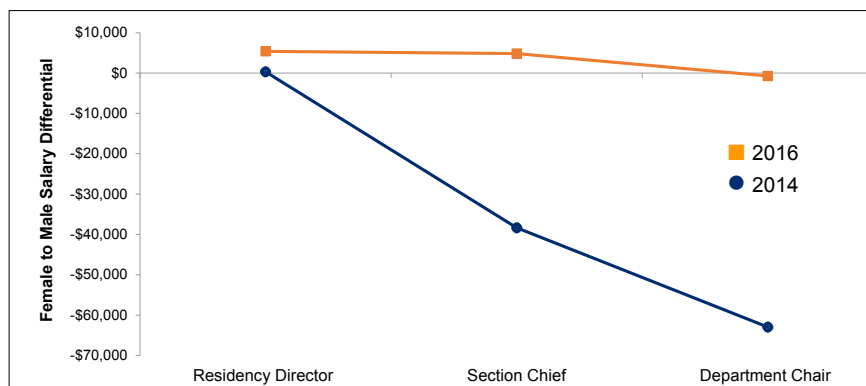
broad landscape of medicine, there is interest in understanding the mechanisms that contribute to pay inequities²,” said Charles Thomas, MD, chair of SCAROP.

“Moreover, leaders are charged with developing creative and fair strategies to mitigate these disparities. It will be important to continue to monitor gender salary³ and start-up package equity.⁴ SCAROP leaders believe that by illuminating these variances, they can lead the effort to make sure that differences in compensation will dissipate,” Dr. Thomas said.

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Figure 1: Gender-based salary differentials across academic radiation oncology positions in 2014 versus 2016.



Each data point represents the average male salary set to \$0 and the average female salary illustrates the difference in compensation.

Survey Says

ASTRO MEMBER SURVEY RESULTS

BY TIM SANDERS, RESEARCH ANALYST, AND ANNA ARNONE, VICE PRESIDENT, MEMBER RELATIONS AND COMMUNICATIONS

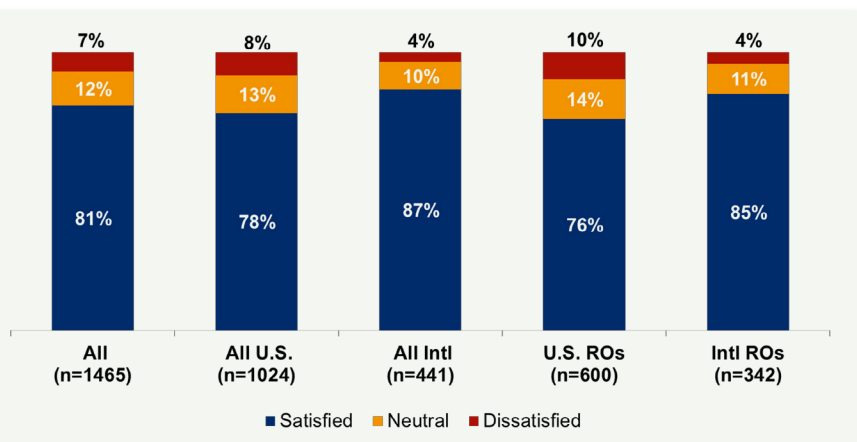
THE ASTRO MEMBERSHIP SURVEY IS OUR YEARLY LOOK at how members feel about their membership and the Society’s initiatives, direction and programs. This year’s survey was fielded from May 22 to July 10 among all Active, Affiliate, International and Associate members, as well as Members-in-Training. A total of 1,528 ASTRO members completed the survey for a response rate of 18.0 percent.

Respondent and practice demographics

The 2017 respondents were representative of ASTRO’s membership as a whole. Nearly two-thirds of respondents were radiation oncologists, with medical physicists and radiation oncology residents as the next most common respondent occupations (see figure 1 for a full list of professions).

Geographically, most respondents practice in North America (75 percent), followed by Asia (12 percent) and Europe (7 percent). A total of 66 countries (up from 60 in 2016) across six continents were represented in the survey, most commonly the United States (70 percent), Japan (5 percent), Canada (3 percent), Brazil (3 percent) and India (2 percent).

Figure 2: Satisfaction with ASTRO Membership



Satisfaction with membership is high for all members, with highest satisfaction reported by international members.

Figure 1: Respondent Demographics by Profession

Profession	% of Total
Radiation Oncologist	64.3
Medical Physicist	18.2
Radiation Oncology Resident	10.2
Administrator	1.6
Medical Dosimetrist	1.0
Radiation Therapist/Technologist	0.9
Clinical Oncologist	0.8
Oncology Nurse	0.8
Radiation Biologist	0.6
Nurse Practitioner	0.6
Other	0.6
Veterinarian	0.1
Diagnostic Radiologist	0.1
Physician Assistant	0.1

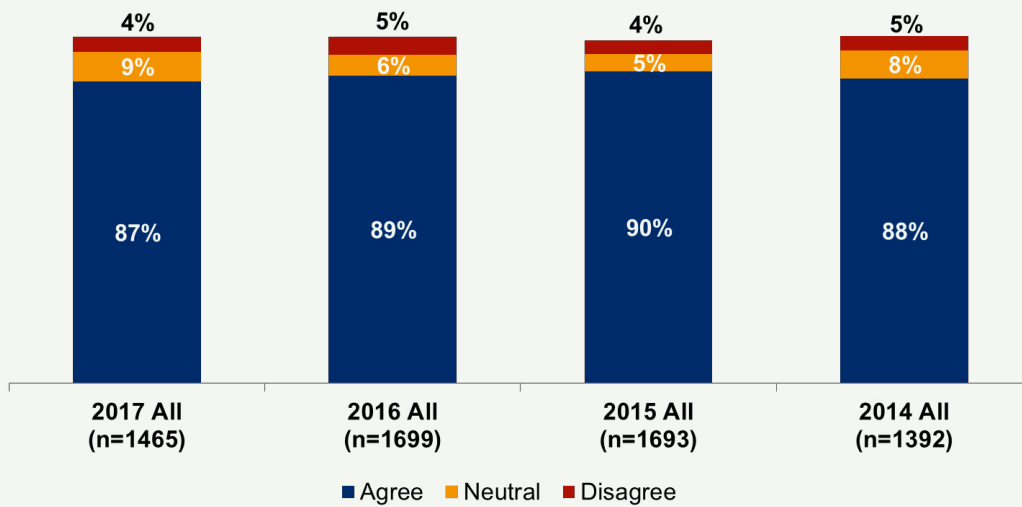
The 2017 Member Survey respondents mirror overall ASTRO membership.

Respondents to the survey confirm the recent research published regarding the gender gap in the profession with two-thirds of respondents being male. Men outnumbered women in radiation oncologist, medical physicist and radiation oncologist resident occupations. The gender gap is the smallest among residents. For all other occupations ASTRO serves, females outnumber males.

Just under half (49 percent) of the respondents practice in an academic/university system, while 38 percent are employed in a private practice/community-based system. Approximately four out of five respondents described their primary work setting as hospital-based, and the remainder reported working primarily in freestanding/satellite clinics. Work setting and primary employer differed somewhat among domestic and international respondents, but has remained relatively stable over time.

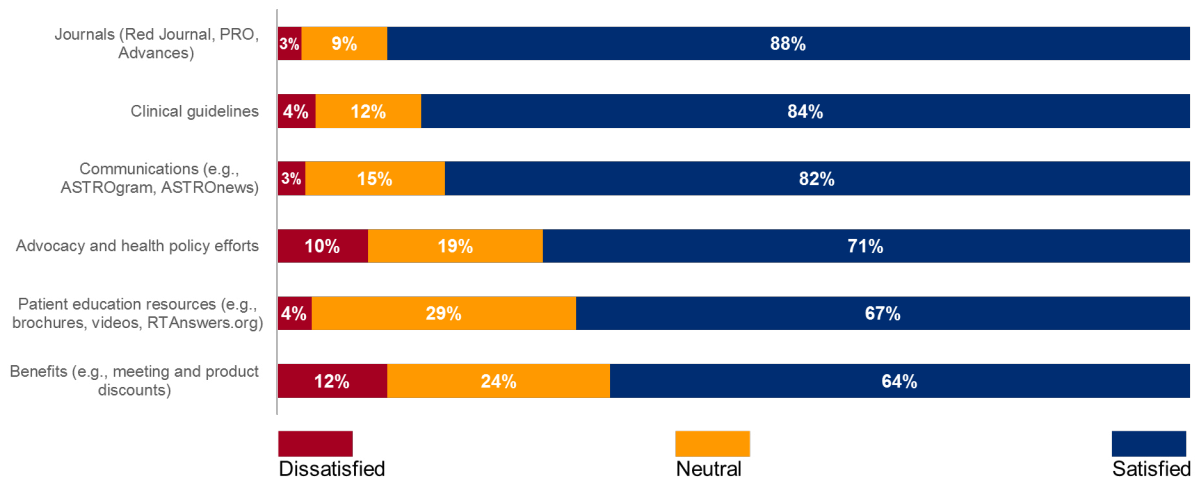
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Figure 3: Satisfaction with ASTRO Volunteering



Over time, the satisfaction level for those who volunteer with ASTRO has held steady.

Figure 4: Membership Satisfaction (U.S.) – Benefits and Services



ASTRO journals and clinical guidelines are highly regarded by ASTRO membership.

Figure 5: Challenges: Academic vs. Private

Challenges Facing U.S. ROs	Academic	Private
Balancing patient care and research	39%	9%
Restrictive coverage policies by payers	37%	48%
Administrative burden (less time available for patients)	36%	39%
Integrating the use of electronic health records	24%	29%
Self-referral arrangements in my community	16%	29%
Participating in federal quality payment programs	14%	45%
State and federal regulatory compliance	13%	28%
Rising practice costs	11%	31%
Managing disparate populations	11%	15%
Keeping up with the latest developments/emerging tech. in the field	10%	11%
Lack of leadership opportunities in multidisciplinary care	9%	9%
Public perception of radiation oncology	8%	12%
Deficiency of qualified/experienced office (allied health) staff	8%	12%
Lack of evidence-based guidelines/best practices	5%	5%
Malpractice issues	3%	4%

Academic and private practice respondents agree that restrictive coverage policies by payers is a top challenge.

Practices of all sizes were represented by respondents, most frequently medium-sized practices (i.e., 500-999 patients, 34 percent), followed by small (0-499 patients, 33 percent), large (1,000-1,499 patients, 17 percent) and jumbo (more than 1,500 patients, 15 percent) practices. Small practices showed the largest growth since 2016.

For a comprehensive account of radiation oncology’s demographics, turn to page 13 for an overview of the radiation oncology workforce in this issue of *ASTRONews*.

Satisfaction with ASTRO membership

New in 2017, the Annual Member Survey took a deeper look at member satisfaction with regard to membership overall, as well as specific benefits and initiatives. Satisfaction was examined by occupation, geography and work setting among other variables.

Ninety-three percent of ASTRO members reported that they were satisfied (81 percent) or neutral (12 percent) with their ASTRO membership. Satisfaction

is highest among international respondents. Looking at satisfaction by profession, nine out of 10 domestic radiation oncologists reported being satisfied or neutral with their ASTRO membership. Residents reported the highest level of satisfaction in both the U.S. and internationally (see figure 2).

Nearly nine in 10 respondents agreed that participation in ASTRO is a good use of their time. This satisfaction level has held steady over the past three years. International respondents were slightly more likely to report ASTRO as a good use of their time (See figure 3).

Members were asked how satisfied they were with different aspects of their membership. Domestic respondents were highly satisfied with ASTRO’s journals (the Red Journal, *Practical Radiation Oncology* and *Advances in Radiation Oncology*), clinical guidelines and the communications they receive from ASTRO, such as the weekly ASTROgram newsletter and the quarterly *ASTRONews* magazine (see figure 4).

Figure 6: Challenges Over Time: Academic

Challenges for U.S. ROs in Academic Practices	2017	2015	Difference
Restrictive coverage policies by payers	37%	32%	+5%
Administrative burden (less time available for patients)	36%	40%	-4%
Integrating the use of electronic health records	24%	29%	-5%
Self-referral arrangements in my community	16%	30%	-14%
Participating in federal quality payment programs	14%	27%	-13%
State and federal regulatory compliance	13%	20%	-7%
Managing disparate populations	11%	13%	-2%
Deficiency of qualified/experienced office (allied health) staff	8%	17%	-9%
Lack of evidence-based guidelines	5%	8%	-3%
Malpractice issues	3%	5%	-2%

Top challenges remained consistent for ROs in academic settings, while concern over self-referral decreased.

Figure 7: Challenges Over Time: Private Practice

Challenges for U.S. ROs in Private Practices	2017	2015	Difference
Restrictive coverage policies by payers	48%	46%	+2%
Participating in federal quality payment programs	45%	53%	-8%
Administrative burden (less time available for patients)	39%	38%	+1%
Integrating the use of electronic health records	29%	40%	-11%
Self-referral arrangements in my community	29%	44%	-15%
State and federal regulatory compliance	28%	29%	-1%
Managing disparate populations	15%	26%	-11%
Deficiency of qualified/experienced office (allied health) staff	12%	20%	-8%
Lack of evidence-based guidelines	5%	11%	-6%
Malpractice issues	4%	13%	-9%

Top challenges remained consistent for ROs in private practice, while concern over self-referral decreased.

Continued on next page

Figure 8: Agreement with ASTRO Strategic Plan Goals



Respondents agree that strategic plan goals identified by the ASTRO Board of Directors are important.

Challenges radiation oncologists face

The survey asked radiation oncologists in the United States to rate the challenges they face at their practices. This question was last asked in 2015.

In 2017, the greatest challenge facing academic/university system radiation oncologists who work in the United States is balancing patient care and research, followed by restrictive coverage policies by payers. Whereas private practice radiation oncologists who work in the United States identified restrictive coverage policies as the leading challenge followed by participating in federal quality payment programs (see figure 5).


When looking at these challenges over time, there are some similarities and a few differences. Most challenges have decreased in level of concern since 2015, regardless of employer type (academic or private practice). Restrictive coverage policies by payers is the only challenge that increased for both academic and private practice radiation oncologists in the United States. Administrative burden was the only other challenge that increased since 2015, and only for private practice practitioners. Self-referral arrangements saw the largest decrease as a challenge since 2015 (see figures 6 and 7 for more details about specific challenges over time).

ASTRO's new strategic plan

In early 2017, the ASTRO Board of Directors set out to update ASTRO's strategic plan. Through a series

of focus groups with members, volunteers and staff, the board identified four goals for ASTRO to concentrate on in the coming years. As part of the Member Survey, members were asked to rate the importance of the strategic plan goals identified by the Board to ensure that the plan was on track. All of the goals were highly rated by respondents (see figure 8). Ensuring the highest quality and value care was rated as the most important goal overall. Domestic radiation oncologists rated positioning radiation oncology as an equal partner in the cancer field as the most important strategic plan goal.

With a new strategic plan in place and feedback from the many members who completed the 2017 Member Survey, ASTRO is poised to move forward and continue to represent the needs of our members. We encourage you to continue to keep abreast of what's happening at ASTRO by continuing to use the many ASTRO communication channels. According to survey respondents, the most popular communication channels aside from attending the Annual Meeting are ASTRO's website (www.astro.org), topical emails, the weekly ASTROgram newsletter and *ASTRONews*. Also, be sure to connect with ASTRO via social media including Twitter, Facebook and the ASTROblog, which continue to gain followers.

Thank you to everyone who took the time to complete the 2017 Member Survey. The survey is sent out every spring, so don't miss it next year. Your input is essential to make ASTRO work best for you. 



Thank you!

Attendees enjoyed another amazing display of products and services in radiation oncology and cancer care in the Innovation and Solution Showcase and the new-for-2017 Product Showcase. ASTRO's Ambassadors and Meeting Sponsors had a special opportunity to share some of their companies' innovations with the Society's leadership in an Annual Meeting tradition. We thank our Ambassadors and Meeting Sponsors for their generosity.

If your company would like to benefit from the opportunity to meet directly with ASTRO leadership during the Annual Meeting next year in San Antonio, please visit our 2018 Annual Meeting Sponsorship Opportunities page at www.astro.org/amsponsorship or contact corporaterelations@astro.org to discuss other ways to support our 60th Annual Meeting.

Accuray

(Left to right) James Hayman, MD, MBA, FASTRO; Todd Pawlicki, PhD, FASTRO; Birgit Fleurent, Chief Marketing Officer; Laura Thevenot, ASTRO Chief Executive Officer; Join Luh, MD; Thomas Eichler, MD, FASTRO



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RESEARCHspotlight

BY TYLER F. BECK, MS, PHD,
ASTRO SCIENTIFIC PROGRAM OFFICER,
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When Cheng-Chia “Fred” Wu, MD, PhD, approached his future mentor, Simon Cheng, MD, PhD, about starting an independent project to study focused ultrasound and radiation with immunotherapy, a new area of research for his lab, Dr. Cheng was fully supportive. “Dr. Cheng gave


me, a resident-physician, the freedom, with appropriate guidance and supervision, to manage his patient clinic,” Dr. Wu explained. “For my research, he allowed me to develop as a scientist—establishing new collaborations, developing new research techniques and exploring new hypotheses. For all these reasons, I elected to join Dr. Cheng’s laboratory, and through his mentorship I am now able to begin to fulfill my research goals.”

Dr. Wu, one of the recipients of the 2016 ASTRO Resident Seed Grant, is currently working on a project that involves investigating the feasibility of increasing the permeability of the blood brain barrier (BBB) by using ultrasound, and examining whether it will improve immunotherapy in brain tumors. Using a mouse model involving implanting B16 melanoma cells into the brain, he showed that combining focused ultrasound (FUS)-mediated BBB-opening to stereotactic radiosurgery and immunotherapy may enhance the abscopal effect in the tumors on the non-irradiated side of the brain. This preliminary work was presented as an oral presentation at ASTRO’s Annual Meeting this year under the title, “What’s the fuss about FUS: focused ultrasound.”

The results of this study have led to additional internal and external funding opportunities, including funding from the Focused Ultrasound Foundation. Dr. Cheng will continue to study the role of FUS-mediated BBB-opening using a murine model of melanoma that develops spontaneous brain metastases.

“As a radiation oncologist, my goal is to become a physician-scientist and a leader in radiation oncology with the objective of providing outstanding and compassionate care for patients, while driving the development of new technology to bridge the gap between the basic sciences and clinical medicine,” Dr. Wu explains. “It is an exciting time in the world of focused ultrasound in which FUS-mediated BBB-opening is being studied in the clinic in patients with brain tumors. This may create a new modality of treatment for patients.”

Dr. Wu’s long-term research goals are to lead and develop programs in vascular function (in both cancer and normal tissue settings) as it pertains to radiation therapy, understanding the effect of FUS-induced blood brain barrier openings, and the future role of immuno-oncology and radiation therapy.

“My hope is that one day my research efforts can lead to a change in standard-of-care management and move our medical and scientific community closer to a cure, or at least beneficial, life-prolonging treatments for patients.” 

Dr. Wu is currently the chief resident in the Department of Radiation Oncology at New York Presbyterian—Columbia University Medical Center. His main areas of expertise include radiation biology, cancer research and tumor vasculature. He completed his MD/PhD training while studying microvasculature pathophysiology in the setting of hypertension, which led to his current interests in tumor vascular biology and radiation oncology. He is currently focused on central nervous system malignancy research, with an emphasis on brain metastasis and glioblastoma, specifically studying the role of the blood-brain barrier in neuroimmunology and cancer immunotherapy in relationship to radiation.

“For my research, Dr. Cheng allowed me to develop as a scientist—establishing new collaborations, developing new research techniques and exploring new hypotheses.”

OBSERVATIONS ON POSTGRADUATE EDUCATION, ASSESSMENT AND THE RADIATION ONCOLOGY WORKFORCE

As has been previously reported,¹ the mission of the Accreditation Council for Graduate Medical Education (ACGME) is “to improve health care and population health by assessing and advancing the quality of resident physicians’ education through accreditation.”² Members of the ACGME Radiation Oncology Review Committee are volunteers deeply committed to postgraduate medical education. The committee also includes residents and members of the general public with staff support from a group of highly skilled education professionals. The committee uses its best judgment and available observations to develop criteria for review and approval of postgraduate training programs, changes in resident complement and specific parameters for acceptable training, including the requirements for the introduction of new procedures and technologies into a training program. Before finalizing various criteria, all policy changes are available for public review and comment.

The mission of the American Board of Radiology (ABR) is “to certify that our diplomates demonstrate the requisite knowledge, skill and understanding of their disciplines to the benefit of patients.”³ ABR initial certification and maintenance of certification assessment tools are developed by volunteers in academic and community practice, assisted by psychometricians, editors and test-development professionals to assure fairness, reliability and relevance of these instruments.

The ACGME uses its best efforts to determine the requirements for physician training, and the ABR similarly uses its best efforts to assess the skills and knowledge that those trainees have achieved. However, none of these efforts include determinations of current or projected workforce needs, and the mission statements and policies of these organizations are entirely workforce agnostic.

For many years, acting either independently or for organizational entities, various authors have attempted


to predict workforce needs in radiation oncology. These reports have often used similar data sets but have drawn different conclusions, with predictions of both an undersupply and oversupply of practitioners.^{4,5,6} Predictions are typically based on generally available metrics, such as population growth (especially in the older-than-65 age cohort), current and projected cancer incidence and current and projected utilization of radiation oncology services at the time of the reports. The wide variability of these prognostications is evidence of the inherent difficulty of making workforce projections. Falit and colleagues^{7,8} have described in detail many of the potential hazards of workforce projections and the host of policy and legal issues that might be encountered with any attempt to influence supply outside of what is currently a free-market environment.

Invariably, in addition to available data, these authors have attempted to read the tea leaves regarding imponderables, such as government and commercial payment policy, changes in radiation oncology clinical practice and, critically, scientific developments that might significantly alter the current therapeutic paradigm for cancer care. Rarely have authors foreseen the penetration of clinical changes, such as active surveillance for many early-stage, low-risk prostate cancer patients; reduced use of radiation oncology in the management of DCIS of the breast; and the impact of shorter courses of radiation on reimbursement and personnel needs. The use of newer biological agents, targeted therapies and innovative technology disruptors will almost certainly affect radiation interventions, but in currently unpredictable ways. Agencies of the federal government also attempt to make workforce projections, but are careful to point out serious limitations in their efforts.^{9,10}

A significant flaw in many of these workforce projections relates to proposals for what are perceived to be appropriate corrective actions to ameliorate

Continued on next page

the predicted undersupply or oversupply of radiation oncologists. These suggestions often include interventions, such as voluntary individual departmental reduction (or increase) in the size of existing training programs, reduction (or increase) in federal funding for postgraduate training in radiation oncology and incentives for practice location in underserved regions. Some proposals for workforce alterations include suggestions that the two entities primarily responsible for radiation oncology training and certification should act as arbiters and controllers of the supply line.^{7,8,11}

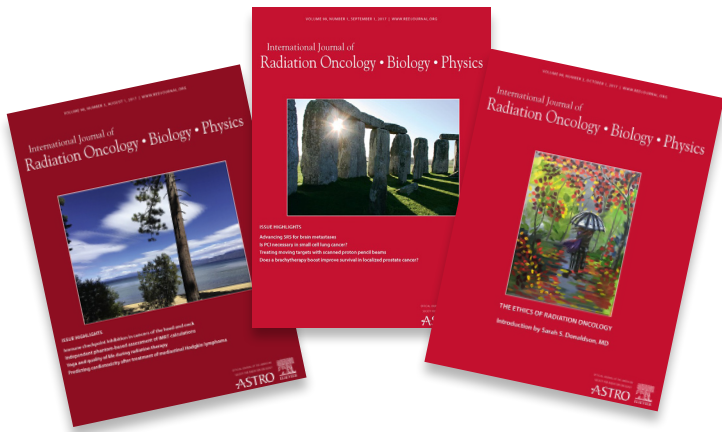
As noted above and previously,¹ this notion is impractical, inappropriate and improper. In their own projections of workforce needs for physicians and nonphysician practitioners,^{9,10} federal agencies provide detailed projections, but leave any potential solutions for those projections to the free market and free choice of individuals seeking careers. That should be the case in radiation oncology. Medical students are well aware of changes in career opportunities in various practice models and regions, and they share this information freely with their peers.¹² The National Residency Matching Program reports numbers of training positions, numbers of applicants for those positions and the demographics of those applicants.¹³ These data suggest that, while radiation oncology continues to draw from among the best and brightest of American medical school graduates, the number of applications in relation to available training slots is falling, suggesting that medical students may be concerned about future career opportunities. As should be the case, young people are making career decisions based on their own practice preferences and projections and not on artificial determinations by others. 

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HIGHLIGHTS FROM INTERNATIONAL JOURNAL OF RADIATION ONCOLOGY • BIOLOGY • PHYSICS

August 1, 2017

Effect of Eischens yoga during radiation therapy on prostate cancer patient symptoms and quality of life: A randomized phase 2 trial

Ben Josef et al.

This randomized phase 2 design trial was performed to measure the potential therapeutic effects of yoga on fatigue, erectile dysfunction, urinary incontinence and overall quality of life in prostate cancer patients undergoing external beam radiation therapy. Participants were randomized to no yoga or twice-weekly yoga interventions throughout six- to nine-week courses of radiation therapy. Sixty-eight eligible men with prostate cancer consented to the study. They concluded that a structured yoga intervention was associated with a significant reduction in pre-existing and radiation-related fatigue and urinary and sexual dysfunction.

Permeability of brain tumor vessels induced by uniform or spatially microfractionated synchrotron radiation therapies

Bouchet et al.

Radiation therapy is known to enhance the permeability of brain tumor vessels. In this study, the authors looked at synchrotron microbeam radiation therapy (MRT), based on spatial fractionation of the incident beam, and tested it in a murine model. MRT appeared to induce increased tumor vascular permeability, which occurred earlier and was more prolonged than that induced by more standard broad beam irradiation. This was especially so in highly proliferative tumor areas.

September 1, 2017

Consensus guidelines for implementing pencil-beam scanned proton therapy for thoracic malignancies on behalf of the PTCOG Thoracic and Lymphoma Subcommittee

Chang et al.

Intensity-modulated pencil-beam scanned proton therapy (PBS-PT) represents the latest advance in proton technology for the treatment of cancer. Its dose-sculpting potential is enormous, particularly for tumors in areas with complex anatomy, but implementing PBS-PT for moving targets, such as lung lesions, is far more challenging. In this article, Chang and colleagues look at the crucial role of 4-D-based motion management and robust optimization in minimizing the uncertainties associated with beam range and organ motion. Rigorous quality assurance is required to validate dose delivery, both before and during treatment, and active motion management (e.g., breath hold), beam gating, rescanning, tracking or adaptive planning may be needed for cases involving significant motion.

Combined radiation therapy and immune checkpoint blockade therapy for breast cancer

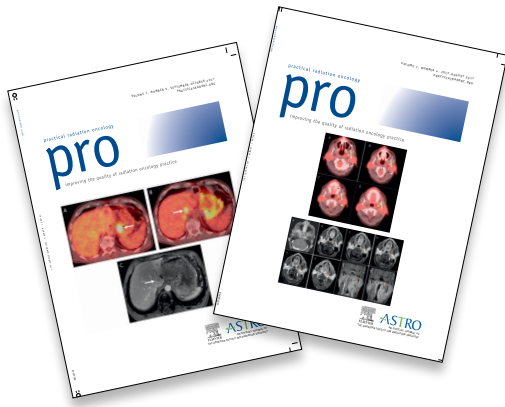
Hu et al.

Durable responses have been seen following checkpoint inhibitor therapy in a number of solid tumors, including melanoma, lung and renal cell carcinoma. Most breast cancers, however, are resistant to monotherapy with these agents. Hu and colleagues reviewed the data from the checkpoint blockade studies reported in breast cancer to date. Clinical trials with checkpoint blockade therapy have demonstrated low response rates of 19 percent or less, with few proving durable. Preclinical data indicate that radiation therapy may combine with checkpoint inhibition to synergize not only antitumor efficacy, but also induce responses outside of the radiation field. The multiple clinical trials currently investigating the combination of checkpoint inhibition with radiation therapy are discussed.

October 1, 2017

Special issue on ethics in radiation oncology

A special section focuses on the question of ethics in radiation oncology. This compilation explores a wide selection of topics through editorials by leaders in the field, and addresses some of the ethical issues that are of interest and value to the community. These include ethics in clinical care and research, financial conflicts of interest, legal and business practices, equity and diversity and scientific publishing as they pertain to radiation oncology.



HIGHLIGHTS FROM PRACTICAL RADIATION ONCOLOGY

July-August 2017

Radiation therapy for oropharyngeal squamous cell carcinoma: Executive summary of an ASTRO Evidence-based Clinical Practice Guideline

Sher et al.

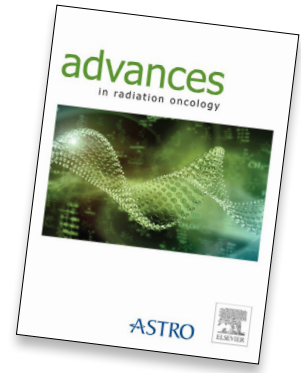
This ASTRO guideline gives the following recommendations for radiation therapy (RT) for oropharyngeal squamous cell carcinoma (OPSCC) patients: those with stage IV and stage T3 N0-1 OPSCC treated with definitive RT should receive concurrent high-dose intermittent cisplatin. Patients receiving adjuvant RT following surgical resection for positive surgical margins or extracapsular extension should be treated with concurrent high-dose intermittent cisplatin, and individuals with these risk factors who are intolerant of cisplatin should not routinely receive adjuvant concurrent systemic therapy. Induction chemotherapy should not be routinely delivered to patients with OPSCC. For patients with stage IV and stage T3 N0-1 OPSCC ineligible for concurrent chemoradiation therapy, altered fractionation RT should be used.

September-October 2017

Stereotactic body radiation therapy for early-stage non-small cell lung cancer: Executive Summary of an ASTRO Evidence-based Guideline

Videtic et al.

Although few randomized trials have been completed for stereotactic body radiation therapy (SBRT), strong consensus recommendations based on extensive, consistent publications were generated, including recommendations for fractionation for central tumors and surgery versus SBRT in standard-risk medically operable patients with early-stage non-small cell lung cancer (NSCLC). Lower quality evidence led to conditional recommendations on use of SBRT for tumors greater than 5 centimeters, patients with prior pneumonectomy, T3 tumors with chest wall invasion, synchronous multiple primary lung cancer and as a salvage therapy after prior radiation therapy. These areas of moderate- and low-quality evidence highlight the importance of clinical trial enrollment, as well as the role of prospective data registries.



HIGHLIGHTS FROM ADVANCES IN RADIATION ONCOLOGY

July-September 2017

Special issue with ROI Publication Award winners

The ROI Value of Radiation Therapy Publication Award winners appear in this issue of Advances in Radiation Oncology. The manuscripts are recognized for their important contributions to the growing body of evidence supporting the value of radiation therapy. “Long-term economic value of hypofractionated prostate radiation: secondary analysis of a randomized trial” by Voong et al., was chosen for the Outstanding Article Award. It adds much-needed quantitative evidence base supporting the value of using an accelerated radiation treatment approach with advanced planning techniques in prostate cancer. “Oncological outcomes from trimodality therapy receiving definitive doses of neoadjuvant chemoradiation (≥ 60 Gy) and factors influencing consideration for surgery in stage III non-small cell lung cancer (NSCLC)” by Vyfhuis et al., received the Excellence Award. It demonstrates a significant overall survival and free-from-recurrence advantage for patients who had surgery in addition to chemoradiation compared with patients who received only chemoradiation for the treatment of locally advanced NSCLC.

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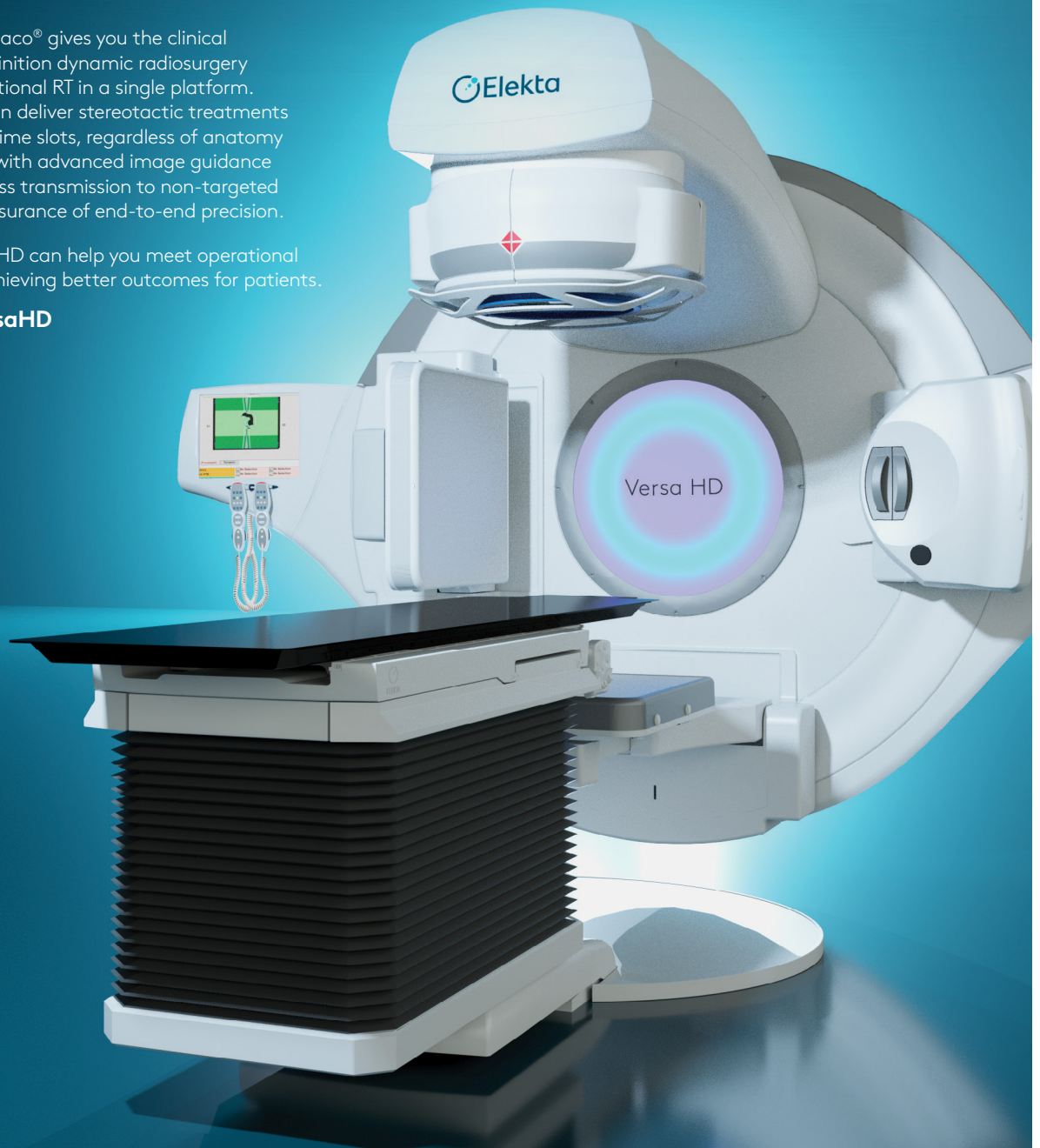
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