SUMMER 2024

ASTRO news

THE RAD ONC TREATMENT TEAM

ADDRESSING CHALLENGES AND SOLUTIONS TO WORKFORCE ISSUES ACROSS THE TECHNICAL TEAM

Best Cure Foundation is a non-profit organization with a mission to promote healthcare and education globally. The foundation aims to collaborate with citizens, medical professionals, government and non-government organizations, educational institutions, as well as charitable institutions around the world to eradicate contagious disease, malnutrition and poverty, and provide superior healthcare at low cost.

TEAMBEST GLOBAL®
One World • One Source • The Best!
healthcare for everyone
TeamBest
Your True Partner
www.teambest.com

BEST CURE FOUNDATION MAIN GOALS

1

Provide purified drinking water and affordable sewer systems in every part of the world by 2040.

2

Establish a global standard of healthcare delivery system using a hub and spoke model with express and mobile clinics linked to general and super specialty medical centers.

3

Reduce suffering/ deaths from major diseases such as cardiac, cancer, diabetes, etc. by 50% by the end of the next decade.

4

Engaging in Global Food Production Growth, Conservation and Reducing Waste.

together we are the cure
Best Cure FOUNDATION

TEAMBEST GLOBAL®
Improving Clinical Outcomes
REthinking Medicine
AT A LOWER COST
www.teambest.com

Best Cure Global Healthcare System is comprised of:

- **Best Cure Health System** (non-profit)
- **Best Cure Insurance** (non-profit)
- **Best Cure Clinical Research Institute** (non-profit)
- **Best Medical Real Estate Investment Trust** (for profit public company)
- **Best Medical Capital** (for profit public company)
- **TeamBest Global (TBG) companies** (for profit public company)

All of the non-profit organizations will be under the Best Cure Foundation (BCF), a non-profit, global, private, non-governmental organization founded in 2007 and supported entirely by Krishnan Suthanthiran, President/Founder of TBG and BCF.

Best Medical International, 7643 Fullerton Road, Springfield, VA 22153
tel: 703 451 2378 800 336 4970 www.besttotalsolutions.com www.teambest.com

In This Issue

9

Features

Society News

Departments

VOLUME 27 • NUMBER 3

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 $775 (U.S.), which includes $38 for an *ASTROnews* subscription. Periodicals Postage Paid at Arlington, 22210-9998 and at additional mailing offices.

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 West Allis, WI.

For all of the most recent news from ASTRO, please visit www.astro.org.

EDITOR'S*notes*

BY NAJEEB MOHIDEEN, MD, FASTRO
SENIOR EDITOR, *ASTRONEWS*

GUEST EDITOR
Julianne Pollard-Larkin, PhD

GUEST EDITOR
Arshin Sheybani, MD

It takes a Team

THE PANDEMIC CAUSED A SEISMIC SHIFT in work culture, significantly impacting health care. Many chose to retire early, prioritizing mental and physical well-being, and radiation oncology was not spared. In this edition of *ASTROnews*, we examine workforce challenges among the treatment team. While we fully acknowledge that nurses are a vital part of our teams, we are focusing on technical staff (radiation therapists, dosimetrists and medical physicists).

A recent ASTRO survey revealed that over 90% of clinics reported staff shortages leading to treatment delays, affecting both rural and urban clinics globally. While early retirements contributed to this, the field has simultaneously seen rapid advancements in complexity, equipment, modalities, and software demanding more skilled staff to maintain high-quality cancer care. Unfortunately, investments in technology have not been matched by an increase in training skilled professionals, exacerbating the shortage.

This issue of *ASTROnews* highlights personnel shortages from various perspectives. Members of the American Association of Physicists in Medicine (AAPM), the American Association of Medical Dosimetrists (AAMD), and the American Society of Radiologic Technologists (ASRT) have proposed solutions for their disciplines. Julianne Pollard-Larkin emphasizes that the elaborate educational requirements and restrictive board exam criteria limit the supply of new qualified medical physicists (QMPs). The AAPM has established a task force to study and address workforce shortages. The AAMD is increasing training programs through grant funding, while the ASRT has launched a public awareness campaign.

Paul Keall, Sandra Turner, and colleagues provide an international perspective, emphasizing job satisfaction, improved communication, staff engagement, career progression, and training quality. Diane Kean, Managing Editor of *ASTROnews*, notes the added difficulties for rural communities. Anna Paulsson, a radiation oncologist near San Francisco, highlights the challenge in filling radiation therapist positions. Dave Beyer and Chris Jahraus have adapted by relying on remote support or outsourcing technical services.

As work-life balance becomes more important, staffing models are evolving. Over 50% of medical dosimetry positions now adopt a hybrid on-site and remote work model. However, remote work can make team dynamics challenging and increase feelings of isolation. The pandemic-induced staff shortages have led to high levels of burnout among health care workers.

The shortage of these highly trained professionals not only delays treatments but also raises operational expenses, putting additional strain on health care systems and patients. It opens the door for outsourcing agencies and vendors to fill in the gaps. The Institute of Physics and Engineering in Medicine in the UK reported an 8% Medical Physics vacancy rate in their 2021 survey with a concerning 21% of entry level positions not being filled, calling the attention to

additional training opportunities.[1] It has been over a decade since ASTRO conducted a comprehensive review of the workforce landscape with respect to our technical staff.

Might the emergence of AI offer a glimmer of respite in bridging this chasm, reducing redundant work and improving work quality (Carlos Cardenas, page 11)? Definitely, but as Mark Littell et al., say in their article, "With the advancement of AI and workplace philosophies of doing more with less, it's more important than ever to keep constant vigilance to promote patient safety."

As we look forward to another exciting meeting discussing our scientific success, this year's Annual Meeting theme is about provider wellness, and one prescription for burnout is gratitude. So, on behalf of our patients, we would like to say THANK YOU to the radiation therapists, dosimetrists and medical physicists who have such a tangible impact on our patients' lives and make our job seem seamless and almost easy. Cancer care is a team effort and this issue is dedicated to your hard work.

REFERENCE

1. Institute of Physics and Engineering in Medicine. Radiotherapy Workforce Census Summary Report 2021. Accessed on June 11, 2024. https://www.ipem.ac.uk/media/o2sksjdy/2021-radiotherapy-workforce-census-summary-report.pdf

Correction: In the Spring 2024 *ASTROnews* article "What Goes Around Comes Around: Radiation Therapy of Nonmalignant Disorders," the authors incorrectly cited Donaldson and Order as the authors of the "first textbook compilation" on the use of radiation in nonmalignant diseases. It has come to our attention that Stephen B. Dewing, MD, first published "Radiotherapy of Benign Disease" in 1965. We apologize for the incorrect citation and thank Edward Halperin, MD, for bringing this to our attention.

The U.S. Radiation Oncologist Workforce Analysis: A Continuing Story

WHILE THIS ISSUE OF *ASTROnews* focuses on the technical radiation oncology workforce, i.e., medical physicists, radiation therapists and dosimetrists, we wanted to remind readers that ASTRO has continued a deeper dive to study the radiation oncologist (RO) workforce. In 2022, ASTRO released an updated position statement on the workforce and commissioned an independent analysis looking at supply and demand in the United States radiation oncologist workforce and projecting future trends for 2025 and 2030. The final report, titled "Projected Supply and Demand for Radiation Oncologists in the U.S. in 2025 and 2030," is published in the *International Journal of Radiation Oncology • Biology • Physics*. The analysis estimated projected radiation oncologist supply (new graduates, exits from the specialty), potential changes in demand (growth of Medicare beneficiaries, hypofractionation, loss of indications, new indications) as well as productivity (growth of work relative value units [wRVUs] produced), and demand per beneficiary. Additionally, a tool was made available for members to further model different scenarios based on evolving data. Download the tool at www.astro.org/modeling_tool.

The study concluded that the radiation oncologist workforce is likely to stay balanced in the short term, however, given the uncertainty of changes anticipated in the near future (i.e., slowing Medicare beneficiary growth, changing reimbursement, utilization of radiation treatments, incorporation of artificial intelligence, the plasticity of wRVU/RO etc.), the supply and demand may tilt toward oversupply and will need continued monitoring for trends beyond 2030.

Moving forward, given the dynamic nature of key indicators and the potential for different scenarios to evolve, the ASTRO Workforce Committee will continue to follow key metrics from the analysis (i.e., number of radiation oncologists, productivity, FTE metrics) when evaluating the job market for any potential changes.

As a first step, and in response to critical feedback from the members, the ASTRO Workforce Committee has taken on the challenge of refining the number of U.S. radiation oncologists and will soon report on their findings.

See www.astro.org/membership/ro-workforce for links to related materials.

CHAIR'S*update*

JEFF M. MICHALSKI, MD, MBA, FASTRO

An ASTRO First: A Bipartisan Radiation Oncology Bill

IT HAS BEEN A VERY LIVELY SPRING and summer of 2024 for our ASTRO members! This is especially true for those members who are engaged in our Health Policy (HP) and Government Relations (GR) Councils. At our ASTRO Advocacy Day in Washington, DC, I fielded questions on a wide-ranging set of hot topics from clinical supervision, non-compete rules, the radiotherapy workforce, and the Radiation Oncology Case Rate (ROCR) program. I'll share some highlights here, but I encourage you to visit the ASTRO website for more information.

Earlier this spring, ASTRO sent a letter to CMS regarding supervision requirements that generated vigorous discussion on our RO*hub* website and other social media channels. In response to these comments, we hosted a town hall that had more than 200 attendees. We really appreciated the genuine, honest feedback from both members and nonmembers during that call. Clearly, not all members were aligned with our recommendation for a return to direct supervision for all radiation therapy treatments. Many voiced an opinion for flexibility surrounding a radiation oncologist's presence in the clinic that was short of 100%. In order to gather more insight into this topic, ASTRO established a Supervision Task Force made up of a diverse group of physicians representing varied geography, practice types and sizes. At the time of print, it was anticipated that they will provide a report in late June that will help us inform CMS once a proposed rule is presented to providers around mid-summer.

In April, the Federal Trade Commission (FTC) issued a final rule that prohibits employers from enforcing non-compete agreements against workers other than senior executives. This rule has far reaching implications across the house of medicine as well as other skilled trades and professions. Undoubtedly, this decision will impact many members of our specialty as they consider their current and future employment circumstances. The rule contains many caveats and exceptions, some of which may face legal challenges. If a member has questions as to how this federal rule may impact their individual circumstances, it is advised they consult their legal counsel.

A huge thank you to our ASTRO staff and HP and GR volunteers that put together the ROCR program legislation. It is an enormous task to draft and submit legislation, but our team has secured bipartisan sponsorship for this program. If enacted, it will stabilize Medicare payments for radiation oncology services while saving the government a substantial amount. Incentives will be aligned toward guideline driven therapy that will benefit our patients and our ASTRO members. In the weeks and months to come we will ask our members to reach out to their congressional representatives and urge them to support this legislation.

This issue of *ASTROnews* is dedicated to the challenges many medical organizations face — the shortage of skilled, certified health care workers. For our specialty, we are seeing challenges in the hire of radiation therapists, dosimetrists, nurses and medical physicists. The reasons for these shortages are manifold and elaborated upon in the accompanying articles. Solutions to increase the numbers of qualified individuals to enter these fields are offered. Consistently cited is the need to maintain high levels of job satisfaction for those professionals that currently serve our patients. This will keep our current workforce engaged, raise the visibility and respect of these careers, and attract more young people to radiation oncology.

Family-friendly resources for your Annual Meeting experience

MAKE YOUR PLANS NOW to join us in Washington, DC — the nation's capital — for ASTRO's 66th Annual Meeting. To help ease planning for parents and caregivers traveling with their children, we have compiled resources to assist with your family's plans. Below is a brief overview. For full details on each topic, visit www.astro.org/childcare.

Child Care Resources in Washington, DC

Reserve your housing early at one of 37 choice DC hotels. All hotels, with the exception of the Moxy Washington, offer cribs based on availability, and the majority of hotels in our housing selections have in-room refrigerators. Confirm availability when you make your reservations.

If you are in need of child care during the day or evening, the following off-site child care providers are available for in-room babysitting. Please contact the provider directly to make your reservation.

Kiddie Keepers

- Rates start at $25/hour with a three-hour minimum and 24-hour cancellation policy.
- You can make your reservation directly by calling 678-791-3441 or by filling out the Parent Registration Form at www.kiddiekeepers4events.com/parent-registration.

White House Nannies

- Inclusive rates start at $45/hour with a four-hour minimum. The inclusive rate covers caregiver's wages, all payroll taxes, liability, and workers compensation and agency fees.
- To make a reservation, call 301-655-8240 or email info@whitehousenannies.com directly.

Additional Resources

- Care.com
- SeekingSitters.com
- Urbansitter.com
- Citysitter.com

Disclaimer: This resource is provided solely as information for the convenience of ASTRO Annual Meeting attendees and is based on information made publicly available on the internet. ASTRO does not endorse or recommend any specific child care provider or individual person, including any listed herein. ASTRO has not conducted any inspection of the child care providers listed and does not guarantee nor warranty, either express or implied, the accuracy, completeness, suitability or reliability of any child care providers or information associated therewith. ASTRO expressly disclaims any and all responsibility for any current or future problems that may arise with regard to child care. All ASTRO Annual Meeting attendees are encouraged to exercise their own good judgment when evaluating a child care provider.

New! Child Care Stipend

ASTRO Members-in-Training and members in their first year of practice participating as an oral presenter, invited faculty, moderator, panelist, discussant, or poster presenter at the Annual Meeting and traveling with their child(ren), may apply for a child care stipend of $250. A limited number of stipends are available on a first-come, first-served basis. Find the stipend application link and full details on this new offering at www.astro.org/childcare.

At the Meeting in the Walter E. Washington Convention Center

Strollers, baby carriers or similar devices are permitted in meeting rooms and the Exhibit Hall (during regular Exhibit Hall show hours only) as long as they do not block aisles or emergency exits. Children are welcome to attend meeting sessions, the Poster Hall (during regular Poster Hall hours only) or Exhibit Hall, or any other meeting functions, but we ask that parents/caregivers help maintain a professional, disturbance-free environment. Children must be supervised at all times. Because of the nature of the programs and forums, no one under the age of 18 will be admitted to any official ASTRO function without first being registered by their parent or guardian. Children and caregivers will need to be registered on-site at the registration counter. All attendees must adhere to the Annual Meeting Attendee Policies.

Nursing Lounge | Salon F, Street level

The Nursing Lounge provides a dedicated space with three private nursing rooms and a refrigerator.

Meditation Room | Room 208 B, Second level

This room offers a quiet place to meditate or pray.

Visit www.astro.org/childcare for details.

New patient education module added to Epic platform

BY JENNIFER JANG, ASTRO COMMUNICATIONS

AFTER TWO YEARS OF FOCUSED EFFORT, ASTRO is excited to share that in a collaborative effort with Epic, we rolled out a module this past May via the Epic platform, to assist patients recently diagnosed with prostate cancer. Spearheaded by the Communications Committee alongside the Epic radiation oncology working group, a prostate cancer module was developed for patients diagnosed with intact prostate cancer. The module has been designed for physicians to provide access to ASTRO-developed content to patients along their cancer journey via the MyChart patient portal. The physicians can be sure their patients have access to accurate and up-to-date information, with automatic notifications to complete tasks via the MyChart Care Companion application. This feature prompts users to explore and read content pertaining to their diagnosis in a "just in time" format, aligned with critical junctures in the radiation treatment process. The goal of this newly organized format is to give patients information relevant to where they are in the treatment journey rather than overwhelming them with cancer information at the start of their treatment plan. Specifically, via RTAnswers, content has been created to correspond with four phases of care in the patient experience: before the initial referral/consult, before the CT sim, at the first on-treatment visit (OTV), and the first follow-up after completing treatment.

What this means for you

As many of you are users of Epic, we encourage you to find out from your administrator how you can access this new feature for prostate cancer and optimize the information. While there is no extra cost to the feature, someone with an administrator role needs to "turn on" the toggle to give access.

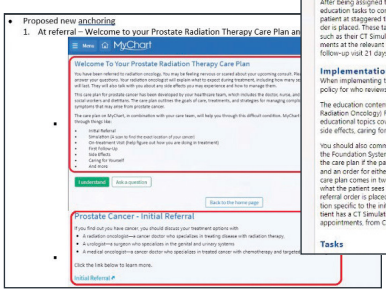
What this means for your patients

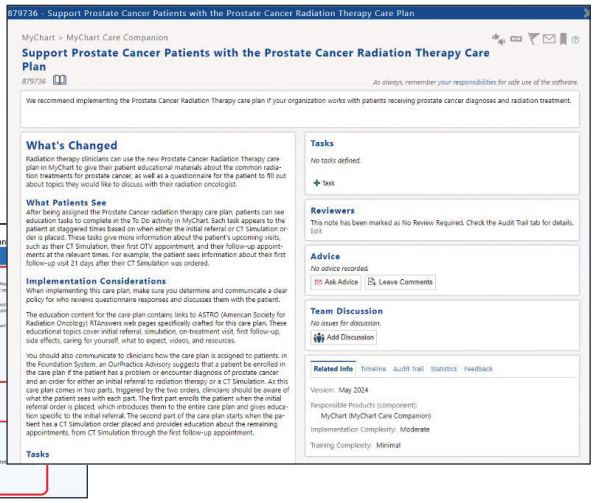
When a patient is diagnosed and is referred to radiation oncology, the physician selects the care plan via Epic and triggers its availability to the patient. Via the MyChart Care Companion, Epic will provide the patient with tasks to complete, which will include links to the RTAnswers website and the pages most relevant to them. For example, upon diagnosis and referral to radiation oncology, the patient will be given access to the pages outlining the information they may find helpful prior to their consultation with the radiation oncology team. The patient will have this facilitated opportunity to be more informed before their first visit and also have other resources that are more focused than a standard google search. If a topic piques their interest, they have the option to view other RTAnswers content, widening the exposure of this resource.

Looking ahead, ASTRO intends to take this module and improve it based on user feedback. Epic will be at the Annual Meeting at the ASTRO Resource Center and in the Early Career and Mentoring Lounge to provide demos for attendees. Look for the Annual Meeting Guide out in September for more details on these demos.

More broadly, this module will serve as a prototype for other types of cancers, with breast cancer as the next disease site in the pipeline, slated for early 2025. The long-term goal is for all disease sites to have organized radiation oncology patient education materials by phase with two care plans released each year.

Visit www.astro.org/ProviderResources to access the worksheet for physicians to provide to your Epic administrators to ensure this tool is available.





ASTRO and RPT Industry Roundtable members discuss the use of radiopharms

RPT Roundtable participants

ASTRO HOSTED an inaugural Radiopharmaceutical Roundtable at the end of March. More than 40 thought leaders involved in radiopharmaceutical therapy (RPT) gathered to discuss several key themes and critical needs, including the status of the workforce and associated training needs, health policy implications, and research and development. ASTRO Board Chair Jeff Michalski, MD, MBA, FASTRO, along with Ana Kiess, MD, PhD, and Freddie Escorcia, MD, PhD, chair and vice-chair of the ASTRO RPT Committee respectively, led the meeting with support from Roundtable members Novartis and Lantheus. Other industry members who attended in person and online included representatives from AstraZeneca, Bayer, Cellectar Biosciences, Elekta, NorthStar Medical Radioisotopes, Sun Nuclear - a Mirion Medical Company, and Theragenics. The Radiopharmaceutical Roundtable members will meet again in late 2024.

Radiopharmaceutical therapy is a rapidly expanding field. ASTRO members are well equipped to lead this effort with their knowledge of physics, radiobiology, pathophysiology, the effects of radiation on tumors and normal tissues and, most importantly, expertise and clinical competencies in oncologic decision making and multidisciplinary patient care.

Since 2018, ASTRO has been advancing efforts to expand the knowledge base for our members in the RPT space. Some of our initiatives include:

- Forming the RPT Committee
- Offering extended training at the ASTRO Annual Meetings since 2019
- Publishing an RPT-focused issue of *ASTROnews* in Winter 2023
- Launching a nine-part RPT webinar series, Beyond the Beam: A Radiation Oncology Curriculum for Radiopharmaceutical Therapy
- Discussing AU status requirements with regulators
- Expanding APEx Accreditation to include a stand-alone or add-on RPT-specific accreditation
- Developing an RPT Safety White Paper

Learn more about ASTRO's RPT efforts at www.astro.org/RPT.

Reirradiation Collaborative Group meet to discuss clinical research challenges

The Reirradiation Collaborative Group (ReCOG) meeting, hosted by the University of Michigan with sponsorship from Varian and AAPM, was held on May 16-18. With 141 participants from 15 countries, and participation from multiple professional societies including ASTRO, this scientific gathering discussed the challenges involved in the clinical and research aspects of reirradiation.

The first project the group hopes to undertake is developing a consensus paper on minimum and recommended reporting standards for dose accumulation and evaluation. Keep an eye out in ASTRO communications for more information and the opportunity to participate.

ROCR Act introduced in Congress

ASTRO members advocate for the field in support of ROCR

ON MAY 14 AND 15, Senator Thom Tillis (R-NC), and Representatives Brian Fitzpatrick (R-PA), Jimmy Panetta (D-CA), John Joyce, MD (R-PA), and Paul Tonko (D-NY), introduced the bipartisan Radiation Oncology Case Rate (ROCR) Value-Based Payment Program Act (S.4330 and H.R.8404). This legislative initiative is designed to reverse disastrous Medicare Part B payment trends that are expected to continue without any intervention. ASTRO believes that the ROCR Act represents the best chance to secure long-term rate stability and continue to deliver cutting-edge care to our patients close to home. Over 50 organizations have signed on in support of ROCR as of this print date and the list continues to grow.

Key features of ROCR include:

- Leveraging episode-based payments to align financial incentives with scientifically proven outcomes.
- Supporting shorter treatments for certain cancers.
- Reducing disparities that create barriers for patients from rural and underserved communities to access and complete treatments.
- Implementing a systematic approach to improve quality and protect patient safety through practice accreditation.
- Unifying payments across settings based on hospital technical payments.
- Generating Medicare savings of approximately $200 million over 10 years.

Directly following the introduction of the ROCR Act, nearly 100 ASTRO members converged on Washington, DC. Representing close to 30 states, ASTRO members met with members of Congress to advocate for the ROCR Act, prior authorization reform, and cancer research funding. The two-day meeting featured guest speakers and Hill meeting training to hone the advocacy skills of ASTRO's members, followed by a full day of congressional meetings.

ASTRO leaders met with the newly elected ARRO Executive Committee prior to the start of Advocacy Day. ARRO presented updates on their accomplishments over the past year and shared new initiatives. The ARRO Executive Committee then joined members of ASTRO at Advocacy Day.

You can advocate on behalf of our field by contacting your representative and senators to cosponsor the ROCR Act (H.R.8404 and S.4330) to advance it through Congress this year at www.astro.org/advocate.

ARRO Executive Committee and ASTRO leaders meet in Washington, DC

[Left to right] ASTRO members Thomas Dilling, MD, MS, FASTRO, Aaron Bush, MD, and Congresswoman Kathy Castor (FL-14)

[Left to right] Congressman Jamie Raskin (MD-8) and ASTRO members Jefferson Moulds, MD, Michael Goldstein, MD, PhD, and Bansi Savla, MD

Images courtesy of AAPM.

Med Phys Workforce: Where Have All of the Physicists Gone and How to Keep the Ones You Have?

BY JULIANNE POLLARD-LARKIN, PHD

Contributors: Erli Chen, MS, Cheshire Medical Center/ Dartmouth Cancer Center–Keene, David Jordan, PhD, University Hospitals Cleveland Medical Center, and the AAPM Therapy Workforce Subcommittee (TWS) and AAPM Task Group 423

DESPITE BEING KNOWN by a select few as the brains behind the scenes in radiation oncology and radiology, medical physicists' work has an impact across medicine. The work of medical physicists affects "nearly every citizen".[1] In spite of this fact, this important cohort of the medical workforce has suffered losses throughout North America. Medical physicists have subspecialties in one or more areas including radiation therapy, imaging, nuclear medicine and health physics. Their role is instrumental in ensuring the safe and effective delivery of external beam radiotherapy or brachytherapy, radiation protection of employees and the public, and educating trainees, patients and the public about radiation. During the pandemic, a number of physicists retired while at the same time radiation oncology practices expanded and demand increased. This has left some centers with unfilled positions and a need to understand more fully the current state of the medical physics workforce.

The American Association of Physicists in Medicine (AAPM) is the largest organization of medical physicists in North America and has approximately 10,000 members.[2] Nearly 76% of this workforce is employed doing radiation oncology work. Most (55%) medical physicists surveyed by ASTRO and AAPM in 2015 worked in cities and 12% worked in rural settings.[3] This 2015 survey also showed that the average work week was about 48 hours for respondents.[3]

In order to do the work of a medical physicist, one must follow the educational path of becoming what is known as a "qualified medical physicist" or QMP. The pathway to becoming a QMP typically involves first getting a bachelor of science undergraduate degree in physics or a similar field with enough physics coursework to suffice the next step, obtaining a masters of science or doctorate in Medical Physics from a Commission on Accreditation of Medical Physics Education Programs (CAMPEP)-accredited program, then a two- or three-year clinical residency program and finally, passing the American Board of Radiology (ABR) three-part exam in the subspecialty of choice. Currently, there are over 120 CAMPEP-accredited clinical residency programs in Therapeutic Medical Physics and 41 programs in imaging physics. There are a few exceptions that QMP hopefuls can use to sidestep this process, but they still require going through an accredited postdoctoral certificate program, on-the-job training, a clinical residency and/or the ABR board certification process.[3]

Many have considered these lengthy educational requirements and the restrictions on who can sit for the board exams as a reason for the lack of supply in new QMPs. This issue is further complicated due to the field having an increase in residency programs to attempt to meet the demand, but this demand has grown exponentially and nowhere near the rate of interest in the specialty. In 1988, there were only two CAMPEP-accredited graduate programs in Medical Physics, whereas in 2019, there were 54.[3] However, the students' demand for these programs far exceeded that. In 2019, 1,914 applications were submitted for these programs of which 677 were offered positions and only 284 matriculated.[3] Medical Physics as a field is as hot as the sources we use to treat patients!

Continued on following page

Not training these interested young potential future QMPs is a major issue that should be investigated and solved prior to the next large wave of medical physics QMP retirements taking place. According to a 2012 paper by Chen et al., 2.2% of the QMP workforce retire each year.[3] Meanwhile, cancer incidence in the U.S. is expected to increase annually by about 2%. In addition to these facts, the rate of retirement tripled between 2010-2020 compared to 1990-2000.[3] This steady and sizable loss of our most senior and experienced QMPs comes at the same time as a growing pool of medical physics PhD and MS graduates are waiting to get into a residency program. The supply of training programs in medical physics is occasionally connected to federal funding and research efforts, and until that is resolved, the number of programs will continue to grow at its current rate.

While there are no official statements on the status of the medical physics workforce from AAPM or another society, AAPM has created work groups to investigate the issue and provide context. Under the guidance of AAPM's Professional Council, Erli Chen, MS, DABR and Brent Parker, PhD, DABR, created a summary titled "Opportunities, Challenges, and the Current Supply and Demand of the Radiation Oncology Medical Physicist Workforce." They did this work under the title of the AAPM Therapy Workforce Subcommittee (TWS).[4] They sent a survey to half of all AAPM members in the fall of 2020 and received 715 responses. Their survey showed that 15% of all respondents planned on retiring within 10 years and 25% of all AAPM members will be older than 65 by 2030.[4] However, they noted that therapy physicist job demand on the AAPM job posting site has only increased by 4% from 2012 to 2021.[4] Note: Only 50% of all therapy physicist jobs are posted on the AAPM job posting website.

TWS identified some key factors affecting medical physicist therapy job supply and demand: an increase in CAMPEP residency programs; automation within radiation oncology; potential reimbursement changes in radiation oncology; remote workflows popularized during the pandemic; and an increase in hypofractionation and complexity in treatment planning.[4]

Another key finding is that the staffing models for medical physics are now up for reevaluation due to an increase in hypofractionation, on-demand adaptive planning, and other special procedures that are more time intensive. Despite medical physicists treating fewer patients on average than they did in 2012, they are spending more time per patient with these more complex cases that typically require medical physicists' direct involvement during simulation through treatment. TWS showed that patient treatment load in their respondents dropped to an average of just 20 patients per QMP in 2020 compared to 30 per QMP in 2012. Several centers base their hiring practices on patient volume per QMP and patient treatment complexity is rarely a factor used to impact hiring and reduce QMP burnout. TWS' survey respondents indicated that 43% had challenges managing their current patient load.[4] Across the field, several modalities are being used more routinely than ever before including cone beam CT, stereotactic radiosurgery (SRS), stereotactic body radiotherapy (SBRT), proton, magnetic resonance-linac treatments, positron emission tomography (PET), automation, adaptive planning and artificial intelligence (AI).[4]

As a happily employed medical physicist and proud member of AAPM, I have some advice to offer centers and potential employers of QMPs in order to weather this new increase in demand for medical physicists.

Advice to Hire Your Next QMP

1) **Use AAPM to advertise:** Nearly half of positions for physicists are posted on the AAPM Career Services website, but there are other ways to use AAPM to secure your next hire. You should also consider using the Annual Meeting as a means to highlight your center and its most important resource, your wonderful current staff of QMPs. Engage potential new hires by wearing your center's logo or lanyard throughout the meeting and ensure all of your cohort at the meeting takes time to speak to graduating trainees and those looking for positions.
2) **Look locally:** Recent changes to state laws have caused some effects in interest in living in certain regions. QMPs have over 700 positions available across the U.S. according to Indeed.com (at the time of this writing). Make sure you strongly pursue future candidates already living in your region heavily as they are more likely to stay. Anecdotally, some managers and chief physicists have noticed that candidates are less mobile recently compared to years past. Both for training and career positions, candidates seem less apt to depart from the locations where they grew up or trained and relocate to new positions in different states or regions.

3) **Make sure your current staff is happy:** Check your center's recruitment and retention data, climate surveys and in-depth one-on-one check-ins with your staff to ensure your center is indeed a good place to work with benefits that are attractive. If your current staff is unhappy, please address those concerns before they also choose to leave and or spread the word to your future candidates. A happy team will advertise well for you and be a great place for a new hire to learn, grow and develop roots.
4) **Be upfront about job details:** Ensure your job post explains the full expectation of the position you are trying to fulfill. Detail the responsibilities the physicist will have to manage (i.e., SBRT, brachytherapy, teaching, research, leadership, etc.). Also, highlight the benefits the job or your institution provide such as family medical leave, the radiation oncologist team they will work with, research opportunities, educational opportunities, opportunities to attend conferences and more.

Julianne Pollard-Larkin, PhD, is an associate professor of medical physics in the Radiation Physics Department and leads as the Service Chief Medical Physicist in the Thoracic Radiation Oncology Clinic at MD Anderson Cancer Center.

REFERENCES

1. Jordan DW, Newhauser WD, Mills MD. Current state of the imaging physics workforce and financial model. *J Appl Clin Med Phys*. 2021 Dec;22(12):4-6.
2. AAPM Committee tree. AAPM Committee Tree - Board of Directors (BRD). Accessed May 10, 2024. https://www.aapm.org/org/structure/?committee_code=BRD.
3. Newhauser WD, Gress DA, Mills MD, et al. Medical physics workforce in the United States. *J Appl Clin Med Phys*. 2022 Dec;23 Suppl 1(Suppl 1):e13762.
4. Chen E and Parker BC. Opportunities, challenges, and the current supply and demand of the radiation oncology medical physicist workforce. Lecture presented at: Society for Radiation Oncology Administrators; September 4, 2022; San Antonio, TX.

Integrating AI and the Medical Physicists Workforce

BY CARLOS CARDENAS, PHD, UAB MEDICINE, THE UNIVERSITY OF ALABAMA AT BIRMINGHAM

ARTIFICIAL INTELLIGENCE (AI) is rapidly becoming a cornerstone in the field of medical physics, offering promising solutions to alleviate the pressing staffing issues highlighted in Dr. Pollard-Larkin's article. AI, with its potential for automating routine and time-consuming tasks, holds the promise of significantly reducing the burden on medical physicists, thus addressing the increasing demand for qualified medical physicists (QMPs) in the long term.

The medical physics profession is uniquely positioned to play a critical role within and beyond our specialties. Our clinical and technical training equips QMPs to be highly involved in patient care while also contributing to the overall clinical workflow. This bird's-eye view, combined with our strong foundation in math and sciences, provides an excellent basis for understanding and implementing AI technologies effectively.

However, it's crucial to recognize that the integration of AI into clinical practice requires careful planning and additional resources in the near term. Implementing AI solutions necessitates the recruitment of QMPs who have expertise in AI, as well as the upskilling of current staff to work alongside these new technologies. Moreover, ensuring the quality and safety of AI-driven processes demands rigorous validation and continuous oversight by QMPs. Several professional groups (AAPM, ASTRO, ESTRO, ACR) have established or are establishing task groups to develop recommendations for the safe implementation of AI and automation. These efforts will play a critical role in ensuring the safe utilization of AI in medicine.

To summarize, while AI holds great potential to mitigate staffing challenges in radiation oncology by automating routine tasks and enhancing efficiency, its implementation will initially require additional investment in both human and technological resources. By strategically integrating AI, we can build a more resilient and efficient medical physics workforce, with the promise of improving patient care and outcomes.

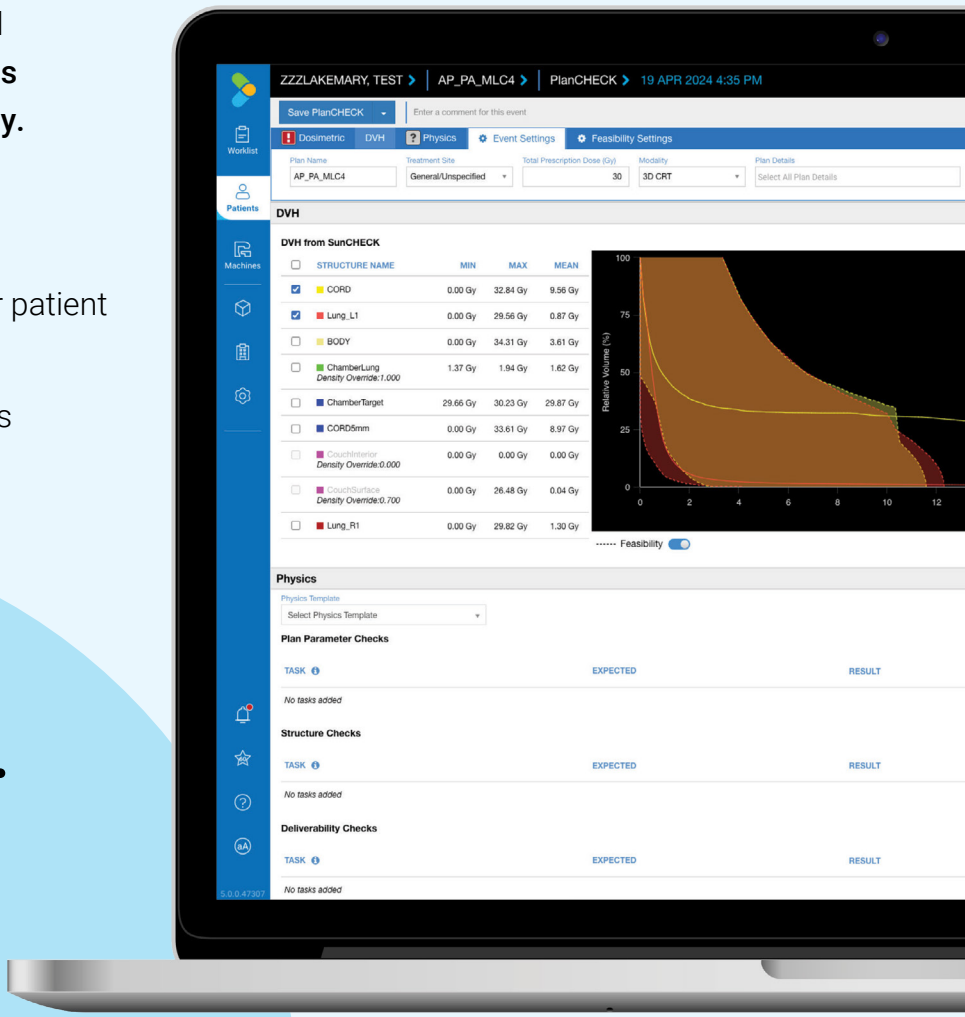
Introducing SunCHECK® 5.0

The Connected Workspace for Higher Quality

Aggregate insights, actions, and opportunities to drive continuous improvement in radiation therapy.

Featured enhancements:

- Plan complexity metrics
- Evaluation of plan feasibility per patient
- Enhanced TPS integration
- Refreshed UI with worklist focus



Learn more & request a demo.

sunnuclear.com

SUN NUCLEAR
A MIRION MEDICAL COMPANY

The State of Medical Dosimetry: Strengthening the Radiation Oncology Department Now and Into the Future

BY MARK LITTELL, BS, CMD, CNMT, PRESIDENT-ELECT, AMERICAN ASSOCIATION OF MEDICAL DOSIMETRISTS, AND LINNAE CAMPBELL, MS, CMD, R.T.(R)(T), BOARD MEMBER-AT-LARGE, AMERICAN ASSOCIATION OF MEDICAL DOSIMETRISTS

AS THE PROFESSIONAL SOCIETY FOR MEDICAL DOSIMETRISTS, the American Association of Medical Dosimetrists (AAMD) supports the education and training of medical dosimetrists while highlighting the critical importance of teamwork among radiation oncologists, medical physicists, radiation therapists and medical dosimetrists. Each of these roles can have a meaningful impact on the state of medical dosimetry. Some timely topics in the medical dosimetry profession include staffing shortages, limited resources for educational programs and creating balanced staffing models.

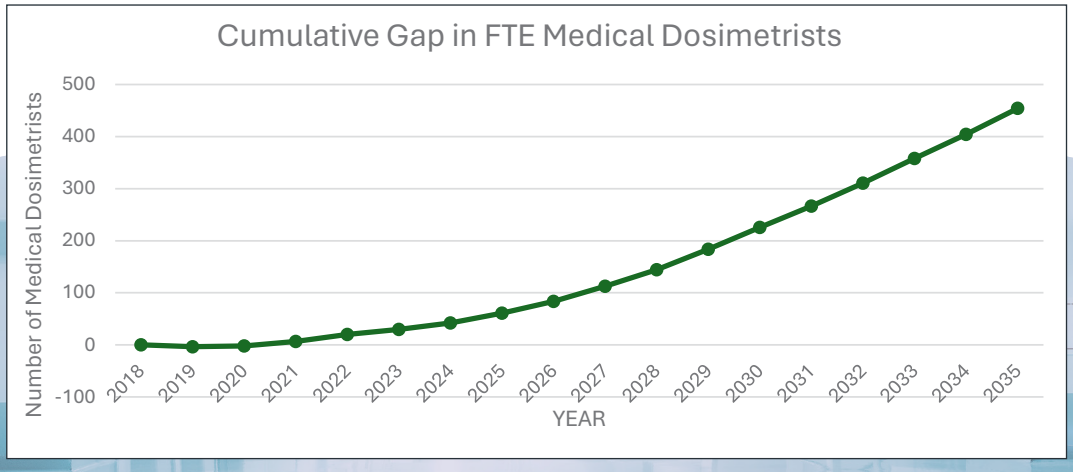
The shortage of medical dosimetrists

There is currently a growing shortage of medical dosimetrists. In fact, the 2020 AAMD Medical Dosimetry Workforce Study determined that by 2035 there would be an annual shortage of 50 medical dosimetrists in the United States, which is an increase compared to the undersupply of 10 per year as seen in 2021.[1] It is expected that the peak percentage rate of medical dosimetrist retirement will be between 2025 and 2030, further increasing the demand for medical dosimetrists. This data does not account for any changes in cancer incidence, number of medical dosimetry graduates, or medical dosimetrist workload.[1]

While artificial intelligence (AI) has aided in automating certain aspects of contouring and treatment planning, all work completed by AI should be assessed by a medical dosimetrist. The 2020 AAMD Medical Dosimetry Workforce Study data indicated that with AI, the work of the medical dosimetrist has "not decreased but shifted to more review of the AI and collaboration with the physician on how to adapt, modify or optimize the outcome."[2]

Additional changes to the profession regarding education and certification have also contributed to the shortage. With the elimination of on-the-job training in 2017 as a route to certification, individuals are now required to hold a baccalaureate degree and complete a medical dosimetry education program accredited by the Joint Review Committee on Education in Radiologic Technology (JRCERT) to be eligible for certification by the Medical Dosimetrist Certification Board (MDCB). An MDCB candidate must pass a test with "performance-based questions" in order to verify that applicants are able to "apply learned skills and knowledge."[4a] Certified medical dosimetrists are life-long learners and must complete "50 continuing education credits in each five-year cycle" to maintain certification.[4b]

Continued on following page



A focus on education and training

To address the shortage, concerted efforts are needed to expand education and training programs for aspiring medical dosimetrists. The 17 JRCERT-accredited medical dosimetry programs are limited in their enrollment capacity by the number of clinical sites available. We urge institutions to become clinical sites for medical dosimetry programs, providing necessary hands-on experience. Radiation oncology professionals can pass on knowledge from their practice to set students up for success. Additionally, career fair participation and school outreach are needed to bring awareness to the profession and attract aspiring medical dosimetrists.

It is imperative to invest in the development of an educational curriculum that equips students with the knowledge and skills needed to excel in their roles. In 2023, the AAMD awarded $170,000 in grants to JRCERT-accredited medical dosimetry education programs. The grants are being utilized to add more software, training and resources to better prepare graduates for their clinical roles.

Furthermore, ongoing professional development opportunities are essential for medical dosimetrists to stay abreast of emerging trends and techniques in radiation oncology. The AAMD assists medical dosimetrists with their continuing education to maintain certification and network through different avenues. The online Continuing Education Center is a resource for those unable to travel due to shrinking budgets. Annual and regional meetings help dosimetrists to network in person and gain valuable information to take back to their radiation oncology departments. Learning from each other is priceless and drives the profession forward!

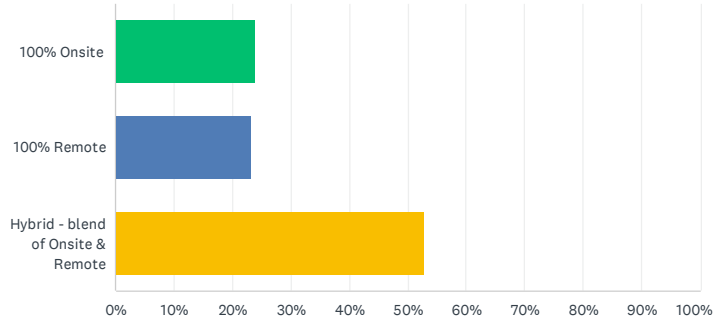
Staffing models in the wake of COVID-19

The COVID-19 pandemic brought about unprecedented challenges for health care professionals, including medical dosimetrists. Many transitioned to remote or hybrid work models to ensure continuity of care. According to the latest data from the 2023 AAMD Salary Survey, there was a 6% increase in fully remote medical dosimetrists when compared to data from the 2021 AAMD Salary Survey.[2] The AAMD MedDos Infinity Task Group further stated, "Each radiation oncology work environment should collaboratively determine the scope of what work is able to be addressed remotely and what needs to be done on site in the support of patient care based on the unique role and responsibilities of the Medical Dosimetrists."[3]

Staffing models have become a hot topic in radiation oncology, specifically medical dosimetry. This is because hybrid work can be helpful where teams have evaluated and figured out what works well for the team. Conversely, some departments may find hybrid work a hindrance if they haven't figured out the right balance or how to leverage technology tools. It is highly important to assess and reassess what's working within the department. Remote work should be acknowledged as a resource for some rural areas or high cost of living segments of the country which may struggle to attract dosimetry talent. A hybrid model can help create work-life balance for those with long commutes, while keeping a physical presence to maintain interdepartmental team building. The best practice is to continue to keep an open dialogue between all departments and administration to determine the proper balance for the radiation oncology department's staffing solution.

Q26 For your primary employment, what is your typical work setting?

Answered: 929 Skipped: 17



ANSWER CHOICES	RESPONSES	
100% Onsite	23.79%	221
100% Remote	23.25%	216
Hybrid - blend of Onsite & Remote	52.96%	492
TOTAL		929

The value of medical dosimetrists

Tenured medical dosimetrists who appreciate their institution's nuances can increase operational efficiencies and bridge the gap between many departments. For example, the medical dosimetrist may assist in the insurance authorization processes by creating comparison plans to indicate the need for advanced treatment techniques.

With the advancement of AI and workplace philosophies of doing more with less, it's more important than ever to keep constant vigilance to promote patient safety. As radiation therapists are the final check before beam on, medical dosimetrists can be an ally in cross-checking patient information too. For example, a well-trained medical dosimetrist can keep an eye out for abnormalities upon fusion or question and confirm unusual contours. Medical dosimetrists can also assist in verifying prescriptions in the record and verify systems are consistent with the doctor's directives/contour names. Good catches happen when employees feel safe to speak up no matter what level they are at within the organization.[5]

Additionally, as patients live longer and re-treatment and cases of prior radiation rise, communication is vital to deliver treatments safely. A communicative department can help foster great collaborations between physicists, physicians and medical dosimetrists to determine the best approach for challenging case presentations. Building strong interdepartmental teams helps reduce the risk of miscommunications and inefficiencies.

Adapting to the future of medical dosimetry

With continued challenges related to radiation oncology staffing models and advancements in technology, medical dosimetrists will remain steadfast in our commitment to teamwork, innovation and patient-centered care.

As an example, adaptive radiotherapy is an evolving modality that has started to become more commonplace. This new approach to treatment comes with a lot of logistical decisions to be made. The duties involved with adaptive radiotherapy don't always align within the scope of practice each radiation oncology profession historically has outlined. The workflow of adaptive radiotherapy has made it imperative for all radiation oncology professions to work together to delineate who is serving each role in the process of an adaptive treatment. In a point/counterpoint paper published in the Journal of Applied Clinical Medical Physics, both viewpoints on adaptive radiotherapy highlighted the need for medical dosimetrists to be involved in the planning process. They said, "Both Physicists and Dosimetrists contribute distinct perspectives and strengths to patient care" and "by focusing on training Dosimetrists instead of taking over their responsibility, Medical Physicists create a synergistic environment where multiple disciplines work together to leverage the benefits of new technologies."[6] This further reinforces our viewpoint that adaptive radiotherapy is a team effort that needs to include all radiation oncology specialties. Together, we can overcome challenges, drive progress and continue to make a meaningful difference in the lives of the patients we serve.

REFERENCES

1. Mills M. (American Association of Medical Dosimetrists). Survey of Currently Active Medical Dosimetrists. Technical Report; 2021 April.
2. Swanson C. (American Association of Medical Dosimetrists). AAMD 2023 Salary Survey Report. 2024 July.*
3. Meddos Infinity. American Association of Medical Dosimetrists. Accessed May 10, 2024. https://www.medicaldosimetry.org/membership/meddos-infinity/.

4a. Applicant handbook. Medical Dosimetrist Certification Board (MDCB). Accessed May 10, 2024. https://mdcb.org/applicant-handbook.

4b. Professional responsibility. Medical Dosimetrist Certification Board (MDCB). Accessed May 10, 2024. https://mdcb.org/cmd-credentialing/professional-responsibility.

5. Edmondson AC. (2012). *Teaming: How organizations learn, innovate, and compete in the knowledge economy*. San Francisco, California: Jossey-Bass.
6. Lin MH, Kavanaugh JA, Kim M, et al. Physicists should perform reference planning for CBCT guided online adaptive radiotherapy. *J Appl Clin Med Phys*. 2023; 24: e14163.

**Pending publication by the AAMD.*

Best™ nomos®

Compact Sonalis® Ultrasound System

TEAMBEST GLOBAL® Improving Clinical Outcomes REthinking Medicine AT A LOWER COST www.teambest.com

TEAMBEST GLOBAL® One World • One Source • The Best! healthcare for everyone TeamBest® Your True Partner www.teambest.com

The Best™ Sonalis® Ultrasound Imaging System provides superior visualization of HDR, LDR, RF or Cryosurgical procedures. Our patented SimulView™ Technology provides simultaneous "live" views of the prostate in both planes, thereby increasing treatment accuracy and precision.

Additional Features

- Capable of supporting over 20 different probe configurations, this system can be used in almost every discipline
- 21.5" touch screen technology
- Superior HD image resolution for improved procedure accuracy, speed and physician confidence level
- Patented probe design
- Sagittal array provides for 140 mm length of view encompassing the bladder, prostate and perineal tissue
- Advanced modular software design provides for future upgrade path
- Convertible to desktop or portable without losing any functionality
- Dual battery backup built-in to protect from power loss

Best Nomos, 1 Best Drive, Pittsburgh, PA 15202 USA
tel: 412 312 6700 800 70 NOMOS fax: 412 312 6701 www.nomos.com

*Certain products shown are not available for sale currently.

Sonalis® Transducers

We offer probes for the most common types of procedures and imaging, all with the enhanced image quality and high resolution that you would expect from the **BEST** name in ultrasounds!

TEAMBEST GLOBAL® Improving Clinical Outcomes REthinking Medicine AT A LOWER COST www.teambest.com

TEAMBEST GLOBAL® One World • One Source • The Best! healthcare for everyone TeamBest® Your True Partner www.teambest.com

8L2A Linear Array
Applications: Arterial, Carotid, Vascular Access, Venous

12L5A Linear Array
Applications: Arterial, Breast, Carotid, Dialysis Access, Lung, Neonatal Hip, Nerve Block, Opthalmic, Testes, Thyroid, Vascular Access, Venous

14L3 Linear Array
Applications: Arterial, Breast, Carotid, Dialysis Access, Lung, MSK, Neonatal Hip, Nerve Block, Opthalmic, Testes, Thyroid, Vascular Access, Venous

15LW4 Linear Array
Applications: Arterial, Breast, Carotid, Dialysis Access, Lung, MSK, Neonatal Hip, Nerve Block, Opthalmic, Testes, Thyroid, Vascular Access, Venous

Biopsy Kit Available

15LA Linear Array
Applications: Arterial, Breast, Carotid, Dialysis Access, Lung, MSK, Neonatal Hip, Nerve Block, Opthalmic, Testes, Thyroid, Vascular Access, Venous

Biopsy Kit Available

15L4A Linear Array
Applications: Arterial, Breast, Carotid, Dialysis Access, Lung, MSK, Neonatal Hip, Nerve Block, Opthalmic, Thyroid, Vascular Access, Venous

16L5 Linear Array
Applications: Breast, Lung, MSK, Nerve Block, Vascular Access

VET Biopsy Kit Available

8V3 Phased Array
Applications: Cardiac

4V2A Phased Array
Applications: Cardiac, FAST, TCD

5C2A Curved Array
Applications: Abdominal, FAST, Fetal Cardiac, MSK, OB/GYN, Renal, Thyroid, Visceral

Biopsy Kit Available

9MC3 Curved Array
Applications: Abdominal, Cardiac,Neonatal Head, Small Parts, Thyroid, Vascular Access

8EC4A Endocavity
Applications: OB/GYN, Prostate

Biopsy Kit Available

XY-Bi-Plane Phased Array
Applications: Cardiac, Vascular, Lung

10EC4A Endocavity
Applications: OB/GYN, Prostate

Biopsy Kit Available

10BP4 Bi-Plane
Applications: Prostate

8BP4 Bi-Plane
Applications: Prostate

8TE3 Trans-esophageal
Applications: Motorized Adult Multiplane TEE Probe

Pedoff
Applications: Cardiac

16HL7 High Frequency Linear Array
Applications: MSK, Venous

Best Medical International, 7643 Fullerton Road, Springfield, VA 22153
tel: 703 451 2378 800 336 4970 www.besttotalsolutions.com www.teambest.com

American Society of Radiologic Technologists: Action for Cancer Care Professionals

BY MELISSA P. CULP, MED, RT(R)(MR), ALYSON BURNHAM, MS, RT(R)(T), CMD, AND STEVEN HARDY, MS, RT(R)(T)(CT), CMD

THE AMERICAN SOCIETY OF RADIOLOGIC TECHNOLOGISTS (ASRT) is the national association for medical imaging and radiation therapy professionals with a mission to advance and elevate the profession and to enhance the quality and safety of patient care. The ASRT has a membership of more than 156,000, which includes radiation therapists and medical dosimetrists, and provides practice standards, continuing education and professional development opportunities for both professions.

Understanding the need

According to the 2022 ASRT Radiation Therapy Workplace and Staffing Survey, the overall vacancy rate for radiation therapists increased to 10.7%. The vacancy rate represents the number of positions that are open and actively being recruited. The 2022 vacancy rate for radiation therapists increased from the 7.2% rate reported in the 2020 staffing survey. The vacancy rate for medical dosimetrists increased from 9.6% to 11.3%.

The report highlighted information about workforce demographics. Although vacancy rates saw sizable increases, the average number of radiation therapists budgeted per facility rose marginally from 7.1 in 2020 to 7.3 in 2022. The number of budgeted dosimetrists fell slightly from 2.5 in 2020 to 2.4 in 2022.

The survey respondents worked in facilities that offer an average of 14.2 radiation therapy-related services, with the most common being intensity modulated radiation therapy (96.6% of responding facilities), computed tomography (CT) simulation (94.8%) and cone beam CT (93.5%).

ASRT emailed the biennial survey to 14,520 radiation therapists in June 2022. At the close of the survey in July 2022, 629 respondents from all 50 states had submitted completed questionnaires, a response rate of 4.3%.[1]

To address these trends, ASRT joined forces with the American Registry of Radiologic Technologists (ARRT) and the Joint Review Committee on Education in Radiologic Technology (JRCERT) to better understand the factors impacting workforce shortages and to address needs and support medical imaging and radiation therapy professionals.

Together, the ASRT, ARRT and JRCERT created the 2023 Professional Workforce survey to initiate data-informed solutions. The ARRT, Joint Review Committee on Education in Diagnostic Medical Sonography and Joint Review Committee on Educational Programs in Nuclear Medicine Technology sent the 2023 Professional Workforce survey to 353,489 registered and credentialed medical professionals. A total of 8,701 responded to the survey yielding a 2.5% response rate. The sample size of 8,701 yields a ±1.0% margin of error at its widest for a 95% confidence level.

In the 2023 Professional Workforce survey, respondents were asked several questions around their employment status. Among those who are registered and certified but not working at all in medical imaging or radiation therapy, the most common reason by a considerable margin was that they are retired.

Most respondents had not changed jobs in the last year. The 16% who have changed jobs in the past year were asked why they left their most recent position, and a majority of those had resigned. The five most common reasons that respondents shared for resignation included that they:

- Changed jobs — a change to an equivalent position at another facility, a promotion or a relocation.
- Left due to burnout.
- Left for better pay elsewhere.

- Left due to problems with management.
- Left for more desirable hours elsewhere.

The results of the 2023 Professional Workforce survey will be included in a white paper from the Consensus Committee on the Future of Medical Imaging and Radiation Therapy published on the ASRT website in summer 2024.

The ASRT, ARRT and JRCERT hosted the Consensus Committee on the Future of Medical Imaging and Radiation Therapy, February 19-20, 2024, at the ASRT office in Albuquerque, New Mexico. Leadership from 18 organizations attended the event including, but not limited to, the American Association of Medical Dosimetrists, American Association of Physicists in Medicine, Association of Collegiate Educators in Radiologic Technology, Association of Educators in Imaging and Radiologic Sciences, AHRA—the Association for Medical Imaging Management, Medical Dosimetry Certification Board, Siemens Healthineers, Radiology Business Management Association and Society for Radiation Oncology Administrators.[2]

The consensus committee reviewed data from the 2023 Professional Workforce survey to work collaboratively and think critically about the future of the profession. The leadership group discussed factors contributing to current workforce shortages and solutions and career pathways in medical imaging and radiation therapy.

To address factors impacting the workforce shortage, consensus committee participants agreed on six goals to prioritize for action:

1. Provide tools and suggestions to improve workplace satisfaction, employee engagement and recognition.
2. Articulate career pathways.
3. Create and strengthen the workforce pipeline in collaboration with education systems.
4. Expand opportunities for education and training that will meet the emerging needs of students and the profession.
5. Raise awareness, visibility and respect of the profession.
6. Create a career ladder for advancement and mentorship.

In conjunction with the discussion on strengthening the pipeline into the profession, the interdisciplinary radiation oncology members of the consensus committee were interested in national certification and professional association support for the emerging advanced practice radiation therapy (APRT) role. To move forward with developing the APRT, a task inventory, curriculum and education program accreditation standards need to be established based on evidence-based practice.

In addition, the radiation oncology leadership at the consensus committee recommends education tailored to working professionals, including recognition of competence in emerging technologies, such as proton therapy and magnetic resonance guided radiation therapy. To support this goal, the group suggests that ongoing dialogue with industry leaders will assist in the facilitation of professional development for emerging technologies. Finally, the consensus committee recommends membership and involvement in professional associations to synthesize these aims.

In summer 2024, a white paper of the consensus committee meeting will be published on the ASRT website. As a next step, supporting organizations will continue the conversation and begin taking action to advance solutions proposed by the consensus committee.

Continued on following page

ASRT in action

To raise awareness about the radiation therapy and medical dosimetry professions, the ASRT launched a nationwide public relations campaign, including a commercial, interviews, emails and social media content. This campaign aims to educate the public and other health professionals about these roles and is available at asrt.org/BeSeen. At the date of this article's submission, more than 28 million Americans have engaged with the campaign, and ASRT has approval from its Board of Directors to continue this communication push in different phases for at least five years.

"Health care wouldn't be the same without medical imaging and radiation therapy professionals, but they often fail to receive the recognition they deserve," said ASRT CEO and Executive Director Melissa B. Pergola, EdD, RT(R)(M), FASRT, CAE. "That's why Danny Gonzales, ASRT chair of the Board and past president, championed this campaign to raise their visibility."[3]

To support workforce development, ASRT offers Radiation Therapy Student Exam Assessment Library online practice tests and radiation therapy lymphatics study modules to help students confidently prepare for the radiation therapy certification exam. To support therapists entering the profession, ASRT created the Radiation Therapy Roadmap, which navigates through six months of preparation for the radiation therapy certification exam. Each milestone along the route provides timely review materials, study resources and valuable advice to help students successfully prepare for the exam and launch their career as a registered radiation therapist.

ASRT advances the radiation therapy and medical dosimetry profession by hosting the Radiation Therapy Conference annually, offering print, digital and livestream continuing education tailored to these disciplines, which are accepted by the ARRT and Medical Dosimetrist Certification Board, and leading advocacy for the profession at the state and federal level. Radiation therapists and medical dosimetrists are active in their chapters and shape their practice standards through ASRT governance. Additionally, ASRT offers a place for therapists and dosimetrists to discuss professional issues in the ASRT Communities.

The ASRT is taking several steps to support the APRT role, including an upcoming call for submissions to a special issue of ASRT's peer-reviewed journal Radiation Therapist that will focus on APRT. This special issue aims to explore the critical aspects of APRT practice within the contemporary landscape of radiation oncology. ASRT participates in a quarterly interdisciplinary APRT working group co-led by ASRT members. In 2024, ASRT will launch a webpage highlighting the APRT role, resources and related research.

Radiation oncology teams value each professional role for the different practice areas and skills they bring to treating patients. These workforce efforts led by the ASRT aim to support the radiation oncology interdisciplinary team and prioritize professionals and patients in cancer care.

Melissa P. Culp, MEd, RT(R)(MR) is the executive vice president of member engagement at the American Society of Radiologic Technologists. She is a registered technologist in radiography and magnetic resonance.

Alyson Burnham, MS, RT(R)(T), CMD, is a continuing education program reviewer at the ASRT. She is a registered technologist in radiography and radiation therapy and a certified medical dosimetrist.

Steven Hardy, MS, RT(R)(T)(CT), CMD, is the chief operating officer of the ASRT Foundation and executive vice president of development and corporate relations for the ASRT. Steven is a registered technologist in radiography, radiation therapy, and computed tomography and a certified medical dosimetrist.

REFERENCES

1. ASRT. Radiation Therapy Staffing and Workplace Survey. ASRT Research. Sept. 6, 2022. Accessed April 8, 2024. https://www.asrt.org/main/news-publications/research/staffing-surveys
2. ASRT. ASRT Hosts Consensus Committee on the Future of Medical Imaging and Radiation Therapy. News Room. Feb. 27, 2024. Accessed April 8, 2024. https://www.asrt.org/main/news-publications/news/article/2024/02/27/asrt-hosts-consensus-committee-on-the-future-of-medical-imaging-and-radiation-therapy
3. ASRT. ASRT Launches Be Seen Public Awareness Campaign. News Room. Feb. 20, 2024. Accessed April 9, 2024. https://www.asrt.org/main/news-publications/news/article/2024/02/20/asrt-launches-be-seen-public-awareness-campaign

An International Perspective on the Medical Physicist and Radiation Therapist Workforce: **Nine Years On from a Call to Action**

BY PAUL KEALL, PHD, FASTRO; MICHELLE LEECH, PHD; JEANNIE HSIU DING WONG, PHD; EUCARIA MUSHOSHO, MTECHRAD, MBUS, DIPCOR; AND SANDRA TURNER MBBS, PHD

Acknowledgement - Thanks to Helen Ball for her background research in writing this article.

IN 2015, THE LANCET ONCOLOGY COMMISSION published "Expanding Global Access to Radiotherapy."[1] With the issue, it stated that "Radiotherapy is a critical and inseparable component of comprehensive cancer treatment ... [and that] … worldwide access to radiotherapy is unacceptably low." Workforce deficit was identified as one barrier to the use of radiation therapy. The Commission made an urgent call to recruit and train specialized professionals across the radiation oncology (RO) disciplines. They also recommended population-based benchmarks of one RO medical physicist (MP) per 300-500 people and one radiation therapist (RT) for 100-150 people.

Nine years on, this article explores the changing workforce landscape as it relates to MPs and RTs in parts of the world outside North America. In examining the topic through a global lens, we cannot provide a comprehensive review of the workforce across individual jurisdictions and countries. Rather we hope to provide food for thought around the impact on workforce and training driven by evolving radiation therapy technologies and RO evidence-base, as well as adaptations to the education environment and professional scope of practice, to name just a few developments in our field. We highlight the evidence and provide illustrative examples from both professions and from diverse parts of the world, in particular, those familiar to our global authorship panel. We discuss ongoing challenges and potential solutions.

Developments influencing our workforce

Several key trends affect the entire RO workforce, maybe especially so for MPs and RTs. Increasing automation of labor-intensive tasks, including contouring, planning and treatment verification, can improve workflow and substantially decrease workforce demands.[2] This automation, increasingly underpinned by artificial intelligence (AI), can increase consistency and help eliminate human error. However, ever advancing technology also increases complexity and requirements for equipment commissioning, quality assurance and risk analysis to ensure safe clinical use. Staff need to be equipped with knowledge in computing/AI to maximize benefits from these advances. Achieving this goal requires a well-structured curriculum and additional training.[3]

Global connectivity through virtual platforms, often incorporating AI, can also improve access to and standardization/quality of education and training required of the modern MP and RT workforce. The COVID-19 pandemic brought a paradigm shift in education, making remote learning vastly more accessible.[4,5] The imperative for virtual training brought with it more sophisticated learning platforms, and accelerated attempts to deliver online education at scale.

Continued on following page

The global evidence-based movement toward moderate- and ultra-hypofractionation for many cancers provides an opportunity to alleviate workforce (and patient) burden by reducing average treatment visits. In turn, this may allow patients greater access to radiation therapy services and reduced health care costs. However, treatment accuracy requirements for higher dose per fraction treatments increases workforce competency and technology requirements. Where feasible, the benefits of these technologies should be embraced.

A global snapshot of radiation therapist and medical physics workforce issues

Workforce shortages for RTs are reported in high- and low- to middle-income countries alike.[6] Workforce gaps can be directly attributed to a deficit in educational programs for RTs in many regions.[7] In the Asia Pacific, a paucity of educational experts to teach RTs exists.[8] In Sub-Saharan Africa, the RT workforce is so heavily depleted that a >200% increase is needed if cancer patients are to access RT in facilities with functioning equipment.[9] Many African countries have no radiation therapy facilities at all or equipment lies dormant due to workforce gaps. For example, in Nigeria, equipment is being purchased and new centers are opening despite there being no national RT training program.

In Western Europe, many RTs are leaving the profession due to limited opportunities for career advancement.[10] Out-of-date pay structures, limited career pathways, inadequate training positions and low remuneration are leading to low recruitment, career dissatisfaction, RT staff shortages and loss of staff even in high income countries such as Australia, New Zealand and Ireland.

For MPs, the field presents a diverse and dynamic landscape, reflecting different regions' varied health care systems, economic resources, educational structures and available technologies. As the demand for MPs continues to rise, particularly for RO MPs, there are also significant workforce challenges, alongside opportunities for growth and development.

Across Asia for example, the quality, length and content of postgraduate MP training programs vary significantly.[11] As a result, major differences are seen in the qualifications and accreditation arrangements for MPs. To illustrate this point, in Indonesia for instance, there are two discrete levels of MPs, "Associate MP" and "Clinically Qualified MP" (CQMP). Associate MPs play a limited role, e.g., relating to simple equipment/techniques. A CQMP must be present for the use of advanced techniques and devices.[12]

Scope of practice and training variations affect both professional groups. In some countries, including in Europe and Asia, RTs are not (or have only very recently been) given status as a recognized profession. In other, even high-income countries, RTs do not treat patients, this role being substituted by nurses or generic "radiographers" with limited specific expertise. RT practice scope also varies widely from either a planning/dosimetrist role, or a patient treatment role, or both roles combined. In the latter case, frequent rotations between planning/dosimetrist and machine roles may impact growth in expertise in complex planning tasks, for example, as well as job satisfaction through attaining subspecialty roles.

Similarly, scarcity of trained dosimetrists, or RTs competent in planning, impacts heavily on the MPs' role and patient throughput. In Malaysia for example, MPs are still in charge of all treatment planning creating a huge burden on their workforce compared to other regions.[13,14]

> "Efforts to catch up and keep pace of workforce requirements will remain a constant challenge as radiation therapy utilization escalates in line with global cancer cases."

Improving training quality and workforce retention

The many variations described above underscore the importance of attempts to standardize education, training and accreditation activities to ensure consistent quality and competency among graduates in both professions. Education focusing on enhancing leadership capability of all RO professionals fosters confidence in championing positive change across the world.[15]

There are numerous organizations and collaborations worldwide working to support RT and MP education and practice quality. For MPs, the International Organization for Medical Physics provides a pathway for programs to seek accreditation and ensure recommended standards are met. In European Union (EU) countries guidelines are being developed (under EU-REST) to address inconsistencies in recognition and training of MPs.[16]

The International Atomic Energy Agency (IAEA) has a strong focus on closing the education gap for RTs and MPs especially among lower- and middle-income

countries. The IAEA supports education and training of RTs and MPs through fellowships, curriculum development, workshops, and virtual education platforms including real-time virtual tumor boards and conference streaming. Initiatives include AMPLE (Advanced Medical Physics Learning Environment), AFRONET (African RO Network tumor board),[17] and APRONET (Asia Pacific RO Network). Global competency-based certification of education may alleviate the shortage of trained RO professionals, however, systematic implementation on the ground remains a challenge.

Efforts to enhance career progression pathways and specialist RT roles in some regions go some way to ensuring workforce remain engaged and appropriately remunerated. In Western Europe for example, there is the opportunity for Ministries of Health to sanction advanced and consultant RT practitioner roles. These have been proven to improve job satisfaction and workforce efficiency.[18] Recruitment ventures aimed at high schools and universities will remain important to increase awareness of these specialized health professional roles.

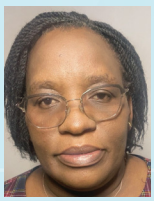
Take home messages

There is no doubt that the MP and RT workforces are under strain across much of the world. Efforts to catch up and keep pace of workforce requirements will remain a constant challenge as radiation therapy utilization escalates in line with global cancer cases. Being smart and agile in sharing education opportunities and international collaborations to recognize commonalities and prevent redundancy will be vital. Clearly training will continue to require tailoring to local needs. Taking advantage of developments in our field that have potential to reduce workforce burden, improve training and create efficiencies will be paramount. All the while, our goal will remain to optimize patients' access to high-quality modern radiation therapy.

Professor Paul Keall is Director of the Image X Institute at the University of Sydney in Australia and a Medical Physicist. He leads a team of scientists and professionals that improve lives by inventing and advancing new ways to image and treat disease. They focus on new technologies for medical imaging and targeted radiation therapy.

Professor Michelle Leech is a Radiation Therapist and Professor in Radiation Therapy, at the School of Medicine, Trinity College Dublin, Ireland. She contributes to global activities of the International Atomic Energy Agency (IAEA) and the European Society of Radiotherapy and Oncology (ESTRO), particularly in the education of Radiation Therapists.

Associate Professor Jeannie Hsiu Ding Wong is a Medical Physicist at the Department of Biomedical Imaging, Faculty of Medicine, University of Malaya in Malaysia. She is the coordinator for the University of Malaya Master of Medical Physics program.



Mrs. Eucaria Mushosho is a Radiation Therapist and Dean of the School of Allied Health Sciences at Harare Institute of Technology in Harare, Zimbabwe. She is a faculty member of AFRONET (IAEA) Radiation Therapists Workshops.

Professor Sandra Turner is a Radiation Oncologist at the Sydney West Radiation Oncology Network and Clinical Professor at the University of Sydney, Australia. She is Clinical Lead of Professional Development across the Western Sydney Local Health District and has strong interests in medical education and radiation therapy advocacy.

Scan QR code to view references online.

The Rural Landscape: Navigating Workforce Challenges

BY DIANE KEAN, SENIOR COMMUNICATIONS MANAGER, ASTRO

Anna Paulsson, MD

David Beyer, MD, FASTRO

Christopher Jahraus, MD

WORKFORCE ISSUES LIKE RECRUITING and retention are nothing new for radiation oncology practices, and we know the problems outlined in the other articles in this issue of *ASTROnews* are especially exacerbated in rural facilities. We took this opportunity to talk with three radiation oncologists practicing in rural or rural-suburban areas spanning coast to coast to better understand their situations and glean potential solutions from their experiences on how to manage shortages and remote workers.

Anna Paulsson, MD, a radiation oncologist with the large multispecialty group Providence, is based out of a three-facility branch, located about 40 miles north of San Francisco. While the facility itself is more suburban, many patients travel from locations all along the northern California coast. These locations are typically rural and underserved, with patients traveling upwards of three hours for treatments, with no public transportation options available. In terms of hiring among the three radiation oncology offices, where four radiation oncologists split their time, the most difficult positions to fill have been radiation therapists. "Most of our therapists right now are locums, with about two or three permanent staff across the three offices," said Dr. Paulsson. In her experience, locums staff stay on for about a month, but a couple have stayed four or five months, but that is unusual.

Similarly, David Beyer, MD, FASTRO, Medical Director, Radiation Oncology at Cancer Centers of Northern Arizona Healthcare, Sedona and Flagstaff, shared, "I think staffing is one of the most difficult problems facing rural clinics. We have a one doc[tor] single linac center with a similar sister center in the next county. We share a lot of staff. We have been actively trying to recruit an RTT for at least a year. We are trying to staff three RTTs at each site and require two in order to treat. While this job is posted on the ASTRO site, we have tried elsewhere as well. We have an RTT who keeps trying to retire and we keep bringing her back as a PRN. She is now retiring for real, and our need is acute. I think this is our biggest challenge. We have used travelers on many occasions but finding a reliable tech is tough, particularly for a long stretch of time."

For dosimetrists, and in some cases medical physicists, many facilities have had to embrace remote work to stay fully staffed. Dr. Beyer added, "Two of our three dosimetrists do not even live in Arizona, much less our town. Similarly, we almost never have two on-site physicists but our three [physicists] share in-person and remote work." Without the flexibility in scheduling and openness to new working situations, "We never would have survived the past few years," said Dr. Beyer. "I worry about what will happen when inevitably one of our physicists gives notice. These positions are hard to fill, and I know we have been lucky." Dr. Beyer's team carefully works the schedule to ensure that all positions are filled for SBRT, brachytherapy and other cases, which can sometimes impact patients' treatment times or days.

Christopher Jahraus, MD, a radiation oncologist in Alabaster, Alabama, shared his perspective as a

solo-practitioner who has worked in rural and rural-suburban settings. For his practice, nursing staff have been the hardest to fill, followed by therapists. "I'm blessed to have a great team that includes a long-time physicist who works with me, mostly remotely, and on site when needed," said Dr. Jahraus. "I've outsourced dosimetry, because it's very hard to find employees who are willing to really commit to both the busy and the not-so-busy times." The expectation of on-site employees tends to be full salary when it's slow, but 40-hours per week max, even when it's busy. Again, outsourcing has been our enemy with respect to expectations, but for me, I happen to have a phenomenal dosimetrist with whom I work remotely, so there are winning opportunities."

A common theme across all offices is how vacancies impact the practice. Many staff have to work overtime, long into the evenings to manage the patient load, and vacancies can impact the length of time between a patient consult and treatment starting. A practice needs to devise creative solutions when not fully staffed. In this scenario, Dr. Jahraus observed, "It's all about technology [for my practice] and trying to get it at a cost that is sustainable. For dosimetry, AI normal tissue contouring has been a huge help. It lets our dosimetrist operate much more efficiently by reviewing generally well-devised contours, but that too adds to the overall cost, often quite substantially."

"We currently have a therapist in dosimetry school," said Dr. Paulsson. At her practice, they've found that hiring individuals with connections to the local area, such as family nearby for example, has proven to make them more likely to stay at the job longer. In addition, reaching out to training programs has been helpful. Dr. Paulsson, who is vice-chair of the ASTRO Early Career Committee shared a final thought. "When thinking of physicists, mentorship is a particularly strong need. Transitioning from an academic or training setting to a practice, the departments are inherently smaller with fewer colleagues. We don't often recognize how challenging that is and need to support people better through that transition." Whether in a rural or urban setting or something in between, Dr. Paulsson conveys that flexible and creative thinking is critical for practices to optimize their staff availability.

KSENIJA KUJUNDZIC, SENIOR MANAGER, QUALITY IMPROVEMENT, ASTRO

10 Years of RO-ILS: Collaboration and Improvement for Patient Safety

GIVEN THE TECHNICAL SOPHISTICATION of radiation therapy, each member of the clinical team has specialized responsibilities and makes valuable contributions to patient care. It is this team-driven environment that helps heighten the quality and safety of patient care. ASTRO's quality programs, APEx - Accreditation Program for Excellence® and Radiation Oncology Incident Learning System (RO-ILS®), leverage collaborative teamwork to propel process-driven improvement. This June marks 10 years of operation for RO-ILS, a program built around collaboration and bringing teams together to benefit patient safety.

More than a decade ago, ASTRO and the American Association of Physicists in Medicine partnered to develop RO-ILS. The three aims of this national program are to (1) offer a secure mechanism for error reporting, (2) foster a non-punitive environment and (3) facilitate safer and higher quality care.

First aim: In 2005, a law creating patient safety organizations (PSOs) enabled collection of medical error information in a protected and confidential environment. ASTRO contracted with an established PSO to provide the associated services and reduce concerns about collecting and sharing sensitive information. While specialty agnostic PSO work has become more commonplace, especially in hospitals, the existence of a specialty-specific program of this sophistication is rare.

Second aim: The opposite of a "shame and blame" environment is a strong safety culture that is transparent, fair and where staff are accountable but not punished. To promote a workplace without fear of retribution, staff at the **850+ facilities enrolled in RO-ILS** can anonymously report a safety event. RO-ILS education serves as an example of how to share and discuss safety events with safety culture in mind; it does not point fingers or identify users but rather focuses on environment-related contributing factors and process-driven mitigation strategies. Positive reinforcement also helps counter apprehension about disclosing errors. With this in mind, in 2022 RO-ILS began publishing multiple great catch events to celebrate different radiation oncology team members generally, and in 2023, started recognizing specific individuals as safety stars.

Third aim: The primary mechanism of facilitating safer care and disseminating shared learning is RO-ILS education. A small group of safety experts known as the RO-HAC work with the PSO to analyze and share findings from RO-ILS data. Starting with quarterly reports and evolving to multiple resources, RO-ILS has released more than **60 written educational reports** (see astro.org/roilsreports), many of which have reached international audiences. Themed reports on topics like peer review, surface guidance, and training have identified trends in a RO-ILS aggregate database now comprising over **37,000 safety events**! RO-ILS fosters

teamwork by including safety check questions in RO-ILS education to facilitate group discussion and hosting interactive events for all clinical team members such as a recent virtual discussion about select RO-ILS events. Together, all this work affords individuals, teams and the field an opportunity to proactively address the risk of errors.

In the first decade of RO-ILS, ASTRO invested in extensive development and standardization of radiation oncology-specific data collection, advancements in safety trend analysis and overall increased outreach to radiation oncology facilities. This work could not be done without:

1. Sponsors and supporters who help finance this work.
2. Safety advocates who pushed for the adoption and use of the RO-ILS platform.
3. Every person who has submitted and/or reviewed an event for RO-ILS.
4. RO-HAC members and volunteers who developed the taxonomy, program materials, etc.
5. People and teams who read and leverage RO-ILS education.

Thanks to the community's ongoing dedication and passion for improving patient safety, we are making a difference.

Visit **astro.org/roils10year** for videos, quotes and more information from safety leaders to celebrate the RO-ILS milestone.

BY MICHAEL YUNES, MD, ABR ASSOCIATE EXECUTIVE DIRECTOR FOR RADIATION ONCOLOGY

Combating Shortages in Radiation Oncology Staffing Requires Long-Term Investment, Creativity

This article was originally published in the ABR newsletter, The Beam, in December 2023.

FOR THE PAST SEVERAL YEARS, our radiation oncology colleagues have been discussing challenges facing the clinical workforce. In addition to the discussion surrounding physician supply, these conversations have focused on the real or perceived undersupply of clinical physicists and dosimetrists available for employment. It was therefore somewhat surprising that the dialogue recently changed, and many hospitals and clinics are now also dealing with a shortage of radiation therapists.

In 2022, the Radiation Therapy Staffing and Workplace Survey was published, and although the response rate was only 4.3%, there were several interesting findings that corroborated what was being experienced in human resource offices. Including all regions of the country, an estimated 10.7% of radiation therapy positions and 11.3% of medical dosimetry positions were unfilled. As expected, there was significant regional, facility and personal demographic variability among unfilled positions. From 2020 to 2022, the overall estimated vacancy rate of radiation therapy and medical dosimetry positions rose by 3.5% and 1.8%, respectively. Per linear accelerator, the mean number of radiation therapists was 2.4 and medical dosimetrists, 1.1.

While this survey does confirm the suspicions, it does not offer potential causes or recommendations on improving the number of trained radiation therapists and medical dosimetrists. We can postulate that the following factors have changed the dynamics of the industry and will last into the next decade.

Due to the aging population, the U.S. Bureau of Labor Statistics estimates that an additional 1,000 radiation therapist positions will become available between 2021 and 2031. There are approximately 15,900 positions in the U.S. as of 2022.[1]

There are approximately 100 schools in the U.S. accredited through the American Registry of Radiologic Technologists.[2]

The COVID-19 pandemic led to early retirement for many therapists and rapidly convinced administrations that remote dosimetry was reasonable and viable. In addition, return to work requirements following COVID positive testing or exposure reduced the available pool of employees available to fill in gaps.[3-4]

These changes have led to a rise in contract workers from vendors to support more remote workers.[5] Reimbursement declines reduced the available funds for recruiting and retention.[6] The modification of federal and state leave policies to dramatically and appropriately improve quality of life and work life balance has impacted available staffing for coverage.[7]

The causes of workforce challenges are multifactorial and evolving. Addressing and resolving these problems require a long-term investment in increased training and education of radiation therapists and medical dosimetrists, which will take time and dedicated resources. Meanwhile, in the clinic, finding creative optimal staffing solutions for safe patient care remains the top priority.

REFERENCES

1. U.S. Bureau of Labor Statistics. Occupational Outlook Handbook. Accessed November 9, 2023. https://www.bls.gov/ooh/healthcare/radiation-therapists.htm.
2. Campus Explorer. Online ARRT (Radiation Therapy) Accredited Degree Programs. Accessed November 9, 2023. https://www.campusexplorer.com/colleges/accredited-schools/arrt-accredited-radiation-therapy-schools/.
3. Chung C. The Impact of the COVID-19 Pandemic on the Field of Medical Dosimetry. Presented at the 46th annual meeting of the American Association of Medical Dosimetrists, June 6-10, 2021. Accessed November 9, 2023. https://pubs.medicaldosimetry.org/pub/0D73B777-FCC8-7C8B-7DAA-45EFA45DBDDC.
4. Riegel AC, Chou H, Baker J, et al. Development and execution of a pandemic preparedness plan: Therapeutic medical physics and radiation dosimetry during the COVID-19 crisis. *J Appl Clin Med Phys*.2020 Sep; 21(9): 259–265.
5. Aspekt Solutions. Why have all the dosimetrists gone remote? February 16, 2023. Accessed November 9, 2023. https://aspektsolutions.com/why-have-all-the-dosimetrists-gone-remote/
6. Hogan J, Roy A, Karraker P, et al. Decreases in radiation oncology Medicare reimbursement over time: Analysis by billing code. *Int J Radiat Oncol Biol Phys*. 2022 Sep 1; 114(1): 47–56.
7. U.S. Department of Labor. Wage and Hour Division. Family and Medical Leave Act. Accessed November 9, 2023. https://www.dol.gov/agencies/whd/fmla

BY STACY WENTWORTH, MD

Giants of Radiation Oncology: Biographical sketches from the ASTRO History Committee

Frank Ellis, MBChB, OBE (1905-2006)

AT THE AGE OF 5, Frank Ellis decided he was going to become a doctor. In school, he enjoyed physiology, disappointed that his chemistry lectures began with memorizing the periodic table. "I didn't like memorizing isolated facts. I like things to be built up," he later recalled. Ellis attended the University of Sheffield where an eye infection during his last year of training sent him to bed for almost two months in agonizing photophobia and pain.

It would not be until he was assigned to "poison gas" duty at Sheffield Hospital during World War II that he read about a new medication called sulfacetamide that could be used to treat people whose eyes had been exposed to nitrogen mustard. Although thankfully no citizens of Sheffield were ever exposed to the gas, Ellis' eight-year struggle with keratitis cleared up after five days of treatment.

The eye infection scrapped his plans to travel to Africa after medical school, so a friend passed along a job posting for the newly created position of radium officer at the Royal Hospital of Sheffield. After the interview, Ellis was offered the position and accepted. The job included six months of funding for travel to learn about radium and an annual salary of £600 (roughly $9,000). In late 1930, the 25-year-old Ellis, still suffering from keratitis, left Sheffield for Middlesex Hospital in London where he learned to measure radium dose. He then embarked on a European tour through Belgium, Sweden and Germany.

Upon returning from his six months abroad, the energetic new radium officer was shown his new department, an empty operating room. Undeterred, he secured a table and a desk for his department, then went about organizing the radium and looking for business. Through thoughtful observations of his surgical colleagues' techniques and human anatomy, Ellis became a passionate proponent of intraoperative and interstitial radiotherapy.

While observing the chief of surgery "fidgeting about" during a radium case, the frustrated surgeon stepped aside and asked Ellis if he would like to try. Recalled Ellis, "I did them all after that." The chief of obstetrics and gynecology readily relinquished his brachytherapy cases as well. Ellis was soon performing 125-mg radium implants every morning including most weekends for almost 12 years.

Ellis planned each case using the tables included in a book he brought back from Germany. He also performed a cystoscopy on every gynecological patient prior to implant and even borrowed a portable x-ray machine from the children's hospital to ensure his "spreader," an early prototype of the Suit applicator, was in place. Ellis followed his patients closely, learning as he went, and dedicated one day each year to tracking down the dozen or so patients who had been lost to follow-up.

In 1934, Ellis began to use wedge filters made of wood and filled with rice flour, an innovative technique

Continued on following page

that allowed shaping of the beam while ensuring a uniform dose distribution. His graduate student and long-time friend, noted radiobiologist Eric Hall recalled, "[Ellis] was always thinking of something new, and that exasperated his colleagues who were more set in their ways."

In 1943 and amid World War II, Dr. Ellis accepted a position as the first director of the radiotherapy department at Royal London Hospital. Concerned about the risk of contamination should a bomb hit the hospital, Ellis hired a moving van to transport their radium stock to a safer location. After the war, Ellis moved to the Churchill Hospital in Oxford, UK, where he built yet another radiotherapy department.

During this time, Ellis developed the concept of nominal standard dose (NSD), a revolutionary idea that for the first time allowed comparison of the effect of different radiation fractionation and protraction regimens on normal tissues. Ellis drilled into the hundreds of trainees who came to study under him that any statement was open to questioning and that improvement was always possible. He served as medical director at Oxford from 1950-1970 when he retired at the government mandated age of 65 and is considered by many to be Britain's most eminent radiation oncologist.

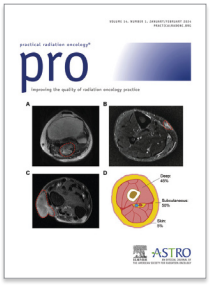
In retirement, Ellis served as a visiting professor at numerous institutions worldwide and received many awards for his contributions to the field of radiation oncology, including the Order of the British Empire (OBE), bestowed by the Queen in 2000. He served as president of the British Institute of Radiology, received the Gold Medal of the Royal College of Radiologists and honorary recognition from the Hospital Physicists' Association (which, by 1997, through a series of organizational mergers, had become the Institute of Physics and Engineering in Medicine and Biology), the American Association of Physicists in Medicine, the American College of Radiology, the American Society for Radiation Oncology, and many others. At the age of 100, he received an honorary Doctor of Science degree from his alma mater, Sheffield University.

A lifelong Christian and supporter of the Society of Friends, he believed in peace and the inherent goodness of people. He died in Oxford, UK, on February 3, 2006. He was preceded in death by his beloved wife, Dorothy, and survived by four children, and dozens of grand and great-grandchildren.

In 1993, an 88-year-old Ellis sat for a videotaped interview. Midway through the conversation, the operator zoomed in on the tie worn by the aging physician. Repeating gold figures of atoms surrounded by the serpents of the medical caduceus cascaded down a navy silk background. The tie was a gift from the Hospital Physicist Association Ellis said, and "represents my philosophy." The atoms depict science, "the only truth we are sure of," and the intertwined serpents represent "looking out for other people." In his long career of care and discovery, Dr. Frank Ellis passionately pursued both.

REFERENCES

1. AAPM. AAPM History and Heritage - Interviews. Accessed April 23, 2024. https://www.aapm.org/org/history/InterviewVideo.asp?i=39.
2. Hall EJ and Suit HD. Obituary of Frank Ellis. *Int J Radiation Oncology Biol Physics*. 2006; 65(4); 963-4. 3. Pincock S. Obituary of Frank Ellis. *The Lancet*. 2006; 367; 1050.



The Role of Medical Physicists in High-Quality Treatment Planning: An Interview with Mu-Han Lin, PhD, Minsun Kim, PhD, Dustin Jacqmin, PhD, and Lindsey Olsen, PhD

Authors of the PRO editorial, "Beyond Acceptable: The Vital Role of Medical Physicists in Ensuring High-Quality Treatment Plans," discussed their paper with ASTROnews. The editorial can be found at https://www.practicalradonc.org/article/S1879-8500(23)00239-4/abstract.

Please give a brief overview of your editorial. What are the major points you would like readers to know?

Treatment planning is a critical step in the radiotherapy process, helping to shape the quality of care for cancer patients. While there are guidelines for ensuring the safety and minimum quality of a treatment plan, achieving the highest quality to the extent feasible is not always straightforward. There is currently no standard for defining the optimal quality achievable for a given patient. Despite physicists conducting initial chart checks post-plan completion, the window for significant plan modifications is often limited unless a plan is deemed egregiously incorrect or unsafe.

The emergence of adaptive therapy and automated planning necessitates the urgency of attaining high quality plans within condensed timelines. This requires a deep understanding of physics principles in imaging, optimization, dose calculation and delivery robustness to effectively utilize advanced tools in clinical settings, which are often black boxes to users. While medical physicists are ideally positioned to conduct plan quality reviews and elevate plan quality, their varying levels of involvement in plan generation are influenced by institutional cultures and resource availability.

Our editorial aims to raise awareness about the critical importance of engaging in physics plan quality reviews to promptly identify and rectify deficiencies in treatment plans. We delve into the nuances of plan quality, stress its pivotal role, outline potential hurdles and propose viable solutions to facilitate more meaningful engagement from physicists. Targeting physicists, physicians, planners, therapists and radiation oncology trainees, our objective is to foster a collaborative, multidisciplinary environment that prioritizes a culture of excellence in quality assurance.

What prompted/inspired you to write this paper?

Our journey began in 2021, when the members of the AAPM Working Group on Treatment Planning embarked on a mission to enhance education around treatment planning at the request of the AAPM membership. During the discussion, it became clear that improving plan quality beyond merely acceptable levels is challenging in the modern era due to complex treatment planning technologies and the diverse responsibilities that medical physicists have in the clinic. This effort culminated in the coordination of our working group to develop a presentation on physics plan quality review, encompassing the fundamental principles and providing a range of real clinical examples of unacceptable to high-quality plans.

Our presentation at the 2022 AAPM Spring Clinical Meeting and Annual Meeting garnered significant positive feedback, leading to invitations to present at several local chapters in 2023. In an effort to gauge the effectiveness and common barriers to implementing physics plan quality review, we conducted a survey targeted primarily to physicists. The survey results highlighted that fostering a quality-driven environment hinges on the collaborative efforts of the entire team, including physicians, physicists, planners and therapists.

It was these insights that inspired us to write this editorial, with the aim of raising awareness about the importance of ensuring the highest feasible plan quality and highlighting the role of physicists in achieving this goal.

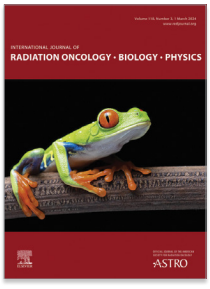
What has surprised you with regard to medical physicists' involvement in high-quality treatment planning?

Our survey revealed several intriguing insights. First, despite treatment planning being a fundamental aspect of therapy physics residency programs, there's a wide spectrum of planning involvement observed in clinical practice. Second, the level of physicists' engagement in treatment plan generation varies significantly based on the prevailing work culture and available resources within each clinic. Third, despite these variations, we

Continued on following page

found that the barriers to adopting plan quality review in the planning process are remarkably consistent across clinics. The most common barriers consistently identified include lack of treatment planning education and resource constraints (both time and personnel).

Given these findings, we believe this editorial highlights the potential benefits for clinics considering the implementation of plan quality review. In fact, we've taken additional steps in 2024 by launching a lecture series titled "Treatment Plan Evaluation" with Rayos Contra Cancer. This series covers both general principles and site-specific plan quality review, aiming to disseminate this crucial knowledge to members of the radiation oncology team, particularly in limited-resource settings worldwide.



Women in the Medical Physics Workforce: An Interview with Jillian Rankin, BS

Ms. Rankin spoke with ASTROnews about the Red Journal paper, "Women in the Medical Physics Workforce: Insights from Membership Trends of the American Association of Physicists in Medicine, 1993 to 2023," which can be found at https://www.redjournal.org/article/S0360-3016(24)00318-3/abstract.

What research question(s) did you explore in this paper?

The "Women in the Medical Physics Workforce" project allowed us to take a deep dive into the world of gender equity in the field. Prior studies had shown that women are underrepresented in medical physics, including in leadership roles, despite significant movement toward parity in the undergraduate and graduate student pipeline. We wanted to better understand why this was the case. Using American Association of Physicists in Medicine (AAPM) membership as a proxy for professional involvement in medical physics, we evaluated whether membership tenure differed between men and women, including when and at what age membership cessation occurred. We further stratified by highest degree to evaluate how differences in training influenced the membership trends that we observed.

Please describe the data you obtained and statistical methods you used.

Historic membership data from 1993-2003, including gender, age, highest degree, membership type, and years of active membership, were obtained from AAPM. To best represent the United States medical physics workforce, only full members practicing in the U.S. were included in the analysis. Stratifying by gender and highest degree type (PhD vs. Master's), a Kaplan-Meier "survival" analysis was used to assess when, by both age and years of active membership, membership cessation occurred. We also specifically evaluated the distribution of age at membership cessation by gender.

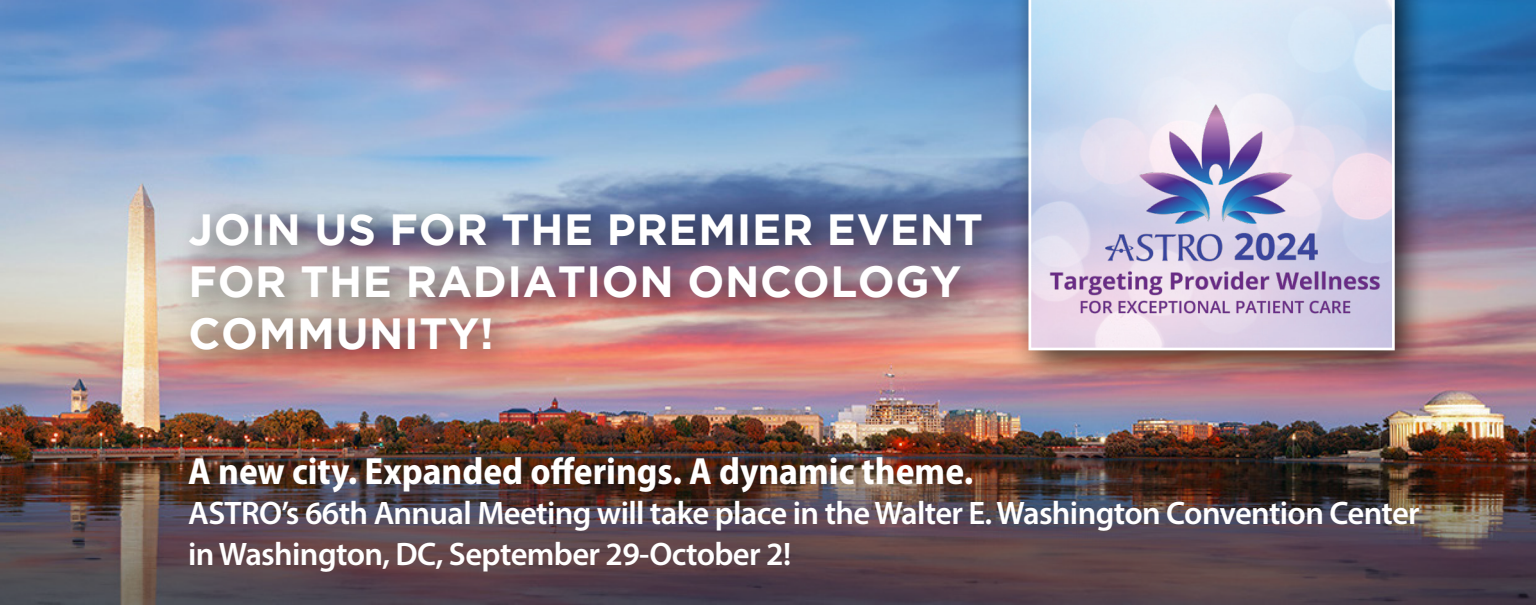
What did you find through your analyses?

Shorter average membership durations were observed amongst women relative to men, and women were found to both start and end their memberships at earlier average ages than men. Additionally, a higher proportion of Master's vs. PhD degree holders were observed amongst women, while the opposite trend was observed amongst men. Regardless of gender or degree, age at membership cessation followed an approximately bimodal distribution. While one peak occurred around retirement age, as might be expected, for both men and women another occurred around age 40. This suggests that, while broader societal factors (e.g., gender roles, child care responsibilities) may play a role in early membership cessation amongst women, additional factors within the field likely contribute to the continued disparity in representation.

What surprised you? Why?

Interestingly, unique membership trajectories were observed by gender-degree subgroup. Notably, despite the earlier average membership cessation amongst women than men, women with PhDs were found to have the greatest membership "survival", meaning that, relative to any other gender-degree subgroup, a greater proportion of the original group of women with PhDs were still members after a given number of years. This suggests that there may exist unique challenges, motivations and experiences for different subsets of women within the field. Further work, especially qualitative analysis, will be necessary to better elucidate these differences. A member exit survey will be particularly important in developing a more complete understanding of the trends observed in this work.

Read author bios for this article at www.astro.org/Summer24News.



WHAT TO EXPECT:

- An engaging program featuring the top science, practice changing research, informative education sessions
- Exciting General Sessions:
  - Presidential Symposium: New Innovations in Genitourinary Cancers
  - Clinical Trials and Plenary Session
  - Keynote Speakers: Bryan Sexton, PhD, Duke Center for Healthcare Safey and Quality and Danielle Ofri, MD, PhD, a primary care internist and author
  - Awards Ceremony: Recognizing leaders in the field
- An Exhibit Hall filled with companies presenting the latest in products and services for radiation oncology
- A variety of dynamic networking events including Speed Mentoring, Early Career and DEI networking lounges, Exhibit Hall Networking Reception, the ASTRO Game Zone and more
- Preconference programing on Saturday designed to meet audience specific interests
  - Practical Radiation Oncology program
  - Radiopharmaceutical Therapy workshop
  - ARRO Annual Seminar
- Special Events
  - International attendee breakfast
  - The Women of ASTRO Luncheon
  - ROI 5K

All this and more, explore astro.org/annualmeeting to learn more.

KEY DATES

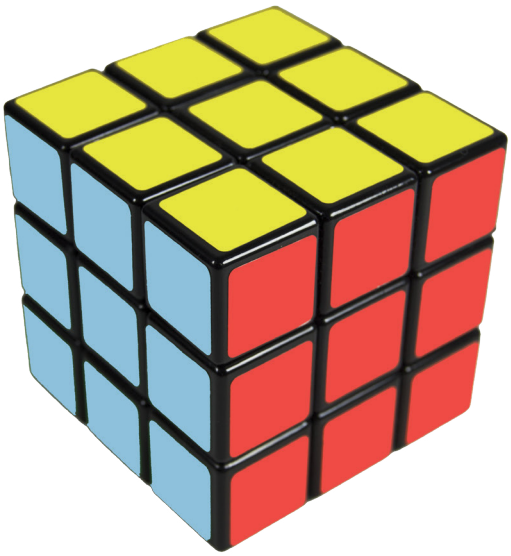
JUNE 26-JULY 12
Late-breaking abstract submissions

AUGUST 15
Advance Registration closes

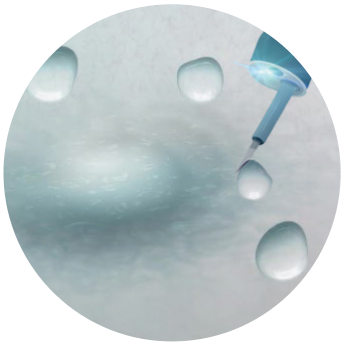
79	10	90	2500+	170+
ORAL SCIENTIFIC SESSIONS	POSTER Q&A SESSIONS	EDUCATION SESSIONS	PRESENTATIONS AND ABSTRACTS	EXHIBITS

FACT:

The world record to solve a Rubik's® Cube is 3.13 seconds.*



Sometimes, what seems out of reach is possible. In the complex world of lung cancer and SBRT treatment, accuracy, efficiency, and patient comfort are achievable. That was the inspiration for bringing our best SBRT solutions together, including the new compatibility of **Body Pro-Lok™ ONEBridge™ for Alta™ Multipurpose Device** and refining how our **ONE Respiratory Belt** and **ZiFix Traverse™ Motion Control System** attach to our most popular platforms. Also, the new **BioXmark® Liquid Fiducial** allows the implantation of multiple markers of varying sizes in the same uninterrupted procedure.



ACHIEVE THE POSSIBLE WITH OUR NEWEST WAYS TO CARE SMARTER.

Learn how to #CareSmarter at CQmedical.com

*Guinness World Records

CQ MEDICAL™
Care Smarter
Formerly CIVCO RT™ and Qfix®