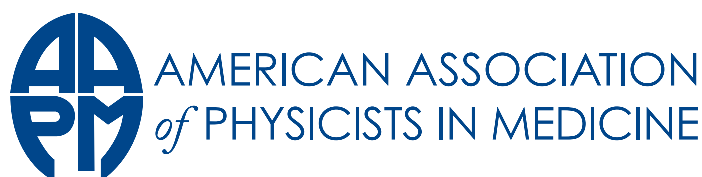


IMPROVING HEALTH
THROUGH MEDICAL PHYSICS

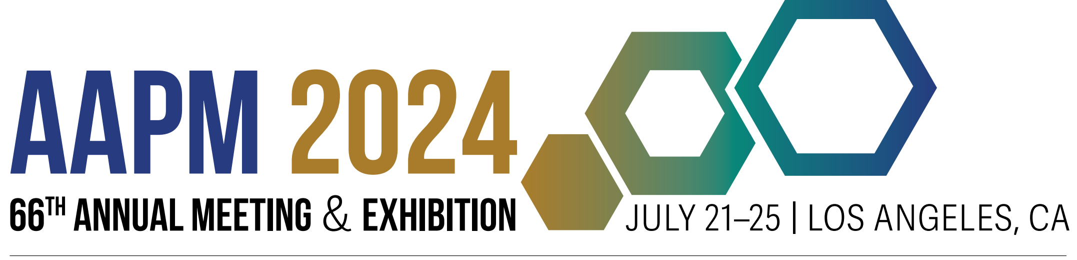
AAPM NEWSLETTER

September/October 2024 | Volume 49, No. 5

IN THIS ISSUE:

- President Elect's Report
- Treasurer's Report
- IHE-RO HDSS Working Group Report
- American Society for Radiation Oncology Report
- Summer School Subcommittee Report
- SDAMPP Education Practices Subcommittee Report

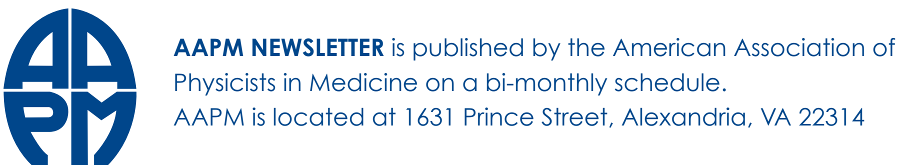
...and more!



EMBRACING CHANGE. IMPACTING PATIENT CARE.

MONDAY, JULY 22, 2024 | 6:30 PM
PLATINUM BALLROOM
JW MARRIOTT LOS ANGELES

See the complete program here:



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To keep all reports uniform, we kindly request that submissions be made through a QuestionPro portal.

Questions? Contact Nancy Vazquez

PUBLISHING SCHEDULE

The AAPM Newsletter is produced bi-monthly.
Next issue: November/December 2024
Submission Deadline: October 4
Posted Online: Week of November 4

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EDITOR'S NOTE

I welcome all readers to send me any suggestions or comments on any of the articles or features to assist me in making the AAPM Newsletter a more effective and engaging publication and to enhance the overall readership experience. Thank you.

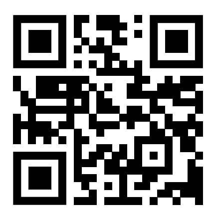
Innovations in QA:

Moving Toward Efficient QA Programs

AAPM Specialty Meetings

OCT 28–29, 2024 | Virtual

Learn about new technologies and tools in QA science from an expert group of physicists and vendors in the field! Speakers will demonstrate how using new automated tools and vendor-provided tools can lead to efficiencies in c-arm linac QA programs, discuss how innovative technology can transform and simplify QA procedures, and focus on how to work with vendors to establish transparent communication and additional information exchange.



Scan or visit https://aapm.me/2024IQA for more information and to register.

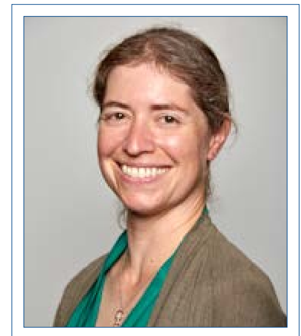
Annual Meeting Attendees Overcome Travel Woes to Participate

NEWSLETTER EDITOR'S REPORT

Welcome to the September/October 2024 edition of the *AAPM Newsletter*! I hope everyone had a great summer and is energized to start the new school year, whether as a teacher, parent, or student. The AAPM Annual Meeting in Los Angeles in July was fantastic, despite a rocky start due to the CrowdStrike bug that caused travel chaos. Thanks to everyone who contributed to making the meeting a success, particularly the AAPM HQ staff and the organizers. While I enjoyed the in-person meeting, I also enjoyed being able to hear recordings from the sessions I missed on the Meeting Program website, and hopefully many people took advantage of that ability. Plans are already in the works for next year's meeting in Washington, DC, which will only be four days long (Sunday through Wednesday) and I look forward to seeing what's in store for that meeting.

In this edition of the *Newsletter,* we have a report from the Summer School Subcommittee on the AAPM Summer School at Dartmouth College in June, which focused on workflow optimization in Radiation Oncology. There's also a report from the Working Group on Student and Trainee Research highlighting their 2024 activities, and a summary from the recent International Council Global Needs Assessment Committee webinar on a day in the life of medical physicists in Africa. You'll find these reports and more in this issue of the Newsletter. This edition doesn't have a featured Special Interest Group; if you know of a group that would like to be featured in a future edition, please reach out to me directly to schedule an issue. AAPM members want to hear about what different groups are doing!

All AAPM members are encouraged to submit content and ideas for the *Newsletter* either directly to the Editor or through the submission link on the *Newsletter* page. If you have an announcement of an honor or award that you would like to share, please submit it to the *Newsletter* for consideration! My goal is to have something of interest to every AAPM member in each edition of the *Newsletter*, and that's only possible with the help of all members. Enjoy this issue, send us your feedback and ideas for future editions, and please share articles you enjoy with your social media network. The *Newsletter* is accessible to anyone. ■

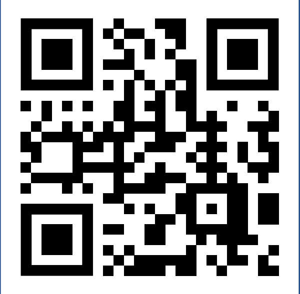


Jennifer Pursley, PhD
Massachusetts General Hospital

INDUSTRY SCIENTISTS or REGULATORY PHYSICISTS:

VISIT

aapm.org/memb for more details.



- As an Industry Scientist or Regulatory Physicist,
  YOU CAN JOIN AAPM.

  Individuals eligible to be an AAPM Full Member possess an earned graduate degree in the Physical or Biological Sciences, Computer Sciences, Mathematical Sciences, or Engineering from a college, university or program accredited by one of the organizations recognized by the Council on Higher Education Accreditation (or its successors), or an equivalent foreign degree. Applicants should also be engaged in clinical care, professional, research, or academic activity related to applications of physics in medicine and biology.

- As an Industry Scientist or Regulatory Physicist,
  YOU CAN VOLUNTEER.

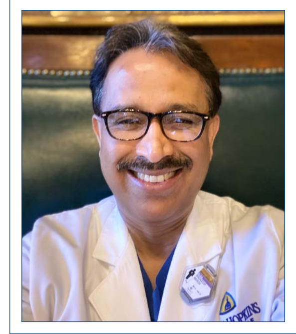
  AAPM Full Members in good standing are eligible for voting appointments on Committees, Subcommittees, Working Groups, and Task Groups. Many AAPM groups could benefit greatly from the unique perspective an industry scientist or regulatory physicist offers. Explore current volunteer opportunities at w3.aapm.org/ads/committee_classifieds/classifieds.php (member login required).

- As an Industry Scientist or Regulatory Physicist,
  YOU HAVE OPTIONS.

  If the Full member class doesn't apply, consider the General, Associate, or Affiliate member classes, tailored to suit your career stage and qualifications.

Navigating the Future: Insights from the 2024 AAPM Annual Meeting and Beyond

PRESIDENT-ELECT'S REPORT



M. Mahesh, MS, PhD
Johns Hopkins University School of Medicine

It is hard to believe it is already September, and pretty soon, the changing colors of the Fall season will be upon us. I take great pleasure in writing this column as your President-Elect after returning from a very successful Annual Meeting in Los Angeles, CA. As per preliminary data, the number of meeting registrants and exhibitors at the Annual Meeting exceeded that of the previous year (2023), and hoping the same trend continues and will be higher at next year's Annual Meeting in Washington, DC. Among many things I would like to share about the Annual Meeting is that the Board approved the strategic plan for the organization, which will be our guiding frame of reference for the next three years.

AAPM Executive Committee at the 2024 AAPM Annual Meeting in LA

In addition to the Annual Meeting, I also want to share with you the success of the specialty meeting on "Artificial Intelligence for Clinical Medical Physicists," which was held on Saturday, July 20, 2024. The interest in this meeting far exceeded expectations, and in fact, the registration had to be closed due to meeting room limitations. As many of you have heard me sharing my thoughts at chapter meetings and council retreats, we, as medical physicists, must be prepared by educating and training ourselves to welcome the influx of AI tools in our clinic. In fact, **David Gammel** and I attended an invitation-only 'Inter-Society Summer Conference' hosted by the American College of Radiology, whose main theme was "Artificial Intelligence and Its Impact on Radiology" this year. The conference included leaders from more than 25 professional organizations in the fields of medical imaging, nuclear medicine, and radiation therapy. Each of the societies is exploring ways to prepare their membership regarding AI. You will be hearing more on how we at AAPM will provide opportunities to prepare our members with regard to artificial intelligence in the clinical arena.

Many of you who attended this year's meeting may have already seen the theme for next year. The theme for the year 2025 is **"Coming Together to Forge Ahead in Medical Physics"**. A few of you may have heard about this, as I

talked about it during my chapter visits. You may wonder why this theme? Being a believer in consensus and also, as Aristotle said, ***"The whole is greater than the sum of its parts"***, it is time for several reasons to dissolve boundaries and to work together. I believe the theme is relevant right now, and by working together, medical physics will benefit in the future in the areas of **patient care, education, research,** and **advocacy**. Already, there are some preliminary works started that fit well under this theme and I will share more in my future columns.

In this issue, I only want to expand here on **"advocacy"**. I strongly believe that "new science becomes a clinical reality with good advocacy." I experienced this first-hand when we implemented the first PET-CT and Cardiac CT (early 2000s) at the Johns Hopkins Hospital, Baltimore, MD. Having a seat on the front line I witnessed how advocacy helped to promote good science in making it a clinical reality. I will be sharing more on this during my presentation at the chapter meetings.

Having worked on advocacy both at the national and state levels with our physician organizations, such as the American College of Radiology, I feel very encouraged to hear how members — especially graduate students, residents, and early career medical physicists — are passionate and interested in advocacy. In fact, while talking with students at the AAPM Annual Meeting last year in Houston, Texas, I came to know that one of our graduate students, **Ms. Barbara Marquez**, even before she knew about medical physics, was an intern at the US Congress, worked with senators, and was exposed to inner workings of the advocacy process. I am so glad that she agreed to share her experience and why she thinks advocacy is very important for medical physics (please check out her article "Advocacy: What I learned from my time on the Hill" that was published in the March-April issue of the *Newsletter*).

Personally, I am a strong believer in advocacy because ***"if we don't advocate for ourselves, who else will?"*** — a question I often ask myself and others when there is hesitation and disillusionment regarding advocacy. It is a long process, where wins are few and far apart, however, when there is a "win", it has significant impact.

After my previous column, I had the chance to visit two more chapter meetings, namely the Florida Chapter meeting in Orlando, Florida, and the Rocky Mountain Chapter meeting in Salt Lake City, Utah. It was refreshing to meet chapter members and even more so to meet students and early career medical physicists and see their interest in working together.

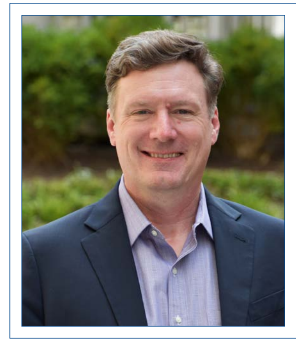
Students attending the AAPM Florida Chapter Meeting

Finally, a lot of changes are coming to next year's Annual Meeting, which will be closer to my home (Washington, DC). First and foremost, the meeting will be shorter (ends on Wednesday, mark your calendar the dates of the Annual Meeting, July 27–30, 2025), and several new things will be rolled out. Among them is the plan to host an "advocacy day" which includes a visit to Capitol Hill (with the hope it will work out) in order to advocate for medical physics. More details will be coming soon. I encourage members to watch for updates in future issues of this newsletter and on social media.

Even though I wanted to keep this article as short as possible, I felt it was my duty as President-Elect to share my experience and thoughts regarding all the exciting things that are happening in our organization. Once again, I am humbled for having this opportunity to serve AAPM as your President-Elect. ■

LA Reflections

EXECUTIVE DIRECTOR'S REPORT



C. David Gammel
Executive Director, AAPM HQ

I'm writing this column while memories of AAPM's 66th Annual Meeting in Los Angeles are still fresh in my mind. This was my first AAPM Annual Meeting, in a year of firsts for me, and it did not disappoint. We had strong attendance by our members and related professionals, a growing exhibit hall, robust agenda of sessions, and a great city in which to enjoy reconnecting with colleagues and meeting new ones.

I had the honor of being invited to speak in AAPM President **Todd Pawlicki**'s President's Symposium. The symposium focused on the future of the medical physics discipline, from new technologies and settings to ideas on entrepreneurship and innovation. My talk reviewed trends in association strategy broadly and then walked through how the AAPM leadership has been developing a new strategic plan to engage with these potential futures while sustaining our enduring value as your professional organization.

Throughout the meeting, I had the pleasure of engaging with many of you and attending a variety of events. The Women's Luncheon and the EDIC celebration were particularly inspiring, showcasing the diversity and dedication within our community. I also had the opportunity to meet with colleagues from related organizations and enjoyed a thrilling baseball game with a couple of thousand physicists, cheering as the Dodgers triumphed over the Giants.

Discussions with vendors in the exhibit hall were equally enlightening, providing insights into the value they see in our organization and their vision for the future. It was encouraging to hear their thoughts and discuss how we can continue to support each other's goals.

We announced exciting plans for our 2025 meeting in Washington, DC, with a new more compact schedule that will make time out of the clinic easier to manage, with new high impact keynote presentations and social events and celebrations.

The Board of Directors met near the end of the conference and conducted important work on your behalf. The Board approved a new strategic plan, which you can read about here, and discussed crucial topics such as meeting and event site selection and an improved budget process and structure.

As I flew home, I felt a mix of exhaustion and exhilaration, fueled by the energy of the meeting and optimism for what lies ahead. Our organization is poised for a bright future, and I am excited to embark on this journey with all of you. ■

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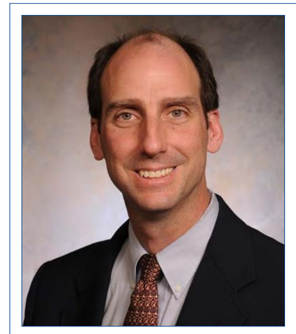
Financial Overview and Strategic Planning: Navigating AAPM's Path to Sustainability

TREASURER'S REPORT



Samuel G. Armato, III, PhD
The University of Chicago

Having recently returned from the 2024 AAPM Annual Meeting in Los Angeles, I am very encouraged. It was the first Annual Meeting for AAPM's new Executive Director, **David Gammel**. The Board approved a new strategic plan that will provide focus and direction for the Association for the next three years. It was great to meet face-to-face with colleagues and discuss issues vital to the future of AAPM and the medical physics profession. From the perspective of both registration and programming, the meeting was very successful—this success resulted from tremendous effort across a team of volunteers and headquarters staff. In my role as Treasurer, it was a pleasure to share with many of you during our annual business meeting the financial results from 2023 and year-to-date 2024, which is the topic of my column this month.

2023 Audited Financial Results

AAPM finished 2023 with a deficit from operations of $981,682 (Figure 1). The 2023 budget (approved by the Board in November of 2022) reflected a deficit of $1,847,941, so 2023 ended with an overall favorable variance of $866k. The most significant single driver of this favorable variance (accounting for approximately $502k) was under-spending by councils and committees; additionally, headquarters overhead expenses were below budget by nearly $178k due to salary and benefits savings realized due to several open staff positions during the year. On the revenue side, meeting revenue exceeded the budget by $430k: $250k from the Annual Meeting and $80k from the Spring Clinical Meeting.

AAPM's balance sheet remained strong at the end of 2023, with total assets exceeding $28.9M (Figure 2)—a $1.1M increase from the prior year. This increase was primarily driven by investments, which were up $2.5M for the year due to strong market performance.

2024 Interim Results

The 2024 budget was approved in November of 2023 with a deficit of $1.3M. Traditionally, council budgets included "wish list" items involving projects that councils hoped might come to fruition. For 2024, FINCOM charged councils to budget for only those items they were confident they could complete. While the lower budget deficit reflects this change, this change will likely result in lower underspending by councils at the end of the year. At the same time, Placement Service revenue, after several years of explosive growth, leveled off in 2023 and is currently pacing 19% behind 2023 through the first five months of 2024. As a result of these trends through May, we are projecting an actual deficit in operations through 2024 of approximately $1.5M.

As of May, AAPM's 2024 balance sheet remains strong, as total assets are up $1.3M (4.4%) over the prior year. The main driver of this growth is investments, which are up $2.5M over the prior year due to strong market performance.

Included for informational purposes are (1) the five-year trend of operating revenues and expenses (Figure 3) and (2) the five-year trend of income (loss) from operations (Figure 4). These charts show the operating income, investment income, unrealized gains (losses), and the Education and Research Fund net activity for the past five years. I wish to highlight that in 2021, AAPM had a net income from operations of $714k; however, as previously communicated, one of the most significant contributors to this surplus was the PPP loan forgiveness ($615k). Figure 4 shows the impact on the operational income of this one-time outlier: over the past five years, the Association has generated a cumulative deficit from operations of $1.4M, but without forgiveness of the PPP loan, AAPM would have generated a cumulative operating deficit of $2.1M over the same period. During the years 2018-2022, AAPM generated a cumulative deficit of $0.97M, while during 2023 alone, AAPM generated a deficit of $0.98M.

One of the strategic priorities in the new strategic plan approved by the Board during the Annual Meeting is to enhance organizational sustainability by having a balanced operating budget by 2027. Currently, the Association is working on the 2025 budget. The process of shifting from a deficit-based budget to a balanced budget started with the 2024 budget process as we implemented several budget changes involving:

- restructuring expenses
- setting target expenses
- scrutinizing fixed expenses
- focusing on achievable activities

As volunteers and staff work on the 2025 budget, the emphasis will be on two main areas: reducing expenses and growing revenue.

Reducing Expenses

To improve financial scrutiny, certain expenditures that have been spread throughout various councils' budgets (for example, dues paid to other organizations) have been consolidated into a single area to aid in evaluating which such expenses provide the most value to the Association and our members.

Growing Revenue

Beginning with the 2025 budget, revenue will be pulled from council budgets and elevated to a central review to allow for a more deliberate approach to growing revenue. One mechanism for growing revenue is the proposed dues increase, which was approved by the Board for a vote by the membership (currently underway). If passed, this time-limited dues increase ($20 in 2025, $15 in 2026, and $10 in 2027) would achieve approximately $140k in additional revenue in the first year. It should be noted that this additional revenue will only provide about 10% of the amount needed to get us to a balanced budget. The key takeaway is that neither FINCOM nor the Board wants to balance the budget on the backs of the members. The steps to achieving a balanced budget will involve strategically reducing expenses and growing a variety of other revenue sources. The changes started in 2024 will

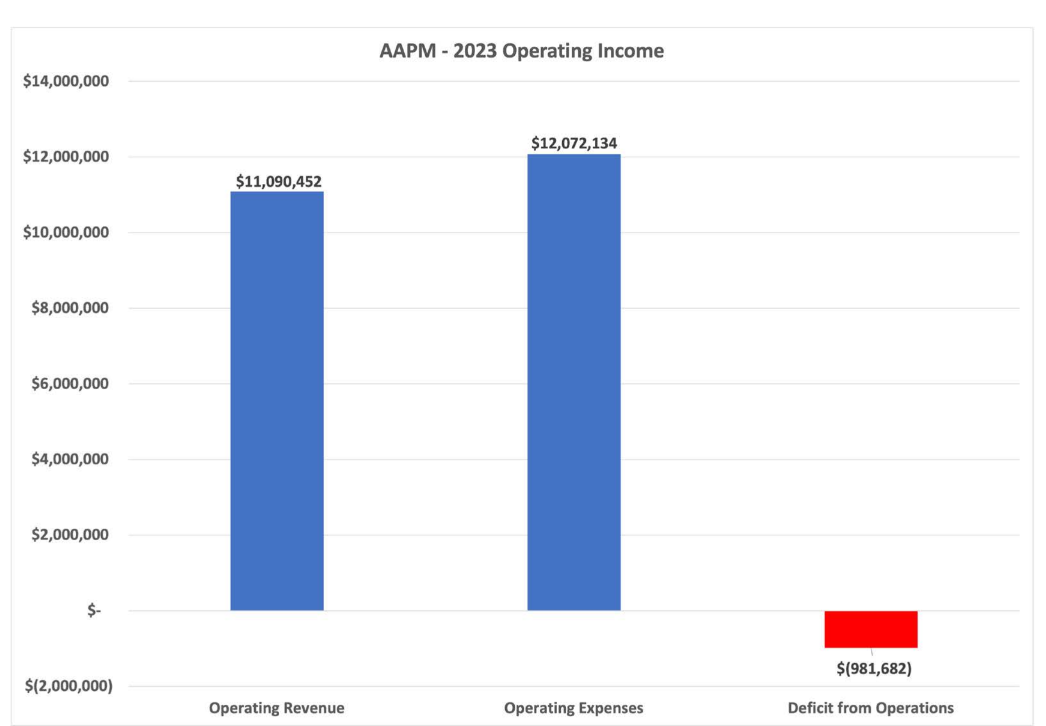


Figure 1: AAPM income and expenses for 2023.

TREASURER'S REPORT, Cont.

continue until a balanced budget is achieved in 2027, and I am confident that we can achieve this goal while maintaining a full commitment to our mission and strategic goals.

I want to thank **Robert A. McKoy, CPA**, AAPM Associate Executive Director, Finance, for his essential subject-matter contributions to this column, and I want to thank the entire AAPM finance team for their skilled stewardship of AAPM finances. ■

AAPM Year-End Balance Sheets for 2023 & 2022

AAPM
Balance Sheet
December 31, 2023 (with Comparative Totals for 2022)

	12/31/23	12/31/22	$ Change	% Change
Assets				
Cash	$ 1,400,808	$ 2,944,088	$ (1,543,280)	-52.4%
Receivables	505,609	501,101	4,508	0.9%
Prepaid Expenses and Other Assets	937,377	767,857	169,520	22.1%
Total Current Assets	2,843,794	4,213,046	(1,369,252)	-32.5%
Investments - Reserves	14,397,882	14,234,472	163,410	1.1%
Investments - E&R Fund	4,653,928	2,284,370	2,369,558	103.7%
Building & Other Fixed Assets	7,011,684	7,064,307	(52,623)	-0.7%
Total Long Term Assets	26,063,494	23,583,149	2,480,345	10.5%
Total Assets	**$ 28,907,288**	**$ 27,796,195**	**$ 1,111,093**	**4.0%**
Liabilities and Net Assets				
Liabilities				
Current Liabilities	$ 3,386,866	$ 3,661,855	(274,989)	-7.5%
Bonds Payable	2,918,335	3,090,335	(172,000)	-5.6%
Total Liabilities	6,305,201	6,752,190	(446,989)	-6.6%
Net Assets				
Without donor restrictions	17,326,684	18,164,349	(837,665)	-4.6%
Board Designated Assets - E&R Fund	2,000,000	-	2,000,000	0.0%
With donor restrictions	3,275,403	2,879,656	395,747	13.7%
	22,602,087	21,044,005	1,558,082	7.4%
Total Liabilities and Net Assets	**$ 28,907,288**	**$ 27,796,195**	**$ 1,111,093**	**4.0%**

Figure 2: AAPM balance sheet

5 Year Trend Statement of Activities

	2019	2020	2021	2022	2023
Operating Revenue	9,797,797	7,686,168	9,388,323	11,179,262	11,090,452
Operating Expenses	10,593,730	8,115,688	8,673,771	11,133,112	12,072,134
Net Income (Loss) from Operations	(795,933)	(429,520)	714,552	46,150	(981,682)
Investment Income	301,314	245,200	259,396	257,780	303,697
Unrealized Gains (Losses)	2,258,255	1,866,573	1,386,115	(3,106,659)	1,859,713
Education and Research Fund, Net	404,060	376,815	262,484	(437,593)	376,356
Net Income (Loss)	2,167,696	2,059,068	2,622,547	(3,240,322)	1,558,084

Figure 3 Five-year trend operating revenues and expenses

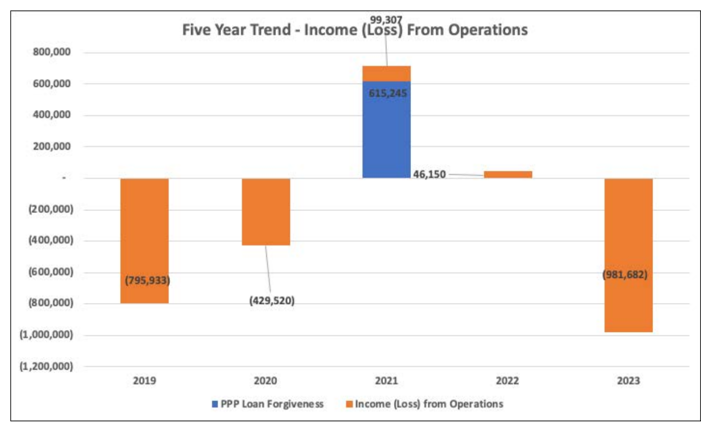


Figure 4 Five-year trend income (loss) from operations

Our Condolences

K. Tareque S. Islam, PhD

Our deepest sympathies go out to the family. We will all feel the loss in the Medical Physics community.

If you have information on the passing of members, please inform HQ ASAP so that these members can be remembered appropriately. We respectfully request the notification via email to: 2024.aapm@aapm.org
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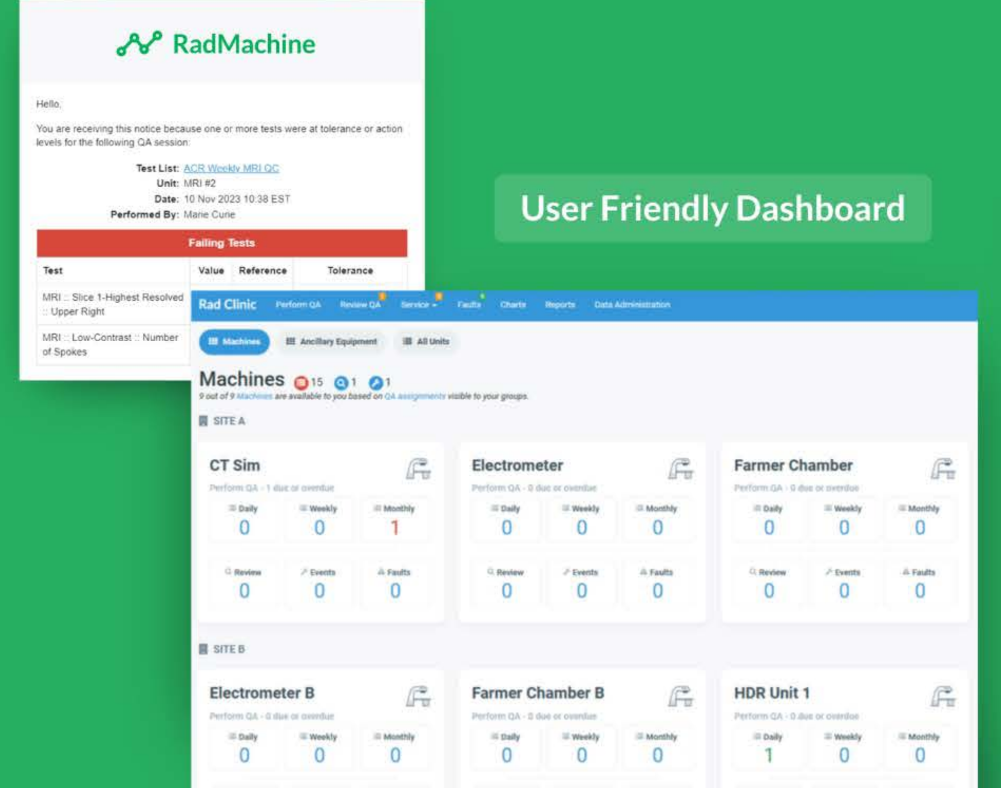
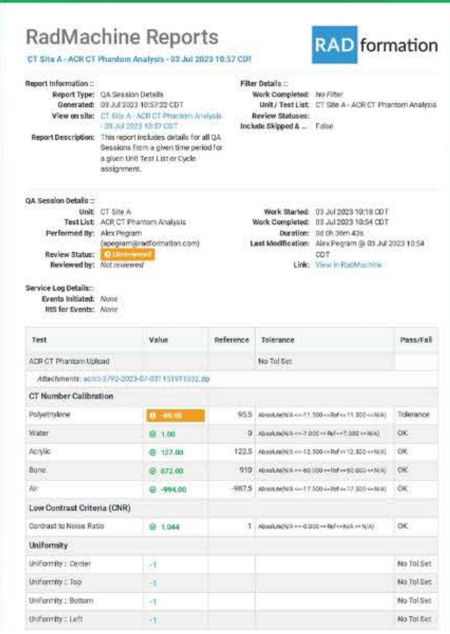


Complete Reports



CMS Issues Medicare 2025 Proposed Rules

HEALTH POLICY AND ECONOMIC ISSUES REPORT

Medicare Physician Fee Schedule

On July 10, 2024, the Centers for Medicare and Medicaid Services (CMS) released the 2025 Medicare Physician Fee Schedule (MPFS) proposed rule. The finalized changes will appear in the November 1st final rule and are effective January 1, 2025. The MPFS specifies payment rates to physicians and other providers, including freestanding cancer centers. It does not apply to hospital-based facilities. Payments to hospital outpatient departments are described in a separate section below.

CMS estimates a 0.0 percent overall impact to radiation oncology services for 2025 based on policies in this proposed rule. The projected 2025 conversion factor is $32.36, a 2.8 percent decrease of $0.93 to the current 2024 conversion factor of $33.29.

Calendar year (CY) 2025 marks the final year of the four-year phase-in of the Clinical Labor Price update. While this update increases labor prices for Medical Physicists, Dosimetrists, and Radiation Therapists, budget neutrality requirements lead to reduced payments for equipment-intensive codes, resulting in an overall reduction in radiation oncology reimbursement.

Labor Code	Labor Description	2021 Rate Per Minute	2025 Final Rate Per Minute	Total Percentage Change
L152A	Medical Physicist	1.52	2.14	41%
L063A	Medical Dosimetrist	0.63	0.91	44%
L107A	Medical Dosimetrist/Medical Physicist	1.08	1.52	41%
L050C	Radiation Therapist	0.50	0.89	78%

In September 2023, the CPT Editorial Panel created a new code family to describe magnetic resonance (MR) examination safety procedures and capture the physician work involving patients with implanted medical devices that require access to MR diagnostic procedures (see table below). CPT 7XX00 and 7XX01 are practice expense only codes. CMS accepted the RUC-recommended works RVUs for CPT codes 7XX02-7XX05 and made refinements to the practice expense inputs for all codes.

CPT Code	Description	2025 Proposed RVUs	2025 Proposed Payment
7XX00	MR safety implant and/or foreign body assessment by trained clinical staff, including identification and verification of implant components from appropriate sources, analyzing current MR conditional status of individual components and systems, and consulting published professional guidance with written report; initial 15 minutes	0.31	$10.03

Wendy Smith Fuss, MPH
Health Policy Solutions

For additional information including Medicare rule summaries, 2024 final payments and impacts visit the AAPM website.

7XX01	MR safety implant and/or foreign body assessment by trained clinical staff, including identification and verification of implant components from appropriate sources, analyzing current MR conditional status of individual components and systems, and consulting published professional guidance with written report; each additional 30 minutes (List separately in addition to code for primary procedure)	1.43	$46.27
7XX02	MR safety determination by a physician or other qualified health care professional responsible for the safety of the MR procedure, including review of implant MR conditions for indicated MR exam, analysis of risk versus clinical benefit of performing MR exam, and determination of MR equipment, accessory equipment, and expertise required to perform examination with written report	2.17	$70.21
-26		0.84	$27.18
-TC		1.33	$43.03
7XX03	MR safety medical physics examination customization, planning and performance monitoring by medical physicist or MR safety expert, with review and analysis by physician or qualified health care professional to prioritize and select views and imaging sequences, to tailor MR acquisition specific to restrictive requirements or artifacts associated with MR conditional implants or to mitigate risk of non-conditional implants or foreign bodies with written report	6.81	$220.35
-26		1.07	$34.62
-TC		5.74	$185.72
7XX04	MR safety implant electronics preparation under supervision of physician or other qualified health care professional, including MR-specific programming of pulse generator and/or transmitter to verify device integrity, protection of device internal circuitry from MR electromagnetic fields, and protection of patient from risks of unintended stimulation or heating while in the MR room with written report	3.44	$111.31
-26		1.05	$33.97
-TC		2.39	$77.33
7XX05	MR safety implant positioning and/or immobilization under supervision of physician or qualified health care professional, including application of physical protections to secure implanted medical device from MR-induced translational or vibrational forces, magnetically induced functional changes, and/or prevention of radiofrequency burns from inadvertent tissue contact while in the MR room with written report	4.43	$143.34
-26		0.83	$26.86
-TC		3.60	$116.48

Beginning for services furnished in 2025, CMS is proposing to require the use of the appropriate transfer of care modifiers (modifier -54, -55, or -56) for all 90-day global surgical packages in any case when a practitioner (or another in the same group practice) expects to furnish only a portion of a global package. CMS reported that in their internal review of the percentages assigned for the pre-operative, surgical care, and post-operative portions of the global package, they found that there were no assigned percentages for CPT codes 77750 (Infusion or instillation of radioelement solution), 77761 (Intracavitary radiation source application simple), 77762 (Intracavitary radiation source application intermediate), and 77763 (Intracavitary radiation source application complex). CMS is seeking comment on whether they should consider if these codes are appropriately categorized as 90-day global package codes. If these are appropriately considered to be 90-day global package codes, CMS is seeking comment on what the assigned percentages should be for the pre-operative, surgical care, and post-operative portions of the service.

Hospital Outpatient Payment System

CMS has released the 2025 Medicare Hospital Outpatient Prospective Payment System (HOPPS) proposed rule, which provides facility payments to hospital outpatient departments. The finalized changes will appear in the November 1, 2024 final rule and are effective January 1, 2025. This rule does not impact payments to physicians or freestanding cancer centers.

CMS is increasing overall hospital outpatient department payment rates by 2.6 percent in 2025 (see 2025 proposed payments below).

Summary of Proposed 2025 Radiation Oncology HOPPS Payments

APC	Description	CPT Codes	2024 Payment	2025 Proposed Payment	Percentage Change 2024-2025
5611	Level 1 Therapeutic Radiation Treatment Preparation	77280, 77299, 77300, 77331, 77332, 77333, 77336, 77370, 77399	$129.28	$133.40	3.2%
5612	Level 2 Therapeutic Radiation Treatment Preparation	76145, 77285, 77290, 77306, 77307, 77316, 77317, 77318, 77321, 77334, 77338	$352.05	$369.19	4.9%
5613	Level 3 Therapeutic Radiation Treatment Preparation	32553, 49411, 55876, 77295, 77301, C9728	$1,320.21	$1,380.16	4.5%
5621	Level 1 Radiation Therapy	77401, 77402, 77789, 77799	$114.25	$109.75	-3.9%
5622	Level 2 Radiation Therapy	77407,77412, 77600, 77750, 77767, 77768, 0394T	$256.06	$265.36	3.6%
5623	Level 3 Radiation Therapy	77385, 77386, 77423, 77470, 77520, 77610, 77615, 77620, 77761, 77762	$560.87	$585.44	4.4%
5624	Level 4 Radiation Therapy	77605, 77763, 77770, 77771, 77772, 77778, 0395T	$683.13	$697.71	2.1%
5625	Level 5 Radiation Therapy	77522, 77523, 77525	$1,351.62	$1,331.24	-1.5%
5626	Level 6 Radiation Therapy	77373	$1,700.12	$1,776.38	3.9%
5627*	Level 7 Radiation Therapy	77371, 77372, 77424, 77425	$7,419.64	$7,702.82	3.8%
5723	Level 3 Diagnostic Tests	76145	$510.68	$527.44	3.3%

*Comprehensive APC

Effective January 1, 2025, CMS proposes to assign the new MR Safety codes to the following APCs.

CPT Code	APC Assignment	2025 Proposed Payment
7XX00	5731 Level 1 Minor Procedures	$24.55
7XX01	Packaged	$0
7XX02	5521 Level 1 Imaging without Contrast	$87.56
7XX03	5734 Level 4 Minor Procedures	$127.99
7XX04	5731 Level 1 Minor Procedures	$24.55
7XX05	5733 Level 3 Minor Procedures	$59.07

For 2025, CMS maintains the seven Imaging APCs, which consist of four levels of Imaging without Contrast APCs and three levels of Imaging with Contrast APCs.

APC	APC Title	2024 Payment	2025 Proposed Payment	Percent Change 2024-2025
5521	Level 1 Imaging Without Contrast	$86.58	$87.56	1.1%
5522	Level 2 Imaging Without Contrast	$104.75	$106.30	1.5%
5523	Level 3 Imaging Without Contrast	$233.47	$240.31	2.9%
5524	Level 4 Imaging Without Contrast	$525.63	$544.85	3.7%
5571	Level 1 Imaging With Contrast	$175.06	$175.75	0.4%
5572	Level 2 Imaging With Contrast	$366.42	$373.77	2.0%
5573	Level 3 Imaging With Contrast	$762.88	$779.02	2.1%

For 2025, CMS maintains five Nuclear Medicine APCs.

APC	APC Title	2024 Payment	2025 Proposed Payment	Percent Change 2024-2025
5591	Level 1 Nuclear Medicine	$392.97	$399.79	1.7%
5592	Level 2 Nuclear Medicine	$514.99	$533.30	3.6%
5593	Level 3 Nuclear Medicine	$1,352.93	$1,305.81	-3.5%
5594	Level 4 Nuclear Medicine	$1,490.60	$1,458.10	-2.2%
5661	Therapeutic Nuclear Medicine	$237.04	$222.07	-6.3%

CMS notes that commenters historically have been concerned that packaging payment for precision diagnostic radiopharmaceuticals in the outpatient setting creates barriers to beneficiary access for safety net hospitals serving a high proportion of Medicare beneficiaries and hospitals serving underserved communities. After significant consideration and ongoing engagement from interested parties, CMS is proposing a change to the current policy that packages diagnostic radiopharmaceuticals regardless of their cost. Effective January 1, 2025, CMS proposes to pay separately for any diagnostic radiopharmaceutical with per day cost greater than $630, which is approximately two times the volume weighted average cost amount currently associated with diagnostic radiopharmaceuticals. Any diagnostic radiopharmaceutical with a per day cost below the threshold would continue to be packaged under the current packaging policy.

For the Hospital OQR Program measure set, CMS previously adopted the Excessive Radiation Dose or Inadequate Image Quality for Diagnostic CT in Adults eCQM for voluntary reporting that begins with the CY 2025 reporting period, and mandatory reporting that begins with the CY 2027 reporting period/CY 2029 payment determination.

AAPM will submit comments to CMS prior to the September 9th deadline. ■

ACR Accreditation & More: Info for Medical Physicists

UPDATES FROM ACR HQ

ACR Accreditation Program Fail Rates

I am occasionally asked what the fail rates are for ACR Accreditation Programs. I included fail rates for the larger programs in one of my presentations at AAPM. Here are the fail rates for each program, for all first attempts over the past three years:

Accreditation Program	Fail Rate
Breast Ultrasound	28.3%
CT	16.0%
Mammography	5.5%
MRI	17.7%
NM	8.0%
PET	3.4%
SBB	6.7%
Ultrasound	26.7%

Frequent deficiencies for each program, both clinical and phantom, are available online here.

ACR Launches AI Recognition Program

ACR's Data Science Institute (DSI) recently launched its ACR Recognized Center for Healthcare-AI (ARCH-AI) program. ARCH-AI is the first program of its kind and addresses the community's need for a framework for successful, secure, and ethical implementation and use of AI in radiological healthcare.

The criteria for a site to be considered an ARCH-AI site are:

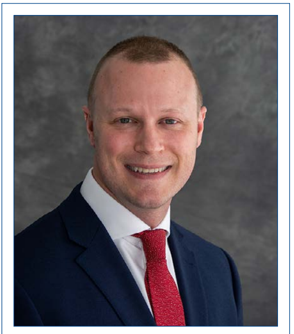
- Establishing an interdisciplinary AI governance group.
- Maintaining an inventory of AI algorithms with detailed documentation.
- Ensuring adherence to security and compliance measures.
- Engaging in diligent review and selection of AI algorithms.
- Documenting use cases and training procedures.
- Monitoring algorithm performance, including safety and effectiveness.
- Participating in the Assess-AI national AI registry for performance benchmarking.

Ten health systems that piloted the ARCH-AI program are already Recognized, and many more are in the pipeline for achieving Recognition. You can read more about ARCH-AI here, you can see ARCH-AI's itemized criteria here, and you can email questions or program inquiries to dsi@acr.org.

Learn more about what ACR's DSI is doing by visiting this page, and see the most complete and searchable directory of FDA-cleared imaging AI products in the US at AI Central.

Recent Accreditation Article Updates

- Clinical Testing: Breast Ultrasound (Revised 5-15-2024)
  Updated to include transducer center frequency requirements in the All Sonogram Images section.



Dustin A. Gress, MS
Senior Advisor for Medical Physics
ACR Quality and Safety, Reston, VA

In each issue of this newsletter, I present information of particular importance or relevance for medical physicists. You may also check out the ACR's accreditation support page for more accreditation information and QC forms. **Thank You** to all the other staff that keep ACR programs running and assist with creating the content in this column.

Did you know that Image Wisely continues to provide free educational content on its website? After expanding its scope in 2023 to include contrast media and MR safety, the complimentary RSNA digital posters published each month have included content spanning all kinds of topics — safe imaging of pregnant patients, theranostics, a lot of MR safety, photon counting CT in neuroradiology, N-13 ammonia myocardial perfusion PET, and much more. You can find all of these RSNA digital posters here. Earlier this year Image Wisely also released a new Safety Case focused on MR, offering 1.0 hour of free CE.

- Clinical Image Testing: PET (Revised 4-30-2024)
  Updated the language in the Brain module for clarity and spelled out AC and NAC in the Oncology module.
- Phantom Testing: Nuclear Medicine (Revised 5-1-2024)
  Clarified language in Module 1 (planar only) with regard to spatial resolution and using the rod phantom.
- Quality Control: Nuclear Medicine (Revised 5-1-2024)
  Updated the dose calibrator linearity test requirement to be annual (was quarterly).
- Quality Control: PET (Revised 5-1-2024)
  Updated the dose calibrator linearity test requirement to be annual (was quarterly).
- Testing Overview: Nuclear Medicine and PET (5-1-2024)
  The guidelines for written procedures document and clinical and phantom atlases have been updated.
- Medium MRI phantom grace period ended May 8, 2024.
  Sites must submit phantom images acquired using the coil that is routinely used for clinical brain imaging and must use the largest phantom that fits inside the head coil. Failure to utilize the appropriate phantom may result in failure of the submission. ■

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High-Definition Structure Sets for Stereotactic Radiotherapy

IHE-RO HDSS WORKING GROUP REPORT

Since 2004, Integrating the Healthcare Enterprise – Radiation Oncology (IHE-RO), an effort currently sponsored by AAPM, has been working to improve the interoperability of systems involved in radiation oncology. IHE-RO is composed of members of the radiation oncology clinical team, administrators, and industry representatives who work together to ensure a safe and efficient radiation oncology clinic. The overall aim of IHE-RO is to identify how existing industry standards, such as DICOM, HL7 and FHIR, should be effectively utilized to solve clinical issues involving connectivity and interoperability among multiple vendor systems. IHE-RO does not directly create these data communication standards, but rather assists vendors in finding a common way of using them based on specific clinical use cases.

Stereotactic Radiosurgery (SRS) involves localization and treatment of small targets with high spatial precision. For SRS treatments, small targets are contoured on CT and/or MR images and the contour information is transferred to a treatment planning system (TPS). The DICOM RT Structure Set was developed to represent these contours. Currently, however, most TPSs require that structure contours be aligned to the planes of the treatment planning CT image series. As a result, when these contours are transferred between image series, there may be significant information loss, especially for small objects.

The loss of spatial information in defining small regions of interest can also contribute to differences in the DVHs calculated for these structures in different TPS. Differences in DVHs can be illustrated by comparing the total volumes of small structures calculated by different TPSs. As seen in Figure 1. the relative volumes calculated by these systems can vary dramatically for small structures.

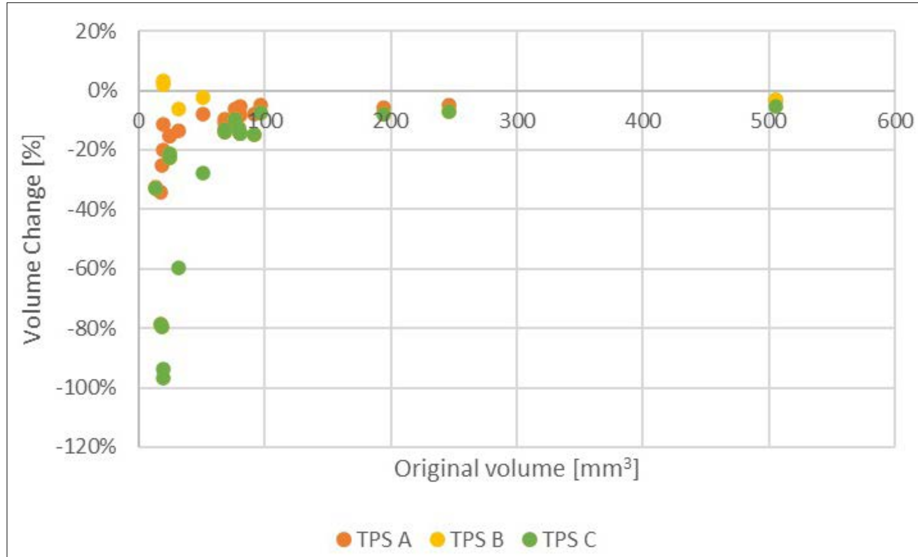

Figure 1: Object volume in mm3 vs change in volume for three different TPS. Reference image slice distance 1mm.

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Washington University in St. Louis

Christof Schadt, Dipl.-Ing. (FH)
Brainlab AG

In this case, the original structures, segmented from e.g. a high-resolution MR or an anatomical atlas had to be downsampled to the image planes of the reference image set. If the reference CT has a slice spacing of 1mm, the image information only can be stored in planes 1mm apart. For small objects, such as the optical nerves or small PTVs, this limitation could lead to significantly different interpretations of dose coverage or avoidance for these objects and therefore, to significant deviations of clinically relevant parameters. Even within a single application, exporting and re-importing contours in the planes of the reference CT can result in significant changes for certain objects.

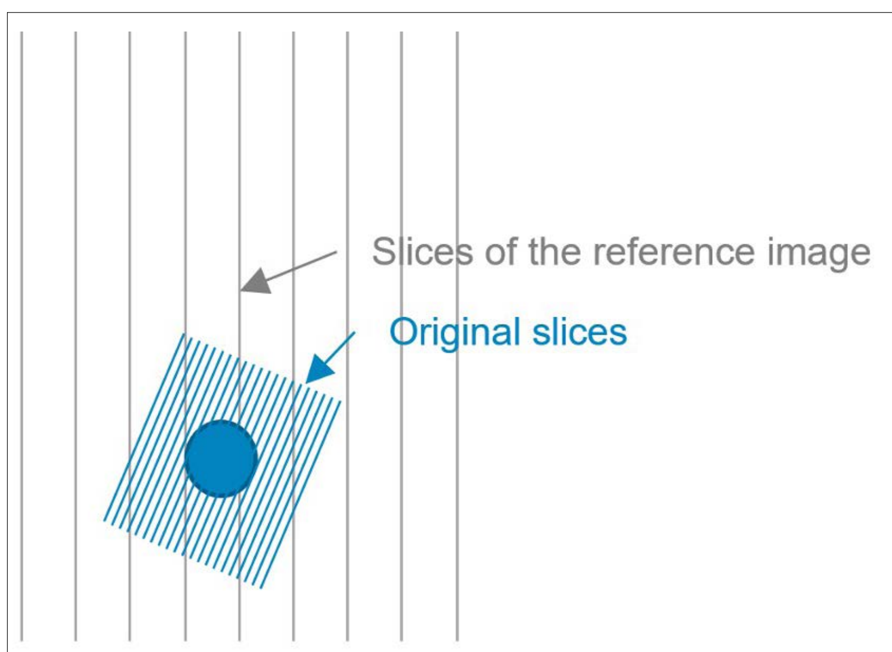


Figure 2: Example of a small object whose shape and volume are not adequately sampled by the reference image set.

A recent DICOM Correction Proposal (CP 2006 "Source Pixel Plane Characteristics for Contours") allows each structure to be represented independent of the image planes of the reference image sets. A "Source Pixel Planes Characteristics Sequence" (3006,004A) attribute is introduced permitting contours to be specified with a finer spacing and potentially, independent orientation. In this way, the original high-resolution structures can be transferred to another application without information loss.

The IHE-RO High-Definition Structure Set (HDSS) Working Group, consisting of industry and clinical representatives, is currently working to extend the IHE-RO technical framework to standardize the clinical use of this new feature. The HDSS Profile has been released for Public Comment and is in preparation for trial implementation and informal testing among the TPS vendors who are beginning to implement this new feature. Ultimately, it is expected that interoperable exchange of HDSS RT Structure Sets will be tested at an IHE-RO Connectathon.

The HDSS Integration Profile will help to increase the quality of the created treatment plans and improve consistency between different systems by increasing the resolution of exchanged contour information. ■

Assessing a Diplomate's Compliance with the ABR's Continuing Certification Program Requirements

ABR UPDATE

The mission of the ABR is to "certify that our diplomates demonstrate the requisite knowledge, skill, and understanding of their disciplines to the benefit of patients". The ABR assesses whether medical physics diplomates who gained initial certification in 2002 or later maintain their knowledge and skills throughout their careers with the administration of a program initially known as Maintenance of Certification (MOC). In 2012 the Continuing Certification (CC) program began and diplomates in the MOC program were issued new certificates. Diplomates who were certified prior to 2002 hold lifetime certificates that do not need to be maintained, although some lifetime certificate holders have voluntarily entered the CC program. In this article, we will explain the process and timeline followed by the ABR to evaluate if a diplomate has met their CC requirements.

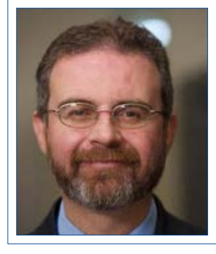
Participation guidelines for the CC program are as follows:

Continuing Certification (CC)	Element	Compliance Requirement
Part 1: Professionalism and Professional Standing	Licensure	Must hold a medical physicist license in FL, HI, NY, or TX. In other states must have one available attester as defined by the ABR.
Part 2: Lifelong Learning	CME	Must have completed at least 75 Category 1 CME credits within the last 3 calendar years.
Part 3: Assessment of Knowledge, Judgment, and Skill	OLA or CC Exam	Must meet or exceed the standard in a current cumulative score in Online Longitudinal Assessment (OLA) in year 5 or pass a CC Exam in year 4 or year 5 of the Part 3 cycle.
Part 4: Improvement in Practice	Practice Quality Improvement (PQI) Project or PQI Activity	Must have completed at least 1 PQI Project or 1 PQI Activity within the last 3 calendar years.

A diplomate who participates in the CC program must maintain compliance with all 4 elements shown in the table above to maintain their certificate. Compliance is assessed by the ABR according to the timelines discussed below.

Diplomates are no longer required to attest to meeting the requirements for Parts 1, 2, and 4 annually. Instead, the ABR conducts random audits during which documentation is requested from the diplomate to provide evidence that the requirements have been met. It is a good idea to periodically review one's professional activities and associated documentation to ensure meeting compliance requirements for these parts.

Several years ago, the ABR implemented Online Longitudinal Assessment (OLA) for Part 3 of the CC program. This meets the recent American Board of Medical Specialties (ABMS) mandate that Member Boards such as the ABR assess a diplomate's knowledge, judgement, and skills at least every five years. As noted in the table above, the ABR offers diplomates two options to fulfill the Part 3 requirement. The first is comparing their OLA cumulative score



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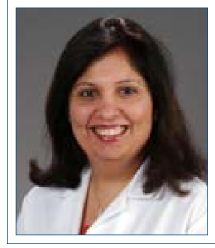

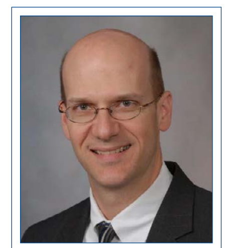

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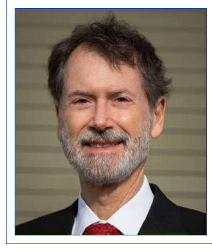

Geoffrey Ibbott, PhD
Executive Director

Maintaining one's ABR certificate requires meeting all four parts of Continuing Certification. A diplomate's OLA performance must meet or exceed their passing level in year 5 of their cycle.

to their passing standard during the last year of a five-year cycle. The end of a diplomate's five-year cycle is indicated on their OLA dashboard as the Part 3 Deadline, and a diplomate can pass the Part 3 component by being above their passing standard at any time during that final year. The second option is for a diplomate to take and pass a CC Exam (CCE) during the fourth or fifth year of their Part 3 cycle. This is a computer-based exam that is tailored to focus on clinical applications of medical physics as would be understood by diplomates who are established in practice. A unique exam is offered two times per year for each medical physics discipline (Diagnostic Medical Physics, Nuclear Medical Physics, and Therapy Medical Physics).

To efficiently administer the Part 3 assessment for the thousands of diplomates across all disciplines who are maintaining their certificates, the ABR Board of Governors decided to split the initial cohort into groups of diplomates with assigned deadlines between December 31, 2024, and December 31, 2028. This way, a smaller and more consistent number of diplomates will be assessed annually. It is therefore possible for diplomates who are employed in the same facility to have different Part 3 deadlines spread across the 2024-2028 timeframe.

If a diplomate who gained initial certification in 2002 or later does not meet the Part 3 requirement at the end of their five-year cycle or does not meet the requirements for Parts 1, 2, and 4 at the conclusion of an audit, their certification status within the public reporting database will be changed to 'inactive'. For a diplomate who was originally issued a Lifetime Certificate and voluntarily joined the CC program but does not meet the CC requirements when assessed, their public reporting status will be changed to indicate that they are 'Not Participating' in the CC Program, but their certification status will nonetheless show that they are certified, essentially reverting to the reporting status associated with their Lifetime Certificate. Further details can be found in the Continuing Certification FAQs on the ABR webpage. ■

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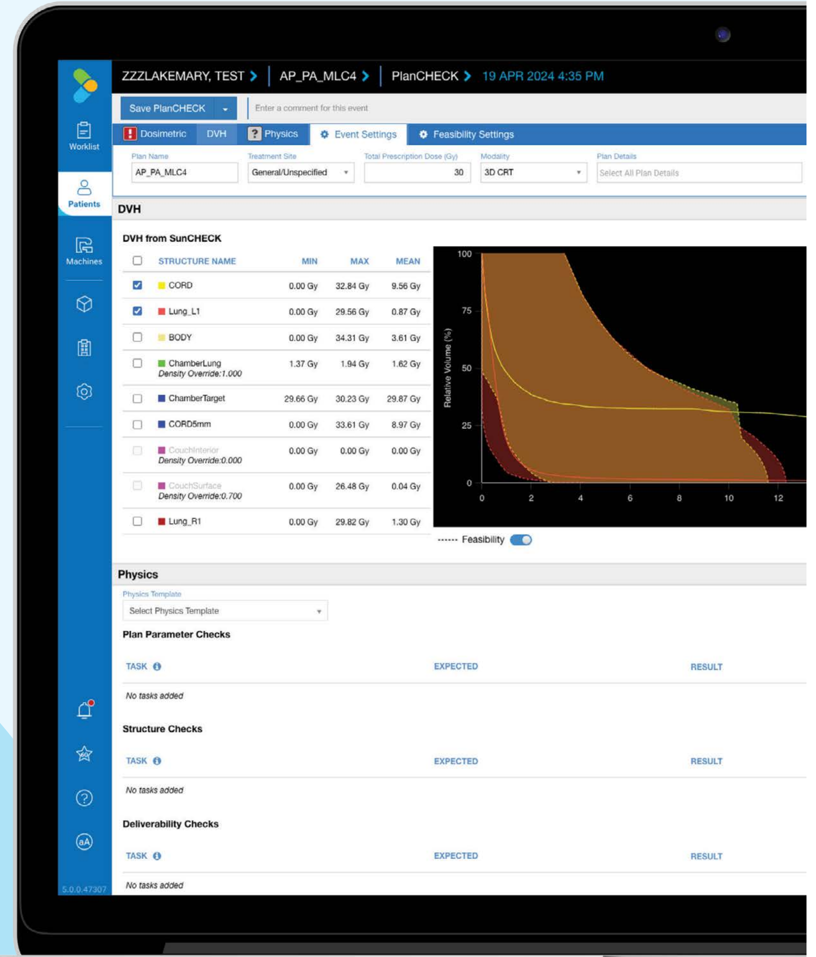

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The Many Ways to Engage with ASTRO

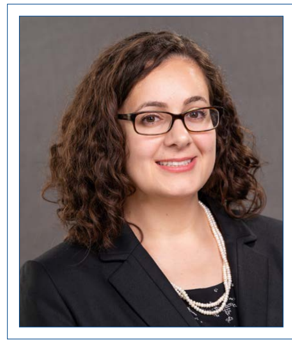
AMERICAN SOCIETY FOR RADIATION ONCOLOGY REPORT

The American Society for Radiation Oncology (ASTRO) is a professional association for all members of the radiation oncology team, including medical physicists. After radiation oncologists and residents, almost 1,400 physicists are among the organization's 10,000 members. The Society engages its membership in various ways to fulfill its vision of improving the lives of people with cancer and other conditions using radiation therapy, so get involved today!

APEx: ASTRO's Accreditation Program for Excellence® (APEx) provides the ideal set of tools for continuous quality improvement to achieve safe and high-quality care for patients — a goal perfectly aligned with the heart of medical physics. APEx ties together ASTRO's *Safety is No Accident* publication with a team-oriented approach, presenting a unique opportunity for physicists to take a leadership role in quality improvement processes and procedures. When a practice seeks APEx accreditation, they must designate one individual to serve as the primary contact and principal for the application. Medical physicists have historically been the primary drivers of the APEx accreditation process and have only recently tied with administrators, each representing a third of all program initiators. After a self-assessment and feedback, the practice schedules an on-site facility visit. Almost 60% of all APEx surveyors are medical physicists. This opportunity offers physicists a chance to meet others in the field, observe other facilities and learn from APEx to improve their own practice, and they receive compensation for their travel and time. ASTRO's Practice Accreditation Subcommittee reviews de-identified survey assessments and determines each practice and satellite's accreditation status. Physicists are critical to decision making, making up half of the committee's membership, including a physicist subcommittee co-chair. At every step in the process, physicists play a key role in APEx accreditation.

RO-ILS: A nice complement to the APEx program is the national Radiation Oncology Incident Learning System (RO-ILS®). The American Association of Physicists in Medicine (AAPM) partnered with ASTRO in 2014 to develop RO-ILS, highlighting how physicists are at the core of this program. For over a decade, the sponsors and supporters have enabled over 850 U.S.-based facilities to participate in the program for free, yielding over 60 written reports to promote shared learning and quality improvement.

With a primary responsibility of quality assurance, it is no surprise that medical physicists are often at the helm of quality and safety initiatives such as RO-ILS. Physicists are most likely to serve in a leadership role as the official "liaison" and as internal "reviewers" responsible for analyzing their local safety events. After radiation therapists, physicists are the next leading group of discoverers of errors, identifying almost a quarter of all events in the RO-ILS database. Physicists are also key partners in incident learning on the national level, as members and leaders on the Radiation Oncology Healthcare Advisory



Ksenija Kujundzic
ASTRO Senior Quality Improvement Manager

- Deadline to apply for a position on the RO-ILS RO-HAC is Tuesday, September 10.
- Join us for ASTRO's Annual Meeting from September 29 to October 2 in Washington, DC. There's still time to register at www.astro.org/annualmeeting.
- Nominate a colleague for RO-ILS Safety Star by Monday, October 7.

Council (RO-HAC) with the responsibility of reviewing events from around the country and developing education for the community and users. This interdisciplinary group of safety experts serves as independent contractors of the patient safety organization in order to access the sensitive data. They are held to high standards of confidentiality to maintain the privilege protections for users.

This coveted opportunity is work-intensive but extremely rewarding. The deadline to apply for the current physicist RO-HAC opening is **Tuesday, September 10**, so don't delay! Additionally, RO-ILS is accepting nominations for physics Safety Stars through **October 7**. Nominate a colleague with exceptional work in patient safety for public recognition alongside an exclusive group of people, including the 2023 physicist Safety Stars **Ryan Manger, PhD, Jason Pukala, PhD,** and **Cassandra Stambaugh, PhD**.

Membership and Awards: Most medical physicists have either associate or active ASTRO membership. ASTRO members receive many benefits such as reduced rates on meetings, discounted or free subscriptions to the *Red Journal* and *Practical Radiation Oncology*, and are eligible for awards, voting and committee service. Four distinguished physicists received the ASTRO Fellow designation, FASTRO, this year for their exceptional contributions to the Society and joined an elite group of radiation oncology professionals:

- **Dimitris Mihailidis, PhD**, University of Pennsylvania
- **Jean Moran, PhD**, Memorial Sloan Kettering Cancer Center
- **Ying Xiao, PhD**, University of Pennsylvania
- **Kamil Yenice, PhD**, The University of Chicago

Committees and Public Comment: Regardless of membership type, all ASTRO members can serve on ASTRO committees. Within the Clinical Affairs and Quality Council, medical physicists serve on every committee. For example, the Multidisciplinary QA Subcommittee comprises 40% physicists and manages various quality and safety projects. Many work products coming from this council are posted for public comment. For example, this year ASTRO sought input on draft Adaptive Safety White Paper, Radiopharmaceutical Safety White Paper, and the ASTRO/VA DVH Constraint Compendium. Physicists also play a key role on the Science Council committees which oversee research funding opportunities such as the ASTRO-AAPM Physics Residents/Postdoctoral Fellows Seed Grant and develop Research-Oriented Career Knowledge and Support education for researchers. The newest volunteer groups are focusing on radiopharmaceuticals, artificial intelligence, and nonmalignant disease. Regardless of your interest, ASTRO has an opportunity for you. Each spring, ASTRO issues a call for volunteers when members can indicate their interest in serving on up to two committees; after review and approval, volunteers are notified in August. Keep an eye out in your weekly ASTROgram email (another member benefit!) for the latest news and volunteer/public comment opportunity.

Education and Meetings: Physicists also serve in a variety of capacities on the ASTRO Education Council, developing and curating the best educational content applicable to a diverse audience. ASTRO's Annual Meeting is a must-attend event to learn the latest research, connect with friends old and new, and explore the latest technology in the expansive Exhibit Hall. The 2024 Annual Meeting will be held in Washington, DC from **September 29 to October 2**. Again this year, physicist attendees can pack their schedules with diverse sessions from the dedicated Radiation and Cancer Physics track, the largest at the conference, and additional quality and safety sessions. Virtual attendees can actively engage from the comfort of their home in real-time educational and scientific sessions streamed live and will have access to on-demand content for an additional nine months. An application will be submitted to the Commission on Accreditation of Medical Physics Education Programs for medical physics continuing education credits that can be claimed by in-person or virtual attendees. It's not too late to join us so register today.

Mentorship: For those attending the ASTRO Annual Meeting, speed mentoring is an exciting and informative way to build networks and gain knowledge from ASTRO leaders. All are invited to participate, and no ticket is required. In a series of one-on-one, 10-minute sessions attendees pose specific questions to mentors on various topics such as establishing/expanding radiopharmaceutical services and navigating bias. For a more ongoing mentorship relationship, physicists can apply to be a mentor or mentee through the ASTRO Mentor Match Program. ASTRO's Annual Meeting will also contain

an Early Career and Mentoring Lounge as a networking space for early career members to relax, connect with peers and meet for one-on-one mentoring.

In addition to the aforementioned opportunities, there are still more ways to get involved with ASTRO! ■

The organization's mission is to advance the specialty of radiation oncology through promotion of equitable, high-quality care for people with cancer and other conditions, cultivating and educating a diverse workforce, fostering research and innovation, and leading policy development and advocacy. ASTRO needs knowledgeable and dedicated physicists to fulfill its mission. Make sure your voice is heard and engage with ASTRO!

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54th AAPM Summer School: Boosting Efficiency in Radiation Oncology Workflows

SUMMER SCHOOL SUBCOMMITTEE REPORT

The 54th AAPM Summer School at Dartmouth College was a resounding success, drawing 155 participants from across the globe. Attendees included radiation oncologists, industry experts, medical dosimetrists and medical physicists, all gathered to explore "Workflow Optimization in Radiation Oncology: From Theory to Clinical Implementation." With 95 first-time attendees from the US, Canada, South America, Asia, and Australia, the event was a rich blend of ideas and experiences.

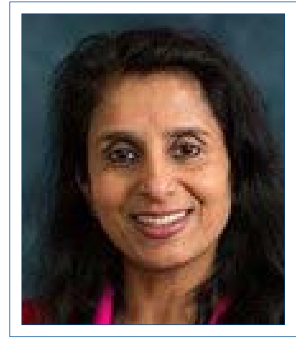
The Summer School addressed the pressing issue of enhancing radiation oncology workflows using cutting-edge technologies like automated contouring, scripting, and AI-based treatment planning. Inspired by past industrial revolutions, the program referenced Eliyahu Goldratt's "The Goal" and "The Phoenix Project," highlighting how other industries have successfully integrated new technologies.

Over 4.5 days, participants delved into operations theory, project management, and resource management through a mix of presentations, hands-on workshops, panel discussions, and interactive sessions, creating a dynamic learning environment.

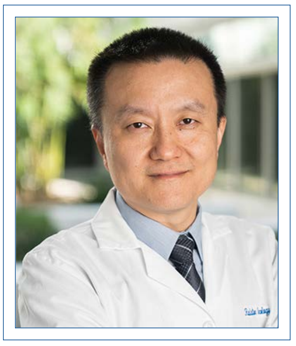
Drs. Shumsky and Spero from the Tuck Business School Faculty began the school with an engaging introduction to operations management, using a smiley face production chain to simulate an assembly line and explain concepts like throughput time and bottlenecks. **Dr. Minsun Kim** and **Navneeth Hariharan** provided specific insights into radiation oncology. Program Director **Reshma Munbodh** and **Dr. Anyi Li**, discussed measuring and modeling radiation treatment planning workflows.

Dr. Carlos Cardenas led a workshop on QA for AI-based contouring, emphasizing the potential errors and biases of AI. **Dr. Rex Carden**'s session on custom clinical software included a compelling examination of the Therac-25 incident, challenging attendees with a virtual exercise to recreate the "Malfunction 54" error. **Dr. Alex Price** discussed optimizing adaptive radiotherapy workflows for pancreas SBRT using a systems engineering approach. **Dr. Lawrence Court** addressed enhanced treatment planning strategies, and **Dr. Leigh Conroy** discussed QA for enhanced radiation oncology workflows.

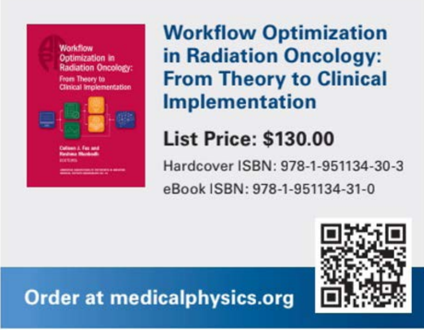
Dr. Leah Katz focused on staff wellness and workday optimization at both personal and departmental levels. Dr. Drew Hope encouraged participants to find joy beyond numbers, introducing the concept of Ikigai for a balanced life. **Dr. Elizabeth Covington** highlighted the benefits of standardization and led a group project on policy creation, underscoring the importance of consensus-building.



Vrinda Narayana, PhD
University of Michigan



Minsong Cao, PhD
UCLA School of Medicine



Dr. Jennifer Willyard's workshop on continuous improvement (DMAIC) and project management was well-received, using a friendship bracelet project to teach waste reduction techniques. The workshop focused on eliminating Defects, Overproduction, Waiting, Non-Utilized Talent, Transportation, Inventory, Motion, and Excess Processing (DOWNTIME).

Participants engaged in role-playing exercises to enhance patient-physicist communication, facilitated by **Drs. Todd Atwood** and **Derek Brown**. Panel discussions covered resource allocation, the future of radiation oncology, and treatment planning workflows, sharing success stories and challenges from various institutions. The program also addressed modern challenges in radiation oncology, including QA for scripting, cybersecurity, and creating robust workflows. **Bruce Curran** discussed setting up redundancies to recover from cyber-attacks.

Abstract ideas were brought to life in structured panel discussions, covering topics like resource allocation opportunities, success stories and struggles, deep work concepts, and data use to support resource allocation. A panel on changing roles speculated on the evolution of radiation oncology over the next decade and how to prepare for these changes through education and improved proficiency with AI and large language models. They also discussed automating mundane tasks to allow human input to focus on unique solutions.

Fourteen attendees were selected to pitch their workflow innovations during the sessions. Evening show-and-tell events created a relaxed atmosphere for further discussion of scientific principles and innovations over beer and wine.

Program Director **Colleen Fox** concluded the summer school by encouraging participants to implement one idea at their clinics based on the skills and knowledge gained. The 54th AAPM Summer School equipped attendees with the tools and insights needed to enhance radiation oncology workflows, paving the way for more efficient and effective clinical practices.

The summer school faculty published a monograph that serves as an excellent reference for developers in the healthcare automation space, as well as radiation oncologists, dosimetrists, therapists, trainees, and managers of radiation oncology. The monograph can be ordered at medicalphysics.org.

Special thanks to the AAPM Headquarters team, **Linda Minor** and **Payton Brown** who made the weeklong on-campus Dartmouth experience most memorable. And as Britt Buchni summarized the school, "Felt like summer camp for adults with a bunch of great minds". ■

2024 Summer School Program Directors at the icebreaker event

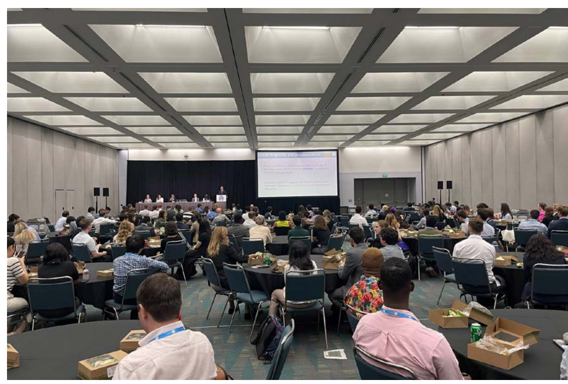
The winning team that minimized waste at the friendship bracelet workshop

2024 Summer School Faculty

Promoting the Research Aspect of Medical Physics: Highlights of WGSTR Activities in 2024

WORKING GROUP ON STUDENT AND TRAINEE RESEARCH (WGSTR) REPORT

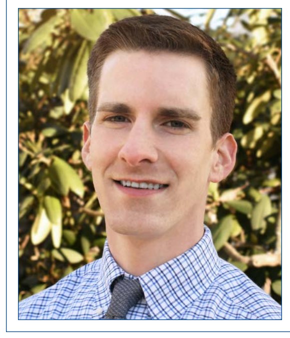
The 2024 Working Group on Student and Trainee Research (WGSTR) consists of twenty members including four graduate students, ten medical physics residents, and six faculty physicists. The WGSTR aims to enhance and expand research among medical physics students, residents, and postdoctoral fellows by organizing research-related events and collaborating with other AAPM committees to diversify research training. Over the past several months, we have been working diligently on multiple initiatives, ranging from the Expanding Horizons Travel Grant (EXHG) program to our student and trainee led activities at the AAPM annual meeting in Los Angeles. In this contribution, we are excited to share recent accomplishments and key updates with the greater AAPM community!



Annual Student and Trainee Luncheon hosted by the WGSTR at the AAPM Annual Meeting 2024 in Los Angeles, CA.

This year, WGSTR hosted the Student and Trainee Luncheon on Sunday July 21 at the Los Angeles Convention Center. The theme was "Empowering Innovators: Equipping Future Leaders of Medical Physics Research". The main motivation is that graduate students, postdoctoral fellows, and residents in medical physics have to navigate a complex environment to achieve success in research and development. This involves staying knowledgeable about emerging trends and topics, developing effective partnerships and collaborations, and honing critical skills like scientific communication and grant applications. At the session, attendees enjoyed lunch, networked with peers and colleagues, and learned from experts who shared their valuable insights and experiences on a range of important subjects (e.g., Medical Physics 3.0, Diversity and Inclusion, Global Health, and Early Career Funding).

During the luncheon, **Ehsan Samei, PhD** provided an overview of the Medical Physics 3.0 initiative, a strategic aim of AAPM that includes expanding medical physics research and clinical practice beyond radiation medicine into new areas such as neurology, pathology, and surgery. **Ghada Aldosary, PhD** gave a presentation that addressed how diversity, equity, inclusion, and accessibility fuel innovation and healthcare equity in medical physics research. **Stephen Avery, PhD** shared his perspectives on scientific innovation in the international setting and ongoing efforts to increase the global health impact of medical



Peter Jermain, PhD
MedStar Georgetown University Hospital

Ahmad Sakaamini, PhD
University of Pennsylvania

Important Expanding Horizons Travel Grant 2025 Round 1 Dates:

Open: August 1, 2024
Deadline: September 15, 2024
Award Decisions: November 1, 2024
Apply at:
https://aapm.secure-platform.com/gaf/page/ExpandHorizons

physics research. Finally, **Magdalena Bazalova-Carter, PhD** provided valuable information and firsthand experience about research funding to bridge the gap between graduate student or trainee to medical physics faculty. Overall, the luncheon was a great success, with over 200 attendees and active discussions continuing after the event.

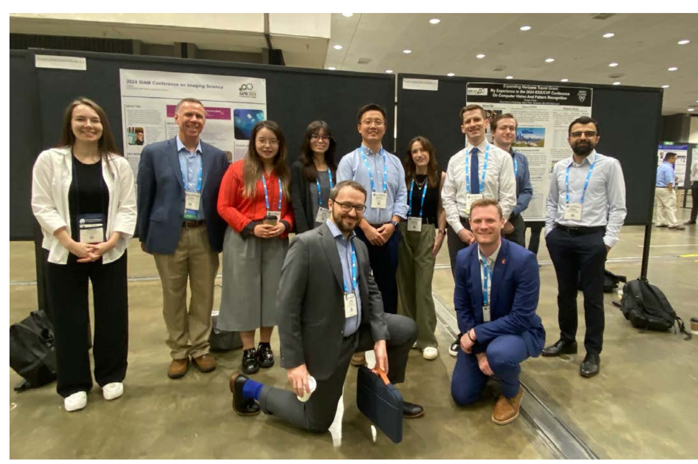
Another important WGSTR activity is the EXHG program, which aims to provide an opportunity for students and trainees to attend a scientific meeting not specifically related to medical physics, where they can investigate new topics that could progress medical physics research into new directions. It is a unique funding mechanism because there is no requirement to submit an abstract or give a presentation at the proposed conference; therefore, award recipients can focus on learning new knowledge and skills that are not extensively covered at traditional medical physics meetings. Approximately eight grants are awarded each year, distributed over two cycles (Spring and Fall).

Most recently, the EXHG was awarded to four additional medical physics students or trainees in order to facilitate conference travel during the second half of 2024. **Zi Yang** of Stanford University attended the 20th International Conference on the Use of Computers in Radiation Therapy (ICCR), July 8 –11, 2024 in Lyon, France. **Jun Hong** of MD Anderson Cancer Center will attend the Cardiovascular and Interventional Radiological Society of Europe (CIRSE) Annual Congress 2024, September 14–18 in Lisbon, Portugal, while **Jingtong Zhao** of Duke University will go to the Society for Industrial and Applied Mathematics (SIAM) conference on the Mathematics of Data Science (MDS24), October 21–25, 2024 in Atlanta, GA. Lastly, **Wesley Cunningham**, also of Duke University, will attend the Biomedical Engineering Society (BMES) 2024 Annual Meeting held October 23–26, 2024 in Baltimore, MD.

At the AAPM annual meeting, recent awardees participated in the interactive Expanding Horizons Travel Grant Poster Session held on Tuesday July 23, 2024, where they highlighted hot topics and emerging research areas from the conferences they attended. EXHG recipients who presented included **Ngara Bird, Shaojie Chang, Morgan Daly, Robert Dawson**, and **Zi Yang**. Multiple WGSTR members (*Peter Jermain, Ahmad Sakaamini, Ryan Price,* and **Eric Wallat**), **John Roeske** (Research Committee Chair), and **Payton Brown** (AAPM staff) were also on hand to promote the program and answer questions from passersby.

Recently, following AAPM Research Committee approval, funding dates for the EXHG were adjusted so that Round 1 (Spring) and Round 2 (Fall) cycles include eligible conferences that occur between January 1 and June 30 and July 1 and December 31, respectively. The modified funding dates provide a more consistent experience for applicants in terms of the submission deadline and notification of award. The 2025 Round 1 cycle will accept applications from August 1–September 15, 2024, and winners will be notified by November 1t, 2024. For additional information or queries regarding conference eligibility, please email exhg@aapm.org. Applications can be submitted here.

At WGSTR, we strive to provide outstanding resources and programs for a diverse group of students and trainees in order to foster academic excellence, encourage innovation, and support their professional development. We are always happy to answer questions and provide feedback on how to get involved! You can stay up to date on all group activities by following us on Twitter/X. In addition, please reach out anytime to **Peter Jermain** (WGSTR Chair) at peter.r.jermain@gunet.georgetown.edu or **Ahmad Sakaamini** (WGSTR Vice Chair) at ahmad.sakaamini@pennmedicine.upenn.edu. You can also contact the complete WGSTR roster via 2024.WGSTR@aapm.org. ■



Expanding Horizons Travel Grant Poster Session hosted by the WGSTR at the AAPM Annual Meeting 2024 in Los Angeles, CA.

Highlights of the SDAMPP Coffee Break Discussion on "Balancing Resident Autonomy and Safe Clinical Practices"

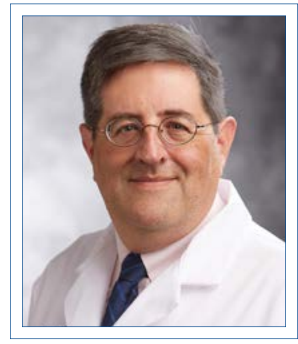
SDAMPP EDUCATION PRACTICES COMMITTEE REPORT

The Society of Directors of Academic Medical Physics Programs (SDAMPP) organized a coffee break on April 16, 2024, to discuss the balance between medical physics residents' autonomy and safe clinical practice. This Coffee Break was moderated by **Abby Besemer, PhD** and **Courtney Buckey, PhD** who facilitated discussion through the use of question prompts. The participants included residency program leaders responsible for creating optimal training experiences for their residents. The event was conducted via Zoom, with about 20 SDAMPP members participating. Several dominant themes emerged during the discussion, as described below.

Resident supervision is part of the broader issue of qualification that also encompasses board-certified medical physicists, junior medical physicists, uncertified medical physicists, and medical physics assistants. It is addressed in professional standards, accreditation standards, and state and federal regulations. General, Personal, and Direct supervision are defined in an AAPM Policy [1]. Appropriate levels of supervision are detailed in MPPG 10 [2], which includes an appendix itemizing a 'scope of practice' task list. This list covers administrative, clinical services, education, informatics, equipment performance evaluation, quality, and safety tasks. It designates several tasks that must be performed by a QMP but does not address the need for some tasks to be performed by supervised residents as part of their learning progression. Resident guidance is given in the 2013 report on essentials and guidelines for clinical medical physics residency training programs [4], which asserts that "second-year residents should be working toward doing more independent duties, which should be approved by the program steering committee and institution or department physician leadership while complying with state regulations."

The first prompt for discussion was, **"What tasks do you feel necessitate faculty presence and decision-making (e.g., residents cannot perform fully independently)?"** There was consensus that residents are not permitted to provide the authorizing signature on reports requiring QMP signatures, such as mammography testing, shielding design reports and surveys, equipment acceptance, commissioning, annual reports, HDR source exchange confirmation, special physics consults, and primary device output calibration reports (e.g., TG-51). Participants also suggested several non-signature-based activities that residents cannot independently perform: authorizing a device for clinical use either initially or after repair, and making "treat vs. no treat" decisions on the machine, such as in response to IGRT image review or patient setup issues. Opinions varied regarding the level of autonomy of residents performing weekly patient chart checks in radiation therapy.

The second prompt was, **"What tasks can residents perform fully independently in your clinic?"** Participant responses primarily focused



Steven Sutlief, PhD
Banner MD Anderson Cancer Center

Written on behalf of the SDAMPP Education Practices Committee:

Leah Schubert, PhD (Chair)**, Ashley Cetnar, PhD, MS,** (Vice Chair)**, John Antolak, PhD, Manuel Arreola, PhD, Abby Besemer, PhD, Steven Biegalski, Courtney Buckey, PhD, Jay Burmeister, PhD, Richard Castillo, PhD, Shannon O'Reilly, PhD, Anna Rodrigues, PhD, Michael Speidel, PhD, Steven Sutlief, PhD, Lydia Wilson, PhD, Amy Shu-Jung Yu, PhD, Da Zhang, PhD**

on therapeutic medical physics tasks. A caveat was made that even tasks for which a resident can act with full autonomy should first be validated with a competency assessment. Most tasks suggested by participants concerned QA of medical equipment or patient plans. Suggested QA tasks that a competent resident can perform independently (under general or direct supervision) include periodic imaging equipment QA (e.g., CT-simulator for radiation therapy), linac QA, periodic HDR QA (while source exchanges generally warrant personal supervision), and patient-specific QA on the linac, although the QMP must be notified about any anomalous results and follow up appropriately. Treatment planning for external beam therapy, including total body irradiation, was also mentioned. Other activities discussed were low dose rate seed calibrations, covering breath hold simulations and 4DCT procedures, in vivo dosimeter calibration and reading (not calibration of the system for initial clinical deployment) for dose verification, and shipping and receiving detectors for ADCL calibration.

There was a diversity of opinions about handling resident autonomy at satellite facilities. One option is having residents go to a satellite for a month but with a dedicated mentor there; the resident would not be permitted to cover the satellite alone. Sometimes satellites have technologies not available at the base institution, such as CyberKnife, Tomotherapy, and surface-guided radiation therapy. In such cases, residents may be required to travel to the satellite to participate in commissioning or special events involving this equipment. Although not discussed, CAMPEP program accreditation applications include a description of all service locations, so residents' official training should be at those locations included in the program's CAMPEP accreditation.

The third prompt was, **"For those tasks, how do you evaluate resident competency and manage the progression of less supervision?"** This prompted many responses and is part of the broader issue of competency assessment and credentialing in medical physics [3]. Specialized software [4] has been developed to manage this aspect of the resident experience, and at least one participant uses software to track the number of each type of procedure performed (either as an observer, helper, or independent worker) to be credentialed. Another method discussed is an "observe three, assist three, do three (with supervision)" policy. Several programs use practicum exams to assess competency and credential residents to perform tasks independently, such as a set of "skills exams" for palliative, 3D, and VMAT treatment planning. Alternatively, one program standardizes the progression to greater autonomy through a list of first-year and second-year supervision levels for the most common tasks, as shown in the accompanying table. If a resident fails to demonstrate the expected competencies, progression of supervised autonomy will not be granted.

The fourth prompt was, **"Do you feel like your program allows residents sufficient autonomy?"** The concern for achieving responsibilities commensurate with those of a clinical medical physicist is explicitly identified in the CAMPEP "Standards for Accreditation of Residency Educational Programs in Medical Physics, Revised May 2023," [5] which states that the medical physics resident shall have "progressively increasing responsibilities under the supervision of qualified medical physicists. Residents' responsibilities shall, under appropriate supervision, rise to the level of actual clinical activities." The discussion revealed considerable variability in resident autonomy between programs. There was consensus that most programs would like residents to be able to achieve a greater level of autonomy before the end of residency.

Challenges in achieving greater autonomy were then discussed. Factors that may limit resident independence can include regulatory constraints, changing practices, and resident or faculty motivation. The breadth of material to be mastered during residency may impede the depth of experience and understanding the resident can achieve due to practical time constraints. A dominant workplace culture could be a barrier to resident autonomy, which may require an intervention by department leadership to adjust the expectations of faculty and of the residency program. Other challenges discussed included undefined or misunderstood expectations of supervision between faculty and residents and addressing issues of over-confidence or under-confidence on the part of the resident. For programs that struggle with facilitating resident autonomy, one participant suggested reaching out to other successful programs to learn what has worked for them.

The discussion concluded with the sixth prompt, **"Do you have any other insights or practical solutions for achieving a safe balance between independence and autonomy?"** Most programs agreed that having a well-defined list of tasks with their corresponding supervision levels supports a resident's safe transition to greater autonomy. Table 1 or the more extensive task list in AAPM MPPG 10 can be used as a starting point. Another recommendation was that it's important to also have a system to assess resident competency as they take on new tasks. Thus, establishing a well-defined credentialing system and clearly communicating supervision expectations among residents, faculty, and clinical staff were identified as being crucial to ensuring a safe pathway to resident autonomy and independence. ■

Task	First Year Resident	Second Year Resident
Plan checks (TG-275)	Personal; Supervisor signs off	General; Supervisor signs off
Weekly Chart checks (TG-40)	General; OK to sign off	General; OK to sign off
Monthly linac output calibration	Personal; Supervisor signs off	General; Supervisor signs off
Monthly linac QA	General; Supervisor signs off	General; Supervisor signs off
Patient specific IMRT QA	General	General
Electron skin collimator	Personal	Direct
3D Conf and VMAT Tx Planning	Direct	General
SRS/SBRT treatment planning	General; Supervisor signs off	General; Supervisor signs off
Case Coverage: SRS/SBRT/HD Txs	Personal	Personal
Sim Coverage for High Dose Daily W-L/MPC prior to SRS	Personal General; Supervisor signs off	Personal General; Supervisor signs off
TBI planning	Personal; Supervisor signs off	General; Supervisor signs off
TBI delivery	Personal	Personal
HDR morning QA	General; Supervisor signs off	General; Supervisor signs off
HDR Tx (anesthesia cases)	Personal	Personal (Resident has limited interaction)
HDR Tx (non-anesthesia cases)	Personal	Personal (Resident has some control)
Y-90 planning	Personal	Personal

Table 1: *This table is an example of time-based expectations for the progression of resident autonomy, shared with permission by one program. The details in this table do not represent recommendations nor endorsements by SDAMPP, but rather could be used as an example that programs should adapt according to their program, institution, and state requirements, as well as the individual progress of their residents. Here general, direct, and personal supervision are defined according to [3].*

References:

1. *AAPM Policy 125-A: Statement on the Description of Involvement of Medical Physicists in Clinical Procedures. 2013.*
2. *AAPM Report No. 249 - Essentials and Guidelines for Clinical Medical Physics Residency Training Programs (2013).*
3. *Standards for Accreditation of Residency Educational Progr-ams in Medical Physics. Revised February 2023. CAMPEP.*
4. *A Report from the AAPM Subcommittee on Guidelines for Competency Evaluation for Clinical Medical Physicists in Radiation Oncology. Daniel C. Pavord, Steven Birnbaum, et al.* J Appl Clin Med Phys. *2016 Jul; 17(4): 3–14. Published online 2016 Jul 8. doi: 10.1120/jacmp.v17i4.5804. PMCID: PMC5690041. PMID: 27455473.*
5. *Management of an Affiliated Physics Residency Program Using a Commercial Software Tool. Albert S. Zacarias and Michael D. Mills.* J Appl Clin Med Phys. *2010 Summer; 11(3): 265–275. Published online 2010 Jun 1. doi: 10.1120/jacmp.v11i3.2996. PMCID: PMC5720446. PMID: 20717075.*

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AMERICAN ASSOCIATION OF PHYSICISTS IN MEDICINE

GNAC Webinar: A Day in the Life of Medical Physicists in Africa

INTERNATIONAL COUNCIL GLOBAL NEEDS ASSESSMENT COMMITTEE REPORT

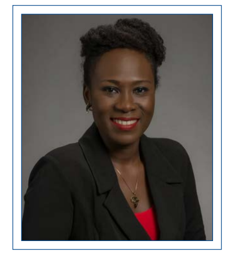
Written on behalf of the International Council.

Despite differences in their daily routines, the presentations by Ms. Quaye, Mr. Onyango, and Dr. Adeneye revealed several recurring themes: limited availability of equipment, high patient workload, the need to strengthen local professional organizations, the need for continuous training and training on new techniques, and the importance of international collaborations. These are critical areas for the AAPM International Council to focus on to help strengthen the physics workforce and improve practices through international partnerships

The Global Needs Assessment Committee (GNAC) within the AAPM International Council is dedicated to assessing needs of medical physicists working in Low-and-Middle Income Countries (LMICs) in order to provide valuable information to AAPM members interested in global health outreach or research activities. Truly, no one is more knowledgeable of such needs than the medical physicists working in LMICs. Therefore, the GNAC has decided to highlight day-to-day activities of medical physicists in LMICs through a series of webinars focusing on the six World Health Organization (WHO) global regions: African Region, Region of the Americas, South-East Asian Region, European Region, Eastern Mediterranean Region, and Western Pacific Region. We believe that the information provided during these webinars will inform the organization's approach to supporting initiatives to address the unique challenges and opportunities in LMICs. Additionally, these webinars aim to inform us about the current healthcare infrastructure and gaps in resource allocation in specific regions of the world.

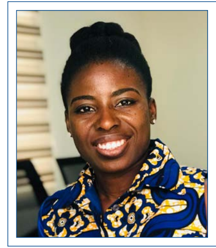
The first webinar in this series occurred on January 25, 2024, and featured medical physicists practicing in Africa. Access to radiation therapy in many African countries is limited, with 23 countries having no radiation therapy facilities at all.[1] For those countries with radiotherapy facilities, limited access can result in long wait times and long-distance travel to receive treatments.[2] The January webinar featured three physicists: **Abigail Quaye, MPhil** (Ghana), **Loreh Peter Onyango, MSc** (Kenya), and **Samuel Adeneye, PhD** (Nigeria). Each physicist provided an overview of the state of medical physics in their country, discussed their radiotherapy infrastructure and provided insight into specific challenges they face in providing medical physics services. We invite you to watch the webinar in its entirety at this link.

In this newsletter article, we highlight some of the recurring themes from the presenters and hope this provides valuable information to potential collaborators.



Afua Yorke, PhD
University of Washington

Stephanie Parker, MS
Atrium Health Wake Forest Baptist High Point Medical Center



Abigail Quaye, MPhil
Komfo Anokye Teaching Hospital

Loreh Peter Onyango, MSc
Kenyatta University Teaching Referral and Research Hospital

Samuel Adeneye, PhD
NSIA-LUTH Cancer Center

Abigail Quaye, MPhil from Ghana

Ms. Abigail Quaye, from the Komfo Anokye Teaching Hospital, began her presentation by highlighting that cancer is the 5th leading cause of death in Ghana, a country of over 31 million people with 16 regions. This number is projected to quadruple by 2040 according to International Agency for Research on Cancer (IARC). There are only three radiotherapy centers to serve the overwhelming number of cancer patients in the country. Given the location of these centers, some patients travel over 400 miles to receive radiotherapy (Figure 1). At the time of the presentation, there were about 12 practicing physicists and eight interns in Ghana. Ms. Quaye described the educational path for medical physicists in the country and the many roles they play. A typical day involves routine quality assurance checks, leading treatment planning, championing radiation safety protocols, and answering questions from therapists and physicians. The dynamic nature of their job means no two days are the same. They are also responsible for training interns, collaborating with international colleagues, and performing QA/QC tasks during weekends due to high patient workload. Ms. Quaye highlighted resource limitations such as inadequate workstations, machine downtime, limited access to spare parts, lack of technical expertise among biomedical engineers, limited employment opportunities for medical physics graduates, and inadequate equipment for dosimetry and quality assurance. International collaborations have been instrumental in addressing these challenges.

Loreh Peter Onyango, MSc from Kenya

Mr. Loreh Peter Onyango, a senior medical physicist at the Kenyatta University Teaching Referral and Research Hospital (KUTRRH), discussed the state of radiotherapy in Kenya. According to the 2020 census, Kenya has a population of 50.3 million and 12 centers with some form of radiotherapy services. Seven of these centers are in the capital city, creating a disparity that forces patients to travel hundreds of kilometers for care. The national health insurance scheme only covers 20 fractions of radiotherapy, leading some patients to discontinue treatment due to costs. KUTRRH has treated over 4800 patients since it began operations in 2019, operating on three seven-hour shifts each day beginning at 5:30 am. Despite prolonged working hours, there is still an 8-12 week waiting time for patients. Mr. Peter's day-to-day responsibilities include equipment QA, computerized patient treatment planning, acting as the radiation safety officer, and ensuring compliance with regulatory guidelines. He highlighted the challenges of a shortage of qualified professionals, high training costs, strenuous working hours, lack of exposure to new techniques, difficulty obtaining brachytherapy sources, and lack of necessary equipment. He also emphasized the role international collaborations have played in advancing the medical physics profession in Kenya.

Samuel Adeneye, PhD from Nigeria

Dr. Samuel Adeneye, head of the medical physics unit at the NSIA-LUTH Cancer Center in Nigeria, provided insight into the challenges and opportunities in Nigeria. With a population of over 200 million, Nigeria has only five radiotherapy centers, seven linear accelerators, and one Co-60 unit. The NSIA-LUTH Cancer Center, equipped with advanced radiotherapy technology, faces a high patient workload with machine and patient-specific QA tasks often performed on weekends. Dr. Adeneye described his daily routine, which includes machine performance checks, addressing staff queries, mentoring interns, and conducting equipment quality assurance. He highlighted the challenges of not offering certain advanced treatments, lack of equipment, and absence of residency training programs. International collaborations have been instrumental in improving clinical and training capacities in Nigeria.

In conclusion, despite differences in their daily routines, the presentations by Ms. Quaye, Mr. Onyango, and Dr. Adeneye revealed several recurring themes: limited availability of equipment, high patient workload, the need to strengthen local professional organizations, the need for continuous training and training on new techniques, and the importance of international collaborations. These are critical areas for the AAPM International Council to focus on to help strengthen the physics workforce and improve practices through international partnerships. ■

Patient flow to RTCs

Ghana map with red arrows indicating the flow of patients from the regional capitals to existing RTCs.

Figure 1: *Ghana map indicating the flow of patients from the regional capitals to existing radiotherapy centers. Patients travel up to 400 miles to access radiotherapy. Similar issues were discussed by all speakers. Photo courtesy of Abigail Quaye.*

Figure 2: *Challenges of Medical Physics in Kenya courtesy of Loreh Peter Onyango. Similar challenges were cited by the other speakers.*

Challenges of medical physicists in Kenya

- Shortage of qualified skilled medical physicists to mann activities of radiotherapy, nuclear medicine and radiology.
- Inadequate local training centers (Only 1 university started medical physics course 2 years ago)
- High cost of training
- Strenuous working hours, due to high number of patients, some centers start treating at 5 am and work until midnight.
- Lack of exposure to new techniques of radiation therapy
- Lack of necessary equipment required for proper QA and QC
- Unavailability of SSDL for calibrations
- Some facilities don't recognize the need to employ medical physicist especially in radiology and NM.
- Association of medical physicists not very strong due to funding problems
- Problem in getting brachytherapy sources in time. This leads to treatment delays
- Lack of essential items such as thermoplastic masks, brachytherapy applicators

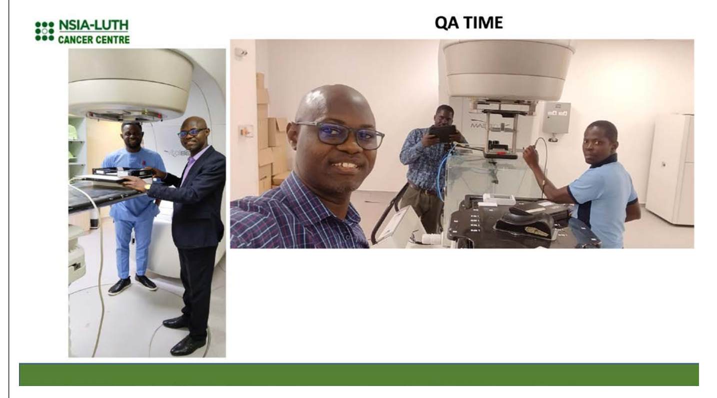


Figure 3: *Medical physicists performing monthly linear accelerator QA in Nigeria courtesy of Dr. Samuel Adeneye. All speakers discussed the need to perform QA on weekends due to the extended treatment schedules.*

References:

1 *Christ SM, Willmann J. Measuring global inequity in radiation therapy: Resource deficits in low-and middle-income countries without radiation therapy facilities.* Advances in Radiation Oncology. *2023 Jul 1;8(4):101175.*

2 *Kochbati L, Vanderpuye V, Moujahed R, Rejeb MB, Naimi Z, Olasinde T. Cancer care and COVID-19: tailoring recommendations for the African radiation oncology context.* Ecancermedicalscience. *2020;14.*

JULY 21–25 | LOS ANGELES, CA

AAPM 2024

66TH ANNUAL MEETING & EXHIBITION

EMBRACING CHANGE
IMPACTING PATIENT CARE

THANK YOU

for attending AAPM 2024

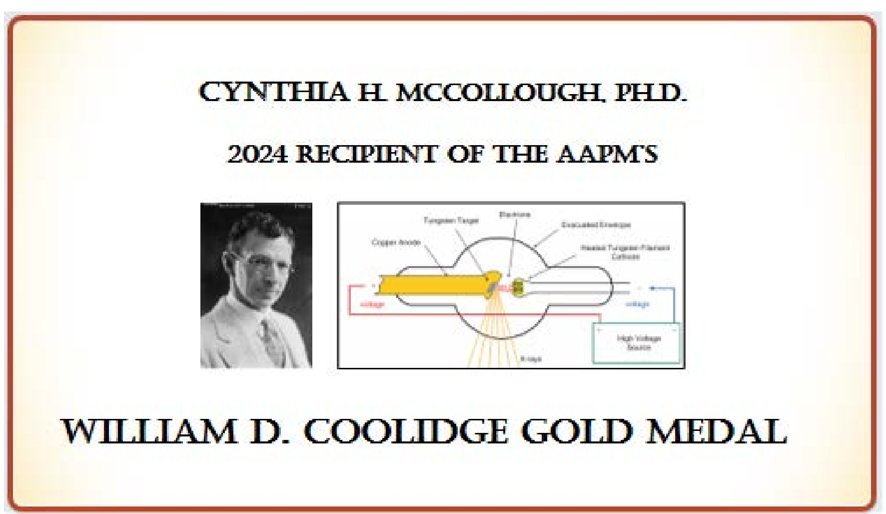
JULY 27–30 | WASHINGTON, DC

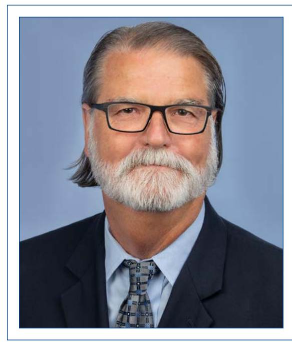
67TH ANNUAL MEETING & EXHIBITION

COMING TOGETHER TO FORGE AHEAD
IN MEDICAL PHYSICS

Introduction Speech

2024 WILLIAM D. COOLIDGE GOLD MEDAL





John M. Boone, PhD
UC Davis Medical Center

Slide 1:

Cynthia and I have been friends and colleagues for a long time and it is an honor and a privilege to introduce her as the recipient of the AAPM's 2024 William D. Coolidge Gold Medal.

Slide 2:

Cynthia started out as this cute little kid, and she studied hard and became the valedictorian of the Lake Shore High School graduating class of 700 students. She moved on to earn her undergraduate degree at Hope College in Michigan as a Presidential Scholar. She graduated Summa Cum Laude with a degree in physics. She then attended "UW" Madison, where she earned her PhD in Medical Physics with the Alumni Research Foundation Graduate Fellowship.

MAYO CLINIC ACTIVITIES

The *Brooks-Hollern* named professorship
Professor of Radiological Physics
Professor of Biomedical Engineering
Mayo Clinic Distinguished Investigator
Mayo Clinic, Rochester, Minnesota

ABR Board Certified in Diagnostic Medical Physics

Directs the **Mayo Clinic CT Clinical Innovation Center**
>$25 million in awarded grants
Research team of ~ 30 FTE

Slide 3:

Fast forward to the present, Cynthia is now a Distinguished Investigator at the Mayo Clinic Rochester, and serves as the Brooks-Hollern professor, and she is professor of radiological physics and biomedical engineering. She leads a research team of 30 scientists in the Mayo Clinic CT Clinical Innovation Center, with significant funding from outside agencies.

Slide 4:

Cynthia is a world expert in diagnostic computed tomography and indeed she testified on behalf of the AAPM on CT dose issues to the United States Congress. It turns out that, long before Cynthia's time, the first CT scan performed in the United States was performed at the Mayo Clinic. That first CT scanner sits as a little time capsule in the hallway not far from Cynthia's office, and I suspect that she is the curator of that shrine.

world expert in diagnostic computed tomography

Testified to US Congress on CT dose

First CT in the United States was performed at Mayo / Cynthia appears to be a curator of this shrine to the Hounsfield Mark 1 CT scanner

AAPM ACTIVITIES

- Board of Directors (1999-2001)
- Vice Chair of both the Education and Science Councils
- Member of 14 task groups, chaired 5
- President of the AAPM (2019)
- Chair of the AAPM board (2020)
- +5 pages of other stuff

Slide 5:

Cynthia has worked hard for the AAPM. She did a stint on the Board of Directors, was in leadership positions of both the Education and Science Councils, contributed to 14 task groups, and served as President of the association five years ago, followed by Chair of the Board.

OTHER SOCIETY ACTIVITIES

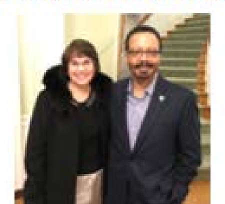
- Delegate to the International Electrotechnical Commission (IEC)
- Member of the National Council on Radiation Protection (NCRP)
- Vice Prez of the International Society of Computed Tomography
- Developed the ACR CT phantom and accreditation program
  - If you know what CTDIvol is – she invented it
- Program and Education Committees of the RSNA

Slide 6:

She was also active in the service of other societies in our field, including the IEC, the NCRP, and she was vice president of the International Society of Computed Tomography. She developed the ACR CT phantom and accreditation program, and if you know what CTDIvol is — she invented it. She also served on important committees for the RSNA.

NIH AND FDA ACTIVITIES

- Charter member of BMIT-A Study Section (2012-2016)
- Chair of BMIT-A (2014-2016)
- NIBIB Advisory Council (2023-2026)
- FDA: Technical Electronic Product Radiation Safety Standards Cm



Cynthia and Roderick Pettigrew (former NIBIB Director)

FDA award (with Dianna Cody)

Slide 7:

Cynthia was a charter member of the imaging study section ten years ago, and chaired that study section for two years. She currently serves on the NIBIB Advisory Council and in that is a big deal, as she meets face to face with the Director of NIBIB and his team on a routine basis. She also serves on a Radiation Standards Committee of the FDA.

ACADEMIC ACUMEN

- H index of 106
- 508 peer reviewed papers
- 6 peer reviewed papers with >1000 citations
- 54 US and International Patents

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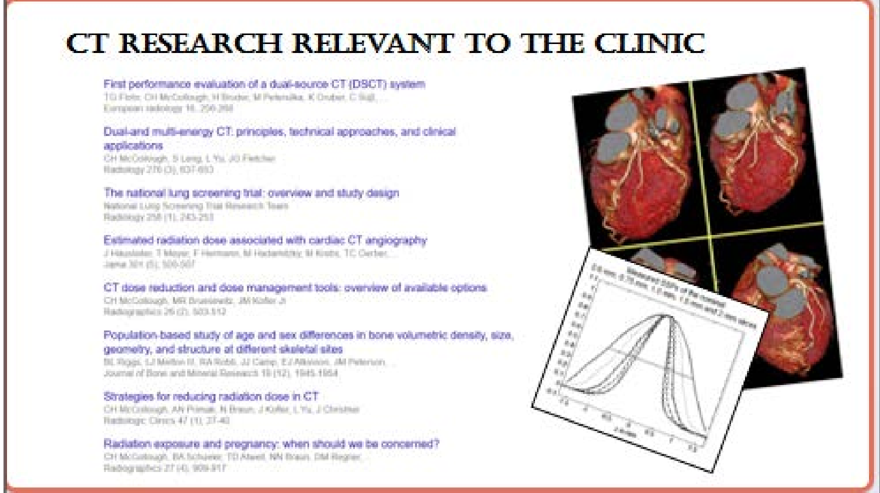
Slide 8:

Dr. McCollough is nothing short of an academic rock star. She has an H-index of 106, has 500 published papers and 54 patents. Stratospheric! Few people in this room have accomplished this level of academic productivity, which is amazing. As it turns out, once a valedictorian always a valedictorian….

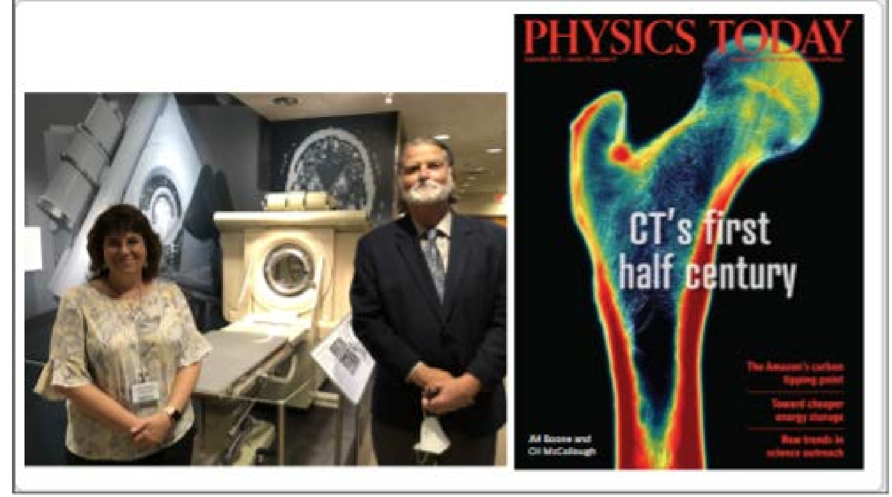


Slide 9:

I failed to note earlier that Cynthia was board certified in diagnostic medical physics by the ABR. Her underpinning as a clinical CT physicist has guided many of her more recent publications, where she is in a position to evaluate the many new technologies that have characterized CT development over the past 25 years. In addition to reporting rigorous characterizations of these new innovations in CT, she publishes very approachable descriptions of new tech with guidance on their clinical applications, and in many cases with strategies and suggestions for optimizing their clinical performance.

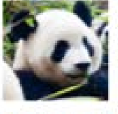
Slide 10:

On a more personal note, I visited Cynthia at the Mayo Clinic last year (2023) and got a tour of that shrine to the Hounsfield EMI scanner. Last year also was the 50th anniversary of the first CT scan performed on a human, and Cynthia and I co-wrote this article that appeared in Physics Today celebrating this hallmark event.



Slide 11:

Cynthia and I were also members of the ICRU Report Committee on CT, and because this project was funded by the European Union, our committee met in Europe perhaps six or seven times. You get to know a person pretty well when you travel internationally with them — spending from breakfast through dinner and into the evening with the entire team for the better part of a week. From this experience, I witnessed first hand Cynthia's brilliance, her passion for the science of CT, and her …. humanity. She is amazing!

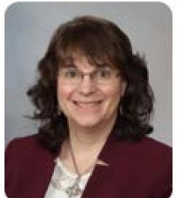


Slide 12:

More recently Cynthia and I were in Chengdu China, home of the Pandas, at an IEC meeting. This photograph demonstrates our mutual "love" of fish (not). One evening, our host treated us with tickets to a Chinese opera, which was great — the tickets came with a special treatment of your choice including face painting.

Slide 13:

It turns out that Cynthia really liked that face painting, and indeed took it to the next level after the show. It was a joyous thing to see how much fun Cynthia McCollough was having with this, dressing up in the traditional attire of the region. I took these photos, and here she is …. trying to look FIERCE!



Slide 14:

Please join me in welcoming Dr. Cynthia H McCollough to the podium to accept the 2024 William D. Coolidge Gold Medal.

Acknowledgement: John Boone would like to thank Dr. Sarah McKenney for her efforts on short notice to add a little more pizazz to the slide deck used. ■

SEPTEMBER

12

12:00 – 1:00 PM | ET

AAPM Webinar Series on MP3.0 Transformational Medical Physics

Episode #22

The Evolving Collaborative Future: Radiation Oncologists, Medical Physicists, and Industry Partnerships

19

12:00 – 1:00 PM | ET

ABR Update: Initial Certification Exams and Continuing Certification Processes

What is "minimally qualified"? How is the cut score for an exam determined, and why do results take so long?

OCTOBER

10

12:00 – 1:00 PM | ET

AAPM Webinar Series on Radiochemistry and Oxygen Sensing in the Era of FLASH RT

Webinar #4

Effects of Oxygen and Oxygen Radicals in Biological or Biochemical System

24

12:00 – 2:00 PM | ET

In vivo Dosimetry: A Practical Guide

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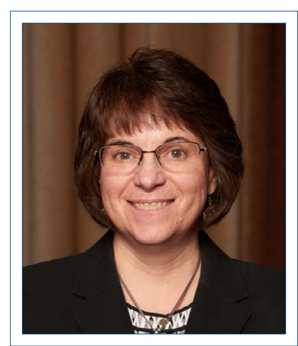
Mark your calendar and make plans to attend.

Registration opens: DECEMBER 4

Acceptance Speech

2024 WILLIAM D. COOLIDGE GOLD MEDAL



Cynthia H. McCollough, PhD
Mayo Clinic

Thank you, John, for that wonderful introduction.

Ladies and Gentlemen,

I stand before you this evening with a profound sense of gratitude. To be awarded the Coolidge Gold Medal by the AAPM — my professional home for almost 40 years — is beyond anything I could have imagined when I started my journey in medical physics.

This recognition reflects not only my efforts but also the unwavering support, collaboration, and friendship of many individuals whom I would like to acknowledge. I want to thank those that started me down this path, Drs. Bryant Hichwa, Charles Mistretta, and Richard Morin, and those that have walked it with me. Drs. Diana Cody, John Boone, Tony Siebert, Bill Hendee, and Michael McNitt-Gray are a few special friends among the many talented AAPM members who have played an important role in my journey.

I especially want to thank Dr. Maryellen Giger for nominating me, and for providing invaluable parenting advice through the years. Additionally, I thank Drs. Willi Kalender, Guang-hong Chen, Norbert Pelc, Jiang Hsieh, and Thomas Flohr — giants in the CT community — for sharing so freely with me their knowledge, their wisdom, and their encouragement.

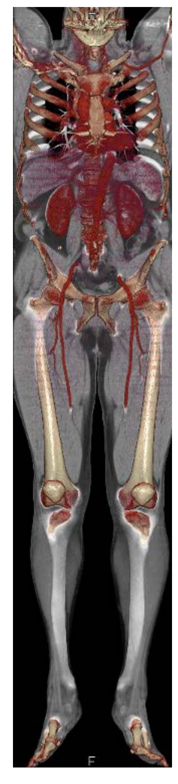
I would like to acknowledge my team from Mayo Clinic, past and present. Your encouragement and friendship have been the most rewarding part of my journey. I am grateful for your time, talents, and team mindset, which have enabled us to push the boundaries of our field. Drs. JG Fletcher, Lifeng Yu, and Shuai Leng are extraordinary scientists and dear friends, and I could not have achieved a fraction of what I've accomplished without their shared passion for CT imaging, patient care, and supporting one another. **This medal is yours as much as mine.**

I am most grateful to my Heavenly Father and Creator, and Jesus Christ my Savior; my parents, Albert and Marge, who first taught me to love and honor God; my husband, Kevin, and my children, Brian and Shannon. Their love and support have been my anchor, particularly during the inevitable storms of life. Kevin, you have always believed in me, and your sacrifices, patience, and encouragement have made this achievement possible.

Throughout my career, I have witnessed remarkable advancements in CT technology and the transformative impact these innovations have had on diagnosing and treating patients. Such progress is not possible without the collaborative efforts of those in industry, who transform novel technologies into commercial products. For their important role in my journey and for advancing the field of CT, I want to thank my many colleagues at Siemens Healthineers, particularly Drs. Thomas Flohr, Bernd Ohnesorge, Bernhard Schmidt, Christianne Leidecker, and Stefan Ulzheimer.

I am particularly proud of the work we have done to enhance the quality, capabilities, and safety of CT imaging. Ensuring that patients receive the most accurate diagnoses with the least amount of radiation exposure has been a guiding principle in my research and practice. It is immensely gratifying to see the tangible benefits of our work in improving patient care and outcomes.

Occasionally on my journey I have had the chance to interact with individual patients. Around 2004, I was called about a 540-pound gentleman whose cancer was found during bariatric surgery. His weight far exceeded the CT scanner system limits at that time. Without a way to image him and determine the extent of his cancer, his doctors could offer no effective treatment plan. My partners at Siemens successfully tested the table weight capacity in the factory with 1000 pounds of lead brick placed overnight on the extended table, and when it did not break it gave us the reassurance that the table would not break during the patient's exam. Then with the help of several technologists, we were able to pull the straps tight enough to allow him to fit inside of the 70 cm gantry. The resulting images were sufficient to stage his cancer and the subsequent treatment extended his life. I came home that day with my feet almost floating above the ground I felt so good. Without the extraordinary efforts of a team of scientists, technologists, and engineers, this man would have been sent home to die. I always hope that I am generically making a difference in patients' lives, but to have such a hands-on role was for me a highlight of my career.



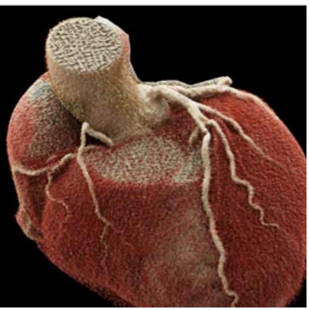
In preparing these remarks, I reflected not only on the journey I've taken, but also on the road ahead. At some point, I'll retire.

The legacy that I leave behind will include the scientific papers that I have written, but they will be supplanted with new work on new topics. That is how science advances. What will remain are the people that I have trained and mentored, and who have gone on to impact our field and train and mentor yet another generation of medical physicists and image scientists. The future of our field lies in their hands, and it is *our duty* to equip them with the tools, knowledge, and inspiration they need to succeed.

An essential part of their journey, and my journey, is being part of the AAPM, which provides the educational, scientific, and professional resources critical to success in our field. I want to particularly thank the amazing staff of the AAPM for their talent and commitment, with a special thank you to Angela Keyser for her support and friendship.

I also want to ask each of you to please support the AAPM in the upcoming membership vote to raise our dues in order that we may extend the level of headquarters *service that we have enjoyed to those who come after us.* The increase is small, a mere $45 by 2027, but the value to our profession is great.

As I sum up, I want to reiterate my profound gratitude for this honor. The Coolidge Gold Medal is a testament to the collective efforts of all those who have supported and collaborated with me throughout my career. It is a symbol of the remarkable progress we have made in CT imaging and radiation safety, and also a call to the important work that still lies ahead.



When William Coolidge invented his x-ray tube, he could hardly have imaged that it would allow us to non-invasively image the coronary arteries of a beating heart, yet now we can. Together, let us continue to advance the field of medical physics, improve patient care, and inspire future generations to reach even greater heights. Thank you. ■

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