AMERICAN ASSOCIATION of PHYSICISTS IN MEDICINE

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AAPM NEWSLETTER

September/October 2019 | Volume 44, No. 5

Special Interest Feature:

AAPM POSITION STATEMENT ON THE USE OF PATIENT AND GONADAL FETAL SHIELDING (PP-32A)

Opinion and Letter to the Editor

IN THIS ISSUE:

2020 JOINT AAPM | COMP MEETING

JULY 12–16

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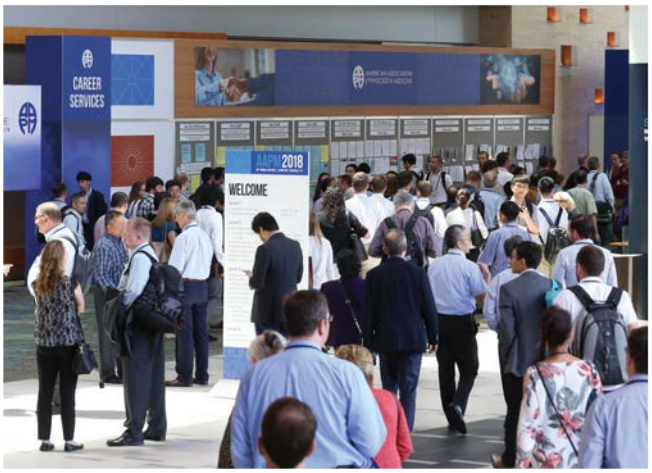

AMERICAN ASSOCIATION of PHYSICISTS IN MEDICINE

COMP Canadian Organization of Medical Physicists

OCPM Organisation canadienne des physiciens médicaux

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I welcome all readers to send me any suggetions 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 enhnance the overall readership experience. Thank you.

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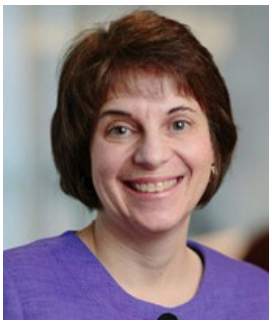
AAPM 2019 ANNUAL MEETING: BUILDING BRIDGES

PRESIDENT'S REPORT Cynthia McCollough, PhD | Rochester, MN



July 2019. **AAPM Annual Meeting**. San Antonio. Texas. It may have been hot outside, but there were many cool things happening inside!

The first human treatment with FLASH radiotherapy was one of the coolest topics of the meeting. Speaking to a packed ballroom, **Julianne Pollard-Larkin** first described the history of the technique and exciting results from pre-clinical trials. **Lei Dong** next described the potential use of FLASH therapy with protons. **Billy W Loo Jr.** then spoke about the potential translation of the technique into clinical practice, sharing a "hot off the press" **study from Lausanne University Hospital** describing the first use of FLASH therapy in humans. This is one major technical development to keep your eyes on!

Another cool technology that is being discussed just about everywhere these days is machine learning. Searching the meeting program for the text "**machine learning**" yields over 60 presentations describing the application of **machine learning** to medical imaging and radiation therapy, which undoubtedly underestimates the total number of presentations because of the multiple terms used in this field, such as **artificial intelligence** and **deep learning**. Judging from the wide range of topics, from computer assisted diagnosis in breast imaging and creation of synthetic CT images from MRI data to stereotactic body radiation therapy treatment planning and improving deformable registration for 4D CT, machine learning soon will be impacting patient care in a significant way. Learning about this field should be high on everyone's list of things to do for their own professional development. **AAPM's Online Learning Center** is a tremendous resource for doing just that.

If you missed the **President's Symposium**, I really encourage you to check it out through the **Online Learning Center**. The symposium focused on the meeting theme, **Building Bridges**. I provided educational material on the topics of diversity, inclusion, equality and equity (I learned that they don't all mean the same thing) and shared personal examples of the many ways that we do, and sometimes don't, have **Everyone at Our Table**. Some of the examples were transformative in encouraging me to pursue a doctoral degree in Medical Physics (big thank you to **Dr. Bryant Hichwa**), and some examples that made it painfully obvious that, in some circles, women still have a tough time entering and thriving in the physical sciences. I also shared some encouraging news: even though our membership is only, on average, about 23% women, the number of women entering medical physics continues to climb – women members aged 26-35 account for about 31% of our membership, approaching a factor of 2 higher than the 18% for women aged 56-65 (Figure 1). Perhaps more importantly, our women members are well represented at

Thank you for taking the time to check out the newsletter this month. As always, if you have thoughts, suggestions or insights to share, please feel contact any member of leadership or headquarters staff. And remember, **Build Bridges**; they can be stunningly beautiful!

PRESIDENT'S REPORT, Cont.

AAPM's leadership table, with the percentage of women volunteers and leaders being about the same as the percentage of women members (Table 1).

Our keynote speaker, **Amy Lynch**, provided a high-energy engaging look at the differences that each of the three generations active in today's workplace bring to the table. The styles and world views of the Baby Boomers, Gen X'ers, and Millennials can indeed be quite different – not better or worse, just different. Understanding, and even embracing, those differences lets us tap into the strengths of working with a **Multi-Generational Team**. With humor and classic generational images and videos, she shared the latest research in the field, which provided compelling evidence that though the work feels harder when people in the group don't all think alike (e.g., are of different ages, cultures, and gender identities), they get their task right more often! A variety of values, perspectives, experiences, and ideas improves a team's ability to solve problems, which is exactly what physicists like to do! So the next time a Millennial texts you instead of calling, or a Boomer doesn't see your Reddit post, be patient with each other and ask questions. Curiosity about the other's thoughts and beliefs will help you to see things from the other's perspective. Our traits and skill sets can complement each other, as long as we take the time to build bridges between our differences and acknowledge that **we are all in this together**, working for the best patient care, impactful science, or commercial product. The demographics of AAPM members (Figure 2) emphasize that we are already a multi-generational team. Let's harness that potential, **together**. ■

Table 1: Percentages of women active in various roles within AAPM

- 25.1 % of volunteers are women
- 24.6 % of chairs, vice chairs, or officers are women
- 29.9 % of council members are women
- 24.5 % of board members are women
- 13.9 % of fellows are women

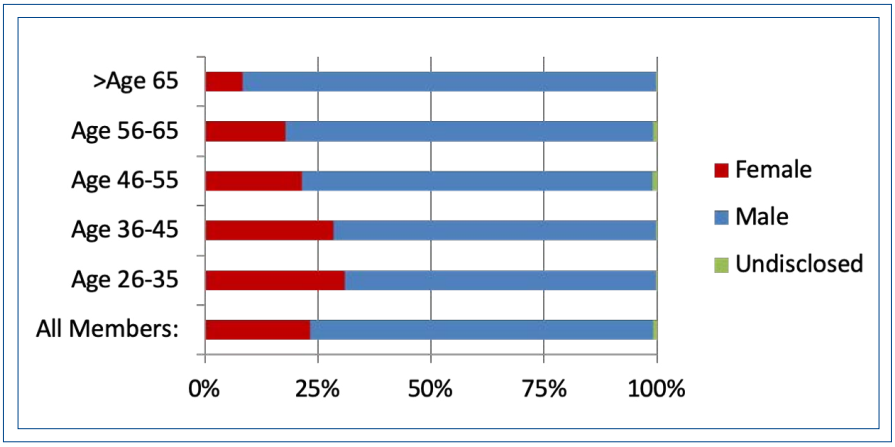


Figure 1: Percentages of women within AAPM, by age

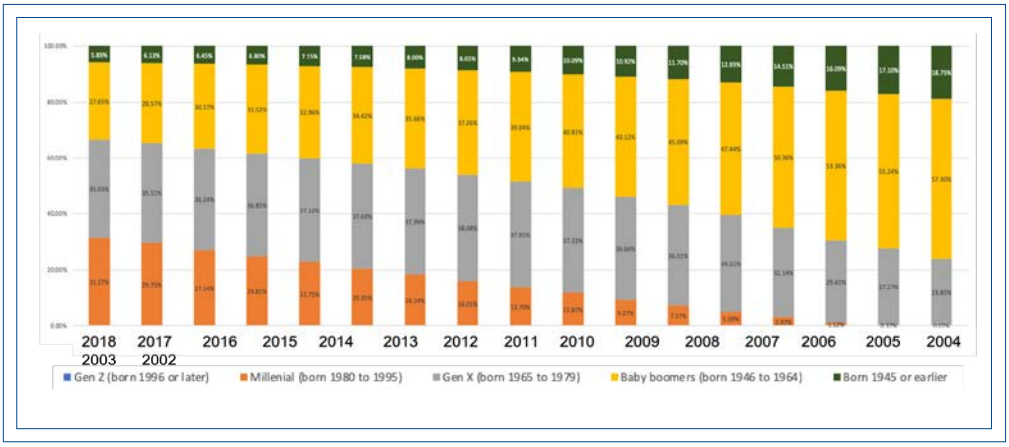


Figure 2: AAPM Membership by generation (orange = Millennials, grey = Gen X'ers, yellow = Baby Boomers, and green = those born before 1946)

WHAT'S NEW AT AAPM HEADQUARTERS?

EXECUTIVE DIRECTOR'S REPORT Angela R. Keyser | Alexandria, VA

MARK YOUR CALENDARS!

The **2020 AAPM Spring Clinical Meeting** will be held April 4 – 7 in Minneapolis, Minnesota.

The **2020 Summer School** on ***Advances in Quality Assurance*** is scheduled for June 8 – 12 at Lewis & Clark College in Portland, Oregon.

AAPM's **2020 Annual Meeting** will be a Joint Meeting with the Canadian Organization of Medical Physics July 12 – 16 in Vancouver, BC.

AAPM HAS AN INDEPENDENT AUDIT PERFORMED YEARLY

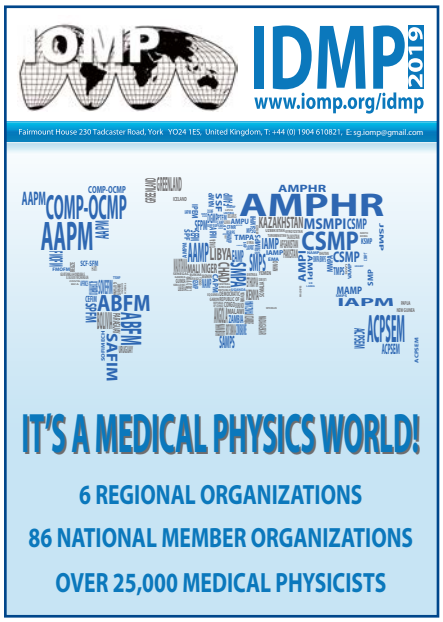
AAPM created an Audit Committee that reports to the Board of Directors 12 years ago to foster a governance structure of accountability. The primary function of this group is to monitor the integrity of AAPM's financial reporting process, the appropriateness of the organization's accounting policies and internal controls and the independence and performance of the independent auditors. AAPM's Audit Committee, chaired by **Jennifer Smilowitz**, met at AAPM HQ on May 30 and provided a report to the Board at the July 18 Board of Director's meeting in San Antonio. AAPM audit reports going back to 1992 are available online.

DID YOU KNOW?

- Presentations for 2019 AAPM Summer School posted in AAPM Virtual Library: Practical Medical Image Analysis
- A new AAPM Report is available online: Report 293 - Size Specific Dose Estimate (SSDE) for Head CT
- AAPM Releases Updated Lung Cancer Screening CT Protocol Recommendations
- Nominations for 2020 Awards and Honors must be made online by September 15
- Register for one of the webinars in AAPM's AAPM Webinar Series: Advances in Medical Physics
- AAPM Members are eligible for joint membership in ESTRO for € 45,45, with access to most services ESTRO has on offer. Details available online.

RSNA 2019 — SEE POSSIBILITIES — TOGETHER

Register now for the RSNA 105th Scientific Assembly and Annual Meeting, December 1-6. AAPM Members must register by November 1 to receive complimentary registration. Reminder – AAPM's Headquarters Hotel is the Hyatt Regency Chicago located at 151 E. Wacker Drive. The AAPM Reception will be held on Tuesday, December 3 from 6:00 PM – 8:00 PM at the Hyatt.



@IntDayofMedPhys

InternationalDayOfMedicalPhysics

International Day of Medical Physics November 7, 2019

IOMP is once again promoting activities to raise awareness about the role of medical physicists through the International Day of Medical Physics (IDMP). The 2019 IDMP is scheduled for November 7, the birthdate in 1867 of Marie Sklodowska-Curie. The theme of IDMP 2019 is "**It's a Medical Physics World**." This is an excellent opportunity to promote the role of medical physicists. Visit the IOMP website for more information and promotional resources.

EXECUTIVE DIRECTOR'S REPORT, Cont.

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You will find more information about the AmazonSmile program here.

AAPM 2018 EDUCATION & RESEARCH FUND ANNUAL REPORT

The 2018 Education and Research Fund Annual Report was recently released and is available online.

2020 DUES RENEWALS

Dues renewal notices for the 2020 year will be sent out in early October. I encourage you to pay your dues via the AAPM website. Remember, many of the regional chapters are partnering with HQ on the dues process, so make sure to check the invoice to see if you can pay your national and chapter dues with one transaction. Be mindful, though, that some chapters have a membership application process. Please only remit dues for chapters of which you are an official member.

INTERESTED IN EMERITUS MEMBERSHIP?

If you have fully retired from the field after being a Full or Associate member of AAPM for 10+ total years (the last two consecutive) and are over the age of 55, you are eligible for Emeritus Membership.

You can apply online and click on the Emeritus application at the bottom of the flow chart. Once you have completed the request, please email it to **Jennifer Hudson**.

AAPM WEBSITE

If you find a page or section of the website that is not working as it should, please send an email to the Help Desk which will put the request into the Information Services Team queue. Someone will then respond to let you know when it has been resolved.

AAPM STAFF NEWS

Congratulations and best wishes to Laurie (Allen) Madden on her August 24 marriage to Brian Madden. They had a picture perfect day for their Annapolis, MD nuptials. Join me is wishing them many blessed and happy years as Mr. and Mrs!

AAPM'S HQ TEAM…AT YOUR SERVICE!

Who does what on the AAPM HQ Team? See a list with contact information and brief descriptions of responsibilities online. An Organization Chart is also provided. ■

OUR CONDOLENCES

John M. Wallace, MS

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 e-mail to: 2019.aapm@aapm.org
(Please include supporting information so that we can take appropriate steps.)

AAPM 2018 FINANCIAL REPORT

TREASURER'S REPORT Mahadevappa Mahesh, MS, PhD | Baltimore, MD

After returning from a very successful Annual Meeting held in San Antonio, Texas, I wanted to share in this column the financial report I gave at the annual business meeting. AAPM as an organization is fiscally strong. Financially 2018 was a strong year.

The Association realized a surplus from operations of approximately $111,000 in 2018 (Figure 1). For the year 2018, AAPM had budgeted for a deficit of approximately ($955,000), therefore this led to a favorable variance of $1.07M for 2018. The largest single driver contributing to this favorable variance came as the result of net under-spending and favorable revenue performance versus budget in Councils and Committees, which contributed $658,000 to the favorable variance. Additionally, positive performance in meetings (annual, spring, summer, other) versus budget contributed approximately $220,000 to the favorable variance. Lastly, growth in full members contributed an additional $83,000 to the favorable variance. As a result of the surplus from operations, AAPM was in compliance with the Debt Service Coverage (DSC) ratio of 1.2 to 1 covenant requirement as a part of AAPM's building financing with TD Bank. For the year ended December 31, 2018 AAPM's DSC ratio was 2.32 to 1.

AAPM's balance sheet remains strong as of the end of the year 2018 with a total asset exceeding $24.7M (Figure 2). This represents a decrease of approximately $912k over the prior year 2017. This decrease is mainly the result of a market decline in AAPM's investments experienced in the fourth quarter of 2018. For the year the investment reserves suffered an unrealized loss of about $1M. At year-end, reserve balances stood at nearly $13.4M. During the first six months of 2019, the losses incurred at the end of 2018 have been recouped.

The 2019 budget has an approved deficit of approximately $976,000. This budget was prepared utilizing a statistical model, using historical budgets and operating results as a guide. In the previous two years, the Association has budgeted for deficits of approximately $1,200,000 and $955,000 while achieving a (deficit) surplus of ($49,000) and $111,000 respectively and meeting the covenants established by TD Bank – evidence that the model is working. The model assumes that AAPM will finish the year in compliance with the DSC covenant requirements of TD Bank. Currently, the Association is working on the budget for 2020. All councils and committees are invited to prepare their respective budgets and will submit them by the end of August. FINCOM will meet on October 17, 2019 to review and approve the 2020 budget.

If you have any questions related to this column, please feel free to reach out to me (email me, call me at 410-955-5115 or tweet me at @mmahesh1).

TREASURER'S REPORT, Cont.

I have included a chart (Figure 3) which compares the Historical Reserves of the Association against the annual operating expenses (blue line in the graph). As shown the unrestricted net assets of the Association exceed the annual operating expenses, indicating the financial strength of AAPM.

I have also included for informational purposes a five-year trend of Operating Revenues and Expenses (Figure 4). This chart shows the operating income, Investment Income, Unrealized Gains (Losses) and Education and Research Fund net activity for the past five years. Over the past five years, the Association has generated Operating Income of approximately $665,000 and total income (all sources) of approximately $3.8M. AAPM remains fiscally strong and the operating results continue to bear this out.

*(I'd like to thank **Robert A. McKoy**, AAPM Finance Director, for his subject matter contribution to this column.)* ■

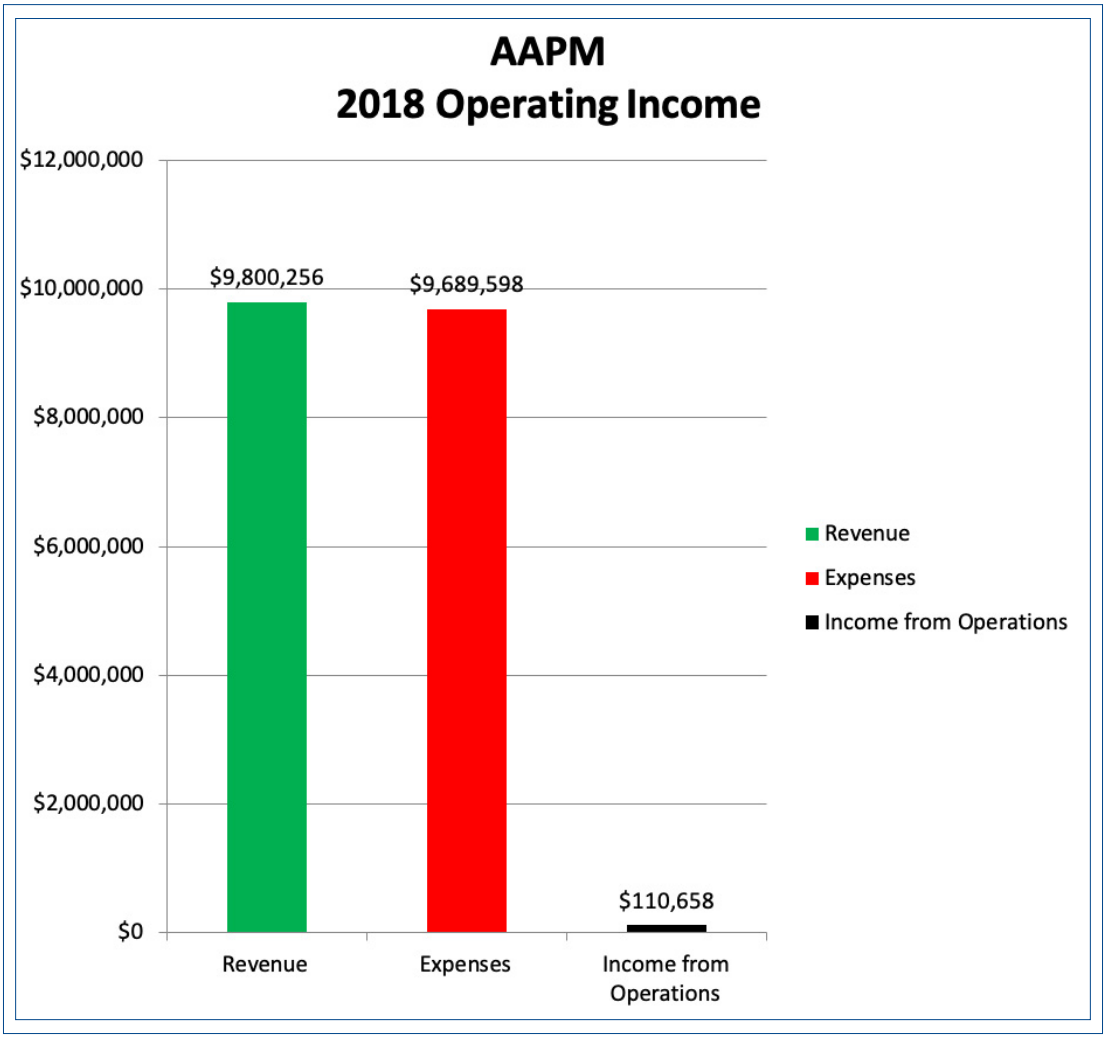

Figure 1: AAPM Income and Expenses for year 2018

TREASURER'S REPORT, Cont.

AAPM Year-End Balance Sheet For 2017 & 2018

	12/31/17	12/31/18	$ Change	Change
Assets				
Cash	1,191,965	882,409	(309,556)	-26.0%
Other Current Assets	942,962	1,067,316	124,354	13.2%
Long Term Investments	15,958,232	15,124,868	(833,364)	-5.2%
Building and Other Fixed Assets	7,527,592	7,633,978	106,386	1.4%
Total Assets	$ 25,620,751	$ 24,708,571	$ (912,180)	-3.6%
Liabilities				
Current Liabilities	3,526,250	3,499,579	(26,671)	-0.8%
Bonds Payable	3,942,642	3,773,984	(168,658)	-4.3%
Total Liabilities	7,468,892	7,273,563	(195,329)	-5.0%
Net Assets				
Unrestricted	16,008,277	15,295,125	(713,152)	-4.5%
Temporarily Restricted	1,883,686	1,819,541	(64,145)	-3.4%
Permanently Restricted	259,896	320,342	60,446	23.3%
Total Net Assets	18,151,859	17,435,008	(716,851)	-3.9%
Total Liabilities and Net Assets	$ 25,620,751	$ 24,708,571	$ (912,180)	-3.6%

Figure 2 AAPM Balance Sheet

Figure 2 AAPM Balance Sheet

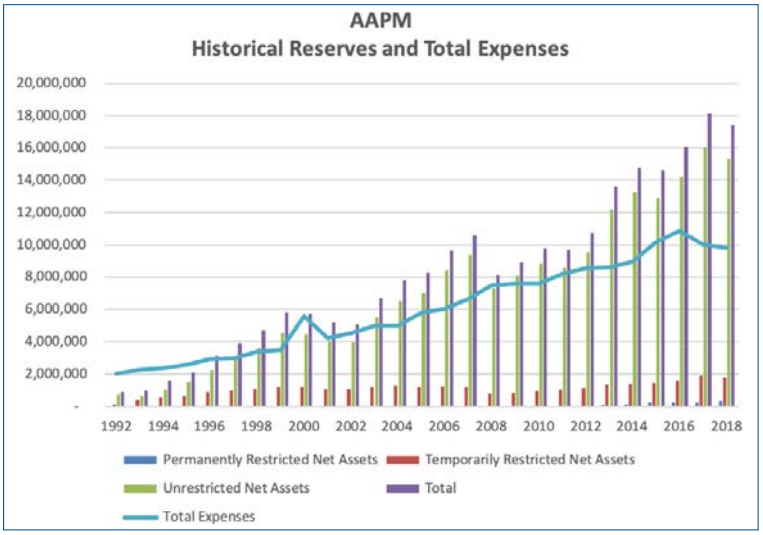

Figure 3: AAPM Historical Reserves (Restricted & Unrestricted funds)

Figure 4 Five Year Trend Operating Revenues and Expenses

	5 Year Trends				
	2014	2015	2016	2017	2018
Operating Revenue	9,196,319	9,657,220	11,002,721	9,686,258	9,800,256
Operating Expenses	8,755,320	9,917,356	10,580,445	9,735,695	9,689,598
Net Income (Loss) from Operations	440,999	(260,136)	422,276	(49,437)	110,658
Investment Income	236,912	229,227	225,067	219,347	267,952
Unrealized Gains (Losses)	389,953	(335,871)	703,017	1,603,959	(1,016,205)
Education and Research Fund, Net	113,698	179,082	111,602	317,107	(79,255)
Net Income (Loss)	1,181,562	(187,698)	1,461,962	2,090,976	(716,850)

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SPECIAL INTEREST FEATURE

OPINION Elizabeth S. Shields, MHA, RT(R) ■ Kelli Welch Haynes, EdD, RT(R) ■ Phillip W. Ballinger, PhD, RT(R), FAEIRS, FASRT ■ Dennis Bowman, RT(R) ■ Stewart Carlyle Bushong, ScD, FAAPM, FACR

PLEASE RECONSIDER PP 32-A

We were dismayed with the publication of PP 32-A by the AAPM regarding the use of patient specific area shielding[1], and we were more disappointed that the ACR BOD within less than a month gave its recognition despite considerable concerns about the science that was not reported and about the intent and the implementation of this policy.

Our immediate thought is that this AAPM policy and the ACR endorsement represent an insult to our friends and colleagues, educators of radiologic technology (RT). How do they abruptly ignore patient specific area shielding during their considerable instructional efforts? PP 32-A will have a significant impact on the content that is taught in the classroom and in clinical areas.

PP 32-A states that the use of such shielding "may jeopardize the benefits of imaging" and "can actually result in an increase in the patient's radiation dose." The first quote apparently refers to incidentalomas while the second to interference with AEC and ABS control systems. Both quotes are correct and are accompanied with several references of opinions but no clinical patient radiation dose data. As we all know, "Opinion is the medium between knowledge and ignorance[2]."

We were particularly concerned with "Shielding can negatively affect automatic exposure control and image quality." This subject is an excellent and continuous teaching example in class and laboratory[3] and will be lost with implementation of PP 32-A. If this is, indeed, a clinical problem it can be solved through the associated teaching programs.

It seems that the principle concern of PP 32-A is excess collimation when coupled with improperly positioned specific area shielding. This is clearly a concern and this is what educators in RT have acknowledged and taught all these years. The solution is continuing education and application by the clinical radiologic technologist.

One of us published several papers in the 1970s[4-8] expressing the same sentiments and including patient dose measurements regarding protective shields in dentistry. The conclusions at that time concerning such dental shielding were miniscule patient radiation dose reduction and expressed then as the PP 32-A states now … "calm and comfort the patient enough to improve the exam."

What's next? Will the AAPM …

- Publish a similar position statement on dental patient shielding? Before any such statement be sure to acknowledge the rather complete review by Crase and Abbott[9]. However, it is also an opinion piece with conclusions "the lack of evidence does not denote the absence of risk" and "it must be

AAPM 2019 JUL 14–18

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The following articles reporting on AAPM 2019 were by published by **Dr. Tami Freeman**, Editor (medical and biophysics), *Physics World:*

AAPM 2019: medical physicists assemble in Texas

MedPhys Slam highlights the art of science communication

Best in physics: showcasing innovation at AAPM

Amino acid PET tracers hold great promise for brain tumour management

Young investigators focus on brachytherapy, dose modelling and deep learning

FLASH radiotherapy: from preclinical promise to the first human treatment

assumed that dental radiography involves a small, but real, risk." Stated differently, absence of evidence is not evidence of absence.

- Suggest that the protective apron assigned to mobile radiography is unnecessary because the radiographer is at least 2 m distant and the scatter radiation intensity insignificant? You can demonstrate the effect of this backscatter radiation yourself[10]. Fix a phantom hand to an image receptor and hold it in front of your protective apron while performing a portable examination. You'll image the phantom hand. Try it!
- Abandon ALARA? It is true that ALARA was born in the Manhattan Project to reduce risk to radiation workers. However, ALARA was quickly adopted by radiography educators, then by all in medical imaging, and finally by the USNRC(11) which recognized "sound radiation protection principles to achieve occupational doses and doses to members of the public that are as low as reasonably achievable (ALARA)." We believe the NCRP to be the ultimate ALARA authority and they nailed it with Report 107[12].
- How do we reconcile this position to abandon specific area shielding with the reported increase in patient radiation dose to 3.2 mSv in BEIR VII (2006) from 0.5 mSv in BEIR V (1990)? The conversion to digital imaging should have resulted in an individual patient dose reduction and it has done so following an early "dose creep."
- Recommend that the several states amend their radiation regulations? Our guess is that all of the agreement states have regulations regarding the use of specific area shielding. Texas has such for sure[13].
- Abandon LNT for LT? At what threshold? 50 mSv? 100 mSv? A most convincing argument for abandoning LNT for LT has been discussed many times by Calabrese[14] but we are not aware that NCRP or ICRP has yet to officially engage in this proposal.

PP 32-A ignores the exceptionally complete and detailed patient radiation dose measurements reported by another one of us[15]. Bowman recommends that we consider wraparound specific area shields for patients even when primary beam collimation is properly applied. Bowman points to the measurable intensity of leakage radiation, off-focus radiation and backscatter radiation.

Fauber[16] published phantom data showing a 36% increase in testicular radiation dose when a contact specific area shield is not used. Her forty-four item reference list and her excellent discussion also describes and references the "bystander effect" which should be considered.

PP 32-A does leave the use of specific area patient shielding as a possibility in unusual circumstances but then whose call is it? Perhaps the radiologist's call in the newborn intensive care unit (NBICU). RTs know that during some situations in the NBICU specific area shielding should be avoided.

Strauss, Gingold and Frush[17] were ahead of PP 32-A when, after covering much of the same background material, they offered the opinion "A traditional 'best practice' which is not as effective as we once thought, may need to be altered or discontinued". These authors acknowledged the 36% dose reduction reported by Farber(16), nevertheless PP 32-A adopted "discontinue" rather than "alter".

Digital image masking(18) is an example of radiographer neglect that is correctable with education. When a radiographer engages in masking it is because the image was not properly collimated. Today radiologists and RTs do not have as much face-time and interaction as in the past so that when an image is masked only the radiographer knows. This is another example of a lesson lost if the procedure is simply banned by a policy statement rather than integrated into an instructional curriculum.

McKenney, Gingold and Azidi[19] took a shot at specific area shielding in a Point/Counterpoint debate by offering strong opinions but no compelling data. They seemed to acknowledge disapproval that when the ICRP[20] reduced the gonadal tissue weighting factor from 0.2 to 0.08 it did not address specific area shielding.

Jones[21], in another opinion piece, reminded us of the potential lawsuits after the AAPM and ACR "making an argument to persuade me to alter my patient care while telling me that it might not hold up in a court of law to protect me from being sued".

When the NCRP issues a report to replace LNT with LT, even with a dose as low as 5 mSv, we will join the movement. Calabrese has written extensively on this[22]. Then maybe

we can, with confidence of no radiation-injury lawsuits, abandon patient shielding in dental radiology, remove the protective apron that accompanies a mobile radiography imaging system, bag protective gloves in IR, exempt 95% of the radiographers from protective apparel at all, and remove ALARA from our teaching material!

We would like to see the PP 32-A committee readdress this issue with the available science which suggests that specific area shielding results in a small but measurable patient radiation dose reduction and with proper implementation results in no patient radiation dose increase. We suggest it is professionally irresponsible for us to totally abandon specific area patient shielding. ■

1 *AAPM Policy PP 32-A "AAPM Position Statement on the Use of Patient Gonadal and Fetal Shielding" 4/2/2019*
2. *Plato*
3. *Content Specifications: Radiography Examination ASRT, 2017*
4. *Bushong, S.C. Galbreath, J.C. Garris, R. and Copley, R.C. "Radiation Exposure in Dental Panographic Roentgenology" Physics in Medicine and Biology 17:870, 1970*
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The authors state they have no conflict of interest related to the material discussed in this article.

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SPECIAL INTEREST FEATURE

LETTER TO THE EDITOR

Rebecca Milman Marsh, PhD, DAB

Dear Editor,

Thank you for the opportunity to respond to the letter by Ms. Shields, Dr. Haynes, Dr. Ballinger, Mr. Bowman, and Dr. Bushong about the recent AAPM position statement on the use of patient gonadal and fetal shielding (PP 32-A)[1]. PP 32-A is the result of discussions within the medical physics community and the proposal, and subsequent review, revision, and approval by multiple subcommittees, committees, Science Council, and the Board of Directors of AAPM. In considering the science behind benefits and risks associated with patient shielding, AAPM concluded that shielding patients does not substantially reduce risk to the patient (i.e., provides negligible or no benefit), but mis-placed shielding introduces a risk that relevant anatomy will be obscured and/or automatic exposure control (AEC) systems will increase X-ray tube output to try and "see through" the lead shield. The letter authors (i.e., Ms. Shields, Dr. Haynes, Dr. Ballinger, Mr. Bowman, and Dr. Bushong) have expressed several concerns and are asking that the AAPM re-consider their position on the matter. I have attempted to address their concerns while re-iterating my strong support for PP 32-A.

First, I would like to start with the premise that everyone involved in these discussions is committed to doing what is best for patient safety – the conversation is about how best to achieve that goal. Second, it is important to clarify that AAPM PP 32-A is not a regulatory or guidance document. Rather, it is a summary of the science associated with patient shielding in diagnostic imaging, reviewed and approved by multiple committees within the organization. Soon after its publication, it was endorsed by the American College of Radiology (ACR) and later by the Canadian Organization of Medical Physicists (COMP) and the Health Physics Society (HPS). The position statement is a starting point for discussing the current use of patient gonadal and fetal shielding. That discussion must include members from throughout the medical imaging community, including radiologic technologists, educators, health physicists, radiologists, radiology administrators, regulatory and accreditation groups, and medical physicists.

Recognizing this, within a week of the AAPM Board of Directors' approval of PP 32-A, AAPM formed an ad hoc committee to facilitate discussions among those within the medical imaging community. The CARES committee (Communicating Advances in Radiation Education for Shielding) includes representatives from several other professional organizations* and is charged with developing educational materials, FAQs, and other tools for healthcare professionals, patients, parents, and caregivers, to help facilities discuss and determine what shielding practice is best for them. This multi-organizational effort demonstrates AAPM's recognition that PP 32-A may have substantial impact on clinical practice, training programs, and regulatory and accreditation programs.

Quite surprisingly, the authors state that the AAPM position statement is an insult to our radiologic science educator colleagues. This is both professionally and personally disappointing to hear, as I hold radiologic technologists and educators in high regard and have great respect for what they do. AAPM PP-32A is not, as some have mentioned, a critique of technologists or educators or a criticism of their professional expertise. On the contrary, it states that current patient shielding guidelines present technologists with an impossible task that has negligible or no benefit to the health of the patient. Currently, technologists must correctly guess where internal anatomy is (which is especially challenging in females, where the location of the ovaries is highly variable), cover one hundred percent of the area of the gonads or fetus without covering any adjacent anatomy, shield as close to the collimated field of view as possible without overlapping the X-ray field, and to do this on a living – and often moving – patient. Multiple publications over the past 20 years have demonstrated that the problems with fetal and gonadal shielding are both prevalent and persistent over time[4-9]. The evidence overwhelmingly indicates that even the most well-trained and conscientious technologist has a high likelihood of mis-placing shielding, not due to negligence or incompetence but to the inherent issues with the prescribed task. Most importantly, the practice provides negligible or no health benefit to the patient.

*American College of Radiology (ACR), Association of Educators in Imaging and Radiologic Sciences, Inc. (AEIRS), American Society of Radiologic Technologists (ASRT), Canadian Organization of Medical Physicists (COMP), Council of Radiation Control Program Directors (CRCPD), Health Physics Society (HPS), Image Gently, Radiological Society of North American (RSNA), Society of Pediatric Radiology (SPR)

SPECIAL INTEREST FEATURE: LETTER TO THE EDITOR, Cont.

While agreeing with the science presented in PP 32-A, the authors raise concerns that relevant information has been overlooked. The first objection is that one reference (a commercial site that provides fluoroscopy training materials and only very recently made any of its material publicly available) was not considered and that PP 32-A ignores the "detailed patient radiation dose measurements" that demonstrate measurable intensity of off-focus and backscatter radiation. If there is compelling evidence contrary to what has been referenced in PP 32-A, then it certainly should be considered. However, data available in the scientific literature (and what I can see on the referenced site) indicate that the effect of radiation shielding placed outside the imaging field of view results in a total dose reduction of a few percent at most and in some cases, much less than that[2,3]. The point is not that there is no measurable radiation outside of the collimated field of view but that the risk associated with this very small dose is either negligible or non-existent and that shielding patients to reduce this dose further is not worth the risk of compromised image quality introduced by shielding.

They also state that studies have found that gonadal shielding can decrease dose to the patient, citing a study that showed a statistically significant reduction in dose to the testes when used appropriately[11]. While often stated in terms of relative dose reduction (36%, in the study by Fauber), one must also consider the absolute dose reduction — in this case, from 0.25 mGy (unshielded) to 0.19 mGy (shielded). However, there is no evidence that either of these doses has any clinical significance or introduces an additional risk to fertility, future development of cancer, or to the offspring of the exposed individual. Without such evidence, how can we continue to justify shielding patients' gonads? As mentioned previously, I agree that patient shielding can reduce dose to the patient in some circumstances. The point is that even a 36% dose reduction is irrelevant when the unshielded dose is very, very low, especially when one considers the substantial risks of obscuring anatomy or otherwise negatively affecting image quality. While the risk of increasing dose by obscuring AEC or ABC sensors might be easier to address through training, is there any reason to do so? If the radio-protective benefit to the patient is either negligible or non-existent, how can one reasonably argue that educational efforts are worthwhile in the face of the known risks?

The authors include a list of other topics, asking "what's next"? Since none of these is within the purview of PP 32-A, I will not address them here. Similarly, I will not address the criticisms of others' publications. I am confident that the science to support PP 32-A exists and is clear. Since the science has been summarized elsewhere (including in the position statement, itself), I will not repeat it here but will direct any interested reader to that document and the references contained therein.

The letter's authors conclude by asking AAPM to reconsider PP 32-A, acknowledging that patient shielding provides negligible benefit to the patient but proposing that there is no risk of increased patient dose. Even if one assumes that there is no risk of shielding increasing dose to a patient (a claim with which I disagree) and completely ignores the evidence regarding obscured anatomy, why would we insist on continuing a practice that we all agree provides negligible or no benefit to patients? The only reasonable argument for continuing to shield patients is because they expect it and that for some patients, shielding may provide a psychological benefit. And while this important aspect of patient care must be recognized, patients expect to be shielded because we keep doing it. If this remains the driving force behind clinical practice, then we are complicit in fostering the rampant radiophobia that currently makes it almost impossible for patients to make informed decisions about their own healthcare.

As chair of the CARES committee, I have invited the authors to discuss their concerns with myself and/ or the CARES committee. (At the time of writing this letter, none has accepted this invitation.) Here, I repeat this invitation and extend it to anyone who has comments or concerns about patient shielding. The committee can be reached at CARES@aapm.org, and my email address is included below.

Respectfully,

Rebecca Milman Marsh, Ph.D., DABR
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SPECIAL INTEREST FEATURE: LETTER TO THE EDITOR, Cont.

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TEXAS REGULATORS EXTOL AAPM ANNUAL MEETING EXPERIENCE

GOVERNMENT & LEGISLATIVE AFFAIRS REPORT Richard Martin, JD | Alexandria, VA

Forty-six members of the Texas Department of State Health Services attended AAPM's Annual Meeting in San Antonio. Our Annual Meeting afforded these state regulators an educational opportunity that would have been difficult to duplicate elsewhere.

Lisa R. Bruedigan, Radiation Unit Manager, Surveillance Section, Consumer Protection Division, Texas Department of State Health Services, described the importance of attending the meeting and noted the educational benefit of the meeting did not stop when AAPM left San Antonio. Presentations at the Annual Meeting have spurred conversations amongst the Texas regulators about the potential impact on inspection processes. Ms. Bruedigan thanked AAPM for its generosity in hosting the group and summed up by noting, "These interactions help us to grow and be better at our jobs."

The AAPM's CRCPD Subcommittee has been working with the Conference of Radiation Control Program Directors (CRCPD) to offer educational opportunities for state regulators, including attendance at AAPM meetings. The CRCPD Subcommittee is encouraging state regulators to attend the 2020 Spring Clinical and Annual meetings.

If you have any questions or comments, please contact **Richard J. Martin, JD, Government Relations Program Manager**, at richard@aapm.org. ■

"There were so many topics our technical staff were able to learn about they actually had a hard time picking which ones to go to. They really liked being able to interact with the vendors to see new equipment and ask questions. They also enjoyed interacting with the physicists from our state and other states to have a conversation about their perspective of things."

— Lisa R. Bruedigan, Radiation Unit Manager, Surveillance Section, Consumer Protection Division, Texas Department of State Health Services

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CMS PROPOSES RADIATION ONCOLOGY EPISODE-OF-CARE BUNDLED PAYMENT MODEL IN 2020

HEALTH POLICY & ECONOMIC ISSUES Wendy Smith Fuss, MPH | Delray Beach, FL

The Centers for Medicare and Medicaid Services (CMS) and the Center for Medicare and Medicaid Innovation are proposing a Radiation Oncology (RO) Model. The intent of the proposed RO Model is to promote quality and financial accountability for episodes of care involving radiation therapy services. The RO Model would test whether prospective episode-based payments to physician group practices, hospital outpatient departments, and freestanding radiation therapy centers for radiotherapy (RT) episodes of care would reduce Medicare expenditures while preserving or enhancing the quality of care for Medicare beneficiaries.

Since 2014, through the Center for Medicare and Medicaid Innovation (CMMI), CMS has been exploring potential ways to test an episode-based payment model for RT services. In December 2015, Congress passed the Patient Access and Medicare Protection Act, which required the Secretary of Health and Human Services to submit to Congress a report on "the development of an episodic alternative payment model" for RT services. The report was published in November 2017. The report identified three key reasons why radiation therapy is ready for payment and service delivery reform: the lack of site neutrality for payments; incentives that encourage volume of services over the value of services; and coding and payment challenges.

The five-year model is currently projected to begin either January 1, 2020 or April 1, 2020, and end December 31, 2024. CMS estimates a net impact of $260 million to the Medicare program over a 5-year period, with a range of impacts between $50 million and $460 million in net Medicare savings.

Participation:

The proposed RO Model would require mandatory participation from providers and suppliers that furnish RT services within randomly selected Core-Based Statistical Areas (CBSAs). As proposed, the RO Model plans to sample approximately 40 percent of all eligible RT episodes or one-third of eligible providers.

RO Model participants treating beneficiaries with one of the 17 included cancer types would receive prospective, episode-based (i.e. bundled) payment amounts for RT services furnished during a 90-day episode of care, instead of regular Medicare fee-for-service (FFS) payments throughout the model performance period.

HEALTH POLICY & ECONOMIC ISSUES, Cont.

Episode payments in the RO Model would be split into a professional component (PC) payment, which is meant to cover payment for the included RT services that may only be furnished by a physician, and the technical component (TC) payment, which is meant to cover payment for the included RT services by the freestanding or hospital facility, including the provision of equipment, supplies, personnel, and costs related to RT services. This division reflects the fact that RT professional and technical services are sometimes furnished by separate providers or suppliers and paid through different payment systems (i.e, Medicare Physician Fee Schedule and Hospital Outpatient Prospective Payment System).

A RO participant would be a physician group practice (PGP), freestanding radiation therapy center, or hospital outpatient department (HOPD). For example, a participating HOPD would have at least one PGP to furnish RT services at the HOPD. A PGP would furnish the PC as a "Professional participant" and a HOPD would furnish the TC as a "Technical participant." Both would be participants in the RO Model, furnishing separate components of the same episode. A participant may also elect to furnish both the PC and TC as a "Dual participant" through one entity, such as a freestanding radiation therapy center.

CMS proposes to exclude certain providers and suppliers from participation under the RO Model, including services furnished in an Ambulatory Surgical Center (ASC), Critical Access Hospital (CAH), or the 11-designated Prospective Payment System-Exempt Cancer Hospitals. RT services furnished in Maryland, Vermont, the US Territories and participants in the Pennsylvania Rural Health Model are also exempt from this proposal.

Included Cancer Types, Radiation Therapy Modalities and Services:

The RO Model would take significant steps towards making prospective episode-based payments in a site-neutral manner for 17 different cancer types (anal, bladder, bone metastases, brain metastases, breast, cervical, CNS tumors, colorectal, head and neck, kidney, liver, lung, lymphoma, pancreatic, prostate, upper GI and uterine). CMS chose to exclude skin cancer, benign neoplasms and cancers that are rarely treated with radiation.

CMS proposes to include the following RT modalities: various types of external beam RT, including 3-dimensional conformal radiotherapy (3DCRT), intensity modulated radiotherapy (IMRT), stereotactic radiosurgery (SRS), stereotactic body radiotherapy (SBRT), and proton beam therapy (PBT); intraoperative radiotherapy (IORT); image-guided radiation therapy (IGRT); and brachytherapy.

CMS proposes that the RO Model would include most RT services furnished in HOPDs and freestanding radiation therapy centers. Services furnished within an episode of RT usually follow a standard, clearly defined process of care and generally include a treatment consultation, treatment planning, technical preparation and special services (simulation), treatment delivery, and treatment management.

In addition, CMS proposes to include brachytherapy radioactive elements (i.e., radioisotopes or seeds) and 4 brachytherapy-related surgical procedures (i.e., CPT 55920 placement of pelvic needles/catheters; CPT 57155 placement of tandem & ovoids; CPT 57156 placement of vaginal cylinder; and CPT 58346 placement of Heyman capsules) in the bundled payment.

CMS would exclude low volume RT services from the Model. These include certain surgical procedures related to brachytherapy catheter/applicator insertion, neutron beam therapy, hyperthermia treatment, and radiopharmaceuticals.

CMS would also exclude evaluation and management (E&M) services as part of the episode payment. RO participants would continue to bill E&M services under Medicare FFS.

Episode Triggers and Payment:

The RO Model would test the cost-saving potential of prospective episode payments for certain RT services furnished during a 90-day episode, and also test whether episode payments lead to shorter courses of RT (that is, fewer doses, also known as fractions), more efficient care delivery, and higher value care for Medicare beneficiaries.

Day 1 of the episode would be triggered by the date of service that a Professional participant or Dual participant furnishes the initial treatment planning service (i.e. CPT

HEALTH POLICY & ECONOMIC ISSUES, Cont.

77261-77263), provided that a Technical participant or Dual participant furnishes an RT delivery service within 28 days of the treatment planning service. In other words, the relevant 90-day period would be considered an episode only if a Technical participant or Dual participant furnishes the TC to a Medicare beneficiary within 28 days of when a Professional participant or Dual participant furnishes the PC to such RO beneficiary. When those circumstances occur, the "start" of the episode would be the date of service that the initial treatment planning service was rendered. If, however, a Technical participant or Dual participant does not furnish the TC to a Medicare beneficiary within the 28-day period, then no episode will have occurred and any payment would be made to the RO participant in accordance with the incomplete episode policy.

CMS proposes to pay for complete episodes in two installments: one tied to when the episode begins, and another tied to when the episode ends. Under this proposed policy a Professional participant would receive two installment payments for furnishing the PC of an episode, a Technical participant would receive two installment payments for furnishing the TC of an episode, and a Dual participant would receive two installment payments for furnishing the PC and TC of an episode.

Pricing and Payment:

The RO Model would transition to site-neutral payment by establishing a common, adjusted national base payment amount for the episode, regardless of treatment modality and where it is furnished.

Participant-specific payment amounts would be determined based on proposed national base rates, trend factors, and adjustments for each participant's case-mix, historical experience, and geographic location.

CMS would further adjust payment amounts by applying a discount factor. The discount factor, or the set percentage by which CMS reduces an episode payment amount, would reserve savings for Medicare and reduce beneficiary cost-sharing. The discount factor for the PC would be 4%, and the discount factor for the TC would be 5%. The payment amount would also be adjusted for withholds for incomplete episodes (2% for PC and TC), quality (2% for PC), and beneficiary experience (1% for TC starting in 2022). RO participants would have the ability to earn back a portion of the quality and patient experience withholds based on clinical data reporting, quality measure reporting and performance, and the beneficiary-reported Consumer Assessment of Healthcare Providers and Systems (CAHPS®) Cancer Care Radiation Therapy Survey. The standard beneficiary coinsurance amount and sequestration would remain in effect.

PROPOSED NATIONAL BASE RATES BY CANCER TYPE (IN 2017 DOLLARS)

Cancer Type	Professional Base Rate	Technical Base Rate
Anal Cancer	$2,968	$16,006
Bladder Cancer	$2,637	$12,556
Bone Metastases	$1,372	$5,568
Brain Metastases	$1,566	$9,217
Breast Cancer	$2,074	$9,740
Cervical Cancer	$3,779	$16,955
CNS Tumor	$2,463	$14,193
Colorectal Cancer	$2,369	$11,589
Head and Neck Cancer	$2,947	$16,708
Kidney Cancer	$1,550	$7,656
Liver Cancer	$1,515	$14,650
Lung Cancer	$2,155	$11,451
Lymphoma	$1,662	$7,444
Pancreatic Cancer	$2,380	$13,070
Prostate Cancer	$3,228	$19,852
Upper GI Cancer	$2,500	$12,619
Uterine Cancer	$2,376	$11,221

Quality:

The RO Model would qualify as an Advanced Alternative Payment Model (Advanced APM) and a Merit-based Incentive Payment System APM (MIPS APM) under the CMS Quality Payment Program (QPP). The RO Model would

HEALTH POLICY & ECONOMIC ISSUES, Cont.

Eligible Medicare FFS beneficiaries will be included in the RO Model if they receive RT services at a selected CBSA site; is eligible for Medicare Part A and enrolled in Medicare Part B; and has "traditional" Medicare FFS as the primary payer. Medicare beneficiaries enrolled in any managed care organization, including a Medicare Advantage plan is excluded from the RO Model. The RO Model's proposed design would not allow Medicare beneficiaries to "opt out" of the Model's pricing methodology, however, beneficiaries have the right to choose to receive RT services in a geographic area not included in the RO Model.

Beneficiaries would still be responsible for the same cost-sharing as under the traditional payment systems (e.g., typically 20% of the Medicare-approved amount for services), but because CMS would be applying a discount to each of these components, beneficiary cost-sharing may be, on average, lower relative to what typically would be paid under traditional Medicare FFS. As with all CMMI models, CMS would monitor the RO Model to guard against any unintended consequences that might negatively impact beneficiaries.

Next Steps:

The Professional Economics Committee continues to analyze potential impacts of the proposed rule and is conducting additional claims data analysis. The AAPM is collaborating with ASTRO and other professional societies and stakeholders on actions and initiatives, and will submit written comments to CMS prior to the September 16th deadline. The final rule will be published on or after November 1st depending on the final 2020 RO Model start date. Randomly selected providers will be identified in the final rule.

For additional information and a more detailed summary of the RO Model proposed rule, go to AAPM's Government Affairs website page. ■

ONLINE LONGITUDINAL ASSESSMENT WILL START IN JANUARY 2020

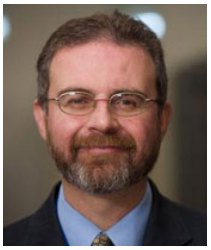
ABR NEWS Jerry D. Allison, ABR Trustee ■ Kalpana M. Kanal, ABR Trustee ■ Matthew B. Podgorsak, ABR Trustee
Robert A. Pooley, Incoming ABR Trustee ■ J. Anthony Seibert, ABR Governor

OLA is a progressive online assessment that will replace the previous proctored MOC exam required every 10 years. OLA is aligned with the other three parts of MOC that remain the same—Part 1: licensure or professional standing attestation; Part 2: CE and self-assessment; and Part 4: participation in practice quality improvement activities. When you read this the roll out of OLA for medical physics will only be a few months away. We, as trustees and governors, look forward to this. We also look forward to it because we are all enrolled in Maintenance of Certification (MOC) and we feel this will be a great improvement over the traditional decennial exam. It has been almost a year since the ABR implemented OLA for diagnostic radiologists. In the six months that followed the response has been overwhelmingly positive.

Over 18,000 diagnostic radiologists have already begun their participation, which is 94 percent of those participating in MOC. So far, they have answered over 775,00 questions. This is one of the great strengths of OLA. The ten-year exam evaluated diplomates on approximately 120 questions every ten years and the questions themselves might have a small group of diplomates upon which to make the evaluation. In diagnostic medical physics we might have a group of 35 people each year; in therapy, a few hundred; but in nuclear it might be fewer than 10. In OLA each diplomate will have a minimum of 520 questions every 10 years and each question will be used for many more diplomates. Even in nuclear medical physics we will have more than 100 diplomates in the group.

J. Allison

K. Kanal



M. Podgorsak

R. Pooley

J.A. Seibert

OLA Benefits

Most diplomates view OLA positively because it eliminates the decennial exam. While the performance on the MOC exam was very good, most diplomates considered it highly stressful. This led some to lengthy study periods and taking the exam early "just to be sure." The ten-year exam was not popular. Most medical physicists who have considered this believe in the following benefits provided by OLA:

- it eliminates the ten-year MOC exam
- it eliminates the need to go to a Pearson VUE center
- it does not require you to set aside time to study
- it offers immediate feedback with rationale and references
- questions answered incorrectly are followed up with a similar question in a few weeks
- it is more focused and relevant to your clinical practice
- it is designed to be an ongoing, learning, and non-stressful experience
- it is flexible – within broad guidelines you decide how often to engage with OLA

What are the key elements of the OLA process?

- The OLA questions are intended to query "walking-around knowledge."
  - Questions from physicians, allied health personnel, service engineers, and the general public that you might encounter as hallway consults or phone questions in a routine workday
- How will I know I have questions to answer?
  - You will receive a weekly email reminder with a link to your OLA home page
  - On your homepage you will see how many questions are available
- How many questions do I have to answer?
  - 52 questions per year per certificate
  - OLA will deliver two question opportunities per week per certificate
  - OLA will store up to eight questions per certificate
- What if a question is not relevant to my practice?
  - You can decline to answer up to 10 questions per year
- How should I prepare for OLA?
  - Study should not be required. OLA is not an exam; it's an assessment of your everyday knowledge which has developed over several years
- Weekly questions? What if I need time off?
  - OLA is flexible and designed to allow you up to six months off every year
- What if I only want to be reminded once a month, or not at all?
  - You can change your communication preferences from your myABR dashboard
- Do I need to enroll in OLA if I'm already in MOC?
  - No. If you are currently participating in MOC, you will be automatically enrolled in OLA
- Which browser platforms are supported?
  - Chrome, Firefox, Safari, Internet Explorer, and Edge
  - Minimum display resolution of 1024x768
- What if I don't want to participate?
  - If you don't want to participate in OLA you can still maintain your certificate by passing the medical physics Certifying (oral) Exam every five years

How Will my OLA Performance be Evaluated?

Your OLA performance will be displayed on your OLA dashboard after you have answered 52 calibrated questions. The display will reflect your performance as it relates to the passing standard for the questions you have answered. The amount of time it will take to reach 52 calibrated questions will vary based on the unique set of questions you have answered. While OLA is designed to be as stress-free as possible, the MOC process does require an evaluation. Each diplomate's OLA performance will be evaluated in March following the completion of at least 200 OLA questions. The evaluation is based on the last 200 questions. Remember that each OLA question includes a rationale describing why the expected answer is correct and a reference. If you miss a question, you will receive a similar question in a few weeks, so you can use OLA as a tool to fill in gaps in your knowledge.

How is the Passing Standard Set?

The passing standard for OLA is criterion referenced; OLA is not graded on a curve. The passing standard for each OLA question is established individually and the aggregate rating for your 200 questions defines your passing standard.

The passing standard is set by OLA participants that have answered the same questions, although in a different sequence than you. These participants include physicists from private practice and academic environments; MS and PhD physicists, diverse in age and gender. We would encourage you to participate in the standard-setting process. OLA participants who watch a short question rating video and complete a four-question quiz may participate. After answering an OLA question, you will have the ability to rate the question, along with your colleagues, to establish the passing standard.

Final Preparations

Beginning around mid-October the ABR will initiate a series of messages with the OLA details. Be sure to keep your contact information up to date.

In early November all medical physics diplomates participating in MOC will have the opportunity to access the OLA system for pre-launch. During pre-launch you will be able to log into the system and access practice questions specific to your certificate(s). The primary purpose of the pre-launch period is to familiarize yourself with the OLA format and types of questions you may see when OLA launches live in January 2020.

While pre-launch is optional, we encourage you to take advantage of the opportunity to prepare for the OLA live launch in January 2020.

So why do we do all this?

- ✓ MOC is designed to make all of us a little better by enabling continuing learning, participation in quality and safety activities, and evaluation, which can lead to self-improvement (especially in OLA)
- ✓ Participating in MOC is the right thing to do
- ✓ MOC is expected by the public as determined by focus groups
- ✓ MOC keeps the process in the hands of medical physicists
- ✓ Lack of a robust MOC process could lead to a process by regulators, the federal government, insurance companies, and/or other regulatory agencies, e.g., the Joint Commission (JC).

We are looking forward to OLA. Please remember that the ABR is always available to answer questions and solve problems. "Ask us first."

Ave atque Vale (Hail and Farewell!)

With this article we say goodbye to Dr. Jerry D. Allison, who served the board as a volunteer for many years as a question writer, committee member, and oral examiner. In the last eight years he has been the medical physics trustee with the NMP portfolio. We will miss Jerry's hard work and wise counsel.

We also welcome Dr. Robert A. Pooley, who has also been an active volunteer. He now takes up the role of medical physics trustee with the NMP portfolio. ■

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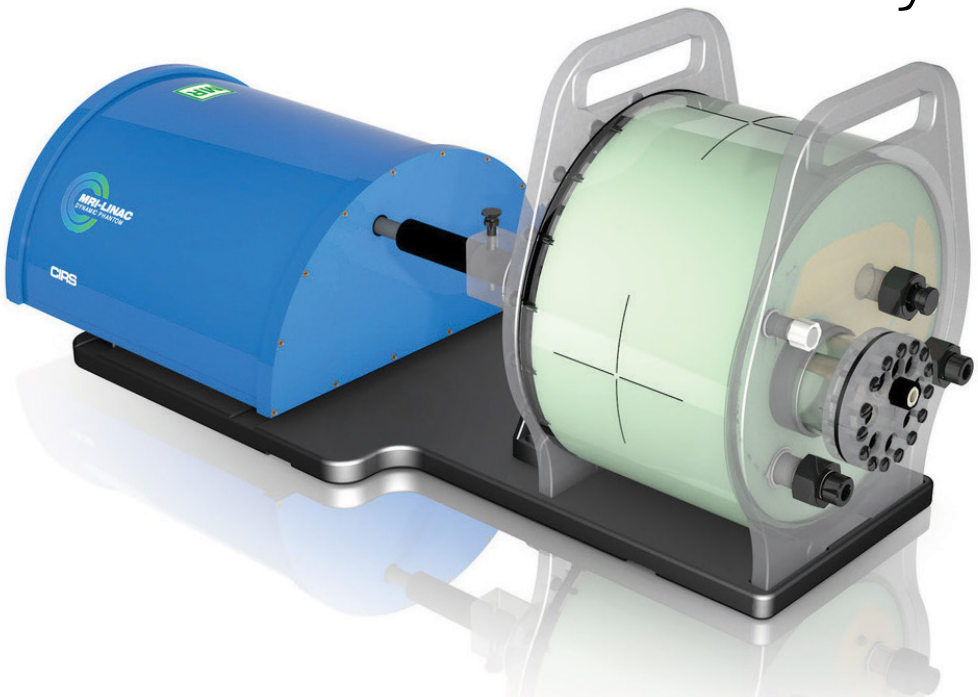

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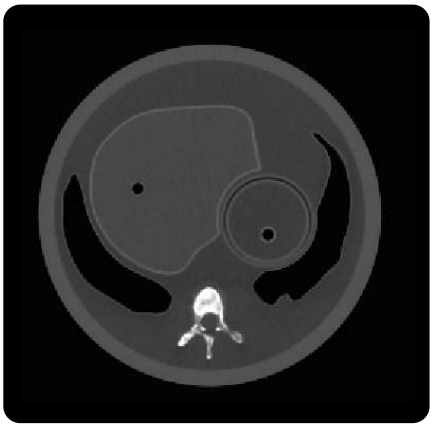

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INFORMATION FOR MEDICAL PHYSICISTS

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

Stereotactic Breast Biopsy and Breast Ultrasound Accreditation Programs

In mid-June, electronic image upload went live for both SBBAP and BUAP. You may recall that all of the other imaging accreditation programs began [mandatory] electronic image upload back in the fall of 2018, but SBBAP and BUAP had unique technical challenges that required more time to address. Electronic upload for SBBAP and BUAP is not mandatory at this time, so facilities can still submit film if they prefer.

Please feel free to email questions and concerns to breastultrasound-accred@acr.org and/or stereo-accred@acr.org as appropriate.

MRI Accreditation Program

There was a recent change to the appearance of the ACR MRI phantom. Due to inability to obtain previously used material, JM Specialty Parts, the designated ACR MR phantom vendor, has begun using a different material for the Slice 5 insert. Although the insert design and material have changed, there is no impact on the current scanning requirements. The MR physics subcommittee tested and approved the material. It will be used in the manufacture of all new phantoms. If you possess a phantom with the old slice 5 insert, it is still acceptable to use.

ACR Updates Session at the AAPM Annual Meeting

I had the privilege of moderating a session on ACR activities on Tuesday afternoon at the AAPM Annual Meeting. I spoke for eight minutes at the beginning of the session to explain some lesser-known aspects of the ACR. We then heard from Eric Berns, PhD on the 2018 ACR Digital Mammography QC Manual, Chad Dillon, MS on the current status of the CT Accreditation Program, and Kyle Jones, PhD on the ACR Dose Index Registry for fluoroscopy, which was nearing completion of its pilot phase with data collected from approximately 60,000 exams. The final 15 minutes was Q&A with the speakers. If you were unable to attend the session, look for it on the AAPM Virtual Library when the Annual Meeting sessions go live.

ACR Updates in Your Inbox

ACR's Department of Quality and Safety publishes a quarterly eNews, where you will find updates on accreditation, Practice Parameters and Technical Standards, registries, and more. You can find the newsletter here, and at the bottom of that page you can sign up to receive the Q&S eNews in your inbox every quarter. I also highly recommend subscribing to the weekly *Advocacy in Action eNews*. ■

In each issue of this Newsletter, I'll present frequently asked questions (FAQs) or other information of particular importance for medical physicists. You may also check out the ACR's accreditation web site portal for more FAQs, accreditation application information, and QC forms.

New Colleagues at RTI Inc.

Friday, 09 August 2019

We are very pleased to announce two new appointments at RTI Inc. (U.S.), based in Towaco, NJ.

Ed Rappel has been appointed "Area Sales Manager" (ASM) in the U.S., responsible for managing RTI sales and growth in the Midwest region. Ed is centrally located in Chicago and will play a pivotal role in our continued success.

Ed has more than 15 years of experience in healthcare selling to medical physics departments, successfully representing CIVCO, where he managed a multi-state territory, selling patient positioning devices utilised in radiology for radiotherapy. In addition to prior positions, Ed represented *Nucletron*, a manufacturer and supplier of machines and applicators utilised by nuclear physicists to perform a method of cancer-fighting radiotherapy called High Dose Rate Brachytherapy.

Dr. Larissa Oliveira, Ph.D. in Nuclear Engineering, has been appointed as "Product Specialist" in Towaco. Dr. Oliveiro completed her Post-Doctorate in Radioprotection and Dosimetry at the *Institute of Radiation Protection and Dosimetry* (IRD/CNEN), Rio de Janeiro, Brazil, and brings a wealth of technical knowledge to our team.

Dr. Oliveira will oversee RTI's calibration lab in the U.S., while working closely with the Product Management and R&D teams at RTI Headquarters in Mölndal, Sweden.

Additionally, Larissa will be involved in the product development process, providing key market information and help support our U.S. customer base including OEMs.

Both appointments play a major part in the continuing global success of the company.

Later this month, they will be formally introduced to their Swedish colleagues at the RTI Headquarters by the President and the VP Sales and Business Development.

Until then, RTI AB is delighted to welcome aboard Ed and Dr. Oliveira!

UPDATES FROM THE AAPM ANNUAL MEETING

IMAGING ACCREDITATION PROGRAM

Tyler Fisher | Signal Hill, CA

The 2019 AAPM Annual Meeting in San Antonio just wrapped up and we were lucky enough to have sessions organized by both the ACR and the Joint Commission. Each session was well attended and presented updated information on the accreditation programs.

Joint Commission Updates

On Tuesday afternoon, Andrea Browne, the medical physicist from the Joint Commission, was able to present updates from the Joint Commission and take questions. Her talk focused on the implementation of the fluoroscopy standards, common questions from accredited organizations, and an overview of the most commonly scored items during inspections in the past 15 months.

As of the time of this newsletter's publication, the Joint Commission will have announced in its August issue of Perspectives that it has removed the specific requirement that all users of fluoroscopy have annual training in Image Gently, Image Wisely, and on the safe operating procedures of the fluoroscopy equipment they use. While there was a small cheer that went up amongst the audience in the room, Andrea made clear that there are still elements of performance that will require users of fluoroscopy to be properly trained and have the knowledge necessary to safely operate the equipment.

Andrea specifically referred to the following elements of performance as providing similar requirements that must be met for users of fluoroscopy:

HR 01.05.03: Staff Participate in Ongoing Education and Training.

EP1: Staff participate in ongoing education and training to maintain or increase their competency and, as needed, when staff responsibilities change. Staff participation is documented.

HR 01.06.01: Staff are competent to perform their responsibilities.

EP 1: The hospital defines the competencies it requires of its staff who provide patient care, treatment, or services.

EP3: An individual with the educational background, experience, or knowledge related to the skills being reviewed assesses competence.

EP 5: Staff competence is initially assessed and documented as part of orientation.

EP 6: Staff competence is assessed and documented once every three years, or more frequently as required by hospital policy or in accordance with law and regulation.

IMAGING ACCREDITATION PROGRAM, Cont.

MS 03.01.01: The organized medical staff oversees the quality of patient care, treatment, and services provided by practitioners privileged through the medical staff process.

EP 16: For hospitals that use Joint Commission accreditation for deemed status purposes: The medical staff determine the qualifications of the radiology staff who use equipment and administer procedures.

MS 06.01.03: The hospital collects information regarding each practitioner's current license status, training, experience, competence, and ability to perform the requested privilege.

EP 1: The hospital credentials applicants using a clearly defined process.

EP 9: For hospitals that use Joint Commission accreditation for deemed status purposes: A full-time, part-time, or consulting radiologist who is a doctor of medicine or osteopathy qualified by education and experience in radiology supervises ionizing radiology services.

The take-away for most of the audience was that the Joint Commission decided that it had been overly prescriptive in its requirement for fluoroscopy training but that users of fluoroscopy still need to be able to demonstrate to a surveyor, generally through the interview process or via observation of their practice, that they know how to properly use the equipment.

The following items were the most commonly scored items from 2018 and Q1 2019: MRI Access Control, a lack of Annual CT Technologist Education, a lack of CT Protocol Review, and not having a process to review CTDI alert levels. Due to the fact that most of the fluoroscopy standards are not in effect until 1/1/2020, it was no surprise that there were very few items scored from these new standards.

ACR CT Accreditation Program Updates

On Tuesday afternoon, the ACR had a two hour session organized by Dustin Gress of the ACR. We were fortunate to have Eric Berns speak on the 2018 Digital Mammography Quality Control Manual, Chad Dillon spoke about the CT Accreditation program, and Kyle Jones spoke about the Dose Index Registry Fluorscopy Pilot Program. All the speakers introduced updates about their respective programs, but we will discuss the changes to the CT accreditation program.

In the past year, the ACR accreditation programs have gone exclusively to a digital image submission process. This eliminates the need for submitting CD's and the stickers to label each submitted piece of work. It also allows the physicist to be more in control of the submission and uploading process. Chad highly recommended that the physicist work with the facility to enter the physics testing data, upload images, and review that the uploaded images match the entered data forms.

There are also significant changes to the phantom scoring process that are listed below:

Dosimetry Images Not Submitted
Previous: This was a major deficiency that required the facility to appeal and submit the proper images.
New: The reviewer will reject the submission and have ACR staff follow up with the facility to submit proper images.

CTDI Beam Collimation (NxT) on phantom data form does not match the CTDI images exclusive of scanner limitations
Previous: Major Deficiency.
New: A Minor Deficiency if the data form detector configuration is smaller than the CTDI images (overestimates dose), A Major Deficiency if the data form detector configuration is larger than CTDI images (underestimates dose).

Artifacts
Previous: Artifacts were only scored on module 3 of the phantom.
New: Artifacts will be scored on modules 1, 2, & 3 of the phantom and can be either a major or minor deficiency based on the reviewer's discretion. The following artifacts will not be scored: artifacts due to phantom construction, artifacts between modules, and artifacts due to the phantom.

CTDI Minimum Number of Images
Previous: No standard.
New: Must submit all images in one axial rotation. Minor deficiency if only one image from the axial rotation is submitted.

IMAGING ACCREDITATION PROGRAM, Cont.

Pitch
Previous: Minor Deficiency if the Pitch used on the ACR phantom scan was more than 10% different from what was in the phantom scanning data form.
New: Major Deficiency if the Pitch scanned on the phantom is more than 10% less than the pitch indicated on the phantom scanning data form. Minor deficiency if the Pitch scanned on the phantom is more than 10% greater than the pitch indicated on the phantom scanning data form.

Pediatric Abdomen CTDI Phantom Size
New: Major deficiency if the submitted CTDI image does not match the phantom size selected in the dose data form.

CTDI Beam Centering
Previous: No Deficiency
New: Major Deficiency if the beam is shifted off the end of the CTDI phantom by more than 50%.

Finally, the ACR is working on a new submission process that will allow for the submission of Dual-Energy scans. There currently have been three successful submissions of dual-energy adult abdomen protocols but it required a special process at the ACR to review the data. For facilities that want to submit a dual-energy protocol, it is recommended to take a CTDI image at each kVp, sum the resulting values, and submit both images for accreditation. Also, if the CT numbers in Module 1 do not meet the ACR standards, facilities should also submit a scan at 120 or 130 kVp to demonstrate acceptable CT Number accuracy.

The handouts from these presentations and many more are available now on the AAPM website. Additionally, these presentations have been digitally captured and will be part of the Virtual Library at some time. I highly encourage anyone who is interested in these topics to go and find these resources on the AAPM website. ■

For over 20 years, the AAPM Education & Research Fund has been a catalyst in raising awareness and obtaining support within our proud profession in the form of funding strategic education and research programs, such as seed grants for early-career researchers, matching support for clinical residency programs, and fellowships for PhD students. The Education & Research Fund is also used to attract undergraduates to the field of medical physics and to promote diversity.

Without the generous contributions from AAPM members, we could not have funded over 100 grants, fellowships, and residencies.

Please join your fellow colleagues by donating now to the Education & Research Fund. Together, we can ensure that this valuable platform of funding remains vibrant and continues to prosper and grow.

To Donate: www.aapm.org/education/edfundintro.asp

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CONGRATULATIONS TO THE

2019 Award Winners

AAPM/RSNA FELLOWSHIP FOR THE TRAINING OF A DOCTORAL CANDIDATE IN THE FIELD OF MEDICAL PHYSICS

Hadley Smith

ASTRO-AAPM PHYSICS RESIDENT/POST-DOCTORAL FELLOW SEED GRANT

Siamak Nejad-Davarani, PhD

2019 DREAM — DIVERSITY RECRUITMENT THROUGH EDUCATION AND MENTORING PROGRAM

Ayobami Ayodele
Neha Swati Bhatt
Matthew Daniel Hwang
Liyan Jacob
Gabrielle R. Moss
Erin Snoddy
Rachel Paige Trevillian

RESEARCH SEED FUNDING GRANT

Dante Capaldi, Michele Kim and Thomas Mazur

AAPM/RSNA IMAGING PHYSICS RESIDENCY PROGRAM GRANT

David Hintenlang and Yogesh Thakur

2019 SUMMER UNDERGRADUATE FELLOWSHIPS

Alexander David
Elizabeth Rene Brown
Madison Emily Grayson
Tobey D. Haluptzok
Benjamin A. Insley
Brendan D. Koch
Olivia Starr Krieger
Eloise C. Lienert
Benson Sarah H. Lim
David K. Martinus
Joshua A. Miles
Tarun P. Naren
Megan Poremba
Noah Schweitzer
Brian-Tinh Duc Vu Jr
Trey J. Waldrop

SUMMER SCHOOL TUITION SCHOLARSHIPS

Arezoo Modiri, PhD
Marc J.P. Chamberland, PhD
Zhilei (Julie) Shen, PhD
You Zhang, PhD
Huijun Xu, PhD

THE AAPM EXPANDING HORIZONS TRAVEL GRANT

Elham Abouei
Elizabeth Boehnke
Justin Brown
Samuel Einstein
Eric Morris
Daniel Huff
Daniel Mulrow
Jennie Crosby

THE AAPM SCIENCE COUNCIL ASSOCIATES MENTORSHIP PROGRAM

Katelyn Hasse
David "Bo" McClatchy
Kristen McConnell
Eenas Omari
Lydia Wilson
Hao Zhang

AAPM BEST AWARDS

Davide Brivio
Jamison L. Brook
Jina Chang
Esther M. Vicente
Chuang Wang

MEDPHYS SLAM

Ricardo Rademacher, First Place
Mychaela Coyne, Second Place
Mary Peters, People's Choice Award

GRAND CHALLENGES

Computed Tomography Ventilation Imaging Evaluation Challenge (CTVIE)

Team 1:

Wei Shao, PhD
John E. Bayouth, PhD
Joseph M. Reinhardt, PhD
Gary E. Christensen, DSc

Team 2:

Guillaume Cazoulat, PhD
Kristy K. Brock, PhD
Molly M. McCulloch, PhD

Autosegmentation on MRI for Head-and-Neck Radiation Treatment Planning Challenge (RT-MAC)

Team 1:

Xue Feng, PhD
Quan Chen, PhD

Team 2:

Petr Jordan, PhD
John Van Heteren, PhD
Phil Adamson
Jeff Newell

TJACK FOWLER JUNIOR INVESTIGATOR AWARD

Davide Brivio, PhD

JACK KROHMER JUNIOR INVESTIGATOR AWARD

Xue Dong, PhD

THE JOHN R. CAMERON YOUNG INVESTIGATORS SYMPOSIUM

1st Place: *Jessica Rodgers*

2nd Place: *Abdelkhalek Hammi*

3rd Place: *Eric Morris*

AAPM AWARD FOR INNOVATION IN MEDICAL PHYSICS EDUCATION

Andrea McNiven, PhD

JOURNAL OF APPLIED CLINICAL MEDICAL PHYSICS PAPER AWARDS

George Starkschall Award of Excellence for an Outstanding Radiation Oncology Physics Article

Rajesh Pidikiti, Bijal C. Patel, Matthew R. Maynard, Joseph P. Dugas, Joseph Syh, Narayan Sahoo, Hsinshun Terry Wu and Lane R. Rosen

Edwin C. McCullough Award of Excellence for and Oustanding Medical Imaging Physics Article

Sebastian Ehn, Thorsten Sellerer, Daniela Muenzel, Alexander A. Fingerle, Felix Kopp, Manuela Duda, Kai Mei, Bernhard Renger, Julia Herzen, Julia Dangelmaier, Benedikt J. Schwaiger, Andreas Sauter, Isabelle Riederer, Martin Renz, Rickmer Braren, Ernst J. Rummeny, Franz Pfeiffer and Peter B. Noel

Peter R. Almond Award of Excellence for an Outstanding Radiation Measurements Article

David E. Hintenlang, Xia Jiang and Kevin J. Little

Michael D. Mills Editor In Chief Award of Excellence for an Outstanding General Medical Physics Article

Eric D. Morris, Joshua P. Kim, Paul Klahr and Carri K. Glide-Hurst

MEDICAL PHYSICS JOURNAL PAPER AWARDS

Moses & Sylvia Greenfield Paper Award

James R. Scheuermann, Adrian Howansky, Marc Hansroul, Sebastien Léveillé, Kenkichi Tanioka and Wei Zhao

Farrington Daniels Paper Award

Linh T. Tran, David Bolst, Lachlan Chartier, Dale Prokopovich, Susanna Guatelli, Alex Pogossov, Marco Petasecca, Michael Lerch, Mark Reinhard, Marco Povoli, Angela Kok, Vladimir Perevertaylo, Naruhiro Matsufuji, Tatsuaki Kanai, Michael Jackson and Anatoly B. Rosenfeld

HONORARY MEMBERSHIP

Kimberly E. Applegate, MD and Carl E. Ravin, MD

FELLOWS

Max Amurao, PhD
Aldo Badano, PhD
Ross I. Berbeco, PhD
Bette W. Blankenship, MS
Minsong Cao, PhD
Wesley S. Culberson, PhD
Chris John Diederich, PhD
Frank F. Dong, PhD
William D. Erwin, MS
Rebecca Fahrig, PhD
Ryan T. Flynn, PhD
William Robert Geiser, MS
Anne W. Greener, PhD
Amy S. Harrison, PhD
Geoffrey D. Hugo, PhD
Andrew Jackson, PhD
Aaron K. Jones, PhD
Srinivas Cheenu Kappadath, PhD
Katja M. Langen, PhD
Shuai Leng, PhD
Jessica R. Lowenstein, MS
Martha M. Matuszak, PhD
Zoubir Ouhib, MS
Brent C. Parker, PhD
Xiangrong (Sharon) Qi, PhD
Donna M. Reeve, MS
Andries N. Schreuder, MS
Ioannis Sechopoulos, PhD
Donna M. Stevens, MS
Iris Z. Wang, PhD
Richard E. Wendt, III, PhD
Sharon L. White, PhD

JOHN S. LAUGHLIN YOUNG SCIENTIST AWARD

Wei Liu, PhD

MARVIN M.D. WILLIAMS PROFESSIONAL ACHIEVEMENT AWARD

Bruce J. Gerbi, PhD and Larry E. Sweeney, PhD

EDITH H. QUIMBY LIFETIME ACHIEVEMENT AWARD

James C. Chu, PhD and Ellen D. Yorke, PhD

WILLIAM D. COOLIDGE GOLD MEDAL

John M. Boone, PhD

View all photos from the AAPM 2019 Awards & Honors Ceremony here.

View the entire AAPM 2019 Awards & Honors Ceremony Program here.

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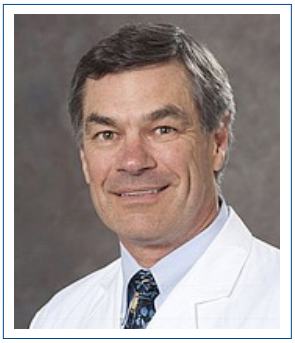
WILLIAM D. COOLIDGE GOLD MEDAL

INTRODUCTION SPEECH J. Anthony Seibert, PhD | Sacramento, CA



JOHN M. BOONE, PhD

2019 COOLIDGE GOLD MEDAL AWARDEE

Fellow colleagues, AAPM members, and guests attending this auspicious awards ceremony – it is my honor and privilege to introduce the 2019 Coolidge Award recipient -- my long-time friend and professional associate John Boone. In this short introduction, I hope to illustrate some of John's significant contributions to our field of Medical physics in terms of Research, Education and AAPM service and the deserved recognition this highest honor of the American Association of Physicists in Medicine bestows upon him. He joins a select group of awardees who have demonstrated outstanding contributions to the profession of Medical Physics.

Research

John is a consummate researcher. He and I have known each other since 1979, when he was accepted into the Radiological Sciences program at UC Irvine – one year after me. Our training and direction were very similar during graduate school, with a focus on digital acquisition of fluoroscopy sequences to provide quantitative capabilities and develop the process of digital subtraction angiography. He received the PhD in Radiological Sciences in1985 from the program.

In the intervening years, first as an assistant professor at the University of Missouri, Columbia, and subsequently at Thomas Jefferson University in Philadelphia, John became a master of Monte-Carlo computer routines, developing models for x-ray spectra for general radiography and mammography. John arrived at UC Davis in 1992 where he has remained since. Upon his arrival to UC Davis, he continued diligently in his quest for NIH funding and grants. Shifting to an interest in Computed Tomography, and more specifically in Breast Computed tomography, one of his areas of focus was on CT dosimetry. With empirical and theoretical approaches, he produced (and is still producing) many articles pointing out the limitations of the dosimetry methods of the day and has provided very insightful approaches to describe how newer technological applications such as cone-beam acquisition geometry can be accurately determined.

John was the co-chair and primary author of the AAPM report 204 "Size-specific Dose Estimates in Pediatric and Adult Body CT Examinations", which has been downloaded over 70,000 times and been cited in over 350 peer-reviewed publications to date. He also chaired the more recent AAPM report 293, extending the SSDE concept to head CT. These ground-breaking reports from the AAPM task group efforts are being incorporated by the International

INTRODUCTION SPEECH, Cont.

Electrochemical Commission as an international standard. Note that John is also quite an international traveler, having traveled across the globe to China last year and more recently Israel. John was the investigator in the concept, design, implementation, validation, and now in the final stages of clinical translation of a career-long effort for Dedicated Breast CT and showed the first images of a human volunteer at the 2004 RSNA. I remember the days when the pundits said, "it couldn't be done in a clinically effective way" but John defied conventional wisdom, was convincing enough to garner millions of dollars from the NIH, and has demonstrated in many publications the benefits of breast CT compared to conventional mammography, due to the power of the 3-dimensional acquisition and overcoming superimposition of anatomy. The benefits are striking, and the effort continues through 4 generations of CT scanners built at UC Davis. We look forward to future innovations and clinical applications in this area from him.

Professionally, John is board certified by the American Board of Radiology in Diagnostic Medical Physics since 1988 and is participating voluntarily in Maintenance of Certification. (Take note, all of you Lifetime Certificate Holders!) He has been active with respect to the issues of radiation dose reporting, particularly in computed tomography. He was the co-principal investigator of the University of California Dose Optimization and Standardization Endeavor which resulted in a major publication in the Journal of the American College of Radiology, worked with the California State Department of Public Health, Radiation Health Branch in incorporating the AAPM dose metric codified in the SB-1237 dose reporting law, volunteered to assist groups reviewing the issues and causes of the radiation overdoses that occurred chiefly in California, and has several professionally pertinent publications and patents that impact the way in which we as medical physicists operate in the professional domain.

He has been the principal architect of two "Best Paper in Medical Physics" journal articles in 2012 and 2015 and is a Fellow of many professional organizations (the most important being the AAPM, of course) --- 5 and counting.

INTRODUCTION SPEECH, Cont.

Education

Likewise, John has made a significant impact in the education of students who have become biomedical engineers, practicing medical physicists, and medical doctors.

He has contributed greatly to our profession as a mentor and instructor to 17 graduates under his tutelage (so far – more to come). This is his "pay it forward" act of selflessness. Destinations for his graduates have included major academic, research, industry, and regulatory positions. There is no doubt that many will demonstrate their own abilities to contribute greatly to our profession now and into the future, largely thanks to his guidance and altruistic nature.

Yes, he has also contributed to the (might I say) popular textbook, the Essential Physics of Medical Imaging. In fact, without John joining the textbook effort in 1993-1994 during the first edition and joining UC Davis, it may have never come to fruition. The authors are now embarking on the 4th Edition of the textbook, likely to hit the shelves sometime in late 2020.

A major effort with a group of august committee members resulted in ICRU Report 87, Radiation Dose and Image Quality Assessment in Computed tomography, which addresses the quantitative methodologies in the assessment. He was the primary author and as a Commissioner of the ICRU, took the lead in getting the report completed and published.

Because of his national and international reputation, John has been around the world spreading his knowledge and wisdom of medical physics for the benefit of all.

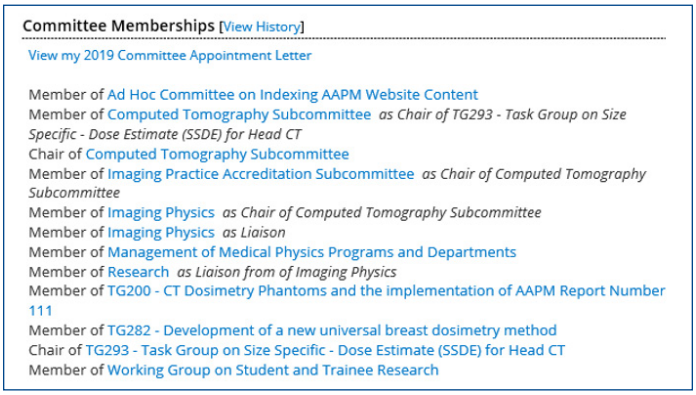
AAPM Service

John has made a great impact on the AAPM and significantly supported the mission in many, many ways through his volunteer contributions to the association.

A significant contribution to the Medical Physics journal has been a major focus. He was an Associate Editor for 16 years, Deputy Editor for 6 years, a member of the Committee on Journal Operations, on the editor search committee, and chair of the Journal Business Management committee for 3 years, during which he oversaw conversion to the on-line journal in 1999. When he was President of the AAPM, John commissioned the search for a new publisher.

Perhaps the pinnacle of contributions to the AAPM came in 2015 as the President of the Association. This was a very consequential 3-year period for the AAPM during which negotiations for NCRP and ICRU documents for the AAPM membership was completed, and as President, the signature for the purchase of the AAPM Headquarters in Alexandria, Virginia was finalized.

He has not fallen off the cliff after his Presidential term. John is contributing to a significant number of ongoing task groups and committees in 2019 and has provided numerous presentations and materials to the virtual library. A list of Committee Appointments includes:



Committee Memberships [View History]

View my 2019 Committee Appointment Letter

Member of Ad Hoc Committee on Indexing AAPM Website Content
Member of Computed Tomography Subcommittee *as Chair of TG293 - Task Group on Size Specific - Dose Estimate (SSDE) for Head CT*
Chair of Computed Tomography Subcommittee
Member of Imaging Practice Accreditation Subcommittee *as Chair of Computed Tomography Subcommittee*
Member of Imaging Physics *as Chair of Computed Tomography Subcommittee*
Member of Imaging Physics *as Liaison*
Member of Management of Medical Physics Programs and Departments
Member of Research *as Liaison from of Imaging Physics*
Member of TG200 - CT Dosimetry Phantoms and the implementation of AAPM Report Number 111
Member of TG282 - Development of a new universal breast dosimetry method
Chair of TG293 - Task Group on Size Specific - Dose Estimate (SSDE) for Head CT
Member of Working Group on Student and Trainee Research

His past AAPM activities, service and contributions are very lengthy – if you are interested, please look on the website for an impressive list since the turn of the century!

John is still impacting this annual meeting, and in fact annual meetings since 1995, during which he was the Scientific Program director. How? It's all about the numbering scheme for the annual meeting schedule. In 1991, it was impossible to tell at first glance where and when presentations and sessions were located, without having to go back to previous pages in the schedule to determine the day, session, and location. His schema accounted for all, and now when one consults the schedule, all the above are included. Thank you, John.

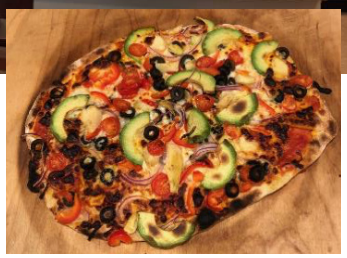
Other accomplishments

There's more to John than just professional and academic

INTRODUCTION SPEECH, Cont.

pursuits… One of his extracurricular activities is sailing… as an undergraduate at UC Berkeley, he was a member of the Sailing Team. Upon his arrival at UC Irvine, he ascended to the top of the Sailing Association as Commodore and participated in the Trans-Pac regatta from Los Angeles to Hawaii, and many international big-boat races into Mexican waters.

He is also quite adept at tackling major construction projects, literally from the ground up. Here is an example of rebuilding a deck from the raw uncut materials, providing the manpower to do the heavy lifting and depending on some "significant other's" advice to figure out the nuances of the project.



A connoisseur of fine foods and appetizers, all performed in the new kitchen he updated as shown in the photograph. He is a superb gelato and pizza maker, having learned these capabilities from the masters in Italy on a recent trip.

To end this brief introduction, I would like to say something about a trip above the Arctic Circle in the summer of 2000 that John and I participated in –part of a 4-man group that took 20 days to cover 400 miles on our way to the Arctic Ocean. What an adventure, where the sun never set, the mosquitos during most of the time were incessantly ubiquitous, and the river was unbelievably slow or terrifyingly rough with standing waves… And the fish were plentiful, with a competition for who caught the big one. I asked John to provide me pictures, and on the next page you see what he sent. A large picture of him and his fish, and a small picture of me and my fish… Controversy reigned!

So, I took the liberty of equalizing the picture size (right), and just wanted to point out that John wisely projected his fish from the lateral (thicker) projection, while mine, now upsized, was from the dorsal-ventral (thinner) projection. However, no contest with final result… John, you indeed caught the *big* one. Colleagues, guests, ladies and gentlemen: I would like to introduce to you John Boone, the highly deserving 2019 AAPM Coolidge Award recipient who joins a remarkable group of accomplished medical physicists. Congratulations, Dr. Boone. ■

INTRODUCTION SPEECH, Cont.

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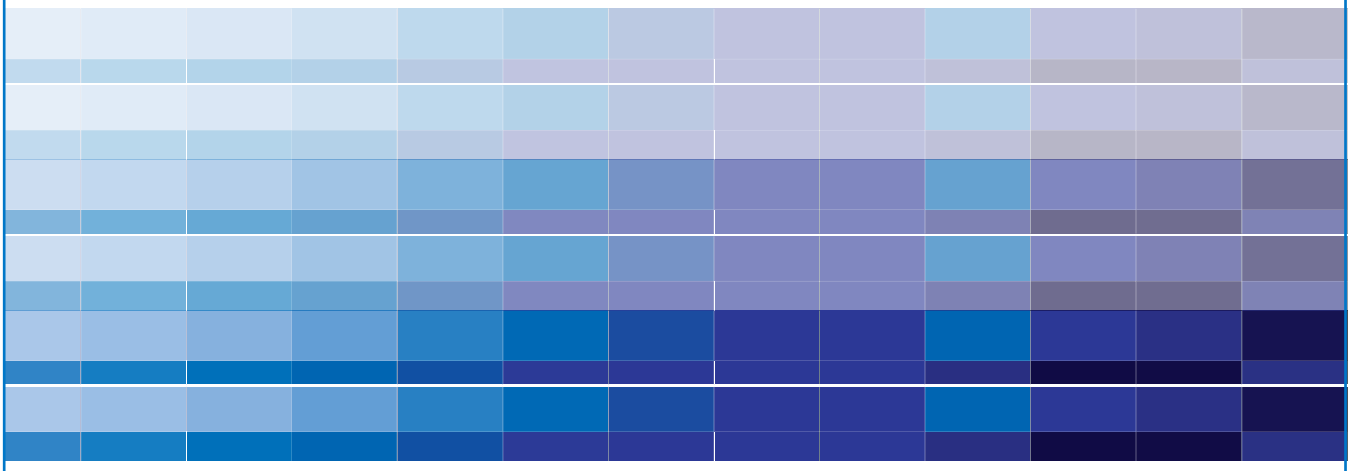

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WILLIAM D. COOLIDGE GOLD MEDAL

ACCEPTANCE SPEECH John Boone, PhD | Sacramento, CA

The bold titles initiating most paragraphs below represent the title of the corresponding slide that Dr. Boone was speaking to. The text below is true to the presentation, with context provided in some cases.

THANK YOU: Thank you very much. Well, it has been a long journey to this podium, and it has been exciting, and I am so appreciative and humbled to be here and receive the highest honor of the AAPM. I want to thank the Awards and Honors Committee, **Geoff Ibbott**, as chair, EXECOM, and the Board of Directors for conferring this award upon me. It is also really you — the members of the AAPM, that I am so appreciative of, and I hope to share that with you in the next few minutes.

TONY SEIBERT: My nominator, Dr. Tony Seibert and I went to graduate school together 40 years ago, and here we are on a beach in Northern California in 1980 – it's been a long journey. We've traveled all around the world teaching in AAPM ISEP programs, as well as other programs. He is the godfather of my daughter, as you can see in the picture. As you can see in the picture on the lower right, he is quite the Amazon warrior when we took a trip to the Amazon a few years back, after an ISEP meeting in Brazil.

MY NUCLEAR FAMILY: I have to thank my nuclear family. My parents in the upper left there are pictured 80 years ago at the 1939 World's Fair on a Portuguese schooner together at age 21 — chaperoned in that era. When this picture was taken, dark forces were taking over Europe. And so, my father went to war, but he started by training in San Diego, California. My parents were sweethearts from Detroit, and he told my mom — he married my mom before he shipped out – that "if I get back from this war, we're going to move the family to California." And, indeed they moved to California when he came back from the war; he went to UCLA and graduated on the G.I. Bill. And that's where my brothers and sister were raised as you can see in the photograph. We had a great life and it was a loving family, and of course that was the foundation of why I'm standing here before you today. I have to apologize for the 70's attire in the lower picture there, but next to that photo are my brother and sister Bob and Pat — those of us who remain from our nuclear family. I am so honored that my sister is here tonight to share this honor with me.

CHILDREN: Of course I also have a nuclear family that I am the father of, and I have these two beautiful children Emily and Julian — they are just the love of my life, they're fantastic kids, and of course they are millennials, age 30 and 31 — I learned a little bit about millennials today at the presidential symposium

ACCEPTANCE SPEECH, Cont.

— so now I can better interpret what they say when they call. So, thank you Cynthia and Amy for that!

Sue Boone and I were married for 30 years and divorced 5 years ago – I would be remiss to not thank her for her part in raising these beautiful children and helping me in this career.

GRADUATE STUDENTS: Graduate students are really a lot like children, and many of you know this, of course. It really was a passion of love for teaching these kids, and some of my graduate students are in the audience tonight. Every individual is different, and of course their projects are different, but it's been a fantastic and very rewarding opportunity to train these young scientists. When you look into the eyes of these young people, you see the future, and I assure you that the future is bright for our field of medical physics. And I was surprised last night when we had a little get together and they presented me with a word cloud of my publications - they all got together and had it printed on T-shirts, which you can see worn by my roommates here in San Antonio– So, thank you students for providing that wonderful gift, as well as a nice plaque with a similar imprint.

THE AAPM FAMILY: The AAPM family, you here in this room and those that are not in this room, have really been the foundation of my scientific maturation and accomplishment. If you think about what it means to be known in your field, the AAPM is not just this logo or the headquarters building, it's the people in this room. And I'm so proud to be a member of the AAPM, it has been a real joy to be a part of this. So many pictures and so many people – too many people to mention, of course, as I've had a long career in the AAPM. I'll just point out that the AAPM is not just the members, the students and residents, it's also the staff. When I was president a few years ago I really had a firsthand view of just how excellent the staff of this association is. I want to give a shout out to **Angela Keyser**, the executive director, and her fantastic crew that have made this meeting and all the meetings that you've been to work so well. She is just fantastic, and I can't say enough after working with these individuals on a daily basis. [picture fades in] And you might not know this, and I don't know if you'll recognize this individual, but she happens to be a queen of the Hunan province, and she is now your AAPM president. (applause). … only a little scary.

ADVENTURE CLUB: I have to give credit to these guys – I trained Tim, on the lower left there, he was a radiology resident when I was in Missouri early in my career, Randy was an ER doc in-training, and we played poker every week. These guys became very good friends, they are essentially my age, and we moved apart as you do after a training program. We made a pact that we would see each other for a week every year. Busy people, right? And we've done it 28 years in a row and are scheduled to go to Michigan fishing in a couple of months. This is free therapy for a week, and I recommend it highly for those of you who are young and have this opportunity to take something like this up.

ACCEPTANCE SPEECH, Cont.

CALIFORNIA: I have to thank the beautiful environment of California where I live, and also the University system in which I trained and have had employment with. My kids went to the University of California, my siblings went, and my father went to the University of California – of the 10, I think we have 7 of them covered. I work at the University of California Davis, and I am so thankful for California, its University system, and its beautiful physical setting.

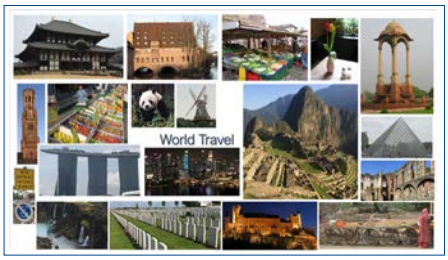
AMERICA: I've traveled a lot internationally, but of course I have also traveled extensively around the country – AAPM meetings in different cities and other meetings at various locations. I'm grateful and thankful for how beautiful our country is, and how lucky we are. This has just been a great opportunity to visit 49 states out of 50 – and I will get to Oklahoma before I die.

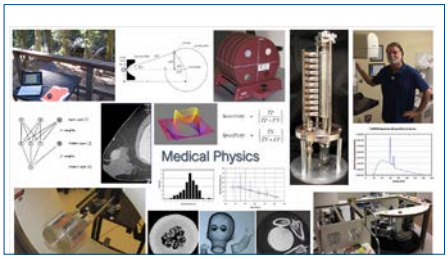
WORLD TRAVEL: As Tony mentioned, lots of world travel. I think I am just shy of about 40 international educational symposia, all over the world on 6 continents. Many of these have been with members of the audience here. And it's been an opportunity to combine passion of science with other people, many from developing countries. It's been an eye-opener to see just how excellent the AAPM is, as a group of medical physicists. I was lecturing in Denmark to a large group of young diagnostic physicists from all over Scandinavia, and I asked them, "Where you get your documents from?". And they said, "the AAPM!". And this was true in Malaysia and China and ….. you don't know how far-reaching those task group reports go. It really is amazing, and I've seen it firsthand.

MEDICAL PHYSICS: I love medical physics – I mean I was born a scientist, and I love the physics of our profession. I'm a bit of a tinkerer, a jack of all trades, and it's been just nothing but joy. I think of research when I'm bored while doing other things. So, it's been a long ride, and a good one. And I'm very appreciative to all those in this room who have been collaborators or reviewers on manuscripts and grants and part of the rest of the scientific ecosystem.

LORI: Lori was my high school sweetheart that was 50 years ago, and we're back together again. She lost her husband a few years ago, I was divorced 5 years ago, and she's turned this journey into a fairytale, and it's been pretty amazing…..

1969: ……but, in 1969 we got a couple things accomplished. Number 1: my first kiss (to Lori). This was the year of Woodstock. We are all scientists in this room and you probably recognize that next Saturday is the 50th anniversary of when a man — Neil Armstrong — walked on the moon. That night, I was camping along the shore of Lake Tahoe at 6200 feet with my brother — I was 15 years old, and I was out there in a sleeping bag under the stars with a transistor radio looking up to the moon as they were broadcasting live events that were happening on that orb – amazing. The other thing that happened in 1969 is that I knew I was to become a scientist. Most of you who are not old enough to remember, the 60's were all about the space race — we had news





ACCEPTANCE SPEECH, Cont.

— positive news, uplifting news, some setbacks with the space program, but science was in the news as a good thing, every week, if not more often. That's not the case now, and hopefully that will be corrected.

My nominator, Dr. Seibert, suggested that I say some words about a life of science. I would just observe that I have. I have chosen – it's not everybody's path, but it was my path – to integrate my personal life with my professional life. I was a nerd when I was 14, and I've been a proud nerd ever since. And it's been fun hanging out with you nerds, too. You know it really has been a great joy. When I have colleagues visit — some of you are in the audience, I don't put them up in hotels, they stay at my house, I cook them dinner, we get a bottle of something and go to the Jacuzzi and talk science until midnight — and then we get up in the morning and go to work and do what we're supposed to be doing. So, it's really been a great opportunity and treat to know all of you and to collaborate with many of you, and for that I am humbled and thankful.

THE FISH: I just have to comment on this fish thing. I'm glad to see that Tony, after all these years, has finally come to God, because when you really look at these fish — I mean that's a side-by-side comparison there, forget about dorsal views or camera angle!

Thank you very much! So honored! ■

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