AMERICAN ASSOCIATION of PHYSICISTS IN MEDICINE

Improving Health Through Medical Physics

AAPM Newsletter — Volume 43 No. 2 — MarchlApril 2018

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AAPM NEWSLETTER

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PRESIDENT ELECT'S REPORT

Cynthia McCollough, PhD I Rochester, MN

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WHY ARE YOU A MEDICAL PHYSICIST?

On February 1, 2018, just a few days before the Super Bowl game, which by the way was held in Minnesota for the first time in 26 years, the NFL Gospel Celebration was held at the university my daughter attends. She served as an usher for the performance (though no cell phones were allowed so there were no selfies with the guest artists or NFL players). Just days before one of the biggest games of their career, players, coaches, friends, family and fans gathered for a night of inspiration, praise and gospel music. In spite of the many ways that they could have been spending the time leading up to the big game, these players and fans chose to spend the time celebrating their faith, which for many is their source of strength and inspiration in the tough world of the NFL.

As medical physicists, it is important for us to also take time to celebrate our source of inspiration. What is it that keeps you going at the end of a long day when nothing seemed to work but there are still patients to treat? How do you cope when the young patient whose care you have been assisting with succumbs to his or her disease, when you don't get the grant that you are depending on, when you lose one or more of your top clients, when your administrator/boss tells you that your performance is lacking? Do you turn to your source of inspiration, whether that be a higher power or altruistic motive? Do you remember why it is that you chose Medical Physics in the first place? Do you stop to ponder how your work has impacted others for the better?

I believe that we all need something (or someone) to believe in. We need a foundation for our work that is strong enough to withstand the rough times that will inevitably come. Why? It's because why we do can be as important as what we actually do. Our motives and objectives paint the worldview in which we see our work, and it's those things that get us through the most demanding or difficult aspects of our profession. Did you pursue Medical Physics because you loved science and math, and discovering how things worked, but wanted to apply your abilities to improving human health? I know that is true for many of us. It is certainly true for me.

During the fall of my senior year in college, I had a bit of an identity crisis. I was a physics major and had worked for several years in my professor's nuclear physics lab. I knew how to bring up the proton beam on our 2.7 MV Van de Graff particle accelerator and conduct PIXE (Proton Induced X-Ray Emission) experiments to determine elemental composition of a variety of samples — including the ashes of a person who police suspected was poisoned with arsenic! As I signed up to take my GRE exam and started thinking about graduate school applications, I realized that I just didn't care about nuclear physics enough to spend my life in that field. Yes I liked the hands on experiments and cool "toys," but deep inside I didn't really care about quarks or "God particles." I just wasn't inspired.

Not wanting to see me forego graduate school, my professor (sort of reluctantly) told me about the field of Medical Physics. Wow - what a revelation. I had no idea such a career path involving physics even existed (this was pre-internet, so the ability to seek out career opportunities was essentially left to word of mouth). So, as President of the Society of Physics Students, I organized a field trip to the University of Michigan (about 3 hours away) to meet with my professor's brother, **Dr. Richard Hichwa**, who just happened to be a medical physicist working in PET research. He showed us the first PET image I'd ever seen, and it showed the foci of Parkinson's disease, unlocking the mystery of what part of the brain was affected by this crippling disease. I WAS HOOKED because I WAS INSPIRED!

To be able to see into the human body and find disease or the cause of disease — without having to cut open the patient — was incredible. From that moment on I realized that medical imaging was the career for me, and I have loved it ever since. Sure there are still hands on experiments and cool "toys," but when I see the images, I know that I have taken part in a miracle — seeing into the human body and discovering its form and function. The information obtained from these images makes a difference in the lives of millions of people each day around the globe, and can lead to the discovery of new knowledge aimed to reduce human disease and suffering. That's my reason for doing what I do. That's what gets me through long days and difficult situations.

Coming into this New Year, I hope that each of you can put your story into words. Write it down or tell it to your family or coworkers. Look inside and ask yourself why you became a medical physicist. Think about what makes this career so gratifying for so many of us. Keep that knowledge close to the front of your mind as you go about your daily work. Whether in the clinic, research lab, factory, business office or regulatory department, you are taking part in a field that at its very foundation is about helping people. I hope that you feel as good about that as I do, and that **focusing on your inspiration allows you to be the best medical physicist that you can be, enjoying what you do (even the bad days), because you know why you are doing it**.

PS — only 1 other student went on the field trip with me, **Kevin McCollough**. We stayed with his family in Ann Arbor and got to know each other a bit better. This August will be our 32nd wedding anniversary. I found my career and my husband in a single road trip. How's that for efficiency?

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EXECUTIVE DIRECTOR'S REPORT

Angela R. Keyser | Alexandria, VA

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I had the distinct pleasure of visiting my mentor, **Sal Trofi**, on a recent trip to Florida. Sal served as AAPM's Executive Director from 1993-2003 and oversaw the HQ move from New York City to the American Center for Physics and the complete staff turnover. He assembled an amazing group of association professionals, the foundation for the crew we have today! I attribute much of the success of AAPM's HQ team to Sal. He established a unique HQ culture that I've strived to continue. His legacy lives on! I am pleased to report that Sal and his wife Ingrid are living very busy and fulfilling lives in Venice, Florida. I think Sal was most excited to hear about the new HQ office and see pictures of the beautiful facility. It was very rewarding to share this with my mentor. He sends his regards to the many AAPM members that he interacted with during his 10-year service to the organization.

UPDATE ON AAPM'S NEW BUSINESS SOFTWARE

At their March 2017 meeting, the AAPM Board of Directors approved the purchase of a new Association Management System (AMS) with integrated Financial Management System (FMS), the main business software for the organization. The recommendation came from TG 285 - Task Group on AAPM Association Management System chaired by AAPM Treasurer **Mahadevappa Mahesh**. AAPM's current system, IMPAK/APAK, has been in place since 1996. The decision was prompted in part by the sale of the software company to another vendor that was not offering a package that met AAPM's requirements.

The new systems we are installing are Microsoft Dynamics 360 GP (formerly Great Plains) as our FMS, and Abila Netforum Enterprise as our AMS. As I write this article in mid-February, we are almost at 'Go Live' for the FMS with all records converted and training being finalized. The AMS contracts have been signed and implementation has begun. The AMS software is installed, the first round of data conversion has been performed and now work on configuration and customization is about to begin with a "Go Live" scheduled

for second week of May. This is a huge investment and undertaking, but I'm very pleased and proud of how the AAPM HQ team has managed this process. The next few months will be very busy, especially for the Information Services and Finance teams as we strive to build out functionality in the new system that meets or exceeds the tools provided by the old system.

NEW AAPM PUBLICATIONS

Three new AAPM Reports are available online:

- Report No. 113 - Guidance for the Physics Aspects of Clinical Trials (2018)
- Report No. 263 - Standardizing Nomenclatures in Radiation Oncology (2018)
- Report No. 268 - RECORDS: improved Reporting of montE CarlO RaDiation transport Studies: Report of the AAPM Research Committee Task Group 268 (2017)

2018 FUNDING OPPORTUNITIES

Science Council Associate Mentorship Program

(Application Deadline: April 1, 2018)

This program has been established to recognize and cultivate outstanding researchers at an early stage in their careers, with the goal of promoting a long-term commitment to science within AAPM. The program uses the process of 'shadowing' to integrate the Associates into the scientific activities of the organization. The program will include six Associates, each assigned to shadow one member from the AAPM Science Council, Research Committee, Therapy Physics Committee, Imaging Physics Committee, or Technology Assessment Committee. SC Associates will participate in the program for one year and would be funded for up to $4000 per Associate (to cover travel costs including flight, hotel, and meeting registration) to attend two consecutive AAPM Annual Meetings.

View additional information and access the online application

AAPM Graduate Fellowship

(Application Deadline: April 30, 2018)

The AAPM Fellowship for the training of a doctoral candidate in the field of Medical Physics is awarded for the first two years of graduate study leading to a doctoral degree in Medical Physics. Both BSc. and MS holders are eligible to apply. A stipend of $13,000 per year, plus tuition support not exceeding $5,000 per year will be assigned to the recipient.

Graduate study must be undertaken in a Medical Physics Doctoral Degree program accredited by the CAMPEP.

View additional information and access the online application

Research Seed Funding Grant

(Application Deadline: May 22, 2018)

Three $25,000 grants will be awarded to provide funds to develop exciting investigator-initiated concepts, which will hopefully lead to successful longer term project funding from the NIH or equivalent funding sources.

Funding for grant recipients will begin on July 1 of the award year. Research results will be submitted for presentation at future AAPM meetings.

Applicants must be a member of AAPM at time of application (any membership category).

View additional information and access the online application

AAPM Best Award

(Application Deadline: May 22, 2018)

Best Medical will provide five fellowships in the amount of $1,000 each, to be used for travel, food and lodging expenses to attend the 2018 AAPM 60th Annual Meeting & Exhibition. AAPM will provide complimentary Annual Meeting registration for each recipient, including social function tickets.

View additional information and access the online application

AAPM MEETING NEWS

Mark your calendars for four upcoming AAPM meetings:

AAPM Spring Clinical Meeting

April 7 - 10, 2018

JW Marriott Las Vegas Resort and Spa, Las Vegas, Nevada

The Spring Clinical Meeting program is available online. Also, note that several AAPM groups plan to meet during the 2018 AAPM Spring Clinical Meeting. A list of AAPM activities is available online. Please make time during the meeting to visit the vendors and thank them for their support of AAPM and the Medical Physics profession.

AAPM Teaching Workshop

Improving the Teaching and Mentoring of Medical Physics

July 26 - 27, 2018, Hilton Nashville Downtown Hotel, Nashville, Tennessee

Plan to attend this 1.5-day workshop and consider alternate approaches to the teaching of Medical Physics and the results of research into how people learn. Workshop presenters will be those who have demonstrated what works in the teaching of Medical Physics, and experts in the field of the science of learning and project-based learning.

AAPM 2018 Summer School

Image Guidance in Radiation Therapy: Techniques, Accuracy, and Limitations

July 26 - 28, 2018, Vanderbilt University, Nashville, Tennessee

View program and registration opens April 4!

This 2.5-day course will provide an overview of the state-of-the-art image-guidance techniques employed in radiation therapy. This course is beneficial to medical physicists at different stages in their careers who would like to know about current image guidance techniques and modalities, including non-ionizing-radiation ones. Please take a moment to review the program outline for more details of material to be covered.

AAPM 60th Annual Meeting & Exhibition

July 29 - August 2, 2018, Nashville, Tennessee

This year's program focusing on **"*Beyond the Future*"** will be held in the new Music City Center in the heart of downtown Nashville.

DID YOU KNOW?

- **AAPM offers webinars geared towards assisting scientists in their career development**

  Recorded Webinars:

  - Bounce Back from a Career Challenge
  - A Mid-Career Change? No Problems, Only Opportunities
  - Successfully Navigating the International Job Search
  - Outstanding Oral Presentations
  - Presenting a Winning Poster
  - Transitioning Your Career Beyond Academia
  - Identifying and Seizing Value from Conference Participation
  - I Am About to Graduate - What on Earth Do I Do Now?
  - Beyond the Residency Match: Options and Strategies for Next Steps
  - The Interview: What You Need to Do Before, During, and After to Get the Job
  - Network Yourself to a Great Career

- **AAPM Reports Authored included in Membership Directory listing**

  Ever want to find an AAPM Report, don't remember all the details, but remember the name of one of the authors? AAPM includes "AAPM Reports Authored" in the AAPM Membership Directory listing of each AAPM Member. Login and check it out!

- **Do you receive Medical Physics in print but would prefer to get it online only?**

  1. If so, go to: AAPM Member Profile
  2. Look for Journal Preferences - Medical Physics in Print
  3. If your current preference is **"I wish to receive *Medical Physics* in Print and Online"**
  4. click the "change" button and it will read **"I wish to receive *Medical Physics* Online Only"**
  5. That's it! In 4-6 weeks, you will no longer receive a print copy.
  6. Change your mind? Click the change button to revert to print at any time.

- **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. To request a change to Emeritus, email Jennifer (Membership Manager) your request and our HQ team will do the rest!

STAFF NEWS

Exciting times here at AAPM HQ!

Congratulations to Erik and **Lisa "G" Schober** on the January 19 arrival of their twins Reilly Sophia and Lucas Marshall. The babies are doing fabulous and big brother Gunnar is adjusting well to his new role. Mom and Dad are a bit sleep deprived but are acclimating to being "Schober Party of 5." Lisa G will return to the office on April 16. Yes, I am counting! And, as if she wasn't busy enough over the past year, Lisa G is now a Certified Association Executive (CAE). The CAE designation is offered by the American Society of Association Executives (ASAE) through a very rigorous process. According to ASAE:

"*The CAE credential is the marker of a committed association professional who has demonstrated the wide range of knowledge essential to manage an association in today's challenging environment.*"

She is now **Lisa Schober, CAE!** I am so very proud of her accomplishment and her commitment to the association management profession.

Join me in wishing **Robert McKoy** and his bride, Denise, many happy years as husband and wife. The couple wed on Friday, January 26 with many of the AAPM HQ team in attendance. It was wonderful to share in this special time with Robert and Denise, meet his four children and other family members, including his father.

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.

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TREASURER'S REPORT

Mahadevappa Mahesh, PhD | Baltimore, MD

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Preventing Electronic Funds Transfer (EFT) Fraud

As the treasurer of the association, I often get emails regarding approval to transfer funds to pay the invoices, etc. We have a system that ensures that the requests are vetted before it is sent and approved and only a few staff handle the transactions. In November 2017, I was at a conference in India, when I received an email request to transfer funds from none other than our president at the time, Melissa Martin. Initially, I was surprised since it is unusual to get such a request, hence I tried to contact our president for more clarification, the reply to which was further disturbing. Meanwhile, since we both were at the same conference, I called her to verify the request which was untrue (read the email conversation here). So, I wanted to discuss this new type of email phishing fraud and share with you what AAPM is doing to avoid such frauds. I would also like to warn many of you who are involved with various committee tasks not to get tempted by such requests which appear very realistic.

When AAPM was first founded in 1958, one of the greatest banking threats was that a member or staff might be robbed when making a bank deposit. Through the years, as time has evolved and more of the Association's banking has become electronic, the risk has changed.

In the late 1980s, online banking started to gain traction throughout the country. Online banking has opened a new world of ease and comfort. The ability to receive funds, pay bills, review transactions, transfer funds and perform many other banking duties has all but eliminated the need to visit the local branch. However, these enhancements have also come at a price. The potential for cyber-crimes, chief among them fraudulent electronic funds transfers (EFT), has increased. On a personal basis, this is often done by attaching a skimming device to an ATM machine or gas station pump and stealing one's debit or credit card information. The thief will subsequently sell or use this information to execute fraudulent transactions. Often, the risk associated with fraudulent EFT is much greater. If a hacker can access one's account, they can easily divert funds to their own personal accounts.

Another potential area of risk is from fraudulent ACH debits. Often a thief will submit a fraudulent ACH debit for a relatively small amount to see if it is processed. If the transaction is approved, the thief will continue to submit transactions in ever increasing amounts. There are two sources of these threats. The first is a dishonest company employee. The dishonest company employee can divert funds by making payments to fictitious vendors that the employee sets up. The second source of threat is external hackers around the world.

Earlier I mentioned the threat imposed from fraudulent ACH debits. In addition, there are threats from malicious programs designed to take over one's computer. Thieves and hackers will also emulate valid email addresses of an organization's leadership in an attempt to request a fraudulent bank transfer or payment. In many cases these payments are for services never rendered but lately thieves are using valid events and activities to request payments. This is similar to what is shown in the box, especially since the email mentions existing events/activities of AAPM.

Many businesses believe they are afforded the same coverage by their bank that individuals receive when it comes to absorbing losses from fraudulent EFTs. However, while in many cases a bank will absorb a loss if the transaction is reported timely, corporations are not afforded that same coverage and bear the burden for absorbing the loss from fraudulent EFTs.

PREVENTION IS THE KEY

The key to avoid becoming a victim to cyber-crime whether internal or external is to develop a strong, robust system of internal control such as what we have at AAPM. The system is reviewed for three weaknesses by our external auditors and audit committee. There are three types of key controls within the AAPM system of internal control: preventative, detective and corrective controls.

Preventative Controls

Preventative controls are designed to prevent fraudulent activities. Examples of preventative controls include segregation of duties, dual signatures on checks and restricting access to online accounts to name a few. These controls are designed to prevent fraud from happening by denying one access to the organization's assets.

Detective Controls

Detective controls do not prevent fraudulent activities from taking place but bring it to the attention of management when they have taken place. In the case of fraudulent EFTs, an example of a detective control would be performing routine bank reconciliations. The bank reconciliation would detect the fraudulent activity. Since detective controls do not prevent the fraud from happening but merely report when it does occur, detective controls are not as robust as a preventative control in terms of preventing losses. They can however help mitigate any losses which do occur by bringing them to the attention of management in a timely fashion.

Corrective Controls

When detective controls identify an irregularity, corrective controls kick in to see what could or should be done to fix the problem. Frequently many of the corrective controls involve IT, such as performing back-ups so in the event of a crash or disaster—the back-up can then be used to get the systems up and running again. However, in our example here of fraudulent EFTs a good example of a corrective control would be insurance. An organization can take out insurance to help mitigate the risk of the theft of some of its assets.

Without divulging the steps that AAPM has taken and potentially exposing its blueprint to potential thieves, I want to assure that we are taking all necessary steps to prevent any type of frauds. The main purpose of my column is to warn fellow colleagues to watch out for such fraudulent emails and like in any other situation, when in doubt please do verify.

I would like to thank **Robert McKoy**, AAPM Finance Director, for his subject matter contribution to this report. Please feel free to reach out to me by mmahesh@jhmi.edu, @mmahesh1, or call me at 410-955-5115, if you have any questions concerning this report.

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EDUCATION COUNCIL REPORT

Vic Montemayor, PhD I Fort Washington, PA

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AAPM WORKSHOP ON IMPROVING THE TEACHING AND MENTORING OF MEDICAL PHYSICS

In 2008, **Bill Hendee** organized the first AAPM workshop on improving the teaching of Medical Physics. This workshop, titled *Becoming a Better Teacher of Medical Physics*, followed the AAPM 50th Anniversary Celebration in Houston. Bill believed that the future of the discipline of Medical Physics depended critically on the quality of the training programs for future medical physicists. I don't think that anyone would argue with that. Bill further believed that an important component of that training is the teaching of Medical Physics. While much attention had been paid to training medical physicists as researchers and clinicians, there was virtually no attention paid to training medical physicists on how to become effective teachers. Bill thought that ought to change.

At the time, the training of most medical physicists was contained within a two-year Master's program, so most of the teaching was didactic teaching in a classroom setting. The primary purpose of the 2008 workshop was, therefore, to improve didactic teaching. I had spoken with Bill several times about the workshop, and I was one of the invited speakers at that first workshop. It was well attended, and well received. Building off of the success of the first workshop, and responding to requests for a follow-up, Bill organized a second workshop in the form of an AAPM Summer School. The Summer School, titled *Teaching Medical Physics: Innovations in Learning*, was held at the University of Pennsylvania and followed the 2010 AAPM Annual Meeting in Philadelphia. The emphasis in this Summer School was again on didactic teaching, although the coverage was expanded to include considerations of the expectations of accrediting agencies and the appropriate use of technology in teaching and learning.

Bill asked me to give the closing plenary talk at the Summer School. In preparation for this talk, I decided to go to the traditional Sunday morning student meeting that was held the previous weekend at the annual AAPM meeting. I asked the students what feedback they would like to give the faculty and administrators of their graduate programs concerning the quality of their Medical Physics education. I felt that, if we wanted to find out how we were doing with our teaching and mentoring, we should go directly to the customers. The

feedback was mixed, but passionate. For the most part, students were satisfied with the training they had received in their graduate programs. They thought that the teaching was adequate on average, but that the clinical training, when present, was much better. The PhD students liked the mentoring associated with their research training. But all of these comments were mere side comments. The thing that was really on the minds of the students at that time was the upcoming requirement for a Medical Physics residency. They were really worried about the consequences of the requirement.

Of course, the students were not the only ones worried about the residency requirement. Where were all of the needed residencies going to come from? How were the residencies going to be run?

Were the residencies for the Master's students going to take away from those for the PhD students? A lot of discussion and effort has been focused on the topic of residencies since that time. Residencies now play a fundamental role in the education and training of a clinical medical physicist.

It's been eight years since the last Teaching Workshop/Summer School. People have been asking when it is going to happen again. Two years ago, the Education Council decided that it was time for another teaching workshop. As chair of the Committee on Medical Physicists as Educators (MPESC), I certainly agree the Committee had been batting around the idea of another workshop for a couple of years. It was decided that the best time to have another teaching workshop would be immediately prior to the AAPM Annual Meeting in Nashville in 2018. It's hard to believe, but 2018 is already upon us, and the meeting in Nashville is going to be here before we know it.

The 2018 *AAPM Workshop on Improving the Teaching and Mentoring of Medical Physics* will take place on 26-27 July (Thursday and Friday) in Nashville, prior to the start of the Annual Meeting. As may be inferred from the inclusion of "mentoring" in the title of the workshop, the emphasis in this workshop is not only on didactic teaching, but also on the mentoring associated with residency training. Many medical physicists who were not involved with residency training previously, either from the mentor or mentee side of things, now find themselves in the position of having to mentor residency students.

An important part of the upcoming workshop will be to have the participants think about residency training within the context of PBL (At Vanderbilt, PBL stands for Practice-based Learning). We will be hearing from two experts on PBL at the workshop. **Dr. Kyla Terhune**, an Associate Professor of Surgery and the Director of the Surgery Residency Program at the Vanderbilt University Medical Center, will be talking about Vanderbilt's residency program and how they use PBL techniques. In addition, **Rebecca Howell** will talk about using PBL techniques for Medical Physics teaching. Participants will spend time discussing PBL, and will then brainstorm on designing possible PBL exercises for their Medical Physics classrooms or residencies.

Additional topics of talks at the workshop will include an overview of the history of teaching reform in AAPM (**George Starkschall**), learning about learning from neuroscience research (**Laurie Cutting**, Professor of Special Education, Psychology, Radiology, and Pediatrics at Peabody College, Vanderbilt University, and member of the Vanderbilt Brain Institute and the Center for Cognitive and Integrative Neuroscience), the importance of teaching reform in Medical Physics (**Jay Burmeister**), flipped learning in Medical Physics

teaching (**Stephen Kry**), and using the ROMPES modules in the teaching of Medical Physics (**Matt Studenski**). The workshop will also include various breakout and brainstorming sessions.

The full program for the 2018 Teaching and Mentoring Workshop can be found here, or simply accessed through the link for the workshop at the bottom of the AAPM homepage under *What's New?* **Registration for the workshop will open on 21 March**.

It is the hope of both MPESC and the Education Council that the upcoming workshop is as successful as the 2008 and 2010 workshops. Be sure to register early if you are interested in attending!

The Education Council Meet at HQ, March 1 - 3, for a 2018 Spring Retreat. Participants included: (L - R bottom row: Angela Keyser, Caridad Borras, Melissa Martin, Lisa Rose Sullivan, Cynthia McCollough and Joann Prisciandaro; Middle Row: Steve DeBoer; L - R top row: Yusuf Erdi, Jim Dobbins - Council Chair, John Antolak, Bruce Thomadsen, Victor Montemayor, Will Parker, Mi-Ae Park, Bill Sensakovic and Jackie Ogburn)

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LEGISLATIVE & REGULATORY AFFAIRS REPORT

Richard Martin, JD | Alexandria, VA

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AAPM CAUTIONS OREGON AGAINST GRANTING TRAINING EXEMPTION FOR DERMATOLOGISTS

The American Association of Physicists in Medicine (AAPM) submitted a comment letter to the Oregon Radiation Advisory Council (RAC) on January 17, 2018, advocating against a request for exemption from training regulations that would allow dermatologists to treat non-melanoma skin cancers with superficial radiation therapy devices after only 16 hours of manufacturer training. The request for exemption provides a method of modifying regulations on a case-by-case basis without going through the rulemaking process. The RAC is now considering the request for exemption of Sensus Healthcare, the manufacturer of the Sensus SRT-100™, an updated version of an orthovoltage style x-ray unit, that uses innovative surface applicators for treating skin lesions.

At present, there is a renewed interest by dermatologists to use radiotherapy to treat skin cancers. While superficial and orthovoltage equipment has long been utilized for treatment of skin cancer, many dermatologists now in practice did not receive radiation medicine and/or radiation safety training during their residencies. At present, only a few dermatology residency programs train residents in radiation medicine and/or radiation safety. The Sensus devices and similar devices by other manufacturers use electronically-generated low-energy radiation sources (ELS) designed to deliver low-energy radiation at a high dose rate.

With this in mind, AAPM National and the Northwest Chapter worked together to craft a comment letter opposing the grant of an exemption from § 333-123-0015 (1) of the Oregon Code, which requires 200 hours of instruction to include basic radiation techniques in patient safety and radiation risk for the authorized use of therapeutic radiation machines. In its letter, AAPM recommended that dermatologists using radiation therapy devices (SRT devices) receive the training and education specified in Oregon's current regulations to ensure the safety of patients and healthcare personnel.

We will keep you advised of developments in this area. See the AAPM Government Relations webpage for full text of the comment letter. If you have any questions or would like additional information on this issue, please contact Richard Martin, JD, AAPM Government Relations Program Manager.

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WEBSITE EDITOR'S REPORT

George C. Kagadis, PhD | Rion, Greece

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Our website is under continuous improvement, and you should experience new things and additions every month as this is an ongoing process. This is due to the revamping of our society's website over the last few years. We have put effort into making the webpage cleaner and more easily accessible to our members. Our IS personnel (**Farhana Khan, Abby Pardes, Rohan Tapiyawala, Ashley Zhu, Michael Woodward**) are continuously working to streamline information as they work to convert the current site to the new look and feel.

We are all getting prepared for the AAPM Annual Meeting, which this year is going to take place in Nashville, TN (July 30 – August 3). The AAPM 60th Annual Meeting & Exhibition website is now up and ready to receive your submissions.

With regard to our Social Media presence, I am pleased to report that as of February 27th, we have 44,237 images posted to AAPM's flickr, 7,234 follows on Facebook, 10,133 members on LinkedIn and 6,517 followers on Twitter. Please, do not hesitate to contact us should you need any further clarification about the policy and the guidelines for posting material on AAPM's social media pages.

Over the last year, most visits to our website have come from the United States (60% of users), followed by China (6% of users), with Canada (3% of users) rounding out the top three. The majority of our site visits are through Windows (67%), and MacOS (11%). During the last few years there has been an increase in the percentage of members accessing our site through mobile devices. The main operating systems are iOS (13%), Android (7%), and Windows (0.07%).

In coming months, we plan to integrate our new association management software into the website. Please excuse our dust as some pages will need to go offline for a short time while we make these changes. I hope you find the AAPM website useful, visit it often, and send me your feedback directly.

AMERICAN ASSOCIATION of PHYSICISTS IN MEDICINE

Improving Health Through Medical Physics

SCIENCE COUNCIL REPORT

Kristy Brock, PhD | Houston, TX
Benedick Fraass, PhD | Los Angeles, CA

AAPM Newsletter — Volume 43 No. 2 — March | April 2018

SCIENCE COUNCIL ASSOCIATES MENTORSHIP PROGRAM (SCAMP)

AAPM's Science Council Mentorship Program was established to recognize and cultivate outstanding researchers at an early stage in their careers, with the goal of promoting a long-term commitment to science within AAPM. The program uses the process of "shadowing" to integrate the Associates into the scientific activities of the organization. SCAMP Associates are assigned to shadow one member from the AAPM Science Council, Research Committee, Therapy Physics Committee, Imaging Physics Committee, or Technology Assessment Committee. The Associate participates in selected meetings of the mentor's committee and joins and contributes to one task group (chosen with input from the mentor). Associates shadow AAPM-related activities of the mentor, including committee phone calls, abstract review, Young Investigator judging, committee activities at the Annual Meeting, etc. Associates receive funding to attend two consecutive AAPM Annual Meetings.

For eligibility criteria and additional information on the SCAMP Program, please visit AAPM's Grants and Fellowship Page. **Application Deadline: April 1, 2018**

Sponsored by the AAPM Science Council through the AAPM Education & Research Fund

HIGHLIGHTS FROM FORMER AND CURRENT SCIENCE COUNCIL ASSOCIATES:

"Participating in the Science Council Associates Mentorship Program has been a fantastic opportunity. Beginning by attending my first committee meetings at last year's AAPM, I've learned a lot about how the organization works and runs, gotten to know colleagues from around the country, and been able to better pinpoint where I can contribute. I'm amazed by the volunteer time that goes into planning the Annual Meeting and creating AAPM member resources, and this program lays a foundation for me to be part of that for the rest of my career. The mentorship I've received through SCAMP has helped me navigate not just AAPM involvement, but also my career at this crucial time. I recommend the program highly"

Christina Brunnquell, PhD

"When I was chosen to be in SCAMP, I was looking forward to learning more about how the Science Council of the AAPM functions and other opportunities in Medical Physics beyond scholarship alone.I was fortunate to be paired with Jean Moran. During the first year, Jean sent me her schedule and suggested I could tag along to meetings she had planned during the AAPM. During the meetings (including planning of Spring Clinical Meeting, task group meetings, working group meetings, ad-hoc committee meetings and therapy physics council) I was able to observe a portion of the work done by volunteer physicists that goes into furthering our field. Jean encouraged me to participate, ask questions and introduced me to many physicists from around the country. From these initial introductions and interactions, I was able to get involved in TG-263 as a consultant and later was invited to join the working group on imaging for treatment planning. What made the program an exceptional experience was the access to my mentor and the other members of science council that I was given. In SCAMP, the model is to take some of the busiest volunteers at AAPM and give them the task of mentoring younger physicists. This was done with enthusiasm and patience. After SCAMP, I remain in touch with Jean, knowledgeable aboutAAPM and I have an involvement in AAPM that I know will grow with time and experience."

Sara St. James, PhD

"SCAMP has been an excellent way to learn about, participate and become more integrated in the AAPM. Through SCAMP and my mentor, I have had the opportunity to be a guest member of the Therapy Physics Council (TPC), joining in on committee meetings, being a guest member of a Task Group and contributing by reviewing several Task Group Reports as they undergo TPC review. Furthermore, the mentorship I receive through SCAMP has extended outside of AAPM-related activities. My SCAMP mentor has been outstanding for my professional development by providing

opportunities to connect with and network with other members of the AAPM, feedback on my CV, and most importantly, has been a role model to me for how to be a great mentor to others. Through SCAMP I have gained a broader perspective of Medical Physics, beyond the local clinic, to the challenges faced nationally and internationally, and the efforts of the AAPM to strive to address these challenges to continually improve patient care."

Elizabeth Huynh, PhD

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

The AAPM and the American Society of Radiation Oncology (ASTRO) are happy to announce a jointly funded research seed grant for Medical Physics Residents and Post-Doctoral Fellows. The goal of the joint seed grant is to advance the field of radiation oncology in novel ways through the support of early-career scientists involved in radiation oncology physics-related research. With this jointly supported grant, both societies aim to help support the next generation of researchers in the field of radiation oncology.

Eligibility Criteria:

- You must show a commitment to a career focusing on physics-related research relevant to radiation oncology
- You must work at an institution with a well-established research and clinical career development program and qualified faculty in physics and radiation oncology to serve as a mentor
- You must be a physics resident or post-doctoral fellow, and your institution must be willing to commit 75% of your time to research for at least one year

One grant of up to $25,000 will be awarded. The start date for the 2018 award will be July 1, 2018.

Applications for the ASTRO-AAPM Physics Resident/Post-Doctoral Fellow Seed Grant will be open from January 15, 2018, and all applications must be received by April 8th, 2018 at 11:59 PM Eastern time. All applications must be submitted through Proposal Central. For more information on details about this grant opportunity, please visit the Proposal Central.

Sponsored by the AAPM Science Council through the AAPM Education & Research Fund and the American Society of Radiation Oncology (ASTRO)

AMERICAN ASSOCIATION of PHYSICISTS IN MEDICINE

Improving Health Through Medical Physics

ACR ACCREDITATION: FREQUENTLY ASKED QUESTIONS FOR MEDICAL PHYSICISTS

Priscilla F. Butler, M.S. I Reston, VA

AAPM Newsletter — Volume 43 No. 2 — March | April 2018

Does your facility need help on applying for accreditation? In each issue of this Newsletter, I'll present frequently asked questions (FAQs) 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.

The Food and Drug Administration (FDA) recently approved the ACR to accredit digital breast tomosynthesis (DBT) units. The following FAQs address the ACR's requirements for DBT accreditation. Please contact us if you have any questions.

Q. We plan to add DBT to our existing accredited FFDM unit. Do we need to accredit this new DBT system?
A. Yes.

Q. Our mammography unit is accredited for FFDM and the FDA extended our certificate to cover the unit's DBT function. Do we now need to accredit the DBT portion of the unit?
A. Yes.

Q. I heard that if I have an FFDM system with DBT, my facility must accredit that unit as two separate units - FFDM and DBT. Is that true?
A. Yes.

Q. My mammography system has the capability to perform both FFDM and DBT, but we will only perform DBT. (We will not perform FFDM.) Do we still need to accredit as two separate units?
A. Yes, the FFDM portion of the unit must be accredited, whether or not it is used clinically, as it is the basis for some of the QC testing for the DBT portion.

Q. My mammography system has the capability to perform both FFDM and DBT, but we will only perform FFDM. We will not be using the DBT portion of the unit. Do we still need to accredit the DBT portion of the unit?

A. No, if the DBT portion is not being used clinically, it does not have to be accredited.

Q. Do I need to submit DBT clinical images for DBT accreditation?

A. No, and in fact we don't accept them. See table below for clinical image submission requirements for both FFDM and DBT accreditation:

ACR Accreditation Clinical Testing for Digital Breast Tomosynthesis (DBT)

Scenario 1. DBT - 2D Synthesized Images Available (whether or not 2D-Syn is used for interpretation)

Testing to be Submitted by Facility		
Type	2D FFDM Accreditation	DBT Accreditation
Clinical Testing (a clinical set = cc and mlo of 1 fatty and 1 dense case)	Whatever is performed clinically: 2D clinical set (cc and mlo), **or** 2D-Syn clinical set (cc and mlo), **or** 2D cc and 2D-Syn mlo clinical set, **or** 2D-Syn cc and 2D mlo clinical set	2D-Syn clinical set (cc and mlo), **or** 2D cc and 2D-Syn mlo clinical set, **or** 2D-Syn cc and 2D mlo clinical set

Scenario 2. DBT - 2D Synthesized Images <u>Not</u> Available on System

Testing to be Submitted by Facility		
Type	2D FFDM Accreditation	DBT Accreditation
Clinical Testing (a clinical set = cc and mlo of 1 fatty and 1 dense case)	2D clinical set	2D clinical set

Q. May I submit a 2D synthesized phantom image for the accreditation of my FFDM unit?

A. No. For FFDM accreditation the facility must submit ***one*** 2D phantom acquired image.

Q. May I submit the 2D acquired phantom image for the accreditation of my DBT system?

A. No. For DBT accreditation the facility must submit ***one*** image that best demonstrates all the test objects ("best-slice" image). See the following table for the phantom image submission requirements:

ACR Accreditation Phantom Testing for Digital Breast Tomosynthesis (DBT)

Scenario 1. DBT - 2D Synthesized Images Available (whether or not 2D-Syn is used for interpretation)

Testing to be Submitted by Facility		
Type	2D FFDM Accreditation	DBT Accreditation
Phantom Testing	2D phantom image	3D best-slice phantom image*

Scenario 2. DBT - 2D Synthesized Images <u>Not</u> Available on System

Testing to be Submitted by Facility		
Type	2D FFDM Accreditation	DBT Accreditation
Phantom Testing	2D phantom image	3D best-slice phantom image*

*The 3D best-slice phantom image allows for high-level evaluation of the impact of DBT-specific parameters (e.g., target, filter, etc.) on image quality for accreditation. Best slice is defined as the slicethat demonstrates all the test objects in the phantom better than any other slice in the tomosynthesis set. As with all accreditation, the medical physicist's annual survey (and/or MEE) provides the detailed evaluation of system performance.

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Our Condolences

Eugene Theodore Agard • ***Melvin P. Siedband*** • ***Xie Nanzhu***

Our deepest sympathies go out to their families. 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: 2018.aapm@aapm.org

Please include supporting information so that we can take appropriate steps.

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ANNUAL MEETING SUBCOMMITTEE REPORT

Robin Stern, PhD I Sacramento, CA

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We're gearing up for another exciting and enlightening meeting this year, and some of the best presentations will be yours. The Annual Meeting Abstract Submission System is open for business now through March 8. Take advantage of this opportunity to present to the medical physics community all the good work you are doing. Please encourage undergraduates you know and/or are working with to submit their abstracts for the Society of Physics Students' special Undergraduate Research and Outreach poster session. As I mentioned in my previous column, this year we are requesting the author of each scientific abstract to select a category, subcategory, and up to three keywords to be associated with their abstract. These will help attendees better navigate the meeting so they won't miss anything of special interest to them.

With the large number of high quality abstracts we receive, this year we will be expanding the number of electronic posters and increasing the number of ePoster viewing stations. In addition to general viewing for ePosters, we will continue to present Moderated ePoster sessions in the ePoster Theater as well as General ePoster presentations at selected ePoster stations throughout the Exhibit Hall.

In addition to the proffered talks, we have a full program of symposia and educational courses scheduled. See here for highlights as well as a list of topics to be presented.

Registration opens March 21. See you in Nashville!

AMERICAN ASSOCIATION of PHYSICISTS IN MEDICINE

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AAPM - ISEP THERAPY PHYSICS WORKSHOP REPORT

Habib Zaidi, PhD I Geneva, Switzerland

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The first AAMP-ISEP Therapy Physics Workshop was held on September 27–30, 2017 in Durban, South Africa in conjunction with the 55th National Congress of the South African Association of Physicists in Medicine and Biology (SAAPMB) under the slogan "*Radiating Medical Physics through Africa.*" This workshop was sponsored by AAPM under the International Scientific Exchange Program (ISEP), with additional financial support provided by the International Organization of Medical Physics (IOMP) and a number of local companies.

This is the first time the AAPM-ISEP workshop took place in South Africa (SA), identified as a unique country having the facilities and the resources enabling attendance from other nearby African countries. Medical physics is well advanced in SA. The first group of medical physicists started working in SA during the 1950s and has been self-sufficient since the 1970s with regards to training and education of medical physicists, satisfying international standards. The profession is regulated by the Health Professions Council of South Africa (HPCSA) with the practice being regulated by the Department of Health Directorate of Radiation Control. There are six academic institutions actively involved in the training of medical physicists. There are currently about 120 registered medical physicists in the country actively involved in the profession. Approximately 80% of these physicists are involved in Radiation Therapy. The country boasts 23 MSc and 13 PhD students at present. The attendance at the workshop consisted mainly of professional medical physicists involved in therapeutic Medical Physics, radiation oncologists and a number of post-graduate students.

The workshop was intended for professionals where renewed faculty specializing in therapeutic physics, imaging and radiation oncology presented their experience in didactic settings, so as to maximize the learning experience for the participants of the workshop, to inspire further collaborative research and development efforts within South Africa and regionally, and to improve the quality of patient care through closer involvement of clinical medical physicists. This 3-day workshop included advanced lectures and practical sessions, organized with generous support provided by Elekta, covering various aspects of the

applications of physics in medicine, emphasizing imaging and radiation treatment of cancer. The AAPM faculty were involved and participated actively in the SAAMBP conference by giving keynote lectures prior to the ISEP meeting that were very well received.

The invited AAPM faculty included **Profs. Habib Zaidi** (Geneva University Hospital, Switzerland, workshop director), **Jacob Van Dyk** (Western University, Canada), **Charles Shang** (Florida Atlantic University, USA), **Moyed Miften** (University of Colorado, USA), **Cheng Saw** (Northeast Radiation Oncology Centers, USA), and **Yakov Pipman** (AAPM/IOMP, USA). The co-directors for the workshop were Prof. Habib Zaidi, representing AAPM-ISEP and **Dr. Graeme Lazarus**, President of the SAAPMB.

The first day was very well attended, with over 100 participants including invited guests representing different bodies involved in Medical Physics and radiation oncology activities in the country. Unfortunately, contrary to the envisaged plans, participants were mainly from South Africa owing to the lack of financial support, but also from other neighboring counties (Nigeria and Namibia). More than 100 certificates were delivered to participants at the end of the workshop.

A small but energetic industrial exhibition took place in the adjacent main auditorium. After the opening of the meeting by **Dr. Rory Callaghan**, (a local radiation oncologist in charge of the busiest private practice in the province), the meeting started with an opening lecture by **Prof. William Raeon** the history of Medical Physics in South Africa, one of the pioneers in the field running an active academic Medical Physics program in the country. This was followed by series of basic and advanced lectures dealing with various aspects of therapeutic Medical Physics and clinical applications in radiation oncology. The official program included more than 18 hours of classroom lectures on various therapeutic Medical Physics topics. The full scientific program can be consulted on the workshop web site. In addition to didactic lectures, one afternoon (three hours) was dedicated to practical sessions that were highly appreciated by the attendees.

After three inspiring days, the workshop came to a close on Saturday September 30; leaving behind some remarkable teachings and countless wonderful memories. This was followed by a short visit to the Medical Physics Department of the University of Bloemfontein where all AAPM speakers accepted the invitation of **Prof. William Rae** to give additional lectures to his graduate students and junior faculty on October 2 – 3, 2017. The interactive sessions with the PhD students, organized in different groups according to their research topics and backgrounds, were very beneficial and enabled fruitful brainstorming sessions. I personally take this opportunity to thank Prof. Rae for his contributions to the advancement of Medical Physics in South Africa and regret that he will be moving to Australia at the end of the year.

The local organizing committee did an excellent job, from looking after accommodations for AAPM faculty and participants coming from outside Durban, to lunches, gala dinners, etc. The educational program was remarkably executed, as witnessed by all participants and reported in the evaluation forms. The conference drew some of the widely known experts in diagnostic and therapeutic Medical Physics and it was no surprise that the lectures delivered were of great quality. All invited speakers delivered brilliant lectures and provided plenty of valuable handouts that were made available to the participants on USB drives.

AAPM-ISEP 2017 would not have been a reality if it weren't for all individual participants and representatives of the involved organizations, with special thanks extended to the main promoters of ISEP workshops (AAPM and IOMP) and the local host (SAAPMB) in addition to all local sponsors.

Invited faculty, including: Professors Charles Shang, Moyed Miften, Habib Zaidi, Yakov Pipman, Jacob Van Dyk and Cheng Saw and the local organizer Dr Graeme Lazarus

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NWAAPM CHAPTER REPORT

Jessica M. Fagerstrom, PhD | Lynwood, WA

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NWAAPM SUPPORT FOR COMMUNITY OUTREACH AT THE PACIFIC SCIENCE CENTER

Medical physics outreach efforts not only promote interest in the field, but also engage a whole new generation of scientists by providing them access to valuable learning and practical experiences. The "Portal to the Public" project through the National Science Foundation and the Institute of Museum and Library Services aims to promote public engagement with current science by fostering dialogue between local scientists and their communities. As part of this outreach initiative, I feel very fortunate to have received a generous grant through the Northwest Chapter of AAPM to undergo training as a member of the most recent cohort of Science Communication Fellows at the Pacific Science Center in Seattle, Washington.

The "Portal to the Public" project is led by the Pacific Science Center and involves a network of over sixty institutions, including universities, natural history museums, libraries, zoos, aquariums, and research groups. Science Communication Fellows at the Pacific Science Center undergo an eight week class designed to build skills in communicating their area of expertise specifically to a non-scientific audience. As a fellow, I developed a hands-on educational activity about Medical Physics and radiation therapy with the guidance of Pacific Science Center staff. The activity is now a regular part of the Science Center's "Meet a Scientist" program, and primarily attracts young visitors to the Science Center, as well as their parents, as an introduction to therapeutic Medical Physics.

The stated mission of AAPM is "advancing medicine through excellence in the science, education, and professional practice of Medical Physics." Education, including education within our broader communities, is an important part of this mission (consider, for example, the excellent work of the Women's Professional and the Diversity and Inclusion Subcommittees on the "Med Phyz Whiz Kidz" outreach program). The financial support of the Northwest AAPM chapter highlights the organization's commitment to community outreach and engagement, and to the promotion of professional Medical Physics to a broad, community-based audience. By participating in events involving aspiring young scientists, this program will alert a new generation about opportunities in our field. The stated purposes of the Northwest Chapter are:

1. To promote the application of physics to medicine and biology.
2. To encourage interest and training in Medical Physics and related fields.
3. To prepare and disseminate technical information in Medical Physics and related fields.

I am honored to be able to support these goals by becoming a medical physicist Science Communication Fellow at the Pacific Science Center. The experience has been incredibly rewarding, and I encourage other AAPM members to explore similar opportunities in their communities.

Volunteering at the Pacific Science Center during the 'Meet a Scientist' program

The most recent cohort of Science Communication Fellows following completion of an extensive training course designed to build skills in communication and public engagement with informal science education

AMERICAN ASSOCIATION of PHYSICISTS IN MEDICINE

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UPSTATE NEW YORK ASSOCIATION OF PHYSICIST IN MEDICINE (UNYAPM) CHAPTER REPORT

Lalith K. Kumaraswamy, PhD I Buffalo, NY

AAPM Newsletter — Volume 43 No. 2 — March | April 2018

The Upstate New York chapter of AAPM (UNYAPM) held its fall meeting on November 18, 2017 at the Twig Auditorium, Rochester General Hospital, Rochester, NY. The UNYAPM comprises members from all across the upstate New York region, from Buffalo to Albany. The meeting started with an invited presentation by **Dr. Harish Malhotra** from Roswell Park Cancer Institute. Quality assurance and patient safety are becoming the main focus in health care. Dr. Malhotra talked about improving patient safety in radiation therapy using the guidelines outlined in the AAPM TG-100 report, which drew much interest from the audience.

Proffered Paper session talks were held then, with nine students from Roswell Park Cancer Institute, and Toshiba Stroke and Vascular Research Center presenting on their research. The work presented by the students was excellent with good impact in the field of medical physics. **Mr. Mubin Shaikh**, President-Elect of UNYAPM, also gave an informative talk on the capabilities of an expansive group of treatment planning systems to create dosimetrically challenging treatment plans.

The highlight of the meeting was the presentation of the Chapter's Lifetime Achievement Award in Medical Physics honoring **Dr. Michael G. Herman** for his outstanding contributions and achievements in medical physics throughout his distinguished career. As part of the award ceremony, Dr. Herman presented a keynote lecture highlighting his days at Johns Hopkins and Mayo Clinic, covering aspects of his early clinical implementation projects, some of the fun he had in education, and his leadership experience in AAPM/ACMP.

The next chapter meeting is scheduled for April 2018 and non-members are welcome to attend. Details can be obtained from the Chapter Secretary, Vikas Patel and the chapter website.

Dr. Harish Malhotra giving the lecture on Patient Safety at the UNYAPM meeting.

Dr. Michael G. Herman receiving the Life Time Achievement Award from UNYAPM executive members. From left to right: President Lalith Kumaraswamy, award recipient Michael Herman, immediate past president Daryl Nazareth, president-elect Mubin Shaikh, and AAPM board rep Iris Wang.

AMERICAN ASSOCIATION of PHYSICISTS IN MEDICINE

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REPORT FROM THE WORK GROUP ON THE IMPLEMENTATION OF TG-100

Jennifer O'Daniel, PhD | Durham, NC

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In mid-2017, the Work Group on the Implementation of TG-100 surveyed 418 participants of six TG-100 workshops. We wanted to determine how many of the participants were implementing prospective risk management techniques in their own clinics. For those working on such projects, we asked for details about their chosen area of focus, any benefits seen, and any barriers encountered. We also requested suggestions about how the AAPM can support these activities. The workshops surveyed included the 2013 AAPM Summer School, the 2016 TG100 Certificate Course, and workshops at the North Central AAPM Chapter Meeting (2014), the Southwest AAPM Chapter Meeting (2016), the Penn-Ohio AAPM Chapter Meeting (2016), and the Great Lakes AAPM Chapter Winter Meeting (2016). We would like to thank the 62 respondents who took the time to complete the survey. In this article we present the survey results and the Work Group activities which have followed.

The majority of respondents were from the United States of America (85.7%), with additional responses from South Korea (3.9%), Australia (2.6%), Canada (2.6%), Saudi Arabia (1.3%), Sweden (1.3%), Brazil (1.3%), and Hong Kong (1.3%). Most respondents worked in centers with 2-6 treatment units (including brachytherapy units), though the number of units ranged from 1 to 21.

A good number of respondents (55%) had used the TG-100 workshop tools at their home facility to develop a process map, perform a Failure Mode and Effects Analysis (FMEA), and/or design a quality management program. More than half (55%) of those activities were performed with a multidisciplinary group, with an additional one-third (32%) performed with multiple participants within a single discipline. Interestingly, only a small number of respondents (23%) had carried through to a fault-tree analysis (FTA), perhaps because it was presented as the final step of a long process.

The majority of the analyses were performed on pre-existing procedures (76%), with a substantial minority on the implementation of new procedures (46%). Since participants may have done more than one analysis, multiple answers to this question were allowed. The most common items changed as a result of the

prospective risk analyses were the pre-treatment plan review process (62%) and treatment procedures (58%). Post-treatment completion checks were least-likely to be altered (24%).

Respondents saw an improvement in treatment quality (60% agree vs. 5% disagree) and communication among team members (65% agree vs. 7% disagree). Comments speak to improving clinical workflow, standardizing procedures, and fostering open communication. In terms of student and resident, education, the tools of TG-100 were found to be a good framework for studying safety and quality. Respondents also discussed the barriers encountered. The time required to complete the analysis was the greatest barrier, followed by lack of "buy-in" from other team members.

WG-100 has developed a number of strategies to mitigate these challenges, so that those interested in prospective risk management can effectively bring these techniques into their clinics:

- Video-based Implementation Guide – the Implementation Guide summarizes the key points of TG-100, explains available tools, and directs viewers to additional resources in a series of short, focused videos. These videos may be found here. Currently, the videos are only available to AAPM members.
- Professional Session at the 2018 AAPM Annual Meeting – this session will focus on practical details of implementation (persuasion of team members, organization of meetings, tips and tricks to simplify the process) both from a small and large clinic perspective. Please make plans to attend the "Prospective Risk Management in the Wild: Tales from the Clinic" session!
- SAM workshops – Please contact a co-chair of WG-100 (**Peter Dunscombe** or **Saiful Huq**) if you are interested in arranging a 4-hr or 8-hr SAM workshop on TG-100 for a local meeting.
- Repository of Risk Management Examples - We are in the process of creating a repository of both completed examples and downloadable forms and workflows in order to reduce the workload on the individual physicist.

We hope these steps can lower the entry barrier to prospective risk management work, bringing its benefits to a wider audience.

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Improving Health Through Medical Physics

Women's Professional Subcommittee

Julianne Pollard-Larkin, PhD | Houston, TX

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Participants of CUWiP 2018 at University of Kansas (photo used with permission of the organizers)

It's Our Year!!

While many in the news media were discussing the likes of Harvey Weinstein, Matt Lauer, and others, on the brisk evening of January 12, 2018, I was having the time of my life. That night, I had the distinct privilege of addressing a room full of the most enthusiastic young physicists in my district and notably, they were all young women.

I was the keynote speaker for the opening night of the Conference for Undergraduate Women in Physics (CUWiP) at the home of the Jayhawks, University of Kansas. It was a triple honor for me to speak at this event since my husband's family lives within minutes of the scenic campus, I was married less than 5 blocks from the conference venue, and I am a fierce proponent for encouraging young women to pursue physics as a field of study. To say I was stoked to be there would have been an understatement. To top it all off, when I asked the audience who knew about Medical Physics, expecting most not to know much, the whole room exploded with hands raised. The word is out and I have a feeling we're going to experience a flood of more

women physicists trying our field out. It truly felt cathartic if not exhilarating to be in a room discussing our gender's capabilities and encouraging our students to follow boldly in our path. And importantly, it was refreshing to have the event coordinated by a male Physics department chair who is also an advocate for increasing the numbers of women in STEM. Having allies in diversity and inclusion efforts makes the work worthwhile, and the University of Kansas has a dynamic physics chair in **Dr. Hume Feldman**.

CUWiP is a massive endeavor sponsored by the American Physical Society (APS) that includes a series of conferences occurring simultaneously on a weekend in January each year at several universities [(1)]. It began in 2006 at the University of Southern California. Each campus invites an array of physicist speakers and organizations aimed at giving the university and high school student participants a professional physics conference experience. The conferences include workshops that help the students navigate choosing which type of physics to pursue in graduate school, how to overcome "impostor syndrome" as well as which jobs are available for each chosen career path. Also, the keynote speakers selected represent the best women physicists such as Harvard's keynote speaker from last year, **Dr. Nergis Mavalvala**, an astrophysics professor at MIT and a 2010 recipient of the MacArthur Genius Award. Her claim to fame was being part of the Laser Interferometer Gravitational-wave Observatory (LIGO) that first detected gravitational waves produced by colliding black holes.

Dr. Julianne Pollard-Larkin, of MD Anderson Cancer Center, speaking to participants at the University of Kansas CUWiP conference on January 12, 2018 (photo used with permission of the organizers)

If you have yet to go to a CUWiP or other conference for women physicists and trainees, make it a goal for 2018. Oftentimes we get caught up in our day-to-day existence and can forget how far we have come as a gender and a society, but being in such an encouraging space where your purpose is celebrated can be life-

altering. And please don't forget the trivia games we play as a group on some nights during CUWiP and the twilight observatory visits that are as educational as they are entertaining.

This conference series is a natural volunteer opportunity for interested professional and academic physicists. If you have wanted to volunteer and give back, please look for more information at the APS website and get details about next year's events in your region. Also, spread the word to students who may be interested in attending.

Our goal as the Women's Professional Subcommittee is to ensure that we are in support of the career development of women medical physicists, but also that we pave the way for the next generation of professional women medical physicists. You may have noticed that many of our current medical physics academic programs are close to having gender parity. Meanwhile, pure physics programs have difficulty surpassing roughly 20% women participation rates. We are part of a unique physics specialty that is moving quickly towards equal participation of women and men. I believe this is due at least in part to the fact that our field requires an interest in medicine, which is equally appealing to both genders compared to pure physics. Also, please note that "for the first time ever, more women than men enrolled in medical school" as reported in Fortune magazine this past December [(2)].

Suffice it to say that the writing is on the wall: this may be our best year yet — and it's only March! Even as we deal with defining how to move forward in the era of #MeToo, women and men are mobilizing, running for office, teaching and mentoring in order to help advance us as a nation. Realize that as a woman medical physicist, you earn at least 35% more than a similar woman in a non-STEM field, you suffer less from a gender wage gap than your non-STEM peers, and you earn 40 percent more than men with non-STEM jobs [(3)]. Also, please remember, even if you are the lone woman physicist at your center, you are not truly alone. You have a healthy supply of sister medical physicists working alongside you in centers nationwide and our daughters are waiting in the wings too!

References:

1. Conferences for Undergraduate Women in Physics (CUWiP)
2. For the First Time Ever, More Women than Men Enrolled in Med School This Year, Fortune, 2017
3. Women in STEM: 2017 Update United States Department of Commerce

AMERICAN ASSOCIATION of PHYSICISTS IN MEDICINE

Improving Health Through Medical Physics

Women's Professional Subcommittee

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AAPM Newsletter — Volume 43 No. 2 — March | April 2018

The Funding Landscape for Women in AAPM: Trends and Outlook

Recently, the AAPM Working Group for the Development of a Research Database (WGDRD) embarked on an important initiative to identify Full AAPM members who are funded by the National Institutes of Health (NIH) [(1)]. The NIH is the largest public contributor of biomedical research and is the primary funding source for investigator-initiated research. Importantly, the WGDRD found that the overall funding rates of AAPM members actually accounted for a very small portion of the NIH budget. For example, in 2015, the National Cancer Institute (NCI) had an annual funding budget of ~$5B, although only 1.2% of the budget was allocated to AAPM member grants[(1)]. After reading the WGDRD's article, a key finding that piqued my interest was that only 11% of the grants held by AAPM members are held by female members — **11%**. As a female Principal Investigator (PI) on an NIH R01 from the NCI, I was floored by this number. With the support of WGDRD, I took a deeper dive into the demographics, potential contributors, and strategies that we (as physicists and as an organization) may consider to support Women in Research, Education, and Development (WIRED, for short).

So just how many female AAPM members do we have, and how many qualify to apply for an NIH grant? In 2015, the AAPM membership was ~22% female, however the NIH requires PIs to have a "terminal research degree," suggesting that a PhD is required. There were ~5 times as many male as female AAPM Full members with a PhD (~2,200 to 450, respectively). Nevertheless, in 2015, males were awarded NIH grants as PIs seven times more than females (155 vs. 22, respectively). Figure 1 highlights that while the number of male PIs has been variable over the past 15 years (ranging from 154 to a high of 246 in 2006), the number of female PIs has remained low and fairly steady (13-30 grants awarded). One confounder is that data are sparse on the number of grants submitted by females vs. males, so it is currently unclear if males are simply applying more frequently. Furthermore, males were six times more likely to serve as a PI on a multiple PI grants than females (22 and 4, respectively).

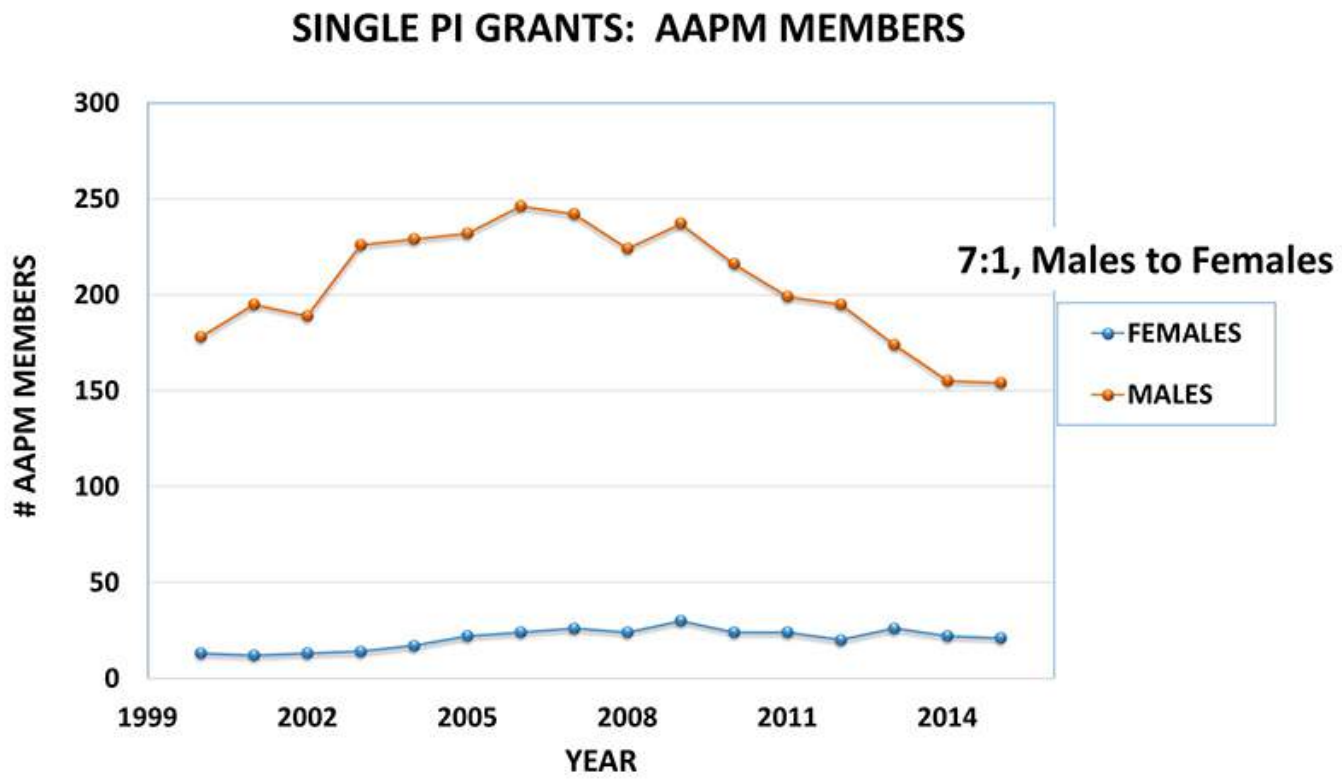

Figure 1: Single Principal Investigator (PI) grants awarded to AAPM members by the National Institutes of Health. Data source: [(1)].

Aside from the number of grants awarded, evidence suggests that a significant funding gap exists between males and females with respect to the average size of their awards [(2)]. From 2002 to 2012, while an increased number of NIH grants nationally were awarded to women (24% to 30%), the average grant size was only 83% of those awarded to males. This suggests that females may also be requesting less (or are just being awarded less) than their male counterparts.

The WGDRD has put forth as a recommendation in their publication that AAPM "must consider developing mechanisms that better encourage and support female members applying for research funding."[(1)] This recommendation is fully supported by the data that suggests an opportunity exists to improve our odds for NIH grant funding, not only for females, but for males as well. Potential avenues include: to develop a formal mentorship program to assist in grant development, for AAPM to commit some resources to hold grant writing workshops, and to develop additional seed funding mechanisms intended to facilitate preliminary data generation, perhaps with an emphasis on addressing the gap in female funding. AAPM currently offers three $25,000 Research Seed Funding Grants annually, with the intent of developing "exciting investigator-initiated concepts, which will hopefully lead to successful longer term project funding from the NIH or equivalent funding sources." Since 2005, AAPM has awarded $550,000 to this initiative. However, during this time frame, only **3 out of 22** of these awards have been awarded to female AAPM members.

In summary, a great opportunity exists to increase the amount of NIH funding for all AAPM members, and especially for females. For our AAPM members who have been fortunate enough to receive NIH funding, please consider mentoring others, sharing your wisdom, and providing examples that you are comfortable sharing with new investigators. For those of you who are interested in becoming a PI, start writing grants early in your career (e.g., predoctoral and postdoctoral fellowships) and study the "art" of grant writing via webinars and seminars such as those offered from RSNA. The road to grant funding is never easy; you can view my personal narrative (and excessive consumption of chocolate ice cream related to that endeavor!) in the AAPM Virtual Library. Overall, if we invest the time and resources needed to generate competitive grant proposals—and we keep applying—we can only increase our chances of success!

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2. H. Shen, "Mind the gender gap," Nature 495, 22 (2013)

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Improving Health Through Medical Physics

Women's Professional Subcommittee

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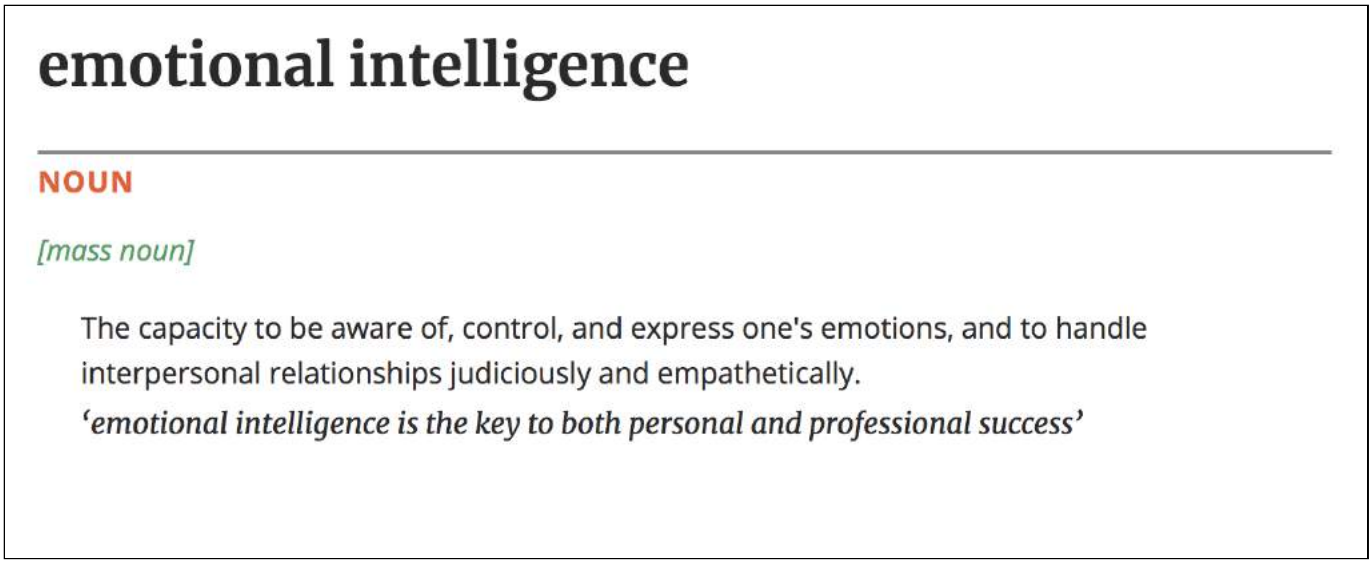
Emotional Intelligence in Medical Physics: Lessons Learned at the Summer School

Think back to a time when you had a conflict in the workplace. Though it may have been fairly professional with only a hint of passive aggressiveness in your tone of voice, can you tell whether the unpleasant event had downstream effects, and how they could impede your efforts for improving patient care in the future? The science of emotional intelligence presents the argument that one can either significantly improve or destroy their ability to motivate and inspire others, and to successfully drive projects to completion based on their interactions with others.



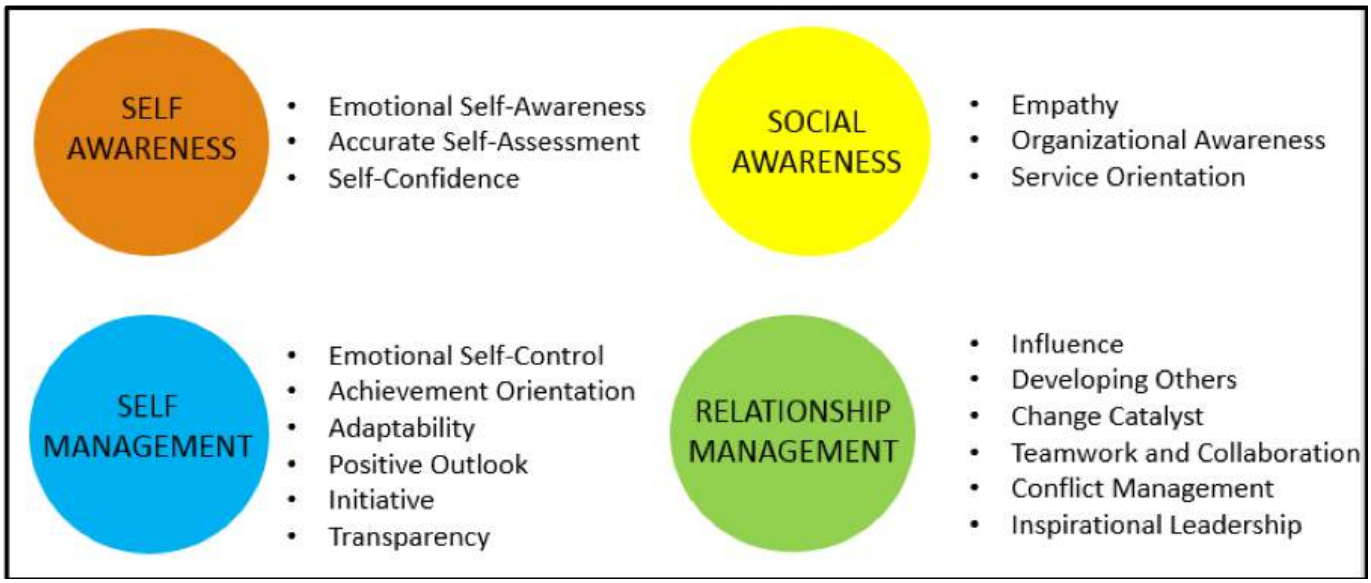
Oxford Dictionary definition of "emotional intelligence"

The concept of emotional intelligence has been around for several decades, but only recently has it been recognized as an important factor in being a successful medical physicist. How you get along with and are perceived by others can greatly determine your effectiveness in the workplace. Studies show that roughly

one-third to nearly one-half of one's success in their position is based on their emotional intelligence (BarOn Model, Center for Creative Leadership). Because physicists are leaders, whether it is defined formally or implied by the role they serve, it is imperative they carry a set of soft skills previously thought nonessential to success in this highly technical field.

Seeing this as potentially unexplored territory for physicists, the AAPM Medical Physics Leadership Academy Working Group (MPLAWG) was formed in 2015 under the AAPM Professional Council. While there was already much work done on the topics of ethics and professionalism in medical physics and initiatives such as MP 3.0 were well underway, the MPLAWG wanted to learn whether medical physicists possessed the aptitudes of great leaders, and if not, what could be done to improve their abilities.

The MPLA WG used a 360° Analysis for the assessment of various emotional intelligence competencies for about 50 AAPM members. The sample group included individuals practicing in therapy and diagnostic physics coming from academic centers, community hospitals, and consulting positions, with various years of experience. The survey was sent to peers, subordinates and superiors and the individuals were scored on how they handled conflict, dealt with change, responded to problems, and whether they instilled trust in their teams.



The Key Domains and Competencies of Emotional Intelligence as defined by Daniel Goleman

Specifically, the 360° survey tested the group on competencies within the key domains of emotional intelligence: Self-Awareness, Self-Management, Social Awareness, and Relationship Management. When the results came in, nearly half of the surveyed group showed lower aptitude for two key competencies: Self-Awareness and Empathy. While the survey revealed that physicists may fall short in two major emotional intelligence components, the good news was that these skills could be learned and that the MPLAWG was putting forth great effort in gathering resources and presenting opportunities for physicists to develop these essential skills.

In 2016, the MPLAWG put together an intensive 5-day leadership program for the AAPM Summer School (SS). The roughly 200 attendees participated in activities that mimicked stressful situations encountered at work, and listened to talks put on by speakers from IMPACT International (a leadership development consultant) and by AAPM members who shared lessons in leadership through their own experiences. All sessions and resources from the AAPM 2016 SS are available on the AAPM virtual library and the SS homepage.

The WG has also formed three Task Groups (TG), each responsible for major aspects of implementing leadership learning into the Medical Physics community. TG295 will work with CAMPEP to ensure graduate programs and residencies are including the leadership training physicists will need as they enter their first formal roles in the field. TG296 is tasked with creating an MPLA website, providing resources and a venue for discussions and shared learning. It is also working on making the 360° survey available to AAPM members for a fee. TG297 members work to prepare MPLA sessions for AAPM meetings and are creating a master catalog of talks and materials that relate to leadership and other professional teachings.

In addition to the many resources currently available on the AAPM website, healthcare organizations frequently offer classes on dealing with conflict and managing others. They may also hold retreat-style leadership courses for physicians and staff such as Physician Leadership Institute (PLI). Consult with your HR department to find out what is offered. There are also simple ways to practice putting emotional intelligence into action in the workplace.

The very act of maintaining a high level of self-awareness during a difficult interaction can help reign in the temptation to react harshly. We are all coded with the fight-or-flight response, but the office may not be the best place to demonstrate this remarkable survival mechanism. When we exercise discipline and moderate the natural inclination to escalate our responses, we have a much better chance of keeping relationships positive, even with those who challenge us. The perception of ill-intent or disrespect is often just that. After careful reflection on the situation we can usually see things from a different perspective, unhindered by the lack of rational thought during heated moments. By just noticing that you are becoming tense and agitated, you can work towards accepting the discomfort, but remaining calm throughout the interaction.

Practicing empathy can also take significant patience and composure during a difficult situation. Poor performance of a staff member can be perceived as a lack of respect and professionalism. Taking the time to understand the root cause of the struggle may reveal someone going through a difficult personal matter or show a need for additional support and training. By creating space for staff to share how they are doing in and out of the office, leaders can build a relationship based on trust and mutual respect while maintaining accountability.

It was Daniel Goleman who first popularized the term "emotional intelligence" with his book titled *Emotional Intelligence: Why it Can Matter More Than IQ* published in 1995. Now, thanks to the formation of the MPLAWG, physicists can learn the skills necessary to be exceptional leaders in a challenging and ever-changing healthcare environment.

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News Bites

For those attending the AAPM Spring Clinical Meeting in Las Vegas, several WPSC members will also be in attendance and would love to organize an informal mixer. Please contact WPSC member Jennifer Pursley if you would be interested in such an opportunity. Also, if you're able to stay for the full conference, there are two interesting sessions scheduled for Tuesday on "In the Era of Consolidation: Making Physics Minutes Count" and "Peer Support and Mentorship."

Come join us at the 60th Annual AAPM meeting in Nashville! The WPSC will likely hold its Annual Meeting on Saturday, July 28. All AAPM members are welcome to attend! Please check the committee meeting schedule closer to the meeting date to find the exact time and location for our meeting, or contact the WPSC members for more information. We are always looking for help with our annual women's luncheon planning, outreach programs, professional development work, and newsletter publication.

Please also plan on joining us for the Women's Luncheon at the AAPM Annual Meeting. The luncheon will take place on Tuesday, July 31, and planning is already underway. Again, all members are welcome to attend. When you register for the Annual Meeting you will also have the option to register for the luncheon. This is a great opportunity to take a break, connect and network with many women physicists from different backgrounds, and do all this while enjoying a delicious meal. Every year the luncheon sells out so don't delay in signing up!

If you're on LinkedIn, there's a Women Medical Physicists Group started by WPSC past-chair **Nicole Ranger**. This is also a great place to make connections with other women medical physicists and share information relevant to careers, work-life balance, or just medical physics!

We also like to highlight great stories or features of women scientists. The 5th International Day of Medical Physics (IDMP) was November 7, 2017 (the exact date chosen because it's the anniversary of Marie Curie's birth) and the theme was "Medical Physics: Providing a Holistic Approach to Women Patients and Women Staff Safety in Radiation Medicine." One resource we found was these great printable posters of five "Forces

of nature: great women who changed science" from the Perimeter Institute. You can download the posters for free. Another resource we learned of is from COMP, the Canadian Organization of Medical Physics, who in honor of IDMP profiled 10 female medical physicists from across Canada. Read through their profiles in the archives, accessible from their website. Many thanks to **John Schreiner, PhD, FCCPM,** of Queen's University for bringing these profiles to our attention!

Seeking contributors!

The WPSC Newsletter is published biannually in the spring and fall, and we are always on the lookout for news, stories, ideas, and features related to women in medical physics to include in future editions. Contributions and suggestions can be sent directly to the WPSC.

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Book Review

"When: The Scientific Secrets of Perfect Timing"

Just published in January 2018, "When" is the latest book from author **Daniel H. Pink**, known for several previous best-sellers including "Drive: The Surprising Truth About What Motivates Us" and "A Whole New Mind." I listened to the audiobook version of "When," which comes with a 68-page pdf called the "Time Hacker's Handbook" that contains all the charts and images from the book, along with specific tips on organizing tasks based on time of day.

So what is the book about? Part 1 starts by building the scientific evidence for how energy and cognitive abilities change throughout the day in a regular, predictable way. For most people, energy and analytic skills peak in the morning, by mid-afternoon they hit the lowest point ("trough"), and then in the evening there's a small recovery of energy. For maximal productivity, Pink argues, each person should figure out their chronotype — their personal rhythm for sleep and the peak-trough-recovery cycle- and then try to arrange their day so that tasks which require the most analytic skill are done during the mental peak and easier tasks or those requiring more insight than analysis are done during the mental trough. In the handbook there's a form for tracking your mental alertness and energy throughout the day to find out where you fall on the "lark" to "owl" scale.

I was particularly interested in the tips on which tasks to focus on during specific parts of your day; I realized one of my bad habits is focusing on answering emails in the morning and putting off other tasks until later in the day. Instead, to maximize effectiveness as a lark, I should focus on my most challenging tasks in the morning and save email for later in the day when I don't have the mental energy for complex tasks. I can also see that trying to push meetings to the afternoons to leave my mornings cleared for complex work could be

very beneficial. I found the suggestions on how to effectively take breaks during the day-when to take them and what — to — do during them-very helpful and I intend to implement some of those (although I don't think I can get away with a nap at work!)

Part 2 focused on details around beginnings, midpoint, and endings. I found this part of the book mostly entertaining, as it was filled with good stories and examples, but fewer practical, day-to-day tips. This part is more about life advice; this is where Pink tries to give advice about big questions like, when should you get married (or divorced)? When should you start looking for a new job? I found the discussion on midpoint to be the most interesting. Pink makes a very convincing argument for the midpoint as a potential energizer, especially if you're working on a project. The midpoint is when you realize that half of your time is gone and you haven't made any progress, and so it provides a kick to make some decisions and get started. This made me think I need to put meaningful time limits on more of my tasks, so I can reach the midpoint and get that mental kick of urgency!

Overall I found this book interesting, informative, and very accessible. It's relatively short (less than 200 pages or six hours of audio) the language is clear and conversational, and there are many entertaining stories — all of which makes the book easy to get through! I found it encouraged me to think more consciously about how I organize tasks during the day and to be more aware of my mental state (ranging from alert to exhausted). "When" is well worth your time to check out, and even those among us who think they've got their schedule all figured out may find a few helpful tips. And as we all attempt to fit more tasks into every 24-hour day, anything that could improve efficiency is a bonus!