Agenda

(Notes: All times are Eastern. Additional live sponsored sessions will be added to the schedule as soon as they are confirmed. Final schedule is subject to change.)

Monday, July 6, 2020

12:45 – 1:00 PM – **Welcome**
Cara Sullivan, CMD and Melissa Nolet, CMD

1:00 – 2:00 PM – **2020 AAMD Plan Study: Maximizing the Possibilities** **(Live)** (1.0 Credit)
Presented by Chavanon Apinorasethkul, CMD and Kalin Shipman, CMD

Radiation treatment planning has changed rapidly in the past decade through advancements in treatment technology and planning techniques. The tools at our disposal are more extensive than ever before, helping us push the ALARA principle to new limits. Treatment plan studies have been a part of the AAMD Annual Meeting for more than ten years and they have been shown to be an effective way to share knowledge of optimal planning methods and techniques throughout our growing community. The voluntary contributions of members within our community and willingness to share their knowledge and experience will be the key to unlocking the full potential of our capabilities in the clinic. The Plan Study has access to the ProKnow software that enables dosimetrists to analyze treatment plans objectively through specific plan metrics, along with prescription and other clinical goals.

The objective of this study is to share knowledge and experience gained during the treatment planning process and to identify techniques that can be employed to achieve given clinical goals for this unique plan.

Learner Outcomes:
1. Review plan metrics and clinical goals for the study case
2. Summarize the knowledge and experience (tips and tricks) gained from advanced and high-scoring participants on optimal treatment planning techniques
3. Recognize high performers
4. Discuss the benefits and drawbacks of different treatment planning approaches

2:15 - 3:15 PM - **Treating Lung Cancer to Move or Not to Move - That is the** Question **(Live)** (1.0 Credit)
Presented by Michael Wussow, MBA
Sponsored by Accuray

Lung cancer is the leading cause of cancer-related deaths among both men and women. There are significant challenges in treating lung cancer, including the motion of the tumor during

breathing. Historically, radiation oncology has tried to prevent, restrict, confine, and limit how a patient breathes. Free-breathing may lessen anxiety and fear for the patient, which may give an overall improved patient experience. This session will discuss motion compensation and synchronization methodologies and their effects on clinical workflow and patient experience when using radiotherapy to treat lung cancer.

Learner Outcomes:

1. List the challenges in treating lung cancer
2. Explain motion compensation and synchronization methodologies
3. Discuss the effects of motion compensation and synchronization methodologies on clinical workflow and patient experience

3:30 - 4:30 PM - **Overview of Velocity, Eclipse and ARIA Utilization - The Emory Experience (Live)** (1.0 Credit)
Presented by Tosin Kayode, MS, CMD, RT(R)(T)
Sponsored by Varian

This session will provide an overview of Velocity, Eclipse and ARIA utilization. The focus will be on the complete integrated patient throughput, accelerated clinical workflow and efficiency in treatment planning, and plan evaluation in a radiation oncology department with all Varian tools.

Learner Outcomes:

1. Utilize Velocity as OncoPACS, and it's tools for contouring, image registration and prior treatment dose evaluation
2. Optimize ARIA for efficient workflow throughput and quality improvement
3. Utilize eclipse TPS for contouring, image registration and fusion, treatment plan and plan evaluation

Monday On-Demand Sessions:

1. **Supplementing 2D and 3D Treatment Plans with Dynamic Conformal Arcs: Case Studies** (1.0 Credit)
Presented by Catherine Cadieux, CMD, BSRT(T)

Dynamic conformal arcs (DCA) are beams that use MLCs to shape the field to the selected target while the gantry delivers dose moving continuously around the patient. Utilizing a dynamic conformal arc with a typical 2D/3D beam arrangement can produce a more conformal plan and reduce the dose to normal tissues.

Learner Outcomes:

1. Describe how DCA creates a more conformal dose distribution compared to AP/PA, opposed laterals, or other simple beam arrangements
2. Outline how to set fields and utilize dynamic conformal arcs in treatment planning
3. Discuss when this technique is most ideal and for which set of patients

2. RO-ILS and APEx: Instruments for Quality Improvement (1.0 Credit)
Presented by Samantha Dawes, CMD and Ksenija Kujundzic, BS

Quality improvement involves both prospective and retrospective review geared at measuring the current state of practice, identifying trends, and improving processes without the attribution of blame. The goal of two distinct ASTRO-led programs, RO-ILS: Radiation Oncology Incident Learning System® and APEx®: Accreditation Program for Excellence, is to promote quality and safety in radiation oncology via a

multidisciplinary, organization-wide initiative. Thanks to RO-ILS supporters such as AAMD, the program is free of charge and allows facilities the opportunity to collect, analyze and address safety errors in a legally protected environment. APEx focuses on a multidisciplinary approach to care that concentrates on quality measurement to encourage safe, effective and peer-reviewed radiation oncology care. The APEx process is predicated on a self-assessment which provides applicants the opportunity to confidentially self-study, compare themselves to established standards, and implement self-correction to prepare for a more productive facility visit and accreditation experience. Both programs may play a role in the upcoming Radiation Oncology Alternative Payment Model, further elevating the importance of the topics. Attendees of this session will learn what measures of quality improvement can be garnered from these programs at a national and local level.

Learner Outcomes:

1. Self-examine dosimetry-related policies and procedures at your facility to promote quality improvement
2. Develop effective corrective actions to mitigate potential incidents and near misses
3. Apply systems-thinking to quality initiatives such as error mitigation and compliance with accreditation standards.

3. **Combined Thermal Therapy and Radiotherapy for the Treatment of Cancer** (1.0 Credit)
Presented by Dario Rodrigues, PhD

Hyperthermia therapy is a potent enhancer of radiotherapy and chemotherapy. This thermal therapy involves selective heating of tumor tissues to temperatures ranging between 39 and 44°C. In particular, microwave (MW) and radiofrequency (RF) hyperthermia devices provide a variety of heating approaches that can treat most cancers regardless the size. This review introduces the biological rationale to combine radiation and heat, the physics of MW/RF hyperthermia, and the current state-of-the-art systems for both localized and regional heating. Clinical trials involving RF/MW hyperthermia are also presented which show Level I evidence of the efficacy of adjuvant hyperthermia when combined with radio- and/or chemotherapy. Next, the clinical workflow of hyperthermia procedures will be reviewed, including patient selection, treatment planning, treatment delivery, and dosimetry. Unlike radiation dosimetry that relies on accurate description of patient anatomy, thermal dosimetry is also dependent on unpredictable patient physiology in the form of blood perfusion and metabolism that strongly influence the temperature distribution in the patient. Thus, thermal dosimetry can only be calculated after treatments by means of thermal dose parameters that capture both tissue temperature and heating time. In the USA, hyperthermia systems only use eight temperature sensors, but the spatial resolution is often increased using thermal mapping via internal catheters located in the rectum, vagina, and interstitially in the tumor. These limitations make hyperthermia treatment verification and reproducibility a challenge and a successful treatment delivery relies significantly on the operator expertise and experience. To this end, this review will also address recent advancements in 3D patient-specific treatment planning as well as guidance using real-time computational simulations and magnetic resonance thermometry.

Learner Outcomes:

1. Explain the biological rationale to combine radiation and heat
2. Outline the physical mechanisms of heat generation during hyperthermia
3. Calculate thermal dosimetry
4. Describe the thermal enhancement ratio observed in clinical trials that used adjuvant hyperthermia

4. **Radiation Oncology Coding & Compliance Denials, Documentation & Updates** (1.0 Credit)
   Presented by Adam Brown, CMD, BSRT(T)

   This course will focus on newsworthy items and hot topics for radiation oncology. With so much going on and happening in cancer centers today, it can feel like no one else is experiencing the same issues and pain points as you. The course will focus on the following:

   - Payer denials for complex simulation (77290) and 3-D planning (77295)
   - Documentation reviews related to IMRT MLC device code 77338
   - Review of supervision guidelines
   - Preparing for 2021 EM documentation and coding updates
   - Billing highlights & updates to COVID-19 response

   Learner Outcomes:
   1. Discuss current payer denial issues and documentation reviews related to radiation oncology services
   2. Explain the preparation for the upcoming E/M coding changes effective for January 2021
   3. List the coding changes for 2020 that are still in place, how the response to COVID-19 may impact them, and what happens when the public health emergency is over

Tuesday, July 7, 2020

1:00 – 2:00 PM - **Keynote Session**: **Artificial Intelligence in Cancer Care** **(Live)** (1.0 Credit)
Presented by Ross Mitchell, PhD

The field of artificial intelligence (AI) is over 60 years old. Recent advances in computational power and biologically inspired artificial neural networks have enabled dramatic breakthroughs. Machines are now able to quickly learn solutions to complex problems previously reserved for human experts. The resulting applications are beginning to transform our lives and societies.

AI will also revolutionize cancer care.

This presentation will provide a high-level introduction to machine learning. It will describe the recent breakthroughs and some of the applications transforming our everyday lives. Then it will provide an intuitive glimpse into the inner workings of artificial neural networks to reveal the strengths and limitations of this technology.

Next, it will focus on new and emerging applications in oncology, with an emphasis on medical imaging. For example, several recent studies have used AI for differential diagnosis of disease, to predict patient responses to treatment, and to discover correlations between patterns in medical images and disease-informed genes in a variety of cancers. Finally, this presentation will discuss the caveats of AI applications in oncology, and glimpse ahead to predict future developments in the field.

Learner Outcomes:
1. Describe the differences between AI, machine learning and deep learning
2. Describe several applications of AI in oncology
3. Describe future applications of AI in oncology, and radiotherapy in particular

2:15 – 3:15 PM – **Establishing Effective Safety Barriers in Radiation Oncology (Live)** (1.0 Credit)

Presented by Daniel Bailey, PhD, DABR

Developing a culture of safety in radiation oncology includes constant assessment and reassessment of the processes and workflows of many complicated tasks throughout diverse professional responsibilities. Analysis techniques such as incident learning, root cause analysis, fault tree diagramming, and failure mode and effect analysis provide valuable information to prospectively anticipate clinical tasks with highest potential risk. What is the next step toward actually improving safety based on this collection of information and multi-disciplinary analyses? Implementation of safety barriers is the process in which definitive steps are formed into policy to effectively mitigate the potential risk of an accident before it has the chance to occur. In this presentation, we will examine current professional guidelines for the creation of simple yet powerful safety barriers to improve the quality and safety of processes across the spectrum of clinical disciplines. Further, we will review some of the literature and case studies demonstrating the usefulness and proven results of some of these safety barriers when established as an integral part of clinical routine. Throughout this presentation, we will focus on practical aspects of implementing safety barriers that each participant can take home and put to immediate use to further develop the quality of the busy professional workload.

Learner Outcomes:

1. Review the basic concepts of incident learning and failure mode and effect analysis toward improving the quality and safety of radiation oncology clinical tasks
2. Gain a working understanding of establishing safety barriers in order to mitigate the tasks with highest risk within any individual's daily workflow
3. Demonstrate the proven usefulness and effectiveness of making smart safety barriers an integral part of daily professional routine

3:30 – 4:30 PM – **Personalized Planning in Pinnacle (Live)** (1.0 Credit)

Presented by Brett Milla, CMD, RT(R)(T); Ted Poulton, CMD, RT(R)(T) and Scott MacDonald, CMD, RT(R)(T)

Sponsored by Philips

This session will cover new Pinnacle software features, including personalized planning, feasibility, and automated planning. These features and other techniques to improve VMAT plans in Pinnacle will be reviewed. This session will help existing users streamline and enhance their skills.

Learner Outcomes:

1. Understand how “feasibility” information aides in planning decisions
2. Review automated planning workflow in therapy planning
3. Create a personalized plan in Pinnacle with feasibility and automated planning using treatment techniques and manual adjustments

5:00 – 6:00 PM – **MedDos Infinity Update/Discussion Forum (Live)**

Moderated by Brian Napolitano, CMD

Tuesday On-Demand Sessions

1. **AI Guided Nodal Volume Delineation to Improve Efficacy of Head and Neck Treatment** (1.0 Credit)
   Presented by Hasti Hesami, CMD and Mu-Han Lin, PhD, DABR

   The optimal dose to the elective neck for head and neck squamous cell carcinoma is actively evolving, with prospective studies suggesting that 40 Gy or even less may be sufficient. We have initiated a prospective study of involved nodal radiation therapy (INRT), in which only involved or suspicious nodes are irradiated, and the rest of the neck is spared. The innovation is the utilization of artificial intelligence and radiomics to assist the physician to identify the suspicious nodes and reduce the irradiated nodal target volume. We hypothesize this regimen should significantly reduce both short- and long-term toxicities. The purpose of this study was to evaluate the dosimetic differences between patients treated on this protocol and patients treated with traditional head and neck VMAT.

   20 patients with oropharynx, larynx, and hypopharynx cancer with traditional volumes were compared with 20 patients treated with the same disease sites on INRT protocol. Five arcs using 6 MV were used for all of the patients. Treatment plans were evaluated based on Dose Volume Histograms (DVHs), isodose distributions, dose conformality, and normal tissue doses. Both sets of plans were designed to achieve a minimum of 95% of the dose to all Planning Target Volumes (PTV's) and spare as much normal tissue as possible. Planning times were also compared based on number of tuning structures.

   Under the same target coverage, INRT plans produced markedly superior normal tissue sparing in comparison to conventional volume plans. INRT plans effectively reduced the intermediate and low dose bath to the patient. In addition, INRT plans are more achievable due to the smaller nodal target volume and hence required significantly fewer planning structures.

   Artificial intelligence guided INRT results in superior plan quality and effectively reduced the dose to OARs and normal tissue. The prospective clinical study is required to assess the oncologic safety and toxicity profile of this promising treatment approach.

   Learner Outcomes:

   1. Explain the INRT-AIR study
   2. Describe head and neck treatment planning using smaller volumes
   3. Use artificial intelligence to improve efficacy of head and neck treatment

2. **Complexity Comes in 3s: IMPT vs VMAT Approach in Three-lesion Small Cell Carcinoma** (0.5 Credit)
   Presented by David Alicia, CMD

   This case study is a comparison of multiple treatment planning modalities explored in treating a patient with three intrathoracic foci (primary tumor, hilar node, mediastinal node) of small cell carcinoma in a patient with prior left pneumonectomy and compromised baseline pulmonary function using IMPT and VMAT. The particular challenge of this case was to maximize target volume coverage while trying to meet the stringent lung constraints (Mean dose < 8.5 Gy and V20 <7%, based on post-pneumonectomy IMRT experience for mesothelioma). IMPT was recommended since lung constraints could not be met with VMAT/IMRT using three full arcs (V20 lung: 30.7%, Mean lung dose: 18 Gy, Mean esophagus dose: 20 Gy, Mean heart dose: 13 Gy, Max cord dose: 23.9 Gy). Further complicating the plan was the significant mediastinal shift from the prior pneumonectomy that resulted in a broad gap between the primary tumor and the nodal disease. As such, a multi-isocenter approach for the proton plan was used, employing a mixed single-field optimization (SFO) and multi-field optimization (MFO). The plan that was ultimately approved was a six field proton plan that consisted of a two-field SFO proton plan targeting the mediastinal node and a four-field MFO proton plan targeting the hilar node and primary tumor. Both plans had their own separate isocenters. In

comparison to the VMAT plan, OAR doses were: V20 lung: 9.7%, Mean lung dose: 5.6 Gy, Mean esophagus dose: 11.6 Gy, Mean heart dose: 2.8 Gy, Max cord dose: 25.5 Gy. Overall, with the analysis of these two plans, advantages and unique indications for proton therapy are highlighted with the ability to not only treating complex tumors with unfavorable anatomy but also a significant reduction in doses to OARs, potentially reducing the risk for serious toxicity.

Learner Outcomes:

1. Discuss the background of patient's diagnosis and pulmonary function
2. List treatment planning concepts of proton therapy
3. Explain the distinction between the treatment planning techniques used for IMPT and VMAT
4. Explain the significant Dose reduction of OARs accomplished with IMPT incomparison with VMAT

3. **Radiation Oncology Culture: Is Yours by Design or Default?** (1.0 Credit)
Presented by Debra Corbin, AS, RT(T), ROCC and Jana Grienke, MHA, ROCC

When a department culture is already established, staff must unlearn the old values, vision, assumptions, and behaviors before they can learn the new culture. The changes in our business are inevitable. As leaders, we cannot afford to be distracted by our success and failures which lure us into taking our hands off the wheel of designing our department's culture!

Learner Outcomes:

1. Develop a team shared vision
2. Explain how to manage communication habits and routines
3. Discuss what a HOT environment is and how to create one

4. **Correlation Between Dosimetry on Smell and Taste Systems and Clinical Outcomes in H/N Patients** (0.5 Credit)
Presented by Li Liu, MS, CMD

The aim of this session is to investigate at which dose level sensory loss on olfactory and gustatory systems appear, and to which extent permanent deficiency occurs after proton radiation therapy (PRT) of nasopharyngeal cancer.

This study includes twenty-five patients with biopsy-confirmed stage IIB-IVB nasopharyngeal carcinoma. Patients were treated with concurrent proton radiation and chemotherapy (cisplatin). Chemosensory Questionnaire (CSQ) was performed before PRT and at 1.5, 3, 6, 12 and 24 months following completion of chemo-radiation therapy. CSQ is a survey instrument for measuring the chemosensory-related quality of life issues in patients with cancer of the head and neck. Treatment planning and dose calculations were performed in CMS XIO. The CTs and Doses were sent to MiM Vista, where taste and smell related anatomical volumes were drawn and DVH data will be computed and analyzed. These volumes include Oral Cavity, Oral Tongue, Parotids, SMGs, Olfactory nerves, Nasal cavity/ethmoids, Sphenoid sinus, and Maxillary sinuses. The dosimetry data being observed will include V5 intervals, D5% intervals, Dmin, Dmax and Dmean. Analysis of variance (ANOVA) and Pearson's correlation statistical tests will also be performed.

Learner Outcomes:

1. Providing a better understanding of the effect of dose to certain organs on patients' quality of life
2. Finding dose levels when olfactory and gustatory system malfunction temporarily and even permanently
3. Helping future treatment planning by better-controlling organs at risk while keeping the same treatment target control.

Wednesday, July 8, 2020

1:00 – 2:00 PM – **The Need for Advanced Education in Proton Beam Dosimetry (Live)** (1.0 Credit)
Presented by Cheryl S. Turner, EdD, RT(R)(T) and Matthew Palmer, MBA, CMD
Sponsored by Legion Healthcare Partners

Proton beam dosimetrists possess advanced treatment planning skills and educational knowledge related directly to the uniqueness of proton beam treatment delivery. These professional traits were recognized by members of the proton beam treatment team and by the AAMD. In response to requests from dosimetrists, educational standards and course material have been developed to offer recognition to those dosimetrists practicing in proton therapy. This discussion will provide an overview of the newly devised educational and clinical standards, as well as explore opportunities for other advanced programs both nationally and internationally.

Learner Outcomes:
1. Define the professional need for advanced proton dosimetry education
2. Understand the similarities and differences in treatment planning for photon vs proton
3. Describe dosimetry applications for specific pathologies and treatment practices in proton therapy

2:15 – 3:15 PM – **Automation of Planning with MCO & Utilizing Informative Plan Visualization Tools to Improve Quality (Live)** (1.0 Credit)
Presented by Randy Larson, CMD
Sponsored by Elekta

Speed up and improve planning workflow using multicriterial optimization and templates. Multicriterial optimization can take the guesswork out of planning by automating OAR sparing. Utilize voxel-based visualization tools in Monaco to help guide the planning process and understand which voxels within a structure are being constrained by that cost function. This session will show how to use the point sensitivity tool to provide feedback as to what constraint(s) are preventing target coverage. You can then utilize clinical knowledge to choose what changes you will make to achieve a better plan.

Learner Outcomes
1. Explain how to use Multicriteria optimization to improve planning workflow
2. Describe how to utilize the Point Sensitivity Tool
3. Explain how to utilize voxel-based plan visualization tools

3:30 – 4-30 PM - **Automation with Deep Learning and Machine Learning in RayStation (Live)** (1.0 Credit)
Presented by Jay Markham, CMD and Scott Hartzell, MS, DABR
Sponsored by RaySearch Americas

The rapid increase of information and accessibility has activated a paradigm shift in algorithm design for artificial intelligence. In this presentation, RaySearch invites you to explore the magnitude of machine learning and deep learning technology that is shaping the oncology field. We have moved beyond concepts and put into everyday clinical use. We will deliver real-time demonstrations of our models to show the flexibility, efficiency and high-quality performance users will experience. In conjunction, we will also supply users with the basic concepts of building and validating models for clinical use. Furthermore, explore the platform RaySearch has developed to facilitate the power of

data intelligence to help predict clinical decision making and outcome-driven approaches for patient treatment. All of these concepts have modernized our field to promote a promising future for healthcare delivery.

Learner Outcomes:

1. Understand how machine learning and deep learning models are revolutionizing the oncology field
2. Describe the framework behind both machine learning and deep learning algorithms
3. Understand basic concepts for building and validating machine learning and deep learning models
4. Discuss the importance of analyzing, indexing and training data for machine learning models
5. Review clinical examples of both machine learning planning models and deep learning segmentation models

5:00 – 6:00 PM – **The Dancing Cord: Inherent Spinal Cord Motion and Its Effect on Cord Dose in Spine SBRT (Live)** (1.0 Credit)
Presented by Patricia Sponseller, MS, CMD, RT(R)(T)

Metastases to the spine are a common complication in cancer patients. These metastases can result in compromised function in these patients resulting in pain and paralysis with loss of organ function. Stereotactic spinal radiation therapy is an emerging treatment technique for spinal tumors. In general, well-established guidelines for spinal cord tolerances have been established. However, spinal cord and central spinal fluid motion dosimetry have not been considered.

Dynamic cardiac-gated balanced fast field echo magnetic resonance imaging (MRI) was obtained in addition to conventional MRI imaging for 17 patients that were treated with volumetric arc therapy (VMAT) spine stereotactic body radiation therapy (SBRT) with spinal tumors.

Dose coefficients were analyzed for the spinal cord in conventional MRI versus the dynamic studies. A dosimetric analysis of the maximum spinal cord dose was reported.

The spinal cord shows inherent motion resulting in measurable dosimetric effects. A recommended planning risk volume (PRV) margin should be added to the spinal cord as an expansion to incorporate motion and ensure that the spinal cord is not overdosed.

Learner Outcomes:

1. Explain the dose limitations to the spinal cord for spinal stereotactic body radiation therapy
2. Discuss and assess motion of the spinal cord
3. Explain the recommended planning organ at risk margin

6:15 – 7:15 PM – **Using Automation to Improve Treatment Planning (Live)** (1.0 Credit)
Presented by Ping Xia, PhD, DABR, FAAPM
Sponsored by Philips

This session will discuss the limitations of current inverse planning optimization and introduce several advanced planning tools such as knowledge-based planning, algorithm-based auto-planning, and multiple criteria optimization to improve automation. Finally, the session will provide clinical examples of how advanced planning tools and automation improve the plan quality and efficiency.

Learner Outcomes:

1. Discuss the limitations of current inverse planning optimization
2. List what advance planning tools are commercially available for treatment planning

Wednesday On-Demand Sessions

1. **Electronic Compensator for Breast Treatment - Manual vs. Auto-generated** (1.0 Credit)
   Presented by Jessica Caselli, CMD

   Electronic compensation (ecomp) is a forward-planning method of achieving breast tangent field modulation. This presentation will cover the process by which an acceptable ecomp plan can be generated in the Eclipse treatment planning system. "Tips and Tricks" will be included such as working with dual energies and getting acceptable matchline doses for 3-4 field breast cases.

   Once the manual process has been described, I will review my experience with auto-generating ecomp plans using Radformation's EZ Fluence tool. This process will also be described step-by-step along with how to handle dual energies and matchlines.

   In conclusion, some case studies will be presented showing the difference between the manual and automatic ecomp generation. Pros and cons will be presented to include plan quality, time of plan preparation, and ease of use.

   Learner Outcomes:
   1. Describe the process to manually create ecomp plans in Eclipse TPS
   2. Gain useful tips for dealing with complex breast setups in Eclipse TPS
   3. Outline the basics of the EZ Fluence software

2. **Where Do We Draw the Line: Quality Assurance of Contours in an Age of AI Segmentation** (1.0 Credit)
   Presented by Yasmin McQuinlan, BRT

   Implementation of AI-based auto segmentation is becoming a reality in many clinics. In this session, we will explore how auto segmentation may help further standardization of processes and the clinical impact this could have. Secondly, the session will show how to critique and utilize contouring guidelines in the era of auto segmentation. Lastly, the practical approaches to editing auto segmented structures in the clinic will be covered. Our perspective on evaluating and editing these auto contours needs to change. We need to ask ourselves, where do we draw the line?

   Learner Outcomes:
   1. Discuss how implementation of auto segmentation can help further standardization and the clinical impact this may have
   2. Explain how to critique and utilize contouring guidelines in the era of auto segmentation
   3. Learn practical approaches to editing auto segmented structures in the clinic

4. **Protons vs. Photons for Pediatric Cancer: How Does a Center with Both Decide Which to Use?** (1.0 Credit)
   Presented by Ralph Ermoian, MD

   Proton therapy has dosimetric advantages in treating patients with many pediatric cancers. However, there are more planning and biologic uncertainties associated with it. In addition, there are more robust long term data associated with photon therapy.

   In this setting, this session will provide an overview of factors and rough algorithm driving the decision of which modality to use in treating pediatric cancers.

Learner Outcomes:

1. Discuss whether protons are associated with a higher risk of severe CNS injury
2. List 3 factors that might result in a physician choosing photons over protons in spite of dosimetric advantages
3. List a pediatric tumor for each of the following 3 proton categories: rarely, sometimes, and usually

Thursday, July 9, 2020

12:00 – 12:30 PM – **AAMD Annual Business Meeting (Live) -** All AAMD Members Are Invited to Attend
Moderated by Cara Sullivan, CMD

1:00 – 2:00 PM – **Proton and Heavier-ion Therapy: Past, Present, and Future (Live)** (1.0 Credit)
Presented by Richard Amos, MSc, FIPEM

Interest in the use of proton beams for radiotherapy continues to grow worldwide due to the physical characteristics of proton dose deposition compared to those of photons. As a proton beam passes through a patient, the protons lose energy along their path as a result of Coulomb interaction. As protons lose energy, they lose momentum, slowing down and becoming more densely ionizing before eventually stopping. This gives rise to the characteristic low entrance dose and plateau, before rising sharply to a maximum, the Bragg peak, then falling to zero at the end of the beam range. The incident energy of the proton beam may be chosen such that the depth of the Bragg peak is coincident with the target to be treated. These distinctive depth-dose characteristics enable increased tissue spared with protons compared to photons, with the potential for reduced risk of radiation-related toxicities.

This presentation will outline the evolution of proton therapy from inception to the current state-of-the art. Furthermore, exciting areas of particle therapy research including heavier-ion therapy, particle minibeams, FLASH therapy, and boron-neutron capture therapy (BNCT) shall be discussed.

Learner Outcomes:

1. Discuss the potential clinical advantage of using proton and heavier-ion beams for radiotherapy
2. List the uncertainties associated with planning and delivering accurate proton therapy
3. Explain the evolution of the field and the exciting research that will shape the future

2:15 – 3:15 PM – **Evaluation of Prostate Planning Strategy for a Multi-site Cancer Center (Live)** (1.0 Credit)
Presented by Mark Herron, CMD and Matthew Goss, MS, DABR
Sponsored by Elekta

This session will discuss prostate planning using robust templates, optimal collimator angles, and modulation along with QA pass rates. It will also cover how to minimize motion of the prostate using bladder and rectal filling.

Learner Outcomes:

1. Use robust templates to deliver a prostate plan
2. Understand and utilize optimal collimator angles
3. Discuss how modulation can improve plan delivery

3:30 – 4:30 PM – **Quality Assurance Essentials - QA Check Improvements That Can Be Implemented by the Medical Dosimetrist (Live)** (1.0 Credit)
Presented by Joe Meyers, MS; Krista Curry-Jones, BA; and Matt Gerace, MS
Sponsored by MIM Software

The treatment planning process consists of many different clinical tasks that require rigorous quality assurance checks to ensure plan quality. This 1-hour workshop will examine three areas in which the medical dosimetrist plays a large role in quality assurance - registration QA, contour QA, and peer review.

Learner Outcomes:
1. Understand the importance of DIR QA in the treatment planning process.
2. Understand the importance of an automated contour QA process.
3. Comprehend the impact of protocol compliance on plan quality and outcomes and how peer review fits into the overall patient care pathway.

Thursday On-Demand Sessions

1. **A Comparison Study of RTT vs non-RTT Medical Dosimetry Graduates – An Update** (1.0 Credit)
Presented by Nishele Lenards, PhD, CMD, RT(R)(T), FAAMD

Education for medical dosimetrists has evolved over the past 40 - 50 yrs. Historically, radiation therapists were trained on-the-job to become medical dosimetrists. Early training emphasized clinical experience tailored to each individual without the typical formal education. As formal medical dosimetry programs emerged and accreditation followed, on-the-job training (OJT) was phased out. Prior researchers have demonstrated that, when compared to RTT medical dosimetrists, the non-RTT medical dosimetrists had superior critical thinking skills, superior medical dosimetry skills upon peer review, and successfully graduated without a radiation therapy certification. However, all but a small number of formal medical dosimetry programs require radiation therapy certification for admission. The problem is a lingering perception from the radiation oncology community that medical dosimetry students must have a prior radiation therapy certification and/or experience. There is a paucity of evidence in the literature to support the perception that prior radiation therapy certification equates to better job performance as a medical dosimetrist. The purpose of this quantitative comparative study was to investigate outcomes of medical dosimetry graduates with and without prior radiation therapy certification (RTT and non-RTT).

Learner Outcomes:
1. Evaluate comparative effectiveness data for RTT and non-RTT medical dosimetry students/graduates
2. Differentiate between RTT and non-RTT medical dosimetry students/graduates from clinical supervisor and employer perspectives
3. Understand potential strengths/weaknesses of RTT and non-RTT education

2. **Treatment Planning for Realtime On-Table Adaptive Radiation Therapy** (1.0 Credit)
Presented by Brett Sloman, BHSc, CMD

This session will provide information for the participants to understand the clinical benefit associated with dose escalation made possible by adaptive treatment using the ViewRay MRIdian system. The treatment planning approach for referent plans will be explained and how this differs from traditional treatment planning so that participants can understand the process for creating a robust treatment plan that may be used as a base for adapting to new anatomy. The overall workflow and roles and responsibilities for the team performing adaptation will be discussed as well as the impact on the clinic.

Learner Outcomes:

1. Describe the clinical benefit associated with dose escalation made possible by adaptive treatment
2. Explain the process for creating a robust treatment plan that may be used as a base for adapting
3. Outline the workflow and roles and responsibilities for the team performing adaptation

3. **Scope of Practice – The Role of the Qualified Medical Dosimetrist in Medical Physics** (1.0 Credit)
Presented by Jeannie Anderson, MS, CMD

At many facilities, the job description for a Qualified Medical Dosimetrist (QMD) often includes responsibilities such as assisting the Qualified Medical Physicist (QMP) with measurements. The AAMD recently released updated documents for the Scope of Practice and Practice Standards. Under the oversight of a QMP, a QMD may perform quality assurance, check charts, and similar physics tasks. The level of involvement of the QMD will depend on facility policies and procedures, personal competency, and the willingness to accept the consequences of those actions. It is entirely appropriate for a Dosimetrist to assist a Qualified Physicist if these circumstances are met.

This session will demonstrate the benefits of applying the AAMD Scope of Practice to your site. With an understanding of the Decision Making Model, dosimetrists should be able to defend and define their roles in their department. Applying the Decision Making Model means taking responsibility for and accepting the consequences of your actions.

Learner Outcomes:

1. Outline the primary points of the decision-making model for determining the Scope of Practice
2. Apply decision-making model in the workplace
3. Use the Scope of Practice document as a tool for defending the responsibility and consequences of individual actions

4. **Bold New Territory, the Next Frontier in Management of Ventricular Arrhythmias** (0.5 Credit)
Presented by Kimberly Marter, MS, CMD, RT(R)(T)

This case study will delve into the collaborative team approach at the University Of Maryland Medical Center in the management of a patient who presented with end-stage ventricular tachycardia (VT). In the setting of limited published data, a multi-disciplinary partnership between cardiology and radiation oncology reviewed cardiac mapping and radiological data to assist with target delineation followed by a stereotactic radiation planning process to deliver effective clinical treatment dose, while respecting doses to adjacent organs at risk. Methodologies to monitor “real-time” motion during treatment delivery were imperative for acceptable clinical outcomes and were addressed as deemed essential. An internal task force was created to define a workflow that included physics, dosimetry, therapy, nursing, regulatory, and support personnel to define the steps from simulation to actual treatment delivery. Once an acceptable treatment plan was achieved, a peer review process was performed from collaborative external “experts” for accuracy and efficacy. Upon treatment delivery, the patient was followed by cardiology and the workflow was evaluated for process improvement against large institution experience.

Learner Outcomes:

1. List treatment planning goals and objectives
2. Explain treatment delivery
3. Discuss clinical outcomes and peer review

5. **Remediation Methods and Outcomes in Medical Dosimetry Education Programs** (0.5 Credit)
Presented by Lori Simmons, CMD

Struggling allied health and medical dosimetry students pose a challenge to their instructors. They require personalized interventions that instructors may not feel qualified to devise or administer, and they need additional instructional time and clinical supervision. Educational programs sponsor a wide variety of remediation efforts ranging from comprehensive plans that address underlying academic and behavioral deficiencies to nothing more than administrative policies that outline the steps for dismissing a failing student. Instructors, consequently, may enjoy broad institutional support for helping failing students, or they may be required to develop and implement an intervention plan. In either case, instructors must invest time and oversight with little evidence that their efforts are pedagogically effective. Although there is substantial research on remediation techniques and outcomes for children and adolescents, comparatively less research exists on post-secondary students and programs. The presentation will review remediation and learning support programs used by allied health and medical dosimetry educators to assist their struggling students.

Learner Outcomes:
1. Differentiate the factors that contribute to the need for remediation among medical dosimetry students
2. Identify which students may need remediation
3. Categorize and assess the remediation techniques used by medical dosimetry education programs

6. **Servant Leadership and the Educator** (1.0 Credit)
Presented by Mellonie Brown-Zacarias, EdS, MET, CMD, RT(T)

The term "servant leadership" was coined by Robert Greenleaf in his 1970 seminal paper titled *The Servant as Leader*. It is still relevant to the daily practice of leaders today. This presentation will introduce the attendee to this concept, as well as the differences between servant leadership and other leadership frameworks. Attendees will learn how servant leadership is applicable to the educator. The concept of servant educator will be introduced with examples and lively discussion of applicability in today's higher education realm.

Learner Outcomes:
1. Explain the foundations of the concept of Servant Leadership
2. Describe differences between Servant Leadership and other leadership frameworks
3. Describe examples of applicability of the concept of servant educator in higher education

Friday, July 10, 2020

1:00 – 2:30 PM – **2020 AAMD Interactive Contouring Session (Live)** (1.5 Credits)
Presented by Upendra Parvathaneni, MD and Matthew Taylor, CMD

The 2020 AAMD Contouring Session will be an interactive, 90-minute session focusing on critical organ-at-risk (OAR) contouring for head and neck cancer.

This session is designed to optimize learning using a combination of hands-on contouring, targeted lectures, contour accuracy scoring, and interactive study of variation in contouring across the population of peers.

During the online session, you will contour live. There will be education provided on each OAR with a focus on contouring methods and tips. Attendees will use ProKnow to contour each specified OAR, and results (both individual and for the whole population) will be processed in real-time.

Learner Outcomes:

1. Individuals will be able to practice contouring for a few critical organs-at-risk (OAR) for a head and neck cancer case study
2. Individuals will be able to score the accuracy of their OAR contours vs. the physician expert contours
3. We will analyze variation in contouring over the population, including variation in accuracy scores, Dice Coefficients, and total organ volumes
4. We will learn where people agree and disagree by inspecting interactive 3D "frequency maps" showing color-coded regions of varying degrees of consensus
5. Individuals will learn critical information and techniques for each OAR from expert radiation oncologist lecturer

2:45 – 3:30 PM – **Closing Remarks/Open Discussion Networking Session (Live)**
Moderated by Cara Sullivan, CMD and Melissa Nolet, CMD