Expanding the Vision

AAMD 36th Annual Meeting
June 12-16, 2011
Hyatt Regency St. Louis at The Arch
St. Louis, MO

PROGRAM

AAMD
American Association of Medical Dosimetrists

TomoTherapy®

We are TomoTherapy. We make it easy for hospitals and cancer centers of all kinds to adopt and apply a radiation therapy solution purposefully designed to advance the quality of care, while improving the quality of lives.

we believe in a better way

TABLE OF CONTENTS

WELCOME TO THE AAMD 36TH ANNUAL MEETING

The American Association of Medical Dosimetrists (AAMD) would like to welcome you to St. Louis and the 36th Annual Meeting. The Administrative Conference Committee (ACC) has worked hard putting together a program that will be sure to "Expand Your Vision" of medical dosimetry!

We would like to take this opportunity to say a special "Thank You" to all our exhibitors and sponsors for our meeting this year. With their continued support and contributions we are able to have a successful meeting.

Please join us Sunday evening from 7:00 PM – 9:30 PM in the Exhibit Hall for our Welcome Reception. Take time to visit all the booths to learn about what's new in radiation oncology products – all while enjoying a tasty buffet and cocktails and mingling with your peers.

The AAMD is excited to welcome our keynote speaker, Dr. Parag Parikh, Assistant Professor of Radiation Oncology at Washington University School of Medicine. His presentation, "Technology & Patient Care from a Patient/Physician Viewpoint," will show you how technology will change care from his perspective as both a physician and a patient. You do not want to miss this, so make sure you are in the General Session room by 8:30 AM on Sunday.

The ACC has made a great effort to listen to the evaluations from last year's meeting attendees and wants to give you the meeting that you requested. The speakers were carefully selected to address the topics that you want to hear. We were also diligent in assembling speakers who could address the upcoming and current technologies that are the hot topics in our field.

The AAMD is happy to once again feature the results of the AAMD/ROR Plan Challenge. Winners will be announced Monday morning during the Plan Challenge session at 8:00 AM. There will also be an interactive Plan Challenge Workshop on Monday afternoon at 3:30 PM in the General Session room. Plus, Nucletron/Velocity Medical Systems, Philips Healthcare and Elekta will be hosting special educational lunch symposia on Sunday, Monday and Tuesday. Be sure to participate in these sessions, which are a great way to earn additional credits! Please check your agenda for details.

While you are here in St. Louis gaining all this new knowledge, don't forget to have some fun. Here are some activities to explore in your free time: Ride to the top of the Gateway Arch, visit the Anheuser-Busch Brewery, indulge the thrill seeker in you and ride roller coasters at Six Flags St. Louis, or just relax and have dinner at one of the many great restaurants in downtown St. Louis. The hotel concierge can assist you with these and other activities.

The AAMD Board of Directors and meeting volunteers would like to thank you for your continued support of the AAMD and our educational activities. Enjoy the meeting!

Sincerely,

Melanie Dempsey, CMD, AAMD President
Cara Sullivan, CMD, 2011 ACC Co-Chair
Laura Earley, CMD, 2011 ACC Co-Chair

SCHEDULE AT A GLANCE

Saturday, June 11

8:00 AM – 5:00 PM	JRCERT Workshop	Mills 6
9:00 AM – 5:00 PM	Registration Open	Grand Foyer
10:00 AM – 6:00 PM	CMD Exam Review	Grand C
12:00 PM – 4:00 PM	Contouring Workshop I	Park View
4:00 PM – 8:00 PM	Contouring Workshop II	Park View

Sunday, June 12

7:00 AM – 6:00 PM	Registration Open	Grand Foyer
7:00 AM – 8:30 AM	Continental Breakfast	Grand Foyer
8:15 AM – 4:15 PM	General Session	Grand ABCD
10:30 AM – 10:45 AM	Break	Grand Foyer
11:45 AM – 1:00 PM	Lunch Break*	
11:45 AM – 12:45 PM	Lunch Symposium**	Park View
	(Sponsored by Nucletron and Velocity Medical Solutions)	
3:00 PM – 3:15PM	Break	Grand Foyer
7:00 PM – 9:30 PM	Welcome Reception	Exhibit Hall

Monday, June 13

7:00 AM – 5:00 PM	Registration Open	Grand Foyer
7:00 AM – 8:30 AM	Continental Breakfast	Grand Foyer
7:00 AM – 8:00 AM	New Member Breakfast	Park View
7:50 AM – 3:00 PM	General Session	Grand ABCD
9:00 AM – 5:30 PM	Exhibits Open	Exhibit Hall
10:00 AM – 10:30 AM	Break	Exhibit Hall
11:30 AM – 1:00 PM	Lunch Break*	
11:45 AM – 12:45 PM	Lunch Symposium**	Park View
	(Sponsored by Philips Healthcare)	
3:00 PM – 3:30PM	Break	Exhibit Hall
3:30 PM – 5:00 PM	2011 AAMD/ROR Plan Challenge Workshop	Grand ABCD
6:30 PM – 8:00 PM	MDCB Item Writing Workshop	Mills 3

SCHEDULE AT A GLANCE

Tuesday, June 14

6:30 AM – 5:00 PM	Registration Open	Grand Foyer
6:45 AM – 8:00 AM	Continental Breakfast	Grand Foyer
7:30 AM – 5:30 PM	General Session	Grand ABCD
9:00 AM – 3:30 PM	Exhibits Open	Exhibit Hall
9:35 AM – 10:05 AM	Break	Exhibit Hall
11:30 AM – 1:00 PM	Lunch Break*	
11:45 AM – 12:45 PM	Lunch Symposium** (Sponsored by Elekta)	Park View
3:00 PM – 3:30PM	Break	Exhibit Hall

Wednesday, June 15

7:00 AM – 6:00 PM	Registration Open	Grand Foyer
7:00 AM – 8:30 AM	Continental Breakfast	Grand Foyer
8:00 AM – 8:15 AM	AAMD Awards Presentation	Grand ABCD
8:00 AM – 5:45 PM	General Session	Grand ABCD
10:15 AM – 10:30 AM	Break	Grand Foyer
11:30 AM – 1:30 PM	Lunch Break*	
11:30 AM – 1:20 PM	Membership Luncheon***	Grand EFGH
3:30 PM – 3:45PM	Break	Grand Foyer

Thursday, June 16

7:00 AM – 1:00 PM	Registration Open	Grand Foyer
6:45 AM – 8:00 AM	Continental Breakfast	Grand Foyer
7:25 AM – 12:35 PM	General Session	Grand ABCD
10:30 AM – 10:45 AM	Break	Grand Foyer

All General Sessions are held in Grand ABCD
Exhibit Hall is Grand EFGH

* Lunch is on your own
** Free box lunch provided for first 75 attendees.
Others welcome to attend on a space available basis
*** Membership Luncheon is for members only - ticket required

DETAILED SCHEDULE

SATURDAY, JUNE 11

8:00 AM

JRCERT Workshop

10:00 AM

CMD Exam Review Workshop

K. Scott Collins, PhD

12:00 PM

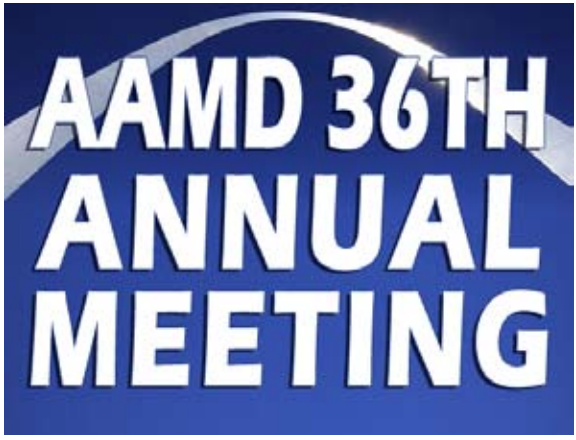
Contouring Workshop I - Presented by Anatom-e

John Pagani

4:00 PM

Contouring Workshop II - Presented by Anatom-e

John Pagani



DETAILED SCHEDULE

SUNDAY, JUNE 12

8:00 AM

Opening Remarks

8:30 AM

Keynote Address: Technology & Patient Care: From a Patient/Physician Viewpoint
Parag J. Parikh, MD

9:30 AM

An Introduction to the Professional Aspects of Medical Dosimetry
Paula A. Berner, CMD

10:45 AM

The Medical Dosimetrist as a Critical Thinker
Anne W. Greener, MS

1:00 PM

The Green Revolution: Massachusetts General Hospital's Conversion to Electronic Medical Records
Brian N. Napolitano, CMD

2:00 PM

Incorporating Dose to Organs at Risk From kV Cone-Beam CT in Radiotherapy Treatment Planning
Mebratu Madebo Ditcha, PhD

3:15 PM

Manuscript Review: Publishing 101 - An Introduction to the Theory and Mechanics of Performing a Peer Review for Scientific Manuscripts
Lon H. Marsh, MBA, CMD; Timothy Ritter, PhD

7:00 PM

Welcome Reception in the Exhibit Hall

DETAILED SCHEDULE

MONDAY, JUNE 13

7:50 AM

Opening Remarks

8:00 AM

2011 AAMD/ROR Plan Challenge

Greg M. Robinson, CMD, RT(T)

9:00 AM

Dosimetry Documentation and Coding: Ensuring Compliance in Your EMR While Incorporating the Latest Requirements

Sally Eggleston, MBA, RT(T), and Kelli Weiss, RT(R)(T)

9:00 AM - 5:30 PM

Exhibits Open in Exhibit Hall

10:30 AM

Contouring Organs at Risk for Modern Breast Cancer Treatment

Robin B. Marsh, MS, CMD

1:00 PM

The Most Important Medical Devices

Benjamin E. Nelms, PhD

2:00 PM

Paperless in a Real World

Mark S. Russell, MHA, RT(R)(T)

3:30 PM

2011 AAMD/ROR Plan Challenge Workshop

Greg M. Robinson, CMD, RT(T)

6:30 PM

MDCB Item Writing Workshop

DETAILED SCHEDULE

TUESDAY, JUNE 14

7:30 AM

Opening Remarks

7:35 AM

Creating a Successful Electronic Medical Record (EMR) at Duke University Hospital: Setting Goals and Achieving Them

Kim L. Light, CMD

8:35 AM

MDCB Cut Score

Robert D. Adams, EdD, CMD, and Kristina Simon, CMD, RT(T)

9:00 AM - 3:30 PM

Exhibits Open in Exhibit Hall

DETAILED SCHEDULE

TUESDAY, JUNE 14 (CONT.)

10:05 AM

AAMD/MDCB Joint Board of Directors Panel Discussion

10:40 AM

Compact Proton Radiotherapy Systems
Eric E. Klein, PhD

1:00 PM

Brain Anatomy on CT and MRIs
Rebecca L. Frame, CMD

2:00 PM

Forward Planning SBRT for Borderline-Resectable Pancreatic Cancer
Dylan C. Hunt, PhD

3:30 PM

EMR Panel Discussion- Electronic Medical Records
Moderator: Gail Ramey, CMD; Panelists: Kim L. Light, CMD; Brian N. Napolitano, CMD; Mark S. Russell, MHA; Kelli Weiss, RT(R)(T)

4:30 PM

IMRT Class Solutions for Treatment Planning of Intracranial CNS Malignancies: Standardized, Efficient, and Effective
Matthew B. Palmer, MBA, CMD

DETAILED SCHEDULE

WEDNESDAY, JUNE 15

8:00 AM

Opening Remarks/AAMD Awards

8:15 AM

Planning Feasibility Study for Low Risk Gynecological Cancer Treatment with Simultaneous Integrated Boost Using RapidArc

Yick Ming Fong, CMD, RT(T)

9:15 AM

Using IMRT Planning to Avoid Pelvic Bone Marrow

Brandie A. Gross, CMD, RT(T)

10:30 AM

Dosimetric Challenges and Planning in Veterinary Radiation Oncology

Jimmy C. Lattimer, DVM, DACVR, DACVRO

1:30 PM

The Leadership Journey – From the Classroom to the Clinic

Rocky Barra

2:30 PM

Reporting Common Isodose Planning Codes and Associated Components

Deborah I. Churchill, RT(T)

3:45 PM

Intensity Modulated Radiation Therapy (IMRT) Benchmarks and Class Solutions for Anal Malignancies

Mary Pham, CMD

4:45 PM

Thoracic Planning with Passively Scattered Proton Therapy: A Paradigm Shift

Jaques B. Bluett, MS, CMD

DETAILED SCHEDULE

THURSDAY, JUNE 16

7:25 AM

Opening Remarks

7:30 AM

Permanent Breast Seed Implant Using Palladium-103
Manon Lacelle, CMD, RT(T)

8:30 AM

Contouring Quality Assurance
Jennifer A. Breuning, CMD, RT(T)

9:30 AM

A Review Of QUANTEC Normal Tissue Tolerances
Mary Lou DeMarco, MS, CMD, RT(T); Thoms Dilling, MD

10:45 AM

Lessons Learned from the Review of Brachytherapy Implants for Cervical Clinical Trials
Franklin B. Hall, BS

11:45 AM

Utilization of FDG PET CT in Target Volume Definition and its Impact on Tumor and Normal Tissue Dose Variation
Tania De La Fuente Herman, PhD

12:35 PM

Closing Remarks
AAMD Administrative Conference Committee

(Schedule is subject to change)

LUNCH SYMPOSIA

Continue learning during lunch by joining our sponsors for these special educational lunch symposia. Box lunches will be provided for the first 75 attendees. Others are welcome to attend on a space available basis. All symposia will be held in the Park View Room. Each session will offer one MDCB credit.

Sunday, June 12
11:45 AM – 12:45 PM
Park View

Educational Symposium sponsored by Nucletron and Velocity Medical Solutions:
Clinical Applications of Deformable Image Registration
Thomas Brunson, *RT(R)(T)*, Clinical Applications Specialist, Velocity Medical Solutions

Abstract:
The use of deformable image registration offers many applications to enhance the efficiency, workflow, and management of a cancer patient. Clinical applications that highlight how deformable enables the utilization of multi-modality imaging will be reviewed:

- How PET/CT taken in the non-treatment position can be deformed to the CTSim to use metabolic information in GTV creation
- Sum dose from different treatment modalities
- Use CBCT images to create an image based quality control check on conformance to treatment plan
- Creating normal anatomy structures with atlas based segmentation
- How advanced contouring tools can aid in both normal anatomy and tumor contouring

LUNCH SYMPOSIA

Monday, June 13
11:45 AM – 12:45 PM
Park View

Educational Symposium Sponsored by Philips Healthcare:
From VMAT to SBRT
Tony Wong, PhD, DABR, Swedish Cancer Institute, Seattle, WA

Abstract:
Volumetric modulated arc therapy (VMAT) is a rotational approach to the delivery of IMRT that provides a simultaneous control of the linear accelerator gantry position, gantry speed, the leaves and the angle of the multileaf collimator and dose rate. We have studied the use of single-arc and multiple-arc VMAT planning and delivery techniques for different treatment sites. We aim to improve treatment plan quality, delivery efficiency and accuracy using VMAT with image-guided radiation therapy (IGRT). This presentation will report on our experience with the acceptance testing and clinical implementation of VMAT on a linear accelerator equipped with on-board cone-beam CT for IGRT. Stereotactic body radiation therapy (SBRT) is an emerging treatment paradigm to deliver a high dose of radiation with a high degree of precision using only a few fractions. SBRT is a modality in which treatment times (excluding patient setup) often exceeds 20 minutes. The use of VMAT for SBRT could significantly benefit patient treatments. Indeed, there are ample evidences to support the efficacy of SBRT in treating non small cell lung cancer (NSCLC) in terms of better local control and survival. This presentation will also report on our 4D motion encompassing cone-beam CT based image guided VMAT treatment strategy for SBRT lung.

LUNCH SYMPOSIA

Tuesday, June 14
11:45 AM – 12:45 PM
Park View

***Educational Symposium Sponsored by Elekta*:**
The Continuous Evolution of Radiation Treatment Planning Systems
Patricia Minyard, CRT, ARRT, CMD, The Disney Family Cancer Center; Virgil Willcut, MS, DABMP, Elekta

Abstract:
We will look into the future of treatment planning, away from the stand-alone applications and dedicated workstations of the past to the vision of integrated oncology information systems. These feature the latest and most effective treatment planning tools available at workstations throughout the facility (and from remote locations). The cornerstone of advanced therapy modalities for many facilities is Volumetric Modulated Arc Therapy, a faster, more efficient treatment technique that allows the oncology care team to produce and deliver the most advanced oncology treatments available today. This symposium will showcase the latest clinical capabilities of Monaco for VMAT, and highlight the scope of the treatment planning platform for the next decade and beyond.

AAMD ADMINISTRATIVE CONFERENCE COMMITTEE

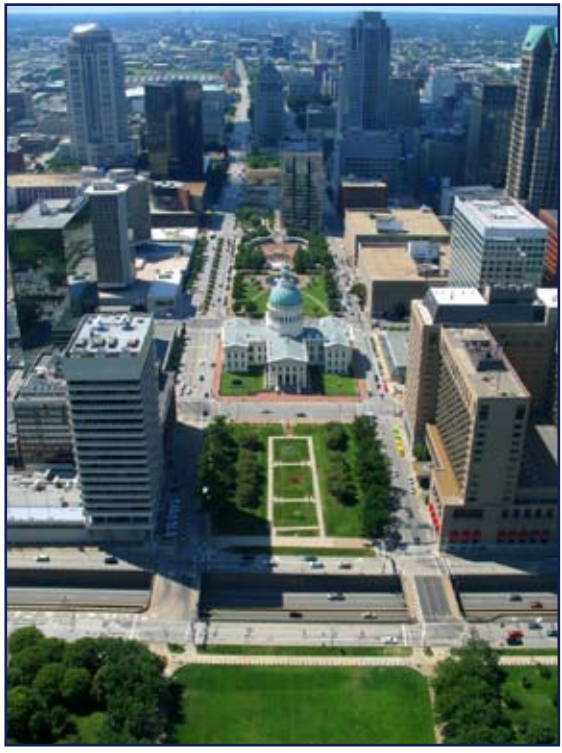
Co-Chairs
Cara Sullivan, Laura Earley

BOD Liaison
Christopher J. Moore

Regional Directors/Regional Representatives
Craig McKenzie, Keitt Mobile, Gail Ramey, Felita James, Rhonda Sabb, Cody Wages

Committee
Crystal Bull, Paul Richards, Karen Diebert, Lori Kasuske, George Beninati, Maria Golish, Anjenette Milligan, Paula Berner, Nishele Lenards

Staff
Gregg Robinson, Stacey Wilson, Spencer Boulter



downtown St. Louis

SPECIAL EVENTS

Welcome Reception

Sunday, June 12 ~ 7:00 PM – 9:30 PM
Exhibit Hall

We will kick-off our meeting on Sunday night with a Welcome Reception in the Exhibit Hall. This event is open to all attendees who have a full registration. It will be a great time to catch up with old friends, make new friends and visit with the exhibitors. Enjoy gourmet food and drinks and enter to win fabulous prizes. As with all AAMD sponsored events, please wear your nametag to identify yourself as part of the AAMD.

AAMD New Member Breakfast

Monday, June 13 ~ 7:00 AM – 8:00 AM
(ticketed event)
Park View
Sponsored by Oncology Data Systems/MuCheck

The New Member Breakfast is open to all new AAMD members who joined the association after July 1, 2010. The breakfast will be held in the Park View Room. The event will provide all new AAMD members the opportunity to meet the Board of Directors, Regional Representatives, Committee Co-Chairs and learn about the many benefits of AAMD membership.

SPECIAL EVENTS

2011 ROR Plan Challenge Workshop

Monday, June 13 ~ 3:30 PM – 5:00 PM
Grand ABCD

Join us on Monday morning, June 13 for the announcement of the winners of the 2011 ROR Plan Challenge, sponsored by AAMD, during a special session of the Annual Meeting followed by a user-interactive workshop on Monday afternoon. The workshop will include an informative, hands-on discussion of the 2011 ROR Plan Challenge.

Unlike previous years, we will not be holding separate vendor-specific breakout sessions for each planning system. This year, the ROR event is aimed at highlighting the commonality between planning on all systems, the complete plan evaluation process. ROR is dedicated to facilitating real dialogue and collaboration on the best practices and trends in Medical Dosimetry. Plan to attend and become a part of the conversation.

MDCB Item Writing Workshop (1.5 CE Credits)

Monday, June 13 ~ 6:30 PM – 8:00 PM
Mills 3

This workshop, led by MDCB President Kristina Simon, RT(T), CMD, and MDCB At Large Representative Robert Adams, EdD, RT(T), CMD, will explain criteria and considerations involved in question writing for the annual MDCB medical dosimetry certification exam. Participants will then be guided through a practical session where they will be able to develop questions that follow the exam's format and content. Questions written may be submitted to the MDCB for consideration on the dosimetry exam. All are welcome to attend. No pre-registration is required.

SPECIAL EVENTS

AAMD Membership Luncheon

Wednesday, June 15 ~ 11:30 AM – 1:20 PM
Grand EFGH

The Membership Luncheon is open to AAMD members only and is included in your full member meeting registration package. The luncheon will be held in Grand Ballroom EFGH. In addition to the luncheon, this event serves as the annual business meeting for the general membership of the AAMD. This meeting provides an opportunity to hear reports, nominate candidates for office, and recognize volunteers who have contributed to the association's well-being. Tickets are required for admission.

Meeting of the Waters

EXHIBITORS

Please visit the AAMD Exhibit Hall to see all the latest products and services for radiation oncology. Our exhibitors help to make this meeting possible and we're most appreciative of their support!

(Exhibitors in alphabetical order; * indicates AAMD Corporate Member)

Company	Booth Number
.decimal, Inc.	106
AAMD	321
Aureus Medical Group	310
Best Medical	101
Bionix Radiation Therapy*	114
Brainlab	120
Churchill Consulting, Inc.*	211
CIVCO Medical Solutions*	104
Elekta*	108 & 110
Genesis Medical Staffing, Inc.*	301
LAP of America*	115
Medical Dosimetrist Certification Board	314
Mission Search	113
Nucletron	116 & 118
Oncology Data Systems*	217
Orfit Industries of America*	215
Philips Healthcare*	205
Radiation Oncology Resources	212 & 214
Radiological Technologies University*	316
RaySearch Americas*	213
Revenue Cycle, Inc.*	303
ScandiDos	117
Siemens Medical Solutions	319
Standard Imaging, Inc.	216
TomoTherapy, Inc.*	201
Varian Medical Systems*	105
Velocity Medical Solutions	312
WFR-Aquaplast/QFix Systems*	311

Exhibit Hall Hours:

Sunday, June 12: Welcome Reception	7:00 PM – 9:30 PM
Monday, June 13:	9:00 AM – 5:30 PM
Tuesday, June 14:	9:00 AM – 3:30 PM

Technology & Patient Care: From a Patient/Physician Viewpoint

Parag J. Parikh, MD
Washington University School of Medicine

Abstract:
Radiation oncology is one of the most innovative and technologically advanced fields of medicine. I will share my thoughts on how these advances will change care, from my experience as a physician and a patient.

Objectives:

1) To appreciate the wonder a radiation therapy patient has about their treatment.
2) To understand that there are new treatment machines that will require novel treatment planning.
3) To learn about some of the efforts to standardize and automate treatment planning.

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An Introduction to the Professional Aspects of Medical Dosimetry

Paula A. Berner, CMD
MD Anderson Cancer Center

Abstract:
Most recent graduates of medical dosimetry educational programs are highly focused on the technical aspects of medical dosimetry as they begin their careers in the profession. Upon acceptance of their first position as a medical dosimetrist they may suddenly find themselves exposed to many professional issues that were not part of their curriculum. This presentation is an overview of topics that the new medical dosimetrist will encounter in their professional career, and that the experienced medical dosimetrist might find as useful reminders.

The major topics that will be addressed are as follows:

- Professional Organizations
- Professional Credentials
- Job Opportunities

- Medical Dosimetry Staffing
- Professional Development Models
- Professional Job Skills
- Financial Issues
- Giving Back to Your Profession
- Resources

Objectives:

1) Identify the professional aspects of medical dosimetry.
2) How these professional aspects can enhance the career of a medical dosimetrist.
3) How the medical dosimetrist can enhance their profession by giving back.

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The Medical Dosimetrist as a Critical Thinker

Anne W. Greener, MS
East Orange VA

Abstract:
Medical dosimetrists use sophisticated simulation, planning, and delivery systems to perform complex tasks during the treatment planning. They are also responsible for recognizing and resolving equipment problems and treatment discrepancies (AAMD, 2010). With the emergence of new technologies, dosimetrists are faced with an abundant amount of information and challenged to use not only their diverse clinical knowledge and professional judgment, but also exercise critical thinking to assure the safe delivery of radiation in the clinic.

Many definitions of critical thinking exist, but a 1990 general consensus statement emerged describing critical thinking as highly developed cognitive skills in interpretation, analysis, evaluation, inference, explanation, and self-regulation (APA, 1990; Facione, 2006). Cognitive skills relates to the process of reasoning, intuition, or perception to acquire knowledge. Dosimetrists use cognitive skills everyday when they are faced with a problem that contains

insufficient data and no immediate, obvious answer. The dosimetrist must use a higher level of inquiry to arrive at a solution. It is imperative that dosimetrists develop critical thinking skills in order to effectively evaluate treatment scenarios and develop an appropriate and safe plan of care for the patient.

This presentation will discuss the theoretical perspectives surrounding the development of critical thinking skills and offer insight into how one might continue to promote critical thinking skills in the clinical environment. Specific critical reasoning techniques will be offered which will guide the participant's understanding of how to develop and apply critical thinking in their professional careers and personal lives.

Objectives:

1) The participant will be introduced to several theoretical perspectives of critical thinking.
2) The participant will be able to assess their critical thinking skill level.
3) The participant will be able to practice their critical thinking skill.

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The Green Revolution: Massachusetts General Hospital's Conversion to Electronic Medical Records

Brian N. Napolitano, CMD
Massachusetts General Hospital

Abstract:
In this presentation, I will discuss the experience of migration to an electronic medical record at the Massachusetts General Hospital in Boston. I will elaborate on the decision to make this conversion and the considerations that we undertook given our patient population. Discussion will touch on the realizations that we have come to while looking at this process for use at the main campus in downtown Boston as well as our satellite facilities, examining the adaptations that were necessary for all facilities involved. I will explore the time frame under which this process took place, going through

the development of the hospital's action plan, the role out of the process to the Radiation Oncology department, and the training program undertaken to ensure seamless implementation. I will discuss the examination of our workflow and the developments and modifications that resulted as we moved forward to an electronic medical record. I will talk about the technical aspects of implementation, looking at both hardware and software solutions that we explored. I will discuss the process of accreditation by the American College of Radiology, and how we have adapted our electronic medical record procedure to meet their criteria. Conversation will also touch on limitations that the electronic medical record has presented and the adaptations that have been necessary as well as our recommendations to the vendors to help make this process easier. I will discuss in specific the role that dosimetrists at the Massachusetts General Hospital play in the electronic medical record from the time of initial simulation through the entire treatment delivery, focusing on treatment planning and plan documentation. Finally, I will make a case for what processes we feel may be beneficial for the dosimetry community at large as they undergo a similar conversion to an electronic medical record.

Objectives:

1) Discussion of necessity of electronic medical record.
2) Discussion of limitations of electronic medical record.
3) Discussion of workflow developments necessary in an electronic medical record.

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Incorporating Dose to Organs at Risk From kV Cone-Beam CT in Radiotherapy Treatment Planning

Mebratu Madebo Ditcha, PhD
Co-Authors: Tomas Kron, PhD; Rick Franich, PhD
Peter MacCallum Cancer Centre

Abstract:

Objective:
To develop guidelines for the inclusion of the dose from a kilovoltage CBCT in the planning protocol, which depends on the patient size and distance of the normal tissue from the isocentre.

Method and materials:
Dose measurements were performed using LiF:Mg,Cu,P thermoluminescence dosimetry (TLD) and water-equivalent RW3 slab phantoms in a kilovoltage CBCT system mounted on a Trilogy accelerator (Varian Medical Systems, Palo Alto, CA). CBCTs were acquired in half fan mode with 125 kVp, 80 mA, and 25 ms. Shutters were adjusted to X1 = 4.8 cm, X2 =15.0 cm and Y1 = Y2 = 9.0 cm and an additional copper filter was introduced to harden the beam and reduce the dose to the patient.

TLDs were placed in a horizontal plane through the isocentre at intervals of 1 cm, sandwiched between rectangular solid water phantoms of different sizes. TLDs were calibrated using a 6 MV photon beam at 100cm SDD, 1.5 cm depth, 10x10cm2 field and 10 MU.

Results and discussion:
Dose measurements at the centre of the scan volume were found to vary with phantom size. Dose variation was also observed as a function of lateral distance from the centre of the scan volume. The results of the measurements can be summarized as follows.

- Central axis for patients with a minimum cross section of 30x20cm2 or above: 3cGy.
- For every cm decrease in the shortest dimension of the patient's cross section, the dose increased by 10%.
- The dose increases towards the outside of the patient by 5% per cm.

Conclusion:
The above findings can be used to estimate the dose in organs in the imaging field from CBCT. These findings are easy to implement and allow a better and generally conservative estimate of dose to the critical structures in the patient,

which can be included in the DVH constraints for planning. No correction is made for target structures. This work recommends a guideline for the inclusion of dose from CBCT to organs at risk in treatment planning.

Objectives:
1) Understand the contribution of CBCT dose to organs at risk.
2) Understand effect of patient size.
3) know how to incorporate CBCT dose in treatment planning.

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Manuscript Review: Publishing 101 - An Introduction to the Theory and Mechanics of Performing a Peer Review for Scientific Manuscripts

Lon H. Marsh, MBA, CMD
University of Michigan Hospitals

Abstract:
This presentation is a primer for the novice reviewer. Discussion of the concepts and applications necessary to perform a thoughtful and thorough review will be included as well as practical examples. Additionally, step by step instruction of the actual mechanics of refereeing a manuscript will be discussed.

Objectives:
1) Develop an understanding of the principles of performing a review.
2) An understanding of the resources available to perform a quality review.
3) Learn the start to finish mechanics of performing a review.

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2011 AAMD/ ROR Plan Challenge

Greg M. Robinson, CMD, RT(T)
Radiation Oncology Resources

Abstract:
Abstract: The purpose of this talk is to present our findings with the most recent AAMD/Radiation Oncology Resources Plan Challenge. The 2011 Challenge will focus on planning and discussion of a prostate bed IMRT case. Dosimetrists from all over the world will have the opportunity to upload the dataset with the tumor volumes to their respective treatment planning systems. Once the plans are complete the dosimetrists will upload the plans back to ROR. The plans will be evaluated and graded by physicians, physicists, and CMDs based on a wide range of criteria, including but not limited to tumor coverage, critical structure doses, dose conformality, and DVH analysis. A single plan from each planning system will then be chosen as the winner. Following the analysis of the plan this talk will not only present those winning plans, but also address the data we have collected and discuss the various approaches and techniques used to generate the winning plan. In addition, we will also present our approach to the same case. The data will be submitted for publication late 2011.

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Dosimetry Documentation and Coding: Ensuring Compliance in Your EMR While Incorporating the Latest Requirements

Sally Eggleston, MBA, RT(R)
Revenue Cycle, Inc.

Abstract:
This program is designed to educate dosimetrist on the most common areas of concern regarding compliance for billing dosimetry procedures that are documented in today's most commonly utilized oncology EMR systems. Information will be presented to the attendees that will include but will not be limited to: documentation requirements, physician signature requirements and correct coding methods to ensure compliance utilizing both ARIA and MOSAIQ.

Objectives:

1) Inform participants of the compliance requirements when documenting the most common dosimetry procedures for 2011 in an EMR.
2) Discuss commonly utilized tools to ensure appropriate documentation.
3) Discuss strategies to ensure proper coding, documentation and compliance.

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Contouring Organs at Risk for Modern Breast Cancer Treatment

Robin B. Marsh, MS, CMD
University of Michigan

Abstract:
As treatment planning techniques for breast cancer continue to evolve, it is necessary to re-assess how breast targets and organs at risk are contoured for use in treatment planning. More clinics continue to change from optimizing a breast plan based on a single axial contour to 3D techniques using a CT simulation of the patient in the treatment position. While full CT datasets have been available for some time, published reports have shown that efforts to contour treatment volumes and organs at risk consistently have been less successful. Contouring of the target anatomy such as the breast or chestwall, tumor bed, and supraclavicular, infraclavicular and internal mammary nodal volumes will be reviewed. Special attention will be given to dealing with treatment planning challenges such as at the surface dose. In addition, normal tissue structures such as the brachial plexus, lung, heart, left anterior descending artery, and carotid artery will be reviewed. By improving the contouring of these regions, progress can be made toward improving the consistency of metrics for assessing the relationship between key metrics and outcomes.

Objectives:

1) Review History of Breast Techniques.
2) Review anatomy of targets and normal structures.
3) Discuss the impact on accurate contouring on outcomes.

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The Most Important Medical Devices

Benjamin E. Nelms, PhD
Canis Lupus LLC

Abstract:
In modern radiation therapy, it is a common perception that advancements in treatment quality are powered by new technology. That is, we often assume that new or more complex devices – for imaging, treatment planning, radiation delivery, and QA – drive the evolution of our field. In the United States, this philosophy is bolstered by a medical reimbursement system that often favors expensive devices that increase the "relative value unit" assessment due to the higher equipment costs per procedure. The purpose of this talk is to hypothesize and support with evidence that the human component of radiation therapy – the individual training, skill, and execution of tasks by dosimetrists, physicians, physicists, and therapists – can have an impact greater than that of new technology. Examples of well-known technology booms of the last decade (such as IMRT, IGRT, particle therapy) will be compared and contrasted to human-controlled outputs (such as target and organ-at-risk delineation, optimized treatment plans, and per fraction patient setup and interaction) in terms of relative impact to common metrics of plan quality such as dose volume histogram (DVH) statistics. In addition, we will review the general elements of "Quality Systems" that are well-established in manufacturing sectors and apply them to modern radiation therapy, postulating where and how we might implement them for maximum effect. Outlines of potential radiation therapy quality systems will be introduced to help catalyze ideas in the audience and inspire practical action. A secondary goal of this talk is to reinforce to all members of the clinical audience that how they do their jobs on a day-in, day-out basis, is of paramount importance. Simply put, it could be argued that the most important medical devices in radiation therapy are, in fact, the clinicians.

Objectives:

1) Learn the importance of accuracy in anatomy contouring in terms of quantifiable plan metrics such as DVH statistics.
2) Learn the relative importance of treatment planning strategies employed by the planner.

3) Learn the relative importance of patient interaction, per fraction, on treatment quality.
4) Understand the role of relative value units when it comes to radiation therapy procedures.
5) Review some of the new technologies in radiation therapy from 2000-2010.
6) Understand elements of a Quality System as understood in manufacturing, and apply it to aspects of radiation therapy.

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Paperless in a Real World

Mark S. Russell, MHA, RT(R)(T)
Moffitt Cancer Center

Abstract:
The objective of the presentation is to describe how one site cleared the "going paperless" hurdle. The real-world issues and concerns that will be described are applicable to a Radiation Oncology department of any size, and the work-a-rounds can be helpful to any facility committed to a paperless medical record.

Objectives:

1) Understand the relationship of a good paper system to a good paperless system.
2) Explain practical problems and functional dilemmas.
3) Describe our experience with forms, work-a-rounds, and how we made it work.

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Creating a Successful Electronic Medical Record (EMR) at Duke University Hospital: Setting Goals and Achieving Them

Kim L. Light, CMD
Duke University Hospital

Abstract:
Converting from Radiation Oncology paper charts to an Electronic Medical Record (EMR) is potentially an enormous and costly process. In January 2009, we at Duke committed to converting to an EMR in our department within 1 year. We formed a multidisciplinary EMR team that met on a regular basis to identify EMR action items. We set goals and agreed to achieve these within a specified amount of time. Although our primary goal was to convert from paper charts to an EMR, it was agreed upon that this would be done only if patient safety and treatment efficacy was not compromised. The EMR team identified all existing paper processes and implemented effective EMR processes. We did this in steps so staff could get used to small changes instead of converting to a complete EMR all at once. Hospital wide data and Radiation Oncology specific data required different processes at our institution. Radiation Oncology specific data was managed with our existing system (ARIA, Varian).

In January 2010, all new treatments were managed solely with the EMR. We found the EMR information became more widely accessible although extensive education and training was performed to ensure that staff was using the EMR efficiently and safely. We encountered many challenges in our journey to implement an EMR but believe Duke Radiation Oncology has converted from paper to EMR without compromising patient safety, quality, and patient confidentiality. The cost of implementing an EMR was associated with new hardware and software along with many hours of hard work from a dedicated staff. It is projected that there will be a yearly savings on other items no longer needed that are related to the paper chart. This presentation will describe the process taken to implement EMR in Radiation Oncology at Duke with specific emphasis on dosimetry, physics, and the Radiation Therapist conversion to an EMR. Lessons learned and challenges encountered will be discussed. Creating a successful EMR takes support from all staff, departmental / hospital leadership, corporate IT, and vendors but what seems impossible can be done by achieving one goal at a time.

Objectives:

1) Understand the resources necessary to convert to an EMR.
2) Describe basic steps necessary to implement an effective EMR.
3) Describe processes implemented to manage the clinical flow of patient information and communication between staff.
4) Describe benefits and challenges to converting from paper to EMR.

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MDCB Cut Score

Robert D. Adams, EdD, CMD
University of North Carolina

Abstract:
The purpose of performing a cut score study – also known as a passing score or standard setting study – is to have an independent group of credentialed practitioners recommend a passing score to the MDCB that is referenced to a standard of minimal knowledge requirements necessary to attain the credential. Test Specifications describe what important content is in the test, but they do not describe how much of that tested content nor at what level of proficiency that content is necessary at a minimum to attain the credential. The results of a cut score study are twofold: 1) a set of minimal knowledge requirements necessary to perform at the credential-worthy level expected by the panel, and 2) a score on the raw test scale reflective of that standard. The fact that the passing score is referenced to what is considered minimal knowledge requirements permits test users to say that people who attain a score at least this high on the raw score scale have the knowledge that enables them to be able to practice at the level expected of a person credentialed by the MDCB.

Thus a cut score study is a process that permits a score on the MDCB raw score scale to be referenced to a standard of minimal knowledge requirements – sometimes referred to as minimal competence – that speaks to the validity of the cut score. Test Validity means that Test Users of the credential are able to draw the conclusion or inference that people who attain at least the minimum passing score (i.e., cut score) and pass are competent and know enough to

practice at the required level (known as a credential-worthy performance level).

The Medical Dosimetrist Certification Board (MDCB) testing committee uses a cut score to identify characteristics of a minimally qualified person to competently work in medical dosimetry. Traditionally, the MDCB has used a modified normative referenced cut score approach. The MDCB, in 2010, moved to a criterion referenced standard, which is the industry standard. In order for the MDCB to properly achieve this goal: Our two job practice analysis, including a survey were completed this past year. From this job practice analysis evolved the specific exam content areas and percentages. Then a panel of MDCB experts were assembled in Chicago to evaluate test questions as to the probability that a minimally acceptable candidate would answer the question.

Historically, the MDCB has tried to maintain a balance between being psychometrically correct and politically palatable. Psychometrically the examination has undergone a strategically planned evolution of the past several years. During this transition the board has been increasingly encouraging openness with its communities of interest. Politically, the board has therefore begun to link strategic, legal, and technological goals to strengthen the position of our examination as the industry standard for medical dosimetry.

Objectives:

1) Describe the concept of a parametric cut score.
2) Discuss the role of the MDCB Board of Directors in establishing linkages between job criteria and test evaluation.
3) Explain the various steps taken to establish the current MDCB examination cut score.

Compact Proton Radiotherapy Systems

Eric E. Klein, PhD
Washington University

Abstract:
Proton Radiotherapy has been in clinic use since 1961 and until recently, large cyclotron (or synchrotron) based facilities have been dominant. These facilities have treated 10s of thousands of patients, quite successfully. The accelerators are enormous (up to 60 meters in diameter) and require expansive transport systems to carry the protons to the treatment rooms. The result is a facility cost including construction of over $150 million. But recently, compact proton systems have come to market. These systems require less space, power, and money. These new systems are based on innovative technologies such as high-powered lasers or dielectric wall. The systems that are currently being installed are based on superconducting magnets that significantly reduce the accelerator size. Protom has developed a system that has a small synchrotron that generates 300 MeV scanned beam protons. Still River Systems (SRS) has designed a synchrocyclotron system, with an accelerator small and light enough to be on a gantry. Washington University in St. Louis (US) is the 1st recipient of this system. The SRS Monarch 250 Proton Therapy Unit possesses a half-gantry (180 degrees of motion), a robotic couch, multiple imaging systems including a CBCT, and a passive scattering field shaping system. The accelerator can produce 250 MeV protons with a range of 32cm.

The constructed proton facility is across the street from the Barnes-Jewish Hospital all-encompassing radiotherapy clinic that possess accelerators, scanners, treatment planning, and general offices for patients, exams, faculty and staff. Therefore, minimal adjacent office and workspace were required, limited to space and activities that is proton specific. The adjacent facility possesses limited but functional space for patient exams and waiting, physician's/physicist's space, treatment planning, storage, etc. The workflow dictated the space allocation. Overall, we have developed an ideal footprint for a small proton facility. We expect to take delivery of the components throughout 2011, with a clinical startup in early 2012. We anticipate building up to a daily patient load of 24 patients per day.

Objectives:
1) The attendee will learn about the various compact systems.
2) The attendee will be given details of how the new technologies compare with existing.
3) The attendee will be given details of the Monarch 250 system and the proton project in St. Louis.

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Brain Anatomy on CT and MRIs

Rebecca L. Frame, CMD
MD Anderson Cancer Center

Abstract:
With enhancements in radiation treatment planning computers, treatment machines, and imaging, the role of dosimetrist has also been changing. Skills in cross-sectional anatomy, using MRI and CT of the brain, are important to help the dosimetrist to identify the anatomy being planned and to communicate effectively with the physicians.

This seminar is offered to provide you with the opportunity to expand your knowledge of brain cross-sectional anatomy and its appearance in CT and MRI images. We will also look at the use of SPECT scans in brain treatment planning. The SPECT scan shows what areas of your brain are more active or less active.

Objectives:
1) Identify cross-sectional anatomy in the sagittal, coronal and axial planes on CT and MR images.
2) Describe various MRI imaging techniques and what they tell us.
3) Locate and identify pertinent cerebral anatomy.
4) On CT and MR images, identify anatomical structures of the brain.
5) What a SPECT scan is and what it tells us.
6) How the various imaging helps us in treatment planning.

Forward Planning SBRT for Borderline-Resectable Pancreatic Cancer

Dylan C. Hunt, PhD
Moffitt Cancer Center
Co-Authors: Susan Leuthold, CMD; Genevieve Butler, CMD;
Mark S. Russell, MHA; Sarah E. Hoffe, MD

Abstract:
The majority of patients who present with pancreatic adenocarcinoma have advanced disease that is inoperable yet long term survival is possible provided surgery is part of the treatment regimen. Subsets of patients are staged as "borderline" respectable if a portion of the tumor abuts a blood vessel less than 180 degrees. Neoadjuvant strategies are designed to facilitate resection with negative surgical margins in this subset. At our cancer center, induction gemcitabine based chemotherapy followed by 5 fractions stereotactic body radiation therapy (SBRT) is our regimen. This report describes the dosimetry techniques we optimized in the gated treatment of our first 15 patients.
The tumor is a moving target because of its proximity to the diaphragm. Furthermore, of major concern is the proximity of the target to the duodenum, liver, stomach, kidneys, spinal cord, and bowel. Hence, tight margins are necessary to avoid the organs at risk (OARs). Each patient underwent staging with pancreatic protocol CT, PET/CT, and endoscopic ultrasound. Fiducial markers were placed into the pancreatic tumor for treatment planning and delivery. The 50% (maximum exhale) CT data set was used as the primary, and was fused to the 40 and 60 % data sets. The planning technique used 7 equally weighted fields. To each field 4 control points were added to permit conformation to 4 distinct dose levels. Normal tissue constraint guidelines were used to specify the dose. A key feature of this approach is the generation of a high dose region strictly within the target. This forward planning technique permits superior dose conformality to the target, while keeping the dose to normal structures within acceptable limits. The majority of patients received 5-6 Gy per fraction to the GTV and up to 8 Gy per fraction to the portion of tumor abutting the blood vessel. Gated treatment with a seven field approach was associated with beam on times

Objectives:

1) Understand dosimetry techniques used to optimized SBRT treatment for pancreatic cancer.

IMRT Class Solutions for Treatment Planning of Intracranial CNS Malignancies: Standardized, Efficient, and Effective

Matthew B. Palmer, MBA, CMD
MD Anderson Cancer Center

Abstract:
The use of IMRT is becoming more commonplace in the treatment of CNS malignancies. However, the determination of beam arrangements is still an empirical process, and optimization of the plan may take hours on the part of the dosimetrist and the physician to achieve optimal conformality. Regional CNS class solutions have been in partial implementation at our institution since 2009. Currently, our dosimetrists are free to use individual patient-specific optimization or to use class solutions, which provide predetermined beam angles and IMRT objectives based on the location of the target in the brain. The purpose of this present work was to investigate the validity of class solutions guidelines in clinical practice. The plans of 55 patients treated for CNS malignancies since 2009 were analyzed retrospectively. 30 plans were categorized as having been planned with class solutions and 27 plans - with patient-specific optimization.

The categorization was based on whether the IMRT plan for the region treated used the predefined beam angles and IMRT objectives for that part of the brain. Each plan was evaluated based on mean dose to the brain, brain V30, and RTOG conformality Index. Also used for comparison was historical benchmark data from 140 patients treated with patient-specific optimization prior to 2009. Plans generated using class solutions were better than those that were individually optimized prior to introduction of class solutions as well as after. This held true for RTOG conformality index, brain mean dose and brain V30. With equivalent PTV volumes, the class solutions reduced the brain V30 by an average of 7.5%, Brain mean by an average 324 cGy, volume of 30Gy by an average of 157 cc, and volume of 20Gy by an average of 218 cc. The RTOG conformality index for the 20Gy volume was reduced by 0.95. As a whole, individually optimized plans were inferior to those generated using class solutions in terms of mean brain dose, brain V30, and RTOG conformality index. The clinical significance of this improvement is yet

unclear. Although the time to complete each plan was not assessed in our study, it is reasonable to assume that the use of class solutions can lead to a considerable conservation of resources for the dosimetrists and physicians in terms of time and staff.

Objectives:

1) Provide an overview of the development of the IMRT optimization class solutions.
2) Demonstrate the benefits of utilizing the class solutions.
3) Demonstrate a live demo of the application of the class solution to show the quality and efficiency.

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Planning Feasibility Study for Low Risk Gynecological Cancer Treatment with Simultaneous Integrated Boost Using RapidArc

Yick Ming Fong, CMD, RT(T)
BCCA Vancouver Centre

Abstract:
RapidArc is a volumetric arc therapy delivery method that was implemented at the Vancouver Cancer Center (VCC) in February 2009. RapidArc can produce dosimetrically equivalent treatment plans compared to conventional Intensity Modulated Radiation Therapy while reducing the treatment delivery time to a level that is comparable to 3DimensionalConformal Radiation Therapy (3D-CRT). Dose to the small bowel and bladder were also reduced using the RapidArc compared to 3D-CRT implies a reduction in acute bowel and bladder side effects for the patient. RapidArc is currently being used for adjuvant treatment of patients with gynecological cancers at VCC. Some patients with gynecological cancer require an additional boost. Current standard of practice at VCC is to use brachtherapy or 3D-CRT.

A feasibility planning study using RapidArc to treat the pelvic area and boosting the primary site simultaneously for patients ineligible for Brachytherapy was undertaken at VCC. Five gynecological patients that were treated with seven non-opposing IMRT beams to the pelvic area followed by Brachytherapy or

3D-CRT boosts were re-planned with RapidArc. The oncologist contoured the additional boost volume onto the original CT data set. Planning criteria, dose constraints and dose prescription were developed with reference to the QUANTEC publications. Dose distribution, Dose Volume Histograms for organs at risk and planning target volume, as well as Conformality Index were used to evaluate the quality of the RapidArc treatment plans.

Objectives:

1) To review the planning strategies for RapidArc.
2) To investigate the feasibility of using RapidArc for low risk gynecological Cancer treatment with integrated boost.
3) To discuss the benefits and some of the challenges of using RapidArc.

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Using IMRT Planning to Avoid Pelvic Bone Marrow

Brandie A. Gross, CMD, RT(T)
University of Iowa Hospitals and Clinics

Abstract:
Purpose: Biological imaging may be a useful tool for normal tissue sparing in radiation therapy treatment planning. In this study, FLT PET was used to locate and reduce dose to active bone marrow regions in IMRT plans created for cervical cancer patients.

Material and Methods: Two cervical cancer patients were scanned in treatment simulation position using FLT PET, both showing biological uptake (active bone marrow) distributed within the pelvis. The FLT PET image was registered to the treatment planning CT using boney landmarks in the pelvis. Bone marrow FLT uptake was different between the two patients. Therefore, active bone marrow was contoured based on SUVs > 2 to enable activity based IMRT optimization parameter prioritization. These contours were then modified to avoid the PTV with a 1cm margin for the dose gradient and force the optimizer to reduce dose only to bone marrow regions outside the PTVs. Two sets of plans were created using an 8 beam arrangement (IEC: 180°, 120°, 80°, 40°, 0°, 320°, 280°, 240°): a baseline conventional IMRT plan, and a bone marrow sparing

IMRT plan (IMRT-BMS) that maintained the baseline PTV and OAR objectives from RTOG 0418 while sparing bone marrow.

Results: Bone marrow FLT uptake was greatest from the L5 vertebrae, to the posterior superior ilium, to the superior sacrum for subject 1, while greatest from the posterior superior ilium, to the inferior illium, to the L5 vertebrae for subject 2. Bone marrow dose was reduced for both subjects when compared to the conventional IMRT plan. V5 was reduced by 1% and 5%, V10 by 1% and 17%, V20 by 16% and 18%, V30 by 23% and 8%, for subjects 1 and 2 respectively. PTV coverage for both subjects was affected by less than 0.3% and no OARs were affected more than 4.6%.

Conclusions: This preliminary data illustrates the potential of FLT PET to localize and reduce dose to the active bone marrow regions in cervical cancer patients while maintaining PTV coverage and OAR objectives. Differences in patient anatomy and bone marrow location and dose response may vary planning outcomes among patients.

Objectives:

1) Explore biological imaging applications in radiation treatment planning.
2) Apply IMRT optimization techniques to biological imaging for normal tissue sparing.
3) Understand the affect of patient anatomy and functional information on IMRT treatment planning outcomes.

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Dosemetric Challenges and Planning in Veterinary Radiation Oncology

Jimmy C. Lattimer, DVM, DACVR, DACVRO
University of Missouri

Abstract:
Radiation Therapy has become a mainstay of cancer treatment in animals and is now recognized as a separate board certification specialty in veterinary

medicine. This is most commonly done with linear accelerators designed for use on human patients. However the variety of size, species and anatomy of veterinary patients precludes the use of any type of standardized treatment approach. Each patient must therefore be individually approached. Some of the more common issues relate to very small size of some patients (less than 4 kg) and the very large size of some patients (> 500 kg), the size of the tumor relative to the patient, the presence of very large air cavities in the head of many patients, beam energy relative to patient size, electron dosimetry in sharply angular patients and use of bolus materials in very superficial tumors. These issues will be highlighted and discussed. The major focus will be on use of very small treatment fields in small patients, the treatment of tumors of the head and neck, treatment of large superficial tumors using combination electron and photon plans and the use of bolus materials with highly angular anatomy in small fields. In addition a brief discussion of the dosimetric issues relative to patient positioning and restraint will be discussed.

Objectives:

1) Understand treatment planning challenges in Veterinary patients.
2) Understand dosimetry of very small fields.
3) Understand planning strategies for very large nasopharyngeal tumors.
4) Understand combination of photon and electron beams for large superficial tumors.
5) Understand the role of bolus in treatment of very small patients.
6) Understand dose and fractionation schemes used in veterinary medicine.

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The Leadership Journey – From the Classroom to the Clinic

Rocky Barra
Corporate Search, Inc.

Abstract:
This 50-minute session will share practical application leadership tips to help ensure a successful and cohesive team. Whether you are a new leader, a seasoned veteran or wanting to step into leadership, everyone will grow in

their influence as we unpack and examine principles from the leadership toolkit.

Objectives:

1) Expanding Your Influence Beyond Your Title
   Influence doesn't merely coincide with position. Leadership and management are separate qualities. As you grow your leadership you can leverage influence beyond your title and authority lines.

2) Coaching 101
   You've been put in charge. They gave you the keys to the car. You have the responsibility for making your team better. What next?

3) Vision Casting
   He who thinks he leads and has no followers is simply taking a walk. How do you get past the cliché to actually moving in the same direction? We will focus on building a collaborative vision where new and seasoned team members can have ownership in the present and future direction of the department.

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Reporting Common Isodose Planning Codes and Associated Components

Deborah I. Churchill, RT(T)
Churchill Consulting, Inc.

Abstract:
With focus on 2D isodose planning, shielding devices, and basic dosimetry calculations, the attendee will understand the appropriate coding levels and quantities to report for routine planning. Discussion will also include what constitutes a reportable simulation procedure, differentiating between the work performed by dosimetry during the isodose planning phase and the work performed by therapists.

With all the focus on 3D and IMRT planning, confusion still exists for basic isodose planning. This seminar will focus on the criteria for each of the standard isodose planning codes, 77305, 77310, 77315, and 77321. The basic dosimetry code 77300 will be discussed, ensuring that the attendee understands what is a reportable calculation compared to a calculation that is part of an isodose plan.Shielding will be discussed, differentiating between technical/professional and hospital/freestanding coding rules. Quantities and modifiers that may be required will be discussed. In regards to simulation, the description 'virtual simulation' has resulted in misconceptions on what constitutes a reportable simulation event, who may report a simulation procedure, and when a simulation is reported. This discussion will educate the attendee on what constitutes a simulation, differentiating between the isodose planning process and a true simulation procedure.

Objectives:

1) Differentiate between the code levels reported with 2D planning; focus on simple, intermediate, and complex isodose planning.
2) Understand what constitutes a reportable shielding device; focus on the level and quantities reported.
3) Be aware of what constitutes a reportable simulation; learning which staff members are required for this process.

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Intensity Modulated Radiation Therapy (IMRT) Benchmarks and Class Solutions for Anal Malignancies

Mary Pham, CMD
MD Anderson Cancer Center

Abstract:
Background
Anal tumor/malignancies have been historically treated with 4-field AP/PA/ Rt lat/Lt lat treatment plans with boosts to nodal volumes. With the advent of intensity modulated radiation therapy, or IMRT, planning techniques, these tumors that previously constituted large fields are treated with more conformal radiation and doses are escalated due to achievable dose sparing

to the bowel, genitalia, and other critical structures that could not be done with previous radiotherapy options. However, there is still a great deal of differences between IMRT treatment planners based on selection of beam angles used, number of beam angles and IMRT objectives used.

Purpose
To develop IMRT benchmarks for Anal tumors and in doing so, decrease inter-planner variability by providing a planning framework for IMRT with integrated boost optimization solution.

Methods and Materials
Forty-two patients treated for anal malignancies since early 2005 to late 2009 were retrospectively analyzed. Patients were then divided into 4 subsets depending on the dose escalation tied to TNM disease classification. These 42 patients were replanned using 7-split beam technique and optimal objectives were developed. Each plan was compared to the original approved plans.

Results
The IMRT plans that were generated for benchmarking were better than the previously treated plans. The bowel, once contouring for this structure was standardized, femoral heads, bladder and genitalia doses were significantly reduced with the new beam angles and objectives.

Conclusions
The new plans generated showed much improved critical structure sparing, mainly the dose to the genitalia against the formerly approved plans. Optimization was minimal once the beam angles and set objectives were used. In setting these benchmarks, we can achieve better-quality plans in a faster time frame. In a clinical setting, this would standardize anal IMRT treatments, improve in achieving time constraints, and decrease extra resources used in planning these time-consuming plans.

Objectives:

1) Learn about benchmarking anal IMRT planning.
2) Learn how far we have progressed, from 3D planning to IMRT for anal site.
3) Learn how this might improve efficiency in a clinical setting.

Thoracic Planning with Passively Scattered Proton Therapy: A Paradigm Shift

Jaques B. Bluett, MS, CMD
MD Anderson Proton Therapy

Abstract:
In the past half century, we have seen many advances in the treatment of thoracic malignancies with radiation therapy. The standard of care continues to evolve from 3D photon treatment (3DXRT) to Intensity Modulated Radiation Therapy (IMRT) to Passively Scattered Proton Therapy (PSPT) to Intensity Modulated Proton Therapy (IMPT). We aim to share our treatment planning experiences in Thoracic planning with PSPT and the progress we have made in the past few years. Our benchmarking data shows that we can correlate involved lung volume and mean lung dose for protons, as has been done for IMRT (Palmer, et. al.). The evolution of this model, combined with innovative techniques in proton treatment planning, has changed the way we think when approaching these cases. This discussion documents the change in our mindset as we shift from 3D photon to 3D proton mentality.

Objectives:

1) Describe proton therapy education.
2) Describe protocol education.
3) Describe statistical benchmarks for future planning.

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Permanent Breast Seed Implant using Palladium-103

Manon Lacelle, CMD, RT(T)
Co-Authors : Jean-Philippe PIGNOL, MD, PhD, FRCPC; Jean-Michel Caudrelier, MD, PhD, FRCPC; Brian M. Keller, PhD, DABR, FCCPM; Joanna Cygler, Ph.D., FCCPM, FAAPM; Patricia Lacasse, RT(T),CMD
The Ottawa Hospital Cancer Centre

Abstract:
Permanent breast 103Pd seeds implant (PBSI) is partial breast irradiation technique that is realized in a single one hour procedure under light

anesthesia. A dose of 90Gy is delivered on the planned target volume and this very high dose is equivalent to a standard dose of 50Gy delivered in 25 treatments. Eligible patients include those referred for adjuvant radiotherapy for an infiltrating ductal carcinoma = 3 cm in diameter, surgical margin ≥ 2 mm, no extensive in situ carcinoma, no lympho-vascular invasion, and negative lymph nodes. With the help of computed tomography, the implant is pre-planned and 2 weeks later the patient is implanted with Palladium 103 seeds under ultrasound guidance. A minimal peripheral dose of 90Gy is prescribed to the CTV identified on the CT scan plus a margin of 1.5 cm. A month later a post plan is done with the help of a new CT scan. This permanent breast seeds implant (PBSI) technique has been tested in a prospective Phase I/II trial and is currently offered in a multicentre Registry trial. Since 2004 we have performed more than 80 permanent 103Pd seed implants on early stage breast cancer patients. I will discuss the procedure, the quality assurance aspects, the dosimetric factors, the patients' satisfaction as well as treatment outcomes and side-effects.

Objectives:

1) Learn implanting technique for Permanent Breast seed implants.
2) Know how to plan and evaluate Permanent Breast seed implants.

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Contouring Quality Assurance

Jennifer A. Breunig, CMD, RT(T)
Loyola University Medical Center

Abstract:
A previous study has shown that variabilities in inter-dosimetrist patient anatomy delineation can result in significant variations in the true dose volume histogram (DVH) of an approved plan. By means of a systematic error, these variabilities may affect target coverage, organ at risk (OAR) doses, daily setup accuracy in image-guided radiotherapy (IGRT) patients, and ultimately, patient outcomes. In this study, we seek to establish a system of contouring quality assurance using multiple anatomical sites (pelvis, head/neck, brain, abdomen,

and thorax). A new software tool, StuctSure (Standard Imaging), was utilized in evaluating patient anatomy delineation by qualitatively and quantitatively comparing two DICOM-RT structure pairs. Briefly, a set of "gold" OAR was defined by a physician team consisting of a radiation oncologist and a diagnostic radiologist. For each treatment site, five Certified Medical Dosimetrists (CMDs) (4.4 years of average experience, post-certification) and one medical dosimetry student independently outlined the same structures defined by the physicians. The dosimetrists' contours were then overlaid with the "gold" contours and compared using various metrics including the variation in volume, dice similarity coefficient (DSC) and a distance penalty score. In this analysis, DSC values close to 1 indicate good agreement, while values closer to 0 indicate poor agreement. A total of 37 OAR were outlined per dosimetrist. For the pelvis, abdomen and thorax, the volumetric agreement was generally within 5% and DSC values ranged from 0.73 – 0.96. Larger disparities were noted for the smaller organs associated with the head/neck as well as brain. In particular, significant variations were noted for the lens, optic nerves, cochlea and chiasm. Lesser, but still significant variation was noted for the parotids which has an average volumetric deviation of 16% with respect to the "gold" contours. Upon completion of the study, each dosimetrist received a customized report based on their contours indicating individual areas of improvement.

Objectives:

1) Understand intra-dosimetrist contour variations.
2) Describe the significance of quantitative measures: Dice scores, metric penalty scores.
3) Understand education/QA contouring.

A Review Of QUANTEC Normal Tissue Tolerances

Mary Lou DeMarco, MS, CMD, RT(T); Thomas Dilling, MD
Moffitt Cancer Center

Abstract:
The increased use of functional imaging, newer treatment planning systems, and more aggressive treatment techniques, has generated large volumes of data that may improve the prospects of using biological response factors as a quantitative modifier in the treatment planning process. QUANTEC (Quantitative Analysis of Normal Tissue Effects in the Clinic) is the outcome of a recent exhaustive literature review of normal tissue tolerances by a large group of medical physicists and radiation oncologists. The new resulting summary tables guide physicians and dosimetrists regarding normal tissue constraints in treatment plans.

Objectives:

1) Understand what increased knowledge the QUANTEC effort provides over the 1991 Emami normal tissue tolerance (TD5/5 and TD50/5) dose tables.
2) Understand the new QUANTEC dose constraints for several organs, such as spinal cord, lung, and esophagus .
3) Understand how to use this new information in treatment planning.
4) Understand new biological-based treatment planning trials.

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Lessons Learned from the Review of Brachytherapy Implants for Cervical Clinical Trials

Franklin B. Hall, BS
MD Anderson Cancer Center

Abstract:
The Radiological Physics Center (RPC) has reviewed brachytherapy doses for the national clinical trial groups since 1968. The purpose of this review is to assure the clinical trial groups that the data reported is correct and

comparable between the institutions placing patients on trial. During this time period the RPC has reviewed over 3000 high dose rate (HDR) and low dose rate (LDR) implants for cervical trials. These implants are submitted by hundreds of different institutions. In order to provide consistency for the trial, each implant undergoes two reviews, a clinical review and a dosimetric review. The clinical review is performed by the radiation oncologist PI on a given study. The dosimetric review is performed by the RPC.

The RPC performs an independent recalculation of the doses reported for each patient. The study group provides the RPC with the brachytherapy dosimetry data including source activities, dwell times, dwell positions, isodose plots and orthogonal implant films or an electronic set of DICOM CT slices for each implant submitted by the participating institution. The RPC recalculates each implant using the specific treatment times for a patient and compares the RPC's dose to the institution's reported dose using an acceptance criterion of ±15%. If the RPC agrees with the institution's reported dose, the dose reported by the institution is accepted by the study group. If the RPC disagrees with the reported dose, the RPC works with the institution to understand and resolve the difference seen. The resulting corrected dose is then reported to the study group. This allows the study group to have consistent and correct data for their trial.

Over the years, the RPC has detected numerous errors in the calculation and reporting of brachytherapy prescription doses for required protocol calculation points. The errors observed are both random and systematic and range from >5% to over 100%. A detailed description of the location of the protocol prescription points for brachytherapy patients is presented along with a discussion of common errors made in defining and reporting doses to these protocol prescription points.

The investigation was supported by PHS grant CA 10953 (NCI, DHHS).

Objectives:

1) Learn the correct location of required protocol points of calculation for cervix studies.
2) Learn the ICRU definition of bladder and rectal points.

3) Learn what mistakes can be made in calculating brachytherapy protocol doses and how to avoid making those mistakes.

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Utilization of FDG PET CT in Target Volume Definition and its Impact on Tumor and Normal Tissue Dose Variation

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The University of Oklahoma Health Sciences Center

Abstract:

Purpose:
To evaluate impact of FDG PET CT in target volume definition, in inter and intra observer variation in target delineation and on tumor and normal tissue dose variations.

Materials and Methods:
Fludeoxyglucose positron emission tomography (FDG PET) combined with computed tomography (CT) has been shown to have greater specificity and sensitivity than CT alone for diagnosis and staging of non-small cell lung cancer (NSCLC) patients. In this study, twenty patients had CT and PET imaging as part of their treatment planning which was performed using pencil beam convolution algorithm with tissue heterogeneity using Eclipse from VARIAN. All treatment plans used multiple non-opposing co-planar beams of four to seven fields. The prescribed dose was 70.2 Gy in 39 fractions.

Two physicians (TH and ST) independently delineated tumor volumes, and treatment plans were generated for each set contoured by them. The doses to the CT contoured structures were obtained from plans that were originally planned based on the contouring of PET-CT fused images for each patient. The tumor volumes defined by PET-CT and CT alone were compared in terms of concordance index (CI) which measures the difference that PET-CT introduces in the target volume definition. The intra and inter observer variations on

tumor delineation were calculated. The mean, minimum and maximum doses to tumor, and normal tissue complication probabilities for lung will be presented.

Results:
The mean intra observer concordance index was 0.48 (range 0.20 – 0.83) for physician ST and 0.50 (range 0.20 – 0.76) for physician TH. The mean inter observer concordance index was 0.45 (range 0.12 – 0.70) and 0.52 (range 0.24 – 0.81) for CT and fused PET-CT tumor outlining respectively. The tumor and normal tissue dose variations are being evaluated and will be presented.

Conclusions:
The use of PET-CT in patients with localized lung cancer significantly changed target volume created by the two experienced radiation oncologists, while pathological verification of PET-CT defined tumor volume was not part of this study; several recent papers suggest clinical correlation with PET-CT clinical tumor volume. Thus, use of PET-CT to define high dose radiation treatment fields represent current state of the art.

Objectives:
1) Understand impact of FDG PET CT in target volume definition.
2) Understand inter and intra observer variation in target delineation.
3) Understand tumor and Normal tissue dose variations.

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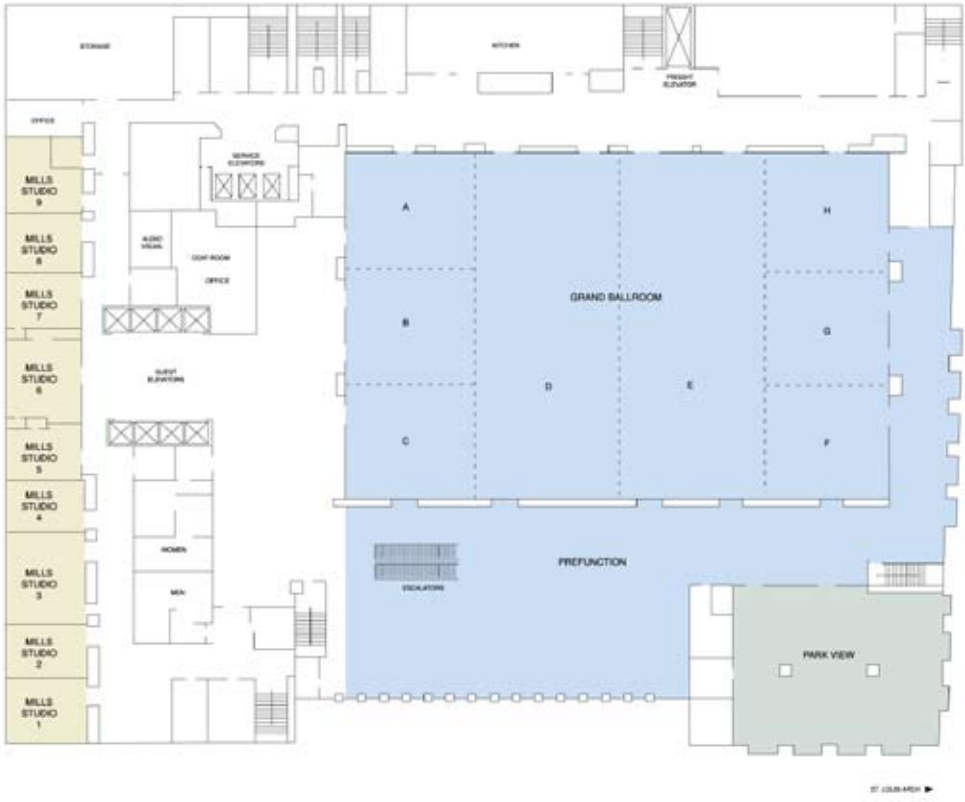

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