Patient Safety in Radiation Therapy

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Outline

• Introduction
• Safety in RT Call to Action
• AAPM Supports Patient Safety
THIS is Why We Are Here
It is ALL about Patient Care

• Ultimately, the result of the Medical Physicist’s work, regardless of whether we do research, provide education or deliver clinical service, is the very best possible patient care.

• Providing tools and resources to help improve the human condition
Patient Safety is Paramount

- Expectation is that the treatment or imaging will be beneficial
- Complex system of technology and humans
- The best people + the best technology NOT = the best System!
- There are many causes of errors
- There are many mechanisms by which safety can be improved.
>300 Attendees

- 45% medical physicists
- 15% administrators
- 10.5% radiation oncologists
- 7% radiation therapist
- 2.5% dosimetrists
- 2.2% regulators
- 6.8% other
- 11% did not respond to the demographics question
RT is a Simple Process

Consultation → Patient Information → Prescription

Treatment R & V → QA → Treatment Plan

Treatment R & V

- 5 to 40 Fractions

Treatment

Different types of cancer
- Different treatment techniques
- Several technologies

Multi- vs. single-vendor environments

Different users:
- Physicians
- Physicists
- Therapists
- Dosimetrists
- IS Staff
- Administrative Staff

Technological Innovations:
- EPID
- kV localize
- CBCT
- Other IGRT

- Research
- Clinical activities

Analysis:
- On-line
- Off-line

Paper vs. Paperless

A lot of Information Communication
CUSTOMIZED

DVAAPM 4/25/2011
Herman # 6
(a portion of) SBRT
Fault Tree for Intensity-modulated Radiation Therapy

TG100
Process + System

• A straightforward process to provide the best, safest and most effective radiation therapy to patients

• Many technologic improvements
  – Allows team to deliver more successful and safer radiation therapy
  – Much hardware & software
  – Creates increasingly complex interactions
  – Many customized to specific clinic
Complex System!

• Educated, professional teams deliver millions of treatments safely and effectively each year
• The complex System is the people plus the technology with many variables.
• We need more than the best people and the best technology, we need the best System!
Full Slide Sets from RT Summit

- Full presentations for each of the following authors are posted on the AAPM website in the virtual library under special meetings, Safety in Radiation Therapy – A Call to Action.

- http://www.aapm.org/meetings/2010SRT/
Growing Complexity of Clinical Oncology

Lawrence B. Marks, M.D.

University of North Carolina at Chapel Hill, NC

- Lessons from new technology and improved QA
Improving Safety

- There is a learning curve for new technology
- Improved QA reduces errors
- Acknowledge the risks and their context
- Consider workflow/processes - Human Factors
- General improvements in workflow reduce stress!
- Improve usability through standardization
- Control the pace of software evolution
What Can Go Wrong in Radiation Treatment?

Peter Dunscombe, Ph.D.

AAPM/ASTRO Safety in Radiation Therapy
Miami. 24th June 2010
What can go wrong in Radiation Treatment?

Learning the lessons

Ola Holmberg, Ph.D.
Head, Radiation Protection of Patients Unit
Radiation Safety and Monitoring Section
Division of Radiation, Transport and Waste Safety
International Atomic Energy Agency
Vienna, Austria
Errors in Radiation Treatment: The Perspective of Regulators

Debbie Bray Gilley
Environmental Manager
Florida Bureau of Radiation Control
June 24, 2010
Safety in Radiation Therapy
Radiation Therapist Perspectives

JOHN FRENCH MSc. FCAMRT CHE
Director of Operations, Radiation Therapy and Surgical Oncology
BC Cancer Agency
Vancouver
The Current Environment: Perspectives from the Team
Role of the Radiation Oncologist

Christopher M. Rose, MD
Valley Radiotherapy Associates Medical Group
Los Angeles, California
WHERE ARE WE IN PATIENT SAFETY?

Lucian L. Leape, MD
Harvard School of Public Health
Potential Tools to Improve Patient Safety

Jim Hayman, MD MBA

The Department of Radiation Oncology
University of Michigan
What Are We Doing to Improve Safety in Radiotherapy?

Benedick A Fraass, PhD

Allen S. Lichter Professor of Radiation Oncology and Director of Radiation Physics, Department of Radiation Oncology
University of Michigan
Complex Systems and the Human Interface

Tim R. Williams, MD
Chairman, Board of Directors
American Society for Radiation Oncology
Medical Director, Lynn Cancer Institute
Boca Raton, Florida

Disclosures: None
ASTRO Six-Point Action Plan

• Creation of an anonymous National Database for error reporting
• Enhance and accelerate the ASTRO/ACR Practice Accreditation Program
• Expand the Educational Training Programs to include intensive focus on QA and safety
• Develop tools for cancer patients to use in discussions with their radiation oncologist
• Accelerate the development of the IHE-RO Program
• Advocate for passage of the CARE Act
The environment at the radiation treatment console in my facility is...
A “time-out” should be required in the delivery process for complex treatments (SBRT, IMRT, SRS, HDR)

- 71.80%: A. Yes Definitely in all cases
- 23.60%: B. Yes, but only for cases above some complex...
- 4.60%: C. No this is over kill
At my facility we perform patient specific quality assurance measurements prior to the patient starting treatment for IMRT.

12.70% Always

4% Most of the time

83.30% Sometimes
To reduce catastrophic errors, additional QA steps that are not currently described in documents available from the AAPM, ASTRO or the ACR are required?

- No, everything we need is currently available (43.50%)
- No, but the necessary QA information is scattered (4.40%)
- Yes, the documents available are inadequate (52.20%)
People in my work group feel free to openly communicate about errors without fear of punishment:

- 59.30% Agree
- 21.20% Neither agree nor disagree
- 19.50% Disagree
Safety in Radiation Therapy: Recommendations

• As complexity increases, control should be simplified
• Use of FMEA and RCA
• Develop a usable reporting system
• Therapist workstation needs human factors engineering
  – Return control to operator at point of care
  – Provide improved early warnings
  – Minimize cognitive clutter
Safety in Radiation Therapy: Recommendations (cont’d)

• Team covenant and safety commitment
• Time outs – called by any team member
• Check lists,
• Facility accreditation
  – audits, SOPs
• Profession-sponsored user groups
• Safety champions
Safety in Radiation Therapy: Recommendations (cont’d)

- Billing process must be simplified
- Team member qualifications consistency, recognized.
- Improve FDA equipment process
- Vendors should address concerns intelligibly
- Recommend staffing levels (Blue Book revision)
Recognizing Qualifications

- demonstrate competence through nationally recognized and consistent qualifications …..

Accreditation

- that qualified people in appropriate staffing numbers perform medical radiation procedures following national consensus best, safe practices.

Event Reporting

- Uniform, consistent, quantitative, accessible national reporting and notifications

Improved Manufacturing/FDA Process
Long Term, Ongoing

- There is no overnight, quick fix to improvement in safety
- We have been working
- We are all responsible
- We all must continue to be vigilant and to work together to develop safer, more effective use of radiation in medicine.