Safety Guidance for Radiotherapy

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Disclosure

Peter Dunscombe is a Founding Partner of TreatSafely, LLC
Safety Guidance for Radiotherapy

Session Objectives

• To review selected recent literature on Quality and Safety in Radiotherapy.
• To distill down the plethora of recommendations to those most commonly sited.
• To present a practical tool for facilitating the enhancement of Quality and Safety in the clinic.
What’s the Summer School all about?

Benefit

Harm

Target Dose

Underdose

Overdose

2013 Summer School, Colorado Springs, CO
Outline

1. Recent literature
2. Key Safety/Quality recommendations
3. Discussion Point
4. Safety is No Accident
5. The AAPM’s Safety Profile Assessment
6. Discussion Point
7. Two SAMs questions
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Radiotherapy Risk Profile

Risk Reduction Interventions

• The top three interventions
  • Planning protocol checklist (20 identified risks)
  • Independent checking (12 identified risks)
  • Competency certification (11 identified risks)

• Other high impact interventions include
  • Equipment quality assurance
  • Peer review audit
  • In vivo dosimetry
Radiotherapy Risk Profile

Risk Reduction Interventions

• In addition there are safety processes...
  • Patient identification
  • Audit of equipment commissioning and processes
  • Staff competency assessment
  • Process and equipment quality assurance
  • Information transfer with redundancy
  • Process governance
  • Error reporting and quality improvement
  • External checking
  • Adequate staffing
Towards Safer Radiotherapy

www.ipem.ac.uk/docimages/2329.pdf
Towards Safer Radiotherapy

- **Summary of Recommendations (37)**
  - Departmental culture, resources and structure (4)
  - Working practices (9)
  - Safety management (6)
  - Patient and staff involvement (5)
  - Change management (4)
  - Quality assurance systems (7)
  - Recommendations for national implementation (2)
ICRP Publication 112

Preventing Accidental Exposures from New External Beam Radiation Therapy Technologies
ICRP Publication 112

15 Main Points

1. The decision to implement a new technology for radiation therapy should be based on a thorough evaluation of expected benefits rather than being driven by the technology itself. To ensure safe implementation, a step-by-step approach should be followed.

2. The following conclusion, drawn in the context of conventional radiation therapy, from publication ICRP No. 86 not only remains applicable but is even more critical for new technologies: “purchasing new equipment without a concomitant effort on education and training and on a programme of quality assurance is dangerous”.

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Hierarchy of Actions

**Stronger actions (6)**
Architectural/physical plant changes
Simplify the process and remove unnecessary steps

**Intermediate Actions (8)**
Software enhancements/modifications
Eliminate/reduce distractions (sterile medical environment)

**Weaker Actions (5)**
New procedure/memorandum/policy
Training
And then there’s

Hendee and Herman: Medical Physics 38 (2011) 78- 82

ASTRO: Six point action plan

TG 100: Key core requirements for quality management
Recent Literature

<table>
<thead>
<tr>
<th>Report</th>
<th>Advice</th>
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<tbody>
<tr>
<td>Towards safer Radiotherapy</td>
<td>37</td>
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<tr>
<td>Radiotherapy Risk Profile</td>
<td>15</td>
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<tr>
<td>Preventing Accidental</td>
<td>15</td>
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<tr>
<td>Hendee and Herman</td>
<td>20</td>
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<tr>
<td>Hierarchy of Actions</td>
<td>19</td>
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<td>ASTRO</td>
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<td>TG 100</td>
<td>5</td>
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<td><strong>Total</strong></td>
<td><strong>117</strong></td>
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A Challenge

What do you do with 117 recommendations?
Outline

1. Recent literature
2. Key Safety/Quality recommendations
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Key Safety/Quality Recommendations

What do you do with 117 recommendations?

First: you eliminate duplicates

That leaves 61

Then: you identify the most frequently cited

12 issues were cited in 3 or more of the documents
Training (7)
Staffing/skills mix (6)
Documentation/SOP (5)
Incident Learning System (5)
Communication/questioning (4)
Check lists (4)

QC and PM (4)
Dosimetric Audit (4)
Accreditation (4)
Minimizing interruptions (3)
Prospective risk assessment (3)
Safety Culture (3)
Recent Literature and Hierarchy of Actions

**Strong**
Safety Culture (3)

**Intermediate**
Staffing/skills mix (6)
Documentation/SOP (5)
Communication/questioning (4)
Check lists (4)
Minimizing interruptions (3)

**Weak**
Training (7)
Prospective risk assessment (3)

**Not mentioned**
Incident Learning System (5)
QC and PM (4)
Dosimetric Audit (4)
Accreditation (4)
Outline

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The NPSF says *Training* is a Weaker Action yet every one of the recent recommendations includes it.
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Safety is No Accident
Safety is No Accident

3.2.0 Examples of Tools/Initiatives to Facilitate Safety and the Safety Culture

Recommendations

Staffing/Schedules
Communication/Facilities
Workflow/Efficiency
Standardization
Hierarchy of Effectiveness
Human Factors Engineering
Incorporating QA
Tools/functionality into Software

Peer and Interdisciplinary Review
Daily Morning Meetings
Safety Rounds
Routine Public
Announcements/Updates
Address Errors and Near-Misses
Quality Assurance Committee
Credentialing and Training
Mapping

Safety is No Accident = Dunscombe

Staffing/schedules = Staffing
Communication/facilities = Communication
Standardization = Documentation
Address errors and near-misses = Incident learning
Credentialing and training = Training.
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A Practical Problem

Who really has time to read >200 pages of complex documents and then figure out how to improve Quality and Safety in their own Department?
SPA is a Safety Profile self Assessment Tool currently under development by the AAPM’s Work Group on the Prevention of Errors in Radiation Oncology.
Safety Profile Assessment

**SPA** includes 92 indicators against which a Department/Program assesses itself using a multidisciplinary consensus approach.
Safety Profile Assessment

1. Actions demonstrate that patient safety is a priority of Radiation Oncology Department leadership.
   - Always / Strongly Agree
   - Most of the time / Agree
   - Sometimes / Neutral
   - Rarely / Disagree
   - Never / Strongly Disagree
   - Don't know / Not Applicable
   Comments:

2. Radiation Oncologist staffing is adequate to meet clinical demands.
   - Always / Strongly Agree
   - Most of the time / Agree
   - Sometimes / Neutral
   - Rarely / Disagree
   - Never / Strongly Disagree
   - Don't know / Not Applicable
   Comments:

3. Medical Physicist staffing is adequate to meet clinical demands.
   - Always / Strongly Agree
   - Most of the time / Agree
   - Sometimes / Neutral
   - Rarely / Disagree
   - Never / Strongly Disagree
   - Don't know / Not Applicable
   Comments:
Safety Profile Assessment

There are 74 assessments in the system. The pie charts and bar graphs for each section below are based on your current answers only.

1. INSTITUTIONAL CULTURE

- Always / Strongly Agree: 22.2%
- Most of the time / Agree: 27.8%
- Sometimes / Neutral: 30.4%
- Rarely / Disagree: 47.6%

1. INSTITUTIONAL CULTURE

- Always / Strong: 7.2%
- Most of the time: 12.5%
- Sometimes / N/A: 9.7%
- Rarely / Disagree: 17.4%
- Never / Strongly Disagree: 22.2%
- Do not know /...: 24.0%

2. QUALITY MANAGEMENT

- Always / Strongly Agree: 17.4%
- Most of the time / Agree: 30.4%
- Sometimes / Neutral: 47.6%
- Rarely / Disagree: 22.2%
- Never / Strongly Disagree: 0.0%
- Do not know /...: 0.0%

2. QUALITY MANAGEMENT

- Always / Strong: 7.2%
- Most of the time: 12.5%
- Sometimes / N/A: 9.7%
- Rarely / Disagree: 17.4%
- Never / Strongly Disagree: 22.2%
- Do not know /...: 24.0%

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Safety Profile Assessment

51. Patient identity is verified before simulation.
   You answered Always / Strongly Agree for a score of 1
   (shorter lines are better)

52. A time out is performed at simulation.
   You answered Sometimes / Neutral for a score of 3
   (shorter lines are better)

53. Physician specifies anatomic extent of the simulation scan.
   You answered Sometimes / Neutral for a score of 3
   (shorter lines are better)

54. Patient set-up is explained by the simulator therapist with visual and textual documentation.
   You answered Always / Strongly Agree for a score of 1
   (shorter lines are better)
Safety Profile Assessment

Results of the Pilot Study

1. Overall how easy was it to complete the SPA:
   - Very difficult
   - Somewhat difficult
   - Neutral: 2/10
   - Easy: 8/10
   - Very easy

2. If your clinic was offered access to the SPA in one year’s time, how likely would you be to complete it again?
   - Definitely not
   - Probably not
   - Possibly: 3/9
   - Very probably: 3/9
   - Definitely: 3/9

3. In your opinion, will the SPA exercise improve safety in your clinic?
   - Definitely not
   - Probably not
   - Possibly: 9/10
   - Very probably: 1/10
   - Definitely

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We’re inundated with advice on how to do better
But talk is cheap
What practical tools should be developed to help us move forward?
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20% Recommends a syllabus for a patient safety course
20% Includes a compendium of RT incidents worldwide
20% Uses FMEA as an example of reactive error management.
20% Is mainly concerned with non-RT incidents
20% Identifies by discipline the instigators of RT incidents
Time for a SAMs Question.

The World Health Organization’s Radiotherapy Risk Profile:

| 20% | Recommends a syllabus for a patient safety course |
| 20% | Includes a compendium of RT incidents worldwide |
| 20% | Uses FMEA as an example of reactive error management |
| 20% | Is mainly concerned with non-RT incidents |
| 20% | Identifies by discipline the instigators of RT incidents |

The World Health Organization’s Radiotherapy Risk Profile: www.who.int/patientsafety/activities/technical/radiotherapy_risk_profile.pdf
And another SAMs Question.

“Simplify the process and remove unnecessary steps” is regarded by the NPSF’s Hierarchy of Actions as:

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- 20% A Stronger Action
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http://www4.va.gov/ncps/CogAids/RCA/indexingpage-page-14
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Summary

• We have reviewed selected recent literature on Quality and Safety in Radiotherapy.
• We have distilled down the plethora of recommendations to those most commonly sited.
• We have looked at a practical tool for facilitating the enhancement of Quality and Safety in the clinic.