VA Radiotherapy Incident Reporting and Analysis System (RIRAS)

Jatinder R Palta PhD
Rishabh Kapoor MS
Michael Hagan, MD

National Radiation Oncology Program(10P11H)

Veterans Health Administration
Disclosure

- Vice President, Center for the Assessment of Radiological Sciences (CARS)
  - A non-profit organization dedicated to improving quality and safety of radiotherapy and radiological imaging.
Objectives

• Describe the design characteristics of the infrastructure for radiotherapy incident reporting in the VHA
• Describe incident reporting workflow
• Give live demonstration of an incident reporting, analysis, and learning
• Discuss lessons learned from the VHA incident reporting system
VA National Center for Patient Safety

**Goal**
- Nationwide (151 VA hospitals) reduction and prevention of inadvertent harm to patients as a result of their care

**Mission**
- Use a "systems approach" to develop health care solutions based on prevention, not punishment.

**Strategy**
- Use Human Factors Engineering methods and apply ideas from "high reliability" organizations, such as aviation and nuclear power, to target and eliminate system vulnerabilities.

**Reporting System**
- Patient Safety Information System (over 1M reports)
  - The information PSIS is protected from disclosure under 38 U.S.C. 5705
Patient Safety Information System

Designed to document patient safety information from across the VA in a general hospital setting, e.g.:

- Misdiagnosis
- Unnecessary treatment
- Unnecessary tests
- Medication mistakes
- “Never events”
- Uncoordinated care
- Infections, from hospital to patients
- Not-so-accidental “accidents”
- Missed warning signs
- Going home- not so fast

Limitations: Lacks Radiation Oncology Taxonomies/Ontologies
Incidents Happen

• We, the radiotherapy community, need to accept that errors do happen.
• Errors happen when even trying to do a good job, good earnest workers.
• Errors almost always happen when multiple unusual things happen at the same time.
• In order to improve the situation, we need to study what happened every time and learn from it.
What to Report?

• Adverse event or incident or any situation that “just doesn’t seem to go like it is supposed to.”
• These include “good catches” that may go undocumented because someone “caught” the problem before anything bad happened.
• Good catches are great opportunities to identify the weaknesses or failure points in systems and processes that, if not addressed, can lead to bad outcomes.
Why Report?

• Sometimes you may be uncomfortable reporting an error or a good catch.
• But if reports are not made, we will never be able to fix or improve the system or process that contributed to the error.
• Intent of reporting incidents or good catches is to prevent similar errors in the future, not to punish any one.
• Reporting is non-punitive.
Radiotherapy Incident Reporting and Analysis System* (RIRAS)

A reporting system to aggregate data for:

• Errors regardless of whether they lead to harm (good catches)
• Adverse events that are recordable at facility level
• Medical events that are reportable as per regulatory requirement
• Issues/problems with radiotherapy devices
Radiotherapy Incident Reporting & Analysis System (RIRAS)

Attributes:

- Taxonomy and data dictionary based on AAPM document on, “Error Reporting”,
- A carefully designed data entry form that minimizes keystrokes (pull-down menus based on well-established clinical workflow for consistent data reporting, pre-filled facility data, etc.),
- Anonymous reporting option,
- Relational event database,
- Data analyses, management and maintenance.
- RIRAS is on the VA Intranet (http://vaww.webdevi.va.gov/NROPA)

RIRAS Workflow

Step 1: Initial Report
RIRAS Workflow

Step 2: Analysis

SME Analyst reviews information provided in initial report

If initial report has complete information on the incident

If initial report is not complete

Local Radiation Oncology Team Members contacted for additional information

Analysis report generated in RIRAS

RIRAS DB.
RIRAS Workflow

Step 3: Patient Safety Work Product

- SME Analyst reviews information provided in analysis report
- Corrective, Preventive & Learning Actions defined
- RIRAS DB
- Patient Safety Work Product report generated
- Email notification
- Reporter
RIRAS Workflow

Step 4: Local Process Improvement

- Reporter
  - Query the database for local facility's reports
- RIRAS DB
  - View local facility reported Patient Safety Work Product reports & trends
- Process Interventions: Event Prevention Quality Improvement
RIRAS Workflow

Step 5: National Process Improvement
RIRAS Status Report

• All 39 Radiation Oncology Services in VHA have used the RIRAS to report at least one incident (mock and or real)
• Current RIRAS database includes (Total: 300 reports)
  – 10 misadministration
  – 277 good catches
  – 8 anonymous good catches
  – 35 reported incidents (CY05-14)
• In addition to these we have received 130 training / mock reports from RTT staff.
• We continue to encourage VHA radiation oncology services to report incidents and good catches in RIRAS
RIRAS Status Report
VHA-wide Reported Incidents
(CY 2005-2014; Historical Data)

35 involving 42 patients

- Distracted RTT staff
- RT Equipment issues
- Communication issues
- Unintended errors
- Dosimetry errors

Potential consequences of distracted RTT staff
1. Wrong patient setup
2. Wrong treatment site
RIRAS Status Report
Reporting Trends

Incident Type

Unsafe Conditions

Good Catches

Actual Events*

*only 3% met the criteria of VHA misadministration classification but with a low medical severity
RIRAS Status Report
“Good Catches” Analysis
5/11/2014 – Present (Total: 277)
Event Origination Process Step

1. Patient Assessment
2. Imaging for Planning
3. Treatment Planning
4. Pre-treatment Verification
5. Treatment Delivery
6. On-treatment Management
7. Post-treatment Management
8. Equipment and Software Issues
RIRAS Status Report
Reporting Trends

Staff Involved

- Radiation physicist: 31%
- Radiation therapist: 25%
- Radiation oncologist: 19%
- Dosimetrist: 8%
RIRAS Status Report

Reporting Trends

Common Reported Events*

- IT Issue: 11
- Wrong MUs: 7
- Prescription plan mismatch: 11
- Contouring issue: 12
- Inconsistent patient setup...: 17
- Previous RT treatment: 15
- Documentation errors: 44

*Based on narrative titles

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Spring Clinical Meeting

2017

March 18-21 | Hilton New Orleans Riverside | New Orleans, LA
RIRAS Status Report
Reporting Trends

Number of Events Originating at Patient Assessment Process Step where discovered

- Post-Treatment Completion: 1
- On-Treatment Quality Management: 3
- Treatment Delivery: 1
- Pre-Treatment Verification: 4
- Treatment Planning
- Imaging for RT Planning
RIRAS Status Report

Reporting Trends

Number of Events Originating at **Imaging for RT Planning**

Process Step where discovered

- **Post-Treatment Completion**: 2
- **On-Treatment Quality Management**: 2
- **Treatment Delivery**: 5
- **Pre-Treatment Verification**: 3
- **Treatment Planning**: 2
- **Imaging for RT Planning**: 4

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Reporting Trends

Number of Events Originating at **Treatment Planning** Process Step

- Post-Treatment Completion: 6
- On-Treatment Quality Management: 8
- Treatment Delivery: 53
- Pre-Treatment Verification: 22
- Treatment Planning: 0

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RIRAS Status Report
Reporting Trends

Number of Events Originating at Pre-Treatment Verification Process Step

- Post-Treatment Completion
- On-Treatment Quality Management
- Treatment Delivery
- Pre-Treatment Verification

13

0 2 4 6 8 10 12 14
RIRAS Status Report
Reporting Trends

Number of Events Originating at Treatment Delivery Process Step

- Post-Treatment Completion: 5
- On-Treatment Quality Management: 12
- Treatment Delivery: 37
RIRAS Status Report
Reporting Trends

Number of Events Originating at On-Treatment Quality Management Process Step

<table>
<thead>
<tr>
<th>Post-Treatment Completion</th>
<th>On-Treatment Quality Management</th>
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RIRAS Status Report
“Good Catches” Analysis
5/11/2014 – Present (Analysis Total: 277)

Majority of “Good catches” are due to organizational management, procedural issues, and human factors.

Causal Analysis

Organizational Management - 92 Good Catches
Procedural Issues - 89 Good Catches
Human Behavior - 70 Good Catches
Technical - 26 Good Catches

- Policy & Procedures
  - Nonexistent
  - Inadequate
  - Not followed
- Procedural Issues
  - Distraction
  - Loss of attention
  - Poor documentation
- Human Behavior
  - Poor judgement
  - Lack of vigilance
- Technical
  - Software operation failure
  - IT issue
Observations

- The importance of checklists to make sure all the “i’s” are dotted and “t’s” are crossed
- Inconsistent patient setup instructions/documentation
- Nonadherence to policies and procedures
- Lax “time out” policies
- Distracted RTTs at the treatment console
  - Lack of “sterile cockpit” environment
- Poor communication between team members
- Inadequate RTT staffing for patient setup and delivery
Incident reporting and learning system is a great tool for enhancing the quality and safety in radiation oncology.

The quality of learning is substantially improved with a thorough analysis of each reported incident:
- Errors in radiation oncology are multifactorial in origin
- May be attributable to any member of the radiation oncology team.