Radiotherapy Incident Management at the MUHC: Standardization, Workflow, and Collaboration

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Incidents in Radiotherapy

• Incident:
  • An unwanted or unexpected change from normal system behaviour which causes or has the potential to cause an adverse effect to persons or equipment

• Incident Learning:
  • Improving patient safety through prevention of incident recurrence and propagation

• To err is human, to learn is divine
Reducing Health Care Hazards: Lessons From The Commercial Aviation Safety Team

A proposed public-private partnership to help the health care community emulate the successes of CAST in commercial aviation safety.

by Peter J. Pronovost, Christine A. Goeschel, Kyle L. Olsen, Tam Pham, Marlene R. Miller, Sean M. Berenholtz, J. Bryan Starz, Marsteller, Laura L. Morlock, Albert W. Wu, Jerod M. Loeb, and M. Clancy

ABSTRACT: The movement to improve quality of care and patient safety standards for health care has yielded examples of measurable and sustained progress are rare. The slow progress in health care contrasts with the success of aviation safety. After a tragic 1999 plane crash in the aviation industry and government created the Commercial Aviation Safety Team (CAST), a public-private partnership to reduce the rate of aviation accidents. This public-private partnership of safety officials and technical experts has been responsible for the decreased average rate of fatal aviation accidents. We propose a similar partnership in the health care community to coordinate national efforts in safety and quality forward. [Health Affairs 28, no. 3 (2009): w479–w489; 7 April 2009; 10.1377/haff.28.3.w479]

Radiation Offers New Cures, and Ways to Do Harm

As Scott Jerome-Parks lay dying, he clung to this wish: that his fatal radiation overdose — which left him deaf, struggling to see, unable to swallow, burned, with his teeth falling out, with ulcers in his mouth and throat, nauseated, in severe pain and finally unable to breathe — be studied and talked about publicly so that others might not have to live his nightmare.

Sensing death was near, Mr. Jerome-Parks summoned his family for a final Christmas. His friends sent two buckets of sand from the beach where they had played as children so he could touch it, feel it and remember better days.

Mr. Jerome-Parks died several weeks later in 2007. He was 43.

A New York City hospital treating him for tongue cancer had failed to detect a computer error that directed a linear accelerator to blast his brain stem and neck with errant beams of radiation. Not once, but on three consecutive days.
## NSIR-RT

### National System for Incident Reporting – Radiation Treatment

<table>
<thead>
<tr>
<th>Taxonomy Data Category</th>
<th>Data Fields and Menu Choices</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Number</strong></td>
<td><strong>Description</strong></td>
</tr>
<tr>
<td>1.1</td>
<td>Incident description</td>
</tr>
<tr>
<td>1.1</td>
<td>Free text</td>
</tr>
<tr>
<td>1.2</td>
<td>Incident type</td>
</tr>
<tr>
<td>1.2</td>
<td>Actual incident: Reached the patient, with or without harm</td>
</tr>
<tr>
<td>1.2</td>
<td>Near miss: Detected before reaching the patient</td>
</tr>
<tr>
<td>1.2</td>
<td>Reportable circumstance: Hazard not involving a patient</td>
</tr>
<tr>
<td>1.3</td>
<td>Acute medical harm</td>
</tr>
<tr>
<td>1.3</td>
<td>Not applicable: Near miss or reportable circumstance</td>
</tr>
<tr>
<td>1.3</td>
<td>None: Patient is asymptomatic and no treatment is required</td>
</tr>
<tr>
<td>1.3</td>
<td>Mild: Symptoms if present are mild; no or minimal intervention (observation, investigation, minor treatment) is required; harm or loss of function is minimal, or intermediate but short term</td>
</tr>
<tr>
<td>1.3</td>
<td>Moderate: Patient is symptomatic requiring intervention (additional treatment or operative procedure) or a prolonged hospital stay; long term or permanent harm or loss of function</td>
</tr>
<tr>
<td>1.3</td>
<td>Severe: Patient is symptomatic requiring life-saving intervention or a major surgical/medical intervention; shortened life expectancy, or major long term or permanent harm or loss of function</td>
</tr>
<tr>
<td>1.3</td>
<td>Death: On the balance of probabilities, death was caused or brought forward in the short term by the incident</td>
</tr>
<tr>
<td>1.3</td>
<td>Unknown</td>
</tr>
<tr>
<td>1.4</td>
<td>Dosimetric severity</td>
</tr>
<tr>
<td>1.4</td>
<td>Not applicable: Near miss or reportable circumstance</td>
</tr>
<tr>
<td>1.4</td>
<td>Minor: ≤5% tumour underdose or OAR overdose, relative to the intended doses to these structures over the course of treatment</td>
</tr>
<tr>
<td>1.4</td>
<td>Moderate: &gt;5% and ≤25% tumour underdose or OAR overdose, relative to the intended doses to these structures over the course of treatment</td>
</tr>
<tr>
<td>1.4</td>
<td>Severe: &gt;25% tumour underdose or OAR overdose, relative to the intended doses to these structures over the course of treatment</td>
</tr>
<tr>
<td>1.4</td>
<td>Unknown</td>
</tr>
</tbody>
</table>
Incident Sharing

Introduction – Standardization – Collaboration – Workflow – Future work
SaILS

• New incident taxonomy is not simply “plug and play”
  • Supporting workflow
  • Multi-professional internal collaboration

• Safety Incident Learning System (SaILS)
  • New online incident management system
  • Incorporate NSIR-RT taxonomy
  • Facilitates workflow
  • Adapted from concept and code base established at TOHCC
  • Written in Django (Python)
  • Tied to MySQL database
Overview

• Paper component
• Online component (SaILS)
• Unique incident IDs for event tracking

• NSIR-RT fields

• Facilitates immediate discussion
• NSIR-RT conditional fields

• Investigator assignment
• NSIR-RT compatible sharing

• Flag for discussion

• Corrective actions
Event Tracking

- Incident tracking
- Up-to-date investigation information
Future Work

• Standardization:
  • Implement in our clinic
  • Validate NSIR-RT for robustness & conciseness

• Collaboration:
  • Batch upload from SailS to national database

• Workflow:
  • Develop suite of statistical analysis tools
  • Analyze historical & new incident data
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- [The Ottawa Hospital](http://www.ottawahospital.on.ca)
- [L'Hôpital d’Ottawa](http://www.habimer.ca)

Introduction – Standardization – Collaboration – Workflow – Future work