

# Maximizing the Value of Incident Reporting: A Medical Physics Perspective

*Increasing the Value of Medical Physics in Clinical Operations*

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## INTRODUCTION

Incident Reporting Systems are playing an increasing role in Radiation Oncology departments, helping to identify error pathways and process vulnerabilities.<sup>1,2,3,4,5</sup> The Radiotherapy Incident Reporting and Analysis System (RIRAS) is a web-based Incident Learning System that uses the taxonomy, data dictionary, and radiotherapy process of care described in the AAPM report on incident learning databases.<sup>2</sup> RIRAS is fully compliant with the Patient Safety and Quality Improvement Final Rule for privileged and confidential reporting of patient safety events for aggregation and analysis.<sup>6</sup>

## AIMS

1. Implement an incident reporting system in a busy clinical setting.
2. Structure the reporting system for Physics to take a lead role.
3. Emphasize efficiency in reviewing and acting on incidents.

## METHODS

Our department launched RIRAS in 2018.

An incident review team (IRT) met weekly to triage reports, assign responders, and identify improvement projects.

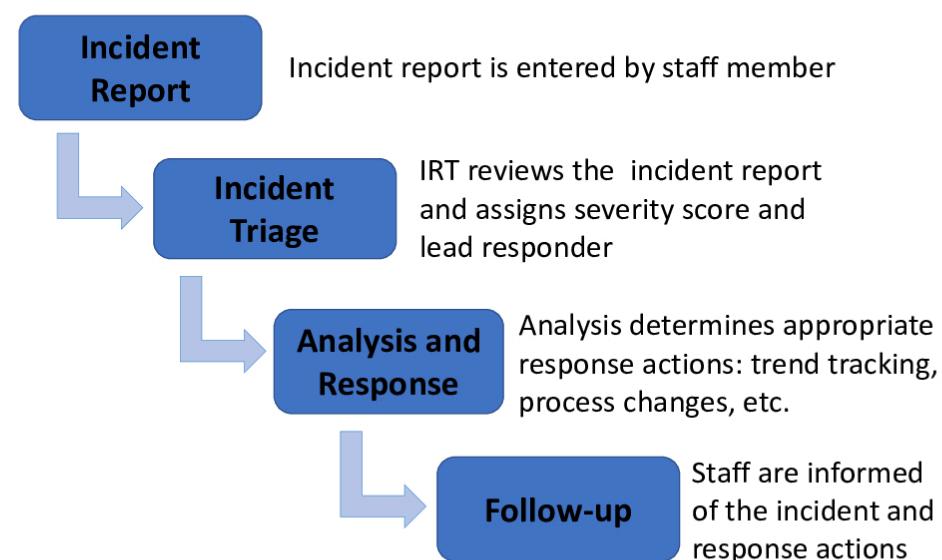
The IRT was led by a Medical Physicist and included: the heads of clinical physics, dosimetry, radiation therapy, and nursing; physician representatives (attending and resident); a management representative; and several special appointees.

## RESULTS

**545 reports** were analyzed by the IRT over a series of **75 one-hour meetings** from September 2018 – March 2020.

Triage – **Severity was scored from D (lowest) to A (highest)** based on the actual and potential hazard, the urgency for action, and other factors.

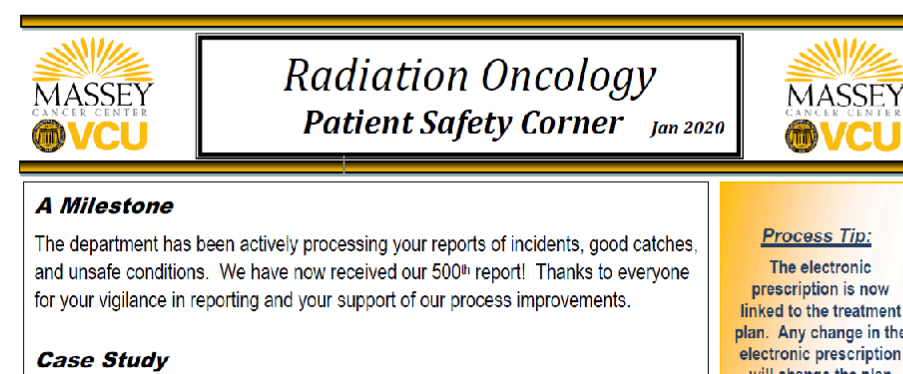
*The process flow is shown below.*



### Communication with staff

IRT members informed their staff of incidents and problems for **immediate awareness, usually through daily or weekly huddles.**

Communication of incidents and response actions were empowered with a **quarterly safety newsletter** (see below).



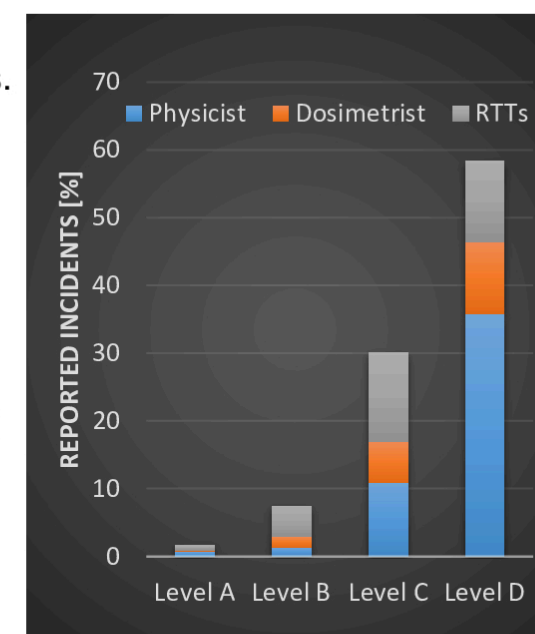
### Summary of incident triage results

Physicists, therapists, and dosimetrists entered reports.

**Level A and B** incidents were addressed using causal analysis and strong follow-up actions.

**Level C and D** incidents were often addressed using enhanced communication and training.

22% of the reports were actual events.



### Incident reporting for quality improvement

**28 QI initiatives** were identified by the IRT. Examples:

- A major restructuring of the physicians' intent and prescription.
- Enhanced Medical Physics pre-treatment plan checks.
- Additional safety barriers to guard against wrong site, wrong plan, and incorrect setup.

These QI initiatives led to a shift in reporting. **Incidents are now identified earlier in the treatment process:**

- *During the first 6 months:* 89% of the reports were submitted by therapists, with events detected either right before or during treatment.
- *One year later:* physicists/dosimetrists submitted 86% of the reports, with most reports coming from pre-treatment plan checks well before treatment.

## CONCLUSIONS & LESSONS LEARNED

Medical Physics can and should lead the incident reporting effort, allowing physicists to play a more impactful role in clinical operations.

Incident analysis and response must be performed by an interdisciplinary radiation oncology team.

Reports must be triaged to prioritize effort and response actions with consideration for time and available resources.

Incident reporting resulted in process improvements that appeared to shift detection of incidents to earlier in the treatment process.

Communication is the key to successful implementation of an incident reporting system.

## REFERENCES

1. Williams MV. Improving patient safety in radiotherapy by learning from near misses, incidents and errors. *Br J Radiol.* 2007;80(953):297-301. doi:10.1259/bjr/29018029
2. Ford EC, Fong de Los Santos L, Pawlicki T, Sutlief S, Dunscombe P. Consensus recommendations for incident learning database structures in radiation oncology. *Med Phys.* 2012;39(12):7272-7290. doi:10.1118/1.4764914.
3. Gabriel PE, Volz E, Bergendahl HW, et al. Incident learning in pursuit of high reliability: implementing a comprehensive, low-threshold reporting program in a large, multisite radiation oncology department. *Jt Comm J Qual Patient Saf.* 2015;41(4):160-168. doi:10.1016/s1553-7250(15)41021-9.
4. Woodhouse KD, Volz E, Bellerive M, et al. The implementation and assessment of a quality and safety culture education program in a large radiation oncology department. *Pract Radiat Oncol.* 2016;6(4):e127-e134. doi:10.1016/j.prro.2015.11.011.
5. ASTRO and AAPM Radiation Oncology Incident Learning System at: <https://www.astro.org/Patient-Care-and-Research/Patient-Safety/RO-ILS>.
6. <https://www.pso.ahrq.gov/legislation/rule>.