



**RO•ILS<sup>®</sup>**

**RADIATION ONCOLOGY  
INCIDENT LEARNING SYSTEM**

*Sponsored by ASTRO and AAPM*



# RO-ILS THEMED REPORT: **TRAINING AND EDUCATION**

PATIENT SAFETY WORK PRODUCT

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# INTRODUCTION

Training and ongoing education are critical aspects of high quality and safe patient care for all practices. Working to ensure that radiation oncology staff have a solid and current knowledge base requires effort in multiple areas; students require oversight, new hires require onboarding, and all staff require continuing education for proficiency with current advances. The addition of new equipment and technology requires specialized training and staffing considerations.

To develop this report on training and education, the Radiation Oncology Healthcare Advisory Council (RO-HAC) analyzed the national RO-ILS: Radiation Oncology Incident Learning® database. Relevant events were initially filtered based on contributing factors, either as identified by the user or a RO-HAC evaluator. Out of 5,000 events for which the optional data element was answered, 570 events were flagged based on nine relevant user-provided answers to [data element #231](#). Of the relevant answer cohort, “facility training inadequate” and “inadequate assessment of staff competencies” were most commonly selected with 200 and 96 events, respectively. Many more events were identified utilizing a recently required RO-HAC data element. Events reported to the PSO are triaged and where warranted, reviewed by a RO-HAC member who answers a few questions based on their understanding of the event. From RO-HAC’s perspective, the contributing factor of more than 12,000 total RO-HAC-reviewed events was inadequate training (380 events), inadequate supervision (426 events), or staff performance (3416 events). The resulting dataset was further filtered in search for key terms, such as “student,” “resident,” “teach,” and “train,” in user-provided free-text fields.

The following RO-ILS cases were identified from this analysis and reflect scenarios on the report theme of training and education.

## NEW STAFF AND REFRESHER TRAINING

### Case 1: Training Students

*An experienced radiation therapist was working with a student to set up and treat a patient with lung cancer. While positioning the patient, an error occurred and the patient was displaced three centimeters anteriorly from where they should have been. A pre-treatment image was taken, but the quality of that image was suboptimal. With the expectation bias from historically accurate setups, the images were approved without any correction being made. While distracted by the need to explain the procedure to the student, the experienced therapist mindlessly overrode the couch position warning required to initiate treatment. The patient was treated in the wrong position.*

When staff considers safety risks and training needs with new personnel, they often overlook the additional burden taken on by the trainers; with additional areas of focus and added distraction, the risk for error is increased. It is important in these situations to make sure that the practice is adequately staffed for training. Students should not be treated as equal contributors to the therapy team, and additional experienced therapists may be required to offset the additional burdens of training. Maintaining a commitment to checklists and systematic workflows will help mitigate some of this added risk. It is also important to recognize override fatigue as a threat to patient safety. When overriding safety warnings becomes commonplace, those safety warnings cease to serve their purpose.<sup>1</sup> Lastly, proactive education for trainers can better prepare staff for the added risk and will help reduce the likelihood of a safety event.

### SAFETY CHECK

How does your practice safeguard a trainer’s focus and attention to patient care when teaching staff? Does your practice add any additional safety measures to the process when training new staff, whether students or new hires?

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### Case 2, 3, 4: Resident Oversight

*Case 2: Resident entered a non-SBRT directive for an SBRT simulation. This resulted in the patient being simulated without gating. The patient had to be brought back to the practice for a simulation with gating.*

*Case 3: Resident wrote the prescription for 5040 cGy in 28 fractions. The patient was correctly consented for 3000 cGy delivered in 10 fractions. The patient received five fractions at 180 cGy per fraction before the error was discovered.*

*Case 4: Resident wrote the prescription for right breast when it should have indicated the left breast was going to be treated.*

These cases highlight the importance of physician oversight and review of documentation when working with trainees, especially residents. It is imperative that this oversight occurs in a timely manner so that any errors in documentation do not affect the patient's course of treatment. Policies and procedures should be established to ensure there are hard stops in place requiring this review by the radiation oncologist. However, oversight alone may not be sufficient in reducing errors.<sup>2</sup> When mistakes such as these are made by trainees or experienced staff, it is important to understand whether they are due to a knowledge deficit or inadequate attention.<sup>3</sup> If knowledge or lack of experience is found to be the issue, staff should receive additional education and repeated exposure.

### SAFETY CHECK

Is there adequate physician oversight in your practice? Is the root cause of documentation errors assessed to determine if there is a knowledge gap? If not, what specific steps can be taken to make improvements?

### Case 5: After Hours Staffing

*A patient presented on a weekend with a heterotopic ossification and required radiation therapy treatment. Weekend treatments were covered by a resident and a therapist. A hand calculation was performed erroneously with half of the actual field size which resulted in a 12.5% error in monitor units. The patient was subsequently treated with this 12.5% dose error. The department had a policy requiring all calculations performed over a weekend to be reviewed by a physicist on the next business day and unfortunately in this case it was not done. The error was caught during an end-of-treatment review.*

This case serves as a reminder that ongoing education is required to support procedures that are done infrequently.<sup>4</sup> Monitor unit calculations can be a simple process but it is human nature to become rusty with tasks performed infrequently. Competency testing with infrequent procedures can serve as a great refresher for even the most experienced staff. Safety practices such as using automated second check software or limiting who performs tasks after-hours (e.g., excluding new staff, trainees, temporary staff) may help reduce some of the risks. Performing a local audit of higher-risk scenarios would be of great value and help to develop mitigation strategies that protect against error.

### SAFETY CHECK

What tasks and procedures are important but performed infrequently in your practice? Does your practice currently use competency testing as a way to keep skills sharp? If not, what is the one area that could be best served by regular competency testing?

### Case 6: New or Temporary Staff

*Three therapists were at the treatment unit, two locums and one new staff member. The senior therapist normally present was on vacation. The patient had a similar name to another patient and the incorrect patient's information was opened at the treatment unit. The patient was imaged, and shifts were applied. Because the incorrect patient information was accessed, an incorrect tolerance table was applied. This resulted in large shifts not requiring an override prior to treating the patient.*

Maintaining proper staffing levels can be difficult while managing vacations and staff shortages. When setting policy for staffing levels it is important to consider the number of staff present and also their training, experience and status. For example, practice may want to commit to staffing an experienced therapist at the machine at all times. Staffing levels must be adhered to even when staff are out on vacation, leave, etc. This is especially important when locums staff are used who may not be as familiar with relevant policies and procedures. This highlights the importance of adequate onboarding, availability of written standard operating procedures (SOPs) and handoffs. Limiting locums' roles and requiring them to be paired with an experienced staff therapist should be considered; locum staff are not "plug and play." If new or locum staff are to be used for complex treatment procedures, refresher training should be considered prior to the procedure.

#### SAFETY CHECK

How does your practice onboard locum therapists? Does your practice have an experienced therapist at the machine at all times? If not, what are the barriers to this level of staffing and what might be a way to optimize the staffing of experienced therapists?

## NEW TECHNOLOGY/EQUIPMENT

### Case 7: Auto-contouring Software

*Treatment planning was being performed for a new SBRT lung case and new auto-contouring software was being incorporated into that process. While the auto-contouring software segmented much of the anatomy, one organ at risk (OAR) had irregularities that were not identified. Unfortunately, the area of this OAR that was missed was particularly significant as it was directly adjacent to the planning target volume (PTV). The contouring error was not discovered by the planner, nor was it caught during the plan review process. It was, however, found during the practice's chart rounds and was corrected prior to the patient starting treatment.*

New technology offers opportunity for advancement but also increased risk, especially during implementation periods when safety practices have not been fine tuned. Education is important prior to commissioning so that staff become familiar with processes, workflows and potential dangers. Education is equally important after go-live when experience is being gained in real time and pitfalls become more clearly understood and error mitigation strategies can be effectively developed. Auto-contouring software can offer significant time savings but requires critical post-contouring analysis, especially in areas adjacent to target structures. Peer reviews are especially important for these cases and having multiple layers of quality assurance helps ensure that errors are ultimately caught before reaching the patient.

#### SAFETY CHECK

What is the standard protocol in your practice for implementing new technology? Is training and peer review adequate or could improvements be made? How does your practice educate staff on the risk of expectation bias for technology/software tools and mitigate the risk?

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# CONCLUSION

The addition of new staff to the practice, whether directly out of school or highly experienced, should be welcomed. Fresh perspectives provide an opportunity for the practice to assess their own policies and improve. For example, this is a chance to confirm that SOPs sufficiently document the practice-specific method. The addition of new equipment can similarly improve patient care and processes. Beyond the more apparent improvements, more subtle benefits may be associated with acquiring trainees, technology, and other staff. For example, training students provides a possible pipeline for hiring, which may have some safety benefits and eliminates the need to onboard a new hire. Use of temporary staff can test efficient and adequate handoff procedures. Practices should maximize the benefit of new staff and equipment while being vigilant and proactive to mitigate any associated safety risk, and simultaneously offer ongoing education for all staff.

## REFERENCES

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