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Safer Radiotherapy

Radiotherapy Newsletter of Public Health England
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Welcome to the 19th issue of *Safer Radiotherapy.* The aim of the newsletter is to provide a regular update on the analysis by PHE of radiotherapy error (RTE) reports. These anonymised reports are submitted on a voluntary basis through the National Reporting and Learning System (NRLS) of NHS England or directly to PHE, to promote learning and minimise recurrence of these events.

Safer RT is designed to disseminate learning from RTEs to professionals in the radiotherapy community to positively influence local practice and improve patient safety.

Published three times a year, *Safer RT* contains key messages and trends from the analysis of four-month periods of RTE reports.

Any comments and suggestions for inclusion in the newsletter would be gratefully received. They should be sent to **radiotherapy@phe.gov.uk**.

Thanks to all contributors to this issue. The next issue of *Safer RT* will be published in September 2016 and will be available at **https://www.gov.uk/government/collections/medical-radiation-uses-dose-measurements-and-safety-advice**.

Helen Best
Editor

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Forthcoming publications of the PSRT

- PHE, in association with the professional bodies, will publish a guidance document outlining the development of learning from RTEs. It will include refinement of the radiotherapy pathway coding and propose causative factor and safety barrier taxonomies. Scenarios or case studies in future issues of the newsletter will incorporate these new taxonomies. The guidance document is currently with the professional bodies for comment
- a fourth two-year report covering data from December 2013 to November 2015 will be published this summer. It will include data from across the UK reported on a voluntary basis through the NRLS and directly to PHE. In addition, analysis of anonymised synopses of closed radiotherapy notifications, for the same reporting period, from the UK IR(ME)R inspectorates will be shared for wider learning

Updates on the progress of these publications will be provided in future issues of *Safer RT*.

The Radiotherapy Team is based at PHE CRCE Chilton

EDITORIAL HEADLINE

Development of the Patient Safety Incident Management System (DPSIMS) Project: Update

The DPSIMS Project was previously described in issue 16 of *Safer RT*. Now in its second year, there has been some progress in the project's aim of specifying and procuring a replacement for the NRLS.

Following stakeholder engagement work including a survey, focus groups and workshops for patient advocates and professional users of the NRLS, 13 high level options were developed for the delivery of a new system. These have been assessed by a panel of senior stakeholders to identify six options to be shortlisted for inclusion in a strategic outline case. This shortlist will be carried forward for further development and testing in an outline business case.

There have been some delays concerning this project and it is expected that its timeframe will be extended. The next steps include procuring a new supplier and seeking approval to purchase in a final business case, with the intention of delivering a new system in 2017/18.

On 1 April 2016 the NRLS moved from NHS England to NHS Improvement, where work on learning from patient safety incidents continues as usual.

Further information can be found at
https://www.england.nhs.uk/patientsafety/dpsims-dev/
and **https://improvement.nhs.uk/about-us/who-we-are/**.

RTE Data Analysis: December 2015 to March 2016

Data Analysis

Submissions from 55 NHS UK RT providers contributed to this issue's full data analysis, covering 1 December 2015 to 31 March 2016. It is available at **www.gov.uk/government/collections/medical-radiation-uses-dose-measurements-and-safety-advice**. This is consistent with the previous analysis when 55 providers submitted data, reflecting the strong reporting culture that continues in the UK RT community.

The analysis includes data on primary process coding and severity classification of the RTEs. A breakdown of primary process codes by classification levels is also included.

New and existing NHS radiotherapy providers are welcome to contact radiotherapy@phe.gov.uk for advice on how to submit data.

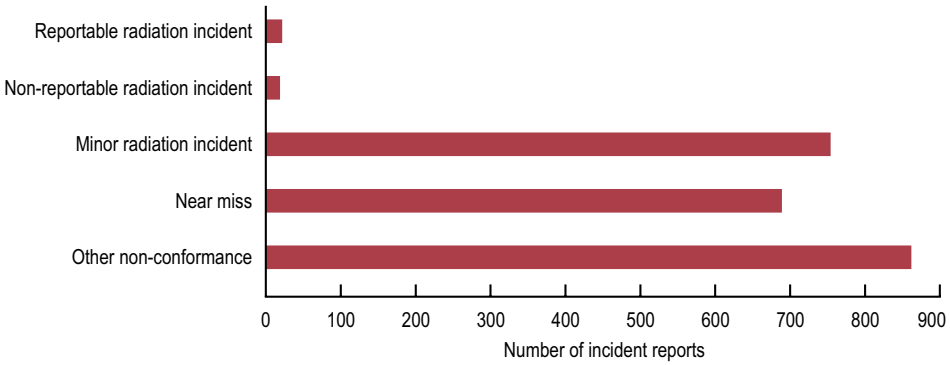
Classification of RTEs

Of those RTEs reported for the period December 2015 to March 2016, 2305 out of 2346 reports (98.3%) were classified as minor radiation incidents, near misses or other non-conformances (see Figure 1). These are lower level incidents which would have no significant effect on the planning or delivery of individual patient treatments.

Reportable radiation incidents (level 1) made up 22 (0.9%) of all reports. 'Authorisation to irradiate' comprised 4 (18.2%) and 'movements from reference marks' comprised 3 (13.6%) of all level 1 RTEs reported for this time period. Non-reportable radiation incident reports (level 2) made up 19 of all reports (0.8%). 'On-set imaging: approval process' comprised 5 (26.3%) of all level 2 RTEs; this proportion is similar to that in the previous analysis. Level 1 and 2 RTEs made up 41 (1.7%) reports for this reporting period, which is a slight reduction from the previous analysis (2.2%).

Of the 754 minor radiation incidents (level 3) reported, 237 (31.4%) of this subset were related to 'on-set imaging: production process', making it the most frequently occurring code in this classification, consistent with the previous analysis.

Figure 1 ***Classification breakdown of RTE reports using the TSRT9 trigger code, December 2015 to March 2016 (2346 reports)***



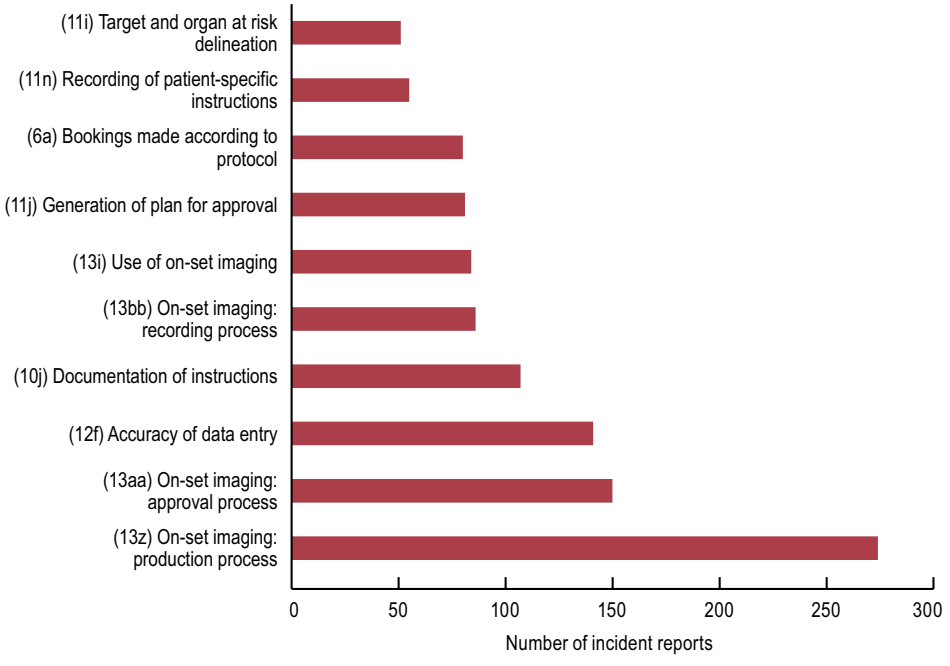
The most commonly occurring RTE process code in the near miss (level 4) classification was 'accuracy of data entry', with 82 reports (11.9%).

Within the non-conformance (level 5) classification 'bookings made according to protocol' had 73 reports (8.5%), making this the most frequently occurring RTE in this classification.

Primary Process Code

The main themes (points in the patient pathway where the majority of reported RTEs occurred) for this dataset are shown in Figure 2. Imaging process codes contributed to 594 of the reports in the main themes (53.6%), making up 25.3% of all reports for this reporting period. Consistent with the previous analysis, 'on-set imaging: production process' is by far the most commonly occurring process code. Guidance on this error can be found in issues 7 and 18 of *Safer RT*.

Figure 2 ***RTE main themes (1109 out of 2346 reports), for December 2015 to March 2016 (with process code indicated)***



The data analysed is submitted by the RT community. If you have any suggestions on how the analysis can be improved, please email the Radiotherapy Team at **radiotherapy@phe.gov.uk**.

Additional Process Codes

The primary process code is the point in the pathway at which an RTE first occurred; each of the 2346 RTEs reported for this reporting period contain primary process codes. Only 786 (33.5%) reports contained a secondary process code, indicating a second point in the pathway where the original error had gone undetected. Further analysis of the data indicated 109 (4.6%) of the RTEs contained a third process code and just 19 (0.8%) contained a fourth.

When coding, please consider all TSRT codes for the primary point in the pathway and any further pathway codes. The inclusion of additional process codes allows the identification of all points in the pathway where the error occurred. Some examples are given in the table below.

Examples of reports which have additional process codes

	Process code			
Description	**1st**	**2nd**	**3rd**	**4th**
TSRT9/level 5/14a/20a Patient did not receive on-treatment review due to staff sickness	(14a) On-treatment review of patient according to protocol by RT staff	(20a) Availability of staff with competency appropriate to procedure		
TSRT/level 5/4j/8b/10l Consent form not signed by patient, department protocol to confirm consent prior to pretreatment exposure. Patient signed consent prior to treatment exposure	(4j) Consent process	(8b) Confirmation of consent	Pretreatment activities (10l) End of process checks	
TSRT9/level 3/13l/13hh Moves from reference marks completed in incorrect direction, departmental procedure is to confirm movement direction before exiting the treatment room. End of process check not complete, incorrect move detected at verification imaging	(13l) Movements from reference marks	Treatment (13hh) End of process checks		
TSRT9/level 4/10j/10l/12f/12g Treatment set up information did not contain breast board angle from pretreatment. All set up information to be confirmed before patient leaves pretreatment. The angle was not confirmed at data entry. Omission of angle detected during treatment set up	(10j) Documentation of instructions/ information	Pretreatment activities (10l) End of process checks	(12f) Accuracy of data entry	Data entry (12g) End of process checks

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ERROR OF THE MONTH

Treatment unit process

TSRT Secondary Process Code: End of process checks (13hh)

This process subcode identifies a point in the radiotherapy pathway introduced solely to identify potential errors, limiting the probability or severity of the event. This is known as a safety barrier.

'On-set imaging: production process' accounted for 274 (11.7%) RTEs. A secondary process code was used on 78 (28.5%) of these, 47 of which were coded as 'end of process checks'.

The reports indicate that if the end of process check had been completed correctly, 47 (17%) level 3 incidents attributed to the imaging production process may have been avoided.

How can we minimise the risk of this RTE occurring?

Points to consider

1. Produce and follow clearly defined, up-to-date imaging procedures and protocols
2. Ensure operators are adequately trained and competent, with maintained training records. These should be detailed and specific to particular imaging procedures, tasks and equipment as appropriate
3. Confirm frequency of image capture
4. Ensure all data is ID checked, including any imaging software not linked to the R&V system
5. Ensure the correct anatomical area is selected for imaging
6. Check the correct filter, pre-set and imaging protocol have been selected before performing the exposure
7. Check the correct imaging field and field sizes have been selected to ensure sufficient anatomy within the exposure for review
8. Ensure the imager is positioned correctly to capture the exposure
9. Monitor locally reported RTEs to identify common occurrences and introduce preventive action
10. Consider 'pause and check' posters to ensure checks are robust

Medical Exposures Group
Centre for Radiation, Chemical and Environmental Hazards
Public Health England
Chilton, Didcot, Oxfordshire OX11 0RQ, UK
T: +44 (0)1235 831600
E: radiotherapy@phe.gov.uk
www.gov.uk/phe

PHE publications gateway number: 2016059

GUEST EDITORIAL

Use of Safety Barriers in Radiotherapy

Debbie Gilley
Radiation Protection Specialist, International Atomic Energy Agency

The IAEA refers to the use of safety barriers as a system that automatically or manually initiates the safety system or administrative controls that are provided to ensure that the required safety function is achieved.

Most accidents are preventable when an effective safety system is in place.

Safety barriers in radiotherapy are similar to barriers used in other complex systems; they are a series of gates and switches designed to stop the process until some action occurs. Efforts to identify adequate safety barriers form one of the tasks under evaluation by the IAEA SAFRON (safety in radiation oncology) learning system.

SAFRON began collecting information on safety barriers in 2012; currently, it holds details on approximately 200 incidents with information on the use of safety barriers in identifying an error or in the reduction of harm to a patient resulting from an error. As more events are added to the system, information will be analysed to determine the best practices in the use of safety barriers.

Some examples are:

- hardware control through the use of interlocks
- software controls such as display of fault errors and record and verify systems
- administrative or management controls such as policies, procedures and checklists

SAFRON provides participants with a list of barriers when reporting an event that assesses barrier failure, barrier success and also a prospective look at potential barriers that might have prevented the error. As there are many ways to prevent errors, SAFRON is looking at all the potential barriers that could have been used.

Example

The use of a patient checklist is one type of administrative barrier that appears to be effective; before a patient is treated the checklist would be used to verify patient identity, pretreatment condition, imaging data for planning and reference points. The effectiveness of this barrier can be evaluated by examining SAFRON data where 13 of the events indicated that verification of patient identity, treatment conditions and imaging data identified the potential of the error and prevented the patient from being treated incorrectly. The data indicates that if this ‘check’ had been used in other events, approximately 50 events may not have happened.

Not all errors can be prevented before treatment; some errors would only manifest themselves in the treatment room, but safety barriers can still be used to reduce patient harm. These barriers are most effective when portal imaging and in vivo dosimetry are used early in the course of treatment and repeated as needed, with modification of treatment planning and set up.

Further analysis is needed in radiotherapy to identify effective safety barriers, as it is believed the safety barriers can be used to improve both safety and quality in radiotherapy. They address many of the issues in people’s ability to work in a complex, highly technical environment.

DATES FOR THE DIARY

6 June	UKRO
13 June	BIR, Virtual Environment in Radiotherapy (VERT)
14 September	SCoR, Prescribing and Safe Use of Medicines and Contrast Media
26 September	BIR, IR(ME)R Update
September	*Safer Radiotherapy,* Issue 20