

Welcome to the seventh issue of *Safer Radiotherapy*. The aim of the newsletter is to provide a regular update on the analysis by the Health Protection Agency (HPA) of radiotherapy error (RTE) reports. These reports are voluntarily submitted to the National Reporting and Learning System (NRLS) to promote learning and improve patient safety.

The newsletter is designed to disseminate learning from RTEs to professionals in the radiotherapy (RT) community to influence local practice and improve patient safety.

Safer RT is published on a quarterly basis; however, it has been 12 months since the previous newsletter was published (December 2011). This delay has been as a result of staffing changes at the HPA. We are now delighted to welcome Helen Best to the HPA as a permanent staff member in her role as a senior clinical radiotherapy officer. We look forward to her contribution to future editions of *Safer RT* and getting us back on track as a quarterly publication.

As of 1 January 2013 the HPA commenced shadowing Public Health England (PHE), in anticipation of the planned move to PHE on 1 April 2013. A full update will be provided in the next issue of *Safer RT*.

Thanks to all contributors to this issue. The next issue of *Safer RT* will be published in March 2013 and will be available at www.hpa.org.uk/radiotherapy

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

Úna Findlay
Interim Editor

PSRT – Patient Safety in Radiotherapy Steering Group

In July the second two-year report entitled *Data Report on Radiotherapy Errors and Near Misses (December 2009 – November 2011)* (HPA-CRCE-035) was published. It is freely available at www.hpa.org.uk

Over 3300 RTE reports were included in the report for trend analysis. This involved a detailed breakdown of the reports by classification and coding from *Towards Safer Radiotherapy*. Errors were identified in activities undertaken by various professional groups, throughout the patient pathway.

When compared with the previous report (HPA-CRCE-002), a reduction was seen in the numbers of higher level (Levels 1–3) RTEs, with an increase in the number of lower level RTEs being evident. The vast majority of these reports were categorised as lower level events, thus not affecting the outcome of patient care.

Learning from RTEs is a highly effective tool for improving patient safety in RT. Please continue to report RTEs for analysis and monitoring to inform ongoing safe and effective RT practice.

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The HPA Radiotherapy Team is based at CRCE Chilton



EDITORIAL HEADLINE

UK Community Influences International Activity

UK practice made a positive contribution to the international field of radiation protection. A paper by Úna Findlay detailing the work of the UK community in improving safety in radiotherapy was presented at the International Conference on Radiation Protection in Medicine 'Setting the Scene for the Next Decade', IAEA and WHO (3–7 December, Bonn) (www-pub.iaea.org/IAEAmeetings/41578/radprom2012). In addition, Steve Ebdon-Jackson gave an invited presentation on accidents in radiotherapy.

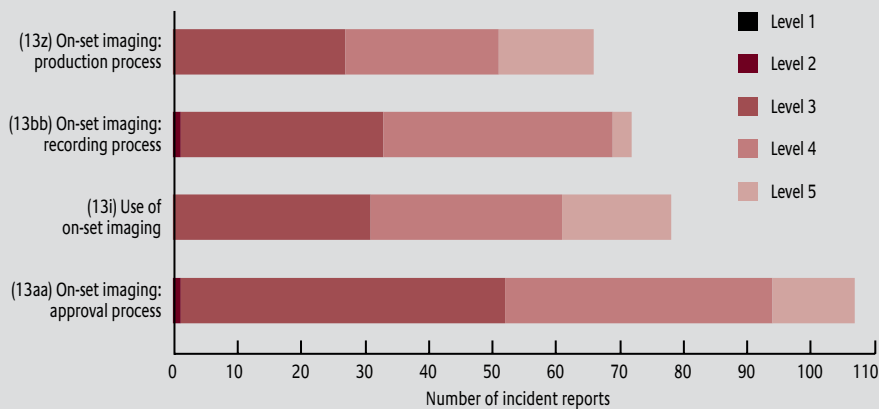
The main objectives of the conference were to:

- Indicate gaps in current approaches
- Identify tools for improving radiation protection in medicine
- Review advances, challenges and opportunities in the field
- Assess the impact of the International Action Plan for the Radiation Protection of Patients, in order to prepare new international recommendations, taking into account recent developments.

RTE Data Analysis: August 2011 – July 2012

On-treatment imaging associated RTE reports

Breakdown of on-treatment imaging RTE reports extracted from the NRLS using the TSRT9 trigger code, August 2011 – July 2012 (323 reports)



On-treatment imaging contributed 16% of the total number of reports for this reporting period, of which none was a Level 1 incident. These include 'use of on-set imaging', 'on-set imaging: production process', 'on-set imaging: approval process' and 'on-set imaging: recording process'. The increase in these types of RTE reflects the escalating use of imaging during routine radiotherapy treatment delivery. It is expected that this contribution will continue to increase as clinical departments adopt image guided techniques.

Application of on-treatment imaging codes

Consistent application of the coding of on-treatment imaging codes is key to informing local analysis and maximising learning from these events. This also ensures that learning can be shared more effectively at a national and international level.

To improve the consistency of the application of on-treatment imaging coding, the PSRT has provided the following examples of RTEs for each on-treatment imaging code. Please note these codes can be applied to 2D, 3D and 4D imaging. Remember to include only one RTE per report.

Process code	Activity code	Example
13i	Use of on-set imaging	Imaging according to protocol
13z	On-set imaging: production process	Inappropriate exposure used Image not captured CBCT filter left in for kV image
13aa	On-set imaging: approval process	Image review not done Image review inaccurate Image matched to inappropriate reference image
13bb	On-set imaging: recording process	Recording of image review not undertaken Actions following image review not undertaken

National guidance now available on IGRT

The National Radiotherapy Implementation Group published its *Image Guided Radiotherapy (IGRT): Guidance for Implementation and Use* document in August 2012. It is primarily a guide for radiotherapy services and professionals to choose and implement appropriate IGRT techniques in different clinical situations to ensure high quality standards. This guidance reaffirms the principles of, and updates, *On Target: Ensuring Geometric Accuracy in Radiotherapy*, published in 2008.

Data Analysis

Submissions from 40 RT departments contributed to this issue's full data analysis, for 1 August 2011 to 31 July 2012, which is available at www.hpa.org.uk/radiotherapy

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

Classification of RTEs

Of those RTEs reported to the NRLS for the period August 2011 – July 2012, 2021 out of 2083 reports (97%) were classified as minor radiation incidents, near misses or other non-conformances (see Figure 1). These incidents would have no significant effect on the planning or delivery of individual patient treatments.

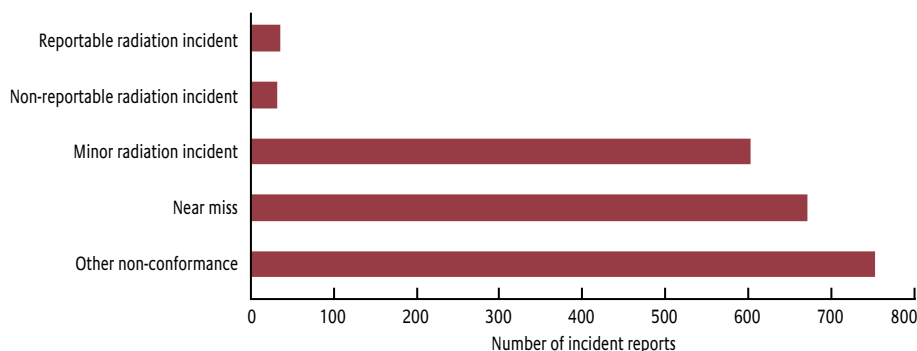
Reportable radiation incidents (Level 1) made up 32 (or 1.5%) of all reports. 'Movements from reference marks' and 'ID of reference marks' comprised 5 (15.6%) of all Level 1 RTEs reported to the NRLS for this period. When compared with the second two-year report (see page 1) this marks a reduction from 14 (36.8%) Level 1 RTEs.

A similar trend was seen in non-reportable radiation incident reports (Level 2), which made up 30 (1.5%) of all reports. For further advice on minimising 'moves from reference marks' see *Safer RT Issue 1, Error of the Month*.

A decrease in the percentage of Levels 1 and 2 RTEs reported related to 'treatment unit processes'; a relative increase in a range of 'pre-treatment planning processes' and 'pre-treatment activities' reports was observed.

Of the 601 minor radiation incidents (Level 3) reported, 51 reports (8.4%) were related to the 'on-set imaging approval

Figure 1 Classification breakdown of RTE reports extracted from the NRLS using the TSRT9 trigger code, August 2011 – July 2012 (2083 reports)



process', making it the most frequently occurring code in this classification. These type of RTE are discussed further in both the panel and the Error of the Month section. 'Use of compensators' was the second most frequently occurring code in this classification at 37 reports (6.2%). Examples of this type of RTE include the omission of bolus.

The most commonly occurring RTE in the near miss (Level 4) classification was 'documentation of instructions' at 49 of 669 reports (7.3%).

'Target and organ at risk delineation' at 60 of 751 reports (7.9%) and 'management of process flow' at 37 (4.9%) were the most frequently

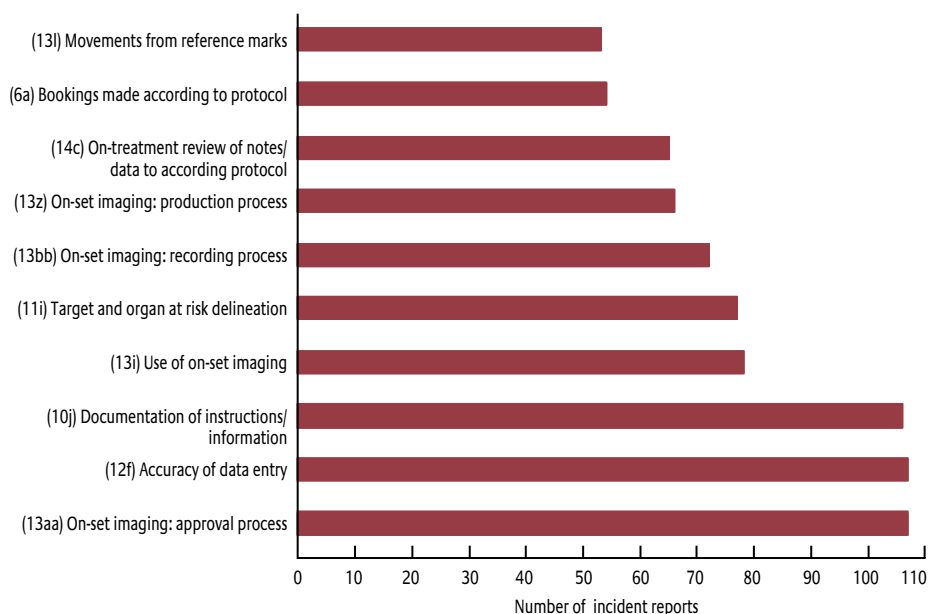
occurring RTEs in the non-conformance (Level 5) classification.

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. This distribution is similar to that shown in the last issue of *Safer RT*. Of note, on-treatment imaging contributed 323 (41%) of the reports in the main themes (16% of the total number of reports for this period). These are reviewed in the panel.

If your department has examples of good practice relating to RTE prevention please email the HPA Radiotherapy Team at radiotherapy@hpa.org.uk

Figure 2 RTE Main Themes (785 out of 2083 reports), for August 2011 – July 2012 (with process code indicated)



The data analysed is submitted by the RT community, therefore your comments and suggestions regarding the RTE analysis are welcomed. For further information or enquiries please contact the HPA Radiotherapy Team at radiotherapy@hpa.org.uk

ERROR OF THE MONTH

On-treatment Imaging

TSRT Process Code:

Use of on-set imaging (13i)

On-set imaging:

production process (13z)

approval process (13aa)

recording process (13bb)

Multiple codes are included in on-treatment imaging as listed above. This reflects the multiple tasks involved in achieving IGRT treatments and highlights areas at risk of error. This risk may be amplified due to the dynamic nature of online review and the rapid pace of development of new technology. However, the benefit IGRT brings to the patient is clear.

How can we minimise the risk of this RTE occurring?

Points to consider

Available guidance:

Image Guided Radiotherapy (IGRT): Guidance for Implementation and Use, at <http://ncat.nhs.uk>

On Target: Ensuring Geometric Accuracy in Radiotherapy, at www.rcr.ac.uk

- 1 Ensure staff are adequately trained, competent and appropriately entitled in the use of the technology (including reference image registration, image acquisition and review)
- 2 Produce and follow clearly defined and up-to-date protocols, which include tolerances, action levels, correction strategies and post imaging processing
- 3 For each radiotherapy centre, have in place anatomical site specific IGRT protocols that are tailored to the needs of that site and take into account the factors affecting the accuracy of set-up, including the site treated, the immobilisation used and the patient's condition
- 4 Apply a consistent approach to nomenclature, image labelling and patient data ID
- 5 Clearly define individual responsibilities in imaging
- 6 Produce and follow a clearly defined implementation plan for the adoption of new technology and techniques
- 7 Monitor locally reported near miss and other non-conformance RTEs to identify further preventive action
- 8 Audit staff compliance with written procedure and protocol.



GUEST EDITORIAL

Letter from North America

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Patient safety in radiotherapy had been a concern in North America a long time before the well-known *New York Times* articles of early 2010.

The American Association of Physicists in Medicine (AAPM) established the (poorly named) Work Group on Prevention of Errors in Radiation Oncology (WGPE) in 2005. Possibly the most important contribution of the WGPE during its early years was the organisation of symposia on patient safety/error management issues at many of the AAPM Annual Scientific Meetings.

The Canadian radiation treatment community has also acknowledged the need to move patient safety issues higher up the agenda through its presentation of a series of Winter Schools on Quality and Safety in Radiotherapy. In fact it was during the first of these Schools that the first *New York Times* article broke.

Partly as a response to these articles, the AAPM and the American Society of Therapeutic Radiology (ASTRO) organised a major multidisciplinary meeting entitled 'Safety in Radiation Therapy: A Call to Action' in 2010 in Miami.

A recommendation that came out of the Miami meeting was to establish a national incident reporting/learning database in the US. Recognition of the value of such a system is not new. The pioneering ROSIS database has been in existence for over ten years, many individual institutions have developed

their own and there are a few national systems, such as that in the UK, either in operation [*Data Report on Radiotherapy Errors and Near Misses (December 2009 – November 2011)*, HPA-CRCE-035 available at www.hpa.org.uk] or under development. On the international scene, the International Atomic Energy Agency is currently pilot testing its system, SAFRON.

Although there are jurisdictional and privacy concerns in North America with sharing data on incidents, the establishment of a US national database looks almost certain to go ahead. To provide a radiotherapy focused structure for such databases, the WGPE has produced a document entitled *Consensus Recommendations for Incident Learning Database Structures in Radiation Oncology*, which was published in December [Ford EC et al (2012), *Med Phys* 39(12): 7272–90].

Discussions are also underway regarding a Canadian database of incidents (www.partnershipagainstcancer.ca and search for radiotherapy).

Those of us interested in such databases need to work together to ensure that they maintain a high degree of compatibility and so maximise learning opportunities.

A further project of the WGPE is an online safety profile self-assessment tool. The tool, recently released for final pilot testing, consists of 92 questions with responses required on a five-point Likert scale.

Quality and safety are related concepts. Some years ago the Canadian radiation treatment community developed a document entitled *Structural Standards for Quality Assurance at Canadian Radiation Treatment Centres*. It is being reviewed and updated to reflect modern radiotherapy practice. The appendices to the document, which describe quality control of key equipment and processes, are likewise currently under review (www.medphys.ca/content.php?doc=58).

Finally, an event of note for your calendars is the 2013 AAPM Summer School on Radiotherapy Safety and Quality. It may be a long way for you to come but it should be worth it.

16–29 June, Colorado
www.aapm.org/meetings/2013SS/

DATES FOR THE DIARY 2013

1–3 February	SCoR Annual Radiotherapy Conference, Brighton
14 March	BIR – Finding the Target, London
19–23 April	ESTRO, Geneva
March	<i>Safer Radiotherapy</i> , Issue 8