

Welcome to the Safer Radiotherapy (RT) e-bulletin, which provides key messages and learning from radiotherapy error (RTE) reports and patient safety initiatives.

Representatives from the UK Health Security Agency (UKHSA), the Royal College of Radiologists (RCR), the Society of Radiographers (SoR), Institute of Physics and Engineering in Medicine (IPEM), NHS England (NHSE) and a lay representative form the Patient Safety in Radiotherapy Steering Group (PSRT) to support the coordination of efforts to improve patient safety in RT across the UK. This work includes the collation, analysis, and promulgation of learning from RTE reports.

Anonymised RTE reports are currently submitted on a voluntary basis through the National Reporting and Learning System (NRLS) or Learn from Patient Safety Events service (LFPSE) of NHSE or the Once for Wales (OfW) Concerns Management System and directly to UKHSA, to promote learning and to minimise recurrence of these events. Safer RT accompanies the [Triannual RTE Analysis & Learning Report](#), which summarises learning from RTE reports submitted for the preceding 4-month period. The report is designed to disseminate learning from RTE to professionals in the RT community to positively influence local practice and improve patient safety.

Please email radiotherapy@ukhsa.gov.uk for advice on reporting and learning from RTE and with suggestions for the e-bulletin. Published three times a year, the next issue will be shared in May 2023. To subscribe to future editions please follow this [link](#).

Thank you to all RTE reporters who facilitate this work.

Advancing Safer Radiotherapy – update

Work on advancing safer radiotherapy has commenced. This work aims to develop guidance for UK radiotherapy stakeholders to support the advancement of safer radiotherapy through the adoption of contemporary thinking in the patient safety field.

The current topics for inclusion in the guidance are as follows –

- Ongoing value of Towards Safer Radiotherapy (TSRT)
- Safety culture
- Shared learning from a radiotherapy incident learning system
- Use of radiotherapy error data
- Advancing Safety principles
- Effective preventative actions
- Patient Safety Incident Response Framework (including incident investigation)
- Patient comfort
- Patient engagement in safety
- Review of RTE Taxonomies

Many thanks to all those who have volunteered to take this work forward. Currently seven of the ten topic sub-groups have already met and started work in these areas. Further updates on this work will be shared in future e-bulletins.

Biennial RT error data analysis and learning report published

The report published in November is the seventh in a series of 2-year reports, providing an overview of Radiotherapy Error (RTE) data reported voluntarily.

The following is a short synopsis of the findings within the report, further detail can be seen in depth within the report available [here](#).

Over the last 5 years, all but one provider submitted RTE reports to the voluntary incident learning system. This reflects a strong community commitment to shared learning from incidents, which should be supported by the employer.

Across this two-year period 18,681 RTE reports were reviewed. The most frequently reported subcode was 'on-set imaging: production process'. A large proportion of these were reported to be due to equipment malfunction, further detail on these can be seen on the next page of this e-bulletin.

Over the past 5 years there has been a decrease in the percentage of RTE associated with 'accuracy of data entry' and 'on-set imaging: approval process'. The decrease in 'accuracy of data entry' may be due to further optimisation of the data pathway and the uptake in the use of IT to reduce the need for transcription. The decrease in 'on-set imaging: approval process' may be due to more competency-based imaging review protocols. Changes in trends over time demonstrate the importance of ongoing cyclic monitoring of RTE. RT is ever evolving with new techniques and technology. Therefore, these trends should continue to be reported and learnt from.

The move to increased hypo-fractionation of external beam RT will reduce the opportunities to correct for RTE. The role of incident learning systems will continue to play a part in helping identify and address RTE. Changes in trends over time demonstrate the importance of ongoing cyclic monitoring of RTE.

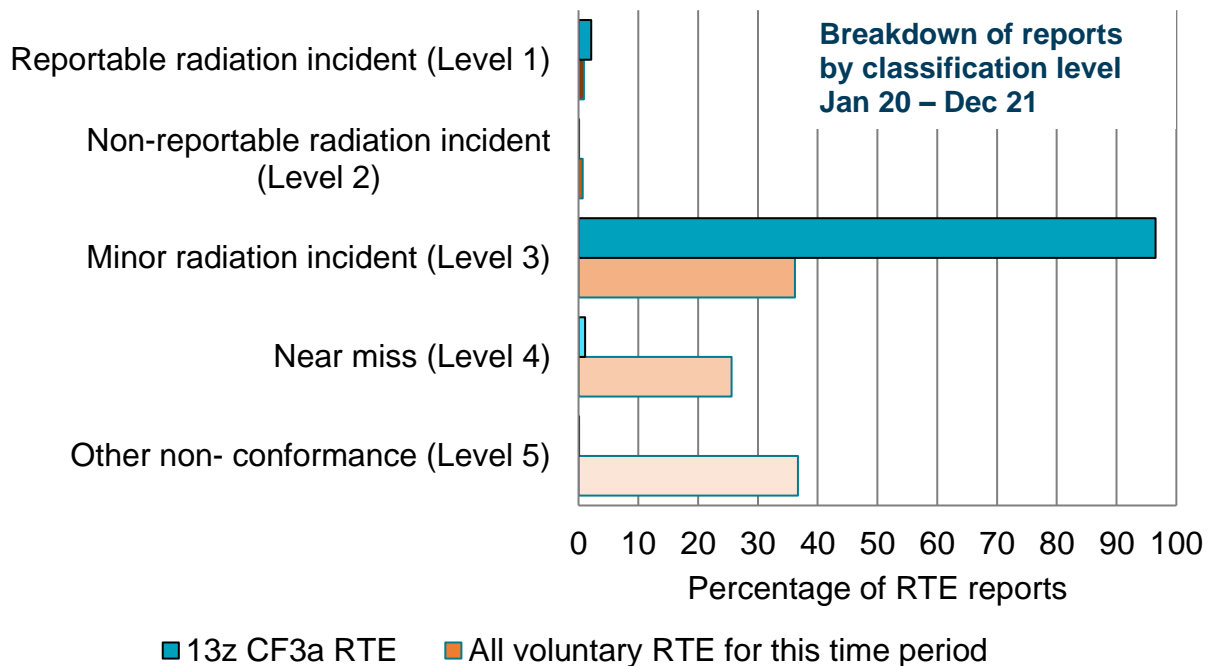
The report contains the following local recommendations

- All NHS UK providers should continue to use the [TSRT](#) and [DoL](#) taxonomies, including the pathway subcodes, failed safety barriers (FSB), method of detection and causative factors, to code all levels of RTE for local analysis and to inform local learning and practice. The entire coding taxonomy should be considered before using the 'other' code within a taxonomy
- Local employers should support adequate resourcing of effective incident learning systems to simplify the local reporting process and to encourage reporting of all classification levels of RTE on a monthly basis to ensure timeliness of shared learning
- Independent RT providers should submit RTE reports to the national voluntary reporting system
- Where imaging device faults persist, a risk assessment should be undertaken for the ongoing use of the device
- Local learning should be compared with the national picture and used to inform local and network level practice
- Outputs from local RTE analysis should be used to inform prospective risk assessments in thematic areas identified in the analysis as part of a study of the risk of accidental and unintended exposures

Other national recommendations can be seen within the report, of which a number have already been acted upon.

Imaging equipment malfunction data

Between January 2020 and December 2021 there were 18,681 RTE reported voluntarily, of these 13.4%, (n = 2,495) were reported with the primary process subcode (13z) 'on-set imaging: production process'. On further review of these types of RTE 49.5% (n = 1,236) were identified as being associated with a primary causative factor (CF3a) 'equipment or IT network failure'. It can be seen from the figure below that 96.5% (n = 1,193) of 13z, CF3a RTE were classified as minor radiation incidents, this is a vast difference when compared to the proportion of minor radiation incidents across all voluntary RTE for this time period (36.2%, n = 6,757).



Typical examples of 13z /CF3a RTE included when the verification CBCT is initiated and part way through the arc the machine malfunctions, the image is not suitable for verification and additional verification images are required

For this two-year period, 13z/CF3a associated RTE reports were received from 47 out of the 57 providers who reported.

Although manufacturer data is not collected within the RTE data from a review of the text descriptors it was noted that this type of RTE occurred across all manufacturers. There were 776 reports which specifically stated a failure in the CBCT, this does not mean that the remaining 460 were not CBCT related, but they did not state CBCT or Cone Beam within the text descriptor.

Guidance on reducing this type of event is included in case study 2 in [issue 32](#) of Safer Radiotherapy and the [good practice guidance](#) series. In trying to minimise the frequency of imaging equipment failure, it is expected that following commission and clinical acceptance of the imaging devices, they are subject to regular and timely QA as per local procedures with tasks, tolerance and action levels and escalation routes clearly defined and responsibilities allocated to appropriately trained and entitled staff.

Equipment failure reports should be reported to local engineers, the manufacturers and the MHRA.

One of the national recommendations from the [biennial report](#) is for the PSRT to engage with the MHRA about these types of events. This data has been shared with the MHRA to try to identify additional methods to mitigate these events.

New UKHSA reporting resource available

A series of 15-minute presentations which introduce the national approach to learning from RTE are available to RT healthcare professionals. A new presentation on the reporting methods of detection is now available. Topic suggestions can be emailed to radiotherapy@ukhsa.gov.uk.

Current topics include:

- Introduction to learning from radiotherapy errors and near miss events (RTE)
- RTE terminology and taxonomies
- Application of RTE taxonomies
- Learning from RTE analysis
- Study of risk of accidental or unintended exposures
- RTE and near miss reporting - method of detection – just added
- Brachytherapy – coming soon

Medical imaging: what you need to know leaflet published

One of the biggest advances in modern medicine has been the use of medical imaging to help diagnose and treat patients. Most people will have some form of medical imaging in their lifetime, some of which use radiation. A new leaflet '[medical imaging: what you need to know](#)' has been produced by UKHSA, this aims to inform patients about the benefits of different types of medical imaging as well as the radiation risks.

LFPSE update

The transition from the National Reporting and Learning System (NRLS) to the new Learn from Patient Safety Events service (LFPSE) now includes an optional extension from the 31 March 2023 to the 30 September 2023. This extension balances the need for providers to take receipt of, test, refine and customise new local risk management system (LRMS) products. Any providers opting to extend their transition period beyond March 2023 will still be required to have adopted a test system by the original deadline and deployed a full transition within six months of that date.

NHSE publish learning from best practice

A new report [Safety culture: learning from best practice](#) has now been published. The report shares insights from focus groups held with NHS organisations CQC rated outstanding/good for safety, to understand how they are supporting safety culture improvement. It includes a number of case studies and is a useful resource to support providers to improve their safety culture.

CQC annual report published

The CQC have published their [IR\(ME\)R annual report](#) which provides a breakdown of the number and type of notifications received between 1 April 2021 to 31 March 2022, and findings from inspections.

The report shows a marked increase in the number of notifications in radiotherapy from the previous year. This was almost entirely in planning and verification imaging, which increased from 69 to 110 notifications. This was due to an increase in the use of short course fractionation regimes triggering the notification criteria for repeat exposures. The report includes key themes for improvement found in radiotherapy inspections: further information on the authorisation of additional imaging, commissioning of new equipment and clinically significant accidental or unintended exposures.

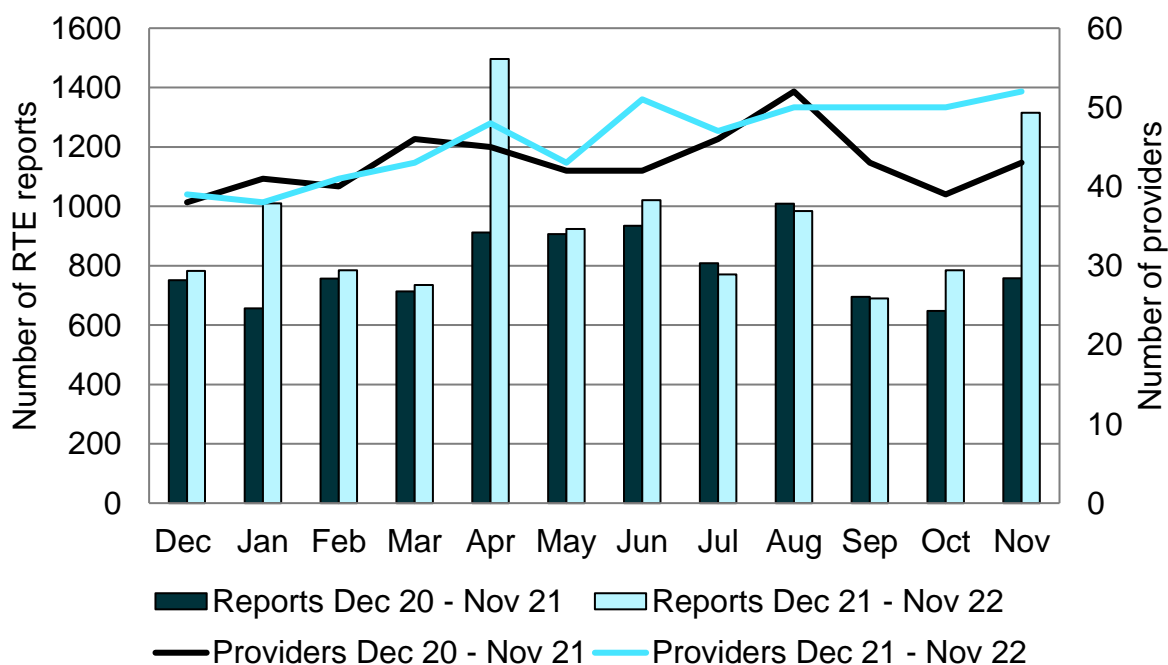
ARSAC practitioner and employer licence renewal reminders

2023 will see the first practitioner and employer licences issued under IR(ME)R-17 expire. ARSAC recommend that renewal applications should be submitted 8 weeks prior to the licence expiry date. The ARSAC Support Unit will send a reminder email to licensed practitioners and MPEs named on employer applications, 14 weeks prior to the licence expiry with instructions on how to submit a renewal application on the [JIRA ARSAC online portal](#). The reminder email will be sent to the address ARSAC have on file from previous applications/notifications. Practitioners and MPEs should notify ARSAC (ARSAC@UKHSA.GOV.UK) of any changes to their contact details. Further information on how to submit licence applications can be found [here](#).

Number of RTE reports received annually

The number of RTE reports received on a monthly basis for the past two years Dec 20 to Nov 22 are shown below. The number of RTE reports received between Dec 20 to Nov 21 was 9,545 which has increased to 11,296 for Dec 21 to Nov 22. The number of incidents reported nationally to the [NRLS](#) also continues to increase. There are two spikes in the number of RTE reported between Dec 21 to Nov 22. The first spike in April 22 may be due to the receipt of data on the establishment of the Once for Wales reporting system. The second spike in data in Nov 22 was not due to reporting of back dated reports and will be monitored.

There has also been an increase in the number of providers reporting from a monthly average of 43 between Dec 20 to Nov 21 to 46 providers in Dec 21-Nov 22. There are currently 59 RTE providers, between Dec 20 to Nov 22 98.3% (n = 58) reported to the national system.



Dates for the diary

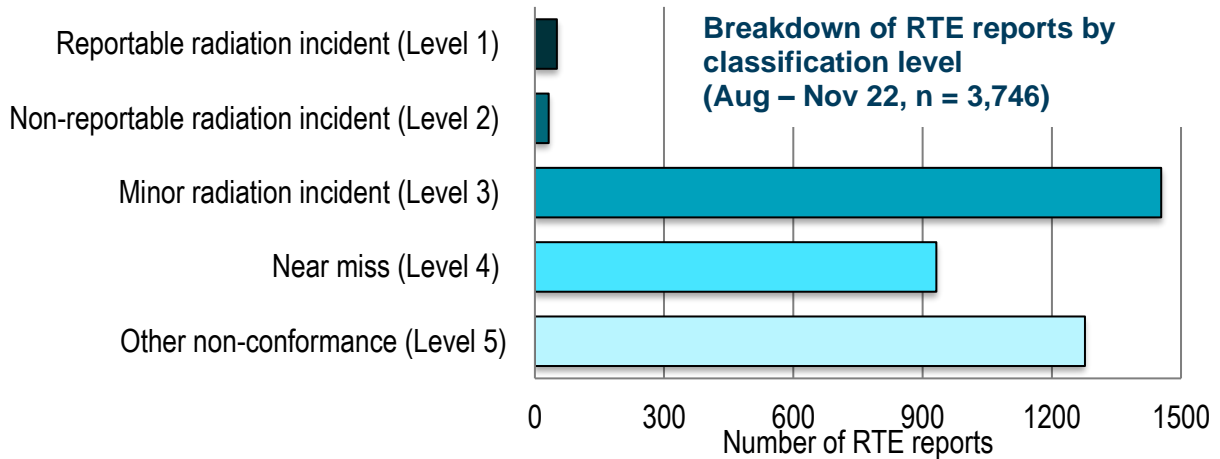
BIR, world imaging congress	24 – 25 February, online
SRP, Annual conference 2023	25 – 27 April, Aberdeen
BIR, Oligometastatic treatment planning	2 March, online
BIR, Annual radiotherapy and oncology meeting	30 – 31 March, London

RTE data analysis – August to November 2022

The full detailed data analysis is available [here](#) and includes data on primary process subcoding, safety barriers, methods of detection, causative factors, and the severity classification of the RTE. These taxonomies are described in the [Development of Learning from RTE](#). A summary of findings is presented below.

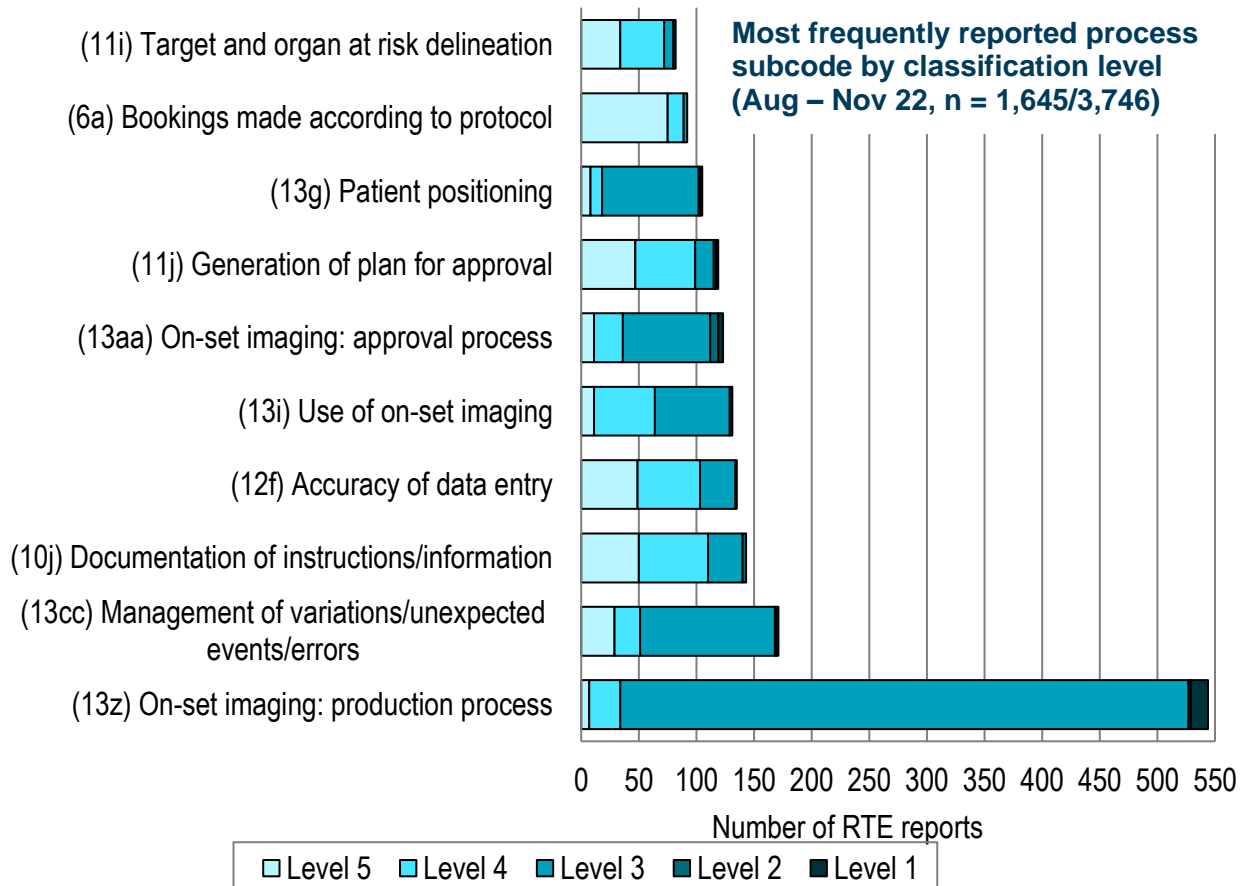
Classification (Level) of RTE

Of those 3,746 RTE reported, 3,663 reports (97.8%) were classified as minor radiation incidents, near misses or other non-conformances (Level 3 - 5). These had no significant effect on the planning or delivery of individual patient treatments or their outcome.



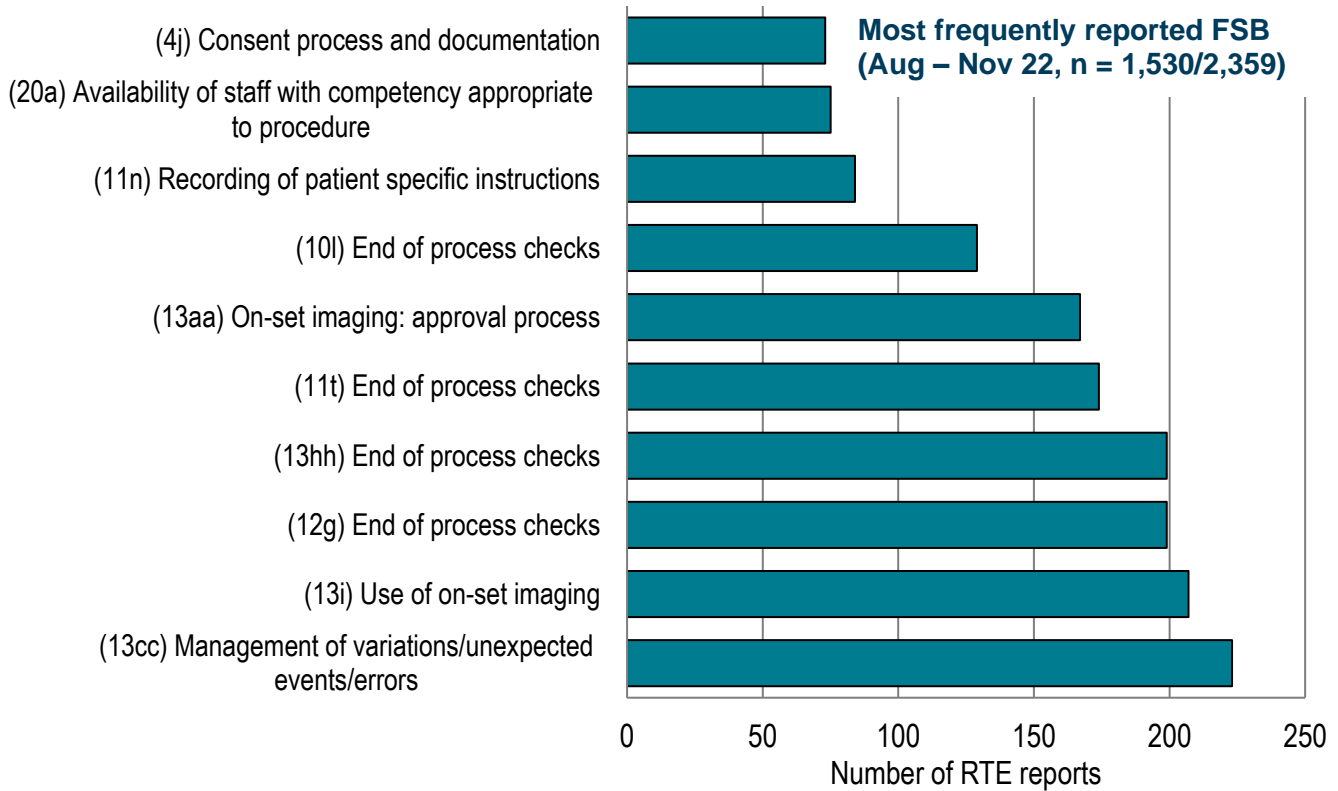
Primary process subcode

The most frequently reported points in the patient pathway where the RTE occurred are shown below. This is broken down by classification level. Consistent with the previous analysis 'on-set imaging: production process' was the most frequently reported process code (14.5%, n = 544/3,746).



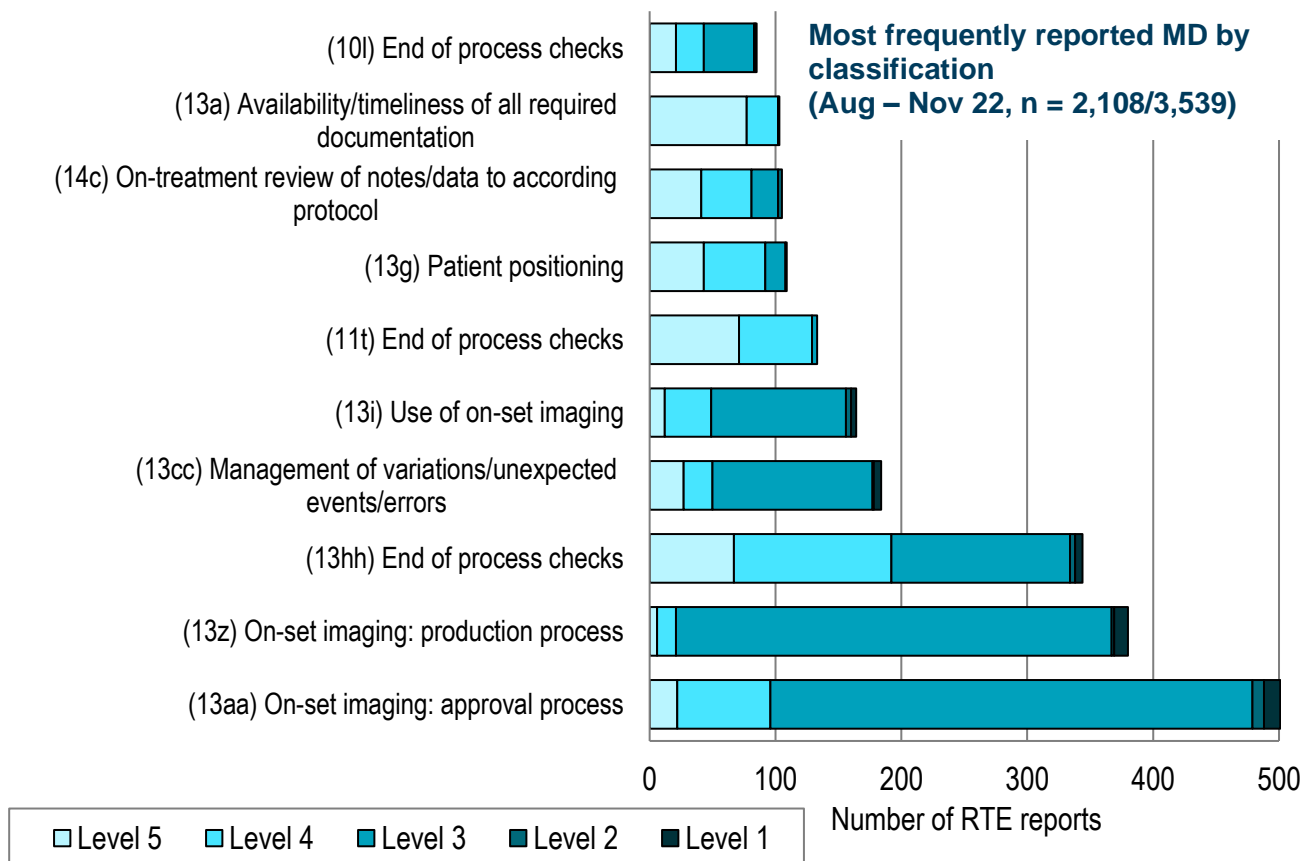
Failed Safety barriers (FSB)

Multiple FSB can be attributed to each individual RTE. A total of 2,359 FSB were identified across all the RTE reported. The most frequently reported FSB can be seen below. Treatment unit process ‘management of variations’ was the most frequently reported FSB (9.4%, n = 223).



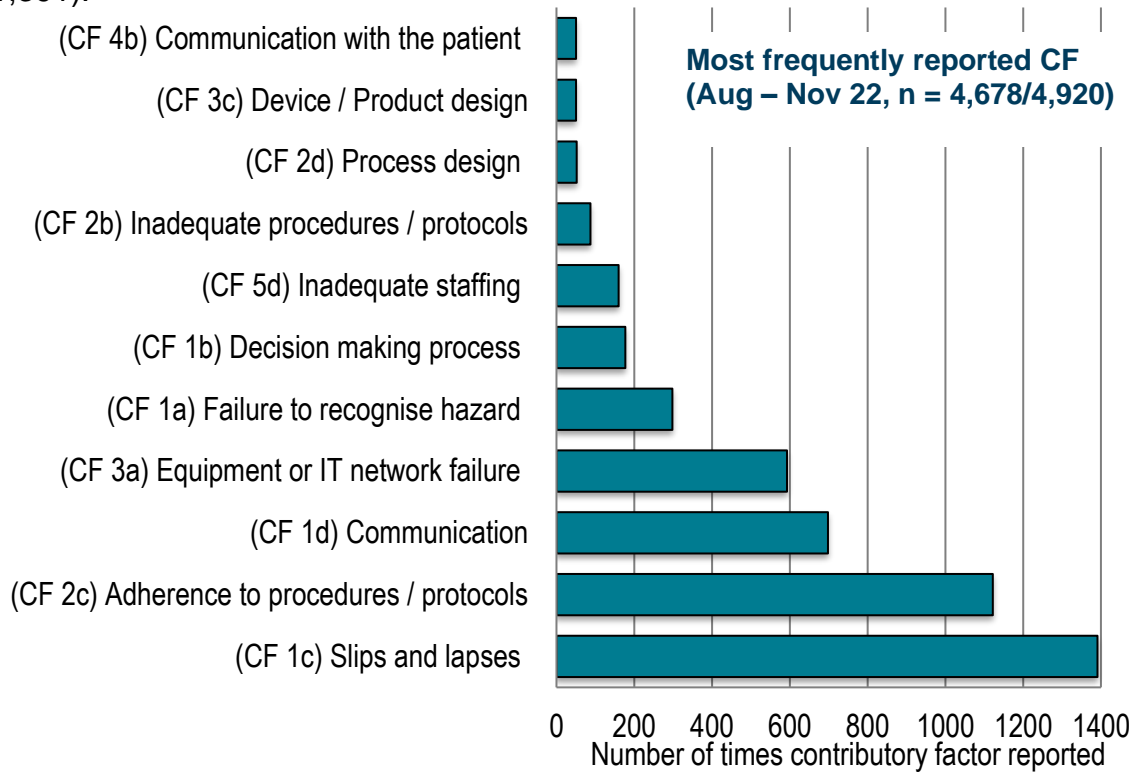
Method of detection (MD)

For this reporting period 3,539 reports included MD coding or data. The most frequently reported MD was ‘on-set imaging: approval process’ (14.2%, n = 501).



Contributory Factors

Each RTE can be assigned multiple CF codes. A total of 4,920 CF were reported in this period. The most frequently reported CF was individual ‘slips and lapses’ at 28.3% (n = 1,391).

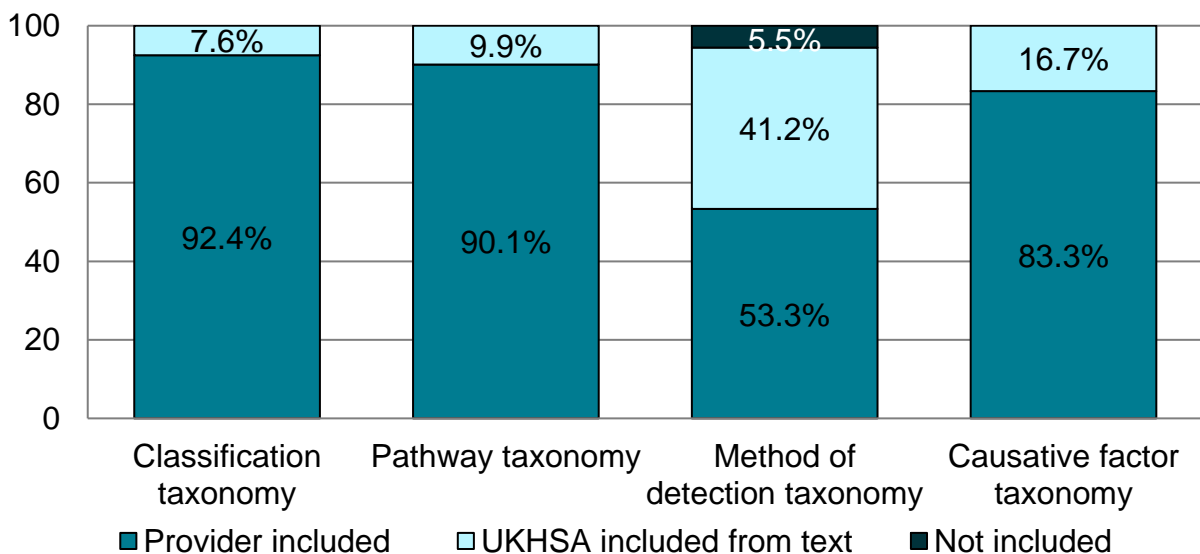


Monitoring of RTE coding by RT providers

All providers are asked to apply a trigger code, classification, pathway coding (including failed safety barriers), method of detection and causative factor coding to their RTE reports to facilitate both local and national analysis. These should be included in the first open text field in the following format:

TSRT9/ Level 1/ 13g/ 13hh/ 13r/ 13aa/ MD13h/ CF1a/ CF2d

The application of these taxonomies by provider for RTE reported between August and November 2022 (n = 3,746) can be seen below.



Thanks to all those that apply the coding locally and include it in submissions to UKHSA. There has been an increase in the inclusion of MD from 34.4% to 53.3%. Please email radiotherapy@ukhsa.gov.uk with any queries about this and particularly with any issues with the application of the MD coding.

Consistency checking 'other' pathway subcodes

On receipt of RTE reports, UKHSA staff with clinical RT expertise perform consistency checking of the local application of the classification and coding. A review of data shared between April to July 2022 (n = 4,129 RTE) is shared here.

Of the 4,129 RTE reports received, 6.7% (n = 278) were allocated a primary pathway subcode 'other' by the local provider. Based on the information shared in the free text description field UKHSA staff were able to allocate a pathway subcode to 86.3% (n = 240) of these RTE reports. The most frequently amended primary pathway subcode was treatment unit process 'other', making up 37.5% (n = 90) of all of the 'other' amended pathway subcodes. Examples of treatment unit process 'other' associated RTE which are reallocated to 'management of variation/unexpected events/errors' include when a non-imaging equipment malfunction occurs during treatment.

Table: Amendments made to pathway process 'other' subcodes

Initial pathway subcode	No. of different subcodes allocated	Most frequently amended to
13jj treatment unit process 'other' (37.5%, n = 90)	25	13cc 'management of variation/unexpected events/ errors' (n = 28) 13z 'on-set imaging: production process' (n = 9)
6e booking process 'other' (15.4%, n = 37)	8	6a 'bookings made according to protocol' (n = 12) 6f 'communication of appointments between staff groups' (n = 10)
10n pretreatment activities 'other' (9.6%, n = 23)	17	4j 'consent process' (n = 3)
11v pretreatment planning process 'other' (7.9%, n = 19)	8	11j 'generation of plan for approval' (n = 9)
12i pretreatment planning process 'other' (7.9%, n = 19)	10	12f 'accuracy of data entry' (n = 5) 12g 'end of process checks' (n = 5)

From the 4,129 RTE reported there were just 1.4% (n = 58) RTE reports which were allocated an 'other' causative factor (CF) by the local provider. During consistency checking UKHSA staff were able to assign 89.7% (n = 52) of these reports with alternative CF codes. These were most frequently amended to either 'slips and lapses' or 'adherence to procedures or protocols' (each equally 26.9%, n = 14)

It is recommended the entire pathway subcoding and CF should be considered when allocating primary pathway subcodes.

National Diagnostic Reference Levels guidance page updated

The National Diagnostic Reference Levels (NDRLS): process to generate, adopt and maintain guidance page was updated on 24 November 2022, this updated information can be seen [here](#).

Guest editorial:

RT target volume definition and peer review, 2nd edition
Petra Jankowska Consultant Clinical Oncologist, Taunton &
Somerset Foundation Trust; Quality & Safety Lead, RCR



“Pride is concerned with who is right. Humility is concerned with what is right” Ezra Benson

This sentiment is at the core of the principles behind the 2nd Edition of the RCR [Radiotherapy target volume definition and peer review guidance](#). Ultimately, RTE are rare, but nevertheless can have significant consequences for the patient. It has been long well established that radiotherapy plan production, treatment delivery and verification are undertaken with second check systems. However, despite the landmark publication by RCR of ‘Radiotherapy target volume definition and peer review’ in August 2017, the majority of clinical oncologists in UK still do not have dedicated time allocated to peer review of radiotherapy contours. This seems disingenuous at the very least, and a high risk, critical omission at the worst, particularly since radiotherapy contouring peer review has been recognised as important in reducing risk from radiation in a variety of publications since 2008 ^(1,2,3,4).

Work on the 2nd edition of this guidance started in early 2020 and was then paused as a result of the Covid pandemic. However, the working party resumed their activity in late 2020 and the final version – having gone through RCR and public consultation – was finally published in October 2022. The underlying philosophy is not changed, but there are some key updates worth noting.

All radiotherapy departments are recommended to adopt a standardised peer review meeting structure with these meetings recorded against nationally agreed minimum dataset requirements. Of note, the meeting structure may vary between departments – some may choose a regular day/ time each week, while others may find an ‘on demand’ model suits their department better. Also, in addition to the agreed minimum dataset, standardisation of nomenclature of both target volumes and organs at risk is recommended. In order for contouring peer review to occur reliably and safely, clinicians require adequate time in their job plans – this is the responsibility of their employer. Where this is not provided, the radiotherapy service management group should undertake a risk assessment of the failure to provide this protected time, and the employer is responsible for determining whether or not they have an appetite for this risk.

There are then further recommendations aimed at making the process of contouring peer review more robust and replicable across the nation – definition of the minimum dataset, grading of the peer review outcome with definitions of what constitutes both ‘major’ and ‘minor’ changes, and recommendations for time allocation for peer review and audit of this. There is also mention of the ways in which computer assisted contouring may be useful both now and in the future.

Going forwards, I would like to see the RCR webpage updated with ‘Frequently asked questions’. It is also likely that there will be a supportive College-led review programme of how this is being implemented across the UK, where the barriers are and guidance on how to overcome these. Ultimately, by the time the 3rd edition is due, my hope is that it will be more about the ‘how’ rather than the ‘if’.

References 1, WHO, 2008: Radiotherapy risk profile 2, RANZCR, Feb 2010: Quality guidelines for volume delineation in radiation oncology 3, ASTRO 2013: White Paper 4, Global Harmonisation Group, 2014: Radiotherapy quality assurance in clinical trials

Learning from good practice – implementation of planning/treatment review meetings

Suzanne Coupland, Research and Development Radiographer, Helen Convery, Senior Dosimetrist, Laura Hammond, Head of Treatment Planning, and Robyn Stirton, Advanced Imaging Radiographer, Raigmore Hospital

Near the beginning of the pandemic, any staff groups in Raigmore Hospital, Inverness that could work from home were advised to do so. The planning team worked hard to provide a paperless transition and remote working commenced. A near miss incident was reported locally, information was missing from the planning set up notes due to poor communication.

Learning from a radiotherapy error or near miss is vital to ensure that any risks of repeating the error can be eliminated. After investigation of some similar near misses, the frequent causative factor was communication (CF1d), so how could we reduce the risk of this issue re-occurring?

It was suggested that a group including planning and treatment staff should be created to improve communication and 'bridge the gap' by providing an opportunity to discuss future patients and any potential issues. And from here, the implementation of planning/treatment review meetings.

The planning/treatment review meetings are held once a week and require the attendance of dosimetrists, the advanced imaging radiographer and treatment lead radiographers. Senior radiographers are also encouraged to attend if available to do so as it provides a good learning opportunity. During these meetings there is an opportunity to look at the treatment plans and discuss any issues not limited to but including: organs at risk (OAR) with tight constraints, areas of Planning Target Volume (PTV) with tight margins, possible changes in contour that will significantly affect dose distribution, set-up fields required, bolus position and out of protocol forms. This is particularly beneficial for complex treatment plans.

Since starting these meetings and providing an opportunity for communication, there has been learning opportunities and a reduced risk of errors from poor/lack of communication, also there has been a noted improvement in the working relationship between the planning and treatment teams.

Do you have any **learning from good practice** that you would like to share? Please email radiotherapy@ukhsa.gov.uk with your ideas for inclusion in future editions of a Safer Radiotherapy e-bulletin.

Safer Radiotherapy resources

Safer RT: [triannual error analysis and learning](#) reports contain analysis and learning from RTE reported voluntarily by UK RT providers and the relevant reporting authorities.

Safer RT: [e-bulletins](#) provide key messages from the national patient safety initiative

Safer RT: [biennial error analysis and learning](#) reports contain 2 years analysis and learning from RTE reported voluntarily by UK RT providers and the relevant reporting authorities.

A series of 15 minute RT [learning resources](#) developed to support RT healthcare professionals in learning from RTE are included on the [Medical Exposures Group webpages](#)

[Towards Safer Radiotherapy](#) contains the classification taxonomy for use when assigning a RTE severity level

[Development of Learning from Radiotherapy Errors](#) provides the pathway coding safety barrier, method of detection and causative factor taxonomies