UK Health Security Agency

Safer Radiotherapy

Triannual RTE analysis and learning report

Issue 46: full radiotherapy event data analysis, December 2024 to March 2025

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Full radiotherapy event data analysis

Event learning systems are a widely accepted safety tool advocated internationally by professional groups, bodies, agencies, and regulators in radiotherapy (1). Analysis of reported data facilitates the identification of possible areas for improvement and informs the direction of future refinements and improvements. It is imperative incidents and near misses are learned from, and effective preventative measures are implemented (2). Further information on event learning systems can be seen in chapter 3 of the guidance Advancing safer radiotherapy.

The Safer Radiotherapy publication series facilitates comparison of locally identified trends against the national picture. The Patient Safety in Radiotherapy Steering Group (PSRT) recommends implementing learning from this analysis locally. In doing so it is expected that these events might be mitigated in the future.

This analysis has been undertaken by the UK Health Security Agency (UKHSA) on radiotherapy events (RTE) reported voluntarily by UK radiotherapy (RT) providers. Anonymised reports were submitted through multiple routes. In England from the Learn from Patient Safety Events (LFPSE) Service, in Wales from the Once for Wales Concerns Management System (OfW), and directly to UKHSA from providers in Northern Ireland, Scotland and the independent sector.

As with any voluntary reporting system, the data will only reflect those events that are reported and may not necessarily be representative of the actual level of occurrence. As such, this data needs interpreting with care.

There is a requirement for RT providers to notify the Ionising Radiation (Medical Exposure) Regulations (IR(ME)R) (3, 4) inspectorates of significant accidental or unintended exposures (SAUE) or ‘reportable radiation incidents’ (Level 1) as defined in Towards Safer Radiotherapy (TSRT). The UK inspectorates for IR(ME)R; Care Quality Commission, Healthcare Inspectorate Wales, Healthcare Improvement Scotland and the Regulation and Quality Improvement Authority, shared anonymised closed synopses of reported SAUE for analysis.

The classification level from TSRT, the pathway coding, failed safety barriers (FSB), methods of detection (MD) and contributory factor taxonomies from the Development of Learning (DoL) from Radiotherapy Errors were employed for the analysis. FSB and MD are discussed further in the May 2021 issue of the Safer Radiotherapy E-bulletin. In May 2025, an updated National patient safety radiotherapy event taxonomy was published. This document provides guidance on the application and submission of radiotherapy event reports, including terminology, definitions, taxonomies, and practical examples. The PSRT encourage all UK radiotherapy providers to adopt the terminology and taxonomies from this document.

If individual providers would like to comment on the analysis, share experience of learning from RTE or application of the coding please email the RT team at radiotherapy@ukhsa.gov.uk

Inspectorate data

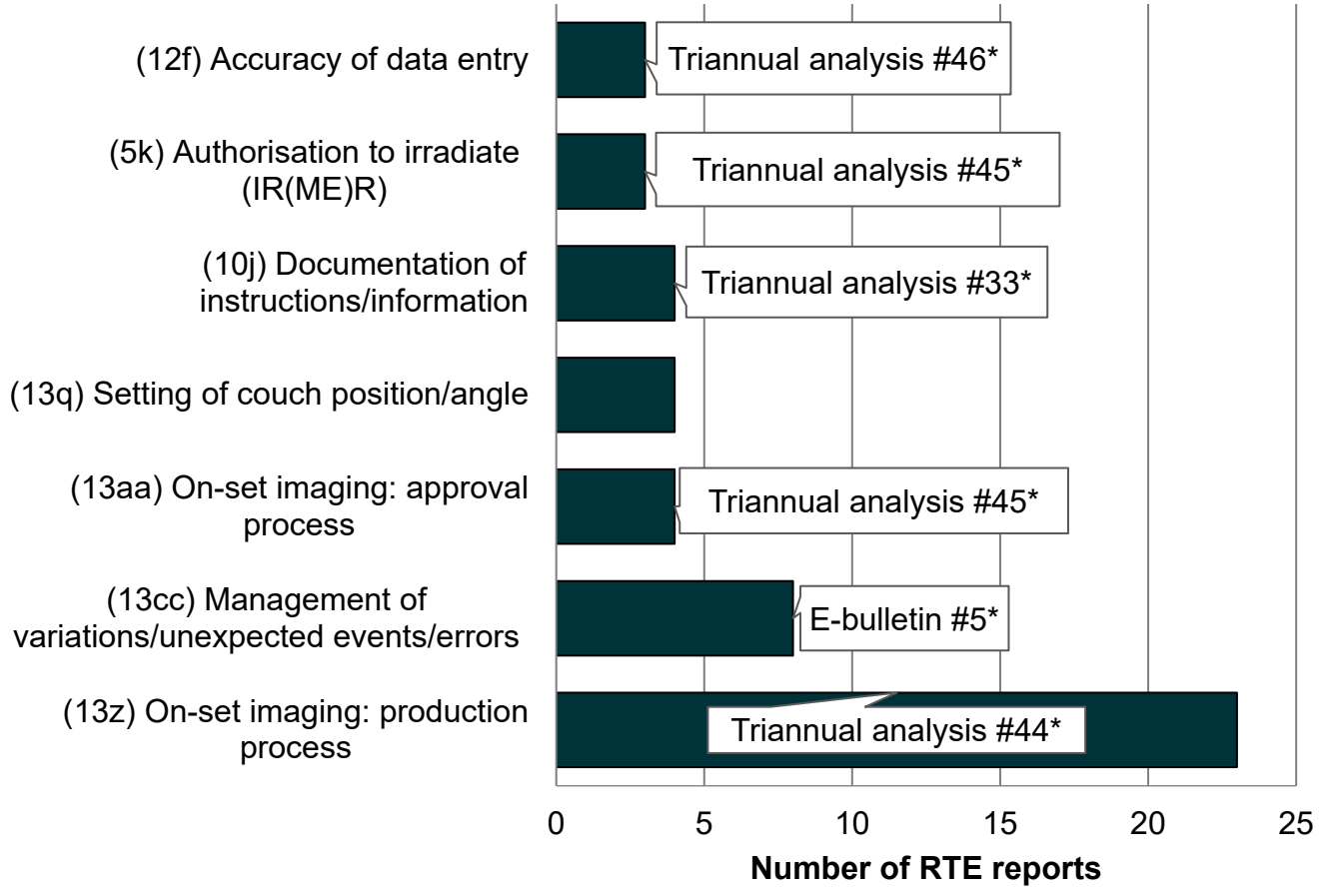
A breakdown of the inspectorate data for this reporting period can be seen in Figure 1. As IR(ME)R (3, 4) applies to both NHS and independent RT providers, this data covers all RT providers. It should also be noted there may be a time lag between notification of an event to the inspectorates, completion of the detailed investigation and the subsequent sharing of information with UKHSA for inclusion in the analysis. Therefore, this data is analysed separately from the voluntary data.

The inspectorates shared 79 anonymised closed synopses of reported SAUE. This is an increase since the previous analysis (issue 45) when 66 reports were shared.

The most frequently reported notifications were associated with 'on-set imaging: production process' (29.1% n = 23). This also represents an increase since the previous analysis (issue 45) where 13 reports (20.3%) were associated with 'on-set imaging: production process'.

A number of case studies have been included in Safer Radiotherapy publications such as the triannual analysis, the E-bulletin, the unseen pathway and good practice guidance. Relevant published case studies are shown with an asterisk (*) in Figure 1.

Figure 1. Breakdown of most frequently reported inspectorate Level 1 process subcodes from closed notifications (n = 49/79 subset of data)



Case study 16: Accuracy of data entry (12f)

Accuracy of data entry includes the incorrect entry of information and transcription inaccuracies; this can include data entry into the oncology management system. These types of events are frequently reported as reportable radiation incidents (level 1) within both the voluntary and inspectorate data. They are often associated with the end of process checks at treatment data entry process. They are also associated with the management of on-set imaging, this includes timing and the scheduling of the appropriate on-set verification imaging.

The use of electronic transfer of data and automation has helped reduce the frequency of this type of event (5) however accuracy of data entry is still prevalent across all RTE. Advancing Safer Radiotherapy contains further information on the mitigation of transcription associated events and the importance of systemic review and redesign, rather than focussing on a single system element such as human error (6).

Synopsis

Patient receiving 55Gy in 5 treatments, SABR to lung. During the data entry process the use of a vac bag was not transcribed or transferred on to the treatment setup sheet by the individual completing the task. The missed transcription was not detected by an independent checker during end of process checks.

The patient was treated for the first 3 fractions without a vac bag. For these first 3 fractions additional CBCT scans were required due to patient positioning issues.

When patient positioning issues were identified during treatment fraction 4, pre-treatment staff were contacted. Following discussion with pre-treatment staff, it was identified that the patient had been positioned and CT planning scanned using a vac bag. For the final 2 fractions the vac bag was incorporated into the patient set up and no further additional verification imaging was required.

During investigation it was noted the current process for recording immobilisation requires manual transcription of data from the CT planning patient position sheet to the treatment setup sheet. The mis-transcription of data on this occasion led to the incorrect positioning of the patient during fractions 1 to 3. As a result, the patient received 3 additional CBCT scans to adjust positioning and confirm the correct delivery of treatment.

Subsequent actions taken included reviewing the transfer of data across the patient pathway. A new electronic patient position sheet has been developed to include all immobilisation, this will be completed during the CT planning scan and accessed during treatment, removing the requirement to transcribe information. This will be audited in 3 months.

Coding: TSRT9/ Level 1/ 12f/ 12g/ 13g/ MD13g/ CF2d/ CF1c/ CF1d

RTE response

A robust RTE response will maximise potential learning from this event. Table 1 contains the key stages to an RTE response and further considerations for this case study (6).

Table 1. Key response stages to RTE described above (12f)

RTE response stage	Considerations
Identification and local reporting of RTE	Staff are appropriately trained and supported to identify and report RTE locally. This event was detected during patient set up and reported on the local reporting system.
Decision to investigate	Preliminary investigation identified that 3 additional CBCT images were undertaken. In accordance with SAUE guidance, this event is therefore a reportable radiation event (Level 1) which requires a detailed investigation in accordance with local procedures.
Planning and selection of investigation team	An interdisciplinary team, including staff from pre-treatment, treatment, information management and an MPE, was formed to investigate the event.
Recording of investigation	The local investigation report template was utilised to guide the investigation and capture the relevant information.
Information gathering	Operators involved in the event contributed to the investigation and the data entry process across the patient pathway was observed by members of the investigation team. A review of relevant documentation was carried out. During the investigation a retrospective audit of RTE was completed to determine if this type of event was thematic. An audit of end of process checks was also carried out to ensure safety critical elements in the pathway were included (7).
Analysis and identification of contributory factors	Analysis was completed using a SEIPS (6) framework. Investigation established that data entry transcription involved numerous manual data entry processes that were vulnerable to mistranscription, confirmed by retrospective audit (CF2d). This contributed to an individual failure to transcribe, and check, data correctly (CF1c and CF1d).
Identification of areas for improvement and agree action plan	The following were agreed within a local action plan: • urgent review of the data entry procedure to minimise manual input • introduction of new electronic form within the oncology management system, to be used by both planning and treatment. The use of the electronic form minimises the need for duplication or transcription

RTE response stage	Considerations
	• enhancing communications between pre-treatment and treatment • review the transfer of data across the department and minimise any manual data transcription requirement • review imaging procedures to ensure triggers for escalation are clearly defined and understood • review of thematic analysis of similar events to identify and proactively manage risk
Dissemination of learning	A summary of the investigation was shared with staff at different staff meetings and through an email alert. Feedback was sought from staff for areas for improvement ideas. Training provided for newly implemented procedures.
Assessment of effectiveness	An audit of the new electronic transfer process to be completed 3 months after implementation. A further review of the last 3 months RTE analysis to confirm effectiveness of improvement actions.

Further guidance and national tools to aid investigations are available (6, 8 to 9). Following a simple risk matrix (10), a study of risk was produced for the primary pathway subcode (12f) ‘accuracy of data entry’.

Table 2. Study of risk matrix

In this table, a G (green) in brackets indicates low risk, an A (amber) in brackets indicates a moderate risk.

Area of risk	Initial risk			Risk following mitigations (corrective action examples shown above)		
	Consequence	Likelihood	Risk score	Consequence	Likelihood	Risk score
Change of beam parameters when data transferred from treatment planning system to oncology management system	3	2	6 (G)	3	1	3 (G)
Transcription of patient set up information	3	3	9 (A)	3	1	3 (G)
Incorrect scheduling of imaging	2	2	4 (G)	2	1	2 (G)
Incorrect imaging modality scheduled for course of treatment	2	2	4 (G)	2	1	2 (G)
Incorrect imaging tolerance documented for use during treatment	2	2	4 (G)	2	1	2 (G)
Patient set up information manually entered differently for Phase 1 and Phase 2 treatment	3	2	6 (G)	3	1	3 (G)
Check lists or questionnaire scheduled on wrong dates	2	1	2 (G)	2	1	2 (G)

December 2024 to March 2025 data analysis

Number of RTE reports

A total of 4,305 reports were received between December 2024 and March 2025. Of those, 11 were not RTE reports, resulting in 4,294 RTE reports received. This equates to a monthly average of 1,074 RTE reports, reflecting an increase of 14.4% (n = 939) when compared to the previous analysis (issue 45) and an increase of 8.7% (n = 988) when compared to the same reporting period between December 2023 and March 2024 (issue 43).

For the first time the data analysis will consider each affected individual as a single patient notification. For example, an event affecting 20 patients, where additional verification imaging exposures were required due to equipment malfunction, is now included as one event per individual, therefore 20 events.

There is some disparity in frequency of reporting across providers. A wide variation is seen when comparing the event date with the date reported to the national voluntary reporting scheme. This time lag ranges from 0 to 2,415 days, with a mean of 35 days and a mode of 0 days, reflecting that 356 were reported nationally on the same day as the event. Five reports did not contain an event date and were not included in the averages. There were 59 outliers with a lag time greater than 365 days, reported from 9 providers. Often there was no reason associated with the delay, and it is possible some may be due to date transcription error.

To ensure timely learning from RTE nationally, providers are asked to make RTE submissions at the earliest opportunity. Issue 26 of Safer Radiotherapy provides further information on reporting frequency. Providers reporting through the LFPSE are encouraged to include the **TSRT9** trigger codes for all RTE once the required investigation is complete and coding taxonomy has been applied. If a report does not contain the **TSRT9** trigger code, it will not be shared by LFPSE with UKHSA.

Monitoring of RTE coding by radiotherapy providers

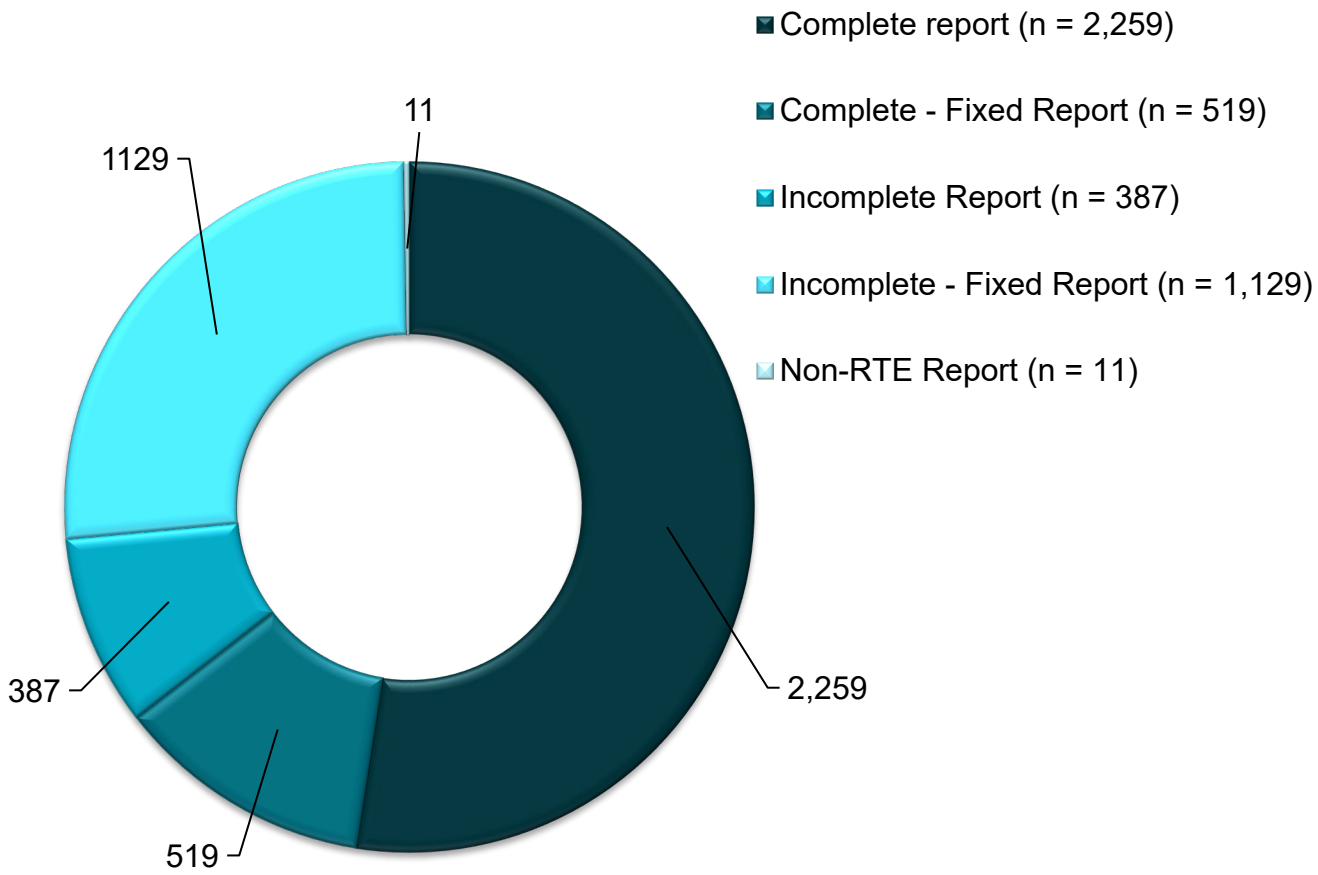
All providers are asked to apply a trigger code (TSRT9), classification level, primary pathway subcode, additional pathway subcoding (including failed safety barriers (FSB)), method of detection (MD) and contributory factors (CF) to their RTE reports to facilitate both local and national analysis.

The format of coding for submission is TSRT9/ Level 4/ 13c/ 13l/ MD13hh/ CF1d/ CF5b/ CF2b. This should be included in the opening section of the first open text field of the local event learning system where possible. Providers within England may add this information to the “What is the radiotherapy error code?” field of the local event learning system.

Consistency checking was undertaken by UKHSA staff on the application of the RTE coding by RT providers. The coding was reviewed for all RTE classified as reportable through to near miss (levels 1 to 4) and 10% of non-conformances (level 5) RTE were audited. A complete report includes the trigger code, classification, pathway code, MD, and CF taxonomies.

From the 2,778 RTE reports classified and coded locally with all the taxonomies, 1,774 were classified as levels 1 to 4. A total of 452 levels 1 to 4 reports were amended (complete fixed in Figure 2 includes level 5 data (n = 519)). Thus, a 74.5.% level of consistency was achieved for levels 1 to 4 RTE. This reflects an decrease since the previous analysis (issue 45) when an 76.1% level of consistency was achieved.

Figure 2. Breakdown of report completeness (n = 4,305)



A total of 1,516 RTE reported did not contain one of the required taxonomies. A total of 1,129 were classified or coded by UKHSA staff using the supporting text supplied by the local providers (incomplete fixed report in Figure 2). Of the incomplete reports, 7 RTE did not contain sufficient supporting text to assign any classification or coding taxonomy, therefore these have not been included in the detailed analysis.

It is recommended that the entire pathway subcoding should be considered when allocating pathway subcodes. Further information on the consistent allocation of pathway codes can be seen in E-bulletin edition 3.

Non-RTE reports submitted formed 0.3% (n = 11) of all the reports for this reporting period. Data and accompanying text indicate that these were Patient Safety Incidents (PSI) but not RTE. A PSI is defined by NHS England as 'Something unexpected or unintended has happened, or failed to happen, that could have or did lead to patient harm' (11). Further information on PSI can be found in issue 5 of Safer Radiotherapy. Non-RTE reports were excluded from the detailed analysis.

In total, 4,287 RTE for the reporting period from December 2024 to March 2025 were included for analysis. The analysis is presented below.

Number of reports per provider

Data was received from NHS providers and from the independent sector. For this reporting period, 57 RT providers have reported. This is consistent with the previous analysis (issue 45) (n = 57). There were 19 anonymised reports received which did not indicate the RT provider, these have been included in Figure 3 as a single default provider.

Figure 3. Number of RTE reported by provider (n = 4,287)

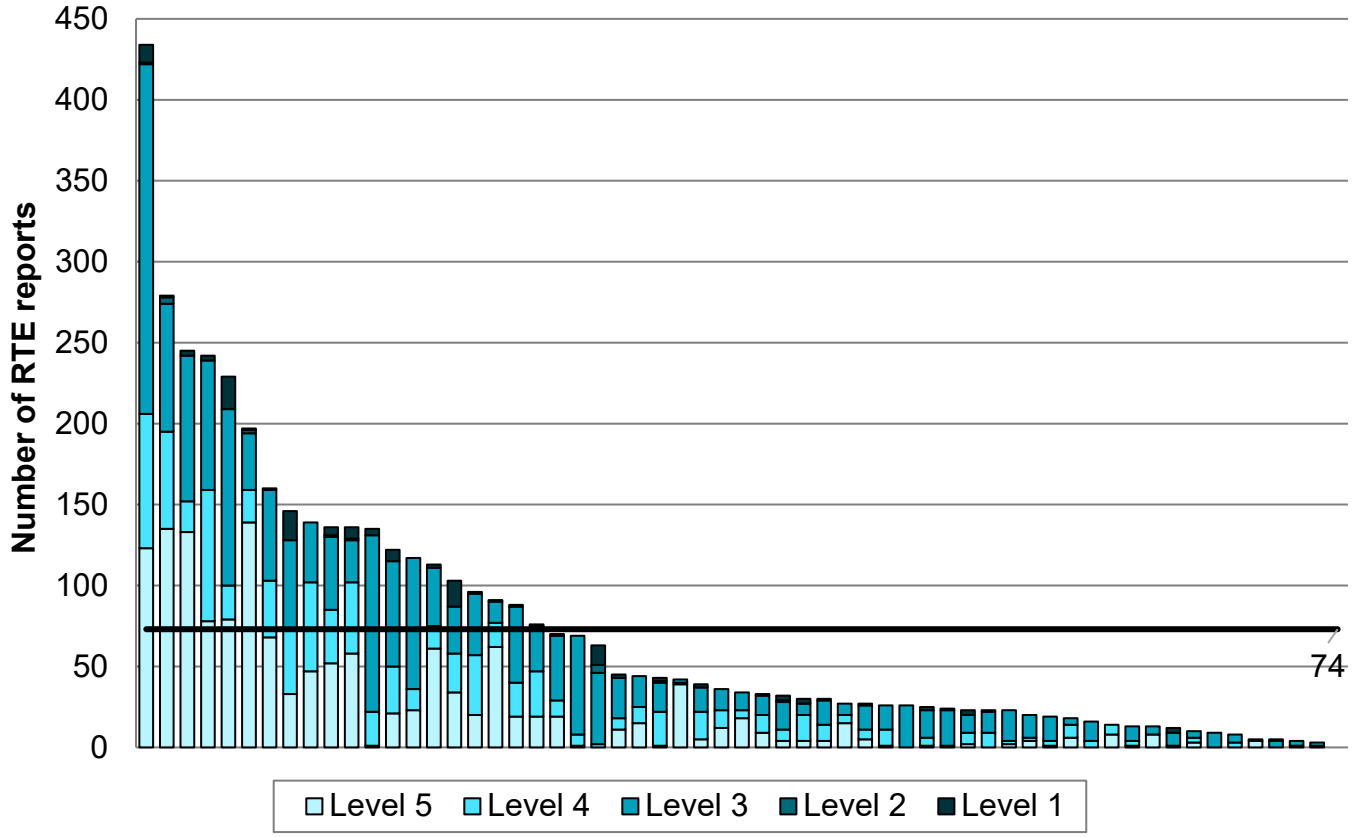


Figure 3 shows the number of RTE reports submitted by provider. This ranged from 3 to 434 reports, with a mean of 74. Of the 58 providers who reported, 53.4% (n = 31) reported less than the national mean. Figure 3 also indicates the classification of reports received per provider. The providers that submitted higher numbers of RTE reports were more likely to include all classification levels of reports. Ten providers did not report any level 5 RTE.

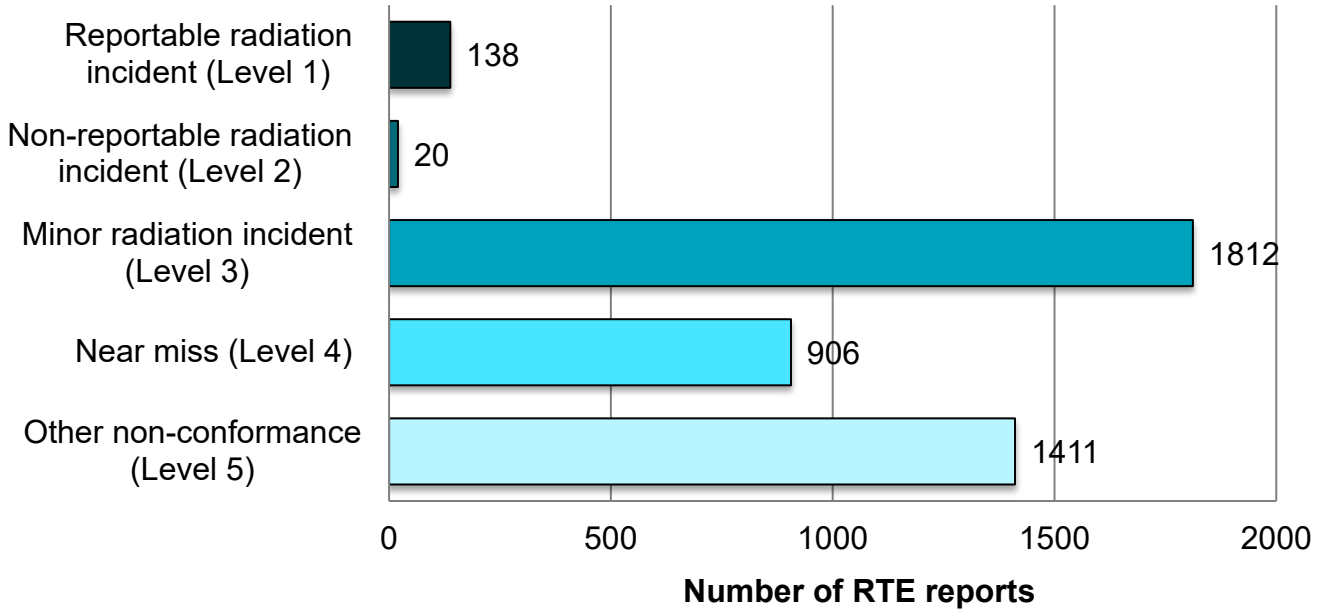
There may be several reasons for reporting variance. Reporting culture varies across providers. Event learning systems are not always easily accessible. Additional resource may be required to support a full system. Finally, a local requirement to use more than one system may disincentivise reporting. Findings of the most recent survey of UK incident learning and local management of RTE is published in the September 2024 issue of Safer Radiotherapy E-bulletin.

The number of reports per provider has not been normalised to account for the variation in provider capacity or service specification. It should be noted that those providers reporting higher numbers of RTE represent providers with mature reporting cultures and should be encouraged to continue reporting.

Classification (level) of RTE

Each of the 4,287 RTE reports was classified as ‘other non-conformance (level 5)’, ‘near miss (level 4)’, ‘minor radiation incident (level 3)’, ‘non-reportable radiation incident (level 2)’ or ‘reportable radiation incident (level 1)’ (Figure 4).

Figure 4. Classification (level) of RTE reports (n = 4,287)



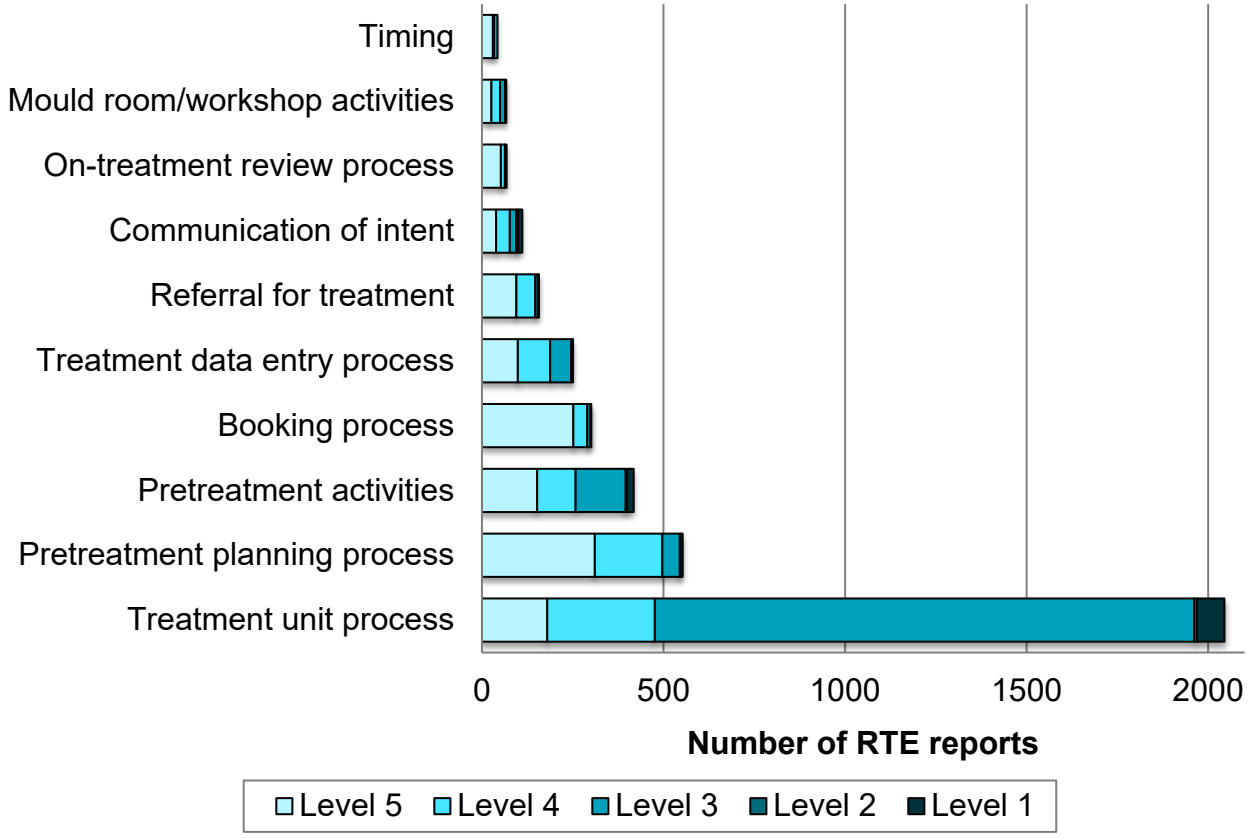
Of the RTE reports, 96.3% (n = 4,123) were minor radiation incident, near miss or other non-conformities (levels 3 to 5) with little or no impact on patient outcome. Of the remaining 3.7% (n = 158) of reports, 3.2% (n = 138) were reportable under IR(ME)R to the appropriate enforcing authority (level 1).

Breakdown of process codes

The 4,287 RTE reports were categorised by process code and classification level so the main themes could be derived. Figure 5 shows 47.7% (n = 2,045) of the RTE were reported to have

occurred during treatment unit processes. The treatment set-up process represents the last opportunity to identify events. Accurate treatment relies on the correct interpretation of the treatment plan and set up details which need to be replicated at each fraction of treatment. This might explain the high prevalence of RTE within treatment unit processes. The most frequently reported process codes remain consistent with the previous analysis (issue 45), with the addition of 'timing'.

Figure 5. Breakdown of RTE process code by level (n = 4,014/4,287 subset of RTE)

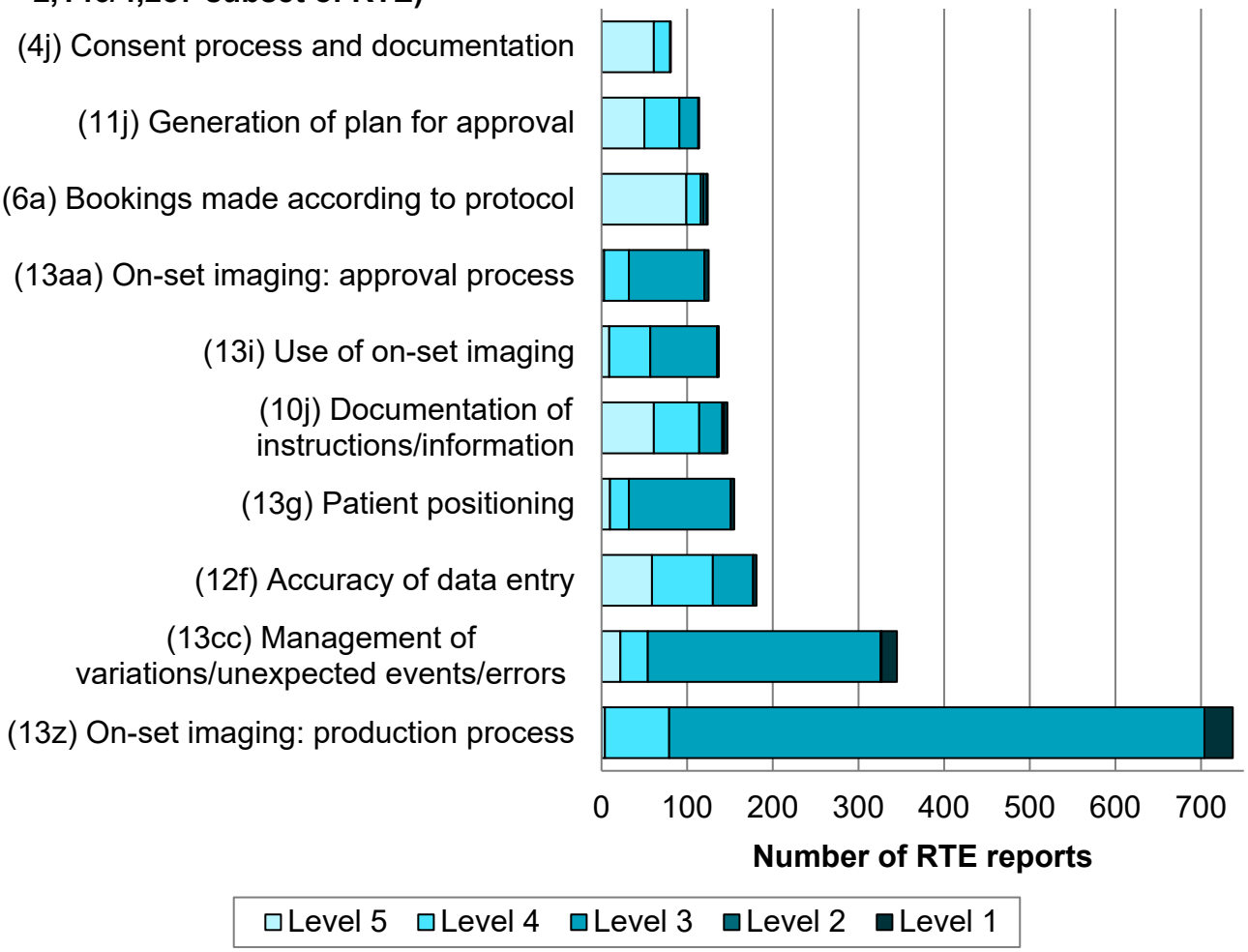


Breakdown of process subcodes

The most frequently reported process subcodes in the RT pathway are presented in Figure 6. This subset of data was also broken down by level.

The most frequently reported RTE was 'on-set imaging: production process' at 17.2% (n = 738) of all reports. This is an slight increase from the previous analysis, issue 45 (16.2%, n = 607). Of this subset, 95.4% (n = 704) of the reports were minor radiation, near miss or other non-conformities with little or no impact on patient care. A large proportion of these reports were associated with contributory factor 'equipment or IT network failure' (64.4%, n = 475). The second most frequently reported RTE was 'management of variations, unexpected events or errors' at 8.0% (n = 344). Eight of the most frequently reported process subcodes during the current review period are similar to the previous analysis (issue 45), additional subcodes include 'generation of plan for approval' and 'bookings made according to protocol'.

Figure 6. Breakdown of most frequently reported RTE process subcodes by level (n = 2,146/4,287 subset of RTE)

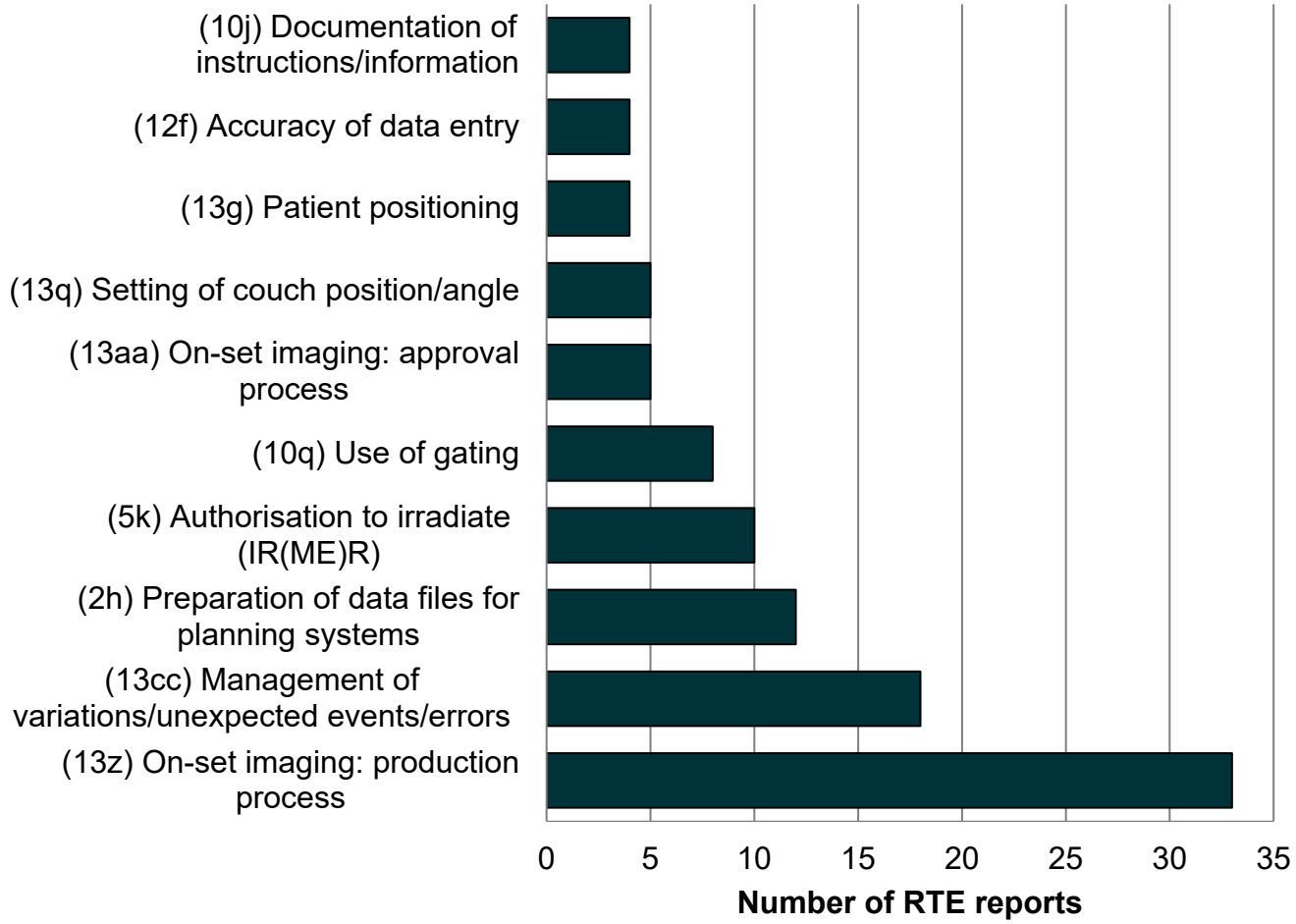


Three of the most frequently reported RTE process subcodes shown in Figure 6 relate to on-set imaging; ‘on-set imaging: production process’, ‘on-set imaging: approval process’, and ‘use of on-set imaging’. When these are combined with the fourth imaging code, ‘on-set imaging: recording process’, they constitute nearly a quarter of all RTE reported for this period (24.9%, n = 1,069). Further guidance on mitigating and reporting these types of RTE can be seen in the Safer Radiotherapy good practice guidance series.

Reportable radiation incident (level 1) RTE

Reportable radiation incidents (level 1), as defined in TSRT, fall into the category of reportable under IR(ME)R (3, 4), in accordance with SAUE guidance. The majority of these events relate to multiple verification or planning imaging exposures, or a single treatment exposure which is often correctable within the course of treatment. As a result, the event does not have a significant impact on the patient or the outcome of their treatment.

Figure 7. Breakdown of most frequently reported level 1 RTE by process subcode (n = 103/138 subset of RTE)



There were 138 level 1 reports submitted by 30 providers to the voluntary system for this reporting period, comprising 3.2% of the RTE reviewed (Figure 4). This is an increase since the previous analysis, issue 45 (2.4%, n = 91) and the variance is considered significant (p = 0.03). The most frequently reported level 1 reports are shown in Figure 7. 'On-set imaging: production process' was the most frequently reported level 1 event comprising of 23.9% (n = 33) of reports. In addition, 'On-set imaging: production process' has been the most frequently reported event within 8 of the last 9 previous analysis (issues 37 to 45). An example of an 'on-set imaging: production process' reportable RTE is when verification images are repeated multiple times due to incorrect set-up and/or hardware or software failure.

Further information on radiotherapy verification imaging IR(ME)R notification criteria may be found within the SAUE guidance. Practical advice on reducing this type of event can be seen in case study 14 in issue 44, case study 2 in issue 32, the good practice guidance series and the biennial report.

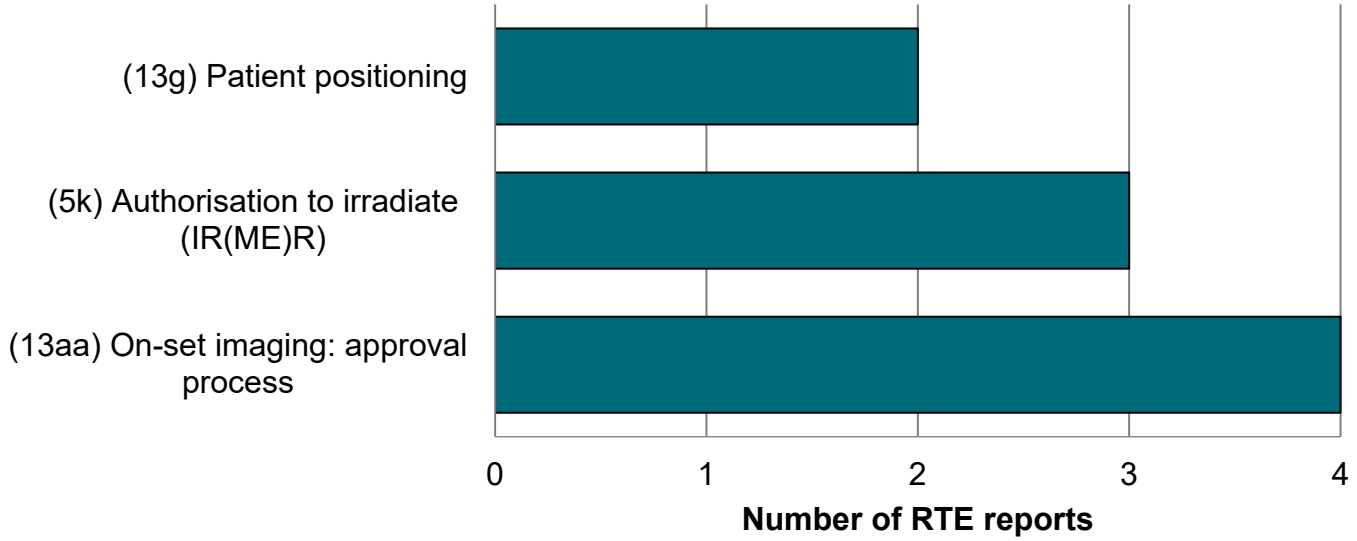
The most frequently reported process subcodes remain consistent with the previous analysis (issue 45), with the addition of 'preparation of data files for planning systems', 'use of gating' and 'accuracy of data entry'. One event involving the 'preparation of data files for planning systems' was reported to affect 12 individuals and has therefore been included as 12 events for analysis.

Of the 138 level 1 reports, 12 were classified locally as either minor radiation incidents (level 3) or other non- conformances (level 5). UKHSA staff amended the classification during consistency checking in accordance with the SAUE guidance.

Non-reportable radiation incident (level 2) RTE

A non-reportable radiation incident (level 2) is defined within TSRT as a radiation incident which is not reportable, but of potential clinical significance. Non-reportable radiation incidents comprised 0.5% (n = 20) of the RTE reported for this time period (Figure 4). This is a slight decrease in proportion compared to the previous analysis, issue 45 (0.7%, n = 27) (p = 0.26).

Figure 8. Breakdown of most frequently reported level 2 RTE by process subcode (n = 9/20 subset of RTE)

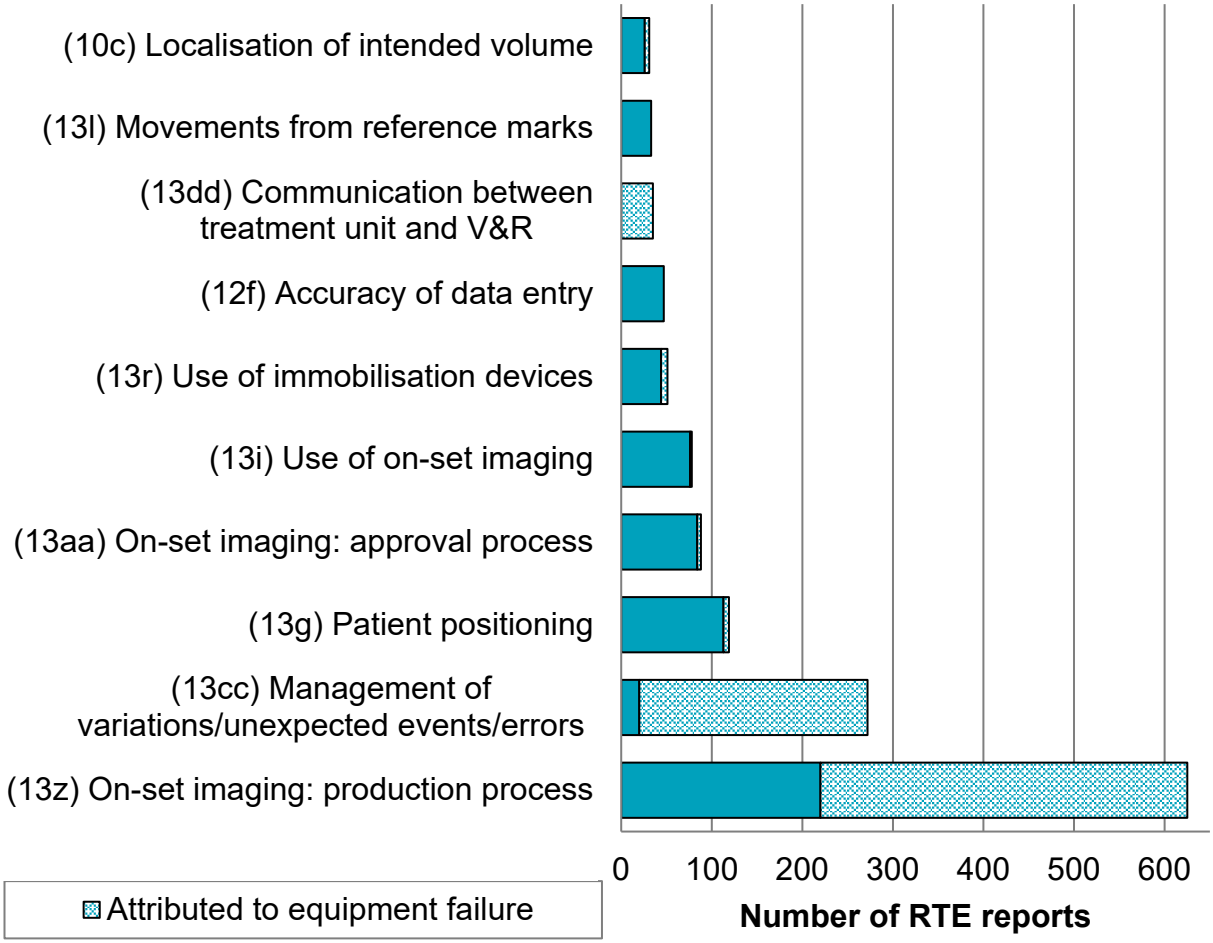


Three pathway codes were cited multiple times as primary pathway points where non-reportable radiation incidents initially occurred (Figure 8). The remainder of Level 2 primary pathway codes were listed once (n = 11) and are not shown within Figure 8. ‘On-set imaging: approval process’ comprised of 20.0% (n = 4) of all non-reportable radiation incident reports. An example of ‘on-set imaging: approval process’ is the incorrect approval of an on-set verification image which leads to a partial geographical miss which is not reportable under IR(ME)R (3, 4), in accordance with SAUE guidance.

Minor radiation incident (level 3) RTE

A minor radiation incident (level 3) is defined within TSRT as a radiation incident in the technical sense, but of no potential or actual clinical significance. Minor radiation incidents comprised 42.3 (n = 1,812) of the RTE reported for this reporting period (Figure 4). This is similar to the previous analysis (issue 45) (41.1% (n = 1,541) and not statistically significant (p = 0.28). A breakdown of level 3 RTE by process subcode can be seen in Figure 9.

Figure 9. Breakdown of most frequently reported level 3 RTE by process subcode (n = 1,379/1,812 subset of RTE) includes equipment failure related



'On-set imaging: production process' was the most frequently reported event with a proportion of 34.5% (n = 625) of the total level 3 RTE reported. This is similar to the previous analysis (issue 45) (35.0%, n = 539). Examples of this type of minor radiation incident can include selecting an incorrect CBCT preset setting the jaws incorrectly for a single image, leading to an additional image. A total of 64.8% (n = 405) of the reported 'on-set imaging: production process' primary process subcode were attributed to equipment failure, this is shown in Figure 9. Examples of this type of RTE include CBCT faults during acquisition. Equipment failure and 'on-set imaging: production process' is discussed further within case study 14 featured in issue 44 of previous analysis.

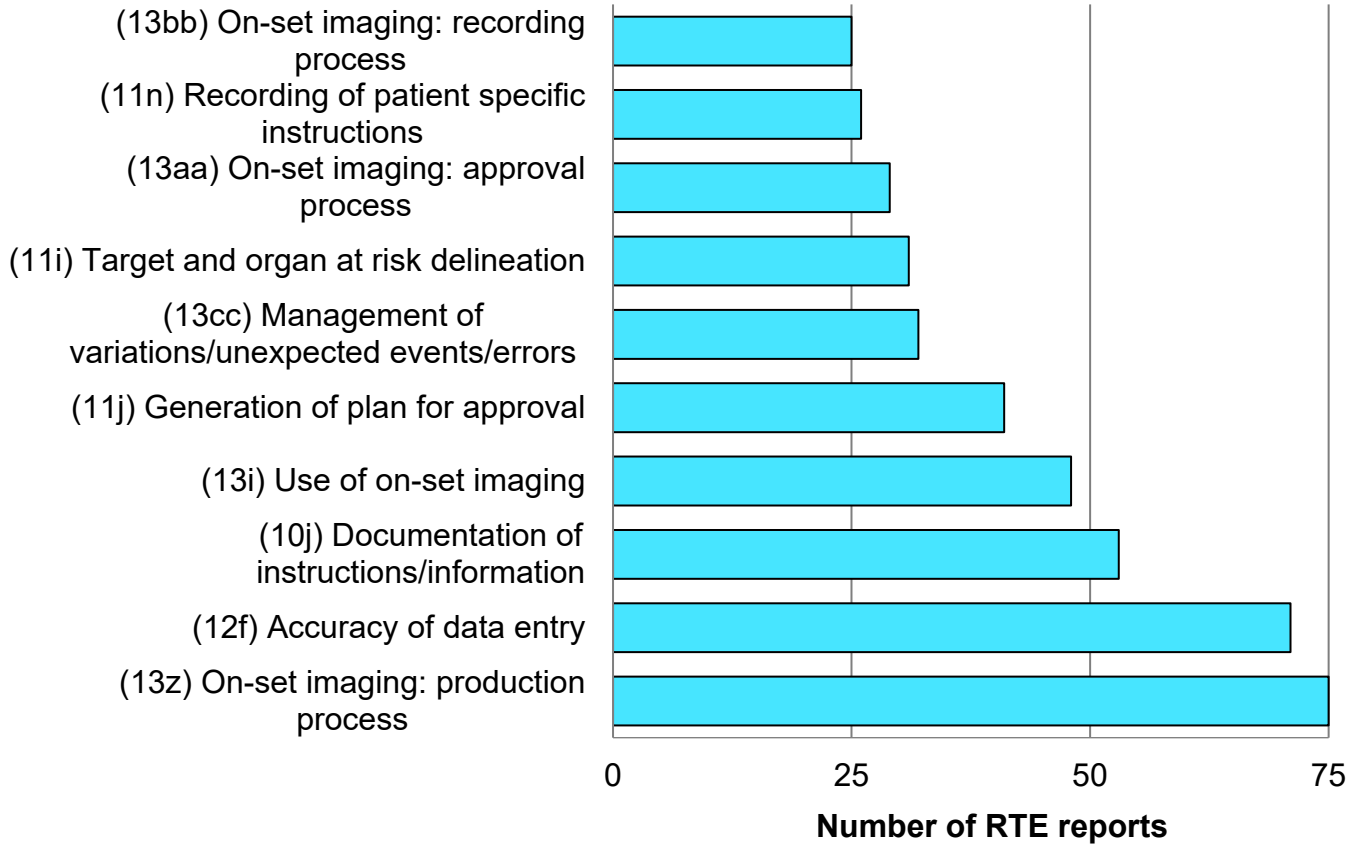
'Management of variations, unexpected events or errors' made up 15.0% (n = 272) of all minor radiation incidents, and of these 92.6% (n = 252) were attributed to equipment failure. Examples of this type of event includes when treatment equipment failure leads to a patient requiring transfer to a matched treatment machine. The re-set of the patient positioning then requires additional verification imaging. Further information on this type of event can be seen in Safer Radiotherapy the unseen pathway.

Near miss (level 4) RTE

A near miss (level 4) is defined within TSRT as a potential radiation incident that was detected and prevented before treatment delivery.

Near misses comprised 21.1% (n = 906) of the RTE reported (Figure 4). This is similar to the previous analysis, issue 45 (21.7% (n = 813) (p = 0.52). Figure 10 shows the most frequently reported Level 4 subcodes.

Figure 10. Breakdown of most frequently reported level 4 RTE by process subcode (n = 431/906 subset of RTE)



'On-set imaging: production process' comprised 8.3% (n = 75) of level 4 RTE. An example of this type of RTE would be a verification image not reconstructed due to a software failure. However, in some cases the image may be retrieved negating the need for further imaging.

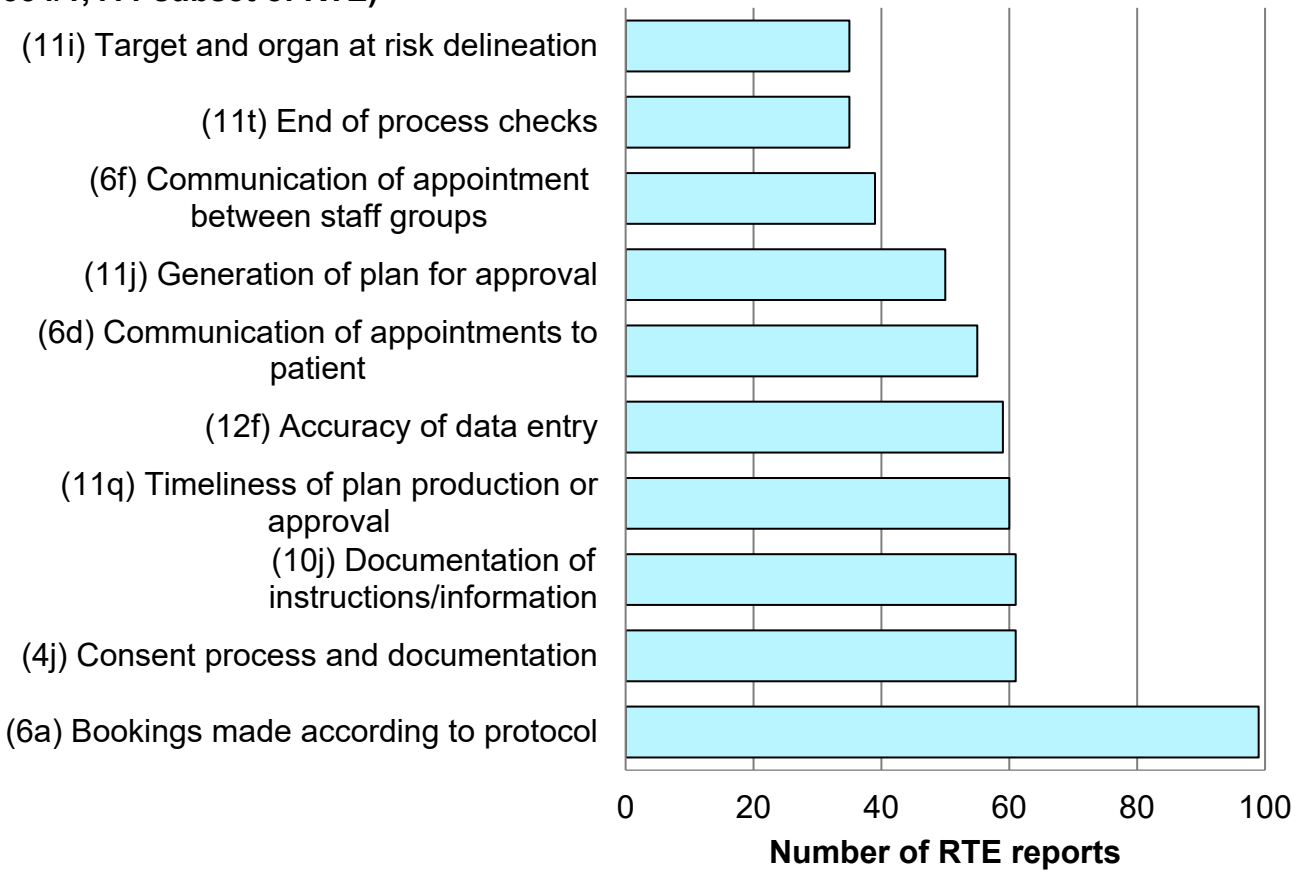
The most frequently reported process subcodes remain consistent with the previous analysis (issue 45), with the addition of 'use of on-set imaging'. Examples of this type of event includes the incorrect scheduling of verification imaging not in accordance with protocol.

Other non-conformance (level 5) RTE

Other non-conformance (level 5) is defined within TSRT as a non-compliance with some other aspect of a documented procedure, but not directly affecting RT delivery.

Level 5 RTE comprised 32.9% (n = 1,411) of all RTE reported for this period (Figure 4). This is a decrease in proportion in comparison to the previous analysis, issue 45 (34.1%, n = 1,277), although not considered statistically significant (p = 0.25).

Figure 11. Breakdown of most frequently reported level 5 RTE by process subcode (n = 554/1,411 subset of RTE)



The most frequently reported level 5 process subcode was ‘bookings made according to protocol’ with a proportion of 7.0% (n = 99). An example of this type of RTE is the incorrect booking of patient appointments, this includes booking appointments on the incorrect day and or treatment machine. These are often detected during an end of process check and do not affect patient treatment.

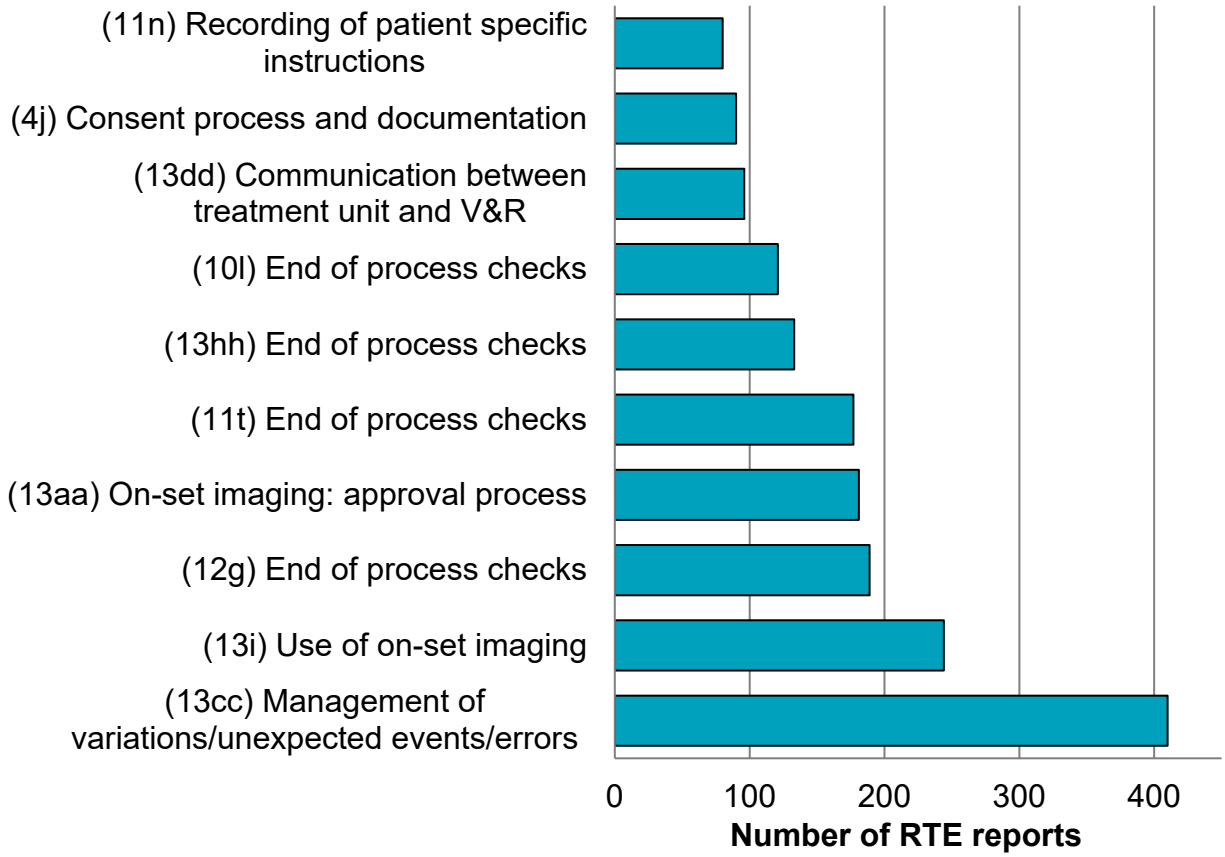
‘Consent process and documentation’ made up 4.3% (n = 61) of level 5 process subcodes. Examples where this subcode might be used include occasions where the consenting clinician has failed to sign the consent form.

Failed safety barriers

A safety barrier (SB) is a critical control point, defence in depth, or any process step whose primary function is to prevent events occurring or propagating through the RT workflow (12). SB embedded in the pathway coding can be allocated to each RTE report to identify all points in the pathway where the error was not detected (failed SB). Multiple FSB codes can be attributed

to each individual RTE. A total of 2,688 failed safety barriers (FSB) were identified from the RTE reported (Figure 12).

Figure 12. Breakdown of failed safety barriers (n = 1,721/2,688 subset of RTE data)



Treatment unit processes were attributed to 44.1% (n = 1,185) of all FSB. The most frequently reported FSB are detailed in Figure 12. Treatment unit process ‘management of variations, unexpected events or errors’ was the most frequently reported FSB (15.3%, n = 410). An example of an RTE with this FSB includes when a machine failure occurs at the treatment unit, and the correct course of action is not taken in accordance with departmental protocol.

All but one of the FSB were also seen in the previous analysis (issue 45), ‘communication between treatment unit and V&R’ was the addition to the most frequent FSB for this reporting period.

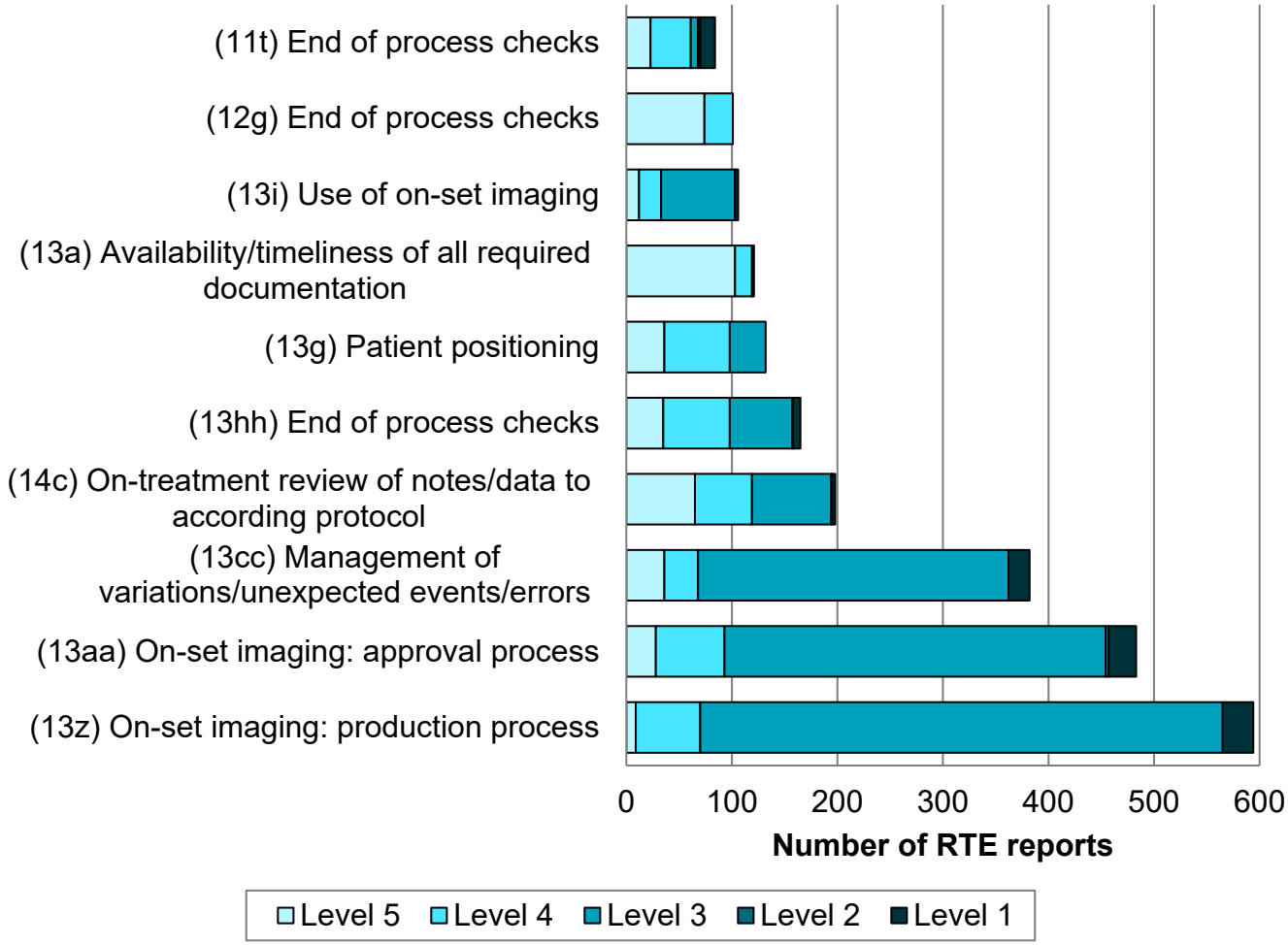
'End of process checks’ occur at the end of each discrete part of the patient pathway and include 6 different pathway subcodes. These comprised of 24.0% (n = 646) of all FSB. The PSRT provided further information on the use of end of process checks in the January (#6) and September (#7) 2022 issues of Safer Radiotherapy E-bulletin.

Method of detection

A method of detection (MD) is the process that identified the event and can be coded using the entire pathway taxonomy. For this reporting period, 52 providers indicated MD in 63.9% (n =

2,739) of reports. Following consistency checking, UKHSA coded a further 1,237 reports with MD taxonomy, resulting in 3,976 reports for analysis. The most frequently reported MD can be seen in Figure 13.

Figure 13. Breakdown of method of detection by level (n = 2,366/3,976 subset of RTE data)



The most frequently reported MD was ‘on-set imaging: production process’ (14.9%, n = 594). This MD was most frequently reported with a primary process code ‘on-set imaging: production process’ (86.2%, n = 512) and a contributory factor of ‘equipment or IT network failure’ (70.5%, n = 419). Seven of the most frequently reported MD occurred at the treatment unit process.

'End of process checks’ occur at the end of each discrete part of the patient pathway and include 6 different pathway subcodes. These comprised of 10.2% (n = 407) of all MD, of which 70.3%% (n = 286) were classified as either near miss or other non-conformances, stopping the RTE from propagating across the patient pathway.

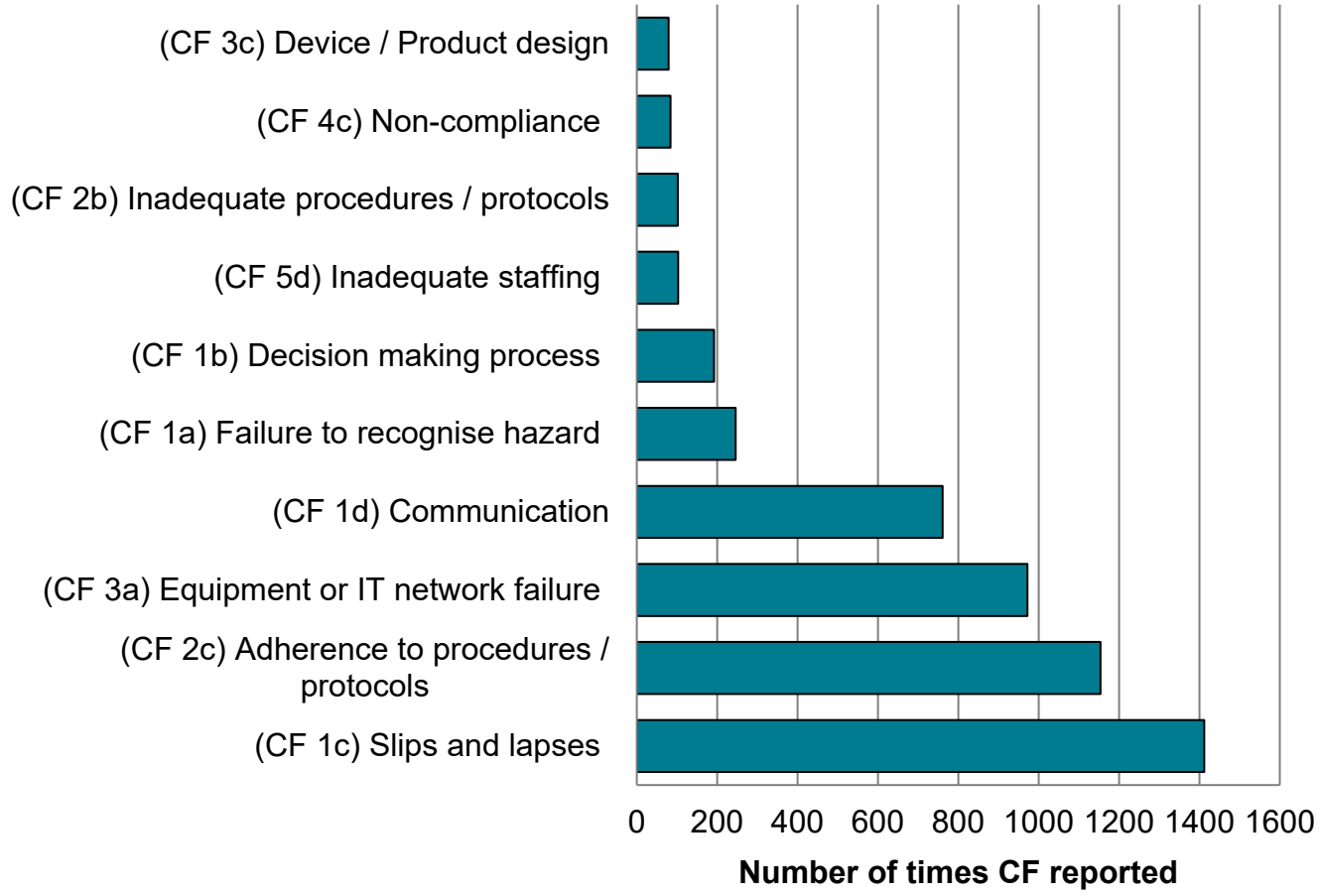
For each part of the patient pathway there are ‘other’ pathway subcodes. ‘Other’ pathway subcodes attribute 6.4% (n = 254) of assigned MD. It is recommended the entire pathway coding should be considered when assigning a MD as described in the January 2022 issue of Safer Radiotherapy E-bulletin.

Contributory factors

Including contributory factors (CF) within a RTE taxonomy enables identification of system problems that could precipitate a range of different events (13).

From the 4,287 RTE reported, 90.4% (n = 3,874) included CF coding. These were reported from all 58 reporting providers. This reflects an increase in the total frequency of CF coding reported since the previous analysis (issue 45), when 55 providers included CF coding in 89.7% of RTE reports (n = 3,364). UKHSA were able to assign a further 280 primary CF, resulting in 4,196 primary CF for analysis. Multiple CF can be assigned to a single RTE, 996 contained multiple CF, a total of 5,522 CF codes were assigned to the 4,196 RTE.

Figure 14. Breakdown of most frequently reported CF (n = 5,105/5,522 subset of data)



The most frequently occurring CF codes are illustrated within Figure 14. The most frequently reported CF was ‘slips and lapses’ making up 25.6% (n = 1,412) of all CF (Figure 14). Issue 22 of Safer Radiotherapy includes guidance on minimising the occurrence of RTE which may be attributed to a slip or lapse of an individual. The ranking of CF is broadly similar to the previous analysis (issue 45). Of note, ‘equipment or IT network failure’ increased in proportion from 16.4% (n = 753) in the previous analysis (issue 45) to 17.6% (n = 972) in the current analysis.

Brachytherapy RTE

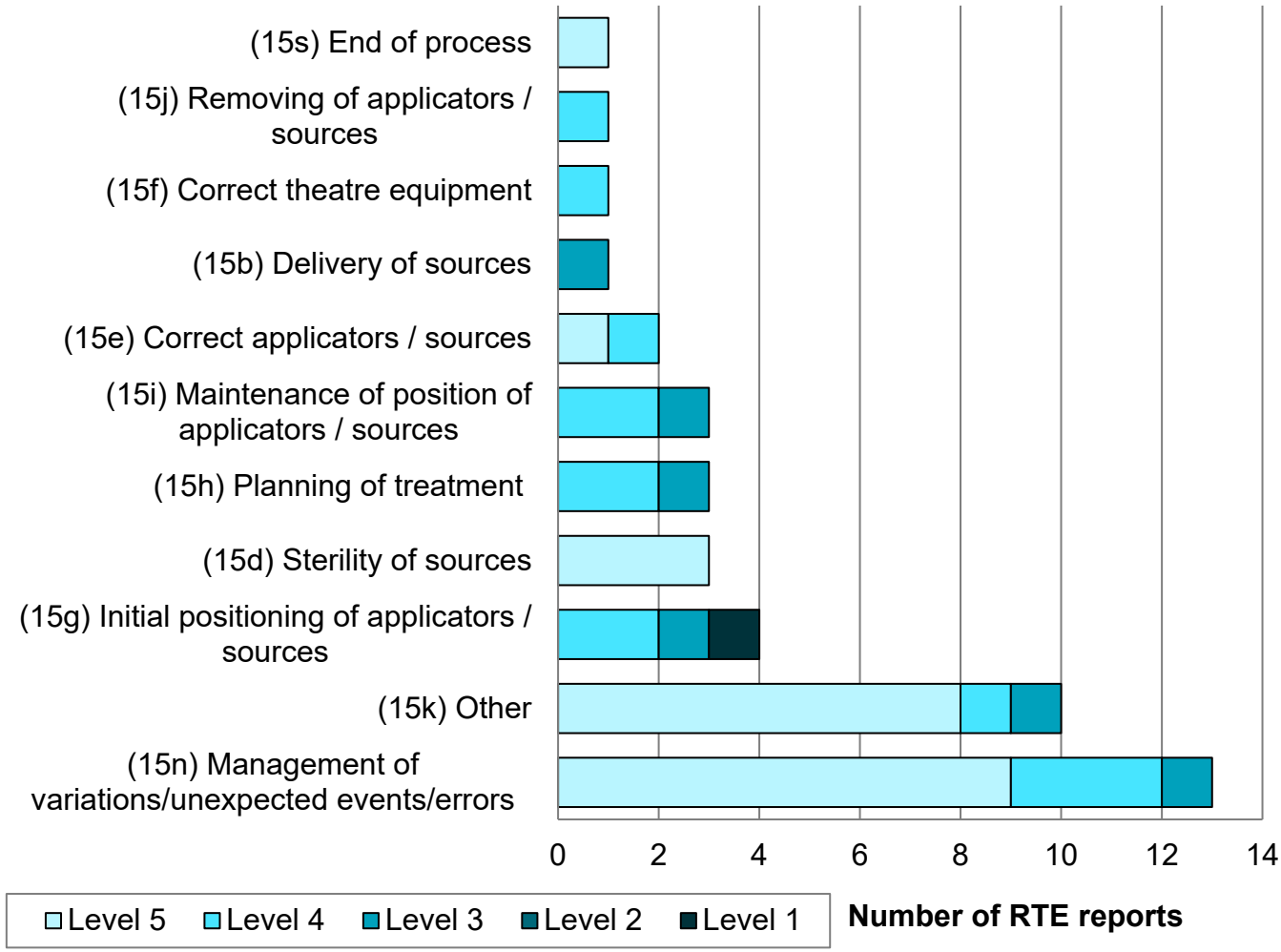
Brachytherapy (BRT) is a RT sub-speciality which involves radiotherapy treatment inside or close to the treatment area. BRT makes up less than 3% of all RT episodes (14). Therefore, the number of BRT associated RTE would be expected to be low and should be interpreted with caution. Further learning from BRT RTE can be seen in a separate learning resource.

RTE coded with BRT process subcodes as the primary code accounted for 1.0% (n = 42) of reports, similar to the previous analysis issue 45 (1.1%, n = 42). Providers reporting BRT RTE reduced slightly at 11 compared to 14 within the previous analysis. A breakdown of the BRT RTE can be seen in Figure 15.

The most frequently reported BRT process subcode was ‘management of variations/unexpected events/errors’ comprising 31.0% (n = 13) of all BRT RTE. This reflects an increase from the previous analysis, issue 45, where this type of event made up 19.0% (n = 8) of all BRT RTE.

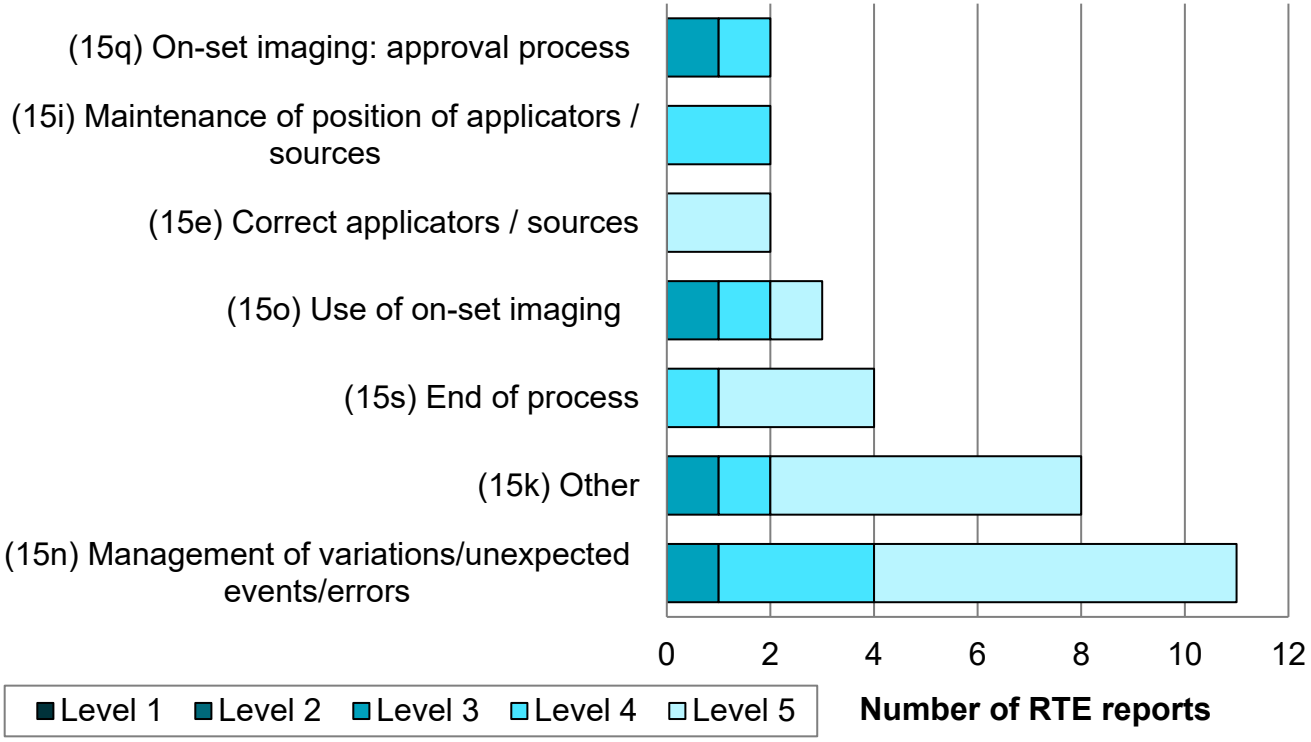
During this review period, 2.3% (n = 1) of BRT RTE were classified as reportable radiation incidents (level 1), this is a decrease since the previous analysis, issue 45 (4.8%, n = 2). This level 1 BRT RTE was attributed to ‘initial positioning maintenance of position of applicators or sources’. Examples of this type of RTE include the implanting of LDR brachytherapy seeds outside of the required treatment area. From the 42 BRT RTE, there were 44 subcodes reported. Of these, 11 were FSB, the most frequently reported was ‘management of variations or unexpected events or errors’ comprising 31.8% (n = 14).

Figure 15. Breakdown of most frequently reported BRT RTE coded '15' by level (n = 42)



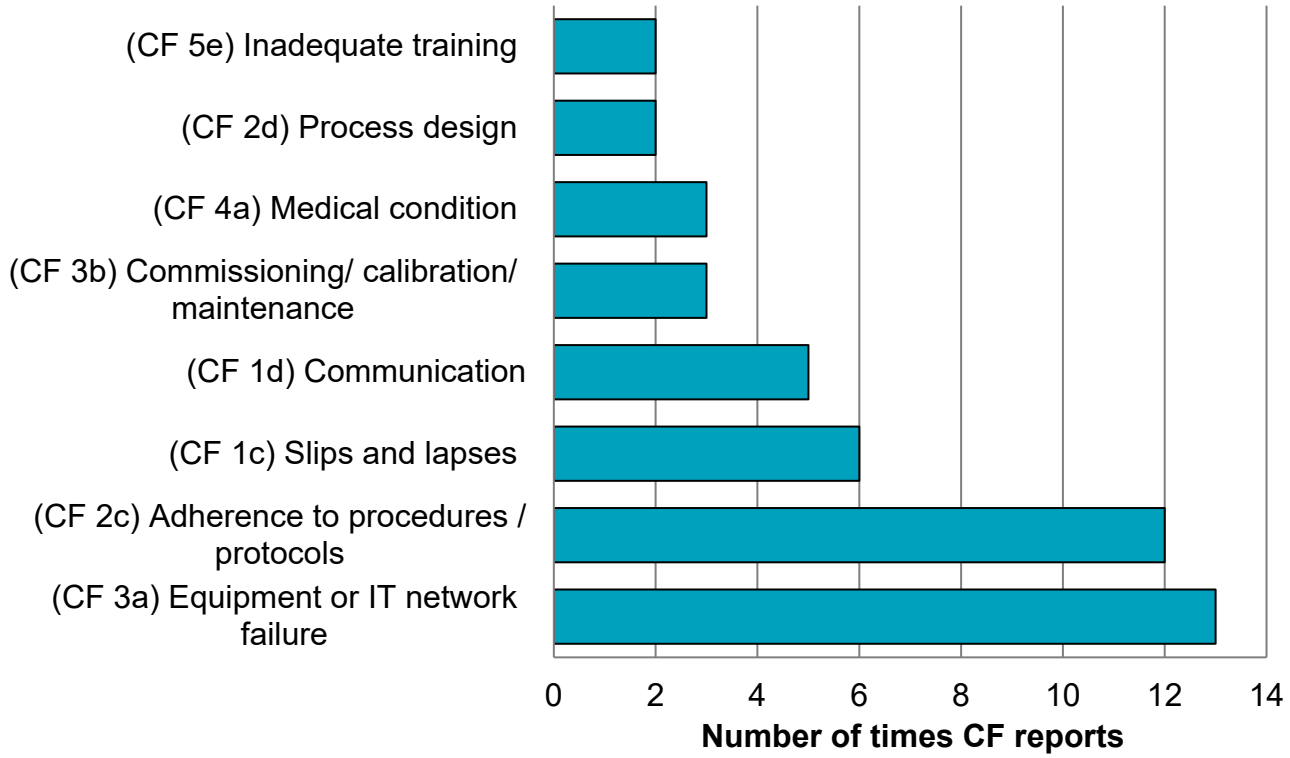
An MD subcode was supplied for 23 of the BRT RTE. Following UKHSA consistency checking, an MD subcode was assigned to 14 more BRT RTE, totalling 37 MDs (88.1%) for the current reporting period. The most frequently reported BRT MD are illustrated in Figure 16.

Figure 16. Breakdown of BRT method of detection by level (n = 32/37 subset of RTE)



All CF codes were reviewed within this subset of the data and 49 CF were identified (Figure 17). The most frequently reported CF associated with BRT RTE was ‘equipment or IT network failure’ comprising of 26.5% (n = 13) of all the CF for BRT RTE. The trends of these BRT CF are slightly different when compared to the entire data as in Figure 14, which may be indicative of differences in the equipment, skill mix and workflow between areas.

Figure 17. Breakdown of BRT RTE CF (n = 46/49 subset of data)



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