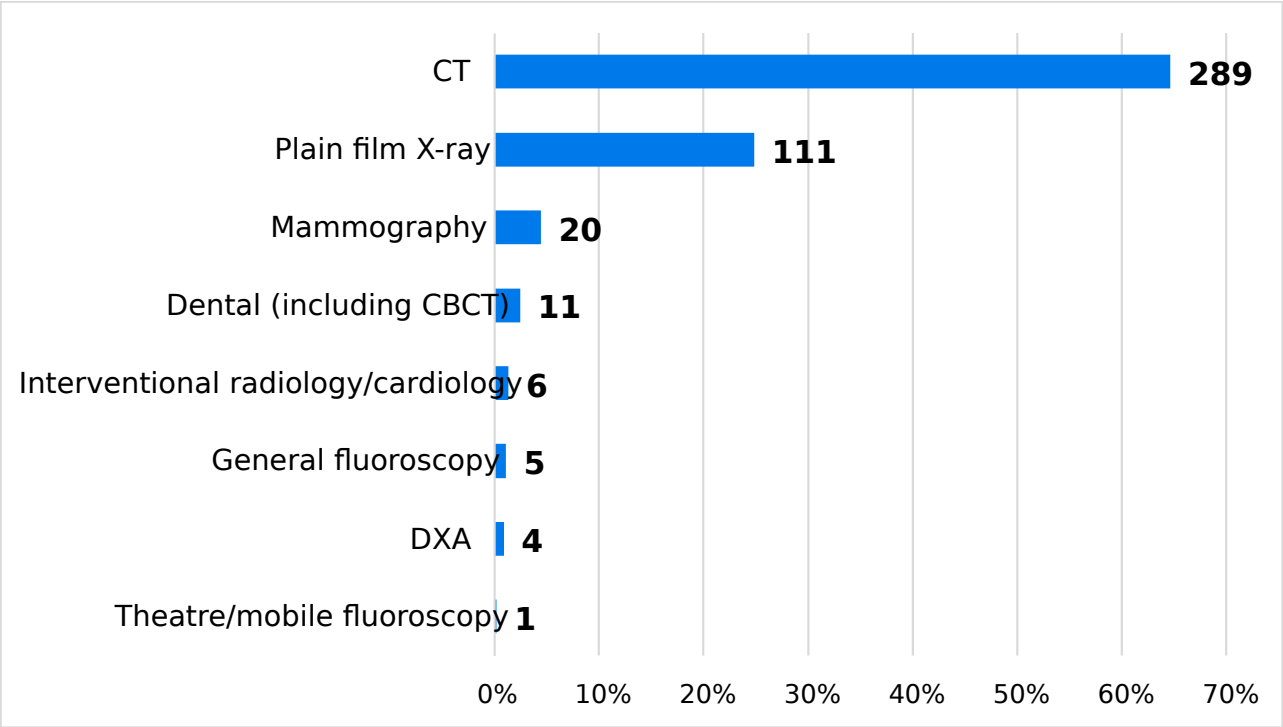
Diagnostic imaging activity

Notifications received in 2023/24

- 447 notifications (compared with 380 notifications in 2022/23)
- this represents 55% of all notifications received across all modalities
- 89% of notifications were from NHS acute trusts
- the highest proportion of notifications from diagnostic imaging (65%) was from CT (computed tomography)

Figure 2: Notifications from diagnostic imaging received by sub-modality, 1 April 2023 to 31 March 2024



Source: CQC SAUE notifications data 2023/24

Note: Percentages may not add up to 100% as they have been rounded to the nearest whole number

Types of error

As in previous years, the most common error was where a patient received an examination meant for another patient. Of the 447 notifications, 88 (20%) involved the wrong patient being referred for a diagnostic examination and a further 27 (6%) involved the wrong patient being exposed due to an identification (ID) error.

Figure 3 shows the number of detailed errors where tier 1 is the causative factor, with tiers 2 and 3 the contributory factors.

Figure 3: Notifications from diagnostic imaging by detailed error type, 1 April 2023 to 31 March 2024

- Tier 1: The duty holder from whom the error originated
- Tier 2: The point in the pathway where the error first occurred
- Tier 3: What went wrong

Tier 1: Employer (2 notifications)

Tier 2	Tier 3
Employer's responsibility (2)	• Equipment not fit for purpose (1) • Inadequate training/supervision (1)

Tier 1: Referrer (146 notifications)

Tier 2	Tier 3
Incorrect referral (100)	• Wrong patient (88) • Wrong timing (10) • Wrong requested modality (2)
Incorrect information (46)	• Failure to cancel (17) • Duplicate/no check of previous imaging (14) • Inaccurate clinical information (15)

Tier 1: Practitioner (10 notifications)

Tier 2	Tier 3
Justification (8)	• Incorrect justification (8)
Safety checks (1)	• Imaging history check failure (1)
Protocol (1)	• Illegible/unclear protocol (1)

Tier 1: Operator (183 notifications)

Tier 2	Tier 3
Pre-exposure checks (107)	• Wrong patient position/setup/protocol (90) • Wrong use of equipment (17)
Patient checks (29)	• Patient ID error (27) • Failure to check pregnancy/breastfeeding (2)

Tier 2	Tier 3
Clinical history (23)	• Failure to check history/details (23)
Post examination (18)	• Failure to upload images (16) • Reporting failure (2)
Authorisation (5)	• Incorrect authorisation (5)
Pharmaceutical contrast (1)	• Preparation (1)

Tier 1: Equipment (67 notifications)

Tier 2	Tier 3
Equipment related (67)	• Hardware (40) • Equipment related (1) • Software (16) • IT failure (7) • Ancillary failure (3)

Tier 1: Other (39 notifications)

Tier 2	Tier 3
Dose reference level (DRL)/Deterministic (2)	• Deterministic effects (1) • 10x DRL (1)
Patient related (15)	• Unknown pregnancy (14) • Patient issue (1)
Equipment related (1)	• Software (1)
Administrative staff error (10)	• RIS input error (6) • Other admin error (4)
Test results (1)	• Request based on incorrect resul ts (1)
Other (10)	• Not listed above (10)

Total diagnostic imaging notifications: 447

Source: CQC SAUE notifications data 2023/24

As in the previous year, operator errors accounted for the highest origin of incidents reported to us (183), rather than referrer errors (146). We have seen another notable increase in the number of incidents due to the operator either setting up the patient incorrectly or selecting an incorrect protocol (90 incidents, up from 79 in 2022/23 and 44 in 2021/22).

Inspections and enforcement

Across our 15 inspections of diagnostic imaging centres, we found 8 cases of non-compliance with the regulations. We made 48 recommendations to help improve awareness and understanding of the regulatory requirements, improve compliance in specific areas and improve patient safety.

Our most common findings of non-compliance were similar to previous years and our recommendations related to:

- **Regulations (6)1, 6(2):** ensuring that all employer's procedures are in place to support staff, and that they reflect current clinical practice
- **Regulation 6(5)(b):** having an established assurance programme for written procedures and protocols
- **Regulations 6(5)(c)** regular review of diagnostic reference levels and enabling operators to access these
- **Regulation 15(2):** maintaining an equipment inventory that includes all information mandated by the regulations
- **Regulation 15(3):** undertaking adequate testing of equipment
- **Regulation 17:** having up-to-date training records available as evidence of adequate training

We also issued 4 Improvement Notices that require the duty holder to take remedial action within a specified timeframe. See further information on these in our enforcement register.

Key themes in diagnostic imaging

Referrals outside scope of practice

In the NHS, workforce transformation is enabling changes in how health care is delivered to respond to the changing needs of local populations. This has resulted in an increasing number of staff groups making referrals for ionising radiation examinations. It is the employer's responsibility to entitle individual referrers and ensure that where group entitlement is made, there is a system to identify individuals within that group.

We were informed of unintended exposures from referrals made by members of staff who were not working within their scope of practice. This included both registered and unregistered health professionals.

Example of error and actions taken

Referrals by unregistered healthcare professionals

The issue was identified when a member of staff asked for additional training on requesting imaging procedures. These procedures were known to be outside of their scope of practice. A subsequent audit identified a significant number of referrals had been made by unregistered healthcare professionals.

Actions taken

- Immediate communication from the Chief Medical Officer to relevant staff groups reiterated that only registered healthcare professionals can be authorised to make a referral for ionising radiation examinations.
- The radiology information system was amended to ensure that a professional registration number is displayed for referrers.
- A detailed scope of practice for the relevant staff group will be created and communicated to relevant members of staff.
- Future audits will include focus on specific staff groups.

Learning from the incident

This example shows the significance of fully understanding the limitations of any existing measures to avoid errors. Although the incorrect referrals were driven by human factors, technical limitations to the referral system were not recognised, and the system did not prevent the possibility of inappropriate referrals as expected.

The initial corrective communication demonstrated the importance of having clear lines of escalation and a framework to quickly share key messages to a wide audience.

Organisational cohesion is central to managing referral processes consistently and effectively. There is a responsibility across an organisation to make staff aware of their scope of practice and work within it. Radiology staff are often seen as the gatekeepers of referrals, but they should not be working in isolation and the employer should support them by ensuring that all departments that make ionising radiation referrals are engaged in processes to maintain good practice.

Paediatric over-exposures

We received multiple notifications regarding unintended doses to paediatric patients. These were often in relation to using adult exposure factors in general x-ray, and broadly fell into categories such as:

- lack of familiarity with x-ray systems
- operators feeling rushed or taking x-rays while distracted
- limited training on paediatric exposure factors
- equipment-related errors.

In some cases, it was not immediately identified that the patient had been over-exposed and subsequent images using incorrect factors continued to be taken.

Actions for IR(ME)R employers

- Make sure staff have easy access to paediatric exposure factors, such as by programming the information into the mobile x-ray system. Attaching exposure charts is also useful as a cross-reference.
- Train staff on paediatric exposure factors so they can identify clear errors. All staff – including locum and agency radiographers – should have detailed induction training. Provide refresher training or updates at a sensible frequency, and review and update competency assessments as a matter of routine.
- Make sure that staff know they should keep accurate dose records, including those for rejected examinations due to using incorrect settings.
- Where a paediatric-specific room is out of action, make paediatric protocols available in alternative rooms.

- Staff should have enough time to perform a thorough pause and check. If using a mobile system, they may need extra time if the unit needs to be moved to another location.
- Set clear expectations around repeat exposures and communicate this to both permanent and temporary staff. Staff should be trained to ask for assistance or carry out quality control tests to rule out an equipment fault when an image is not adequate.

Support for internationally trained radiographers

We received notifications where it was identified that internationally trained radiographers needed additional training. Although registration with the Health and Care Professions Council (HCPC) requires equivalence checks, new international recruits may still need additional support. New international recruits may be less aware of requirements under relevant UK regulations and may not always have confidence in challenging more senior members of staff where there were concerns.

We identified some good practice with some sites delivering bespoke training sessions for new international recruits, providing them with relevant information about the regulations and their role, as well as a peer group for support.

Providers may want to consider two e-learning sessions from the Society of Radiographers, which are specifically for international recruits:

- Working in the NHS – a brief overview of the NHS and the principles and values within the constitution.
- The role of the radiographer in the UK – this outlines a radiographer's requirements under HCPC, the career structure, the other professional staff groups they may encounter and other professional differences.

Mammography

We received 20 notifications related to mammography exposures. In many cases, we saw that the breast screening programme was using good governance, with incident reports shared appropriately with programme managers.

The main type of operator error was incorrect changes to protocol settings, either by the operator themselves or by equipment engineers. This was most commonly due to leaving the unit in manual mode rather than switching to clinical automatic exposure control settings. On several occasions, pause and check or QA tests did not pick errors up and they were picked up by clinical or dose audits.

Example of error and actions taken

Errors from protocol changes

Following a new tube installation, multiple patients received mammograms using incorrect factors, where clinical modes were set to expose using manual factors rather than automatic exposure control (AEC). This was eventually noticed by an operator, but was initially not picked up during QA or pause and check.

Actions taken

- Access to console settings was restricted where possible to super users, including medical physics experts, applications specialists, and trained service personnel.
- Images were checked to determine whether they were clinically appropriate or if patients needed to be recalled.
- Equipment training and the competency sign-off process were reviewed, including awareness of doses.
- Staff received reminders of the importance of pause and check.

- The QA protocol was checked to determine whether it needed additional information.
- All relevant clinical staff received information and learning by email, team huddles, and shared learning meetings.

Learning from the incident

It is important to have a robust handover process to ensure that staff know about any checks that are needed before using equipment clinically. However, this example highlights the benefit of pause and check where other safeguards may not be sufficient to highlight unexpected changes.

Operators should know not to assume that mitigations, such as QA or handover forms, will always catch errors.