Arolygiaeth Gofal Iechyd Cymru
Healthcare Inspectorate Wales

DRIVING IMPROVEMENT THROUGH INDEPENDENT AND OBJECTIVE REVIEW

HIW activities and enforcement under the Ionising Radiation (Medical Exposure) Regulations (IR(ME)R)

Annual Report 2014-2015

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Contents

Healthcare Inspectorate Wales (HIW) is the independent inspectorate and regulator of all health care in Wales.

HIW's primary focus is on:

- Making a contribution to improving the safety and quality of healthcare services in Wales
- Improving citizens' experience of healthcare in Wales whether as a patient, service user, carer, relative or employee
- Strengthening the voice of patients and the public in the way health services are reviewed
- Ensuring that timely, useful, accessible and relevant information about the safety and quality of healthcare in Wales is made available to all.

1. Context

The Ionising Radiation (Medical Exposure) Regulations (IR(ME)R) was established in 2000 to satisfy European Council Directive 97/43/EURATOM to ensure that all medical radiation exposures in diagnosis, treatment, research and screening are individually justified and optimised. They were amended in 2006 and again in 2011. The European Union Basic Safety Standards Directive 2013/59/EURATOM, sets out to update, harmonise and replace a number of radiation protection directives. This directive for safeguarding patients and others from radiation was published in January 2014 and will be transposed in UK regulations, replacing IR(ME)R, in February 2018.

The current regulations place responsibilities on practitioners, operators, those who refer patients for medical exposure and the employers of these three groups. The employer is required under the regulations to create a framework for the safe, efficient and effective delivery of ionising radiation by the provision of standard operating procedures and protocols. A breach of the regulations can result in the issue of prohibition, improvement notices or criminal proceedings.

For the purpose of this report, we refer to the responsibilities of groups/persons defined under IR(ME)R, known as duty holders. IR(ME)R duty holders include the following:

- Employer - any natural or legal person who, in the course of a trade, business or other undertaking, carries out, or engages others to carry out, medical exposures at a given radiological installation
- Referrer - a registered health care professional who is entitled in accordance with employer's procedures to refer individuals for medical exposure to a practitioner
- Practitioner – a registered health care professional who is entitled in accordance with employer's procedures to take responsibility for an individual medial exposure
- Operator - any person who is entitled by the employer, to carry out practical aspects of medical exposures. An operator does not have to be a registered healthcare professional, but is required to be adequately trained for their scope of practice.

The regulations are designed to ensure that:

- Patients are protected from unintended, excessive or incorrect exposure to medical radiation and that, in each case, the risk from exposure is assessed against the clinical benefit (justification)
- Patients receive no more exposure than necessary to achieve the desired benefit within the limits of current technology (optimisation)
- Adequate training of practitioners and operators.

HIW is responsible for monitoring compliance against IR(ME)R. We achieve this through a programme of assessment and inspection of clinical departments that use ionising radiation. In Section 3 of this report, we provide an overview of the key themes identified from our IR(ME)R inspection activity during 2014-15. We also review incidents notified to us involving radiation exposures of much greater than intended. Notifying HIW of such exposures is a legal requirement. In doing so, organisations can accept their part in the error and learn from this. It also helps to mitigate the risk of repeat errors involving subsequent patients, thereby improving overall safety. In Section 3.2 of this report, we provide an analysis of the notifications received during 2014-15.

HIW inspections of general dental practices seek to establish how well practices meet the Health and Care Standards, and where private dentistry is provided, the provisions of the Private Dentistry (Wales) Regulations 2008 and the Private Dentistry (Wales) (Amendment) Regulations 2011. During these inspections, we also consider how each practice meets the requirements set out in the Ionising Radiation Regulations 1999, IR(ME)R and any other relevant professional standards and guidance such as the General Dental Council Standards for the Dental Team. In relation to the IR(ME)R, we consider the measures in place for the protection of patients. In Section 3.3 of this report, we provide an overview of the key IR(ME)R themes identified from our inspection of general dental practices in Wales during 2014-15.

2. Summary

This is HIW's first annual report on regulatory activities in Wales in relation to IR(ME)R. Our detailed findings are set out in the body of this report. What follows is a summary of the key issues identified from our activity during 2014-15.

IR(ME)R compliance inspections

On the whole, we found that patients were very satisfied with their experiences whilst visiting the radiology services we inspected. All patients who provided feedback told us that staff were helpful, friendly and approachable. Many patients also told us that although staff were very busy, they were always pleasant, efficient and helpful.

We found that there was a lack of consistency in the extent to which health boards and the specific hospital locations were compliant with IR(ME)R. Particular themes identified included the variable quality of required policies and procedures and in the standard of training records held in health boards. We did, however, find some good examples for handling incomplete or inaccurate referrals.

In order that our inspections underpin continuous development and improvement, it is important that organisations act on the recommendations made as part of the inspection process. It was disappointing to note that despite a number of recommendations being made as part of an inspection to Cwm Taf University Health Board, specifically Prince Charles Hospital, Merthyr Tydfil in July 2012, there was little evidence of any progress having been made when we inspected both the Royal Glamorgan Hospital and Prince Charles Hospital in November 2014. This was in stark contrast to our inspection of Ysbyty Gwynedd, Betsi Cadwaladr University Health Board, carried out in January 2015, where there was clear evidence of action taken and learning shared following a previous inspection of Wrexham Maelor Hospital (part of the same health board) in November 2012.

Notifications of exposures 'much greater than intended'

Where incidents occur in which a person, whilst undergoing a medical exposure, has been exposed to ionising radiation much greater than intended, this should be investigated by the health care organisation and reported to HIW.

During 2014-15, we received a total of 46 notifications. Of these, two occurred in nuclear medicine and two in radiotherapy, the remainder occurred in

diagnostic imaging services. We found there were common causes that emerged from these notifications, which have been detailed within this report.

HIW evaluated each of the 46 notifications to consider the severity of the incident and assessed whether the organisation had taken the appropriate actions to prevent similar occurrences in future and ensure patients were appropriately safeguarded. Where further information was required, HIW requested this from the health board to further inform our assessment.

From the work undertaken by the Care Quality Commission (CQC) in England about common causes of notifications, the radiology community have worked in some areas to introduce a 'pause and check' initiative which encourages staff to check clinical details with the patient in an effort to reduce the risk of errors. There was evidence in some departments inspected by HIW that this has also been adopted in Wales; this represents good practice.

IR(ME)R and dentists

In general, we found suitable arrangements were in place for the safe use of dental radiographic (x-ray) equipment. However, not all practices were adhering to the regulations and we issued seven immediate assurance letters in this regard[1]. Particular issues identified included:

- A handful of practices did not have a letter notifying the Health and Safety Executive (HSE) that the practice was using ionising radiation
- Just over a quarter of the practices we inspected did not conduct quality assurance audits for radiographic equipment
- In many practices we inspected, we found that there was no evidence available to inspectors to demonstrate that dental teams had completed appropriate radiation training within the last five years, as recommended by the General Dental Council.

[1] HIW issues immediate assurance letters when we have immediate concerns that need to be addressed within specified timescales.

3. Our work in 2014/15

3.1 IR(ME)R compliance inspections

During 2014-15, HIW undertook a programme of proactive compliance inspections of diagnostic imaging departments across four health boards in Wales. The following radiology departments were inspected:

Abertawe Bro Morganwwg University Health Board:

- Princess of Wales Hospital, Bridgend

Cwm Taf University Health Board:

- Royal Glamorgan Hospital, Llantrisant
- Prince Charles Hospital, Merthyr Tydfil

Betsi Cadwaladr University Health Board:

- Ysbyty Gwynedd, Bangor

Hywel Dda University Health Board:

- Bronglais Hospital, Aberystwyth
- Withybush Hospital, Haverfordwest
- Glangwili Hospital, Carmarthen.

How we did it

Each inspection was announced in advance and was conducted by a small team which included an inspection manager from HIW, who was supported by a Senior Clinical Officer from Public Health England (PHE)[2] acting in an advisory capacity. During each of the inspections we considered and reviewed:

- Quality of patient experience

[2] Given the specialist nature of this area of work, HIW works with the Medical Exposures Group of Public Health England. PHE provides HIW with support on matters relating to radiation protection and radiological practice in the context of IR(ME)R. There is a service level agreement between HIW and PHE which sets out the terms of this working relationship.

- Compliance with IR(ME)R
- Staffing, management and leadership
- Delivery of a safe, effective service.

We selected the organisations to be inspected as part of HIW's annual announced IR(ME)R inspection programme based on intelligence gathered by HIW's wider work programme, incidents reported to us and how often the organisation had been inspected in the past.

Each organisation was notified in writing (generally six weeks in advance) of our intention to visit and a self-assessment form was issued, which the organisation was required to complete and return to HIW prior to the inspection. This information allowed the inspection team to plan the approach to the visit and prioritise the key areas to focus on.

During the inspections, we review documentation and information from a number of sources including:

- Information held by HIW
- Conversations with patients and relatives
- Discussions with staff
- Examination of a sample of patient medical records
- Review of policies and procedures which are required by IR(ME)R
- General observation of the environment of care and care practice.

These inspections captured a snapshot of the standards of care patients receive. These inspections may also point to wider issues about the quality and safety of services provided. If this is the case, HIW takes note of this and other intelligence when considering our risk based approach to inspection and escalation. We also share any wider concerns we have with other relevant stakeholders who have a role in the quality and safety of services provided by healthcare organisations.

What we found

Patient experience

On the whole, we found that patients were very satisfied with their experiences whilst visiting the radiology services we inspected.

Without exception, patients who provided feedback told us that staff were helpful, friendly and approachable. Many patients also told us that although staff were very busy, they were always pleasant, efficient and helpful.

In two of the departments we inspected - the Royal Glamorgan Hospital and Glangwili Hospital - some patients commented about the length of time they had to wait for their examination. They suggested that it would have been helpful if staff had kept them informed about the length of the wait.

The design and layout of the majority of the departments we inspected over the course of the year had some limitations. In most cases, however, opportunities to maximise space and privacy for patients had been taken wherever possible. One example included the creation of separate waiting areas for in-patients and out-patients at Ysbyty Gwynedd.

Most of the patients we spoke to said that the signage to the department they were visiting was clear. However, at Withybush Hospital one person did comment that the signs could be bigger as they had had some problems reading them. Also, at Glangwili Hospital a comment was made about the importance of ‘front of house’ staff knowing where to direct people for different examinations.

Most patients who provided feedback commented that the departments were clean and tidy. However, there were some comments made that some of the facilities, including chairs and work surfaces looked “tatty and worn”.

All patients said that they had received sufficient information about their examination. Some patients stressed the importance of having a clear explanation of where results will be sent and the timescales for receiving them, as they were often confused about this.

Overall, the feedback we received during the course of the inspections indicated that patients were satisfied with the services they received from the radiology departments we inspected.

Compliance with IR(ME)R

From the four inspections undertaken in 2014-15, we found that there was significant variation in the extent to which the health boards and the specific hospital locations were compliant with IR(ME)R.

The only location where there was a significant breach in relation to the requirements under IR(ME)R was at Cwm Taf University Health Board. It was disappointing to note that despite the issue of a lack of training records having been raised at a previous inspection to Prince Charles Hospital in July 2012, there was no evidence of any progress with this issue when we inspected during 2014-15. Given this lack of progress, the health board was issued with an immediate assurance letter requiring them to take action. HIW was satisfied that the health board's improvement plan provided sufficient assurance that action was being taken to address these concerns. Given the issues identified at this inspection, HIW will undertake a follow-up visit during 2015-16 to ensure that the health board's improvement plan has been fully implemented.

In contrast, our inspection at Betsi Cadwaladr University Health Board was extremely positive and HIW commended the department and health board for their high standard of work and compliance with IR(ME)R.

The other two inspections we carried out were to hospitals within Hywel Dda University Health Board and Abertawe Bro Morganwwg University Health Board. Overall, these inspections were positive, though some recommendations for improvement were identified.

One of the key issues that emerged from our inspections concerned the policies and procedures. IR(ME)R requires the employer to have written procedures and protocols in place. However, we found that the standard of these documents was variable.

We found the overarching ionising radiation protection policy document in use at Betsi Cadwaladr University Health Board was well written and clear. It included the relevant duties and responsibilities of the employer and the procedures required under IR(ME)R were all in place and had clear processes for managing how and when documents needed to be reviewed.

Another key issue raised at our inspections was the importance of health boards having standardised, up-to-date and approved procedures across all sites. Whilst we found this was in place at Betsi Cadwaladr University Health Board, other health board sites we visited required further work to achieve this.

Local Diagnostic Reference Levels (DRLs)[3] had been established at Ysbyty Gwynedd in Betsi Cadwaladr University Health Board and at locations within Hywel Dda University Health Board. However, at the Princess of Wales Hospital in Abertawe Bro Morganwwg University Health Board and the hospitals within Cwm Taf University Health Board, we found that national DRLs were in use rather than local versions. At both of the inspections of the latter, it was identified that the national DRLs were frequently exceeded due to patient size and they were clearly not appropriate for the local patient population. Of particular concern for HIW, was that this issue had been raised with Cwm Taf at a previous inspection in 2012.

During our inspections, we found some good examples of work for dealing with situations where incomplete or inaccurate referrals were received, for instance, where a patient's clinical history did not match the requested examination. It is important that accurate referral information is included on request forms to avoid the potential for errors taking place, which could result in unnecessary exposures. A good example of dealing with this issue included returning incomplete or inaccurate referrals to the person making the referral for correction and completion of the information. In addition, where inadequate referrals were received from a particular referrer there were systems in place to monitor this, to help ensure this issue was addressed. To assist with IR(ME)R compliance, Betsi Cadwaladr University Health Board implemented a process to remind referrers in primary and secondary care on an annual basis of their responsibilities under IR(ME)R, including the importance of submitting accurate and complete patient referrals.

The standard of training records we observed during our inspections was variable. A particular issue in this respect concerned the format of training records. For example, in some health boards, while training records were available the differing formats can be confusing for both staff and managers, especially when monitoring staff training needs and discussing individual training needs at supervision.

We found there was clear evidence that clinical audit was taking place at all of the sites we inspected. However, the approach and standard of audit varied considerably. In some areas, most of the audits tended to be carried out by radiologists. In others, there was no dedicated audit programme, but there were

[3] Diagnostic Reference Levels (DRLs) are dose levels for typical examinations on standard sized adults or children for broadly defined types of equipment. They are used as a guide to help promote improvements in radiation protection practice.

ad hoc audits being undertaken. We saw examples of effective and efficient coordination of audit which provided background details, context and clear outcomes, followed by shared learning.

All the health boards we inspected received support from Medical Physics Experts (MPEs)[4]. There was evidence of learning and development provided by the MPE service, including radiation protection newsletters, proactive support in developing local DRLs, as well as advice and quality assurance issues.

As part of our inspections, we spoke to a number of staff to test their understanding of their roles and responsibilities as duty holders under IR(ME)R. In almost all of the locations we inspected, staff were generally clear about their roles and were able to describe their scope of practice, with the exception of one member of staff in one of the departments. This was fed back the management team during the inspection.

Staffing, management and leadership

The inspection team was well received by departmental management teams at all of the locations we visited. All teams approached the inspection with openness and appreciated the feedback and constructive criticism that the inspection team provided. It was evident, however, that some teams were significantly better prepared for the inspection than others. The extent to which senior managers were supportive and committed to both IR(ME)R and radiology more widely, appeared to have a significant impact on the success of the inspections carried out during the year. This was evident from the preparation and submission of the self-assessment, policy documents and the interest and involvement shown during the inspection.

The positive impact of the management and leadership of diagnostic services across Betsi Cadwaladr University Health Board was clearly evident at the time of our inspection and resulted in no recommendations for action. The health board should be commended for their work in this area.

One of the unique factors apparent at Betsi Cadwaladr University Health Board was the presence of a service wide post in radiology - Head of Quality and Governance - which appeared to have a positive impact on the focus and

[4] A medical physics expert is a person who holds a science degree or its equivalent and who is experienced in the application of physics to the diagnostic and therapeutic uses of ionising radiation.

coordination of the work within radiology services across the health board locations.

Noteworthy practice

We found a number of areas of noteworthy practice during our 2014-15 inspections. These are shared below with a view to supporting continuous development and learning:

- At Withybush Hospital the radiology staff had identified issues in relation to incorrect patient information on imaging referrals. To address this, they designed a poster along with specific training focussing on the importance and significance of patient identification
- A lot of work had taken place at Withybush Hospital in relation to the medical exposures of children and a paediatric group has been developed to discuss and optimise practice and introduce service improvements
- A number of the hospitals had introduced 'pause and check'[5] into the patient identification process in order to confirm clinical details, in an effort to reduce wrong patient and laterality errors (wrong side being imaged e.g. left wrist instead of right wrist)
- We found examples of effective communication at Betsi Cadwaladr University Health Board through the use of radiology and radiation protection newsletters and flyers, including top tips for referrers to imaging and radiation bulletins focusing on patient safety issues as well as good news and updates
- At Betsi Cadwaladr University Health Board there had been an extremely positive approach to managing change by the managers involved. An in-depth leadership programme was provided for all staff working in radiology
- At Withybush Hospital IR(ME)R training for non medical referrers and for junior doctors had been developed and delivered. It was extremely positive to note that training for users outside radiology was being provided.

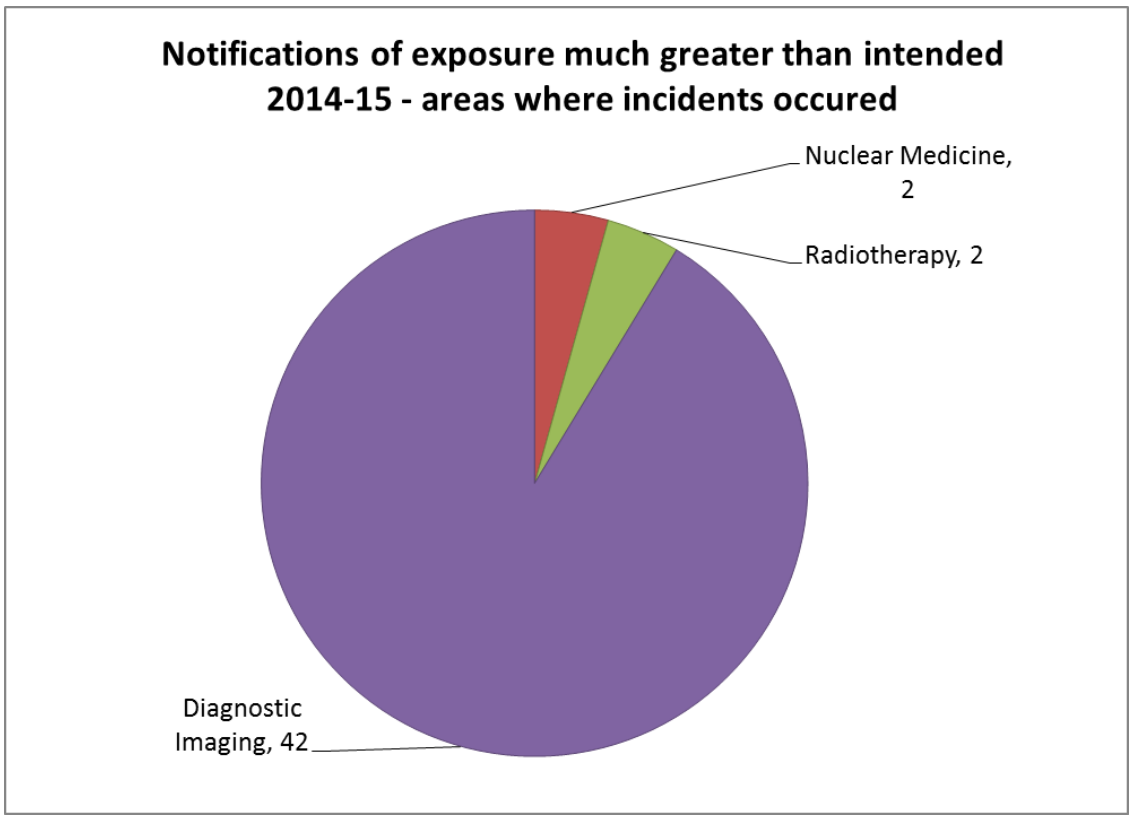
[5] The 'pause and check' initiative encourages staff to check clinical details with the patient in an effort to reduce the risk of errors.

3.2 Notifications of exposures much greater than intended

What we did

HIW reviewed the notifications we received from health boards where incidents occurred in which a person, whilst undergoing a medical exposure, had been exposed to ionising radiation much greater than intended.

During 2014-15 HIW received 46 notifications of exposure much greater than intended. The following figure shows the areas where these notifications occurred.



HIW evaluated each of the 46 notifications to consider the severity of the incident and assessed whether the organisation had taken the appropriate actions to prevent similar occurrences in future and ensure patients were appropriately safeguarded. Where further information was required, HIW requested this from the health board to further inform our assessment.

We considered the responses of healthcare organisations to these incidents to ensure compliance with IR(ME)R. Patient safety is a key consideration in each case we reviewed. In particular, we considered the risk to the patient(s) directly involved in the incident and whether there were wider implications that had the potential to impact on others.

We found that nearly half of the 46 notifications were received from Betsi Cadwaladr University Health Board and Abertawe Bro Morganwwg University Health Board. However, the relatively large number of notifications from these health board sites may be due to an open and positive reporting culture, rather than indicative of failures in procedures or safety issues.

There was a concern, prior to our inspection at Hywel Dda University Health Board, about the significantly low number of notifications we had received. Having had a detailed discussion with the team about the recording and reporting of incidents, we were satisfied that the information submitted provided an accurate picture of all reportable incidents.

Prior to our inspection at Princess of Wales Hospital, there had been three incidents involving laterality errors (imaging the wrong side of the patient) between May and August 2014. This was discussed during the inspection and we were satisfied that full investigations had been carried out for each of the incidents and that no common factors were identified as a result.

How we did it

We issued acknowledgement letters to health boards within five working days of receiving a notification.

HIW expects to receive the completed investigation report and supporting information from the health board within 12 weeks of discovering the incident.

HIW considered investigation reports, to ensure that the action taken was appropriate to mitigate the likelihood of a similar incident occurring in the future. In some cases, we wrote to the healthcare organisation with follow up queries or recommendations.

Incidents were closed when HIW was content with the information provided and the action taken by the healthcare organisation.

What we found

The following table shows the annual number of notifications received by HIW between 2011 to 2015, as part of our IR(ME)R enforcement responsibilities in Wales.

Year notifications received				
	2011-12	2012-13	2013-14	2014-15
Number of notifications	26	32	47	46

We received a total of 46 notifications in 2014-15, reflecting a decrease of one compared with 2013-14. We attribute the steady increase of notifications since 2012 to changes in the Department of Health's guidance on what constitutes a notification of exposure much greater than intended.

Of the 46 notifications above, two occurred in nuclear medicine, two in radiotherapy and the remainder occurred in diagnostic imaging services. Notifications received in each of these areas are detailed below.

Nuclear medicine

We received two notifications from nuclear medicine departments in 2014-15, the same as received in 2013-14. The common causes for these notifications are similar to those in diagnostic radiology. We are pleased to note that there were no nuclear medicine therapy notifications received in 2014-15. As only two notifications were received from nuclear medicine departments, it is not possible to identify themes or trends. However, learning outcomes from the common causes of notifications, described later within this report, should assist in reducing these occurrences. A summary of these incidents is provided below.

The first notification occurred because a patient, who was due to receive a bone scan, was injected with the wrong radiopharmaceutical[6]. This only became apparent when an attempt was made to scan the patient three hours after the injection (in line with the procedure for a normal bone scan). As a result of this error, uptake of the radiopharmaceutical was seen in the patient's heart, liver, bowel and lung.

[6] A radiopharmaceutical is a radioactive drug used for diagnosis or therapy in a tracer quantity with no pharmaceutical effect. It is composed of two parts: a radionuclide and a pharmaceutical.

The second notification occurred because a patient received a larger dose of radiation than would usually be given for a planned parathyroid scan[7]. This was due to the operator inadvertently selecting the incorrect setting on the dose calibrator (which measures the radioactivity prior to administration to the patient).

Radiotherapy

We received two notifications from radiotherapy departments in 2014-15, the same as received in 2013-14. Due to the small numbers of notifications received, it is not possible to identify themes or trends. However, learning outcomes from the common causes of notifications, described later within this report, should assist in reducing these occurrences. A summary of these incidents is provided below.

The first notification occurred because a radiographer positioning error occurred during the first five (of 10) radiotherapy treatment fractions[8] which meant that the patient's target area for radiotherapy was missed by approximately 3.9cm and an area of tissue was exposed to radiation unnecessarily. Compensation was made during subsequent treatment fractions to ensure that the target area received the prescribed dose.

The second notification occurred because a patient received one out of 37 fractions of radiotherapy treatment, where the treatment delivered was not as planned (as incorrect movements from the reference mark were applied). This meant that the target area for the radiotherapy was missed and an area of tissue was exposed to radiation unnecessarily.

Diagnostic imaging

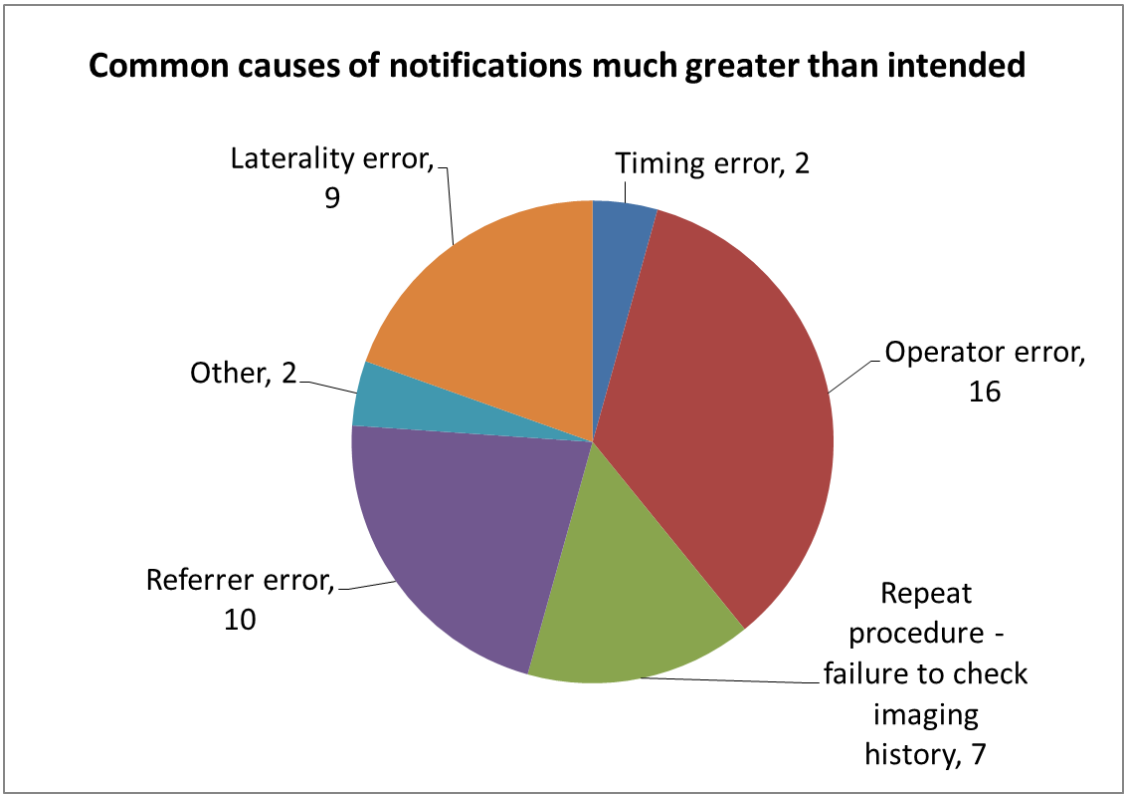
We received a total of 42 notifications from diagnostic imaging departments in 2014-15. We identified that there were common causes and themes that emerged from these notifications, which are highlighted in the following section.

[7] A parathyroid scan is used in nuclear medicine to look at possible problems involving the parathyroid gland(s). The parathyroids are four small glands lying close to or embedded in the back surface of the thyroid gland, which is situated in the front of the neck.

[8] The individual radiotherapy doses are often called fractions.

Common causes for notifications

We found that there were common themes/causes that emerged from the notifications we received in 2014-15. The following figure illustrates the distribution of notifications under these common causes. Descriptions and examples of these causes are detailed further below.



Referrer error - wrong patient

The wrong patient or referrer errors are predominantly due to the wrong addressograph sticker[9] being applied on the patient's referral form, leading to the incorrect patient receiving the examination. The implementation of the 'pause and check' approach should assist in reducing this type of error and with reducing laterality errors (where the wrong side of the patient is imaged).

[9] Addressograph sticker- this is a sticker that can be placed on a referral/ request form that shows a patients details for example, name, date of birth, hospital number.

Example - referrer error

A consultant requested an abdominal x-ray as part of a follow up treatment for a patient. The request form was given to clerical staff in the radiology department. However, the incorrect patient number had been written on the request form by the consultant. Therefore, the incorrect addressograph sticker was generated and was attached to the request form, resulting in the incorrect patient being given an appointment. The incorrect patient attended for the abdominal x-ray.

Laterality errors

Laterality errors often occur due to accidental imaging of the wrong side of a patient (for example, left arm instead of right arm). However, they can also be due to referrer error, for instance if the person making the referral wrote left instead of right (or vice versa) on the referral form.

Example - laterality error

A patient attended the radiology department for a left shoulder x-ray following a referral from the emergency department. Unfortunately, the radiographer misinterpreted the referral form and imaged the right shoulder. The error was realised immediately by the radiographer and the patient was informed. The left shoulder was then imaged.

Repeated procedure - duplicate requests or failure to check previous imaging history

Repeated procedure errors occur when a patient receives the same examination unnecessarily. This often happens because a patient's previous imaging history is not checked by staff to confirm if imaging is still required. Previous imaging may have been checked when an appointment was made, but there may be a considerable gap between this and the examination taking place. Meanwhile, the same examination may have already been conducted. These occurrences may be prevented by asking the patient if they have had any previous imaging, as part of the 'pause and check' process.

Example - repeated procedure

An NHS patient was referred to an independent hospital to have a CT angiogram. However, the patient then received this scan in the NHS and a cancellation email was sent to the independent hospital stating that the patient no longer required the procedure. This cancellation was not acted upon and as a result the patient attended the independent hospital and received the same procedure unnecessarily. The patient was not asked if they had any previous imaging.

Operator error

Operator errors mainly occur when the imaging equipment is used incorrectly. This highlights the importance for healthcare settings to ensure that staff are appropriately trained and that they have documented training records in place.

Operator errors also occur due to failure to accurately read the patient's referral form, which can happen when staff are rushed. This means that errors can be made in the examination the patient receives. For instance, if staff do not read the original referral they may not notice if clerical staff have accidentally selected the wrong examination on the computer system.

Example - operator error

A patient attended for a CT urogram. The radiographer positioned the patient in the scanner, but inadvertently setup the scanner incorrectly. As the patient was in the wrong position for the settings selected, the scan started at the neck rather than upper abdomen. Due to the speed of the scan, the radiographer only realised the error after the exposure was complete.

Timing errors

In most cases, it does not matter when an imaging examination takes place (usually this is as soon as possible). However, there are some situations where the date or timing of an examination is very important. For instance, chest x-rays to check the position of a feeding tube need to be done after the tube has been put in.

Example - timing errors

A patient's radiology request form arrived at the CT department. The request was then sent to a radiologist, however, the radiologist did not highlight that the request needed to be deferred for 12 months. The request form was returned to CT department and scanned onto the system. The patient was given an appointment to attend for his scan two months later. Again, it was not noticed that the request needed to be deferred. The patient attended for the CT scan. Following the scan, it was then realised that it had been performed 10 months early and that another appointment would need to be made for the appropriate time.

Learning outcomes from notifications

Sharing learning from incidents and near misses is fundamentally important. It is important that learning is shared with all staff and not just those involved in the incident. From the inspections we undertook during 2014-15, there were some examples of processes that had changed or been introduced as a result of learning from incidents, these included newsletters, information sharing via departmental staff meetings and as part of audit activity in identifying any recurrent themes.

From the work undertaken by the Care Quality Commission (CQC) in England about some common causes of notifications, the radiography community have worked in some areas to introduce the 'pause and check' initiative which encourages staff to check clinical details with the patient in an effort to reduce the risk of errors. There was evidence in some departments visited that this has also been adopted in Wales, as mentioned earlier in the report.

As part of an incident investigation, measures should be put in place to prevent similar incidents happening in the future. This may be addressed through ensuring:

- Incidents are audited in order to identify any recurrent issues
- Near misses are reported, as these may prevent actual incidents from happening
- The employer's procedures are reviewed and kept up-to-date to ensure that they reflect practice
- Any training needs identified during incident investigations are addressed.

3.3 IR(ME)R and dentists

What we did

On 1 September 2014, HIW began a three year programme of inspections of all general dental practices in Wales. Between 1 September 2014 and 31 March 2015, HIW conducted 77 dental practice inspections.

HIW inspections of general dental practices seek to establish how well practices meet the Health and Care Standards 2015, and where private dentistry is provided, the provisions of the Private Dentistry (Wales) Regulations 2008 and the Private Dentistry (Wales) (Amendment) Regulations 2011.

During these inspections, we also considered how practices meet the requirements under the IRR, IR(ME)R and any other relevant professional standards and guidance such as the General Dental Council Standards for the Dental Team. In relation to the IR(ME)R, we considered the measures in place for the protection of patients.

How we did it

Each inspection was announced and was conducted by a team which included an inspection manager from HIW and an external reviewer who is an experienced dentist. Clinical oversight of the dental inspection programme is undertaken by HIW's clinical dental lead.

What we found

In general, we found suitable arrangements were in place for the safe use of dental radiographic (x-ray) equipment. However, not all practices were adhering to the IR(ME)R regulations and we issued seven immediate assurance letters in this regard. HIW issues immediate assurance letters when we have immediate concerns that need to be addressed within specified timescales.

HIW verified that the radiation equipment in use in dental surgeries had been regularly serviced and tested, and that appropriate signage was in place to mark the controlled area where radiation was used. In most practices we inspected, relevant documentation including safety checks, maintenance and testing were available. However, we noticed that just over a quarter of the practices we inspected did not conduct quality assurance audits for radiographic equipment. This means that the practice does not regularly monitor the quality of the image produced by the x-ray equipment and could mean that x-rays would need to be repeated if the image produced is of

insufficient quality, meaning that patients could be exposed to more radiation than is necessary. We recommended that these audits are conducted by all practices. We also found that some practices had not properly identified the controlled areas for radiation.

HIW inspectors checked that there was evidence of the training undertaken by the practitioners and operators engaged to carry out medical exposures, or any practical aspect of such exposures as required by IR(ME)R. The General Dental Council recommends that all their registrants attend appropriate radiation training once every five years, as part of their continuing professional development. Continuing education is also required by IR(ME)R. In many practices we inspected, we found no evidence was available to inspectors to demonstrate that dental teams had completed appropriate radiation training within the last five years. This has been raised with the dental postgraduate department of the Wales Deanery, who have agreed to consider this finding when planning future training programmes.

4. What next

In 2015-16, HIW will be attending an IR(ME)R workshop organised by the office of the Welsh Government Chief Scientific Officer. The key themes of this event will be learning from inspections and learning from notifications. Contributors to the event will include the Chief Scientific Officer, HIW and Public Health England, with attendees invited from all health boards in Wales.

This is an important event as it will provide attendees with the opportunity to:

- Share their experiences/learning from recent inspections and to consider more broadly how inspections are carried out
- Clarify what incidents should be reported and the reporting process in Wales.

HIW regards this as an invaluable opportunity to meet with key stakeholders in this area.

HIW's operational plan for 2015-16[10] sets out our commitment with regard to IR(ME)R. The plan includes undertaking IR(ME)R inspections in the independent healthcare sector and to undertake an inspection of a radiotherapy department within one health board in Wales.

Another key consideration for HIW during 2015-16, will be to develop in-house capacity to lead and support our IR(ME)R inspection programme.

[10] HIW's operational plan can be accessed via the following link http://www.hiw.org.uk/operational-plans

5. Supporting information

The following information can be found on HIW's website – www.hiw.org.uk. If you are reading an electronic version of this report, the information can be accessed by clicking on the links below:

- IR(ME)R compliance inspection reports
- Notification of IR(ME)R Incident
- Statutory notification of 'exposure much greater than indented' incident under IR(ME)R regulations 4(5) guidance for employers)
- IR(ME)R Incident Investigation Report Guidance
- IR(ME)R Investigation Template (Example)

As stated within the report, given the specialist nature of this area of work, HIW works with the Medical Exposures Group of Public Health England. PHE provides HIW with support on matters relating to radiation protection and radiological practice in the context of IR(ME)R. Further information about the work of the Medical Exposures Group of Public Health England can be found on its website - https://www.gov.uk/government/organisations/public-health-england