Arolygiaeth Gofal Iechyd Cymru
Healthcare Inspectorate Wales

Gwirio bod pobl yng Nghymru yn derbyn gofal da

Checking people in Wales are receiving good care

Ionising Radiation (Medical Exposures) Regulations (IR(ME)R)

Annual Report 2016-2017

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Mae'r ddogfen yma hefyd ar gael yn Gymraeg.
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Healthcare Inspectorate Wales (HIW) is the independent inspectorate and regulator of healthcare in Wales

Our purpose

To check that people in Wales are receiving good care.

Our values

- **Patient-centred: we place patients, service users and public experience at the heart of what we do**
- **Integrity: we are open and honest in the way we operate**
- **Independent: we act and make objective judgements based on what we see**
- **Collaborative: we build effective partnerships internally and externally**
- **Professional: we act efficiently, effectively and proportionately in our approach.**

Our priorities

Through our work we aim to:

Provide assurance:	**Provide an independent view on the quality of care.**
Promote improvement:	**Encourage improvement through reporting and sharing of good practice.**
Influence policy and standards:	**Use what we find to influence policy, standards and practice.**

1. Foreword

Healthcare Inspectorate Wales is responsible for monitoring compliance with the Ionising Radiation (Medical Exposure) Regulations IR(ME)R 2000 and its subsequent amendments in 2006 and 2011. The regulations are intended to protect patients from hazards associated with ionising radiation.

Whilst HIW is responsible for monitoring compliance with IR(ME)R, individuals working within healthcare organisations have both professional and legal obligations to ensure that patients undergoing medical exposures receive safe and effective care.

This report brings together our findings across NHS radiotherapy, radiology and nuclear medicine departments and NHS and private dental practices in Wales. It aims to identify common strengths and areas for improvement, and makes recommendations for organisations providing relevant services. It also highlights good practice to support improvement in the services provided to patients.

Individual reports have been published for all inspections and can be found on HIW's website www.hiw.org.uk .

2. Summary

Whilst areas for improvement were identified across the radiotherapy, radiology and nuclear medicine departments and dental practices HIW inspected, overall these services had arrangements in place to provide safe and effective care to patients in relation to IR(ME)R.

During 2016 - 17 HIW completed a range of activities to monitor compliance with the Ionising Radiation (Medical Exposure) Regulations (IR(ME)R) 2000. This included a programme of IR(ME)R compliance inspections of radiotherapy, radiology and nuclear medicine departments within NHS organisations, inspections of NHS and private dental practices and review of incidents notified to HIW involving 'exposures much greater than intended'[1].

During the course of our inspections of radiotherapy, radiology and nuclear medicine departments, we invited patients to provide feedback about their experiences of using these services. Positive comments were made, with patients telling us that they were happy with the service they had received. Overall, we saw that departments offered suitable areas for patients to wait and be seen. Where we identified improvement was needed, this was in relation to developing environments to further promote patients' privacy. Our inspections of dental practices were broader in scope but for the purposes of this report, only our findings specific to IR(ME)R are included.

HIW inspection teams found that radiotherapy, radiology and nuclear medicine departments provided safe and effective care and that staff made efforts to

[1] When a person undergoing medical exposure is exposed to ionising radiation to an extent much greater than intended, this should be investigated by the health care organisation and reported to HIW. Revised guidance on investigation and notification of medical exposures much greater than intended was published in January 2017.

https://www.gov.uk/government/publications/the-ionising-radiation-medical-exposure-regulations-2000

comply with IR(ME)R. We found dental teams were broadly compliant with the regulations for those areas of IR(ME)R we considered.

From our inspections of radiotherapy, radiology and nuclear medicine departments, we identified that improvement was needed around the level of detail within some written procedures and protocols, the arrangements for the entitlement of duty holders and the completeness of training records.

In dental practices we identified improvement was needed around the training for dental care professionals, dentists recording the justification for and clinical evaluation of radiographs and audit activity.

From our evaluation of incidents involving exposures 'much greater than intended' we found that there was variation in the numbers of notifications received from healthcare organisations. The main reasons for patients receiving an exposure 'much greater than intended' was due to incorrect addressographs (labels with patient identification details) being used, a failure to correctly confirm a patient's identity and staff not checking previous imaging or treatment history. Investigation reports submitted by healthcare organisations demonstrated that action had been taken to reduce the likelihood of similar incidents happening again

3. What we did

HIW is responsible for monitoring compliance with IR(ME)R 2000 (and its subsequent amendments 2006 and 2011).

During 2016-17 we did this through:

- A programme of IR(ME)R compliance inspections of NHS radiotherapy, radiology and nuclear medicine departments
- A programme of inspections of NHS and private dental practices
- Reviewing incidents reported to us where patients had received exposures 'much greater than intended'.

IR(ME)R compliance inspections of NHS hospitals and screening services

HIW conducted IR(ME)R compliance inspections of the following:

- Radiotherapy Department, North Wales Cancer Treatment Centre, Glan Clwyd Hospital (Betsi Cadwaladr University Health Board)
- Radiography (diagnostic imaging) Departments, Victoria Memorial Hospital (Welshpool), Brecon War Memorial Hospital and Ystradgynlais Community Hospital (Powys Teaching Health Board)
- South East Wales Breast Screening Centre (diagnostic imaging), Breast Test Wales, (Public Health Wales Trust)
- Nuclear Medicine Department, Singleton Hospital (Abertawe Bro Morgannwg University Health Board)
- Nuclear Medicine Services, University Hospital of Wales (Cardiff and Vale University Health Board)

Inspections of NHS and private dental practices

On 1 September 2014, HIW began a three year programme of inspections of all dental practices in Wales.

During 2016-17, HIW conducted a total of 80 inspections of dental practices. These included 50 practices providing both NHS and private dental services and 30 practices providing private only dental services.

The following shows the number of practices we inspected within each health board locality:

- 11 within Abertawe Bro Morgannwg University Health Board
- 18 within Aneurin Bevan University Health Board
- 12 within Betsi Cadwaladr University Health Board
- 20 within Cardiff and Vale University Health Board
- 4 within Cwm Taf University Health Board
- 11 within Hywel Dda University Health Board
- 4 within Powys Teaching University Health Board

Inspection methodology

Each of our IR(ME)R compliance inspections of NHS radiotherapy, radiology and nuclear medicine departments was announced. Each was given advance notice and required to complete and return a self assessment form to HIW prior to the inspection. This information allowed inspection teams to plan the approach and prioritise the areas to focus on. We were accompanied by senior clinical officers from Public Health England, acting in an advisory capacity. During our inspections we looked at documentation and information specifically to establish how departments were complying with IR(ME)R.

Inspections of dental practices were also announced and we were accompanied by peer reviewers who were dentists. We considered how practices met the Health and Care Standards and, where private dentistry was provided, the Private Dentistry (Wales) Regulations 2008 and the Private Dentistry (Wales) (Amendment) Regulations 2011. In relation to IR(ME)R, we adopted an approach proportionate to the size and complexity of these services and considered the arrangements in place for the protection of patients.

We provided an overview of our main findings to representatives of services at the feedback meeting held at the end of each of our inspections. Where we identified immediate risks to the safety and welfare of patients, these were brought to the attention of senior representatives within services at the time. We also followed these up in writing in accordance with our immediate assurance process.

Following each inspection, the service was sent a draft report of our findings and (where necessary) an improvement plan to complete. The completed

improvement plan informed HIW of the actions being taken to address the improvement needed. All improvement plans were evaluated by HIW to determine whether the service had taken, or proposed to take sufficient action.

We published our findings within our inspection reports under three themes:

- Quality of the patient experience
- Delivery of safe and effective care
- Quality of management and leadership.

Once agreed, the improvement plan was also published alongside the final inspection report for each department or dental practice.

Individual reports for all our inspections and can be found on HIW's website www.hiw.org.uk

Notifications of exposures ‘much greater than intended’

During 2016-17, HIW received 65 notifications of incidents where patients had been exposed to ionising radiation 'much greater than intended'.

We required healthcare services to provide HIW with details of their investigation findings and the action taken as a result. We evaluated this information to determine whether the service had taken sufficient action to reduce the likelihood of similar incidents happening again. Incidents were only closed when HIW was content with the action taken by the service.

4. What we found

Quality of the patient experience

We spoke with patients, their relatives, representatives and/or advocates (where appropriate) to ensure that the patients' perspective is at the centre of our approach to inspection.

Patients told us they were happy with the level of service they had received. We saw staff teams treating patients with respect, courtesy and politeness.

Patients also felt they had been provided with enough information about their care and treatment. Overall, patients were provided with timely care.

We found environments provided safe and clean areas for patients to wait and be seen. Overall, we found arrangements in place to promote patients' privacy and dignity.

IR(ME)R compliance inspections of NHS hospitals and screening services

We sought patients' views about their experiences of using departments by inviting them to complete a HIW questionnaire. We also spoke to patients and their families who were visiting departments on the days of our inspections.

In total, 150 completed questionnaires were returned to us during the course of our IR(ME)R compliance inspections.

Patients told us that they were happy with the services they had received and praised the approach and attitude of the staff. Comments we received included:

> *"Staff very helpful. Good care. Any queries sorted during appointments."*
>
> *"All the staff were very friendly and informative. They talked me through the procedures step by step and were always*

able to answer questions. Well trained and professional staff."

"The staff were friendly and very willing to converse and answer my questions. A happy painless appointment."

"Great service right on my doorstep. Couldn't fault it. All staff friendly and helpful."

"Very quick and professional service, kind, caring staff. I was made to feel comfortable and put at ease as soon as I entered the suite."

We also saw staff treating patients with respect and kindness during the course of our inspections.

Patients told us that they had been given enough information about their care and treatment.

Overall, we found that departments provided suitable environments for patients to wait and receive care. Within the diagnostic imaging and radiotherapy departments we saw that thought had been given to make waiting rooms pleasant areas in which patients could wait. For example, pictures were displayed and reading material was available.

We also saw that efforts had been made to protect patients' privacy and dignity and that waiting areas and treatment rooms were clean and tidy. Comments from patients praised the cleanliness of these areas.

"The hospital is clean."

"immaculately clean in all areas."

"The whole hospital is very clean it is a pleasure to visit."

We did identify that improvements needed to be made to environments within the nuclear medicine departments we inspected to further promote patient privacy.

When asked to provide comments about whether they had experienced any delays, patients told us that generally they had received timely care. Where delays had been experienced, this was due to delays with hospital transport and waiting for medication prescribed as part of their ongoing treatment.

Delivery of safe and effective care

We considered the extent to which services provide high quality, safe and reliable care centred on individual patients.

Whilst we identified areas for improvement during our inspections, overall services had arrangements in place to provide safe and effective care to patients in relation to IR(ME)R.

The number of notifications of exposures 'much greater than intended' received varied across healthcare services. The main reason for patients receiving unnecessary or repeat exposures was due to patient identification incidents.

IR(ME)R compliance inspections of NHS hospitals and screening services

Duties of employer

Each organisation had identified an employer in accordance with the regulations. This was the Chief Executive of the NHS health board or Trust and is in keeping with national guidance on implementing IR(ME)R.

Duties of the employer were set out in policy documents within six out of the seven departments we inspected. We identified that these duties could sometimes be described more clearly and in practical terms for staff. Where they were not included, we required that this be addressed.

Procedures and protocols

It was evident that patient safety was a priority and this was reflected in the written procedures and policies in place. Whilst those required by IR(ME)R were available, we identified that some of these needed to be more detailed, could have been written more clearly for staff teams and better reflect current practice requirements.

We found that improvement was needed within each of the departments we inspected.

Incident notifications

We found that all departments had arrangements in place for the reporting, recording, investigation and learning from patient safety incidents. These arrangements included reporting incidents to HIW in accordance with IR(ME)R and Welsh Government as required under Putting Things Right.

Diagnostic reference levels

We found that, where required, all departments had established diagnostic reference levels[2] (DRLs) and there were arrangements to monitor these. Some departments also had local DRLs as well as national DRLs that had been determined taking into account the local population and equipment used. We identified this as noteworthy practice.

Staff were aware of the local procedure to follow should a DRL be consistently exceeded.

Entitlement

Senior staff within all departments we inspected were able to identify and describe the arrangements for the entitlement of duty holders, namely referrer, practitioner and operator.

Written procedures for entitlement, however, did not always accurately reflect those staff groups/individuals who were performing duty holder functions in practice. There were individuals identified in some departments who had no record of having received appropriate training and competency checks to perform their IR(ME)R role and scope of practice. The relevant training required and scope of practice had not been described for these individuals.

We looked at a sample of training and competency records for different grades of staff working within each of the departments we inspected. The completeness of such records varied. We saw examples where comprehensive training records had been maintained, whilst others we saw were incomplete.

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[2] The objective of diagnostic reference levels is to help avoid excessive radiation doses to patients. DRLs are used as a guide to help promote improvements in radiation protection practice.

Referral criteria

We found that all departments had procedures and referral criteria for referring patients for medical exposures.

We saw examples of noteworthy practice around referrals. These included annual letters being sent to referrers, reminding them of their responsibilities under IR(ME)R, and systems to monitor inadequate referrals. The latter identifying learning so that improvement action could be taken in the form of further training or advice.

Justification

We found that all departments had procedures in place for justifying medical exposures of patients.

We looked at examples of completed referral forms and saw that these had been signed by practitioners to demonstrate that exposures had been justified and authorised by them. Where the referrer and practitioner was the same person, we recommended that forms be signed twice to clearly demonstrate that the person was acting both as a referrer and practitioner. Or that the referral form makes it explicitly clear that a single individual is taking responsibility for referral and justification of the requested exposure

Identification

We found that all departments had procedures in place for the positive identification of patients with the intention of ensuring the correct patient underwent the correct medical exposure. Staff working in departments, and with responsibility for correctly identifying patients, were able to describe the procedure to follow.

Whilst procedures were in place, one of the main reasons for patients receiving an exposure ‘much greater than intended’ was due to patient identification errors (see section Notifications of exposures ‘much greater than intended’).

Females of childbearing age

We found that all departments had procedures in place to identify potentially pregnant women and also those who may be breastfeeding. Staff we spoke to were able to describe the correct procedure to follow.

As an additional safety system, we saw signs were displayed advising female patients to let staff know if they were or could be pregnant and/or were breast feeding.

Medico legal exposures

Senior staff at six out of the seven departments we inspected confirmed that exposures for medico legal reasons were not performed within their department. This was not always clearly described in the written policies and procedures. In the department where such exposures were said to be performed, the written policy and procedure contradicted this.

We required that the policies on medico legal exposures be revised to accurately reflect the arrangements in place.

Optimisation

We found that all departments had arrangements for keeping doses of diagnostic medical exposures as low as reasonably practically (known as ALARP).

Paediatrics

Where departments provided services to children, we found that procedures were in place for medical exposures of children. Some departments had access to advice and support from a Paediatric Radiologist and we identified this as noteworthy practice to promote the safety and wellbeing of patients who were also children.

Clinical evaluation

All departments had arrangements for the clinical evaluation of medical exposures. Within some departments we found not all clinical staff who were recording and assessing (evaluating) medical exposures had been formally entitled to do so within written procedures.

Medical and research programmes

Where departments were involved in medical and research programmes we found that procedures were in place setting out the arrangements for these.

Clinical audits

We saw evidence that audit activity had been conducted within six out of the seven departments we inspected. Audits aimed to identify possible areas where service improvements could be made.

Expert advice

We were able to confirm that Medical Physics Experts (MPEs) were available to provide advice on medical exposures to staff teams within each of the departments.

Equipment

Each department was able to provide an up to date written inventory of equipment being used. These did not always contain all the information required under IR(ME)R.

IR(ME)R compliance inspections - Immediate assurance

Whilst we did not identify any imminent risk of harm to patients, it was necessary for HIW to issue non compliance letters to two departments in accordance with HIW's immediate assurance process. These concerned a lack of progress to address improvement needed from previous HIW inspection activity and the formal arrangements for the entitlement of staff to act as referrer, practitioner or operator.

Inspections of NHS and private dental practices

Training

All dentists and dental care professionals involved in taking medical exposures must attend the required training to comply with IR(ME)R. Whilst it is a requirement under IR(ME)R for duty holders to complete relevant training, the regulations do not specify the frequency of training.

Overall, dentists could demonstrate that they had attended the required training on ionising radiation within the previous five years as 'highly recommended' by the General Dental Council[3]. Where we identified improvement was needed, this was usually in relation to dental care professionals not having attended the required training on ionising radiation.

[3] The General Dental Council (GDC) is the UK-wide statutory regulator of members of the dental team, including dentists and dental care professionals. Its primary purpose is to protect patient safety and maintain public confidence in dental services.

Justification and clinical evaluation of medical exposures

We found that improvement was needed around dentists recording the justification for taking exposures and their clinical evaluation of the radiographs (images) produced. It is a requirement under IR(ME)R that all medical exposures are justified and the images evaluated.

Audit

Overall, we found that dentists were grading and auditing medical radiographs as part of quality improvement activity. Where we identified improvement was needed, this was either because audits were not being conducted or because audits did not demonstrate findings and action taken as a result.

We did not issue any non compliance letters to dental practices in relation to IR(ME)R.

Notifications of exposures ‘much greater than intended’

During 2016-17, HIW received 65 notifications of exposures 'much greater than intended'. This is an increase from 45 in the previous year.

Of the notifications received, 58 occurred in diagnostic imaging departments and 7 occurred within radiotherapy departments. There were no notifications received from nuclear medicine departments. Each notification affected a single patient receiving a given exposure and so did not result in harm or affect the outcome of radiotherapy treatment.

The following table shows the number of notifications received annually by HIW between 2012 and 2017, as part of our IR(ME)R enforcement responsibilities in Wales.

	Year notifications received				
	2012-13	2013-14	2014-15	2015-16	2016-17
Number of notifications	32	47	46	45	65

The main reasons for patients receiving an exposure ‘much greater than intended’ within diagnostic imaging departments were due to incorrect addressographs (labels with patient identification details) being used, a failure to correctly confirm a patient's identification, or the failure to check previous imaging or treatment history. These resulted in patients receiving unnecessary

or repeat procedures. Within radiotherapy departments the reasons were due to a lack of communication around a non protocol procedure being required, procedural errors, a failure to include full details (on the referral form) of the radiotherapy treatment required, a patient positioning error, or a patient identification error.

Quality of management and leadership

We considered how services are managed and led and whether the workplace and organisational culture supports the provision of safe and effective care.

Overall, we found effective leadership and management arrangements around IR(ME)R with clear lines of accountability and reporting.

IR(ME)R compliance inspections of NHS hospitals and screening services

Overall, we found arrangements to support the effective management and leadership of the radiotherapy, radiology and nuclear medicine departments with clear lines of reporting and accountability in place. Staff at all levels engaged well with HIW inspection teams and showed that they were committed to providing a safe service to patients.

We found examples of very effective management arrangements during the course of our inspections, provided by both senior managers and team leaders within departments.

Senior management staff demonstrated a commitment to making improvements as a result of our inspection findings. It was disappointing, however, to find that improvement had not been made or sustained in response to our previous inspection activity at one of the nuclear medicine departments. This resulted in HIW issuing a non compliance letter. Whilst HIW is responsible for monitoring compliance with IR(ME)R, duty holders within healthcare organisations also have legal obligations to comply with the regulations.

Vacancies within the IR(ME)R management structure at one health board resulted in local team leaders having to take on additional work and responsibility. Senior staff described that interim arrangements had been put in place and considerable efforts made to address the situation.

Where we identified regulatory breaches or areas for improvement, organisations were required to provide HIW with improvement plans. Overall, plans were comprehensive and submitted within agreed timescales. Where necessary HIW requested further information until we were assured that

suitable action had been taken or was being taken to address the improvement needed.

5. Conclusions

Whilst areas for improvement were identified across the services and dental practices we inspected, overall these services had arrangements in place to provide safe and effective care to patients in relation to IR(ME)R.

We found that some employers' written procedures and protocols would benefit from being more detailed to help guide staff teams involved in medical exposures. Employers also need to ensure that all individuals with responsibility for medical exposures and/or operating associated equipment are trained and entitled to perform these functions.

In relation to IR(ME)R within dentistry, practices need to ensure that dental professionals involved in taking exposures have attended the required training. In addition, dentists must always record the justification for medical exposures and their evaluation. Also, audit activity must demonstrate what improvement action, if required, has been taken.

During 2016-17 the number of notifications to HIW from healthcare organisations varied. Higher numbers of notifications from particular organisations may be due to an open and positive reporting culture, rather than indicating failures in procedures or safety issues. Another reason for this variation may be due to how organisations interpreted 'much greater than intended'.

In January 2017, a letter was jointly issued from Healthcare Inspectorate Wales and Welsh Government to healthcare organisations. This set out revised arrangements for reporting IR(ME)R incidents together with updated guidance[4] on incidents that require notification to HIW. This should promote a more consistent reporting approach by organisations.

The main reason for patients receiving an exposure 'much greater than intended' was due to patient identification errors. This was despite organisations having written procedures in place in this regard.

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[4] Guidance on investigation and notification of medical exposures much greater than intended - 16 January 2017 https://www.gov.uk/government/publications/the-ionising-radiation-medical-exposure-regulations-2000

In April 2016, Welsh Government issued a Patient Safety Notice[5] to all Welsh health boards and trusts requesting organisations to assure themselves that they have processes in place to ensure the positive and correct identification of all patients receiving care. The need to have a procedure in place is also required under IR(ME)R. All healthcare organisations must, therefore, maintain a focus on this important patient safety issue through initiatives such as 'pause and check'[6].

[5] Patient Safety Notice PSN026/April 2016 - Positive Patient Identification http://www.patientsafety.wales.nhs.uk/sitesplus/documents/1104/PSN026%20Positive%20patient%20identification.pdf

[6] The 'pause and check' initiative involves checklists that cover patient checks, anatomical checks, user checks, system and settings checks, exposure checks and reminders on what to do at the end of an examination.

6. What next?

HIW's operational plan[7] for 2017-18 sets out our commitment in relation to IR(ME)R. During this period, we aim to conduct approximately five IR(ME)R compliance inspections and 100 dental practice inspections. In addition HIW will continue to evaluate notifications involving exposures 'much greater than intended' from healthcare organisations. We will publish reports from our inspection activity in accordance with our performance standards.

HIW will continue to work closely with our stakeholder groups and the Medical Exposures Group of Public Health England to develop our approach to these inspections and update HIW's IR(ME)R self assessment and inspection tools.

HIW will also continue to build in-house expertise to lead and support its IR(ME)R work activity through a training programme for HIW staff.

[7] HIW Operational Plan 2017-18 http://hiw.org.uk/docs/hiw/publications/170330opplanen.pdf

Appendix A – Recommendations

As a result of the findings from our IR(ME)R activity during 2016-17, we have made the following overarching recommendations which all services should consider as part of providing a safe and effective service.

Recommendations	Regulation / Standard
Quality of the patient experience	
Organisations must maintain a focus on promoting patient privacy.	Health and Care Standards - Standard 4.1
Delivery of safe and effective care	
Written procedures and protocols should be sufficiently detailed and clear for staff to understand and reflect current practice requirements.	IR(ME)R - Regulation 4(1) and Schedule 1
Written procedures for entitlement should accurately reflect those staff groups/individuals entitled to perform duty holder functions. This should include staff working across organisations under a local service level agreement.	IR(ME)R - Regulation 4(1) and Schedule 1(b)
Training records for practitioners and operators must be complete and readily available for inspection by HIW.	IR(ME)R - Regulation 11(4)
There must be quality assurance and clinical audit programmes in place for medical exposures.	IR(ME)R - Regulation 4(3)(b) and 8
Dental professionals involved in taking exposures must attend the required training on ionising radiation.	IR(ME)R - Regulation 11(4)
Dentists (who may be practitioners and operators) must record the justification and authorisation for taking exposures and their clinical evaluation.	IR(ME)R -Regulation 6(1)(a),(b)and 7(8)
Quality of management and leadership	
Organisations must maintain a focus on ensuring the positive and correct identification of patients to reduce the risk of patients receiving	IR(ME)R - Regulation 4(1)(a) and Schedule 1(a)

Recommendations	Regulation / Standard
unnecessary or repeat medical exposures.	

Appendix B – Glossary

Term	Definition
Duty Holder	Duty holders include the following: • Employer • Referrer • Practitioner • Operator
Employer	Any natural or legal person who carries out or engages others to carry out , medical exposures or practical aspects , at a given radiological installation
Referrer	A registered healthcare professional who is entitled , in accordance with the employers procedures , to refer individuals for medical exposures
Practitioner	A registered healthcare professional who is entitled, in accordance with the employers procedures, to take responsibility for an individual medical exposure, The primary role of the practitioner is to justify medical exposures.
Operator	Any person who is entitled, in accordance with the employers procedures , to carry out the practical aspects of a medical exposure.
Entitlement	The process of defining the duty holder roles and tasks that individuals are allowed to undertake
Justification	The intellectual process of weighing up the potential benefit of a medical exposure against the detriment for that individual from the ionising radiation risk.
Medico Legal Exposure	Procedure performed for insurance or legal purposes without a medical indication

Term	Definition
Optimisation	The process by which individual doses are kept as low as reasonably practicable
ALARP	As Low as Reasonably Practicable
Medical Physics Expert	A person who holds a science degree or its equivalent and who is experienced in the application of physics to diagnostic and therapeutic uses of ionising radiation