

Announced Inspection Report

Ionising Radiation (Medical Exposure) Regulations 2017

The Lanarkshire Beatson, NHS Greater Glasgow and Clyde

11–12 August 2026

Background

Healthcare Improvement Scotland (HIS) has a statutory responsibility to provide public assurance about the quality and safety of healthcare through its inspection activity.

Our focus

The focus of our inspections is to ensure each service is implementing IR(ME)R 2017. Therefore, we only evaluate the service against quality indicators that align to the regulations. We want to find out how the service complies with its legal obligations under IR(ME)R 2017 and how the services are led, managed and delivered.

About our inspection

We carried out an announced inspection to the Lanarkshire Beatson, Monklands Hospital in NHS Lanarkshire on Tuesday 11 and Wednesday 12 August 2026.

We spoke with a number of staff, including chief of medicine, scientific director department of clinical physics and bioengineering, clinical oncologist, general manager department of clinical physics and bioengineering, general manager specialist oncology services, medical physics experts (MPEs), quality manager, radiographers, head of radiotherapy physics, scientific lead equipment and dosimetry, the head of therapy radiography, technical services manager, technologists, and treatment lead radiographer.

This was our first inspection to the service at this site.

Based in Airdrie on the Monklands Hospital site, The Lanarkshire Beatson (TLB) is a satellite centre for the Beatson West of Scotland Cancer Centre (BWOSCC) in Glasgow. The centre is based on an NHS Lanarkshire site and responsibility for the facility management is with NHS Lanarkshire. However, NHS Greater Glasgow and Clyde (NHS GGC) operate and employ the staff. The facility has identical equipment which is fully compatible with the main Beatson centre in Glasgow. The TLB provides radiotherapy planning and treatments for patients in the Lanarkshire and surrounding areas undergoing radiotherapy treatment for:

- bladder cancer
- breast cancer
- colorectal cancer

- lung cancer, and
- prostate cancer.

Some palliative patients may also be treated at this site. The department consists of two linear accelerators and one computed tomography (CT) scanner. TLB does not operate an out of hours or weekend service.

The BWOSCC was previously inspected by HIS in 2025. As part of this inspection to the TLB we followed up on the requirements and recommendations made at the BWOSCC inspection, reviewed implementation of the action plan. We also assessed the integration between the main BWOSCC and TLB satellite site.

As the satellite centre operates inside the same governance arrangements, IT systems and protocols with BWOSCC, not all areas were examined in the same level of detail during this inspection. The service was described as ‘universal’, meaning that it is seen as one department across two geographical sites.

The inspection team was made up of three inspectors.

What action we expect NHS Greater Glasgow and Clyde to take after our inspection

The actions that Healthcare Improvement Scotland expects the NHS board to take are called requirements and recommendations.

- **Requirement:** A requirement is a statement which sets out what is required of a provider to comply with the Regulations. Requirements are enforceable at the discretion of Healthcare Improvement Scotland.
- **Recommendation:** A recommendation is a statement that sets out actions the provider should take to improve or develop the quality of the service but where failure to do so will not directly result in enforcement.

This inspection resulted in one requirement and no recommendations. Requirements are linked to compliance with IR(ME)R.

Safety Culture and Leadership

Requirements	
	None.
Recommendations	
	None.

Implementation of IR(ME)R requirements

Requirement	
1	NHS GGC must ensure that there are appropriate medical physics experts available to be closely involved in the optimisation of radiotherapeutic exposures, including being available to respond to queries arising at the point of treatment. Regulation 14 (see page 14).
Recommendations	
	None.

Risk and Communication

Requirements	
	None.
Recommendations	
	None.

An improvement action plan has been developed by the NHS board and is available on the Healthcare Improvement Scotland website.

NHS Greater Glasgow and Clyde must address the requirement and make the necessary improvements as a matter of priority.

We would like to thank all staff at The Lanarkshire Beatson for their assistance during the inspection.

What we found during our inspection

Safety Culture and Leadership

This is where we report on how clear the service's safety culture and how supportive its leadership and culture is.

Key questions we ask

How clear is the service's vision and purpose?
How supportive is the culture and leadership of the service?

Our findings

The department demonstrated a strong safety culture and staff showed clear commitment to maintaining high standards of patient safety. Staff understood IR(ME)R well and its principles were embedded in practice.

Safety culture

We observed a positive safety culture in the centre during our inspection. We saw evidence that demonstrated learning from incidents and shared learning across the sites we inspected. Openness and transparency among staff was evident, as well as a strong reporting culture and a well-established radiation safety culture.

The radiotherapy service had increased the frequency of radiation safety committee meetings from 6-monthly to every 3 months. Each meeting had a different topic of focus. This allowed a structured opportunity to explore particular radiation safety topics and bring appropriate issues, learning and findings to the committee meetings.

We were told that this change had led staff at all levels to feel more involved in radiation safety. It also provided an opportunity to present and discuss findings. This approach demonstrated a proactive commitment to strengthening staff

engagement, shared learning and maintaining a strong radiation safety culture across both sites we inspected.

- No requirements.
- No recommendations.

Implementation of IR(ME)R requirements

This is where we report on how well the service implements the requirements of IR(ME)R and manages and improves performance.

Key questions we ask

How well does the service manage and improve performance?
How does the organisation demonstrate the safe use of ionising radiation (patient exposure?)

Our findings

TLB operates under the same governance arrangements, procedures, protocols and training standards as the BWOSCC, providing consistent oversight. We found clear processes for entitlement, referral, justification and optimisation, with comprehensive documentation, effective audit arrangements and robust patient identification procedures.

Staff demonstrated a strong understanding of their roles, responsibilities and escalation pathways, and records reviewed demonstrated compliance with established procedures. While most requirements of IR(ME)R were being met, we identified that MPE capacity was insufficient to assure appropriate involvement in all research and clinical trial activities involving ionising radiation, resulting in one requirement for improvement

Employer's procedures

TLB followed the same employer's procedures and protocols as the BWOSCC. Any differences in the details of departmental activities or work instructions were documented in appropriate TLB documents and work instructions. The governance arrangements in the TLB were in line with those previously reported in our last inspection to the BWOSCC. This provided consistency in oversight and the application of organisational procedures and standards.

- No requirements.
- No recommendations.

Training

Regulation 17(4) requires the employer to keep training records for all practitioners and operators and make these available at inspection. During our inspection, we reviewed a selection of training records for randomly chosen staff members of various levels. Appropriate persons had signed all training records and showed the variety of competencies for those individuals. The training records contained the dates, as well as the nature of the training and was linked to the staff member's scope of practice.

As the same equipment was used across both sites, staff received consistent training and worked to the same standards and protocols. This resulted in consistency in knowledge, skills and competency. It also allowed appropriately trained and entitled staff to provide cross-site cover when required, supporting operations across both locations.

We discussed the role of consultant radiographers and the extensive training required to allow them to practice in their defined scope of practice. We reviewed a range of consultant radiographers' training records and found them to be appropriately completed and signed. As part of the induction process for consultant radiographers, suitably qualified clinical oncologists provided mentorship to support the development of the knowledge, skills and competencies required for the role.

It was reported that allocating dedicated continuous professional development (CPD) time can be challenging during staff shortages and peak holiday times, a more ad hoc flexible approach is used across both radiotherapy sites. Staff have access to an online channel with resources and recordings of previous meetings and learning sessions. To accommodate both sites, in person presentations are often repeated in both centres, and staff are encouraged to actively seek out CPD opportunities and request dedicated time.

- No requirements.
- No recommendations.

Entitlement

The entitlement processes for authorising staff to carry out the roles of referrer, practitioner and operator in TLB were in line with those in the BWOSCC. Clear lines of accountability were established for determining who was able to authorise staff to act in these duty holder roles. Entitlement and scope of practice are linked to individual competencies, as demonstrated through qualifications, role-specific training and relevant experience.

Entitlement for radiographers and physics staff is directly linked to each individual's scope of practice and what they are trained and competent to do. There is an overall document for both radiography staff and medical physics staff showing each staff member's role they are entitled to carry out. Each individual's scope of entitlement is recorded within their personal training record.

Consultant oncologists in NHS GGC are entitled to refer patients for all radiotherapy procedures. Referrals may be for palliative or radical treatments, with radical referrals applicable to specific tumour sites. Oncology registrars are entitled to refer for palliative treatments and require additional sign-off before undertaking referrals for radical treatments. Depending on their training and competence, therapeutic radiographers are entitled to act as operators and to undertake treatment of site-specific tumours.

NHS GGC employs three consultant therapeutic radiographers. A competency framework had been developed, which we were told was in line with the Society of Radiographers' (SOR) education and career framework. All staff were provided with a defined scope of entitlement and demonstrated a clear understanding of their individual scope of practice.

Entitlement was reviewed regularly and records clearly documented the entitlement and scope of practice for all staff groups.

- No requirements.
- No recommendations.

Referral

The TLB followed the same referral pathway as the BWOSCC. A consultant oncologist saw patients in-clinic and determined whether radiotherapy treatment was indicated. The consultant oncologist would then refer the patient

for treatment. For a patient to receive treatment in the TLB, the patient's tumour site and post code were considered.

Referrers were required to make sure that all relevant clinical information was available and that the referral form contained all necessary details to support the booking pathway. Consultant radiographers and registrars could also refer patients for radiotherapy treatment, where they were appropriately entitled and the referral fell inside their defined scope of practise.

- No requirements.
- No recommendations.

Justification

NHS GGC had comprehensive justification criteria and clinical protocols in place, which it regularly reviewed and updated. This process was also followed in TLB. The justification process includes consideration of the risks and benefits to the patient. As part of this process, the consultant oncologist reviews the patient's clinical history, relevant clinical information, and any previous imaging before confirming the prescription and the clinical protocol to be followed.

Consultant oncologists developed agreed clinical protocols. The oncologists also developed site-specific tumour protocols for the appropriate speciality and included details, such as organ-at-risk dose tolerances and target tumour doses. We were told that these protocols were evidence-based and referred to appropriate guidance, including that from the Royal College of Radiologists (RCR) and published medical literature.

Where a referral fell outside an approved protocol, the out-of-protocol form was used. In these instances, a second consultant and an MPE reviewed the intended protocol and prescription to support the referral and justification.

Justification in TLB also included verification imaging, which removed the need to individually justify each image acquired during the patient's treatment pathway. Any requirement to re-plan a patient's treatment required a new justification.

- No requirements.
- No recommendations.

Optimisation

Optimisation aims to ensure that radiation doses to surrounding normal tissues and organs at risk (OARs) are kept as low as reasonably practicable (ALARP), while delivering a dose to the target volume that is as close as possible to the prescribed dose.

All patient treatment plans we reviewed were individualised and considered the patient's:

- anatomy
- OARs, and
- previous treatment history.

Patient treatment plans also documented the clinical intent of treatment.

In TLB, we saw that appropriately entitled oncologists identified and described the target volumes in line with tumour site-specific protocols. The oncologists prescribed the required dose and applicable dose constraints for the target volume and OARs. Planning staff then developed treatment plans to meet these requirements.

Treatment planners develop treatment plans based on the oncologist's prescription and applicable clinical protocols, aiming to achieve the intended treatment outcome while minimising radiation dose to organs at risk (OARs) as far as reasonably practicable. Growing the GTV based on the protocol to create the CTV and PTV.

As the result of an audit it has been identified that not all the clinical protocols have the dose constraint information included. the dose constraint information has alternatively been included in the physics work instructions. It was confirmed that the clinical protocols will be updated.

Where the prescribed dose constraints could not be achieved, a dose constraint form was completed and submitted to the responsible consultant for review and approval before treatment could commence. The consultant oncologist retains overall responsibility for the treatment plan and reviews and approves all plans to ensure they meet the intended treatment objectives. This process provided appropriate clinical oversight and helped make sure that any deviation

from established dose constraints was appropriately reviewed, documented and authorised by the responsible clinician.

Other measures in place to help make sure that medical exposures were kept as low as reasonably practicable in TLB included:

- daily quality assurance
- dosimetry reviews
- operator training, which included applications training
- routine equipment maintenance, and
- treatment techniques and plans.

■ No requirements.

■ No recommendations.

Operator

Therapeutic radiographers carried out the practical aspects of patient treatment and CT planning. The radiographers acquired online imaging and matched the images to the defined treatment area before carrying out the treatment. Radiographers worked in teams of a minimum of two, providing appropriate support and oversight throughout the treatment and image matching process.

Staff clearly described the escalation process for incidents and equipment faults, including who to contact when issues arose. Staff also demonstrated an awareness of the use of alerts and the patient journal to communicate important individual-patient information and their treatment. Staff were knowledgeable about their individual scope of practice, as well as the training and competency requirements for different treatment techniques and tumour sites. As the protocols and of procedures are the same across both radiotherapy departments, appropriately entitled and trained staff at the TLB were able to provide treatment cover at the BWOSCC when required.

■ No requirements.

■ No recommendations.

Records

The TLB use the same IT systems as BWOSCC for the storage and management of protocols and procedures. All staff had access to this quality management system, which allowed them to access current, approved versions of documents, protocols and work instructions.

The patient pathway was recorded in the oncology management system (ARIA), which was linked to TLB. This shared system made patient information accessible across both sites, which allowed patients to be treated at TLB if required, such as in the event of equipment breakdown. Paper records continued to be used for some information. These paper records were scanned and uploaded to the patient's electronic record in ARIA to maintain a full record. ARIA recorded key information throughout the patient pathway, including:

- all images required
- any immobilisation requirements
- the referring clinician
- the treatment plan, and
- the treatment protocol used.

ARIA also documented any additional information or communications relevant to the patient's care.

- No requirements.
- No recommendations.

Patient identification

Patient identification processes in TLB were in line with BWOSCC. A three-point identification check was completed before each planning scan was carried out, as well as before each treatment fraction. The radiographers involved in exposing the patient to ionising radiation were responsible for confirming the patient's identity.

- No requirements.
- No recommendations.

Expert advice

Our previous inspection to BWOSCC resulted in the following recommendation:

‘NHS Greater Glasgow and Clyde should continually monitor the medical physics expert workforce resources and consider the potential impact on the service provision and mitigate any risks to the service provision that are identified.’

NHS GGC radiotherapy service calculated the medical physics workforce using a recognised workload-based tool. We were told that the calculation considered:

- equipment commissioning
- governance
- optimisation
- patient activity
- provision of advice
- quality assurance
- research and development activities
- statutory MPE requirements
- the range and amount of equipment
- training, and
- treatment complexity.

A combined workforce plan, including MPEs and clinical scientists had been developed by the department of clinical physics and bioengineering and a business case was planned to be submitted for consideration.

The business case includes a review of how to increase MPE staff numbers. It has been identified that an MPE development pathway to support staff development would support NHS GGC develop more MPE capacity. NHS GGC increased the number of assessors to support staff through MPE training criteria.

What needs to improve

NHS GGC has met the recommendation to monitor the MPE workforce and had identified the impacts on service provision. To mitigate risks, the need for additional resources had been identified. We were advised the current MPE support cannot always assist in the event of treatment issues onset, such as

providing a review of the patient dose effect when there are anatomy changes. Medical physics experts' availability requires to be monitored to ensure they can be closely involved in every radiotherapeutic practice and contribute to the optimisation of patient exposures as appropriate. (requirement 1)

The medical physics team are currently looking to develop an escalation pathway to ensure timely intervention and support better optimisation, but due to current staff capacity this project cannot be started.

MPE support is required for medical research trials and clinical research projects involving ionising radiation. The level of involvement depends on the nature and complexity of the exposure. IR(ME)R places additional requirements on research, where participants are exposed to ionising radiation but are not expected to receive a direct health benefit. We could not be assured that medical physics support or input was provided for all medical research trials and clinical research projects involving ionising radiation.

It was confirmed that the medical physics team's capacity did not allow for additional tasks, such as clinical trials. Appropriate MPE resource will be required to be assessed and provided to develop and provide access to clinical trials involving medical exposure to ionising radiation.

Requirement 1

- NHS GGC must ensure that there are appropriate medical physics experts available to be closely involved in the optimisation of radiotherapeutic exposures, including being available to respond to queries arising at the point of treatment. Regulation 14
- No recommendations.

General duties in relation to equipment

The physics team at TLB carried out all equipment quality assurance (QA) in line with the established procedures and protocols. We saw that daily QA was completed before clinical use. During our inspection, we observed that the physics team changed the machines' status from non-clinical to clinical before radiographers could commence patient treatments. Appropriately trained technicians carried out daily, weekly and monthly QA checks.

Treatment units displayed restriction certificates that identified any equipment components or functions unavailable for use. The restriction certificate also

confirmed whether the machine remained suitable for certain treatments, such as those requiring a specific electron energy.

Equipment faults could be escalated to engineers through the established ticketing system online, with all faults recorded in a dedicated log. Staff confirmed that no remote engineering access or changes were carried out without previously alerting the relevant department. IPEM 81 was used to inform the scheduling and frequency of QA testing. Following an engineer visit, the in-house physics team completed appropriate QA tests, using the locally produced, 'beam quality guidance' document to identify the tests required. The document is informed by manufacturer's guidance. The department also maintained regular communication with the equipment manufacturer through scheduled calls every month, providing an opportunity to discuss issues and resolve concerns promptly.

Regular dose audits were carried out to verify that the equipment continued to perform consistently and that treatment machines maintained the required standards of output and dose delivery.

We reviewed QA documentation and records during our inspection. We found that all records reviewed were within specified tolerance parameters and had been appropriately signed and dated.

- No requirements.
- No recommendations.

Clinical audit

Audit is a tool for directly improving healthcare outcomes and ensuring patient care is provided in line with best practice standards. We saw that a clinical audit programme was in place across the TLB and the BWOSCC. A variety of audits were carried out to monitor compliance, identify areas for improvement and support the ongoing quality and safety of patient care. These included audits of:

- Imaging review looking at target volume margins. This has resulted in a reduction of the PTV margins in comparison to previous years, and
- a rolling programme that reviews the patient pathway of individual tumour sites from referral through to completion of treatment.

- No requirements.
- No recommendations.

Peer review

The service prioritises peer review for complex and off-protocol radiotherapy plans with further reviews undertaken of standard treatment plans as staffing and service capacity allow. For prostate treatments, the service reported that approximately 40% of plans currently receive peer review.

Accidental or unintended exposure

We saw that all radiation incidents were investigated in line with the department's established procedures across BWOSCC and TLB. If an incident met the relevant significant accidental or unintended exposures (SAUE) criteria, it was reported to Healthcare Improvement Scotland. All staff we spoke with during our inspection demonstrated an awareness of the incident reporting and escalation processes. Staff confirmed that those directly involved in an incident were supported to complete Datix reports and kept informed of the resulting investigation findings and learning outcomes. Incidents and associated learning are discussed at radiotherapy events feedback meetings. These meetings were held every 3 months and were recorded online for access for those who could not attend.

Important information and learning from incidents were also shared with staff through email. Staff we spoke with described an open and positive culture around reporting near misses and incidents. They told us that reporting them was viewed as an opportunity to identify learning and support continuous improvement.

- No requirements.
- No recommendations.

Risk and Communication

This is where we report on what difference the service has made and what it has learned.

Key questions we ask

How well does the organisation communicate with the service users?

Our findings

The study of risk shows clear evidence of trends being monitored and acted upon proactively, alongside the continued use of the RCR consent form. It was positive to see the implementation of asking pregnancy status on day one before treatment, in response to the findings from the previous inspection.

Study of Risk of Accidental or Unintended Exposures

The previous inspection to the BWOSCC resulted in the following requirement:

- ‘NHS Glasgow must undertake a study of risk in respect to all therapeutic practices, including accidental or unintended exposures proportionate to the radiological risk (Reg8(2)).’

NHS GGC has fully met this requirement.

A study of risk is a structured analysis of potential radiation-related failures and their consequences, incorporated into the employer's quality assurance programme to reduce the likelihood and impact of accidental or unintended patient exposures.

NHS GGC carried out a study of risk that analysed all stages of the patient pathway and identified areas of risk. It analysed where errors could occur, identified the control measures and safeguards in place and where additional controls could be implemented. This included a review of incidents, near misses and lessons learned. The review included reviewing data from incident reporting systems, including patient and equipment incidents. Data collection had been developed in line with the national taxonomy coding system to support consistency and shared learning across centres in the UK.

We saw that changes had been implemented since the study of risk. For example, a monthly meeting with the equipment supplier had been introduced

to discuss ongoing issues, review trends and incidents. Adopting a more proactive approach to component replacement has been beneficial to help reduce potential machine faults, reduced the need for additional imaging of patients and reduced downtime. For example, a component linked to the multi leaf collimation (MLC) was proactively replaced based on trend data. This will reduce the potential for faults that had previously led to the need to take additional verification images and interrupt treatment fractions.

- No requirements.
- No recommendations.

Risk benefit conversations

As we found in the inspection to BWOSCC the same process was implemented at the TLB, risk and benefit conversations were carried out with the oncologists, who gained consent from the patient for treatment. BWOSCC and TLB used the Royal College of Radiologists (RCR) consent forms, developed for each tumour site to support risk and benefit conversations with patients. Patients signed each page of the consent form to show that they understood the benefits and risks of the proposed treatment.

- No requirements.
- No recommendations.

Making enquiries of individuals who could be pregnant

The previous inspection to the BWOSCC resulted in the following recommendation:
‘NHS Greater Glasgow and Clyde should implement a procedure to undertake a pregnancy enquiry immediately before the initial treatment exposure.’

NHS GGC has fully met this recommendation.

NHS GGC had updated the EPs to include a pregnancy status question on the first fraction, before treatment exposure. The documents were provided before our inspection and the therapeutic radiographers we spoke with confirmed the process in place. The patient signed the original RCR treatment consent form that they were not pregnant. The radiographer initialled the form and scanned it onto the ARIA system on the first day of treatment. The patient was asked to confirm their pregnancy status on the first day before the first exposure.

- No requirements.
- No recommendations.

Carers and comforters procedures

A policy remained in place and was unchanged from the previous inspection to BWOSCC. The TLB did not use carers or comforters as only the patient was permitted in the room during exposures.

- No requirements.
- No recommendations.

Our approach

Healthcare Improvement Scotland has a statutory responsibility to provide public assurance about the quality and safety of healthcare through its inspection activity.

How we inspect services that use ionising radiation for medical exposure

The focus of our inspections is to ensure each service is implementing IR(ME)R 2017. Therefore, we only evaluate the service against quality indicators that align to the regulations.

What we look at

We want to find out:

- how the service complies with its legal obligations under IR(ME)R 2017 and addresses the radiation protection of persons undergoing medical exposures, and
- how well services are led, managed and delivered.

Complaints

If you would like to raise a concern or complaint about an IR(ME)R service, you can directly contact us at any time. However, we do suggest you contact the service directly in the first instance.

Our contact details are: [his.IR\(ME\)R@nhs.scot](mailto:his.IR(ME)R@nhs.scot)

Healthcare Improvement Scotland
Gyle Square
1 South Gyle Crescent
Edinburgh
EH12 9EB

Telephone: **0131 623 4300**

Email: [his.IR\(ME\)R@nhs.scot](mailto:his.IR(ME)R@nhs.scot)

Published | October 2026

Need information in a different format? Contact our Equality, Inclusion and Human Rights Team to discuss your needs. Email his.equality@nhs.scot or call 0141 2.25 6999. We will consider your request and respond within 20 days.

Healthcare Improvement Scotland

Edinburgh Office
Gyle Square
1 South Gyle Crescent
Edinburgh
EH12 9EB

Glasgow Office
Delta House
50 West Nile Street
Glasgow
G1 2NP

0141 225 6999

www.healthcareimprovementscotland.scot