



## National Survey of Nurse-led Dual Energy X-ray Absorptiometry Imaging Services

### Background

Dual energy x-ray absorptiometry (DXA) scanning is a diagnostic imaging procedure involving ionising radiation that is typically ordered to either assess a patient's bone density or their level of visceral adipose tissue. The demand for DXA imaging services has increased in recent years with the focus on healthy aging, obesity and disease prevention. DXA imaging is available in many, but not all, radiological services.

HIQA published a survey in 2021, entitled '*National diagnostic reference levels for general radiography mammography and DXA scanning*<sup>1</sup>' which identified that, nationally, there were 58 medical radiological facilities providing a DXA imaging service to patients, using 64 DXA scanners, with 155,072 procedures performed in that year.

### Legal responsibilities

DXA procedures deliver a low dose of ionising radiation to the patient however they are not without risk. Practitioners performing the procedure must be appropriately trained and competent, and they must have a clear understanding of their legal role and responsibilities in relation to radiation protection.

Statutory instrument 256 (2018)(10) ensures that all medical radiological procedures take place under the clinical responsibility of a practitioner. The practitioner may delegate the practical aspects of a radiological procedure to an operator, such as a nurse registered with the Nursing and Midwifery Board of Ireland<sup>2</sup> (NMBI), who is appropriately trained and competent. This delegation of authority must be documented, endorsed by the local Radiation Safety Committee and made available to the regulator upon request.

### Nurse-led DXA services

As mentioned, nurses can be delegated the task of performing the practical aspects of DXA imaging procedures. To support this expansion of practice, the NMBI published '*Standards and Requirements for Education Programmes for nurses undertaking the practical aspects of dual energy X-Ray Absorptiometry (DXA) scanning for adults, 2023.*' ( <https://www.nmbi.ie/Education/Standards-and-Requirements/Nurses-Undertaking-DXA-Scans> )

The HSE National Lead for Nurse Referral for Radiological Procedures highlighted that there was currently no national standardised training programme available for DXA imaging technique that would meet the full requirements of the NMBI. They also noted that the number of nurses who perform these imaging procedures and the national demand for training in this practice, are unknown.

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<sup>1</sup> <https://www.hiqa.ie/reports-and-publications/key-reports-investigations/national-drls-general-radiography-mammography>

<sup>2</sup> The NMBI is the professional regulator and competent authority for nurses and midwives in Ireland.

The National Radiation Protection Committee commissioned a national survey to establish the number of nurse-led DXA services in order to determine the potential demand for certified training in DXA imaging technique.

## The survey

This survey was developed by the National Radiation Protection Office (NRPO) with the support of the National Lead for Nurse Referral for Radiological Procedures.

The aims of the survey were as follows:

1. To ascertain the number of nurses providing a DXA service nationally.
2. To determine if all nurses who undertake the practical aspects of DXA procedures had documented delegation of authority from a practitioner.
3. To identify the demand for certified training on DXA imaging technique.
4. To estimate the long-term educational requirements for nurses undertaking the practical aspects of DXA procedures.

The NRPO issued the survey to the Designated Managers of all public hospital and community diagnostic imaging services in October 2024.

## Findings

### DXA services

It was anticipated that DXA imaging would not be available in every hospital and community service, indeed it was unknown how many DXA services were in operation nationally. Several respondents confirmed that their hospital had no DXA service but that there were arrangements in place with local private healthcare providers to meet demand.

To determine the number of DXA services provided by the HSE hospital and community services and the voluntary hospitals, the NRPO reviewed historical data submitted by locations for registration on the HIQA portal, information provided to the NRPO for the review of radiation equipment in 2020 and relevant HIQA inspection reports.

26 locations were identified as providing a DXA service and all received the survey from the NRPO. The returns indicated that 7 DXA services were led by nurses (27%) and the remainder were managed by radiographers (73%).

In total, there were 16.5 (whole time equivalent) nurses providing DXA imaging services nationally, with each nurse delegated authority from the local practitioner to operate the DXA imaging equipment.

### Training

There is no national standardised training programme available to support staff who perform the practical aspects of DXA imaging procedures. Respondents confirmed that nurses operating DXA equipment had received radiation safety training tailored to their service from radiation safety officers and medical physicists within their hospital; and the majority had undertaken the two NRPC Radiation

Protection training modules available on the HSElanD platform. Also, it was confirmed by some respondents that the equipment manufacturer had facilitated onsite training for operators. One respondent noted that there was a DXA education programme provided by University College Dublin however it lacked practical training.

The additional training that nurses had undertaken varied across locations and included the following programmes:

International Society for Clinical Densitometry (ISCD) *Certified Bone Technologist*

ISCD *Interpretation and Clinical Applications for Technologists*

ISCD *Osteoporosis Essentials course for DXA Technologists*

ISCD *Technologist Examination*

ISCD *Vertebral Fracture Assessment Course*

ISCD *Total Body Composition Course*

Irish DXA Society *Radiation Protection Course*

Irish DXA Society *DXA Practical Aspects Workshop*

Royal Osteoporosis Society *National Training Scheme for Bone Densitometry*

One respondent noted that the provision of a nurse led DXA service is a relatively new specialist practice for nurses in Ireland. With the absence of a dedicated training programme, nurses were often required to travel to the UK for training and qualification in this modality, which perhaps was a barrier to developing the service in this country.

### **Provision of a national standardised training programme**

The majority of respondents supported the notion of providing a national standardised training programme for DXA imaging technique. Respondents suggested that this training would benefit both new and existing operators and ensure that best practice was maintained across all DXA services.

In addition, standardisation would allow for the establishment of a recognised post graduate qualification in the area of DXA and bone health, helping to develop a clinical nurse specialist role for nurses.

Some respondents observed that whilst a national standard for training in DXA imaging is optimal, it was important that radiographers were not excluded from this modality as they possess the skill set for radiation safety in their core competencies and qualifications.

Several respondents said that the development of a standardised training programme for DXA imaging should include input from all professionals involved in this modality.

### **Long term priorities for nursing educational requirements in DXA imaging**

Respondents cited the importance of understanding the DXA imaging technology, how to use the equipment and the correct positioning of the patient, particularly in relation to patients with

conditions such as scoliosis. Technologists must be aware of when the machine is not operating optimally.

A thorough understanding of the principles of radiation protection was considered essential, together with clinical audit, patient assessment and patient education. Knowledge of pharmacology in relation to bone health was also important.

Nurses would need to have a good understanding of how scan results are calculated and presented so that erroneous outcomes could be identified and addressed in a timely manner. Respondents also noted the importance of competency in relation to clinical decision making and follow up.

Other considerations included data protection, manual handling and decontamination post procedure.

One respondent observed that the current training syllabus seemed to address all of these topics however another reported that the education programmes available lacked practical training.

### **Additional comments**

Respondents submitted the following comments for consideration:

- The authority to undertake the practical aspects of a DXA scan is delegated from the attending consultant who is legally responsible for reporting the image and the care of the patient. It is important that DXA imaging practices are monitored by the local Radiation Safety Committee so that safe practice and clinical governance can be assured.
- Precision and accuracy in DXA imaging technique is essential to ensure that the service is of value to the patient and the referrer. This can only be achieved if the technologist undertakes the appropriate training and continuous professional development.
- The establishment of postgraduate training programmes specific to DXA and bone health and financial support from the employer to undertake these courses would help nurses to develop a clinical nurse specialist role.

One respondent observed that when there is a shortage of radiology staff, the DXA service is often curtailed as it is not considered urgent compared to other modalities. Thus, establishing a nurse – led DXA service that was separate from the radiology department proved to be an advantage in their hospital. This enabled the nurse to complete an episode of care for the patient in a timely manner without burdening the radiology department.

### **Conclusion**

58 medical radiological facilities provide DXA services nationally, with 26 of these operating in the public service. Of these 26, 7 DXA services were nurse-led, with 16.5 whole time equivalent nurses delegated authority from the local practitioner to operate the DXA imaging equipment.

All nurses leading these DXA services had undergone training in radiation protection, bone health and DXA imaging technique however the various courses available have not been submitted to NMBI for assessment against the standards and requirements of the NMBI

The proposal to provide a national standardised training programme for DXA imaging technique was welcomed, particularly if it was multidisciplinary based and supported all practitioners such as doctors, radiographers and nurses.

This national survey provided assurance that all nurse-led DXA services operated under the delegated authority of a consultant and that radiation protection was prioritised. However, there is no room for complacency when exposing patients to radiation. Therefore, it is important that the local radiation safety committees maintain oversight of all DXA imaging procedures, including nurse-led DXA services, to ensure that legal standards are maintained and that patients are treated safely.

**The NRPO would like to thank everyone who took the time to respond to this survey. Your continued support is greatly appreciated.**