

Introduction to the Nuclear Medicine/PET Diagnostic Reference Levels

In 2012, ARPANSA developed and published national Diagnostic Reference Levels (DRLs) for multi-detector computed tomography (MDCT) examinations. Subsequently work began on developing DRLs for other modalities, such as image guided interventional procedures, mammography and in particular nuclear medicine imaging.

Nuclear medicine DRLs were generated by analysing data collected through surveys of nuclear medicine facilities across Australia in 2014/15. The DRLs were developed in consultation with the Australian and New Zealand Society of Nuclear Medicine, the Australasian Association of Nuclear Medicine Specialists and the Australasian College of Physical Scientist and Engineers in Medicine, and have been endorsed by the boards/and councils of these institutions.

The setting of nuclear medicine DRLs provides a mechanism by which facilities can compare the radiation dose associated with the administration of a radiopharmaceutical to a patient undergoing a nuclear medicine procedure to that of a national benchmark. Comparison of typical administered activities to patients with established DRLs is a requirement in Australia of the *Code of Practice for Radiation Protection in the Medical Applications of Ionizing Radiation* - ARPANSA RPS 14. Section 3.1.8 of the Code states:

The Responsible Person must establish a program to ensure that radiation doses administered to a patient for diagnostic purposes are:

*(a) periodically compared with **diagnostic reference levels (DRLs)** for diagnostic procedures for which DRLs have been established in Australia; and*

(b) if DRLs are consistently exceeded, reviewed to determine whether radiation protection has been optimised.

The DRLs are not recommended activities. They are only a reflection of current practice within Australia. The DRLs should not be used as the basis of calculating paediatric activities or as a starting point for facilities conducting a scan for the first time. More importantly, if your facility uses administered activities lower than the DRL, they should not be increased to match the DRL.

While it is true that the median administered activity is also not a recommendation, ARPANSA believes that the median administered activity is a reasonable starting point for facilities to use when introducing procedures they have not performed before. As with the DRL, if your facility uses activities lower than the median, they should not be increased to match.

If your facility routinely administers activities higher than the DRL then your protocols should be reviewed. Ensuring that any reduction in an administered activity does not degrade the image quality to the point where diagnosis is compromised. Maintaining diagnostic quality is of paramount importance, even if doing so requires an administered activity higher than the DRL, which might occur if the facility uses older hardware or regularly images patients with clinical indications that are underrepresented within the nuclear medicine DRL data.

Accessing the DRLs

Further details about the DRLs, including the Nuclear Medicine DRL Tables, are available at the ARPANSA website address below. ARPANSA have included a survey template to help perform a local dose audit for comparison of administered activities against the DRLs.

www.arpansa.gov.au/nuclear-medicine-drls