Australian Government
Australian Radiation Protection and Nuclear Safety Agency

arpansa

Australian national diagnostic reference levels for Multi-Detector CT (MDCT) - Adult

Comparing your facility's doses to the DRLs

You should determine your Facility Reference Level (FRL) for a particular protocol and compare that dose to the DRL.

Your FRL is the median dose, in terms of Dose Length Product (DLP) and volume CT Dose Index ($CTDI_{vol}$), delivered to a sample of patients. The sample should be representative of the normal patient cohort (with regards to gender, weight and age) and ideally should include 10 or more patients. A CT DRL comparison is scanner specific; a separate FRL should be calculated for each scanner that is regularly used to perform a given scan.

ARPANSA has a web-portal to aid your DRL comparisons. After submitting a survey to the National Diagnostic Reference Level Service's (NDRLS) MDCT survey, you will be issued with a report comparing your doses to the DRL. These reports can be used to prove compliance with relevant state and federal requirements.

Registering with ARPANSA's NDRLS survey

You can register with the NDRLS MDCT survey at **ndrld.arpansa.gov.au**. Once you register, your facility will be issued three user accounts:

1. An account intended for the main point-of-contact at a facility, often operated by a senior radiographer (username prefixed NC).
2. An account intended for a radiologist to keep them informed of reports being generated (username prefixed NR).
3. A generic account intended to be shared among the staff members entering data (username prefixed NG).

Interpreting DRL comparison results

If your FRL exceeds the DRL for a particular protocol, it is an indication that you are delivering a higher dose than 75% of Australian imaging facilities for that procedure. You should consider if there are particular reasons for your dose level and whether you can safely reduce the dose without adversely affecting diagnostic capability.

The ARPANSA website provides additional statistics relating to each of the CT scans issued a DRL. This includes tables of the interquartile dose ranges, providing greater context regarding how a facility compares to the national dataset. Visit **www.arpansa.gov.au/ndrls** to view the additional data.

Automatic tube current and voltage modulation

The NDRLS survey requests basic scan parameters for a given procedure along with patient characteristics and doses. Only a single value per survey can be entered for each exposure parameter.

If your scanner uses automatic tube current, the mAs of each scan will be patient specific. Some systems provide a reference mAs which can be used as the mAs in the NDRLS protocol section. Other systems set a maximum and minimum current; for these scanners, please enter the middle of the available current range multiplied by the rotation time:

$$\left(\frac{mA_{max} + mA_{min}}{2}\right) * \text{rotation time}$$

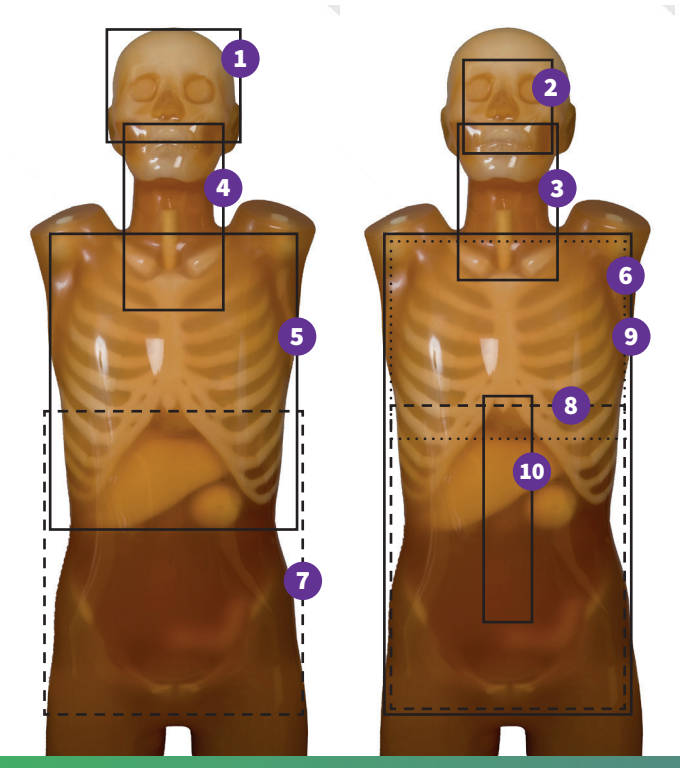
A similar approach can be used for kVp; if no reference value is available, use the middle of the available range or most common kV setting. Please make a note in the comments field of the survey explaining which value of mAs and/or kVp you have entered.

Two phase scans

Some scanners conduct Chest Abdomen Pelvis (CAP) scans in multiple phases and report the dose metrics (DLP and $CTDI_{vol}$) separately for each phase. In such cases, please sum the DLP and take the average of $CTDI_{vol}$.

Other notes

1. Do not include the contribution of scout scans to patient dose
2. Patient weight does not need to be confirmed, asking the patient is sufficient.
3. If your facility participates in a bulk collection of dose data, please contact ARPANSA via **ndrld@arpansa.gov.au** if you would like to arrange to upload to the NDRLS database.
4. The generic user account password is set by the NC or NR account holders; ARPANSA cannot reset these passwords. To reset the other passwords, contact **ndrld@arpansa.gov.au**.
5. The scans included in a dose comparison do not necessarily have to be for the listed phase/indication; however, the exposure parameters of the included scans must match what would be used for the listed phase/indication.
6. Dose indices for the Head region are based on the 16 cm reference phantom. Dose indices for all other scan regions are based on the 32 cm reference phantom.



#	Scan region		Description (e.g. indication)	$CTDI_{vol}$ (mGy)	DLP (mGy.cm)
1	**Head**	Base of skull or C2 to vertex	Non-contrast brain (trauma/headache)	45	820
2	**Paranasal sinuses**	Hard palate to above the top of the frontal sinuses	Non-contrast (chronic sinusitis)	12	160
3	**Cervical spine**	External auditory meatus to include aortic arch	Non-contrast (trauma)	18	390
4	**Soft-tissue neck**	External auditory meatus to T2	Post contrast (oncology)	13	380
5	**Chest**	Lung apices to adrenal glands, including liver if specified	Post contrast (oncology)	8	310
6	**Low-dose CT (LDCT) chest**	Lung apices to the bottom of lungs	Non-contrast (National Lung Cancer Screening Program)	3	90
7	**Abdomen-pelvis**	Diaphragm to below symphysis pubis	Post contrast (oncology)	10	480
8	**Kidney-ureter-bladder**	Superior pole of kidneys to symphysis pubis	Non-contrast (suspected renal colic)	8	380
9	**Chest-abdomen-pelvis**	Above lung apices to below symphysis pubis	Post contrast (oncology)	9	760
10	**Lumbar spine**	Between T12 to S1	Non-contrast (degenerative pain)	20	570