



Australian Government
**Australian Radiation Protection
and Nuclear Safety Agency**

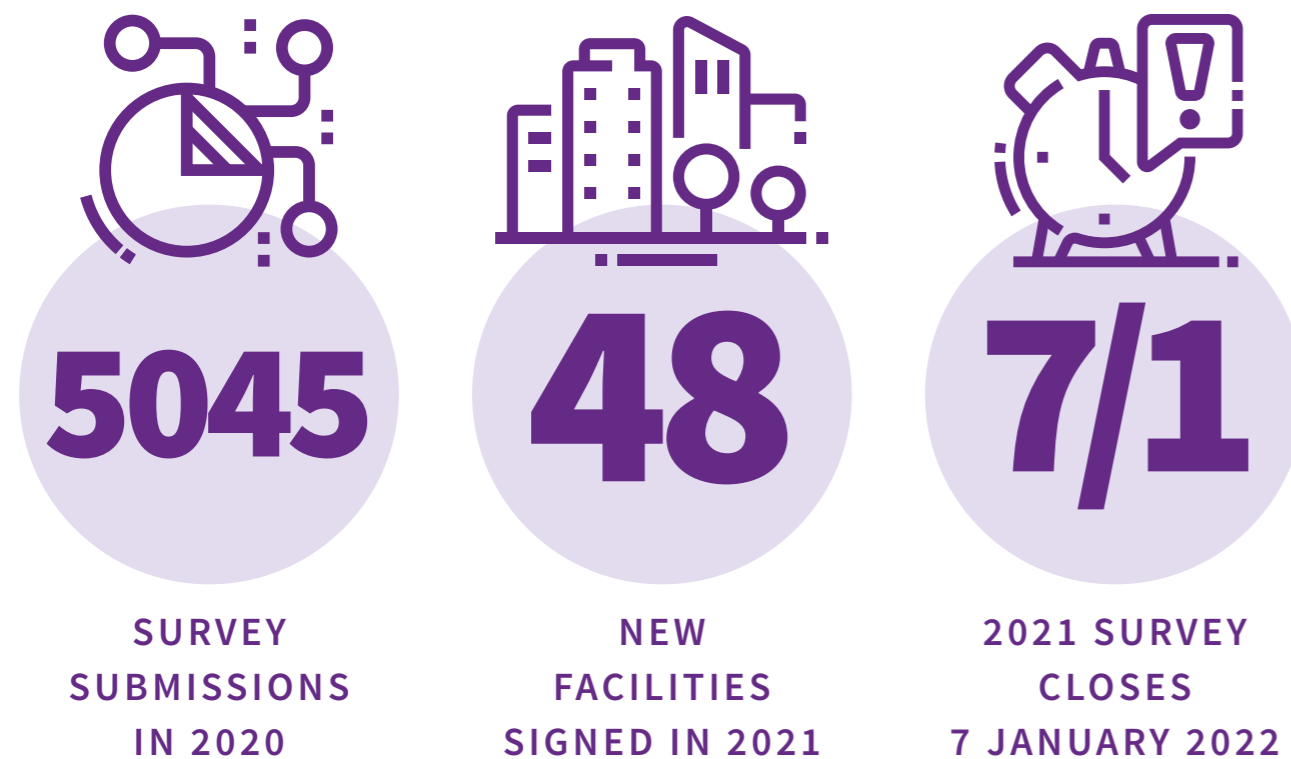


WELCOME TO THE ARPANSA
NDRLS NEWSLETTER FOR 2021

After taking a break from the newsletter last year, we are back with an update on the current state of the National Diagnostic Reference Level Service (NDRLS) and to remind you to get your Multi-Detector Computed Tomography (MDCT) data in before the end of year shutdown.

MDCT news

The NDRLS continues to grow, with an additional 48 facilities signing up so far this year. Last year we received a record 5045 survey submissions for adult patients – if we are to reach that figure again, we will need to receive over 2000 surveys between now and 7 January 2022. As always, we are appreciative of all those who participate in the MDCT DRL survey. The more sites actively involved, the more representative the derived national Diagnostic Reference Levels (DRLs) will be, which will help support optimal care for patients.



2021 data collection close off

There will be a brief service interruption on the morning of 7 January 2022 while we conduct the 2021 close off. Open surveys with less than 10 patients will be locked and no DRL report will be generated. Surveys with 10 or more patients will be closed and a DRL report will be generated.

The NDRLS will be closed from 24 December – 4 January (inclusive). During this time the NDRLS hotline and email service will be unattended, and we will not be able to reset your passwords. We apologise if you have found responses from the NDRLS hotline patchy of late; however, a new system is now in place and we should be able to answer your calls in a more consistent manner.

Update to the DRLs

Since the last newsletter update, the DRLs for soft-tissue neck, cervical spine and kidney-ureter-bladder scans have been updated as per Table 1.

Table 1: New DRLs for selected protocols (with previous DRL in brackets where different).

Protocol	CTDI _{vol} (mGy)	DLP (mGy.cm)
Cervical spine	21 (23)	470
Soft-tissue neck	15 (17)	450
KUB	10 (13)	460 (600)

An [explanation of how and why the DRLs were changed](#) can be found on our website. The NDRLS MDCT portal was updated at the end of March 2021 to include the new DRL values - if you submitted a survey since that time you have been using the updated values.

Update to MDCT reports

We are finalising work to add an indication of patient weight to NDRLS summary reports for CT survey data. Figure 1 shows an example of how this will look. The first two rows remain unchanged with the median dose-length product (DLP) and the median volume CT dose index (CTDI_{vol}) for the survey compared to the respective national DRLs. Below that we are adding a row showing the median patient weight for the survey and how it compares to the median patient weights in the data used to set the national DRL.

Survey Outcome			
Dose Metric	FRL	Australian Adult DRL	Comment
DLP / mGy.cm	426	450	Your FRL falls within the Australian Adult DRL.
CTDI _{vol} / mGy	44	17	Your FRL is greater than the Australian Adult DRL. Unless clinically justified the implementation of an optimisation process is recommended.
Characteristic	Median	Median (&IQR) for DRL data	Comment
Weight / kg	56	75 (70 - 80)	The median patient weight in your survey is below the interquartile range (IQR) for the Australian Adult DRL data.

Figure 1: Example of an updated survey report that includes a comment on the patient weight of the submitted survey.

The comparison data shows the median and the interquartile range (the range from the 25th to the 75th percentile) for median patient weight in the reference data. This information is being added to provide context to the comparison of your facility reference level (FRL, the median value of each dose metric) with the national DRL. A comparatively heavy or light patient cohort may explain your relatively high or low FRL.

Image-Guided and Interventional Procedures (IGIP) news

Were you aware that the NDRLS is collecting data on image-guided and interventional procedures (IGIP)? Or that there is a [national DRL for diagnostic coronary angiography procedures](#)?

Well, we need your data! Please get involved or let your colleagues in angiography, fluoroscopy, and interventional radiology know. [Register for the survey](#) on our website.

New template mailout

At the beginning of each year, we e-mail updated survey templates (excel spreadsheets) to all registered sites. Please make sure you're using the new templates for each year when submitting your data as we update our processing systems to match changes to the templates - we can't process the old templates.

Update your details

You don't need to re-register every year, but please advise us of any changes to contact details by emailing ndrld@arpansa.gov.au with the subject line 'IGIP - update to contact details'. Please include your facility's name, and your Location Specific Practice Number (LSPN), if known, so we can make the appropriate changes.

More data needed

The list of procedures covered by the NDRLS IGIP survey is shown in Table 2, along with the numbers of surveys received in the last 2 years. We'd like to boost these numbers to at least 30 surveys per year in each category so we can set national DRLs. As always, the more data, the better!

More information about the [IGIP survey](#) can be found on our website.

Table 2: Number of IGIP surveys submitted

Procedure	2020	2021*
Cerebral angiography	4	0
Coronary angiography	22	21
Pelvic embolisation	1	3
Barium swallow	3	2
Water-soluble swallow	2	2
Single lesion PCI ¹	7	7
EVAR ²	3	2
Line insertion	3	3

* As at 26/11/2021

¹ percutaneous coronary intervention

² endovascular aortic repair

Handy hint for completing IGIP surveys

Fluoroscopy and angiography systems love to confuse us by using a range of units to express the same quantity. How many times have you scratched your head trying to convert $\mu\text{Gy}\cdot\text{m}^2$ to $\text{Gy}\cdot\text{cm}^2$ or time in decimal minutes into seconds?

Well, your pain is our pain and all our IGIP template spreadsheets include a handy little unit selection box on the 'data entry' tab. It's the green box on the right-hand side at the top (see Figure 2). Here's how the unit settings work:

- The quantities are named in **bold type** and the selected units are displayed in the **yellow highlighted** boxes.
- Each of the **yellow highlighted** boxes is a pull-down menu.
- Click on the cell and select the units that your system uses from the drop-down list.
- The selected units are also reflected in the column headings of the data entry grid.
- Now you can happily enter the data as reported by your system and our conversion tool will do the necessary work to translate the data into our preferred common units.

Figure 2: IGIP unit settings box – it's at the upper right on the Data Entry tab

Thanks to all those who have made suggestions about the weird and wonderful range of units to include. We've got you covered!

Nuclear medicine news

2021–2022 nuclear medicine survey

A new NDRLS nuclear medicine survey is currently underway. Participants are being asked to provide information relating to their written protocols and to then record the doses administered to patients over a two-week period. The survey is being conducted via Excel spreadsheets, which we will email to you if you [register via our webpage](#). All nuclear medicine and Positron Emission Tomography (PET) providers within Australia are encouraged to participate – the more facilities participating, the better the new DRLs will be.

When you submit a survey, the NDRLS will provide you with a report that shows how your doses compare to the current national DRLs and how your administered doses compare to your prescribed doses. This report can be used to demonstrate compliance with your regulatory requirements relating to DRLs.

Thank you to those who have already submitted data – those who have not have until 31 March 2022 to do so.

ARPANSA training material update

An updated RPOP?

ARPANSA is updating its Radiation Protection of the Patient (RPOP) online training material and we'd value your suggestions or feedback. While primarily intended for referring physicians, it's also been used by medical professionals and radiation safety officers (RSOs), trainers etc. to provide a basic introduction to medical radiation safety.

If you haven't seen [RPOP](#), please check it out on the ARPANSA website. The associated printable [patient handout](#) is particularly popular. Once you've had a look, please send your feedback to alan.mason@arpansa.gov.au or give Alan a ring on 0414 747 447. Thanks!

Indicative radiation dose to adult patients from common medical imaging procedures
Paediatric doses are generally lower, however the risks may be higher. Doses vary, depending on gender, age and weight as well as equipment and imaging settings used.
 In Australia, background radiation is approximately 1.5 mSv per annum

Procedure	(Approx) Typical Adult Dose (mSv)	Background Equivalent Radiation Time (BERT)	Equivalent Chest X-rays	* <1mSv ** 1-5mSv *** 5.1-10mSv **** >10mSv	Additional Lifetime Risk Level of Fatal Cancer	
CENTRAL NERVOUS SYSTEM	X-ray - Cervical Spine	0.2	7 weeks	10	*	MINIMAL
	X-ray - Thoracic Spine	1.0	8 months	50	**	VERY LOW
	X-ray - Lumbar Spine	1.5	12 months	75	**	VERY LOW
	CT - Head	2	18 months	100	**	VERY LOW
	CT - Head with & without contrast	4	3 years	200	**	LOW
	CT - Neck	3	2 years	150	**	LOW
CT - Spine	6	4 years	300	***	LOW	
BONE	X-ray - Extremity	0.001	6 hours	0.05	*	NEGLECTIBLE
	X-ray - Shoulder	0.01	2.4 days	0.5	*	NEGLECTIBLE
DENTAL	X-ray - Bitewing	0.01	2.4 days	0.5	*	NEGLECTIBLE
	Dental Cone Beam CT (CBCT)	0.1	3 weeks	5	*	MINIMAL
CHEST	X-ray - Chest	0.02	5 days	1	*	NEGLECTIBLE
	CT - Chest	7	5 years	350	***	LOW
HEART	Cardiac CT for Calcium Scoring	3	2 years	150	**	LOW
	Coronary Angiography	16	11 years	800	****	LOW
ABDOMINAL REGION	X-ray - Pelvis	0.6	5 months	30	*	VERY LOW
	CT - Abdomen	8	5 years	400	***	LOW
	CT - Pelvis	6	4 years	300	***	LOW
	Fluoroscopy - Upper GI	6	4 years	300	***	LOW
	Fluoroscopy - Small Bowel follow-through	5	3 years	250	**	LOW
	Fluoroscopy - Barium Enema	8	5 years	400	***	LOW
WOMEN'S IMAGING	Fluoroscopy - IV Pyelogram	3	2 years	150	**	LOW
	Bone Density (DEXA)	0.001	6 hours	0.05	*	NEGLECTIBLE
NUCLEAR MEDICINE EXAM	Mammography	0.3	3 months	15	*	VERY LOW
	3D Tomosynthesis	1	8 months	50	**	VERY LOW
	Hysterosalpingogram	2	18 months	100	**	VERY LOW
	Lung Ventilation/ Perfusion	3	2 years	150	**	LOW
Magnetic Resonance* Imaging (MRI)	Thyroid	3	2 years	150	**	LOW
	Bone Scan	5	3 years	250	**	LOW
	Cardiac Rest/Stress	12	8 years	600	****	LOW
	PET/CT	14	9 years	700	****	LOW
Ultrasound*	All	0	0	0	0	Nil

*While Ultrasound and MRI do not use X-rays or similar radiation, they are not always available, or suitable for a number of medical conditions.

***RISK LEVEL**

Negligible	Minimal	Very Low	Low	Moderate
Less than 1 in 1,000,000	1 in 1,000,000 to 1 in 100,000	1 in 100,000 to 1 in 10,000	1 in 10,000 to 1 in 1,000	1 in 1,000 to 1 in 100

ESTIMATED LIFETIME RISKS OF DEATH

Lightning strike	1 in 100,000
Bicycle accident	1 in 10,000
Drowning	1 in 1,000
Motor vehicle accident	1 in 100
Heart (Natural causes)	1 in 5

*Note: These risk levels represent very small additions to the 1 in 5 chance we all have of dying from cancer.

ARPANSA Fact Sheet - Medical Imaging: Information for Patients
 Email: info@arpansa.gov.au | www.insideradiology.com.au | www.radiologyinfo.org

ARPANSA's ORE released

Do you know anyone within your facility that is unnecessarily scared of radiation? What about some that are a bit too blasé in its use? To help provide you with high quality radiation information, ARPANSA has released its Occupational Radiation Exposure (ORE) online training material.

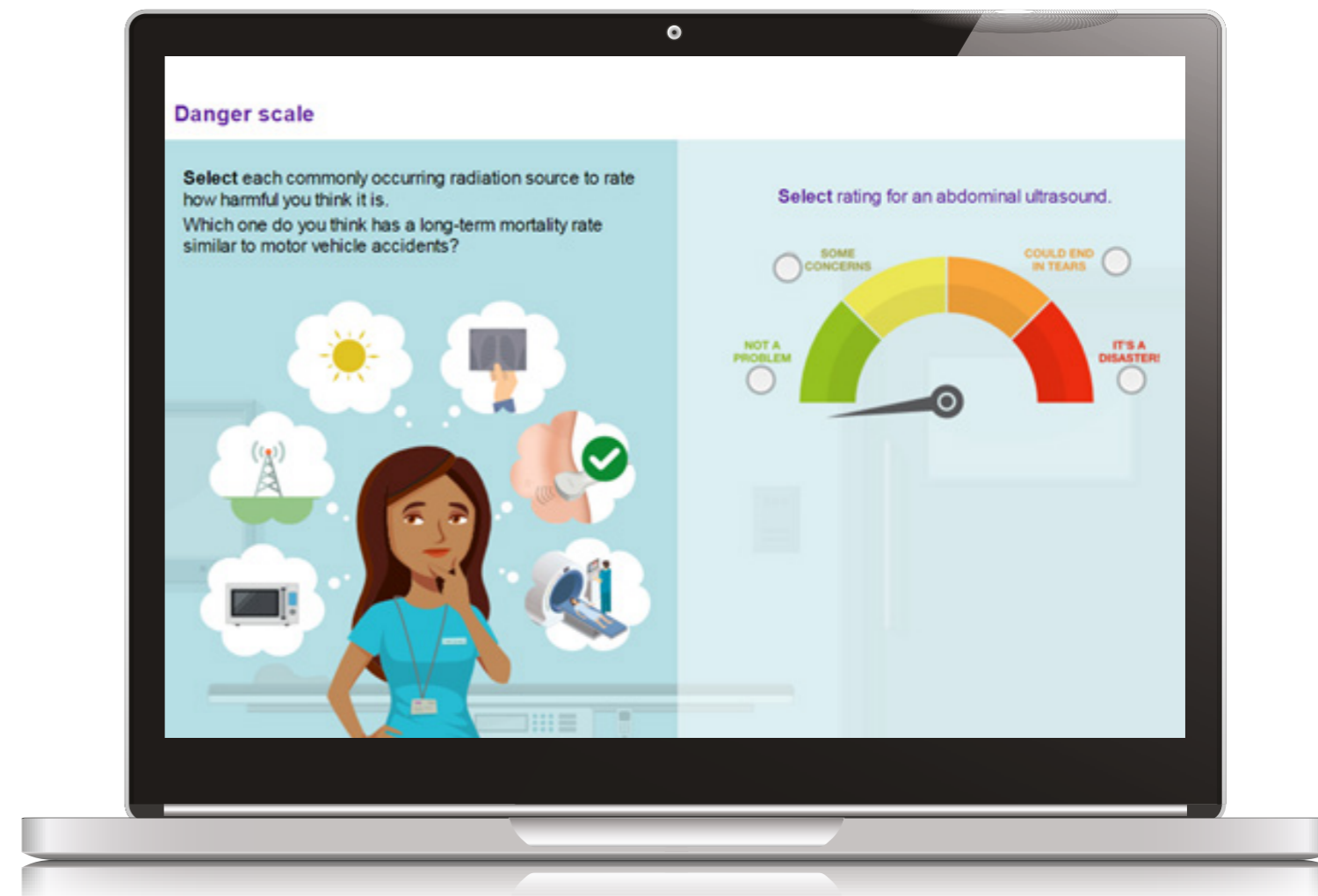
The training is brief – we're not talking of a day, half day or even hours, rather 10–30 minutes. Despite this, it's interactive and uses contemporary adult learning principles that will keep you engaged.

The module is easily tailorable by occupation, the level of involvement with radiation and other considerations. This means for example, that an admin person or a cleaner will get a smaller module covering their issues, while a nurse or physician working in CT will each get different, more comprehensive content.

Please check out [ORE](#) on our website.

ORE is also available in PDF and SCORM versions and it's all free. If you have an RSO or training manager etc. that hasn't seen ORE yet, please pass it onto them. They will thank you.

If you have any queries or feedback, please email alan.mason@arpansa.gov.au or give Alan a ring on 0414 747 447. Thanks!



National Diagnostic Reference Level Service

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