



Australian Government

Australian Radiation Protection  
and Nuclear Safety Agency

2015 Vol. 2

# National Diagnostic Reference Level Service (NDRLS)

## Newsletter

### Welcome

Welcome to the second edition of ARPANSA's NDRLS Newsletter for 2015. This edition covers general information, some end of year housekeeping and changes for 2016.

### Facility Reference Levels and ARPANSA's NDRL Service

From 1 January 2016, facilities that do not have a documented system that compares radiation doses typically administered to a patient (known as FRLs) to the national Diagnostic Reference Levels (DRLs) will not meet the requirements for Medicare funding as required by the Department of Health, Diagnostic Imaging Accreditation Scheme (<http://www.health.gov.au/internet/main/publishing.nsf/Content/diagnosticimaging-accred2>).

As a medical facility it's a good idea to follow mandatory health requirements, especially when they are intended and actually do lead to better outcomes for patients. For those facilities that are comparing and reporting their FRLs to the national Diagnostic Reference Levels – well done. For those that are not yet doing so, now is the time to start; especially as ARPANSA offers a **free** service to make this easy.

There are approximately 900 radiological imaging facilities in Australia with CT scanning capabilities – less than 30 per cent participate in ARPANSA's NDRL Service. In some states the participation rate is in single figures... There is even more scope for improvement with paediatric DRLs, with a single institution dominating. In the case of nuclear medicine, there are approximately 220 departments with about 35 per cent completing the dose survey.

All imaging facilities are required to establish FRLs and to compare their doses to the NDRLS. While it's not mandatory to use ARPANSA's free service, it is a lot easier than doing it individually. In fact it's surprisingly straight forward. You don't have to report on all of your scans, typically only 10 or 20 for a given type of procedure (e.g. chest CT). For this, you then get the ability to compare your doses and if necessary optimise them, helping assure that your patients are receiving optimal care, and you satisfy mandated requirements. You are also making valuable additions to the Australian database and improving national practice.

#### 2015 Data collection close off

**Any surveys started under ARPANSA's free NDRLS have until 3 January 2016 to be completed.** It's good practice **not** to leave it to the last minute – the more that are finalised before the end of the year holiday period, the better. Open surveys with less than 10 patients will not generate an FRL.

See page 3 for DRLs - Facility Reference Level Comparisons

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## Changes to Medicare rebates under the Diagnostic Imaging Accreditation Scheme (DIAS)

It has always been a requirement of the DIAS that facilities seeking access to Medicare rebates comply with states and territories adoption of the requirements set out in ARPANSA's *Code of Practice for Radiation Protection in the Medical Applications of Ionizing Radiation* (RPS 14). However, as of 1 January 2016, new DIAS standards will be implemented that will make compliance with Section 3.1.8 of the code (concerning comparison with national DRLs) an explicit condition of accreditation or reaccreditation. An extract of the new standards is shown below:



### **Standard 3.2 Optimised Radiation Technique Charts Standard**

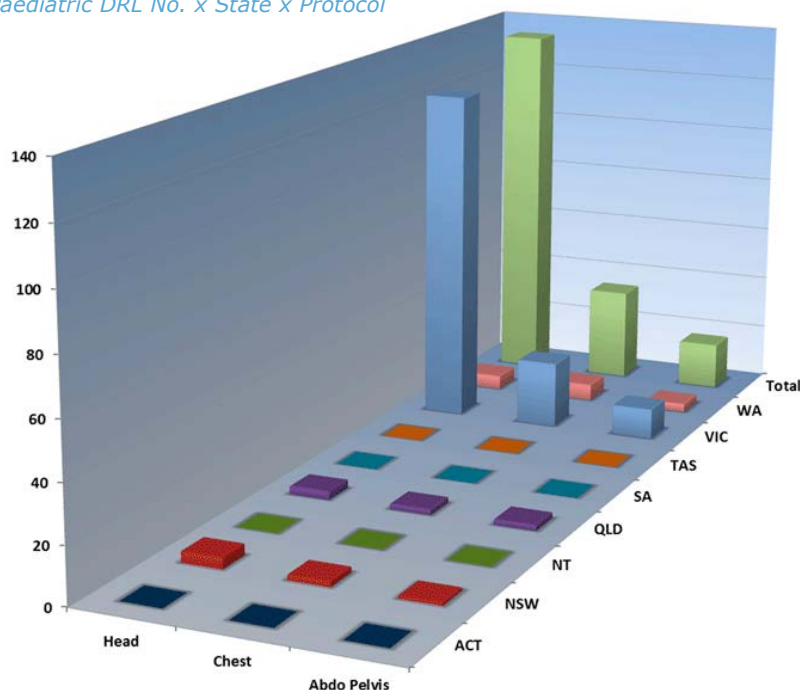
*A diagnostic imaging practice which uses ionising radiation must ensure that patient radiation exposure is kept as low as reasonably achievable (ALARA) by selecting equipment and techniques for diagnostic imaging procedures sufficient to provide the required clinical information.*

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

- a) annually 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.*

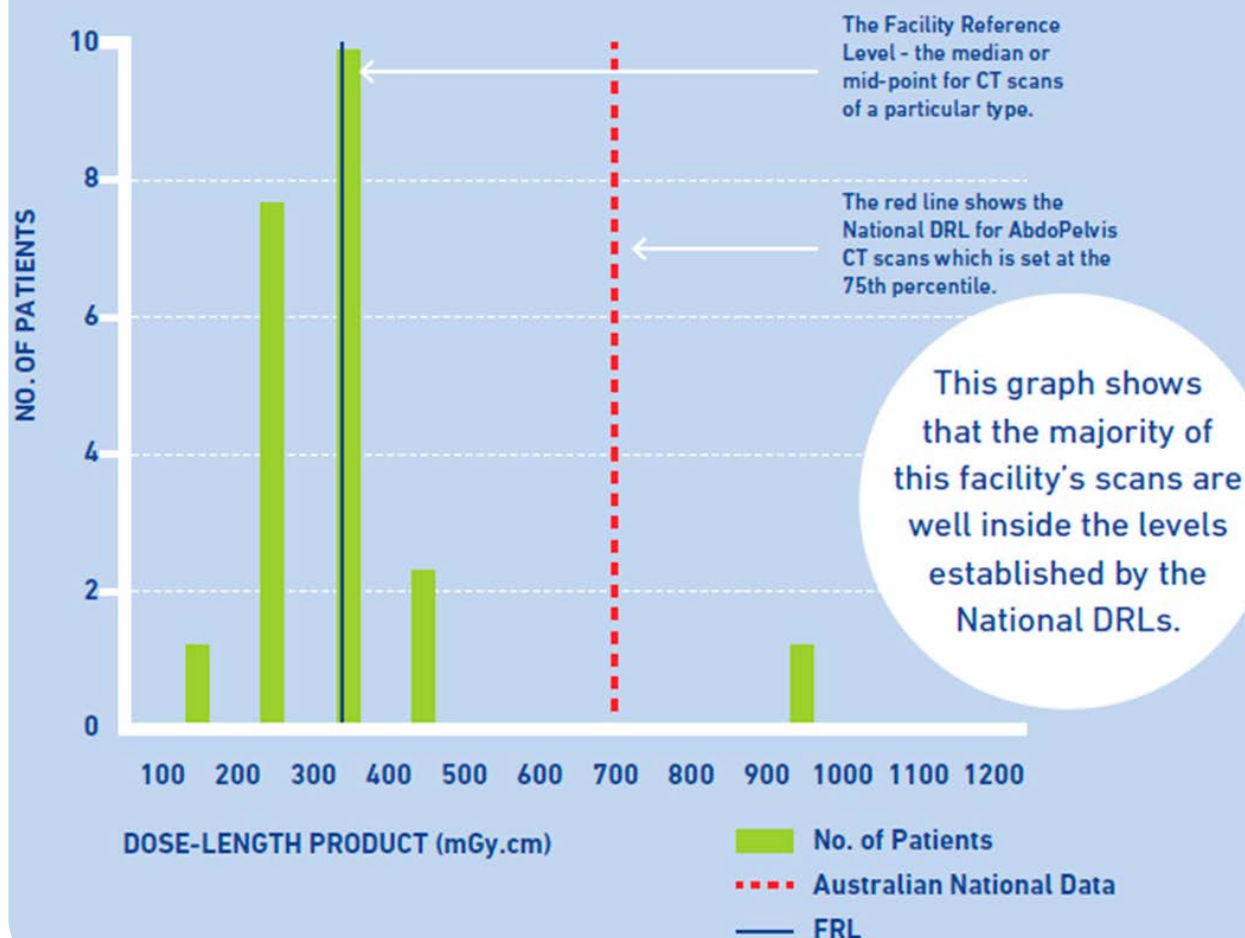
If you're not yet doing so, it's a **very** good idea to establish a program of annual comparison with the DRLs **before** the regulators and auditors require proof. With approximately 30 per cent of facilities due for reaccreditation at the start of 2016, it may pay to start planning.

*Paediatric DRL No. x State x Protocol*



This graph shows the paucity of data on paediatric DRLs from states other than Victoria. While it's understood that not all facilities undertake paediatric scanning, it would be useful if those that do reported their results. This is particularly true given the imminent changes to the DIAS standards! The current data does not reflect national practice and if we don't know what's going on, then we can't compare with international data sets and provide informed guidance.

## DRLs - Facility Reference Level Comparisons



### Image Guided Interventional Procedures (IGIP) Survey

In 2014, ARPANSA launched the IGIP survey. This survey involves recording dose information from 30 patients for each of five common interventional and diagnostic fluoroscopic procedures. Submissions will be accepted until the end of December 2015 and interested facilities are encouraged to [register](#). The survey restarts on 1 January for 2016.

[www.arpansa.gov.au/services/ndrl/igip.cfm](http://www.arpansa.gov.au/services/ndrl/igip.cfm)

### Referral Guidelines – App Available

Using referral guidelines is another way of assuring the appropriate use of ionising radiation and medical imaging.

An app based on Diagnostic Imaging Pathways (DIP) and optimised for iPhone 5, iPhone 6, and iPhone 6 Plus, and also for Android 4.3 and higher, is now freely available. Once downloaded it is fully operational without the need for an internet connection. Access to the internet is required for periodic updates. An intuitive menu structure allows navigation to the suite of pathways, which cover all of the major organ systems and many clinical conditions.

Further information about the app is available from <http://dipapp.info/> (Please note: this is a product of WA Health, not ARPANSA)





## Looking ahead to 2016.....

### Multi-site imaging networks

ARPANSA is making changes to its NDRL database to better deal with multi-site imaging networks. It's expected that these changes will be implemented in the first half of 2016. If you have any queries, please contact Dr Peter Thomas on 03 9433 2295.

### Multi-Detector Computed Tomography (MDCT) update

The current MDCT DRLs were based on 2011 data. These will be reviewed using current data submitted to the NDRL Service and updated in 2016. The new DRLs are expected to be lower than the existing levels indicating the positive influence of iterative reconstruction.

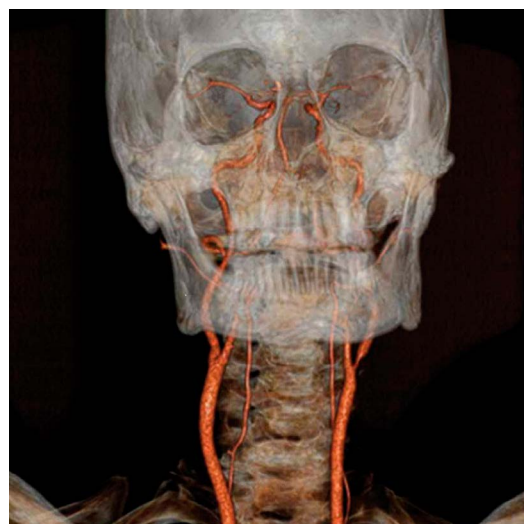
The current Australian Paediatric (baby and child) MDCT DRLs were calculated from data collected by an independent Royal Australian and New Zealand College of Radiologists MDCT survey. These will be updated once sufficient data has been obtained.

### Iterative Reconstruction

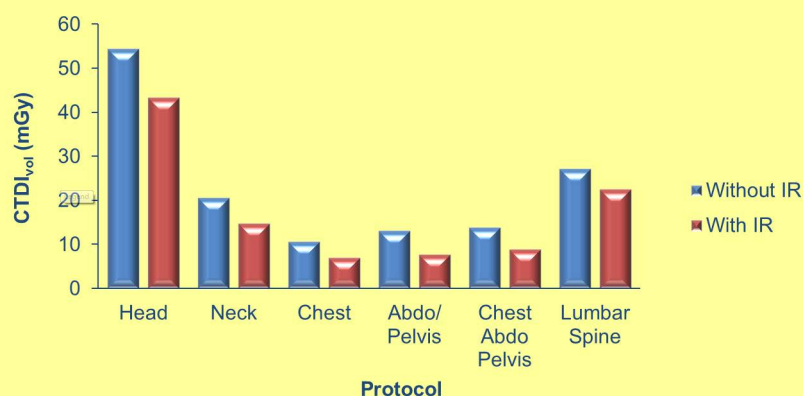
Since April 2013 the use of Iterative Reconstruction (IR), has been included in the parameter settings data collected.

<input type="text"/>	Rotation Time *	<input type="text"/>	<a href="#">Reconstruct</a>
<input type="text"/>	No of Phases *	Please Select ▼	<a href="#">Reconstruct</a>
<input type="text"/>	Helical or Axial *	<input type="radio"/> Helical <input type="radio"/> Axial	<a href="#">Kernel *</a>
<input type="text"/>	Detector Configuration *	<input type="text"/> X	<a href="#">Scan Field of</a>
<input type="text"/>	Iterative Reconstruction *	<input type="radio"/> Yes <input type="radio"/> No	<a href="#">Beam Shaping</a>
<input type="text"/>			<a href="#">Noise Index</a>

Submissions received indicate that IR results in lower doses than protocols that do not use IR. The following graph shows the median of all FRL values calculated for all adult surveys with and without IR submitted during 2013 and 2014. The typical overall reduction in dose concurs with international findings, so if you have the capability but are not yet using IR, then it's worth reviewing your practice.



### Iterative Reconstruction



The median of the FRLs with IR is consistently lower than the median of the FRLs without IR. The dose reduction ranges from approximately 20 to 40 per cent.

## Nuclear Medicine & PET update

Nuclear Medicine DRL surveys commenced in late 2014 and the submission window for Australian facilities has now closed. The table below summarises the facility response from each state and territory. ARPANSA would like to thank all of the facilities that participated in the survey.

State	Estimated number of facilities	Number of participants	Percentage participating
VIC	74	30	41%
NSW	72	29	40%
QLD	37	5	14%
SA	17	9	53%
WA	13	1	8%
TAS	6	3	50%
ACT	4	2	50%
NT	1	0	0%
<b>Total</b>	<b>224</b>	<b>79</b>	<b>53%</b>

Nuclear Medicine guidance documents will be prepared in 2016.

## Mammography update

Mammography data analysis continues – expect an update in 2016.

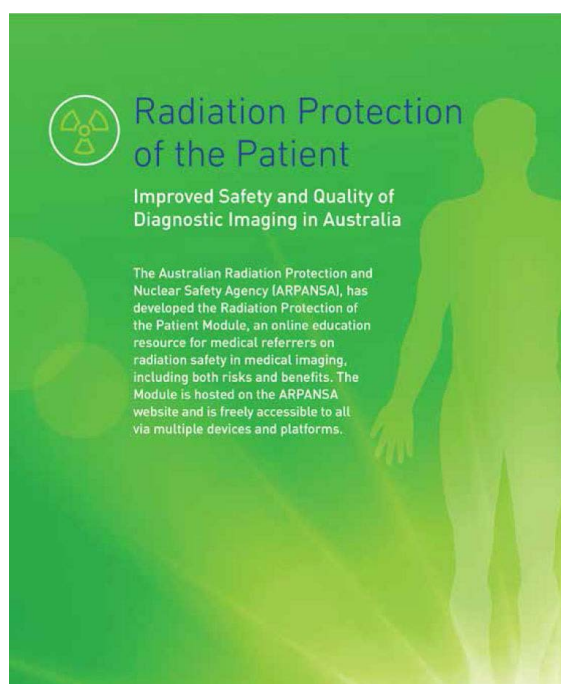
## Radiation Protection of the Patient (RPOP) Project

ARPANSA has launched an online Radiation Protection of the Patient Training Module for improving safety awareness in medical imaging that can be used by referrers and others nationally.

The module is intended to provide assistance to referrers, particularly those that do not always have ready access to radiologists and medical physicists, such as physicians in rural and remote practices, general practitioners and other allied medical practitioners.

If you have any queries please contact Alan Mason on 03 9433 2429 or [alan.mason@arpansa.gov.au](mailto:alan.mason@arpansa.gov.au).

[www.arpansa.gov.au/rpop/module](http://www.arpansa.gov.au/rpop/module)



## FAQs

### What is the NDRLS?

The National Diagnostic Reference Level Service, or NDRLS, is a free web based service run by the Australian Radiation Protection and Nuclear Safety Agency, ARPANSA, which allows facilities nationwide to compare their doses with the Australian National Diagnostic Reference Levels.

Currently the web based service allows for comparison of doses for Multi Detector Computed Tomography (MDCT), only. Once registered for the service, facilities can log in and complete individual dose surveys for specific protocols and age groups.

In 2014 surveys were also launched to collect data to review Diagnostic Reference Levels, DRLs, for Nuclear Medicine and PET and establish DRLs for Image Guided Interventional Procedures, IGIP. These surveys are being conducted in the form of Excel spreadsheets which are distributed and returned via email. More information on these surveys can be found on pages 3 and 5 of this newsletter.

### What are the Australian DRLs?

Australia currently has DRLs established for MDCT. DRL values for six adult and three paediatric MDCT protocols were established in 2012 and are published on the ARPANSA website; (tables are also provided on the following page of this newsletter). The DRL values are defined in terms of Dose Length Product (DLP, mGy.cm) and Volume Computed Tomography Dose Index ( $CTDI_{vol}$ , mGy).

The current Nuclear Medicine and PET and IGIP surveys will collect data to establish DRLs for some procedures in these modalities.

### How were the Australian DRLs calculated?

The Australian adult DRLs for MDCT were calculated by taking the 75th percentile of the spread of all Facility Reference Levels, FRLs, generated in the first year of the service. An FRL is the median dose value from an individual compliant survey. (A compliant survey is one with a minimum of 10 patient data points).

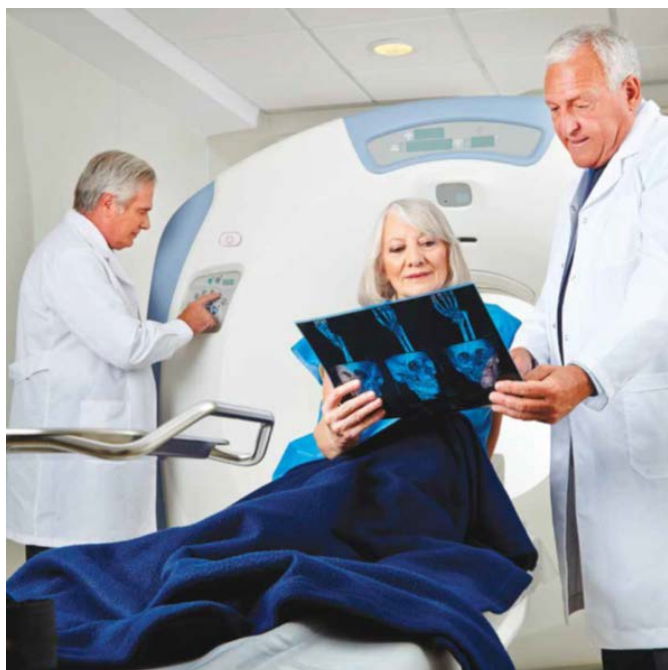
### What does it mean if the doses at my facility are above the Australian DRLs?

By definition we expect that 25% of facilities will have doses that are above the Australian DRLs. It is important to remember that DRLs are not strict dose limits; they represent a dose level which is achievable by 75% of facilities.

If you submit a survey and your FRL is above the Australian DRL and you do not have clinical justification for exceeding the DRL, you should review your protocol and consider whether it can be further optimised.

More information on the DRLs can be found on the ARPANSA [website](http://www.arpansa.gov.au/services/ndrl/).

**[www.arpansa.gov.au/services/ndrl/](http://www.arpansa.gov.au/services/ndrl/)**



### Australian Adult (15+ yrs) MDCT DRLs

Protocol	DLP (mGy.cm)	CTDI <sub>vol</sub> (mGy)
Head	1000	60
Neck	600	30
Chest	450	15
AbdoPelvis	700	15
ChestAbdoPelvis	1200	30
Lumbar Spine	900	40

### Australian Child (5-14 yrs) MDCT DRLs

Protocol	DLP (mGy.cm)	CTDI <sub>vol</sub> (mGy)
Head	600	35
Chest	110	5
AbdoPelvis	390	10

### Australian Baby/Infant (0-4 yrs) MDCT DRLs

Protocol	DLP (mGy.cm)	CTDI <sub>vol</sub> (mGy)
Head	470	30
Chest	60	2
AbdoPelvis	170	7



## Radiation Protection of the Medical Practitioner (RPOMP) Project

Occupational radiation protection training is needed for all staff working in medical facilities where ionising radiation is used. ARPANSA is working with a number of peak bodies, governmental and educational organisations and specialists to create Radiation Protection of the Medical Practitioner (RPOMP) educational material for inducting staff into these facilities and for ongoing training of existing staff.

There is some excellent training material 'out there'; however the quality and availability varies considerably. Some of the large teaching hospitals with dedicated medical physicists and fully trained Workplace Health and Safety staff have professional and sophisticated resources, while some smaller facilities have minimal and/or outdated information. ARPANSA is proposing 'tiered' modules that will make the fundamental requirements available to all facilities and promote consistent and up-to-date information. The tiered approach acknowledges that the information required for professional medical staff with ongoing regular contact (e.g. physicians and nurses in nuclear medicine rooms) will have different needs to cleaners or administrators who may have minimal or incidental contact with ionising radiation.

If you have any queries, suggestions or know of people with particular interest and expertise that ARPANSA could talk to, please contact Alan Mason on 03 9433 2429 or [alan.mason@arpansa.gov.au](mailto:alan.mason@arpansa.gov.au).

## A final reminder on NDRL surveys...

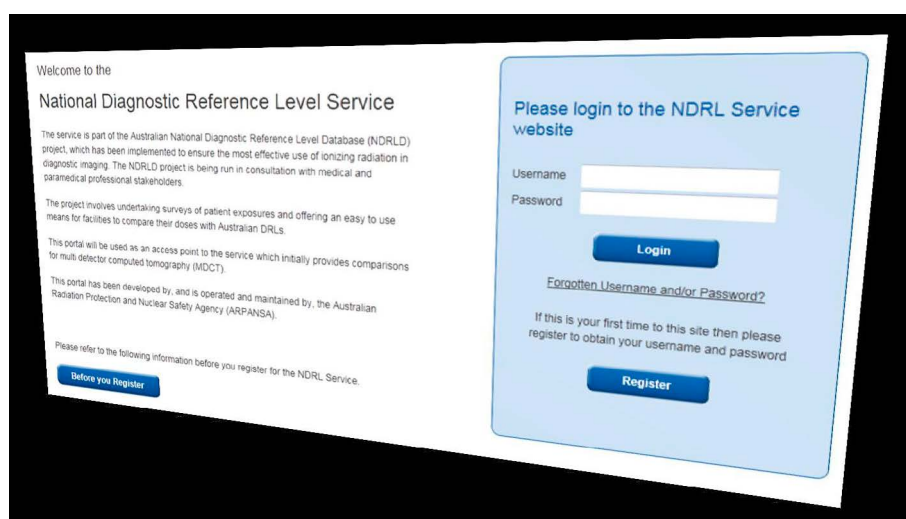
Completing the NDRLS surveys facilitates compliance with the mandatory requirements of ARPANSA's medical code (RPS 14) and compliance is now a requirement for continued facility accreditation and the ability to receive Medicare rebates.

Any surveys started this year have until 3 January 2016 to be completed.

If you have any queries, please contact us on **1800 033 972** or [ndrld@arpansa.gov.au](mailto:ndrld@arpansa.gov.au)

Here's a direct link to the Login page:

**<https://ndrld.arpansa.gov.au/>**



## Contact info

Have a query? Email us at: [ndrld@arpansa.gov.au](mailto:ndrld@arpansa.gov.au)

or ring on: **1800 033 972**