Development of Queensland Health CT Local Diagnostic Reference Levels

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Aims

To determine the typical patient radiation exposure from Computed Tomography (CT) examinations within Queensland Health (QH). The data is provided for benchmarking purposes and to inform decisions regarding optimisation of CT protocols.

Materials and Methods

All QH CT sites were invited to provide local CT patient dose data to BTS during the period 2020-2024 inclusive. Data was limited to the median Volume CT Dose Index ($CTDI_{vol}$) and Dose Length Product (DLP) for each ARPANSA specified protocol[1] and was collated (in a spreadsheet) on a per-scanner basis. A script was developed to provide a user interface facilitating extraction of the data and presentation of scatter plots of DLP vs $CTDI_{vol}$ along with scanner-specific dosimetric information on a per protocol basis. The plots include display of both Local Diagnostic Reference Levels (LDRLs) generated from this data set and the National Diagnostic Reference Levels (NDRLs)[1].

Results

Complying data associated with 53 CT scanners was received. Scatter plots showing typical dosimetry across QH CT scanners were produced and have been shared with participating sites. LDRLs for each protocol are consistently below the associated NDRL. Individual data points of interest that are likely to generate a discussion around optimisation are highlighted in the report. The report proposes a data update and re-generation of LDRLs every 2 to 3 years.

Conclusion

A process for collation and display/sharing of QH CT patient dose data including LDRLs has been established.

References

1. Current Australian national diagnostic reference levels for multi detector computed tomography | ARPANSA
2. ICRP, 2017. Diagnostic Reference Levels in Medical Imaging. ICRP Publication 135. Ann. ICRP 46(1).