

Recommendations for cross-sectional imaging in cancer management, Second edition

Appendix

Faculty of Clinical Radiology

Appendix

National reference values of $CTDI_{vol}$

National reference doses represent a practical tool for facilitating the optimisation of patient protection.¹ They are specified for CT in terms of two special dose quantities: volume weighted CT dose index ($CTDI_{vol}$), which represents the average dose to the scanned volume of a standard CT dosimetry phantom for a particular scan sequence; and dose-length product (DLP), which takes account of the volume of irradiation so as to represent the total energy imparted by the examination. National reference values for these doses are based on the third quartiles of the distributions observed in periodic national reviews of practice and, as such, provide a simple yardstick for identifying centres where levels of dose are unusually high. Any technique for which doses are above the relevant national reference dose should be critically reviewed and either clinically justified or revised so as to reduce patient doses without loss of clinical efficacy.

National reference doses for $CTDI_{vol}$ published following the 2003 UK review of CT are summarised in Tables 1 and 2 for examinations on adult and paediatric patients respectively.¹

Separate values are shown for examinations on adults with multi-slice (MDCT) and single-slice (SSCT) CT scanners, although general values are given for paediatric CT; the doses for examinations of the adult head and children relate to the 16 cm diameter CT dosimetry phantom, whereas those of the adult trunk relate to the 32 cm diameter CT dosimetry phantom. Such national reference doses will be updated periodically on the basis of further timely national reviews of CT practice. Whereas the national reference values for $CTDI_{vol}$ in Tables 1 and 2 can be applied to the imaging tasks in this document, there is presently a lack of appropriate values of DLP for the general scanning techniques described.

Values of $CTDI_{vol}$ should be assessed for each CT protocol, from the scanner display, where available and validated, or by calculation.¹ In the first instance, local levels should normally be below any national reference dose relevant to the scan region. However, since such reference values are clearly not optimum doses, further dose reductions should always be pursued, where clinically compatible, in close collaboration with medical physics experts.

Table 1. UK national reference doses (2003) for single slice (SSCT) and multislice (MSCT) CT on adult patients¹

Scan region	2003 National reference value for $CTDI_{vol}$ (mGy)	
	SSCT	MSCT
Head (posterior fossa)	65	100
Head (cerebrum)	55	65
Thorax	10	13
Abdomen or pelvis	13	14

Table 2. General UK national reference doses (2003) for CT on paediatric patients¹

Patient group	Scan region	2003 National reference value for CTDI _{vol} (mGy)
0–1 year old	Head (posterior fossa)	35
	Head (cerebrum)	30
	Thorax	12
5 year old	Head (posterior fossa)	50
	Head (cerebrum)	45
	Thorax	13
10 year old	Head (posterior fossa)	65
	Head (cerebrum)	50
	Thorax	20

Reference

1. Shrimpton PC, Hillier MC, Lewis MA, Dunn M. *Doses from computed tomography(CT) examinations in the UK – 2003 review*. Chilton: NRPB, 2005.
http://www.hpa.org.uk/webc/HPAwebFile/HPAweb_C/1194947420292

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The Royal College of Radiologists
63 Lincoln's Inn Fields, London WC2A 3JW
Tel: +44 (0)20 7405 1282
Email: enquiries@rcr.ac.uk **www.rcr.ac.uk**



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