Imaging Performance Assessment of CT Scanners

Comparison of the Imaging Performance of CT Scanners, Issue 11

Comparison data is presented on the following scanners :

Elscint Twin Flash
IGE HiSpeed Advantage
IGE ProSpeed SX Power HiLight
IGE ProSpeed Xenon
IGE Sytec SRi
Philips AV Expander
Philips SR 7000
Picker PQ 2000
Siemens Somatom AR/HP
Siemens Somatom Plus 4 Lightning
Siemens Somatom Plus 4 Xenon
Toshiba Xpress HS1

Data is obtained from the individual assessments and reports

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Scanners Included in the Comparison

Manufacturer	Model	Date of evaluation	Current models to which imaging performance relates
Elscint	CT Twin Flash	March 1996	Twin series
IGE	HiSpeed Advantage	Sept 1992	CR/i head and CT/i body without SmartBeam
	ProSpeed SX Power Hilight	Feb 1996	ProSpeed series with solid state detectors
	ProSpeed Xenon	Oct 1992	ProSpeed series with xenon detectors
	Sytec Sri	Dec 1994	Sytec series and Synergy
Philips	AV Expander	Dec 1997	AV-PS
	SR 7000	Oct 1992	AV Performance
Picker	PQ 2000	Jan 1995	All Picker **except** those models appended with -S or -SV
Siemens	Somatom AR/HP	June 1994	AR Star
	Somatom Plus 4 Lightning	June 1997	Plus 4 series with solid state detectors
	Somatom Plus 4 Xenon	July 1997	Plus 4 series with xenon detectors
Toshiba	Xpress HS1	Nov 1994	XVision series

■ Issue 11

The last published version of the CT Comparison Report was Issue 6, in 1989. The intermediate issues have been collated for internal use, or for individual hospitals only. Now, with issue 11, the comparison report is published for wider use again. Subsequent issues will be produced as more scanners are evaluated.

Scanners are only included which are, or are related to in terms of image quality and dose, models that are currently on the market in the UK.

Notes

■ Clinical scan parameters

For each of the standard clinical scans, one set of data is presented for each scanner using the manufacturer's recommended scan parameters. Where possible, a standard slice width is used to assist comparison. All standard head scans use a 5 mm slice width and all standard body scans use a 10 mm slice width.

The clinical scan data does not necessarily indicate the limits of the scanner. At the ImPACT assessment, the scanner is tested to its limits, particularly with respect to resolution. Other modes of operation are also investigated in order to establish trends. The results can be found in the full data tables which are published as appendices in the individual scanner reports.

The methods of evaluation, as well as the clinical scan criteria, are described in the ImPACT MDA Report entitled 'Type Testing of CT Scanners: Methods and Methodology for Assessing Imaging Performance and Dosimetry'. This is published in March 1998 as report number MDA/98/25 (formerly referenced as MDA/95/43 in some scanner reports).

■ Presentation of data

In tables 1-5, the scanner with the best performance for the clinical scan type in question is placed at the top of the table and the remaining scanners placed in order of merit. Scanners are ordered according to the most important imaging parameter (outlined in bold) for the given scan type.

For standard scans, the Q-factor is the parameter used for comparison, since it combines measurements of noise, resolution and dose in one figure to give an overall indication of the image quality and dose efficiency of the scanner.

The low noise scans do not necessarily show the limit of low noise achievable, but rather demonstrate the relationship between image quality and dose associated with a low noise scan. Therefore, the Q-factor is also used as the comparison parameter for this scan type.

The 10% MTF level is used for comparing high resolution scans. This value is given both as spatial frequency in cycles/cm and as object size in mm. A geometric efficiency value is given for the high resolution scans indicating the extent of post patient collimation.

■ The dose efficiency factor, Q

Statistical noise, spatial resolution and slice width are the fundamental parameters which describe the amount of object information retrievable from an image, or its image quality. X-ray dose can be regarded as a cost of this information. In general, it is meaningless to quote any one of these measurements without reference to the others. The Q-value incorporates the dose, noise, spatial resolution and slice width into one number. This figure has been derived from a relationship between image quality and dose received.

A dose efficiency factor has a fundamental meaning, in that a dose efficient scanner will produce good resolution at minimum dose and noise. However that can take a number of forms depending on how the various parameters are measured and quoted.

The Q value used in this comparison report is modified from the previous value calculated by ImPACT. The Q-factor, Q_1, used in this report differs in three respects from the form of Q formerly used.

Q_1 is defined as follows:

$$Q_1 = \sqrt{\frac{f_{av}^{\ 3}}{\sigma^2 z D_w}} \qquad \textbf{Equation 1}$$

where:

σ = % noise

This remains unchanged from the previous form of the Q equation.

f_{av}= ($f_{50\%}$+ $f_{10\%}$)/ 2

Where $f_{50\%}$ is the 50% MTF value and $f_{10\%}$ is the 10% MTF value. $f_{10\%}$ has been incorporated into the formula in order to give a closer approximation to the resolution response over all frequencies.

z = the FWHM of the imaged slice (z-sensitivity)

This has replaced the nominal slice width, since the effect on image quality from the thickness of the slice is from the imaged, as opposed to the nominal, slice width. This is especially relevant in spiral scanning since the imaged slice thickness can be quite different from the nominal slice thickness, depending on both pitch and interpolation algorithm.

D_w= $CTDI_w$ = 1/3 $CTDI_{centre}$ + 2/3 $CTDI_{periphery}$

This is measured in standard perspex phantoms. It is more representative of the overall cross-sectional dose than the multi-slice surface dose used in the previous form of Q.

The Q-factor is in part empirical and it should be used with caution. It is not an absolute figure. Its derivation relies on assumptions of the shape of convolution filter used. Comparisons between scanners will be more reliable when comparing scans reconstructed with similar convolution filters. It is of most importance when considering the standard scans for head or body. The uncertainty in this value is up to about +/-15%, with a conservative estimate of +/- 10%.

Clinical Comparison Tables

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■ Table 1. Standard Head

Table 1 - Standard Head Scans (5mm)														
SCANNER		**kVp**	**mAs**	**Scan time (sec)**	**Nominal slice (mm)**	**FOV (mm)**	**Matrix**	**Conv. filter**	**$CTDI_W$ (mGy)**	**z-sensitivity (mm)**	**Noise %**	**MTF 50% (c/cm)**	**MTF 10% (c/cm)**	**Q_1 +/- 10%**
IGE ProSpeed SX P.H.	ss	120	250	1.0	5	230	512	Std	50	4.8	0.32	3.3	6.2	6.6
IGE HiSpeed Advantage(1)	ss	140	340	1.0	5	250	512	Std/I	56	5.0	0.30	3.4	6.2	6.6
Siemens AR/HP(5)	xe	130	210	3.0	5	210	512	AH4	46	4.6	0.31	3.3	5.6	6.6
Siemens Plus 4 Lightning	ss	120	300	1.5	5	250	512	AH40	36	4.9	0.34	3.4	5.3	6.4
Elscint Twin Flash(2)	ss	120	300	1.0	5	227	512	C	36	4.6	0.44	3.7	6.1	6.0
Philips AV Expander	ss	120	350	2.0	5	250	512	1	40	4.7	0.38	3.2	6.0	6.0
Picker PQ 2000(4)	ss	130	300	1.5	5	240	512	P F(Std)	44	4.8	0.49	4.0	7.3	6.0
Siemens Plus 4 Xenon(3)	xe	140	309	1.5	5	250	512	AH40	55	4.9	0.30	3.4	5.4	6.0
IGE ProSpeed Xenon	xe	120	300	1.0	5	250	512	Std	60	4.8	0.38	3.6	6.2	5.3
Toshiba Xpress HS1	xe	120	300	1.5	5	240	512	FC23	49	4.9	0.40	3.4	5.8	5.0
Philips SR 7000	xe	120	400	2.0	5	250	320	1	47	4.7	0.58	4.2	6.9	4.8
IGE Sytec SRi	xe	120	300	3.0	5	250	512	Std	62	4.6	0.36	3.0	5.6	4.6
MEAN									48	4.8	0.38	3.5	6.1	5.8

(1) CTDI values derived from measurements on HiSpeed CT/i.

(2) Additional parameters for Twin Flash: Dual beam, 360^0 scan, High sampling density, Standard resolution mode

(3) CTDI values and z-sensitivity values from Plus 4 Lightning.

Dose measured in air found to be the same on both scanners. Spiral z-sensitivies found to be within 4% on both scanners.

(4) Convolution filter: Posterior Fossa (Standard)

(5) A question is raised on this data as the Q value is not expected to be higher than that on the Siemens Plus 4.

■ Table 2. Low Noise Head

Table 2 - Standard Brain Scans -(Low Noise Head) 10mm slice														
SCANNER		**kVp**	**mAs**	**Scan time (sec)**	**Nominal slice (mm)**	**FOV (mm)**	**Matrix**	**Conv. filter**	**$CTDI_W$ (mGy)**	**z-sensitivity (mm)**	**Noise %**	**MTF 50% (c/cm)**	**MTF 10% (c/cm)**	**Q_1 +/-10%**
Picker PQ 2000[1]	ss	130	300	2.0	10	240	512	AB(Smth)	46	10.1	0.20	3.1	5.8	6.9
IGE HiSpeed Advantage[2]	ss	120	340	1.0	10	250	512	Soft/I	40	10.0	0.21	3.1	5.6	6.8
Siemens Plus 4 Lightning	ss	140	257	1.5	10	250	512	AH40	45	9.4	0.21	3.4	5.3	6.7
Siemens AR/HP	xe	130	210	3.0	10	210	512	AH3	48	9.4	0.20	3.1	5.3	6.4
IGE ProSpeed SX P. H.	ss	120	300	1.0	10	230	512	Soft	58	9.6	0.19	3.0	5.6	6.3
Siemens Plus 4 Xenon[3]	xe	120	300	1.5	10	250	512	AH40	36	9.4	0.26	3.4	5.3	6.0
Philips AV Expander	ss	120	250	2.0	10	250	512	1	29	10.0	0.31	3.2	6.0	5.9
IGE ProSpeed Xenon	xe	120	260	2.0	10	250	512	Soft Tis.	50	9.4	0.22	3.1	5.2	5.6
Elscint Twin Flash[4]	ss	120	600	2.0	10	227	512	EB	66	9.4	0.18	2.8	5.1	5.6
IGE Sytec SRi	xe	120	260	2.0	10	250	512	Soft	54	9.7	0.19	2.6	4.8	5.2
Philips SR 7000	xe	120	400	2.0	10	250	320	0	48	9.7	0.30	3.3	6.2	5.1
Toshiba Xpress HS1	xe	120	300	1.5	10	240	512	FC23	49	9.8	0.32	3.4	5.8	4.5
MEAN									47	9.7	0.23	3.1	5.5	5.9

(1) Convolution filter: Adult Brain (Smooth)

(2) CTDI values derived from measurements on HiSpeed CT/i

(3) CTDI values from Plus 4 Lightning. Dose measured in air found to be the same on both scanners.

(4) Additional parameters for Twin Flash: Dual beam, 360^0 scan, High sampling density, Standard resolution mode

■ Table 3a. High Resolution Head ; > 1.5 mm slice

Table 3A - High Resolution Head Scans (>1.5 mm)															
SCANNER		**kVp**	**mAs**	**Scan time (sec)**	**Nominal slice (mm)**	**FOV (mm)**	**Matrix**	**Conv. filter**	**$CTDI_W$ (mGy)**	**z-sensitivity (mm)**	**Noise %**	**MTF 50% (c/cm)**	**MTF 10% (c/cm)**	**10% MTF as mm**	**Q_1**
Picker PQ 2000[1]	ss	130	250	2.0	1.5	120	512	I E(Sharp)	35	1.5	5.97	10.3	15.4	0.32	3.4
Philips AV Expander	ss	120	300	4.0	2.0	120	512	2H	20	2.1	8.92	10.9	15.3	0.33	2.6
Siemens Plus 4 Lightning	ss	140	167	1.5	2.0	120	512	AH92	27	1.8	6.04	9.4	13.5	0.37	2.9
Siemens Plus 4 Xenon[2]	xe	140	167	1.5	2.0	120	512	AH92	27	1.8	6.31	8.7	13.1	0.38	2.6
Toshiba Xpress HS1	xe	130	400	2.0	2.0	120	512	FC80	101	1.7	9.47	8.6	13.2	0.38	0.9
IGE ProSpeed SX P.H.	ss	120	80	1.0	3.0	120	512	Edge/E3	15	2.8	6.17	9.6	12.7	0.39	2.9
IGE HiSpeed Advantage[3]	ss	120	360	2.0	3.0	120	512	Edge	44	3.1	3.76	10.0	12.6	0.40	2.7
Philips SR 7000	xe	120	400	4.0	1.5	119	512	2HR	44	1.4	9.26	9.2	12.5	0.40	1.6
IGE ProSpeed Xenon	xe	120	160	1.0	3.0	120	512	Edge	32	3.0	2.34	6.8	11.4	0.44	3.8
Siemens AR/HP	xe	130	150	3.0	2.0	150	512	AH9	31	1.8	6.29	7.7	9.9	0.51	1.7
Elscint Twin Flash[4]	ss	120	440	2.0	2.5	152	768	D	57	2.2	2.20	7.3	9.4	0.53	3.1
IGE Sytec SRi	xe	120	160	2.0	3.0	120	512	Edge	34	2.5	2.28	4.8	9.2	0.54	2.8
MEAN									39	2.1	5.75	8.6	12.4	0.42	2.6

(1) Convolution filter: Inner Ear (Sharp)

(2) CTDI values from Plus 4 Lightning.

(3) CTDI values measured on HiSpeed CT/i

(4) Additional parameters for Twin Flash: Dual beam, 360^0scan, High sampling density, High resolution mode.

■ Table 3b. High Resolution Head ; < 1.5 mm slice

Table 3B - High Resolution Head Scans (<1.5 mm)															
SCANNER		**kVp**	**mAs**	**Scan time (sec)**	**Nominal slice (mm)**	**FOV (mm)**	**Matrix**	**Conv. filter**	**$CTDI_W$ (mGy)**	**z-sensitivity (mm)**	**Noise %**	**MTF 50% (c/cm)**	**MTF 10% (c/cm)**	**10% MTF as mm**	**Q_1**
Elscint Twin Flash[(1)]	ss	120	440	2.0	1.0	152	768	E	84	0.9	8.55	7.7	19.5	0.26	2.1
Picker PQ 2000[(2)]	ss	130	250	2.0	1.5	120	512	IE(Sharp)	35	1.5	5.97	10.3	15.4	0.32	3.4
Philips SR 7000	xe	120	400	4.0	1.0	119	512	1HR	142	0.6	7.54	7.9	13.9	0.36	1.6
Siemens Plus 4 Lightning	ss	140	167	1.5	1.0	120	512	AH92	55	1.0	7.89	9.4	13.5	0.37	2.1
Philips AV Expander	ss	120	400	4.0	1.0	120	512	2H	52	1.4	7.56	9.3	13.5	0.37	1.9
Toshiba Xpress HS1	xe	130	400	2.0	1.0	120	512	FC80	202	1.0	12.51	8.6	13.2	0.38	0.6
IGE ProSpeed SX P.H.	ss	120	100	1.0	1.0	120	512	Edge/E3	25	1.2	8.64	9.6	12.7	0.39	2.5
IGE HiSpeed Advantage[(3)]	ss	120	400	2.0	1.0	120	512	Edge	50	1.6	5.94	10.0	12.6	0.40	2.3
IGE ProSpeed Xenon	xe	120	200	1.0	1.0	120	512	Edge	44	1.6	3.23	6.8	11.4	0.44	3.2
IGE Sytec SRi	xe	120	200	2.0	1.0	120	512	Edge/E3	52	1.1	6.99	7.5	10.8	0.46	1.7
Siemens AR-HP	xe	130	150	3.0	1.0	150	512	AH9	63	0.9	8.78	7.7	9.9	0.51	1.3
MEAN									73	1.2	7.60	8.6	13.3	0.39	2.1

(1) Additional parameters for Twin Flash: Dual beam, 360^0scan, Very High sampling density, Ultra High resolution mode

(2) Convolution filter: Inner Ear (Sharp)

(3) Z-sensitivity measured using broad focus. This scan normally uses fine focus, which would result in lower z-sensitivity and therefore higher Q_1

CTDI measured on HiSpeed CT/i

■ Table 3c. High Resolution Head ; Geometrical Efficiency

Table 3C - Geometric Efficiency for High Resolution Head Scans (<1.5 mm)					
SCANNER	**Nominal slice (mm)**	**Pre-patient collimation**	**Dose profile (mm)**	**z-sensitivity (mm)**	**Geometric efficiency**
Elscint Twin Flash(1)	1.0	Y	1.8	0.9	0.5
Picker PQ 2000(2)	1.5	Y	1.5	1.5	1.0
Philips SR 7000	1.0	N	3.1	0.6	0.2
Siemens Plus 4 Lightning	1.0	N	2.0	1.0	0.5
Philips AV-E1	1.0	Y	1.4	1.4	1.0
Toshiba Xpress HS1	1.0	N	2.8	1.0	0.4
IGE ProSpeed SX P.H.	1.0	Y	1.4	1.2	0.9
IGE HiSpeed Advantage(3)	1.0	Y	1.2	1.6	1.3
IGE ProSpeed Xenon(4)	1.0	Y	1.7	1.6	0.9
IGE Sytec SRi	1.0	Y	1.3	1.1	0.8
Siemens AR-HP	1.0	N	1.9	0.9	0.5

(1) Additional parameters for Twin Flash: Dual beam, 360^0scan, Very High sampling density, Ultra High resolution mode
Dose profile for Twin Flash given as half the measured fwhm as two slices are irradiated simultaneously.

(2) The Picker PQ 5000V now has a 1 mm slice

(3) The dose profile is measured with a fine focus, however the z-sensitivity given is measured using broad focus.
The z-sensitivity measured with the broad focus will be wider than that with the fine focus.

(4) Dose profile geometrically extrapolated from head phantom surface profile and corrected for scatter.

■ Table 4. Standard Body

Table 4 - Standard Body Scans

SCANNER		kVp	mAs	Scan time (sec)	Nominal slice (mm)	FOV (mm)	Matrix	Conv. filter	$CTDI_W$ (mGy)	z-sensitivity (mm)	Noise %	MTF 50% (c/cm)	MTF 10% (c/cm)	Q_{mod} +/-10%
IGE ProSpeed SX P.H.(1)	ss	120	200	1.00	10	380	512	Std/M	17	9.6	0.86	3.2	5.5	2.6
Philips AV Expander	ss	120	200	1.00	10	380	512	3	11	10.0	1.08	2.7	5.3	2.2
IGE HiSpeed Advantage(2)	ss	120	340	1.00	10	380	512	Std/P	18	10.0	1.22	3.5	6.1	2.1
Siemens Plus 4 Lightning	ss	120	150	0.75	10	350	512	AB40	10	9.4	1.62	3.5	5.9	2.0
Siemens Plus 4 Xenon(3)	xe	120	150	0.75	10	350	512	AB40	10	9.4	1.81	3.7	6.3	2.0
IGE ProSpeed Xenon	xe	120	300	1.00	10	380	512	Std	26	9.4	1.01	3.3	5.9	2.0
Elscint Twin Flash(4)	ss	120	250	1.00	10	358	512	C	13	9.4	1.52	3.4	5.8	1.9
IGE Sytec SRi	xe	120	300	3.00	10	380	512	Std/M	28	9.7	0.86	3.0	5.3	1.9
Siemens AR-HP	xe	130	190	1.90	10	350	512	AB3	22	9.4	1.17	3.7	5.2	1.8
Picker PQ 2000(5)	ss	130	200	1.00	10	380	512	MA (Std)	22	10.1	1.41	3.2	6.5	1.6
Toshiba Xpress HS1	xe	120	300	1.00	10	380	512	FC12	19	9.8	1.23	3.2	5.1	1.6
Philips SR 7000	xe	120	350	1.00	10	380	512	4	21	9.7	1.72	3.7	6.4	1.5
MEAN									18	9.7	1.29	3.3	5.8	1.9

(1) With "Advanced Noise Reduction "

(2) CTDI values derived from measurements on HiSpeed CT/i (without SmartBeam)

(3) CTDI values measured on Plus 4 Lightning

(4) Additional parameters for Twin Flash: Dual beam, 403^0 scan, High sampling density, Standard resolution mode

(5) Convolution filter: Medium Abdomen (Standard)

■ Table 5. Helical Body

Table 5 - Helical Body Scans Pitch 1															
SCANNER		**kVp**	**mAs per rev**	**Scan time (sec/rev)**	**Nom slice (mm)**	**Interp. alg.**	**FOV (mm)**	**Mat.**	**Conv. filter**	**$CTDI_W$ (mGy)**	**z-sensitivity (mm)**	**Noise %**	**MTF 50% (c/cm)**	**MTF 10% (c/cm)**	**Q_1 +/-10%**
Elscint Twin Flash[1]	ss	120	250	1.00	5	360LI	358	512	C	12	6.3	1.73	3.3	6.0	2.1
IGE HiSpeed Advantage[2]	ss	120	340	1.00	10	180LI	380	512	Std (M)	18	9.8	1.25	3.5	6.1	2.0
IGE ProSpeed SX P.H.	ss	120	200	1.0	10	180LI	380	512	Std	17	10.4	0.98	3.0	5.3	2.0
Philips AV Expander	ss	120	200	1.0	10	180LI	380	512	3	11	9.6	1.20	2.7	5.2	2.0
Siemens Plus 4 Lightning	ss	120	180	0.75	10	Slim 2	350	512	AB40	12	11.2	1.43	3.2	5.6	1.7
Toshiba Xpress HS1	xe	120	200	1.0	10	180LI	380	512	FC12	11	8.8	1.48	2.9	4.9	1.7
Philips SR 7000	xe	120	350	1.0	10	180LI	380	512	4	21	9.9	1.67	3.5	6.5	1.5
Picker PQ 2000[3]	ss	130	125	1.00	10	180LI	380	512	SA(Std)	13	10.7	1.78	2.9	6.0	1.4
MEAN										15	9.6	1.44	3.1	5.7	1.8

(1) Additional parameters for Twin Flash: Dual beam, High sampling density, Standard resolution mode

(2) CTDI values derived from measurements on HiSpeed CT/i (without SmartBeam)

(3) MTF's measured using "normal" sampling mode. "Full centre" mode, now available for this FOV, may result in higher MTF values.
Convolution filter: Spiral Abdomen (Standard)

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CTDI Comparison Tables

■ Table 6. CTDI Head Phantom

Table 6 - $CTDI_{10cm}$ in 16 cm phantom: 10 mm Axial Head Scan						
SCANNER		**kVp**	**mAs**	**$CTDI_{10cm,\ perspex}$ (mGy)**		
				Centre	**Mean periphery**	**Weighted average**
Philips AV Expander	ss	120	250	28	30	29
Siemens Plus 4 Xenon(1)	xe	120	300	33	38	36
IGE Hispeed Advantage(2)	ss	120	340	39	40	40
Siemens Plus 4 Lightning(3)	ss	140	257	42	46	45
Picker PQ 2000	ss	130	300	49	45	46
Philips SR 7000	xe	120	400	45	49	48
Siemens AR-HP	xe	130	210	45	49	48
Toshiba Xpress HS1	xe	120	300	53	47	49
IGE ProSpeed Xenon	xe	120	260	47	52	50
IGE Sytec SRi	xe	120	260	51	56	54
IGE ProSpeed SX P.H.	ss	120	300	55	60	58
Elscint Twin Flash	ss	120	600	64	66	66
MEAN				44	45	44

(1) Measured on Plus 4 Lightning. The CTDI values for 140 kV should also be the same for both scanners.

(2) Measured on HiSpeed CT/i.

(3) The CTDI values for 120kV are those given for the Plus 4 Xenon.

■ Table 7. CTDI Body Phantom

Table 7 - $CTDI_{10cm}$ in 32 cm phantom: 10 mm Axial Body Scan

SCANNER		kVp	mAs	$CTDI_{10cm, perspex}$ (mGy)		
				Centre	Mean periphery	Weighted average
Siemens Plus 4 Lightning	ss	120	150	6	12	10
Siemens Plus 4 Xenon(1)	xe	120	150	6	12	10
Philips AV Expander	ss	120	200	7	14	11
Elscint Twin Flash(2)	ss	120	250	9	15	13
IGE ProSpeed SX P.H.	ss	120	200	10	21	17
IGE Hispeed Advantage(3)	ss	120	340	11	21	18
Toshiba Xpress HS1	xe	120	300	13	23	19
Philips SR 7000	xe	120	350	13	25	21
Siemens AR-HP	xe	130	190	13	26	22
Picker PQ 2000	ss	130	200	11	27	22
IGE ProSpeed Xenon(4)	xe	120	300	15	32	26
IGE Sytec SRi	xe	120	300	16	34	28
MEAN				12	25	21

(1) Measured on Plus 4 Lightning

(2) With overscan

(3) Measured on HiSpeed CT/i

(4) ProSpeed SX measurements multiplied by mAs correction

MDA Information

■ Background

One of the roles of the Medical Devices Agency (MDA) is to fund evaluation programmes for medical devices and equipment. The MDA Device Evaluation and Publications Business Unit is responsible for this work. The programme includes evaluation of X-ray Computed Tomography Equipment currently available on the UK market.

MDA aims to ensure that evaluation techniques keep abreast of improvements in CT imaging performance and that MDA reports present evaluation information that is timely, useful and readily understood.

■ Evaluation facility

ImPACT (Imaging Performance Assessment of Computed Tomography) is MDA's CT evaluation facility. It is based at St George's Hospital, London which is part of St George's Healthcare Trust.

ImPACT have developed test objects and measurement procedures suitable for inter-comparing CT scanner performance. For each CT evaluation several hundred images are obtained from the system under test and these are analysed on UNIX based imaging workstations. CTDI measurements are made by means of an ion chamber, and film and thermoluminescent dosemeters (TLDs) are used to obtain additional X-ray dose information.

ImPACT also employ a radiographer to carry out an evaluation of CT scanners from the users perspective. This ‘user’ evaluation programme complements the technical evaluation programme.

■ MDA support to purchasers and users

While a clinical user evaluation is outside the scope of this report, CT user reports are underway which present data on ergonomics and ease of use etc.

The ImPACT team are available to answer any queries with regard to the details of the report, and also to offer general technical and user advice on CT purchasing, acceptance testing and quality assurance.

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■ MDA contact points for CT enquiries

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