

# Dose Data Collection, IHE REM

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NHS Foundation Trust

# Protocol Image Scraping

- Grab protocol image
  - Siemens series 501, older scanners can auto-send to dose audit server for all exams
  - GE series 999, LightSpeed onward scanners can auto-send to dose audit server on a per-exam basis
- ‘Read’ the image
  - Optical Character Recognition
  - Data from the DICOM header fields



# Protocol Image Scraping links

- David Clunie's DoseUtility
  - Can use from web without local installation
  - Java
  - <http://goo.gl/bgHCM>
- David Clunie's PixelMed Toolkit
  - Java source code of several applications
  - <http://www.pixelmed.com>

# IHE REM

- Radiation Exposure Monitoring profile
- DICOM Dose Structure Reports
- Send Dose SR objects to a dose audit server or PACS
  - Newer Siemens can auto-send Dose SR
- Interrogate!
- eg: Siemens CARE Analytics
  - <http://goo.gl/o7iZS>

Microsoft Excel - Attr_tash_Summary.xls															
File Edit View Insert Format Tools Data Window Help											Type a question for help				
L72 814.14 mGycm															
G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	
Information		System Information			CT Dose	CT Acquisition				CT Dose					
Series Date	Series time	Manufactu	Manufactu	Manufactu	DLP Total	Acquisitor	Organ Cha	Body Size	CT Acquisi	Procedure	Mean CTD	DLP	Number of	ID of X-Ray	KVp
20110713	113156.562	SIEMENS	CTAWP730	73086	903.58 mG	TestBolus	Thorax	Adult	Stationary	CT without	44.87 mGy	44.87 mGy	1	A	120
						DS_CorAd	Cardio	Adult	Sequence	Diagnostic	17.75 mGy	306.14 mG	2	A	100
						BodyAngio	AngioBody	Adult	Spiral Acq	Diagnostic	5.54 mGy	525.55 mG	1	A	120
20110713	123331.609	SIEMENS	CTAWP730	73086	40.59 mGy	PreMonitor	Thorax	Child	Stationary	CT without	0.6 mGy	0.6 mGycm	1	A	100
						Monitoring	Thorax	Child	Stationary	Diagnostic	8.96 mGy	8.96 mGyc	1	A	100
						FI_Thorax	Thorax	Child	Spiral Acq	Diagnostic	1.68 mGy	31.03 mGy	2	A	100
														B	100
20110713	140248.484	SIEMENS	CTAWP730	73086	401.52 mG	Thorax_XC	Thorax	Adult	Spiral Acq	CT without	12.79 mGy	401.52 mG	1	A	120
20110713	150523.125	SIEMENS	CTAWP730	73086	149.79 mG	PreMonitor	Thorax	Adult	Stationary	CT without	1.26 mGy	1.26 mGyc	1	A	120
						Monitoring	Thorax	Adult	Stationary	Diagnostic	1.26 mGy	1.26 mGyc	1	A	120
						DE_Thora	Thorax	Adult	Spiral Acq	Diagnostic	5.03 mGy	147.27 mG	2	A	80
														B	140
20110713	153657.031	SIEMENS	CTAWP730	73086	218.55 mG	Control Sc	Thorax	Adult	Stationary	Diagnostic	2.25 mGy	2.25 mGyc	1	A	100
						TestBolus	Thorax	Adult	Stationary	Diagnostic	15.75 mGy	15.75 mGy	1	A	100
						AdSeq_Co	Cardio	Adult	Sequence	Diagnostic	11.63 mGy	200.55 mG	2	A	100
														B	100
20110713	164905.14	SIEMENS	CTAWP730	73086	280.38 mG	Thorax_XC	Thorax	Adult	Spiral Acq	CT without	8.43 mGy	280.38 mG	1	A	120
20110714	122936.765	SIEMENS	CTAWP730	73086	1001.93 m	Thorax	Thorax	Adult	Spiral Acq	CT without	19.68 mGy	279.8 mGy	1	A	120
						i-Sequence	Thorax	Adult	Stationary	CT without	4.82 mGy	6.95 mGyc	1	A	120
						Thorax	Thorax	Adult	Spiral Acq	CT without	20.16 mGy	239.42 mG	1	A	120
						Thorax	Thorax	Adult	Spiral Acq	CT without	20.04 mGy	238.19 mG	1	A	120
						Thorax	Thorax	Adult	Spiral Acq	CT without	19.99 mGy	237.57 mG	1	A	120
20110714	124847.421	SIEMENS	CTAWP730	73086	259.26 mG	PreMonitor	Thorax	Child	Stationary	CT without	0.6 mGy	0.6 mGycm	1	A	100
						Monitoring	Thorax	Child	Stationary	Diagnostic	17.92 mGy	17.92 mGy	1	A	100
						FI_Thorax	Thorax	Child	Spiral Acq	Diagnostic	8.18 mGy	240.74 mG	2	A	120
														B	120
20110714	142845.312	SIEMENS	CTAWP730	73086	814.14 mG	FI_CaScor	Cardio	Adult	Spiral Acq	CT without	1.65 mGy	32.09 mGy	2	A	120
						TestBolus	Thorax	Adult	Stationary	CT without	19.63 mGy	19.63 mGy	1	A	120
						DS_CorAd	Cardio	Adult	Sequence	Diagnostic	13.73 mGy	189.49 mG	2	A	100
						BodyAngio	AngioBody	Adult	Spiral Acq	Diagnostic	7 mGy	572.93 mG	1	A	120
						Control Sc	Cardio	Adult	Stationary	CT without	3.83 mGy	1.91 mGyc	1	A	120



Microsoft Excel - AllfashiSummary.xls							
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C36 Thorax Exp							
B	C	D	E	F	G	H	I
Organ Characteristic	Acquisition Protocol	Min CTDIvol	Ø CTDIvol	Max CTDIvol	Min DLP	Ø DLP	Max DLP
Cardio	ADSeq_CaSc	1.61 mGy	4.72862068965517 mGy	13.08 mGy	27.69 mGycm	68.2531034482759 mGycm	211.66 mGycm
	Spiral_Coro	22.92 mGy	63.3392307692308 mGy	111.51 mGy	426.96 mGycm	1104.35384615385 mGycm	2059.89 mGycm
	FI_CaScore	0.76 mGy	2.31845070422535 mGy	7.08 mGy	16.69 mGycm	46.0101408450704 mGycm	136.67 mGycm
	DS_CorAdSeq	6.82 mGy	17.0517647058824 mGy	42.87 mGy	117.71 mGycm	247.197058823529 mGycm	591.61 mGycm
	AdSeq_Coro	5.17 mGy	14.8511940298507 mGy	43.17 mGy	42.07 mGycm	216.011044776119 mGycm	595.81 mGycm
	FI_Coronary	2.92 mGy	4.29423076923077 mGy	7.37 mGy	60.71 mGycm	84.1638461538462 mGycm	142.16 mGycm
	Control Scan	3.83 mGy	3.96666666666667 mGy	4.05 mGy	1.91 mGycm	1.98 mGycm	2.02 mGycm
	AdSeq_AO	8.83 mGy	9.45 mGy	9.87 mGy	199.83 mGycm	217.17 mGycm	238.35 mGycm
	PreMonitoring	0.44 mGy	0.772857142857143 mGy	1.04 mGy	0.44 mGycm	0.772857142857143 mGycm	1.04 mGycm
	AdSeq_Carto	9.57 mGy	19.3585714285714 mGy	32.89 mGy	132.1 mGycm	273.474285714286 mGycm	453.86 mGycm
	DS_Chest	17.95 mGy	44.476 mGy	62.29 mGy	467.79 mGycm	1146.154 mGycm	1537.89 mGycm
	FI_CorCTA	1.94 mGy	1.94 mGy	1.94 mGy	30.16 mGycm	30.16 mGycm	30.16 mGycm
	FI_Carto	2.84 mGy	3.015 mGy	3.19 mGy	67.05 mGycm	68.21 mGycm	69.37 mGycm
	Gated_Aorta	21.58 mGy	28.21 mGy	35.06 mGy	1252.52 mGycm	1645.02666666667 mGycm	2249.21 mGycm
	FI_ChestPain	3.72 mGy	5.165 mGy	6.61 mGy	225.98 mGycm	310.29 mGycm	394.6 mGycm
Delay_Carto	2.3 mGy	2.345 mGy	2.39 mGy	8.84 mGycm	12.66 mGycm	16.48 mGycm	
FI_GatedCTPA	3.54 mGy	3.565 mGy	3.59 mGy	98.35 mGycm	106.64 mGycm	114.93 mGycm	
Thorax	TestBolus	4.5 mGy	22.7311278195489 mGy	77.67 mGy	4.5 mGycm	22.7311278195489 mGycm	77.67 mGycm
	Thorax_XC	3.85 mGy	14.1969230769231 mGy	32.74 mGy	34.99 mGycm	421.073461538462 mGycm	914.18 mGycm
	i-Sequence	2.37 mGy	13.305 mGy	30.84 mGy	3.42 mGycm	19.1605 mGycm	44.41 mGycm
	PreMonitoring	0.6 mGy	1.00158536585366 mGy	1.26 mGy	0.6 mGycm	1.00158536585366 mGycm	1.26 mGycm
	FI_Thorax	0.18 mGy	4.39510638297872 mGy	8.3 mGy	8.02 mGycm	117.564468085106 mGycm	299.97 mGycm
	DE_Thorax	4.49 mGy	6.88444444444445 mGy	9.48 mGy	121.59 mGycm	215.945555555556 mGycm	271.6 mGycm
	Control Scan	2.25 mGy	2.29457142857143 mGy	2.77 mGy	2.25 mGycm	2.29457142857143 mGycm	2.77 mGycm
	HRCT_XC	0.21 mGy	11.4265625 mGy	24.81 mGy	1.43 mGycm	325.9878125 mGycm	630.06 mGycm
	Thorax_C_XC	5.29 mGy	10.851935483871 mGy	18.46 mGy	30.58 mGycm	328.229677419355 mGycm	573.61 mGycm
	DE_Thx	4.43 mGy	5.27 mGy	6.24 mGy	162.19 mGycm	192.6 mGycm	229.29 mGycm
	DE_Thx_Cold	4.4 mGy	5.07 mGy	5.95 mGy	172.94 mGycm	191.233333333333 mGycm	213 mGycm
	CTPA	6.55 mGy	13.1933333333333 mGy	17.18 mGy	254.14 mGycm	450.88 mGycm	576.86 mGycm
	ThxAorta_XC	6.7 mGy	9.30666666666666 mGy	13.68 mGy	184.04 mGycm	301.59 mGycm	469.12 mGycm
	FI_Thorax_D	1.31 mGy	1.75 mGy	2.06 mGy	14.67 mGycm	32.86 mGycm	41.72 mGycm
	Thorax Insp	0.81 mGy	1.47666666666667 mGy	2.33 mGy	13.38 mGycm	22.8866666666667 mGycm	34.05 mGycm
	Thorax Exp	1.26 mGy	1.7675 mGy	3.03 mGy	17.23 mGycm	23.375 mGycm	37.22 mGycm
	Add Scan	4.17 mGy	4.17 mGy	4.17 mGy	0.83 mGycm	0.83 mGycm	0.83 mGycm



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B2 DLP																	
B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S
LP																	
Organ Characteristics Cardio																	
Protocol Month																	
	ADSeq_Ca#	Spiral_Cor#	Fl_CaScor#	DS_CorAd#	AdSeq_Co#	Fl_Coronat#	Control Sc#	AdSeq_A(#									
201107	736.04 mG	7 10473.02 r	9 1258.01 m	26 1219.22 m	6 5500.47 m	23 788.96 mG	8 3.93 mGyc	2 199.83 mG									
201108	575.57 mG	10 8057.09 m	9 1274.78 m	30 943.98 mG	6 6103.47 m	27 619.82 mG	9 2.01 mGyc	1 213.33 mG									
201109	667.73 mG	12 10183.09 r	8 733.93 mG	15 2039.15 m	5 2868.8 mG	17 779.48 mG	9 0 mGycm	0 238.35 mG									
total	1979.34 m	29 28713.2 m	26 3266.72 m	71 4202.35 m	17 14472.74 r	67 2188.26 m	26 5.94 mGyc	3 651.51 mG									
TDIvol																	
Organ Characteristics Cardio																	
Protocol Month																	
	ADSeq_Ca#	Spiral_Cor#	Fl_CaScor#	DS_CorAd#	AdSeq_Co#	Fl_Coronat#	Control Sc#	AdSeq_A(#									
201107	48.55 mGy	7 564.97 mG	9 63.73 mGy	26 75.54 mGy	6 364.06 mG	23 40.81 mGy	8 7.88 mGy	2 9.65 mGy									
201108	40.2 mGy	10 471.93 mG	9 63.12 mGy	30 71.5 mGy	6 405.01 mG	27 29.98 mGy	9 4.02 mGy	1 8.83 mGy									
201109	48.38 mGy	12 609.92 mG	8 37.76 mGy	15 142.84 mG	5 225.96 mG	17 40.86 mGy	9 0 mGy	0 9.87 mGy									
total	137.13 mG	29 1646.82 m	26 164.61 mG	71 289.88 mG	17 995.03 mG	67 111.65 mG	26 11.9 mGy	3 28.35 mGy									
Selection Criteria CARE Analytics Data List Results Monitoring																	

# Questions?

- Clunie's DoseUtility
  - <http://goo.gl/bgHCM>
- Clunie's Source Code
  - <http://pixelmed.com>
- IHE REM Profile
  - check the Integration Statements
- Siemens CARE Analytics
  - <http://goo.gl/o7iZS>

