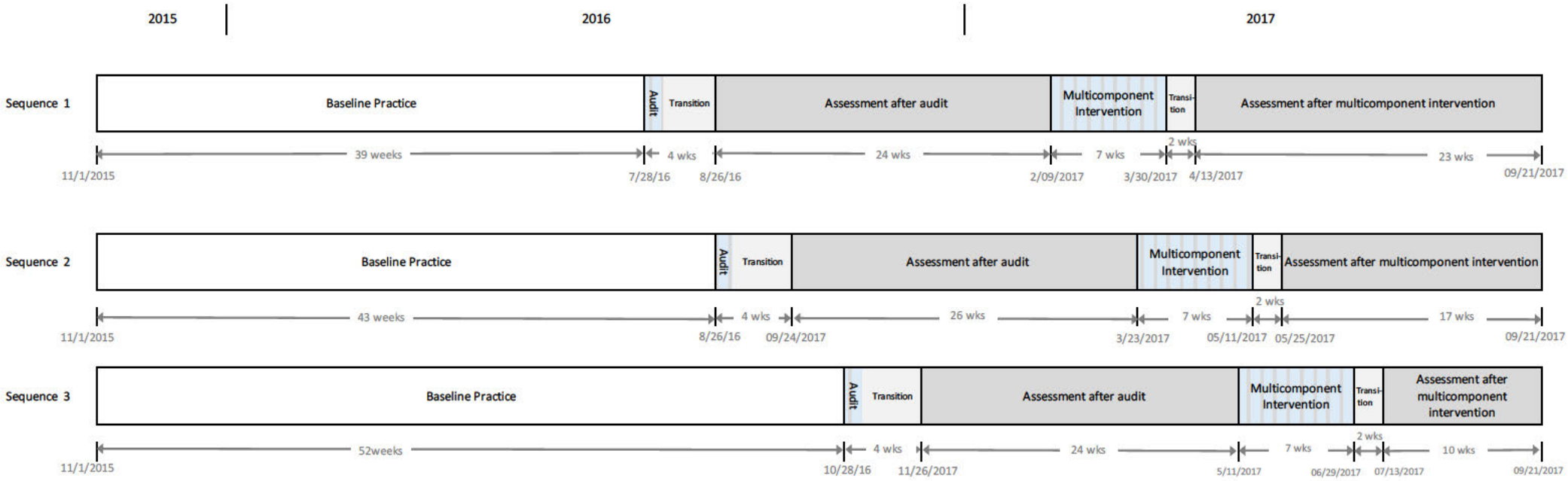
Supplementary Online Content

Smith-Bindman R, Chu P, Wang Y, et al. Comparison of the effectiveness of single-component and multicomponent interventions for reducing radiation doses in patients undergoing computed tomography: a randomized clinical trial. *JAMA Intern Med.* Published online March 30, 2020. doi:10.1001/jamainternmed.2020.0064

eFigure. Study Timeline

eAppendix: Audit Report, selected pages

This supplementary material has been provided by the authors to give readers additional information about their work.



eFigure. Study Timeline

Blue, audit feedback or complex intervention; light gray, transition before assessment; gray, assessment period.

eAppendix
Selected Content from Audit Report

You are receiving this audit as part of a study on CT Dose optimization.

Our intention is that your audit be distributed as widely as possible to people who work within your facility. Additionally, anyone who can influence practice at your facility should also have access to the audit.

We do not want people sharing results across facilities, but understand that this may be difficult given possible personnel overlap. Any administrators who receive the audit for facilities in your track should share this with staff who work at or influence your facility, even if they also work at or manage other facilities.

However, **to help us maintain a robust study design and to maximize our chances of identifying change**, we hope all facilities will restrict their audit discussions to only those facilities in their respective tracks. Please do not distribute the report to any organization, institution, or company outside of that listed on the audit report.

If you have any questions, issues, or comments regarding the audit and/or data, please contact UCSF study personnel: Principal Investigator, Dr. Rebecca Smith-Bindman, rebecca.smith-bindman@ucsf.edu; Project Manager, Naomi López-Solano, naomi.lopez-solano@ucsf.edu; and/or Research Assistant, Donna Liu, donna.liu@ucsf.edu.

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This report can help guide dose optimization by showing you how your doses compare with other facilities. Each facility's doses in the head, chest, and abdomen were provided a grade of A, B, or C. You will only receive a grade if you have more than 12 scans for any of these anatomical regions. Based on DLP values (see Section A),

Your head grade is: B.
Your chest grade is: C. Your median DLP in the chest is 460 compared with 130 for the best sites.
Your abdomen grade is: B.

Table of Contents

Summary of your data

These are the data we are using for your report. Please check the specific machines and the numbers of studies we have listed to ensure we have collected data from all of your CT machines. "CAP" refers to combined chest-abdomen-pelvis scans.

Table 1: Scans

	Head	Chest	CAP	Abdomen	Total
Children	197	10	2	82	291
Adults	3742	2034	426	3864	10066

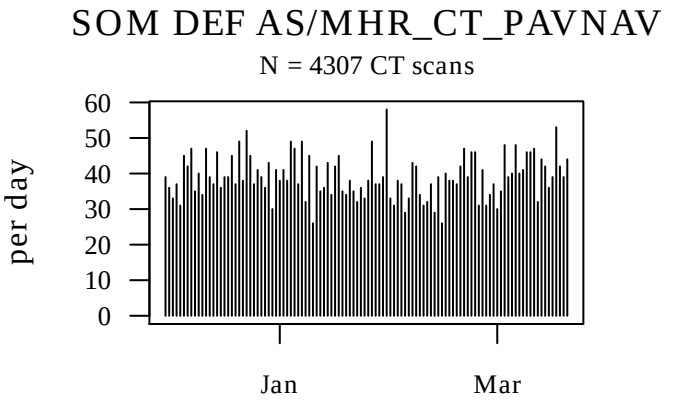
Table 2: Scans by device/machine

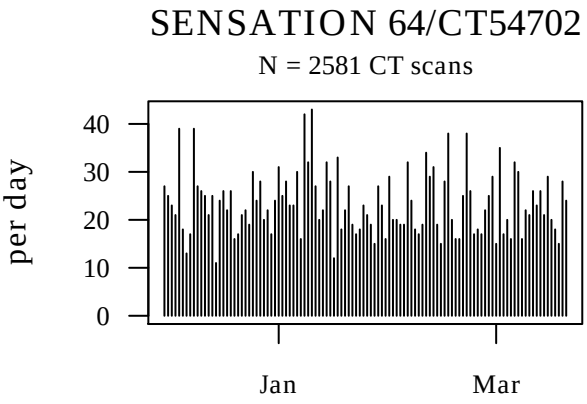
Device/machine name	Head	Chest	CAP	Abdomen	Total
BRILLIANCE 16/PMRS_5212	126	430	14	106	676
SENSATION 64/CT54702	1184	415	0	1028	2627
SOM DEF AS/MHR_CT_PAVNAV	1933	694	149	1735	4511
SOM DEF AS/SML-CT-SMDEF64	535	274	85	634	1528
SOM DEF/MHR_CT_T2ACWS	161	231	180	443	1015

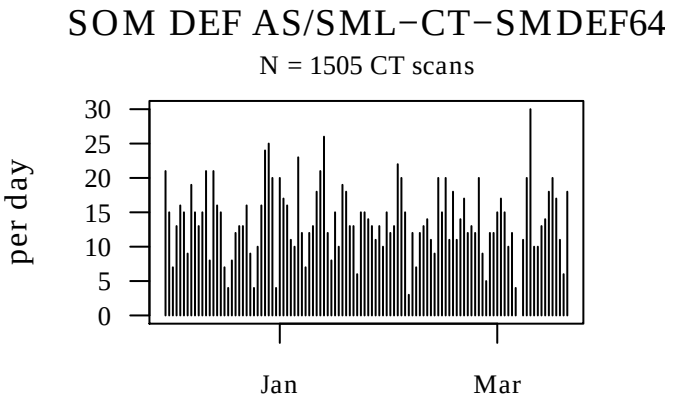
Table 3: Number of unique protocols by device/machine

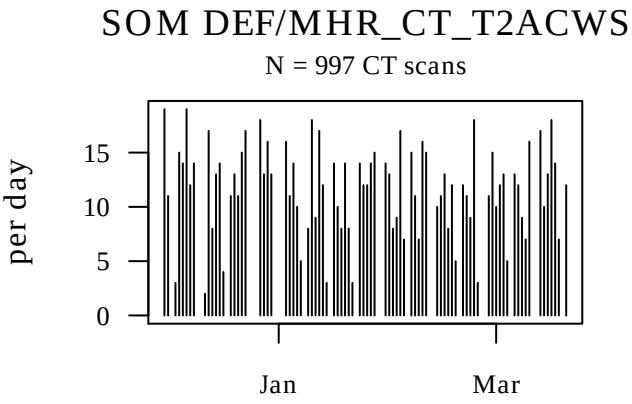
Device/machine name	Head	Chest	CAP	Abdomen	Total
BRILLIANCE 16/PMRS_5212	3	6	4	7	20
SENSATION 64/CT54702	10	9	0	21	40
SOM DEF AS/MHR_CT_PAVNAV	16	14	16	27	73
SOM DEF AS/SML-CT-SMDEF64	14	8	10	17	49
SOM DEF/MHR_CT_T2ACWS	9	11	9	17	46

The following plot (or plots) show the number of diagnostic scans for adults for the head, chest, and abdomen/pelvis over time for each of your machines. Each plot is identified with the specific machine name recorded in your data file. Please let us know if this does not correspond with your expected volume for CT scans of the head, chest, and abdomen/pelvis. If there is a gap in scans for a given period, it means we do not have scans for this period in the data we are summarizing in this report.









How to use this report

This is the second audit report we are providing for your facility during your participation in the study. This detailed report provides a summary of the CT dose metrics collected from your facility, information on most commonly used protocols, graphs on technical parameters, and an appendix with more in-depth dose information. The results are adjusted for patient size, and many of the results are shown comparing your facility to other facilities that use the same type of equipment. The purpose is to help you understand how your doses – in general – compare to doses at the other facilities that are participating in the project and provide you with ideas where there may be opportunities to lower and to standardize your doses. The purpose is to supplement other dose optimization activities at your facility. This report does not tell you whether your doses are adequate for diagnosis. You must decide whether your images are satisfactory for diagnosis. You must re-evaluate image quality every time you change your protocols.

The report primarily describes the doses you use in the head, chest and abdomen (the abdomen category includes all examinations of the abdomen and/or pelvis). We also provide one graph showing examinations that include the chest, abdomen and pelvis (CAP). We do not summarize other CT examination types, such as combined anatomic areas, the spine, etc. in this report.

The report includes separate analysis in children only if your facility has contributed a sufficient volume of pediatric CT examinations.

Most of the feedback will be provided using two dose metrics: CT dose index volume (CTDIvol) and dose length product (DLP), both of which reflect dose measures directly reported by the CT scanner. CTDIvol reflects the average dose per slice, while DLP reflects the total output of the scanner, calculated as the dose per slice multiplied by the scan length.

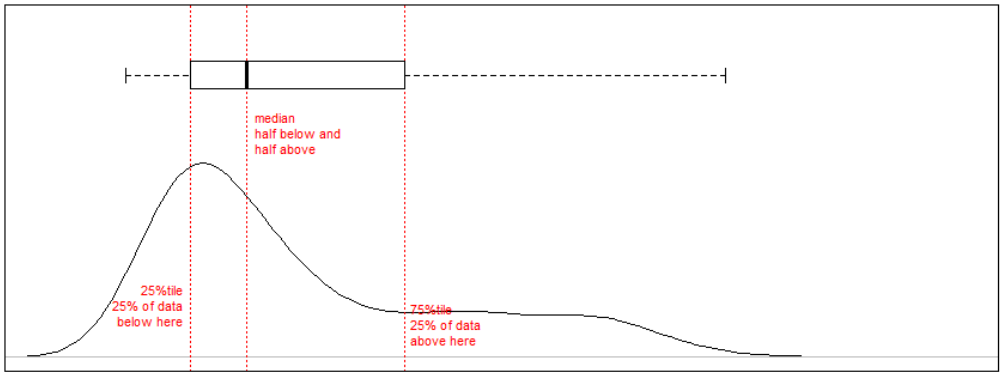
The report provides feedback on your average doses and the proportion of doses above the benchmarks, calculated among all facilities that participate in the Partnership for DOSE. Benchmarks were set at the 75th percentile. This means that on average, across all of the facilities, 25%, or one quartile, of doses within each anatomic area will be above the benchmark. If your number is higher than this number, it means you have a larger proportion of high dose studies in comparison to other facilities.

The “best performing facilities” are defined as those facilities that have doses in the lowest quartile. You must decide if it is appropriate to alter your parameters in part based on your patients, radiologists, types of equipment, and the types of clinical questions that are imaged at your facility.

A. Comparisons of your dose distribution to other facilities

The graphs in this section show the distribution in dose for each facility in your track, ranked from highest to the lowest median dose. Each graph shows a series of boxplots, one for each facility in your track. There are 156 facilities in your track, so there are 156 boxplots in these graphs.

Like a histogram, a boxplot is a way to summarize a distribution of values, but it focuses on only a handful of those values.

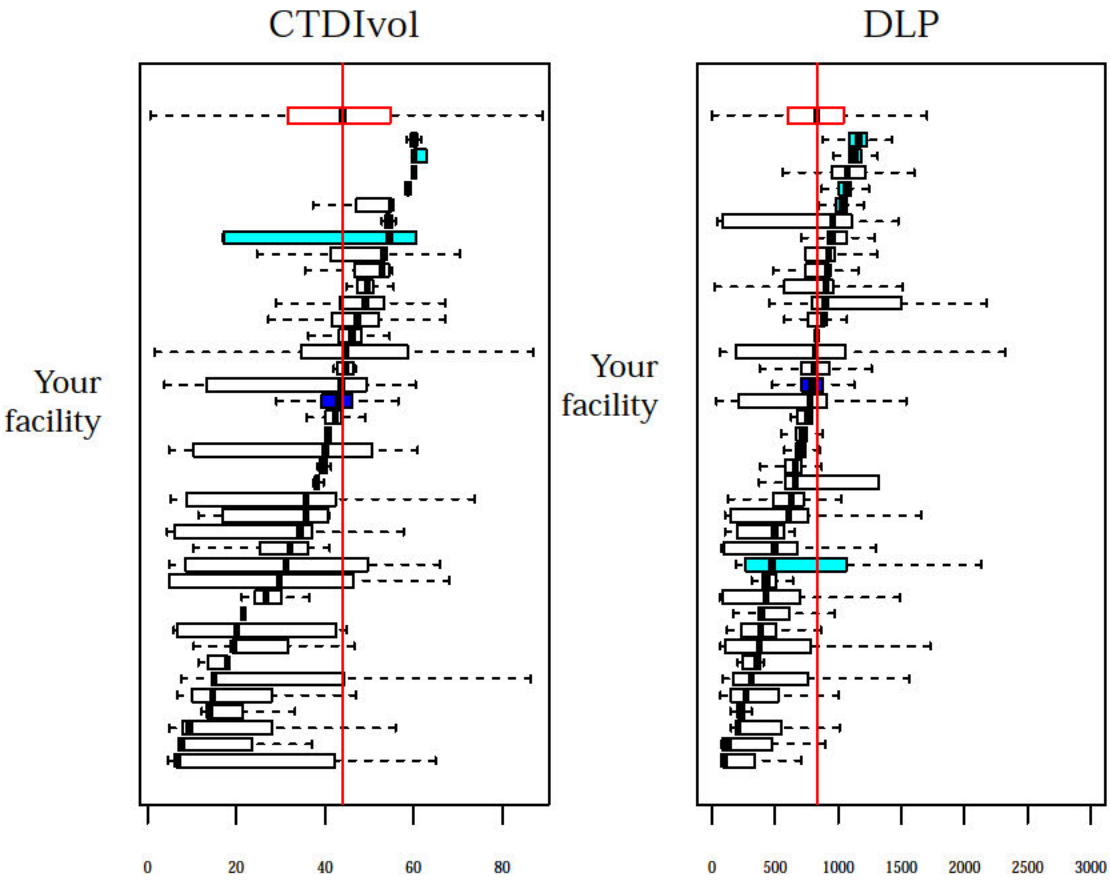


In the example above, you can see a bell-shaped curve that shows the distribution of dose, like a histogram. Three dotted vertical lines show the 25th percentile, the 50th percentile (that is, the median), and the 75th percentile doses. Above the bell-shaped curve is a box, which is another way to summarize the same data as in the bell-shaped curve. The left-hand edge of the box coincides with the 25th percentile; the right-hand edge coincides with the 75th percentile. The thicker black line in the middle of the box is the median dose. If the length of the box is short, it means the doses were concentrated in a narrow range. If the box is long, it means the dose distribution was spread out. In this example, the dose distribution has a longer right-hand side than left-hand side. Accordingly, the boxplot is longer on the right than on the left of the median. The dotted lines coming out of the box extend to the extreme values and show the asymmetry in the dose distribution. For the example above, the right side of the distribution spreads out much further from the median and beyond the 75th percentile.

On the following pages, at the top of each graph, you will see a boxplot in red, followed by one boxplot for each facility in your track. The red boxplot at the top summarizes the doses over all facilities. Your facility is identified and indicated in dark blue. If your institution has other facilities included in this track they will be shown in a lighter shade of blue.

The summary tables below the plots report the 25th percentile, median, and 75th percentile dose for your facility and for all scans across all facilities. In addition, you can also see the proportion of your cases whose dose exceeded either the median dose or the benchmark dose, which is set at the 75th percentile of all doses. For example, over all facilities and all scans, 50% of cases will exceed the median, and 25% will exceed the 75th percentile benchmark. Thus, you should compare the values in those columns with 50 or 25, respectively.

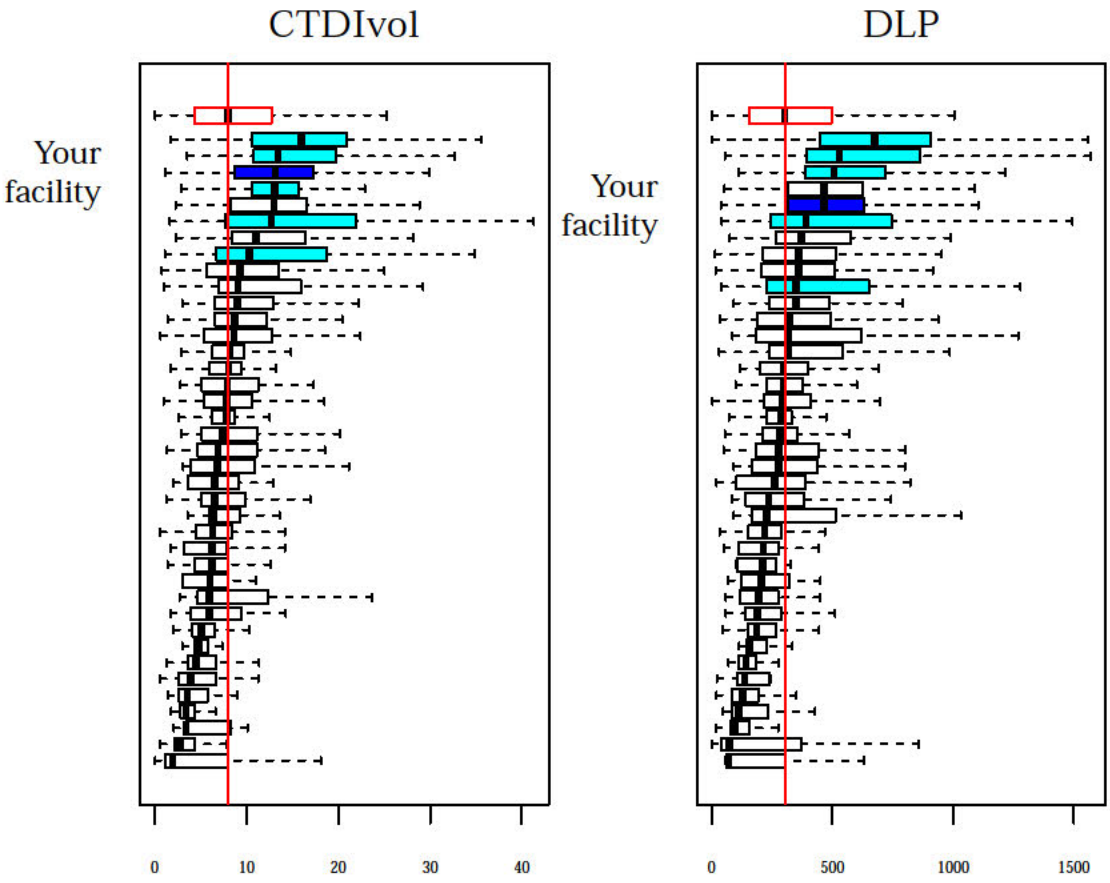
Head



	25%tile	median	75%tile	%>median	%>benchmark
overall CTDIvol	32	44	55	51	25
your CTDIvol	39	43	46	43	3

	25%tile	median	75%tile	%>median	%>benchmark
overall DLP	599	832	1042	54	29
your DLP	713	791	880	44	9

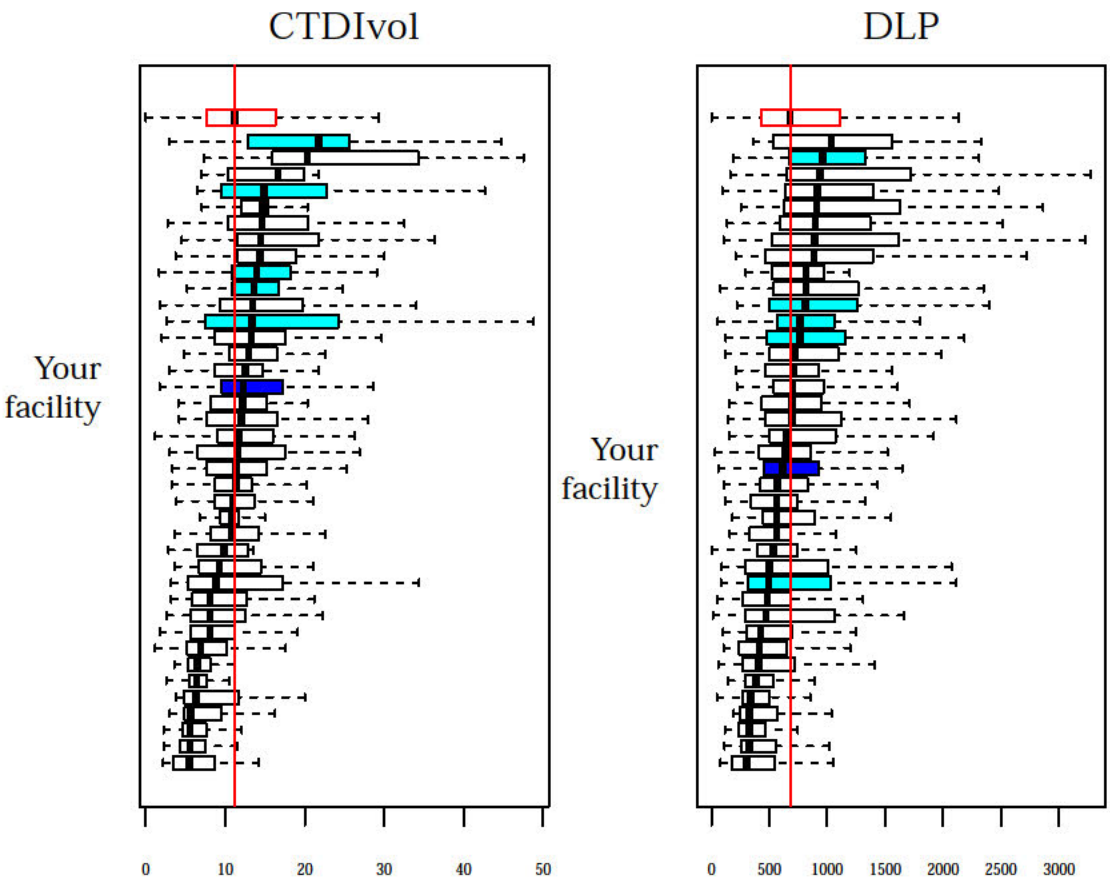
Chest



	25%tile	median	75%tile	%>median	%>benchmark
overall CTDIvol	4	8	13	49	20
your CTDIvol	9	13	17	79	45

	25%tile	median	75%tile	%>median	%>benchmark
overall DLP	156	303	496	49	22
your DLP	314	464	630	75	38

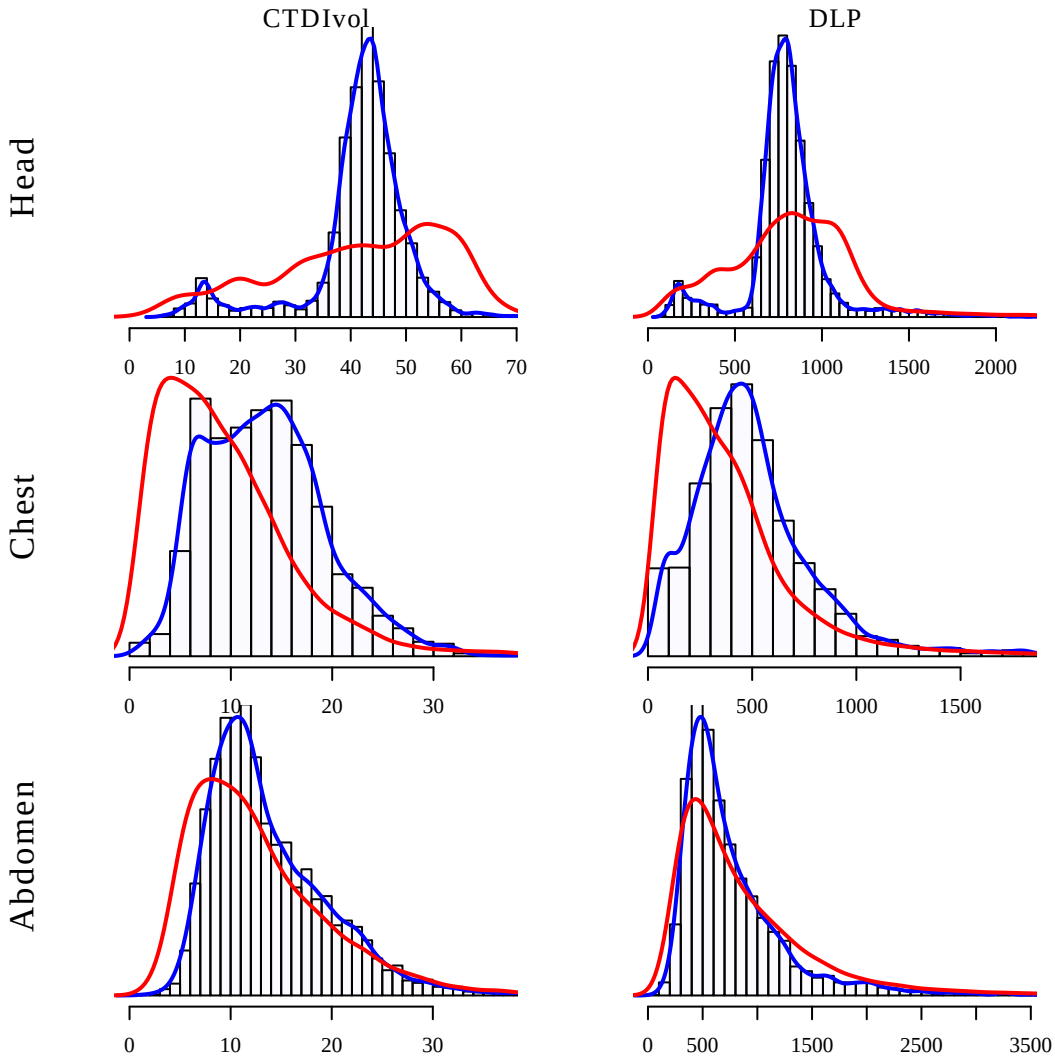
Abdomen



	25%tile	median	75%tile	%>median	%>benchmark
overall CTDIvol	8	11	16	49	22
your CTDIvol	10	12	17	58	25

	25%tile	median	75%tile	%>median	%>benchmark
overall DLP	431	680	1113	49	24
your DLP	452	618	930	42	16

The following graphs show the distribution in dose for your facility compared with the distribution across all facilities. The boxplots above show how your facility (in blue) compares to all other facilities in your track, and with the overall distribution (in red). The graphs below give you a detailed comparison of your dose distribution against the overall dose distribution of all facilities combined. Just as above, the heavy red line shows the distribution for all facilities and machines combined; the blue line is the distribution of dose in your facility. You should check whether your doses are shifted right (higher) than the overall. The width of the distribution tells you if you have more dose variability than other facilities. You should also see if there are multiple peaks in the distribution in your doses. If there is a bi- or tri-modal distribution, this may be due to a few "outlying" protocols.



B. Comparison of your doses to other facilities by device

These plots and tables show you how your doses compare with all other facilities that are using the same type of devices. For each device type, and each anatomical area, we show how your doses compare to all facilities using this device and to the "best performing facilities," meaning those facilities who have achieved the lowest 25% of doses. The tables show your mean CTDIvol and DLP, and compares them to the means over all other facilities who use the same device; that is, the column labeled "AvgDose" is the average dose for all scanners of the same device make and model.

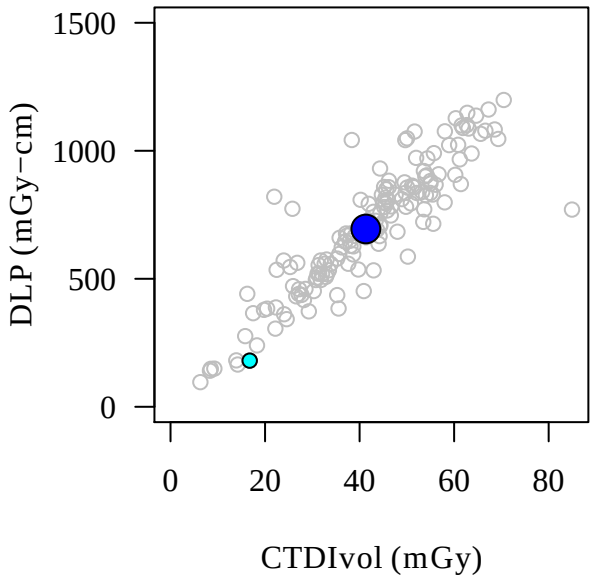
After adjusting for patient factors, all scanners were ranked. The tables also show the ranking for each scanner at your facility. Among all facilities participating in the Partnership for DOSE, there are a total of 172 individual scanners, of 46 different device models. Some models are more common than others, of course, so if your facility uses one of the more popular ones there may be more than a dozen other examples of your same device against which to compare; if you use one of the less common ones you may have only one or two comparisons, or even none. In the tables below, the "rank" that is reported is out of 172 unique scanners.

The plots show the average patient-adjusted dose for all scanners in the Partnership for DOSE, for each anatomical region. Each dot shows the mean dose for CTDIvol and DLP for that scanner. Your scanner is identified in dark blue. All other scanners of that same model type are shown in lighter blue. If you have two or more scanners of the same model type, you will see two or more dark blue dots. If your scanner is rare or unique, you may see few or no other light blue dots.

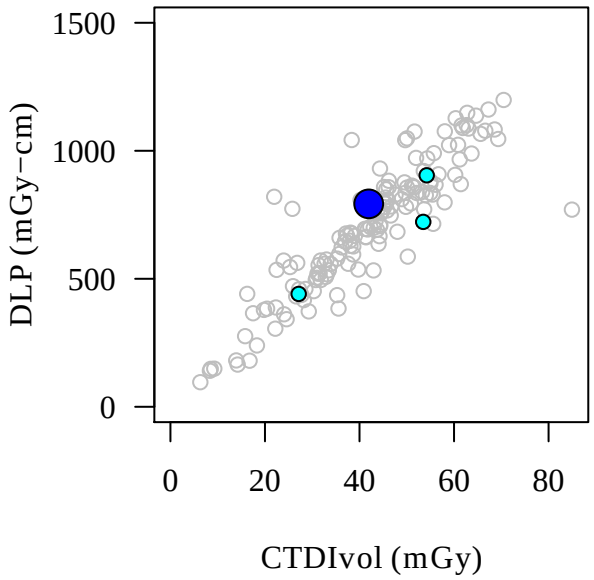
The general pattern and location of the light blue dots tells you how scanners of your model type compare with all other scanners of any type. The location of your dark blue dot tells you both how your scanner compares with both a) all other scanners, and b) all other scanners of the same model.

HEAD

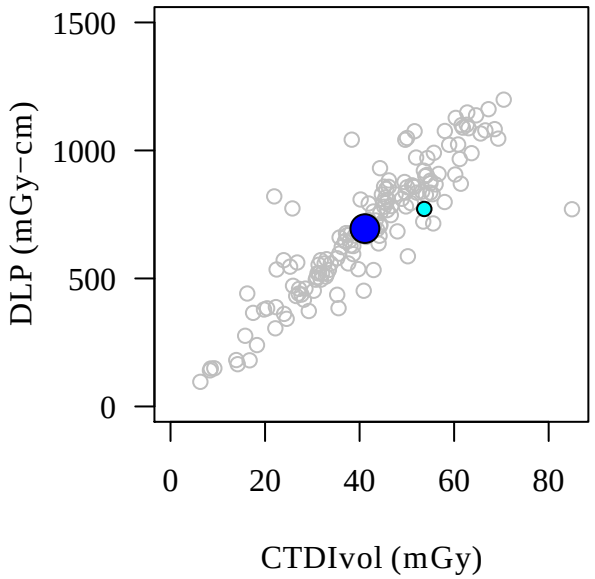
BRILLIANCE 16



SENSATION 64



SOM DEF



SOM DEF AS

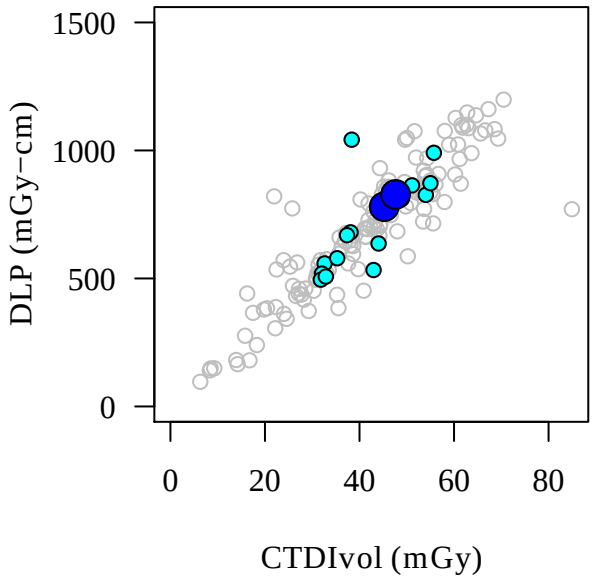


Table 10: BRILLIANCE 16 ~ PMRS_5212

metric	BestDose	AvgDose	YourDose
CTDIvol (mGy)	17	32	41
DLP (mGy-cm)	180	493	695

Table 11: SENSATION 64 ~ CT54702

metric	BestDose	AvgDose	YourDose
CTDIvol (mGy)	27	42	42
DLP (mGy-cm)	722	757	793

Table 12: SOM DEF ~ MHR_CT_T2ACWS

metric	BestDose	AvgDose	YourDose
CTDIvol (mGy)	41	48	41
DLP (mGy-cm)	695	736	695

Table 13: SOM DEF AS ~ MHR_CT_PAVNAV

metric	BestDose	AvgDose	YourDose
CTDIvol (mGy)	38	40	45
DLP (mGy-cm)	671	689	780

Compared with all other SOM DEF AS scanners, DLP for MHR.CT.PAVNAV are AVERAGE

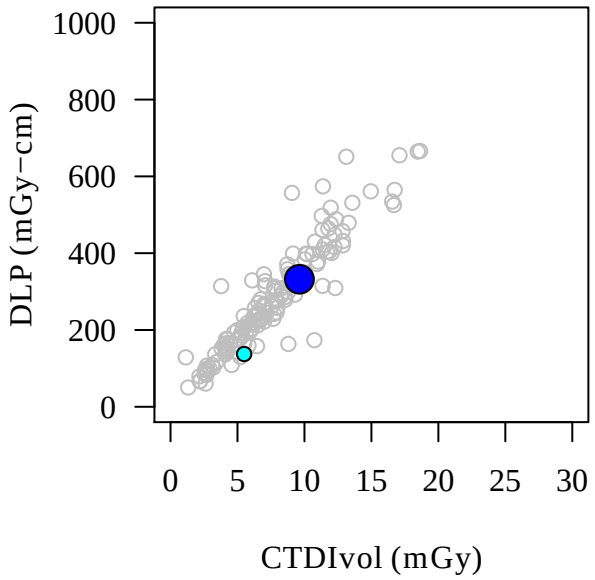
Table 14: SOM DEF AS ~ SML-CT-SMDEF64

metric	BestDose	AvgDose	YourDose
CTDIvol (mGy)	38	40	48
DLP (mGy-cm)	777	689	828

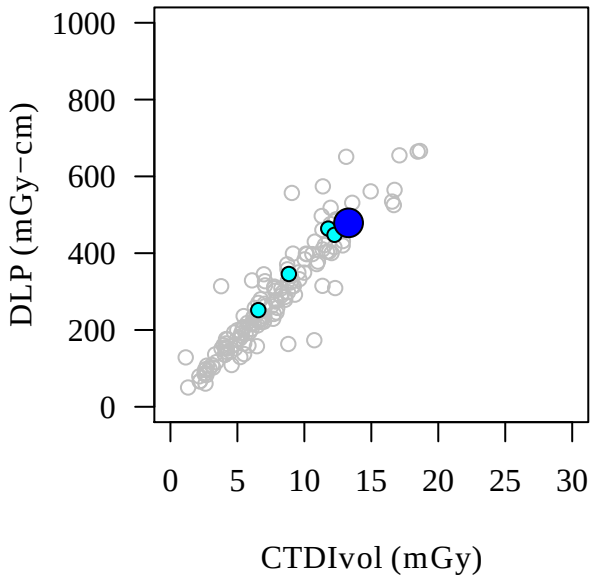
Compared with all other SOM DEF AS scanners, DLP for SML-CT-SMDEF64 are WORSE THAN AVERAGE

CHEST

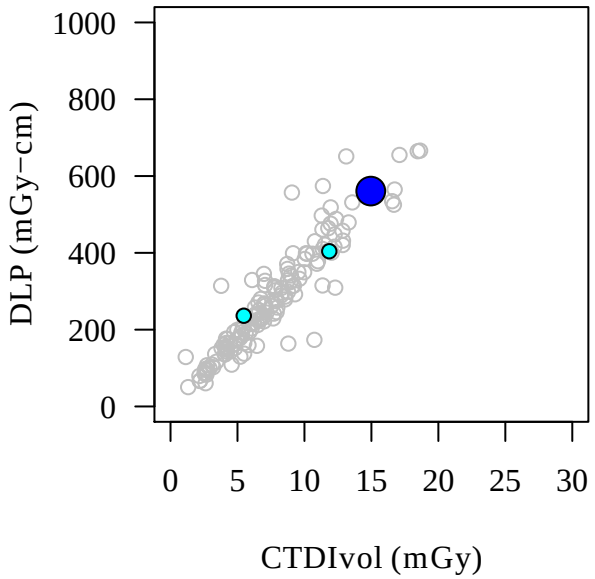
BRILLIANCE 16



SENSATION 64



SOM DEF



SOM DEF AS

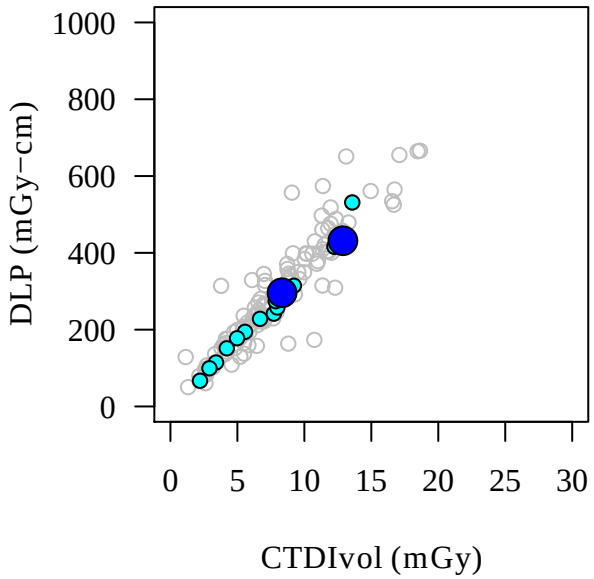


Table 15: BRILLIANCE 16 ~ PMRS_5212

metric	BestDose	AvgDose	YourDose
CTDIvol (mGy)	5	9	10
DLP (mGy-cm)	137	296	332

Table 16: SENSATION 64 ~ CT54702

metric	BestDose	AvgDose	YourDose
CTDIvol (mGy)	12	12	13
DLP (mGy-cm)	464	444	479

Table 17: SOM DEF ~ MHR_CT_T2ACWS

metric	BestDose	AvgDose	YourDose
CTDIvol (mGy)	5	11	15
DLP (mGy-cm)	236	409	561

Table 18: SOM DEF AS ~ MHR_CT_PAVNAV

metric	BestDose	AvgDose	YourDose
CTDIvol (mGy)	8	8	13
DLP (mGy-cm)	276	267	432

Compared with all other SOM DEF AS scanners, DLP for MHR.CT.PAVNAV are WORSE THAN AVERAGE

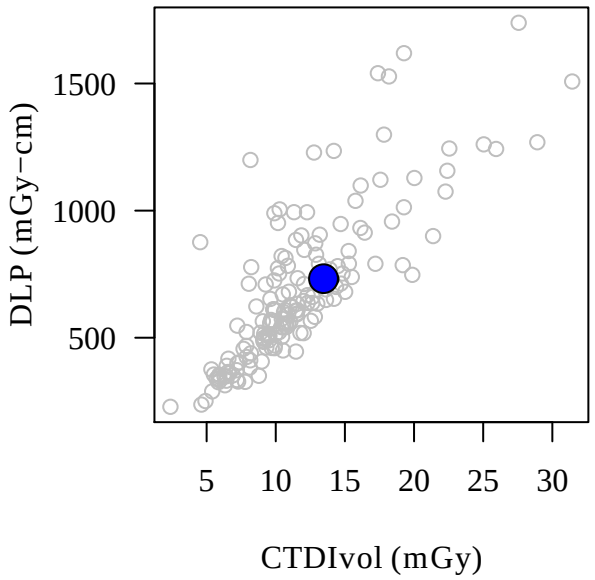
Table 19: SOM DEF AS ~ SML-CT-SMDEF64

metric	BestDose	AvgDose	YourDose
CTDIvol (mGy)	6	8	8
DLP (mGy-cm)	206	267	296

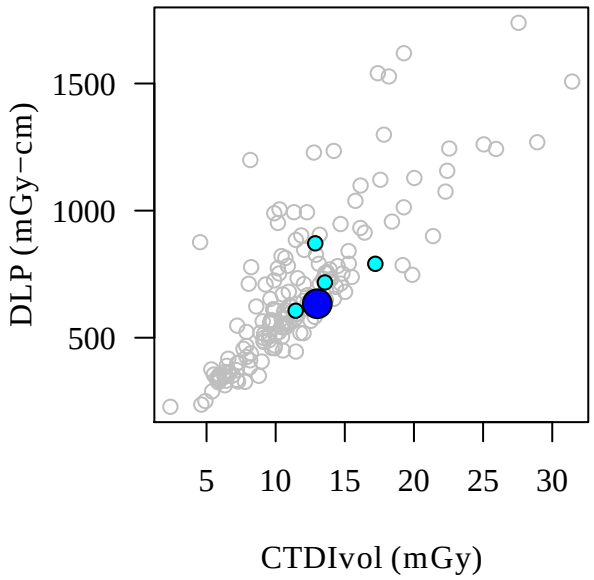
Compared with all other SOM DEF AS scanners, DLP for SML-CT-SMDEF64 are WORSE THAN AVERAGE

ABDOMEN

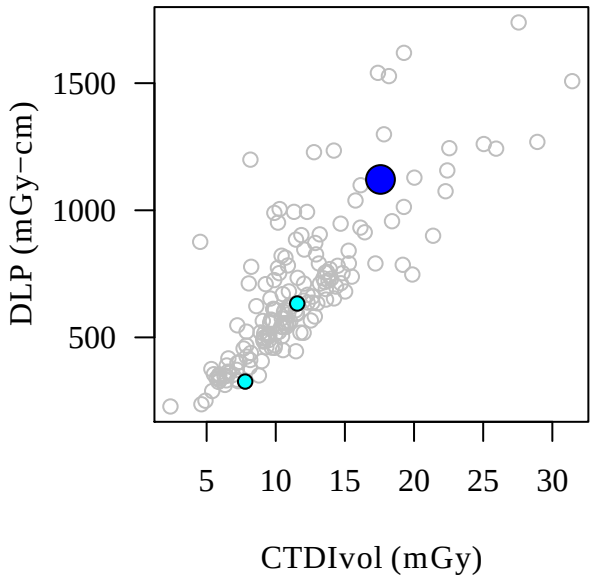
BRILLIANCE 16



SENSATION 64



SOM DEF



SOM DEF AS

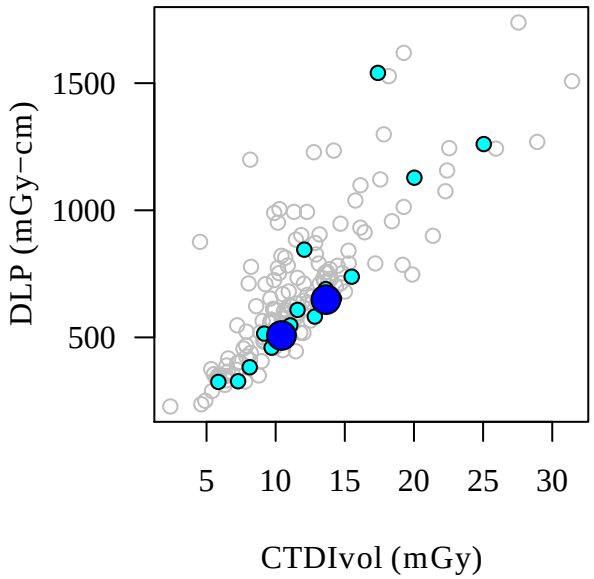


Table 20: BRILLIANCE 16 ~ PMRS_5212

metric	BestDose	AvgDose	YourDose
CTDIvol (mGy)	13	14	13
DLP (mGy-cm)	731	732	732

Table 21: SENSATION 64 ~ CT54702

metric	BestDose	AvgDose	YourDose
CTDIvol (mGy)	12	13	13
DLP (mGy-cm)	606	689	634

Table 22: SOM DEF ~ MHR_CT_T2ACWS

metric	BestDose	AvgDose	YourDose
CTDIvol (mGy)	8	13	18
DLP (mGy-cm)	326	716	1121

Table 23: SOM DEF AS ~ MHR_CT_PAVNAV

metric	BestDose	AvgDose	YourDose
CTDIvol (mGy)	11	13	14
DLP (mGy-cm)	600	707	649

Compared with all other SOM DEF AS scanners, DLP for MHR.CT.PAVNAV are AVERAGE

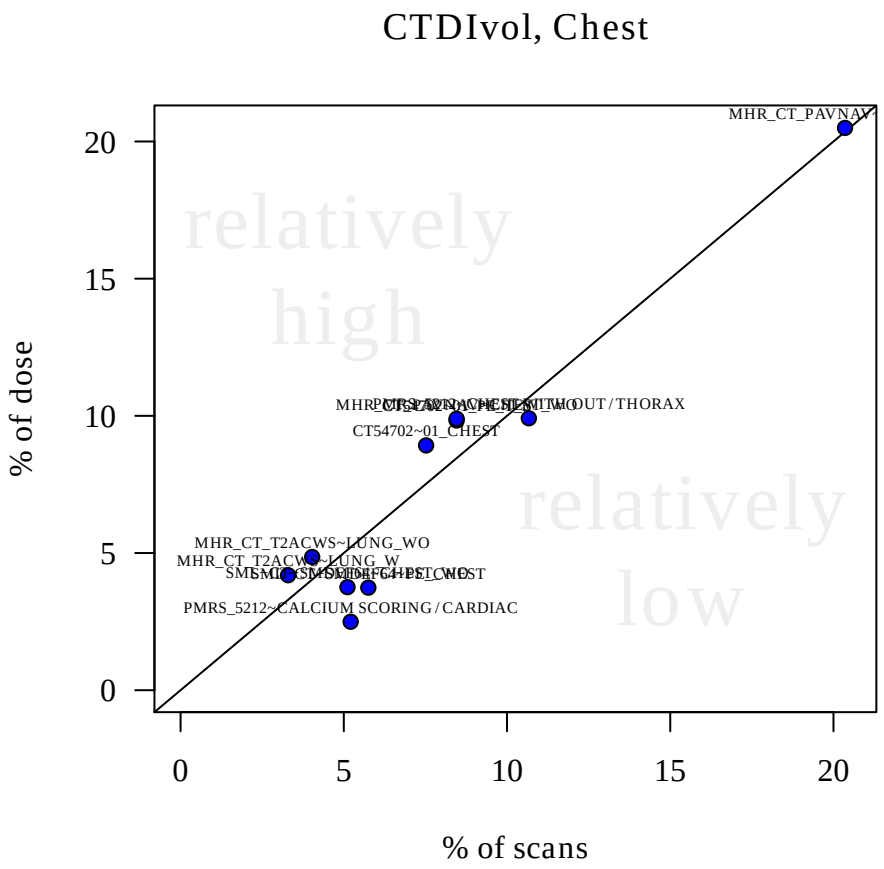
Table 24: SOM DEF AS ~ SML-CT-SMDEF64

metric	BestDose	AvgDose	YourDose
CTDIvol (mGy)	8	13	10
DLP (mGy-cm)	325	707	508

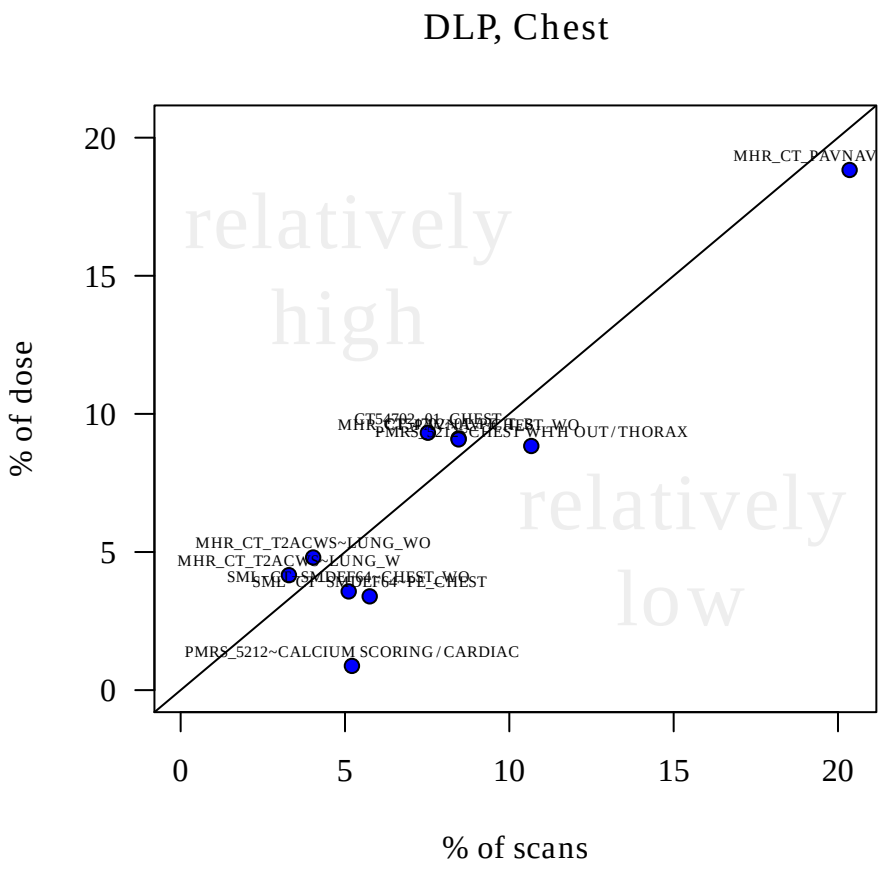
Compared with all other SOM DEF AS scanners, DLP for SML-CT-SMDEF64 are AVERAGE

C. Relative contribution to dose of specific protocols at your facility

The number of protocols that are used at your facility for head, chest, and abdomen scans are provided at the beginning of this report. The graphs on the following pages show you – for a limited number of those protocols– how the dose, and the frequency that you use these protocols, varies. The y-axis shows the percent of the total dose at your facility that comes from each protocol, and the x-axis the frequency that you use this protocol. Protocols that fall along the diagonal line can be considered "typical dose" protocols – as they account for an average amount of doses. Protocols that fall above the line use more than an average amount of dose, and the farther they fall from the line, the higher their relative dose. Protocols that fall below the line use less than an average amount of dose compared to other protocols. It is not necessarily wrong for a protocol to lie far from the line as it simply reflects its relative contribution. The table below shows you the potential dose reduction that could be achieved (as a proportion of all of the dose at your facility) by altering how often you use particular protocol or by altering the parameters of these protocols to make them closer to the average.



Machine~Protocol Name	% scans	% dose	Abs. diff	% diff	ratio
MHR_CT_PAVNAV~CHEST_WO	8.5	9.9	1.4	17.0	1.2
CT54702~01_CHEST	7.5	8.9	1.4	18.6	1.2
CT54702~01_PE_T_B	8.5	9.8	1.4	16.3	1.2
MHR_CT_T2ACWS~LUNG_W	3.3	4.2	0.9	27.2	1.3
MHR_CT_T2ACWS~LUNG_WO	4.0	4.9	0.8	20.4	1.2
MHR_CT_PAVNAV~PE_CHEST	20.4	20.5	0.1	0.7	1.0
PMRS_5212~CHEST WITH OUT/THORAX	10.7	9.9	-0.8	-7.1	0.9
SML-CT-SMDEF64~CHEST_WO	5.1	3.8	-1.4	-26.5	0.7
SML-CT-SMDEF64~PE_CHEST	5.8	3.7	-2.0	-35.0	0.6
PMRS_5212~CALCIUM SCORING/CARDIAC	5.2	2.5	-2.7	-52.1	0.5



Machine~Protocol Name	% scans	% dose	Abs. diff	% diff	ratio
CT54702~01_CAP	1.6	3.9	2.3	146.8	2.5
MHR_CT_T2ACWS~THORACIC_ANGIO	1.2	3.2	2.0	170.9	2.7
CT54702~01_CHEST	7.5	9.3	1.8	23.9	1.2
MHR_CT_T2ACWS~LUNG_W	3.3	4.2	0.9	26.4	1.3
MHR_CT_T2ACWS~LUNG_WO	4.0	4.8	0.8	19.1	1.2
CT54702~01_PE_T_B	8.5	9.1	0.7	7.7	1.1
MHR_CT_PAVNAV~CHEST_WO	8.5	9.1	0.6	7.3	1.1
MHR_CT_PAVNAV~PE_CHEST	20.4	18.8	-1.5	-7.5	0.9
SML-CT-SMDEF64~CHEST_WO	5.1	3.6	-1.5	-30.1	0.7
PMRS_5212~CHEST WITH OUT/THORAX	10.7	8.8	-1.8	-17.1	0.8
SML-CT-SMDEF64~PE_CHEST	5.8	3.4	-2.4	-41.0	0.6
PMRS_5212~CALCIUM SCORING/CARDIAC	5.2	0.9	-4.3	-83.2	0.2

D. Doses of your most common protocols compared with those at best performing sites

We have identified the facilities with the lowest doses for each device. This table shows you how the technical parameters within each protocol at your facility compares with the average technical parameters used at facilities with the lowest doses *for that device*. When assessing these data, you must take into account what the indications are for scanning at your facility, as they may differ from other facilities.

In the tables in this section, your most common protocols are labeled by scanner name. The following table shows the name and device types for all scanners at your facility.

Device Type	Scanner name
BRILLIANCE 16	PMRS_5212
SENSATION 64	CT54702
SOM DEF	MHR_CT_T2ACWS
SOM DEF AS	MHR_CT_PAVNAV
SOM DEF AS	SML-CT-SMDEF64

Head protocols	%	CTDI	DLP	mAs	Phase	Pitch	ScanLen
Best sites: SENSATION 64				183	1	0.9	16
Best sites: SOM DEF AS				143	1	0.6	17
MHR_CT_PAVNAV~BRAIN_WO	44	44	793	289	1	1.0	18
CT54702~SPIRAL_BRAIN	28	41	804	280	1	1.0	19
SML-CT-SMDEF64~BRAIN_WO	13	46	826	163	1	0.6	17

Chest protocols	%	CTDI	DLP	mAs	Phase	Pitch	ScanLen
Best sites: BRILLIANCE 16				113	1.1	0.9	26
Best sites: SENSATION 64				228	1.5	1.1	34
Best sites: SOM DEF AS				137	1.2	0.9	33
Best sites: SOM DEF AS				85	1.1	0.7	32
Best sites: SOM DEF				104	1.6	0.9	28
MHR_CT_PAVNAV~PE_CHEST	20	14	464	155	1.0	0.9	31
PMRS_5212~CHEST WITH OUT/THORAX	11	12	394	171	1.0	1.0	33
MHR_CT_PAVNAV~CHEST_WO	8	15	508	184	1.0	1.0	33
CT54702~01_PE_T_B	8	15	515	183	1.0	0.9	32
CT54702~01_CHEST	8	16	580	165	1.0	0.7	37
SML-CT-SMDEF64~PE_CHEST	6	9	289	112	1.0	0.9	33
PMRS_5212~CALCIUM SCORING/CARDIAC	5	6	87	100	1.0	1.0	14
SML-CT-SMDEF64~CHEST_WO	5	8	308	167	1.0	1.0	35
MHR_CT_T2ACWS~LUNG_WO	4	16	599	195	1.0	0.8	36

Abdomen protocols	%	CTDI	DLP	mAs	Phase	Pitch	ScanLen
Best sites: SENSATION 64				191	1.9	1.0	43
Best sites: SOM DEF AS				153	1.6	0.8	46
Best sites: SOM DEF AS				137	1.6	0.7	38
Best sites: SOM DEF				108	1.3	0.8	39
MHR_CT_PAVNAV~ABD_PEL_WO	32	13	620	216	1.0	1.5	47
CT54702~01_ABDPEL_WO	20	12	606	130	1.0	0.7	49

Abdomen protocols	%	CTDI	DLP	mAs	Phase	Pitch	ScanLen
SML-CT-SMDEF64~ABD_PEL_WO	8	10	486	178	1.0	0.8	48
MHR_CT_PAVNAV~ABD_PEL_WITH	7	12	586	217	1.0	1.5	48
SML-CT-SMDEF64~ABD_PEL_WITH	7	9	422	94	1.0	0.8	47
MHR_CT_T2ACWS~ABD_PEL_WITH	3	18	871	209	1.0	0.7	48

E. Patients who received the highest doses at your facility

Reviewing individual patients who received the highest doses at your facility is a way to identify possible quality issues. The lists on these pages identify those patients within the audit period who received the highest doses. You can search within your database using the information we have provided to identify these patients.

The 95th percentile doses for CTDIvol across all patients and facilities is 62 mGy for the head, 22 mGy for the chest, and 26 mGy for the abdomen. At your facility, there were 34 patients who received a head dose above 62 mGy.
There were 163 patients who received a chest dose above 22 mGy.
There were 139 patients who received an abdomen dose above 26 mGy.

Table 57: Patients receiving highest doses for HEAD

EffDose	CTDIvol	DLP	mAs	Phase	ScanLen	Machine	Date	Time	Age	Sex
47	63	4390	219	4	17	SML-CT-SMDEF64	2016-12-02	21:19:11	34	M
9	68	2857	258	3	14	MHR_CT_PAVNAV	2017-01-02	15:33:46	41	M
8	58	3049	248	3	17	SML-CT-SMDEF64	2017-01-11	15:14:50	90	F
8	34	2103	181	2	15	MHR_CT_PAVNAV	2017-01-15	2:47:28.	96	F
7	44	2433	290	2	19	MHR_CT_PAVNAV	2017-02-12	12:27:59	18	M
6	25	1720	319	1	23	MHR_CT_PAVNAV	2017-03-05	13:05:41	93	M
6	46	2147	299	3	15	MHR_CT_PAVNAV	2017-02-06	20:26:45	64	M
6	77	2031	152	1	26	SML-CT-SMDEF64	2016-12-23	3:42:13.	73	F
6	33	1686	223	2	17	MHR_CT_PAVNAV	2017-01-23	12:01:49	64	F
6	56	2335	333	2	21	CT54702	2017-03-06	9:21:07.	96	F
6	33	1879	290	1	19	MHR_CT_PAVNAV	2016-12-23	21:37:45	74	M
6	65	2339	407	2	18	MHR_CT_PAVNAV	2016-12-18	6:05:41.	24	F
6	73	1902	263	1	26	MHR_CT_PAVNAV	2017-01-07	6:34:33.	21	F
6	46	1944	205	2	21	MHR_CT_T2ACWS	2017-01-05	10:32:28	69	M
6	62	2297	224	3	12	SML-CT-SMDEF64	2017-02-04	18:27:33	47	M
5	20	1704	196	2	21	MHR_CT_PAVNAV	2017-01-28	18:47:42	33	F
5	29	1815	249	1	21	MHR_CT_PAVNAV	2017-01-21	13:05:35	28	F
5	64	2031	226	2	16	MHR_CT_PAVNAV	2017-01-15	16:42:16	61	F
5	53	1986	235	2	19	SML-CT-SMDEF64	2017-02-20	17:11:05	26	M
5	28	1302	243	1	23	MHR_CT_PAVNAV	2017-01-03	18:40:23	93	F
5	32	1396	300	1	22	MHR_CT_PAVNAV	2017-01-09	13:27:27	54	M
5	43	1661	147	2	19	MHR_CT_PAVNAV	2017-02-16	20:11:06	49	M
5	28	1643	250	1	19	MHR_CT_PAVNAV	2016-12-26	2:03:15.	30	M
5	42	2223	341	3	18	MHR_CT_PAVNAV	2016-12-18	10:26:30	51	M
5	108	1948	367	1	18	MHR_CT_PAVNAV	2016-12-03	2:36:29.	85	F

Table 58: Patients receiving highest doses for CHEST

EffDose	CTDIvol	DLP	mAs	Phase	ScanLen	Machine	Date	Time	Age	Sex
50	21	2372	229	3	37	MHR_CT_T2ACWS	2016-12-14	8:39:31.	69	F
45	19	2112	274	4	27	MHR_CT_PAVNAV	2016-12-01	12:01:43	61	F
41	18	2695	246	3	50	CT54702	2017-01-10	15:02:37	89	M
39	23	1840	241	2	41	CT54702	2017-02-28	17:04:43	80	F
39	44	2916	250	3	22	MHR_CT_T2ACWS	2016-12-29	15:14:28	64	M
38	41	2069	310	2	25	MHR_CT_T2ACWS	2016-12-13	9:57:01.	81	M
36	25	2162	290	2	43	CT54702	2016-12-01	12:07:17	34	F
35	27	1791	296	2	33	MHR_CT_T2ACWS	2016-12-23	10:04:33	68	F
33	20	1709	236	2	42	CT54702	2017-02-12	17:14:17	38	F
33	25	2355	287	2	47	MHR_CT_PAVNAV	2017-03-11	15:03:28	56	M
33	20	1791	274	2	45	CT54702	2017-01-28	16:21:59	57	F
33	17	1494	272	2	43	CT54702	2016-12-03	17:39:50	34	F
32	17	1271	239	2	38	CT54702	2016-12-09	17:37:32	88	F
32	19	1356	261	2	36	MHR_CT_PAVNAV	2017-01-31	19:00:47	25	F
31	15	1251	237	2	41	CT54702	2017-03-12	18:11:03	67	F
31	17	1134	175	2	34	MHR_CT_T2ACWS	2016-12-22	14:00:31	68	F
31	31	2186	224	2	35	MHR_CT_PAVNAV	2016-12-31	23:49:23	47	F
30	18	1295	189	2	36	MHR_CT_T2ACWS	2017-01-19	10:52:12	73	F
30	20	1769	277	2	45	MHR_CT_PAVNAV	2016-12-16	4:42:19.	52	M
30	19	1952	188	2	53	MHR_CT_T2ACWS	2016-12-16	8:31:06.	58	M
30	13	1261	283	3	33	MHR_CT_T2ACWS	2017-02-07	11:32:24	74	F
30	15	1204	248	2	40	CT54702	2017-01-21	9:28:01.	43	F
30	24	1499	253	2	32	MHR_CT_T2ACWS	2017-03-17	11:11:05	73	F
30	27	1986	225	2	36	MHR_CT_T2ACWS	2017-02-07	14:54:52	68	M
30	19	1398	220	2	37	MHR_CT_T2ACWS	2017-01-06	12:04:21	72	F

Table 59: Patients receiving highest doses for ABDOMEN

EffDose	CTDIvol	DLP	mAs	Phase	ScanLen	Machine	Date	Time	Age	Sex
65	39	4329	268	3	37	MHR_CT_T2ACWS	2017-02-10	7:58:16.	65	M
62	32	4409	233	4	35	MHR_CT_PAVNAV	2017-02-17	15:21:02	72	F
53	23	3272	261	4	35	MHR_CT_T2ACWS	2017-01-31	10:12:31	60	F
52	24	2901	268	4	30	MHR_CT_T2ACWS	2017-01-18	9:41:49.	77	F
52	21	3365	221	3	53	MHR_CT_T2ACWS	2017-02-14	10:58:24	48	F
51	28	3470	319	4	31	MHR_CT_T2ACWS	2017-01-26	8:51:43.	60	F
50	38	3769	276	3	33	MHR_CT_T2ACWS	2016-12-30	11:32:58	73	F
50	15	2171	160	4	37	MHR_CT_T2ACWS	2017-02-13	13:55:19	60	F
49	25	2988	279	4	30	MHR_CT_T2ACWS	2017-01-16	13:57:17	48	F
49	36	3250	245	3	30	MHR_CT_T2ACWS	2017-02-06	16:29:59	70	F
48	26	3663	211	3	47	MHR_CT_T2ACWS	2017-01-03	12:59:09	68	M
47	23	3703	201	3	53	MHR_CT_T2ACWS	2017-02-23	15:01:17	49	F
47	21	3250	235	4	39	MHR_CT_T2ACWS	2017-02-21	10:02:25	56	M
46	21	3538	207	4	42	CT54702	2017-02-25	12:42:29	93	M
45	35	3315	238	2	48	MHR_CT_PAVNAV	2017-01-19	14:24:22	63	F
44	18	2322	197	4	33	MHR_CT_T2ACWS	2016-12-05	11:17:00	78	F
44	16	2588	202	3	53	MHR_CT_T2ACWS	2017-02-07	12:16:17	65	M
43	29	2838	278	2	48	MHR_CT_T2ACWS	2017-03-17	15:05:28	66	M
43	15	1891	161	4	32	MHR_CT_T2ACWS	2017-03-16	15:28:04	60	F
41	15	2233	183	3	51	MHR_CT_T2ACWS	2017-02-02	10:24:02	49	F
41	14	1980	180	3	46	MHR_CT_T2ACWS	2017-02-13	14:31:39	68	F
41	19	2861	311	3	49	PMRS_5212	2016-12-13	13:16:44	71	M
41	14	1960	178	3	47	MHR_CT_T2ACWS	2016-12-28	13:54:53	54	F
40	12	1743	161	3	47	MHR_CT_T2ACWS	2017-03-17	11:29:04	62	F
40	12	1734	162	3	47	MHR_CT_T2ACWS	2016-12-19	11:48:53	21	F

F. Effect of changing specific parameters on doses received by your patients

We have identified for each type of equipment those facilities with the lowest doses. These graphs are meant to help you understand what would happen to the protocol-specific doses at your facilities if you copied the technical parameters and protocols of the facilities with the lowest doses.

The following plots show the average settings for mAs, phase, pitch, and scan length for a particular machine at your facility along with the settings for other facilities using the same model of machine for the same anatomical region. Each machine of a certain model type at your facility is indicated in blue; all other machines of that same model type at other facilities are in grey. If you have two machines of the same model, you will see two blue dots showing the average settings for each one. The green dot shows the average value for the setting for the same model type at "best performing" facilities. That is, we look at the doses for the same anatomical region across all facilities that have the same device as you, and then we calculated the average settings for mAs, pitch, and so on for the low dose facilities. That is the green dot.

If your device is a common one, you will see many comparisons; if your device is rare or unusual, you will see very few comparisons. If your machine is the only one of its type, there will be no other comparisons.

Reducing mAs, phases, and/or scan length reduce dose, while increasing pitch reduces dose, so the plots show pitch with the sign reversed. Lower doses will tend to be in the lower left corner of each panel while higher doses will tend to be in the upper right corner.

G. Chest-Abdomen-Pelvis (CAP) frequency

We have identified the proportion of examinations that combine chest and abdomen/pelvis (CAP) scans for each facility. This graph below is sorted by how often a facility uses CAP scans. Facilities on the left use CAP more frequently, whereas facilities on the right use these combined scans less frequently. Your facility is indicated at the top of the graph. Within each slice, the bars sum to 100%.

The following table ranks the 39 facilities in your track according to percentage of scans that were combined CAP scans. At your facility, CAP scans comprised 4 percent of all scans.

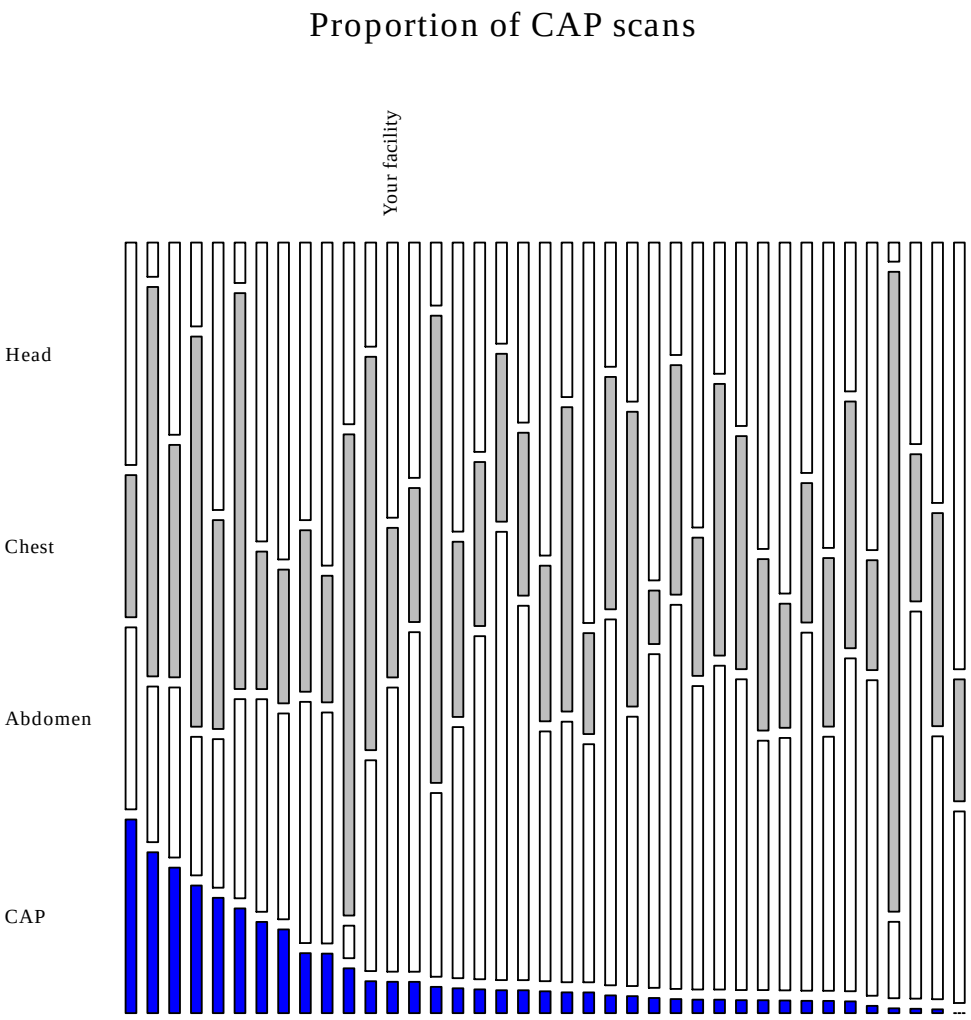


Table 85: Patients who received highest doses for CAP

EffDose	CTDIvol	DLP	mAs	Phase	ScanLen	Machine	Date	Time	Age	Sex
83	41	4090	302	1	34	MHR_CT_T2ACWS	2017-02-09	11:17:33	40	M
73	23	3748	219	2	40	MHR_CT_T2ACWS	2017-03-20	15:35:39	65	F
70	19	2962	233	2	38	MHR_CT_T2ACWS	2017-03-07	10:03:50	80	F
58	21	3318	251	2	40	MHR_CT_T2ACWS	2017-03-06	14:13:03	92	M
58	15	2173	221	4	37	MHR_CT_T2ACWS	2017-03-13	16:57:34	85	F
56	25	4393	278	1	43	MHR_CT_T2ACWS	2017-03-02	9:11:25.	86	M
55	20	2207	230	1	37	MHR_CT_T2ACWS	2017-01-12	9:34:38.	71	F
54	23	3486	273	1	30	MHR_CT_T2ACWS	2017-02-09	13:56:30	74	M
54	22	2577	231	1	39	MHR_CT_T2ACWS	2017-01-25	14:11:23	70	F
53	21	2749	233	1	44	MHR_CT_T2ACWS	2017-01-30	11:46:55	68	M
52	15	2173	279	4	37	MHR_CT_T2ACWS	2017-03-13	16:47:46	85	F
52	19	2339	217	2	42	MHR_CT_T2ACWS	2017-01-30	14:33:13	58	F
49	29	2271	278	1	39	MHR_CT_T2ACWS	2017-02-23	10:20:38	52	F
49	27	3527	254	3	33	MHR_CT_T2ACWS	2016-12-27	17:19:21	76	M
48	28	2145	231	1	38	MHR_CT_T2ACWS	2016-12-30	15:36:19	51	F
47	22	2293	210	2	34	MHR_CT_T2ACWS	2017-01-31	18:14:37	33	F
46	22	1884	269	1	43	MHR_CT_T2ACWS	2016-12-13	9:24:57.	45	F
45	19	2322	231	3	40	MHR_CT_T2ACWS	2016-12-13	13:29:12	82	F
45	22	1743	261	1	40	MHR_CT_T2ACWS	2017-02-21	9:42:22.	70	F
45	30	2225	308	1	37	MHR_CT_T2ACWS	2017-02-23	15:50:29	57	F
45	23	1892	283	1	41	MHR_CT_T2ACWS	2017-01-20	15:59:22	69	F
45	17	2024	198	2	39	MHR_CT_T2ACWS	2016-12-01	18:06:22	44	F
44	21	1870	260	1	44	MHR_CT_T2ACWS	2017-01-04	9:30:36.	75	F
44	21	2481	248	1	40	MHR_CT_T2ACWS	2016-12-13	12:04:58	66	M
44	21	2485	239	2	40	MHR_CT_T2ACWS	2017-02-16	16:54:48	59	F

Selected Pages From Audit Shown

A.2 List of All Protocols by Anatomic Region
Frequency Order
ABDOMEN

Protocol Name	Count of Scans	Percent of Scans	Effective Dose (mSv)	Scan Length (cm)	KVP	mAs	Pitch	Phase Count	Rank for Variable COUNT
ABD_PEL_WO	5382	42.92	11.1	48	123	208	1.2	1.0	1
ABD_PEL_WITH	2197	17.52	10.6	49	123	167	1.1	1.1	2
01_ABDPEL_WO	2094	16.70	11.0	49	120	144	0.7	1.0	3
01_ABDPEL_WITH	493	3.93	10.7	50	120	137	0.7	1.0	4
ABD_PEL_COMP	268	2.14	21.0	76	115	203	0.7	2.0	5
UROGRAM	203	1.62	32.1	127	120	182	0.8	3.0	6
PELVIS_	171	1.36	5.2	32	113	159	0.8	1.1	7
ABDOMEN ROUTINE W/O/ABDOMEN	134	1.07	10.4	45	120	250	1.0	1.0	8
PEDS_ABD_PEL_WO	93	0.74	2.3	35	97	61	1.0	1.0	9
TRIPLE_PHASE_LIVER	86	0.69	33.6	120	116	203	0.7	4.0	10
01_PELVIS	84	0.67	5.5	32	121	121	0.7	1.0	11
01_CAP	83	0.66	14.6	53	120	174	0.7	1.1	13
CT_UROGRAM	83	0.66	19.4	140	103	164	0.9	3.0	13
PANCREAS_PROTOCOL	66	0.53	15.4	101	104	152	0.8	3.0	14
PELVIS_FX	58	0.46	4.1	34	111	111	0.8	1.0	15
ABD/PELV ROUTINE WO & W/ABDOMEN	57	0.45	25.5	105	120	259	1.0	2.3	16
CAP_W_TRAUMA	52	0.41	12.8	49	128	228	1.3	1.1	17
3_PHASE_LIVER	51	0.41	16.1	124	102	143	0.8	4.0	18
ABD_PEL_COMPLETE	48	0.38	13.4	83	121	124	0.9	2.1	20
CTA_ABD	48	0.38	31.9	108	119	199	0.8	2.8	20
PANC_PROTOCOL	46	0.37	31.6	101	117	203	0.7	3.0	21
ABDOMEN/PELVIS WITH/ABDOMEN	45	0.36	13.3	55	120	260	1.0	1.3	22
TRAUMA_HEAD_C_SPINE	40	0.32	15.8	58	128	228	1.2	1.8	23

A.2 List of All Protocols by Anatomic Region
Frequency Order
CHEST

Protocol Name	Count of Scans	Percent of Scans	Effective Dose (mSv)	Scan Length (cm)	KVP	mAs	Pitch	Phase Count	Rank for Variable COUNT
PE_CHEST	1516	25.02	8.1	34	116	144	0.9	1.2	1
CHEST_WO	824	13.60	8.6	34	117	180	1.0	1.0	2
CHEST WITH OUT/THORAX	626	10.33	8.5	33	120	233	1.0	1.0	3
01_CHEST	431	7.11	12.1	40	120	175	0.7	1.1	4
01_PE_T_B	419	6.92	11.3	36	120	184	0.9	1.1	5
CALCIUM SCORING/CARDIAC	355	5.86	2.1	13	120	104	1.0	1.0	6
LUNG_WO	280	4.62	11.0	37	116	190	0.8	1.0	7
LUNG_W	228	3.76	11.9	37	117	199	0.8	1.0	8
CHEST_W	203	3.35	8.7	38	115	174	1.0	1.1	9
MH HRCT SUPINE/THORAX	191	3.15	9.1	44	120	241	1.0	1.9	10
HIRES_LUNG	109	1.80	11.6	44	120	311	1.4	1.5	11
PE_STUDY_1	85	1.40	13.6	35	118	203	0.8	1.3	12
01_CAP	81	1.34	22.1	76	120	234	0.9	1.8	13
THORACIC_ANGIO	74	1.22	25.5	72	120	209	0.7	2.0	14
LUNG SCREENING/THORAX	72	1.19	1.5	35	120	183	1.0	1.0	15
HR_LUNG	60	0.99	16.0	59	128	176	1.0	1.9	16
CHEST WITH CONTRAST/THORAX	56	0.92	9.6	35	120	232	1.0	1.0	17
01_PE_CHEST_ACR	55	0.91	10.3	33	120	188	0.9	1.0	18
THOR_ANGIO	51	0.84	14.8	76	113	130	0.8	2.1	19
TRAUMA_HEAD_C_SPINE	47	0.78	17.5	51	131	238	1.3	1.7	20
01_HIRES_LUNG	38	0.63	12.1	56	120	139	0.8	2.1	21
CAP_W_TRAUMA	30	0.50	16.6	52	138	243	1.3	1.3	23
CTA_HEART_SPIRAL	30	0.50	10.2	23	118	211	0.9	1.3	23

A.2 List of All Protocols by Anatomic Region
Frequency Order
HEAD

Protocol Name	Count of Scans	Percent of Scans	Effective Dose (mSv)	Scan Length (cm)	KVP	mAs	Pitch	Phase Count	Rank for Variable COUNT
BRAIN_WO	6755	57.06	2.1	20	119	261	0.9	1.0	1
SPIRAL_BRAIN	2952	24.94	2.0	20	120	283	1.0	1.0	2
SPIRAL_BRAIN_WO	284	2.40	1.9	18	120	156	0.6	1.1	3
01_FACIAL_BONES	218	1.84	1.1	20	120	106	0.9	1.1	4
FACIAL_BONES	209	1.77	1.4	19	105	121	0.8	1.0	5
PEDS_HEAD_SPIRAL	192	1.62	1.9	18	100	194	0.8	1.2	6
MH BRAIN HELICAL/HEAD	162	1.37	2.0	18	120	316	1.0	1.0	7
SINUS	122	1.03	0.5	14	107	90	0.8	1.1	8
TRAUMA_HEAD_C_SPINE	107	0.90	2.9	28	117	187	0.7	1.6	9
MH SINUS/FACIAL SUPINE/HEAD	76	0.64	0.5	14	120	103	1.0	1.0	10
COW_CTA	72	0.61	2.8	31	107	209	0.7	1.2	11
CAROTID_COW_CTA	58	0.49	2.6	28	112	196	0.7	1.2	12
BRAIN HELICAL/HEAD	52	0.44	2.3	19	120	300	1.0	1.0	13
IAC	48	0.41	0.9	8	107	211	0.8	1.0	14
COW	47	0.40	3.9	37	120	181	0.7	2.0	15
STROKE	43	0.36	2.5	19	116	195	0.6	1.1	16
SINUS SUPINE/HEAD	42	0.35	0.7	15	120	300	1.0	1.0	17
SINUS_	37	0.31	0.5	15	100	109	0.8	1.1	18
SPIRAL_BRAIN_COMP	34	0.29	3.7	35	120	157	0.6	1.9	19
BRAIN_COMP_WWO	29	0.24	3.7	34	119	162	0.6	1.7	21
MH SINUS SUPINE/HEAD	29	0.24	0.6	13	120	300	1.0	1.0	21
01_BRAIN_PERFUSION	21	0.18	0.4	5	82	361	1.0	1.0	23
01_SINUS	21	0.18	0.5	17	119	57	0.9	1.0	23

A.2 List of All Protocols by Anatomic Region
Frequency Order
CHEST/ABDOMEN/PELVIS

Protocol Name	Count of Scans	Percent of Scans	Effective Dose (mSv)	Scan Length (cm)	KVP	mAs	Pitch	Phase Count	Rank for Variable COUNT
CAP	293	22.03	34.9	84	120	244	0.8	1.2	1
CAP_WITH	252	18.95	18.7	84	121	172	1.1	1.0	2
PE_CHEST	171	12.86	20.8	85	122	170	1.0	1.2	3
CAP_WO	167	12.56	19.4	82	120	175	1.0	1.0	4
CTA_HEART_SPIRAL	137	10.30	19.5	31	118	185	0.6	1.3	5
CAP_W_TRAUMA	90	6.77	27.1	91	139	203	1.4	1.0	6
ABD_WO	22	1.65	40.0	118	119	228	0.8	1.5	7
CAP WO/W/THORAX	21	1.58	27.5	95	120	274	1.0	1.2	9
CAP_COMP	21	1.58	33.1	103	120	255	1.0	1.3	9
ABD_PEL_WO	19	1.43	28.3	101	120	203	1.0	1.1	10
CHEST WITH OUT/THORAX	17	1.28	17.0	78	120	235	1.0	1.0	11
COMPLETE_AORTA_ANGIO	16	1.20	17.8	106	109	168	0.8	1.5	12
CAP_COMPLETE	15	1.13	24.7	111	124	173	1.2	1.5	13
CHEST_WO	11	0.83	20.9	86	121	183	1.0	1.1	14
HIRES_LUNG	8	0.60	28.3	85	126	304	1.3	1.0	16
THOR_ANGIO	8	0.60	24.6	116	118	159	0.8	1.6	16
CHEST_W	7	0.53	18.7	120	112	177	1.1	2.4	18
TRAUMA_HEAD_C_SPINE	7	0.53	35.3	91	133	244	1.3	1.3	18
ABDOMEN ROUTINE W/O/ABDOMEN	6	0.45	17.8	79	120	235	1.0	1.0	19
HR_LUNG	3	0.23	41.5	109	125	244	0.9	1.7	21
PANC_PROTOCOL	3	0.23	33.7	134	115	211	0.8	1.0	21
PE_STUDY_1	3	0.23	21.8	80	113	197	0.8	1.0	21
01_CAP	2	0.15	17.7	86	120	121	0.8	1.0	26

A.1: Protocol Rankings for: PULMONARY EMBOLISM

Facility	Device Model	Protocol Name	Rank Effec Dose	Effec Dose	Scan Length	KVP	mAs	Pitch	Phase
Lowest			1	2.0	38	88	239	1.8	1.0
Low 2			2	2.1	32	85	97	0.6	1.0
Low 3			3	2.2	34	100	129	1.5	1.0
Low 4			4	2.2	34	103	108	1.4	1.0
Low 5			5	2.9	37	100	237	1.8	1.0
Top 5 Avg	mixture	mixture	.	2.3	35	95	162	1.4	1.0
You	SOM DEF AS	PE_CHEST	63	8.2	34	116	144	0.9	1.2
You	SOM DEF AS	PE_CHEST_ACR	67	8.3	32	112	204	0.9	1.2
You	SENSATION 64	01_PE_CHEST_ACR	95	10.4	33	120	190	0.9	1.0
You	SENSATION 64	01_PE_T_B	104	11.4	36	120	183	0.9	1.1
You	SOM DEF	PE_STUDY_1	127	13.4	35	118	200	0.8	1.3
Highest			171	34.2	123	116	212	0.8	2.9

A.1: Protocol Rankings for: HEAD SINGLE

Facility	Device Model	Protocol Name	Rank Effec Dose	Effec Dose	Scan Length	KVP	mAs	Pitch	Phase
Lowest			1	0.3	17	117	45	0.8	1.0
Low 2			2	0.4	17	80	160	1.0	1.0
Low 3	SENSATION 64	01_BRAIN_PERFUSION	3	0.4	6	82	368	1.0	1.0
Low 4			4	0.4	23	120	50	1.0	1.0
Low 5			5	0.5	6	90	128	0.6	1.0
Top 5 Avg	mixture	mixture	.	0.4	14	98	150	0.9	1.0
You	SENSATION 64	01_HEAD_SPIRAL	43	1.5	18	120	122	0.8	1.0
You	SOM DEF AS	PEDS_HEAD_SPIRAL	66	1.7	17	100	193	0.8	1.0
You	SOM DEF AS	PEDS_BRAIN_XC	76	1.8	16	100	158	0.6	1.0
You	SOM DEF	SPIRAL_BRAIN_WO	82	1.9	18	120	157	0.6	1.0
You	SENSATION 64	SPIRAL_BRAIN	97	2.0	19	120	283	1.0	1.0
You	BRILLIANCE 16	MH BRAIN HELICAL/HEAD	102	2.0	18	120	317	1.0	1.0
You	SOM DEF AS	BRAIN_WO	111	2.1	19	119	261	0.9	1.0
You	BRILLIANCE 16	BRAIN HELICAL/HEAD	113	2.1	18	120	311	1.0	1.0
You	SOM DEF AS	STROKE	151	2.4	17	117	195	0.6	1.0
Highest			235	5.9	27	120	532	1.4	1.0

A.2 List of All Protocols by Anatomic Region
Alphabetical Order
CHEST

Protocol Name	Count of Scans	Percent of Scans	Effective Dose (mSv)	Scan Length (cm)	KVP	mAs	Pitch	Phase Count
CAROTID_CTA	2	0.03	12.1	38	120	206	1.2	1.0
CHEST CTA PE/THORAX	3	0.05	12.5	34	120	300	1.0	2.7
CHEST WITH CONTRAST/THORAX	56	0.92	9.6	35	120	232	1.0	1.0
CHEST WITH OUT/THORAX	626	10.33	8.5	33	120	233	1.0	1.0
CHEST_W	203	3.35	8.7	38	115	174	1.0	1.1
CHEST_WO	824	13.60	8.6	34	117	180	1.0	1.0
CHEST_WO_XC	6	0.10	4.9	32	100	103	0.6	1.0
COMPLETE_AORTA	4	0.07	38.0	115	118	207	0.7	2.5
COMPLETE_AORTA_ANGIO	20	0.33	16.1	88	108	142	0.8	1.9
CTA_HEART_SPIRAL	30	0.50	10.2	23	118	211	0.9	1.3
DS_GATED_THORACIC_AORTA_CTA	1	0.02	39.2	66	120	250	0.7	3.0
ENB CHEST WITH OUT/THORAX	4	0.07	9.6	33	120	228	1.0	1.0
ENBPROTOCOLLUNGWO	2	0.03	6.5	34	110	159	1.0	1.0
HIRES_LUNG	109	1.80	11.6	44	120	311	1.4	1.5
HR_LUNG	60	0.99	16.0	59	128	176	1.0	1.9
LUNG SCREENING/THORAX	72	1.19	1.5	35	120	183	1.0	1.0
LUNG_CHEST	2	0.03	11.1	38	110	125	1.0	1.5
LUNG_W	228	3.76	11.9	37	117	199	0.8	1.0
LUNG_WO	280	4.62	11.0	37	116	190	0.8	1.0
MH HRCT SUPINE/THORAX	191	3.15	9.1	44	120	241	1.0	1.9
PEDS_CHEST_WO	3	0.05	2.3	24	100	69	1.0	1.0
PE_CHEST	1516	25.02	8.1	34	116	144	0.9	1.2
PE_CHEST_ACR	9	0.15	9.1	32	113	205	0.9	1.2
PE_STUDY_1	85	1.40	13.6	35	118	203	0.8	1.3

A.2 List of All Protocols by Anatomic Region
Alphabetical Order
HEAD

Protocol Name	Count of Scans	Percent of Scans	Effective Dose (mSv)	Scan Length (cm)	KVP	mAs	Pitch	Phase Count
01_BRAIN_LARGE_FOV	1	0.01	1.9	19	120	266	1.0	1.0
01_BRAIN_PERFUSION	21	0.18	0.4	5	82	361	1.0	1.0
01_CARCOW_CTA	2	0.02	3.0	12	100	242	1.0	1.0
01_COW_CTA	20	0.17	1.2	21	120	107	0.7	1.1
01_FACIAL_BONES	218	1.84	1.1	20	120	106	0.9	1.1
01_HEAD_SPIRAL	15	0.13	1.6	19	120	129	0.8	1.1
01_IAC	7	0.06	0.8	8	120	110	0.7	1.0
01_LANDMARK_PROTOCOL	5	0.04	0.6	21	120	71	1.1	1.0
01_PROTOMED	2	0.02	1.1	21	120	136	1.1	1.0
01_SINUS	21	0.18	0.5	17	119	57	0.9	1.0
01_ST_NECK	2	0.02	3.1	21	120	175	0.7	1.0
01_TRAUMA_HEAD_CSPINE	2	0.02	2.1	19	120	296	1.0	1.0
AXIALBRAIN	5	0.04	2.0	21	120	299	1.0	1.6
BRAIN HELICAL/HEAD	52	0.44	2.3	19	120	300	1.0	1.0
BRAIN_COMP_WWO	29	0.24	3.7	34	119	162	0.6	1.7
BRAIN_LARGE_FOV	2	0.02	7.9	42	120	204	0.6	2.5
BRAIN_PERFUSION	9	0.08	2.6	13	97	205	0.9	2.3
BRAIN_WO	6755	57.06	2.1	20	119	261	0.9	1.0
BRAIN_WO_XC	5	0.04	2.1	21	120	146	0.6	1.2
CAP_W_TRAUMA	1	0.01	2.8	19	120	398	1.0	1.0
CAROTID_COW_CTA	58	0.49	2.6	28	112	196	0.7	1.2
COW	47	0.40	3.9	37	120	181	0.7	2.0
COW_CTA	72	0.61	2.8	31	107	209	0.7	1.2
C_SPINE_	1	0.01	1.9	18	120	293	1.0	1.0

A.2 List of All Protocols by Anatomic Region
Alphabetical Order
HEAD

Protocol Name	Count of Scans	Percent of Scans	Effective Dose (mSv)	Scan Length (cm)	KVP	mAs	Pitch	Phase Count
FACIAL	19	0.16	2.2	22	120	126	0.9	1.1
FACIAL_BONES	209	1.77	1.4	19	105	121	0.8	1.0
FACIAL_ST	1	0.01	1.5	24	90	216	0.9	2.0
HEADROUTINE	1	0.01	2.3	18	100	263	0.8	1.0
HEAD_SPIRAL_WO_PEDS	8	0.07	2.2	19	100	234	0.8	1.1
IAC	48	0.41	0.9	8	107	211	0.8	1.0
KIDS_IAC	7	0.06	0.9	10	100	192	0.8	1.1
LANDMARK_SINUS	4	0.03	0.8	11	100	157	1.0	1.0
MASTOIDS	19	0.16	1.0	8	116	169	0.9	1.2
MAX_FACE	14	0.12	0.8	17	120	89	0.8	1.1
MH BRAIN HELICAL/HEAD	162	1.37	2.0	18	120	316	1.0	1.0
MH BRAIN W/WO HELICAL/HEAD	1	0.01	3.9	39	120	325	1.0	2.0
MH SINUS SUPINE/HEAD	29	0.24	0.6	13	120	300	1.0	1.0
MH SINUS/FACIAL SUPINE/HEAD	76	0.64	0.5	14	120	103	1.0	1.0
ORBIT	3	0.03	0.5	12	120	83	0.8	1.0
ORBIT_CONTRAST	4	0.03	0.3	15	100	88	0.9	1.0
ORBIT_FACIAL_BONES	1	0.01	0.2	8	80	161	0.8	1.0
PEDS_BRAIN_XC	14	0.12	1.9	17	100	157	0.6	1.2
PEDS_FACIAL_BONES	21	0.18	0.6	14	91	113	0.8	1.1
PEDS_HEAD_SPIRAL	192	1.62	1.9	18	100	194	0.8	1.2
PEDS_SINUS	2	0.02	0.2	11	100	37	0.8	1.0
PEDS_SINUS_FACIAL	1	0.01	0.3	16	100	54	0.8	1.0
PEDS_ST_NECK	1	0.01	0.4	18	80	139	1.0	1.0
PERFUSION	1	0.01	2.4	8	100	213	0.8	2.0

A.2 List of All Protocols by Anatomic Region
Alphabetical Order
CHEST/ABDOMEN/PELVIS

Protocol Name	Count of Scans	Percent of Scans	Effective Dose (mSv)	Scan Length (cm)	KVP	mAs	Pitch	Phase Count
01_CAP	2	0.15	17.7	86	120	121	0.8	1.0
01_CHEST	1	0.08	18.1	81	120	107	0.7	2.0
01_COMPLETE_AORTA_ANGIO	2	0.15	24.6	122	120	155	0.8	2.0
01_THORANGIO	1	0.08	21.0	88	120	164	0.8	2.0
3_PHASE_LIVER	2	0.15	27.9	163	110	130	0.8	2.0
ABDOMEN ROUTINE W/O/ABDOMEN	6	0.45	17.8	79	120	235	1.0	1.0
ABDOMEN_WO	2	0.15	21.7	124	117	174	1.2	2.0
ABD_PEL_COMPLETE	1	0.08	11.8	106	100	123	0.8	2.0
ABD_PEL_WITH	1	0.08	24.8	80	130	282	1.5	1.0
ABD_PEL_WO	19	1.43	28.3	101	120	203	1.0	1.1
ABD_WO	22	1.65	40.0	118	119	228	0.8	1.5
ADRENALS	1	0.08	16.5	127	100	103	0.8	4.0
CALCIUM_SCORING	1	0.08	27.6	26	120	300	0.7	1.0
CAP	293	22.03	34.9	84	120	244	0.8	1.2
CAP WO/W/THORAX	21	1.58	27.5	95	120	274	1.0	1.2
CAP_COMP	21	1.58	33.1	103	120	255	1.0	1.3
CAP_COMPLETE	15	1.13	24.7	111	124	173	1.2	1.5
CAP_WITH	252	18.95	18.7	84	121	172	1.1	1.0
CAP_WO	167	12.56	19.4	82	120	175	1.0	1.0
CAP_W_TRAUMA	90	6.77	27.1	91	139	203	1.4	1.0
CHEST WITH OUT/THORAX	17	1.28	17.0	78	120	235	1.0	1.0
CHEST_W	7	0.53	18.7	120	112	177	1.1	2.4
CHEST_WO	11	0.83	20.9	86	121	183	1.0	1.1
COMPLETE_AORTA	2	0.15	39.0	146	120	231	0.8	1.5