



School of Medicine
and Public Health

UNIVERSITY OF WISCONSIN-MADISON

Dose Check and Dose Benchmarking Manual

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Introduction

NEMA XR 25-2019 specifies an equipment feature for CT scanners to produce dose-related notification and alert messages to inform operators prior to scanning if the estimated dose would exceed the preset levels.

GE Healthcare CT scanners are compliant via a feature named “Dose Check”. This feature allows the set-up of scanner output warnings at the scan series/ group level on a protocol-by-protocol basis. The Dose Check feature also allows one to monitor how often warnings are triggered and analyze data from these occurrences.

Dose Check warning levels occur at two thresholds denoted as notification value (NV) and alert value (AV). The AV is higher than the NV and requires special user privileges to bypass. At the University of Wisconsin-Madison (UW), we have calculated NV for each series for each of our CT protocols. These are presented in this manual.

Editing scan parameters on the scanner console has the potential to change the maximum possible dose. The notification values in this report may not be valid if you customize the protocols that originally came from the UW. Additionally, depending on what version of UW protocols you have, the dose values may have changed. This document is meant to serve as a guide and should be used as a reference only. Please consult with your qualified medical physicist to assist you in setting your institution’s dose check values.

The previous version of this manual listed NV by scanner type. There were slight differences in NV among the scanner platforms. These differences existed because of different tube power, beam width, reconstruction options, tube rotation time, mA ranges, and scanner geometry options¹. A scanner listed as having a higher NV value setting relative to another scanner does not mean that the scanner delivered more imaging dose. It does, however; mean that a higher dose could potentially be delivered if requested by the automatic exposure control. In this version of the manual, we simplified the Dose Check process by listing a single set of NV since the scanner-to-scanner differences shown in the previous manual were deemed too small to be clinically significant.

UW’s philosophy behind setting these values is to limit Dose Check alerts to cases in which: (1) the protocol has been modified at scan time resulting in a higher dose than was originally prescribed for that protocol, and (2) in which a scan or series is repeated which would also result in a higher dose than expected. We do not desire the alert to be triggered each time an above-average patient is scanned. We use size-based protocols and tailor the dose in each size category to a specific size range of patients; this sizing is reflected in our NV values.

UW’s notification values were calculated by multiplying the maximum effective mAs possible during a given series by the $CTDI_{vol}$ per 100 mAs factors provided in the GE technical reference manuals. Since the maximum mA, tube rotation time, and pitch are values controllable, we can therefore accurately predict what the maximum possible scanner output should be for any given protocol.

In response to recent Joint Commission guidelines (specifically PI.02.01.01 and PC.01.03.01), we have also compiled dose data in the form of $CTDI_{vol}$, DLP, and SSDE for our protocols. We list dose on a series-by-series level instead of an exam level so you can better compare what is on your scanner to what we have at the UW. In addition, we have compiled data on some of our most common single-

phase exams similar to what is commonly reported in the literature.

UW has partnered with Imalogix, a cloud-based dose monitoring solution. We have cross-checked each dose value in our tables against our dose monitoring software, Imalogix. This is to ensure there are no cases in which the doses our patients receive, exceed the doses entered in our Dose Check Tables. To aide in comparing to external benchmarking data, we have also included dose data from a recent publication listing doses from 5 imaging centers in California² and data from the American College of Radiology Dose Index Registry (ACR DIR).

We hope that this manual can serve as a “one stop shop” to meet your dose compliance needs. For more information, please visit <https://www.radiology.wisc.edu/> or email Professor Szczykutowicz at tszczykutowicz@uwhealth.org

¹Szczykutowicz, Timothy P., Robert K. Bour, Nicholas Rubert, Gary Wendt, Myron Pozniak, and Frank N. Ranallo. "CT protocol management: simplifying the process by using a master protocol concept." *Journal of Applied Clinical Medical Physics* 16, no. 4 (2015).

²Smith-Bindman, Rebecca, et al. "Radiation doses in consecutive CT examinations from five University of California Medical Centers." *Radiology* 277.1 (2015): 134-141

Setting the AV

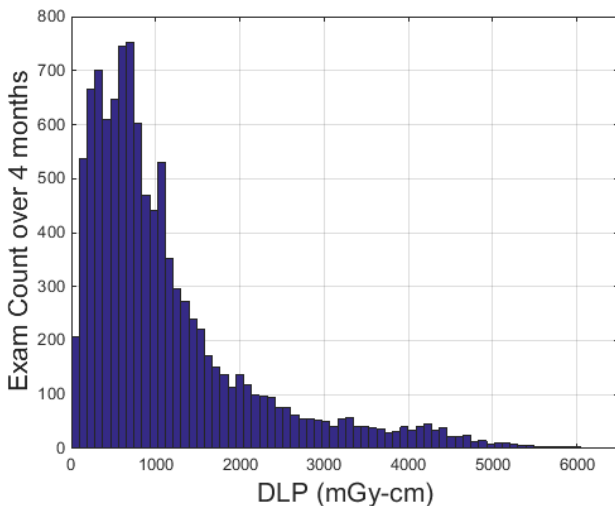
To set the AV, you must be a member of the Dose Check Administrator group. Please contact your site Dose Check Administrator. If your site does not have a Dose Check Administrator, consult your GE documentation manuals, or contact your applications specialist to assist you in setting up appropriate permissions.

Instructions for setting the AV:

1. From the scan monitor, click the **Protocol Management icon** located on the left bottom of the screen.
2. Click on the box labelled **Dose Check Management**.
3. In the AV checking section, select the box labelled **CTDI_{vol}**.
4. Enter a value of 1000 mGy into the box below the CTDI_{vol} box.
5. Click save. You have now set the AV.

An AV value of 1,000 mGy was chosen. Previously, we recommended using 5,000 mGy*cm (a DLP-based AV), but this threshold can be triggered for clinically appropriate reasons. A 1,000 mGy limit is more representative of a “never event” and therefore better suited for the AV threshold. This level of irradiation should never be necessary under usual clinical conditions. This warning level will catch multiple scans of the same body region or altered exam parameters yielding a much higher than originally programmed dose. Note, it is possible for a technologist to still administer a dose over this amount if they repeatedly “end exam” and start a new exam. In such a situation, the scanner cannot know the patient is the same. A robust third-party dose monitoring solution should be in place to identify and prevent this potential scenario.

If you wish to set your AV based on DLP, we recommend a value slightly over 5,000 mGy-cm. Below is a histogram of UW-Madison DLP data taken over a 4-month period. Only 4% of our exams exceeded 5,000 mGy-cm. These exams consisted mainly of stroke codes (multiphasic exams which include a perfusion series), trauma exams (require high dose to visualize subtle spinal fractures), and multiphasic routine heads (non-contrast, with contrast, and axial scans acquired with a gantry tilt).



Setting the NV

To set the NV, you must be a member of the Standard User Group if the protocol change control (PCC) is turned on. Please consult your site's Dose Check Administrator to assist you with obtaining this level of permission if you are not a Standard User already.

Instructions for setting the NV:

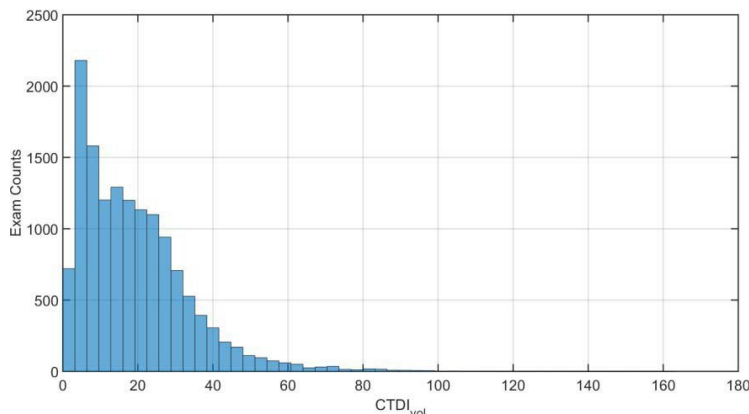
1. From the scan monitor, click the **Protocol Management icon** located on the left bottom of the screen.
2. Click on the box labelled **Dose Check Management**.
3. In the NV Checking section, de-select the box labelled **DLP** and select the box labelled **CTDI_{vol}**.
4. Click save. You have now set the NV to use CTDI_{vol} instead of DLP.

Now you must enter the proper CTDI_{vol} NV for every protocol. Depending on the version of UW protocols you have, this may have already been done for you when you loaded the UW protocols onto your scanner.

To edit the NV for a single protocol:

1. From the scan monitor, click the **Protocol Management icon** located on the left bottom of the screen.
2. Click on the box labelled **Protocol Management**.
3. Navigate to the protocol you wish to add a NV to and click edit.
4. Navigate to the specific series to which you wish to add a NV.
5. In the upper right-hand corner of the screen, dose information will be displayed. Click on the box labelled **set up**.
6. Enter the proper CTDI_{vol} values as listed in this document in the section titled "UW Table of NV".

Note, we do not have values listed for the smart prep series of any protocol. If you wish to enter a smartprep NV, we recommend setting it slightly higher than the displayed value on the scanner. At the top of the next page is a plot of all UW-Madison smartprep doses (in CTDI_{vol}) from our scanners. You can see, the values rarely exceed 100 mGy. However, it is possible for some neck protocols using 140 kV, if the full 40 images of smartprep were acquired, to have smartprep CTDI_{vol} values over 400 mGy.



If your dose monitoring alarm system is reporting smartprep series as high dose events, you need to consult a qualified medical physicist to review these cases. Usually, the dose from a properly run smartprep series contributes only a small portion to a patient total dose.

Our tables of NV currently do not list values for timing bolus (cine scans of the same anatomical region). Our timing bolus scans use a manual technique, so the NV for them can simply be set to whatever the scanner displays while in protocol manager. The scanner will display an anticipated $CTDI_{vol}$ for each irradiation event in the upper left-hand corner next to the field where NV values are entered. You can simply enter this value for the NV of the timing bolus scans. This displayed value will be higher than what is actually used on patients as long as the peak is reached before the end of the timing bolus cine scan. If the timing bolus scan duration is increased, this NV would be tripped. This is appropriate as we have set default timing bolus durations that are clinically reasonable.

UW Table of NV

The following pages include UW's NV values by protocol, series, and patient size. A description of how these were developed is listed below.

For most pediatric protocols, the sizes are reported according to the Broselow color groups: Pink, Red/Purple, Yellow/White, Blue/Orange, and Green/Black, which we group according to patient scout measurements (AP+ Lat). For pediatric neuro protocols, we have 3 groups: *Adolescent* refers to pediatric patients between 7 and 17 years old. *Child* refers to pediatric patients between 3 and 6 years old. *Infant* refers to pediatric patients between 0 and 2 years old. Pediatric neck and c-spine protocols have small, medium and large variations which we group according to patient scout measurements. Values denoted with an asterisk* were taken from the AAPM working group on standardization of CT nomenclature and protocols and can be accessed at the link below. AAPM values were used for cine, cardiac, and perfusion exams.

<http://www.aapm.org/pubs/CTProtocols/documents/NotificationLevelsStatement.pdf>

<https://www.aapm.org/pubs/CTProtocols/documents/GEHealthcareEducationSlides.pdf>

Notification values are provided for every group of CT acquisition, but not for scouts, Smart Preps, timing bolus scans, and recons. As with the protocol booklet, the series numbers in the dose check notification values table are incremented with every acquisition, including both scouts and CT acquisitions. For example, the Routine Abdomen/Pelvis protocol uses one scout (CT localizer radiograph) and one CT (helical/spiral) acquisition. The scout is labelled as Series 1 in our protocols, but there is no notification value listed for it since it contributes a very small dose to the overall exam. The CT acquisition is labeled Series 2 (S2). From the table shown in this manual for Routine Abdomen/Pelvis, you can see that the small, medium, and large protocols have notification values of 20, 40, and 65 mGy respectively. These values are the ones to be entered for the NV in the Routine Abdomen/Pelvis protocol.

A more complex protocol is the Abd-Liver Hepatocellular Carcinoma (HCC) protocol. This protocol has a scout labeled Series 1, a Smart Prep labeled Series 2, two groups of CT acquisitions labeled Series 2, Group 1 (S2G1) and Series 2, Group 2 (S2G2), and a third CT acquisition labeled Series 3 (S3). The scout and Smart Prep do not have notification values. From the table, you can see that Series 2, Group 1 has small, medium, and large notification values of 15, 25, and 50 mGy respectively. Series 2, Group 2 has small, medium, and large notification values of 20, 40, and 65 mGy. The last series, Series 3, has small, medium, and large notification values of 15, 25, and 50 mGy respectively. For this Abd-Liver - HCC protocol, you will enter 2 NVs (for Groups 1 and 2) on one screen of your protocol manager and the last series (S3) on the last series of the Abd-Liver - HCC protocol manager screen.

When we list multiple NVs for a single protocol, you will need to hit "next series" each time the series number increments. If the series number does not increment, but the group number does, all of these values are entered on the same series within protocol manager. Also be aware, the displayed value for NV shown on each page of the protocol manager displays the $CTDI_{vol}$ that would be observed using the manual mA for that protocol. This is different from when a patient is actually being scanned. During the actual scan, the displayed $CTDI_{vol}$ represents the output the scanner plans on using. The difference is due to the following: when automatic exposure control is on and you are in protocol manager, the

scanner does not know the size of the patient is, so it displays a $CTDI_{vol}$ value using the selected manual mA value. When you are actually scanning a patient and have the scout images, the scanner knows the patient size and selects the mA it plans to use on that patient for calculating the displayed $CTDI_{vol}$.

Protocol Name	Protocol Number	Acquisition	Patient Size	Notification Value (mGy)
BODY PROTOCOLS				
Chest/Abd/Pelvis with IV Contrast	5.4	S2G1	Small	10
	5.5		Medium	30
	5.6		Large	45
		S2G2	Small	20
			Medium	40
			Large	65
Chest/Abd/Pelvis without IV	5.7	S2G1	Small	10
	5.8		Medium	30
	5.9		Large	45
		S2G2	Small	20
			Medium	40
			Large	65
CTPA for PE with Abd/Pelvis	5.19	S2G1	Small	15
	5.2		Medium	15
	5.21		Large	30
		S2G2	Small	20
			Medium	40
			Large	65
Trauma - Chest	5.22	S2	Small	10
	5.23		Medium	30
	5.24		Large	45
Trauma - Chest/Abd/Pelvis	5.25	S2G1	Small	10
	5.26		Medium	30
	5.27		Large	45
		S2G2	Small	30
			Medium	70
			Large	135
		S3	Small	20
			Medium	40
			Large	65
Abd/Pelvis	6.1	S2	Small	20
	6.2		Medium	40
	6.3		Large	65
Trauma - Abd/Pelvis	6.4	S2	Small	30
	6.5		Medium	70
	6.6		Large	135
		S3	Small	20
			Medium	40
			Large	65
High Image Quality Cancer Follow-Up Abd/Pel	6.7	S2	Small	30
	6.8		Medium	70
	6.9		Large	115
Abd/Pelvis - Flank Pain	6.1	S2	Small	20
	6.11		Medium	40
	6.12		Large	65
Limited Follow-Up Kidneys Only	6.13	S2	Small	10
	6.14		Medium	20
	6.15		Large	30
Abd/Pelvis - Colonography	6.16	S2	Small	15
	6.17		Medium	15

Protocol Name	Protocol Number	Acquisition	Patient Size	Notification Value (mGy)
	6.18		Large	15
		S4	Small	15
			Medium	15
			Large	15
		S6	Small	15
			Medium	15
			Large	15
Abd/Pelvis - Colonography with IV	6.19	S2	Small	15
	6.2		Medium	15
	6.21		Large	15
		S4	Small	20
			Medium	40
			Large	65
		S6	Small	15
			Medium	15
			Large	15
Abd/Pelvis - Urography	6.22	S2	Small	15
	6.23		Medium	25
	6.24		Large	45
		S3	Small	25
			Medium	45
			Large	85
Abd-Liver - Biphasic	6.25	S2G1	Small	15
	6.26		Medium	25
	6.27		Large	50
		S2G2	Small	20
			Medium	40
			Large	65
CTA Abd-Liver - Triphasic	6.28	S2	Small	15
	6.29		Medium	15
	6.3		Large	15
		S3G1	Small	30
			Medium	45
			Large	85
		S3G2	Small	10
			Medium	20
			Large	35
		S3G3	Small	10
			Medium	20
			Large	35
Abd-Adrenal Gland - Adenoma	6.31	S2	Small	35
	6.32		Medium	60
	6.33		Large	80
		S3	Small	30
			Medium	45
			Large	60
		S4	Small	35
			Medium	60
			Large	80
CTA Abd-Liver - Donor Work-up	6.37	S3G1	Small	30
	6.38		Medium	45
	6.39		Large	85

Protocol Name	Protocol Number	Acquisition	Patient Size	Notification Value (mGy)
		S3G2	Small	10
			Medium	20
			Large	35
		S3G3	Small	25
			Medium	50
			Large	80
Abd- Pancreas Cancer (Neoplasm)	6.4	S2G1	Small	30
	6.41		Medium	70
	6.42		Large	115
		S2G2	Small	25
			Medium	45
			Large	85
CTA Abd-Pancreas - Transplant	6.46	S2	Small	10
	6.47		Medium	25
	6.48		Large	35
		S3G1	Small	30
			Medium	45
			Large	85
		S3G2	Small	25
			Medium	45
			Large	85
Abd/Pelvis-Kidney Tumor	6.49	S2	Small	10
	6.5		Medium	25
	6.51		Large	35
		S3	Small	20
			Medium	40
			Large	65
		S4	Small	25
			Medium	45
			Large	85
CTA Abd - Renal Donor	6.52	S2	Small	10
	6.53		Medium	25
	6.54		Large	35
		S3G1	Small	20
			Medium	35
			Large	65
		S3G2	Small	20
			Medium	35
			Large	65
		S4	Small	15
			Medium	25
			Large	50
Abd-Small Bowel Enterography	6.55	S2	Small	25
	6.56		Medium	45
	6.57		Large	85
CTA Abd - Obscure GI Bleed	6.58	S2	Small	10
	6.59		Medium	25
	6.6		Large	35
		S3	Small	30
			Medium	45
			Large	85
		S4	Small	10

Protocol Name	Protocol Number	Acquisition	Patient Size	Notification Value (mGy)
			Medium	20
			Large	35
CTA Abd - Mesenteric Ischemia	6.61	S2G1	Small	30
	6.62		Medium	45
	6.63		Large	85
		S2G2	Small	20
			Medium	40
			Large	65
Urothelial Tumor Follow-Up	6.7	S2	Small	20
	6.71		Medium	40
	6.72		Large	65
		S3	Small	25
			Medium	45
			Large	85
		S4	Small	25
			Medium	45
			Large	85
Abd/Pelvis - Venogram (Pre-IVC Filter Removal)	6.73	S2	Small	20
	6.74		Medium	40
	6.75		Large	65
CTA Abd/Pelvis - Active Bleeder	6.79	S2	Small	20
	6.8		Medium	40
	6.81		Large	65
		S3G1	Small	30
			Medium	45
			Large	85
		S3G2	Small	20
			Medium	40
			Large	65
Abd-Liver - Hepatocellular	6.82	S2G1	Small	15
	6.83		Medium	25
	6.84		Large	50
		S2G2	Small	20
			Medium	40
			Large	65
		S3	Small	15
			Medium	25
			Large	50
CTA Abd-Liver - Transplant	6.85	S2	Small	15
	6.86		Medium	15
	6.87		Large	15
		S3G1	Small	30
			Medium	45
			Large	85
		S3G2	Small	10
			Medium	20
			Large	35
		S3G3	Small	10
			Medium	20
			Large	35
		S4	Small	15

Protocol Name	Protocol Number	Acquisition	Patient Size	Notification Value (mGy)
			Medium	25
			Large	50
Abdominal Wall Flap CTA	6.88	S2	Small	60
	6.89		Medium	80
	6.90		Large	125
Cystogram	8.1	S2	Small	20
	8.11		Medium	40
	8.12		Large	65
		S3	Small	20
			Medium	40
			Large	65
Body Pelvis	8.16	S2	Small	20
	8.17		Medium	40
	8.18		Large	65
Abd/Pelvis-R/O Hernia (Use Routine Abd/Pelvis Protocol)		S2	Small	20
			Medium	40
			Large	65
CT Adult Neuro Protocols				
Brain-Routine (Helical Mode)	1.1	S2	Adult	85
		S3	Adult	70
Brain-Helical Scan with Angled Axial Reformations	1.2	S2	Adult	85
		S3	Adult	70
Brain (Axial Mode)	1.3	S2	Adult	85
		S3	Adult	70
Brain Post Thrombolysis Helical	1.4	S2 GSI	Adult	85
3D CT (Craniosynostosis, Congenital Facial Anomaly)	1.5	S2	Adult	85
Stroke Deluxe – Total	1.6	S2	Adult	85
		S3	Adult	100
		S4	Adult	600
		S5	Adult	70
CTA Head Only (Stenosis, Aneurysm, Unknown Bleed)	1.7	S2	Adult	85
		S3	Adult	70
		S4	Adult	600
		S5	Adult	70
CT Venography	1.9	S2	Adult	85
		S3	Adult	100
		S4	Adult	70
Stereotactic Head: (Whole Brain Treatment Planning)	1.1	S2	Adult	85
KLS Bone Flap	1.15	S2	Adult	85
Orbit - Routine	2.1	S2	Adult	85
		S3	Adult	70
Facial Trauma - Routine	2.5	S2	Adult	85
		S3	Adult	70
Pituitary Gland and Cavernous	2.6	S2	Adult	85
		S3	Adult	70
		S4	Adult	70
Sinuses - Diagnostic	2.7	S2	Adult	40

Protocol Name	Protocol Number	Acquisition	Patient Size	Notification Value (mGy)
		S3	Adult	40
Temporal Bone	2.11	S2	Adult	85
Dentascan	2.13	S2	Adult	40
Stereotactic Sinus (Stryker/Lorenz)	2.15	S2	Adult	40
Adult Neck - Routine	3.1	S2	Small	35
	3.2		Medium	75
	3.3		Large	120
		S3G1	Small	30
			Medium	60
			Large	110
		S3G2	Small	30
			Medium	60
			Large	110
		S3G1 REV Only	Small	35
		S3G1 REV Only	Medium	75
		S3G1 REV Only	Large	120
Neck (Parathyroid Adenoma) Adult	3.5	S2	Small	100
			Medium	100
			Large	100
		S3	Small	35
			Medium	75
			Large	120
		S4	Small	35
			Medium	75
			Large	120
		S5G1	Small	30
			Medium	60
			Large	110
		S5G2	Small	30
			Medium	60
			Large	110
		S5G1 REV Only	Small	35
		S5G1 REV Only	Medium	75
		S5G1 REV Only	Large	120
Neck (Add-on Options)	3.8	S2	Adult	600
Neck (Salivary Gland)	3.9	S2	Small	35
			Medium	60
			Large	120
		S3	Small	35
			Medium	60
			Large	120
		S4G1	Small	30
			Medium	60
			Large	110
		S4G2	Small	30
			Medium	60

Protocol Name	Protocol Number	Acquisition	Patient Size	Notification Value (mGy)
			Large	110
		S4G1 REV Only	Small	35
		S4G1 REV Only	Medium	75
		S4G1 REV Only	Large	120
CTA Neck Only (Cerebrovascular	3.11	S2	Adult	100
Neck (Hypervascular Papillary	3.13	S2	Small	35
			Medium	75
			Large	120
		S3	Small	35
			Medium	75
			Large	120
		S4G1	Small	30
			Medium	60
			Large	110
		S4G2	Small	30
			Medium	60
			Large	110
		S4G1 REV Only	Small	35
		S4G1 REV Only	Medium	75
		S4G1 REV Only	Large	120
Adult Cervical Spine (without	3.16	S2	Small	50
			Medium	95
			Large	135
		S3	Small	50
			Medium	95
			Large	135
Adult Cervical Spine (With Metal)	3.19	S2	Small	80
			Medium	135
			Large	135
		S3	Small	80
			Medium	135
			Large	135
Adult Lumbar Spine (Without	7.1	S2	Small	30
			Medium	75
			Large	135
		S3	Small	30
			Medium	75
			Large	135
Adult Thoracic Spine (Without	7.4	S2	Small	30
			Medium	75
			Large	135
		S3	Small	30
			Medium	75
			Large	135
Stealth (Stereotactic) Spine	7.8	S2	Adult	70
Adult Lumbar Spine (With Metal)	7.1	S2	Small	60

Protocol Name	Protocol Number	Acquisition	Patient Size	Notification Value (mGy)
	7.11		Medium	110
	7.12		Large	135
		S3	Small	60
			Medium	110
			Large	135
Adult Thoracic Spine (With Metal)	7.13	S2	Small	60
			Medium	110
			Large	135
		S3	Small	60
			Medium	110
			Large	135
CT Pediatric Neuro Protocols				
Brain - Routine and Peds NAT	11.1	S2	Infant	35
	11.2		Child	50
	11.3		Adolescent	85
		S3	Infant	30
			Child	45
			Adolescent	70
Brain - Helical Scan with Angled Axial Reformations (< 6 y/o)	11.4	S2	Infant	35
	11.5		Child	50
	11.6		Adolescent	85
		S3	Infant	30
			Child	45
			Adolescent	70
Brain (Axial Mode)	11.7	S2	Infant	30
	11.8		Child	50
	11.9		Adolescent	85
		S3	Infant	30
			Child	45
			Adolescent	70
Brain Post Thrombolysis Helical	11.1	S2	Infant	45
	11.11		Child	50
	11.12		Adolescent	85
3D CT (Craniosynostosis, Congenital Facial Anomaly) (< 6 y/o)	11.13	S2	Infant	35
	11.14		Child	50
	11.15		Adolescent	85
Stroke Deluxe – Total	11.16	S2	Infant	35
	11.17		Child	50
	11.18		Adolescent	85
		S3	Infant	40
			Child	55
			Adolescent	100
		S4	Child/Infant	300
			Adolescent	600
		S5	Infant	30
			Child	45
			Adolescent	70
CTA Head Only: (Stenosis, Aneurysm, Unknown Bleed) (< 6	11.19	S2	Infant	35
	11.2		Child	50

Protocol Name	Protocol Number	Acquisition	Patient Size	Notification Value (mGy)
	11.21		Adolescent	85
		S3	Infant	30
			Child	45
			Adolescent	70
		S4	Child/Infant	300
			Adolescent	600
		S5	Infant	30
			Child	45
			Adolescent	70
CTA Neck Only (Cerebrovascular Disease) (< 6 y/o)	11.22	S2	Infant	40
	11.23		Child	50
	11.24		Adolescent	100
CT Venography	11.25	S2	Infant	35
	11.26		Child	50
	11.27		Adolescent	85
		S3	Infant	40
			Child	55
			Adolescent	100
		S4	Infant	30
			Child	45
			Adolescent	70
Stereotactic Head: (Whole Brain Treatment Planning)	11.28	S2	Infant	35
	11.29		Child	50
	11.3		Adolescent	85
Pediatric Low - Dose	11.31	S2	Infant	20
	11.32		Child	30
Orbit - Routine	12.1	S2	Infant	35
	12.2		Child	50
	12.3		Adolescent	85
		S3	Infant	30
			Child	45
			Adolescent	70
Temporal Bone	12.4	S2	Infant	35
	12.5		Child	50
	12.6		Adolescent	85
Facial Trauma - Routine	12.7	S2	Infant	35
	12.8		Child	50
	12.9		Adolescent	85
		S3	Infant	30
			Child	45
			Adolescent	70
Sinuses - Diagnostic	12.1	S2	Infant	20
	12.11		Child	30
	12.12		Adolescent	40
		S3	Infant	20
			Child	20
			Adolescent	40
DentaScan	12.13	S2	Infant	20
	12.14		Child	30
	12.15		Adolescent	40

Protocol Name	Protocol Number	Acquisition	Patient Size	Notification Value (mGy)
Pediatric Neck - Routine	13.1.1	S2	Small	10
	13.4.1		Medium	15
	13.8.1		Large	30
		S3G1	Small	10
			Medium	15
			Large	30
		S3G2	Small	10
			Medium	15
			Large	30
Pediatric Cervical Spine	13.1.11	S2	Infant	10
	13.4.11		Child	20
	13.8.11		Adolescent	35
		S3	Infant	10
			Child	20
			Adolescent	35
Pediatric Lumbar Spine - Routine	17.1.1	S2	Pink	10
	17.2.1		Red and purple	15
	17.4.1		Yellow and white	25
	17.6.1		Blue and Orange	40
	17.8.1		Green and black	50
		S3	Pink	10
			Red and purple	15
			Yellow and white	25
			Blue and orange	40
Pediatric Thoracic Spine - Routine	17.1.2	S2	Pink	10
	17.2.2		Red and purple	15
	17.4.2		Yellow and white	25
	17.6.2		Blue and orange	40
	17.8.2		Green and black	50
		S3	Pink	10
			Red and purple	15
			Yellow and white	25
			Blue and orange	40
		Green and black	50	
CHEST PROTOCOLS				
Chest - Standard (Routine & High-	5.1	S2	Small	10
	5.2		Medium	30
	5.3		Large	45
		S3	Small	10
			Medium	30
			Large	45
	S5	Small	15	
		Medium	30	
		Large	55	
Chest - Low Dose Follow-	5.1	S2	Small	5
	5.11		Medium	10
	5.12		Large	20
		S3	Small	10
			Medium	30
		Large	45	
Chest - CTPA for PE	5.16	S2	Small	15

Protocol Name	Protocol Number	Acquisition	Patient Size	Notification Value (mGy)
	5.17		Medium	15
	5.18		Large	50
Chest- Esophagram (Routine)	5.51	S2	Small	10
	5.52		Medium	30
	5.53		Large	45
		S3	Small	10
			Medium	30
			Large	45
		S4 (optional prone)	Small	10
			Medium	30
			Large	45
Chest - Dynamic 3D Airway	5.7	S2	Small	10
	5.71		Medium	30
	5.72		Large	45
		S3	Small	5
			Medium	10
			Large	20
Pediatric Protocols				
Chest - Standard (Routine & High-	15.1.1	S2	Pink	5
	15.2.1		Red and Purple	5
	15.4.1		Yellow and White	5
	15.6.1		Blue and Orange	15
	15.8.1		Green and Black	25
		S3- Hi Res Grp	Pink	5
			Red and Purple	5
			Yellow and White	5
			Blue and Orange	15
			Green and Black	25
Peds Chest Inspiration/Expiration	15.1.2	S2	Pink	5
	15.2.2		Red and Purple	5
	15.4.2		Yellow and White	5
	15.6.2		Blue and Orange	15
	15.8.2		Green and Black	25
		S3	Pink	5
			Red and Purple	5
			Yellow and White	5
			Blue and Orange	15
			Green and Black	25
Chest Pectus	15.1.3	S2	Pink	5
	15.2.3		Red and Purple	5
	15.4.3		Yellow and White	5
	15.6.3		Blue and Orange	10
	15.8.3		Green and Black	20
CTA Chest for PE	15.1.4	S2	Pink	5
	15.2.4		Red and Purple	5
	15.4.4		Yellow and White	5
	15.6.4		Blue and Orange	15
	15.8.4		Green and Black	25
Routine Chest/Abdomen/Pelvis	15.1.5	S2	Pink	5

Protocol Name	Protocol Number	Acquisition	Patient Size	Notification Value (mGy)
	15.2.5		Red and Purple	5
	15.4.5		Yellow and White	5
	15.6.5		Blue and Orange	15
	15.8.5		Green and Black	25
Trauma Chest/Abdomen/Pelvis	15.1.6	S2G1	Pink	5
	15.2.6		Red and Purple	10
	15.4.6		Yellow and White	10
	15.6.6		Blue and Orange	25
	15.8.6		Green and Black	40
		S2G2	Pink	5
			Red and Purple	10
			Yellow and White	10
			Blue and Orange	25
			Green and Black	40
		S3	Pink	5
			Red and Purple	5
			Yellow and White	5
			Blue and Orange	15
			Green and Black	25
Peds CINE Airway	15.1.7	S2	All Sizes	15
Routine Abdomen/Pelvis	16.1.1	S2	Pink	5
	16.2.1		Red and Purple	5
	16.4.1		Yellow and White	5
	16.6.1		Blue and Orange	15
	16.8.1		Green and Black	25
Renal Stone / Flank Pain	16.1.2	S2	Pink	5
	16.2.2		Red and Purple	5
	16.4.2		Yellow and White	5
	16.6.2		Blue and Orange	15
	16.8.2		Green and Black	25
Triphasic Liver	16.1.3	S2G1	Pink	5
	16.2.3		Red and Purple	10
	16.4.3		Yellow and White	10
	16.6.3		Blue and Orange	25
	16.8.3		Green and Black	40
		S2G2	Pink	5
			Red and Purple	5
			Yellow and White	5
			Blue and Orange	15
			Green and Black	25
		S2G3	Pink	5
			Red and Purple	5
			Yellow and White	5
			Blue and Orange	15
			Green and Black	25
Trauma Abdomen/Pelvis	16.1.4	S2	Pink	5
	16.2.4		Red and Purple	10
	16.4.4		Yellow and White	10
	16.6.4		Blue and Orange	25
	16.8.4		Green and Black	40
		S3	Pink	5
			Red and Purple	5

Protocol Name	Protocol Number	Acquisition	Patient Size	Notification Value (mGy)
			Yellow and White	5
			Blue and Orange	15
			Green and Black	25
Peds Enterography	16.1.5	S2	Pink	5
	16.2.5		Red and Purple	5
	16.4.5		Yellow and White	10
	16.6.5		Blue and Orange	25
	16.8.5		Green and Black	40
Peds High Image Quality				
Chest - Standard (Routine & High-Resolution) High Image Quality	15.1.8	S2	Pink	5
	15.2.8		Red and Purple	5
	15.4.8	S4	Yellow and White	10
	15.6.8		Blue and Orange	25
	15.8.8		Green and Black	40
		S4	Pink	5
			Red and Purple	5
			Yellow and White	5
			Blue and Orange	15
			Green and Black	25
Chest Pectus - High Image Quality	15.1.10	S2	Pink	5
	15.2.10		Red and Purple	5
	15.4.10		Yellow and White	10
	15.6.10		Blue and Orange	10
	15.8.10		Green and Black	20
CTA Chest for PE - High Image	15.1.11	S2	Pink	5
	15.2.11		Red and Purple	5
	15.4.11		Yellow and White	10
	15.6.11		Blue and Orange	25
	15.8.11		Green and Black	40
Routine Chest/Abdomen/ Pelvis - High Image Quality	15.1.12	S2	Pink	5
	15.2.12		Red and Purple	5
	15.4.12		Yellow and White	10
	15.6.12		Blue and Orange	25
	15.8.12		Green and Black	40
Trauma Chest/Abdomen/Pelvis High Image Quality	15.1.13	S2G1	Pink	5
	15.2.13		Red and Purple	10
	15.4.13		Yellow and White	15
	15.6.13		Blue and Orange	30
	15.8.13		Green and Black	55
		S2G2	Pink	5
			Red and Purple	10
			Yellow and White	15
			Blue and Orange	30
			Green and Black	55
		S3	Pink	5
			Red and Purple	5
			Yellow and White	10
			Blue and Orange	25
			Green and Black	40

Protocol Name	Protocol Number	Acquisition	Patient Size	Notification Value (mGy)
Routine Abdomen/Pelvis - High Image Quality	16.1.6	S2	Pink	5
	16.2.6		Red and Purple	5
	16.4.6		Yellow and White	10
	16.6.6		Blue and Orange	25
	16.8.6		Green and Black	40
Renal Stone / Flank Pain - High	16.1.7	S2	Pink	5
	16.2.7		Red and Purple	5
	16.4.7		Yellow and White	10
	16.6.7		Blue and Orange	25
	16.8.7		Green and Black	40
Triphasic Liver - High Image Quality	16.1.8	S2G1	Pink	5
	16.2.8		Red and Purple	10
	16.4.8		Yellow and White	15
	16.6.8		Blue and Orange	30
	16.8.8		Green and Black	55
		S2G2	Pink	5
			Red and Purple	5
			Yellow and White	10
			Blue and Orange	25
			Green and Black	40
		S2G3	Pink	5
			Red and Purple	5
			Yellow and White	10
			Blue and Orange	25
			Green and Black	40
Trauma Abdomen/Pelvis - High Image Quality	16.1.9	S2	Pink	5
	16.2.9		Red and Purple	10
	16.4.9		Yellow and White	15
	16.6.9		Blue and Orange	30
	16.8.9		Green and Black	55
		S3	Pink	5
			Red and Purple	5
			Yellow and White	10
			Blue and Orange	25
			Green and Black	40
Peds MSK				
Peds Bony Pelvis w/o metal	18.1.1	S2	Pink	5
	18.2.1		Red and Purple	10
	18.4.1		Yellow and White	10
	18.6.1		Blue and Orange	25
	18.8.1		Green and Black	40
Peds Bony Pelvis with metal	18.1.2	S2	Pink	65
	18.2.2		Red and Purple	65
	18.4.2		Yellow and White	65
	18.6.2		Blue and Orange	65
	18.8.2		Green and Black	65
Peds Bony Pelvis Spica Casting	18.1.3	S2	Pink	5
	18.2.3		Red and Purple	5
	18.4.3		Yellow and White	5
	18.6.3		Blue and Orange	10

Protocol Name	Protocol Number	Acquisition	Patient Size	Notification Value (mGy)
	18.8.3		Green and Black	20
CV				
Upper Extremity CTA	4.1	S2	Small	15
	4.11		Medium	25
	4.12		Large	35
		S3G1	Small	15
			Medium	30
			Large	40
		S3G2	Small	15
			Medium	30
			Large	40
Non-gated CTA (Chest/Abd/Pelvis)	5.28	S2	Small	20
	5.29		Medium	30
	5.3		Large	50
		S3	Small	15
			Medium	35
			Large	60
		S4	Small	20
			Medium	35
			Large	65
Retrospectively-Gated CTA Chest (Non-Coronary)	5.31	S2	Small	20
	5.32		Medium	30
	5.33		Large	50
		S3	Small	100
			Medium	100
			Large	100
		S4	Small	15
			Medium	30
			Large	50
Gated Chest and Non-Gated	5.34	S2	Small	20
	5.35		Medium	30
	5.36		Large	50
		S3G1	Small	75
			Medium	75
			Large	75
		S3G2	Small	25
			Medium	35
			Large	60
		S4	Small	20
			Medium	35
			Large	65
Prospectively-Gated Coronary CTA	5.37	S2	Small	75
	5.38		Medium	75
	5.39		Large	75
		S3	Small	75
			Medium	75
			Large	140
Retrospectively-Gated Coronary	5.4	S2	Small	100
	5.41		Medium	100
	5.42		Large	100
		S3	Small	100

Protocol Name	Protocol Number	Acquisition	Patient Size	Notification Value (mGy)
			Medium	100
			Large	100
TAVI CTA	5.43	S2G1	Small	75
	5.44		Medium	75
	5.45		Large	140
		S2G2	Small	25
			Medium	35
			Large	60
Prospectively-Gated CTA Chest (Non-Coronary)	5.46	S2	Small	20
	5.47		Medium	30
	5.48		Large	50
		S3	Small	75
			Medium	75
			Large	75
Subclavian CT Venogram	5.55	S2	Small	15
	5.56		Medium	35
	5.57		Large	60
Adult CTA Coronary with Vascular Intervention	5.58	S2G1	Small	75
	5.59		Medium	75
	5.6		Large	125
		S2G2	Small	25
			Medium	35
			Large	60
Prospectively-Gated CTA Chest Triple R/O (Non-Coronary)	5.64	S2	Small	20
	5.65		Medium	30
	5.66		Large	50
		S3	Small	75
			Medium	75
			Large	75
Prospectively-Gated Left Atrial	5.73	S2	Small	75
	5.74		Medium	75
	5.75		Large	75
		S3	Small	75
			Medium	75
			Large	75
Thoracic Outlet	5.83	S2	Small	15
	5.84		Medium	30
	5.85		Large	40
		S4	Small	15
			Medium	30
			Large	40
		S5	Small	15
			Medium	30
			Large	40
Post-endostent Non-con Volume Change (Abd/Pelvis only)	6.43	S2	Small	20
	6.44		Medium	30
	6.45		Large	50
Lower Extremity CTA	9.13	S2	Small	15

Protocol Name	Protocol Number	Acquisition	Patient Size	Notification Value (mGy)
	9.14		Medium	25
	9.15		Large	35
		S3G1	Small	15
			Medium	30
			Large	40
		S3G2	Small	15
			Medium	30
			Large	40
Pediatric CTA Gated Chest	15.9.1	S2	All Sizes	75
Pediatric Prospectively-Gated	15.9.2	S2	All Sizes	75
Pediatric Gated Chest and Non-Gated Abd/Pel CTA	15.9.3	S2G1	All Sizes	75
		S2G2	All Sizes	10
Pediatric Non-Gated CTA	15.9.4	S2	All Sizes	75
CHD with Prospective-Gated	15.9.5	S2	All Sizes	75
		S3	All Sizes	75
Pediatric Pre-Op CTA	15.9.6	S2G1	All Sizes	75
		S2G2	All Sizes	75
Peds CTA Harmony Device	15.9.7	S2	All Sizes	75
Peds Coronary with Vascular	15.9.8	S2G1	All Sizes	75
		S2G2	All Sizes	75
Peds Glen/Fontan	15.9.9	S2	All Sizes	75
MSK Protocols				
Shoulder/Humerus (With or	4.1	S2	Small	50
	4.2		Medium	70
	4.3		Large	100
		S3	Small	50
			Medium	70
			Large	100
Zimmer/Biomet Shoulder	4.5	S2	All Sizes	40
Elbow/Forearm (Without Metal)	4.6	S2	All Sizes	50
Elbow/Forearm (With Metal)	4.7	S2	All Sizes	110
Wrist (Without Metal)	4.8	S2	All Sizes	50
Wrist (With Metal)	4.9	S2	All Sizes	110
Chest Wall/Clavicle/AC Joints/SC Joints/Sternum/Ribs	4.13	S2	Small	50
	4.14		Medium	70
	4.15		Large	100
Bony Pelvis/Hips/SI/Femur/FAI (Without Metal)	8.1	S2	Small	30
	8.2		Medium	60
	8.3		Large	100
Bony Pelvis/Hips/SI/Femur/FAI	8.4	S2	Small	70
	8.5		Medium	120
	8.6		Large	130
Hip Preservation CT	8.13	S2G1	All Sizes	55
		S2G2	All Sizes	55
		S2G3	All Sizes	55
Mako Hip	8.14	S2G1	All Sizes	55
		S2G2	All Sizes	55
Ankle/Foot /Distal Tibia (Without	9.1	S2	All Sizes	55
Ankle/Foot/Distal Tibia (With	9.2	S2	All Sizes	110

Protocol Name	Protocol Number	Acquisition	Patient Size	Notification Value (mGy)
Knee/Tibia (Without Metal)	9.3	S2	All Sizes	55
Knee/Tibia (With Metal)	9.4	S2	All Sizes	110
Body CAD	9.5	S2	All Sizes	60
Mako Knee	9.7	S2G1	All Sizes	50
		S2G2	All Sizes	50
		S2G3	All Sizes	50
Femoral Anteversion/Lower Extremity Rotational Study	9.8	S2G1	Small	20
	9.9		Medium	35
	9.1		Large	50
		S2G2	Small	10
			Medium	25
			Large	40
		S2G3	Small	10
			Medium	25
			Large	40
Soft Tissue Extremity with IV	9.24	S2	Small	15
	9.25		Medium	30
	9.26		Large	40
GSI MSK				
GSI Gout Upper Extremity	4.4	S2 GSI	All Sizes	45
GSI Gout Lower Extremity	9.6	S2 GSI	All Sizes	45
GSI Gout Spine/ Shoulder	7.16	S2 GSI	Small	50
	7.17		Medium	70
	7.18		Large	100
GSI NEURO				
Brain Post Thrombolysis Helical	1.4	S2 GSI	Adult	85
Adult Neck - Routine with GSI (Non-Revolution 256)	3.1	S2	Small	30
	3.2		Medium	75
	3.3		Large	100
		S3- GSI limited	Small	30
			Medium	75
			Large	100
		S3G1	Adult	30
		S3G2	Adult	30
Adult Neck - Routine with GSI (Revolution 256)	3.1	S2	Small	30
	3.2		Medium	75
	3.3		Large	100
		S3- GSI limited	Small	30
			Medium	75
			Large	100
		S4	Small	30
			Medium	75
			Large	100

UW Dose Data by Protocol & Series

The following UW dose data was compiled from an Optima CT660 platform. Please note the following as you review this information:

1. The data below represent those studies for which more than 10 patients were scanned. Some pediatric and less frequently used adult protocols are not included in this table.
2. This data is more detailed than is commonly published. A more typical dose breaks down by indication and body region is listed after this table. That table includes pediatric dose levels.
3. The series names listed in this table will change on future versions of the UW protocol package. Future series level names will be vendor neutral and more similar among the different indications to enhance hanging protocol utilization by radiologists.
4. All head doses are reported using the 16 cm phantom. Cervical spine doses are reported using both the 16 and 32 cm phantoms. The pediatric body doses are reported using a 32 cm phantom.

Protocol Names in BOLD followed by series level names corresponding to those protocols # of exams included in statistics provided after name	Series Level Statistics												Total Study Statistics			
	CTDI				SSDE				DLP				DLP			
	25pctCTDI	Mean CTDI	Median CTDI	75pctCTDI	25pctSSDE	Mean SSDE	Median SSDE	75pct SSDE	25pctDLP	Mean DLP	Median DLP	75pctDLP	25%	Mean	Median	75%
01.01 ADULT BRAIN: ROUTINE (HELICAL MODE) 606	31	34	33	37	32	35	34	37	594	683	666	744	615	776	681	779
HEAD W IVC 38	21	23	23	25	23	24	24	25	418	469	462	516	887	1053	1060	1278
HEAD W/O IVC 6566	33	42	39	49	32	36	35	37	610	697	671	751	616	778	684	780
01.02 ADULT BRAIN: HELICAL SCAN WITH ANGLED AXIAL REFORMATIONS 277	38	47	45	56	38	45	43	51	749	955	899	1161	760	1086	929	1262
HEAD W/O IVC 277	38	47	45	56	38	45	43	51	749	955	899	1161	760	1086	929	1262
01.03 ADULT BRAIN: (AXIAL MODE) 250	27	35	28	50	26	35	29	47	518	661	519	975	518	875	576	1021
HEAD W/O IVC 250	27	35	28	50	26	35	29	47	518	661	519	975	518	875	576	1021
01.06 CTA STROKE DELUXE 44	24	95	30	36	27	111	38	63	507	891	738	1192	2366	3243	3649	3960
CTA STROKE DELUXE 42	26	27	29	30	57	57	61	63	1010	1054	1121	1191	2354	3233	3649	3962
HEAD W IVC 41	21	23	22	24	23	24	24	25	419	452	441	487	2372	3218	3648	3873
HEAD W/O 41	32	35	34	36	35	37	36	38	624	698	678	731	2404	3318	3650	3963
PERFUSION 27	399	399	399	399	427	436	435	451	1597	1597	1597	1597	3649	3787	3783	4035
01.07 CTA HEAD ONLY 54	22	27	26	32	23	28	27	33	444	560	530	632	1374	1789	1562	2004
CTA HEAD 53	22	26	24	27	23	26	25	28	456	561	491	567	1373	1771	1528	1980
HEAD W IVC 41	21	22	22	24	22	23	23	25	393	439	438	471	1416	1670	1528	1749
HEAD W/O 48	31	34	33	36	33	35	34	36	591	661	656	705	1425	1879	1607	2039
01.10 STEALTH-STEREOTACTIC HEAD 17	53	53	53	53	49	51	52	53	1006	1019	1006	1059	1006	1705	1059	2117
STEALTH 17	53	53	53	53	49	51	52	53	1006	1019	1006	1059	1006	1705	1059	2117
01.13 CTA STROKE DELUXE W/PERFUSION SHUTTLE 166	27	77	32	54	30	84	41	67	585	1020	827	1352	3549	3805	4116	4299
CTA STROKE DELUXE 150	27	27	29	31	53	56	59	63	1005	1052	1129	1214	3782	3960	4146	4311
HEAD W IVC 152	26	28	27	28	26	28	27	28	504	557	533	573	3714	3974	4135	4310
HEAD W/O 149	32	36	35	38	33	36	35	38	620	725	685	770	3650	3827	4135	4310
PERFUSION 143	224	224	224	224	218	225	227	227	1795	1795	1795	1795	3890	4105	4161	4316
02.01 ORBIT (ROUTINE) 12	39	40	40	41	39	40	40	42	389	434	409	490	406	508	454	543
ORBIT W/O IVC 12	39	40	40	41	39	40	40	42	389	434	409	490	406	508	454	543
02.05 FACIAL TRAUMA (ROUTINE) 82	37	48	46	58	38	45	46	52	752	976	950	1188	760	1095	958	1277
FACIAL TRAUMA 82	37	48	46	58	38	45	46	52	752	976	950	1188	760	1095	958	1277
02.07 SINUSES (DIAGNOSTIC) 229	18	20	20	22	18	20	20	22	289	349	323	385	291	352	323	385

SINUS W/O	229	18	20	20	22	18	20	20	22	289	349	323	385	291	352	323	385
02.10 TEMPORAL BONE (W/O CONTRAST)	30	23	35	35	41	23	35	36	41	204	346	314	409	204	395	314	409
T BONE W/O IVC	30	23	35	35	41	23	35	36	41	204	346	314	409	204	395	314	409
03.01 NECK (ROUTINE)	67	32	36	32	39	31	54	34	87	136	684	136	1356	1540	1761	1712	1940
ANGLED AXIALS	48	32	32	32	32	30	31	31	33	136	136	136	136	1663	1844	1746	2034
NECK W /IVC	66	39	43	39	45	81	88	89	94	1320	1489	1415	1601	1539	1735	1711	1912
03.02 NECK (ROUTINE) (MEDIUM ADULT)	99	39	50	59	59	60	66	63	70	251	608	251	1007	1377	1563	1565	1799
ANGLED AXIALS	76	59	59	59	59	57	60	62	64	251	251	251	251	1476	1678	1659	1930
NECK W /IVC	97	28	36	35	42	66	76	74	89	921	1167	1108	1428	1377	1563	1560	1817
03.02 NECK (ROUTINE) (MEDIUM ADULT)	125	38	50	59	59	55	61	59	67	251	587	251	970	1276	1515	1524	1790
ANGLED AXIALS	91	59	60	59	60	52	57	57	60	251	253	251	251	1413	1665	1627	1850
NECK W /IVC	120	28	35	33	42	59	69	68	77	891	1097	1089	1316	1283	1495	1512	1782
03.03 NECK (ROUTINE) (LARGE ADULT)	13	59	62	60	62	57	79	60	121	251	831	251	1887	2459	2693	2655	2752
ANGLED AXIALS	13	59	60	59	61	56	57	57	60	251	251	251	251	2459	2693	2655	2752
NECK W /IVC	12	62	65	64	69	124	126	128	133	1931	2088	2116	2255	2449	2696	2618	2757
03.03 NECK (ROUTINE) LARGE ADULT	13	59	60	59	61	55	68	57	80	251	854	251	1727	2207	2734	2661	2693
ANGLED AXIALS	11	59	60	59	61	55	55	56	57	251	251	251	251	2314	2520	2661	2686
NECK W /IVC	12	56	61	60	65	80	94	94	105	1727	1959	1950	2181	2200	2740	2571	2708
03.07 CERVICAL SPINE (16 cm phantom)	30	91	111	98	115	95	109	102	110	2069	2626	2464	2952	2461	3038	2874	3473
C-SPINE W/O IVC	30	91	111	98	115	95	109	102	110	2069	2626	2464	2952	2461	3038	2874	3473
03.11 CTA NECK	22	30	33	34	36	61	66	68	74	925	1023	1011	1162	939	1238	1023	1185
CTA NECK	22	30	33	34	36	61	66	68	74	925	1023	1011	1162	939	1238	1023	1185
03.13 CTA STROKE DELUXE W/ PERFUSION SHUTTLE	25	28	77	32	51	32	84	47	67	612	1045	879	1333	3726	3792	4043	4391
CTA STROKE DELUXE	21	28	29	29	31	55	59	58	62	1060	1158	1143	1267	3828	3990	4140	4391
HEAD W IVC	23	26	29	27	31	27	29	27	30	503	564	525	605	3815	4057	4140	4406
HEAD W/O	21	33	38	36	42	34	37	36	41	620	744	712	851	3726	3666	4043	4288
PERFUSION	20	224	224	224	224	224	225	227	236	1795	1795	1795	1795	3992	4258	4211	4430
03.17 CERVICAL SPINE MEDIUM ADULT - NO METAL	145	27	33	31	39	58	66	64	73	569	733	688	857	664	1099	943	1377
C-SPINE W/O IVC	145	27	33	31	39	58	66	64	73	569	733	688	857	664	1099	943	1377
03.17 CERVICAL SPINE MEDIUM ADULT - NO METAL	11	27	36	30	40	61	69	66	68	605	693	675	858	634	804	734	888
C-SPINE W/O IVC	11	27	36	30	40	61	69	66	68	605	693	675	858	634	804	734	888
03.18 CERVICAL SPINE LARGE ADULT - NO METAL	19	57	61	62	67	100	106	104	109	1215	1349	1373	1473	1424	1749	1603	2059
C-SPINE W/O IVC	19	57	61	62	67	100	106	104	109	1215	1349	1373	1473	1424	1749	1603	2059

04.01 SHOULDER (WITH OR WITHOUT METAL) MEDIUM ADULT	10	11	23	14	33	16	30	20	42	260	529	307	780	260	548	399	781
UPP. EXT. W/O IVC	10	11	23	14	33	16	30	20	42	260	529	307	780	260	548	399	781
04.06 ELBOW WITHOUT METAL	11	21	25	33	33	68	71	71	74	279	339	440	449	494	561	557	654
ELBOW	11	21	25	33	33	68	71	71	74	279	339	440	449	494	561	557	654
04.08 WRIST WITHOUT METAL	28	23	29	23	25	58	60	60	63	352	508	381	490	348	470	361	430
WRIST	28	23	29	23	25	58	60	60	63	352	508	381	490	348	470	361	430
05.01 CHEST-STANDARD (ROUTINE AND HIGH-RESOLUTION) SMALL ADULT	50	4	8	9	11	6	10	11	13	156	301	310	420	165	363	340	421
CHEST	50	4	8	9	11	6	10	11	13	156	301	310	420	165	363	340	421
05.02 CHEST-STANDARD (ROUTINE AND HIGH-RESOLUTION) MEDIUM ADULT	680	3	6	6	9	5	8	7	10	124	233	210	323	153	292	245	369
CHEST	680	4	7	6	9	5	8	8	10	140	253	227	338	153	292	245	369
EXPIRATION HI RES	52	0	3	1	1	1	4	1	2	8	19	16	26	147	266	242	330
05.03 CHEST-STANDARD (ROUTINE AND HIGH-RESOLUTION) LARGE ADULT	158	11	18	17	24	12	17	17	22	381	617	589	893	494	834	739	973
CHEST	157	12	19	18	24	13	18	18	22	443	675	640	904	496	839	740	973
EXPIRATION HI RES	14	1	10	2	3	1	10	2	3	23	43	31	61	370	657	606	837
05.04 CHEST/ABD/PELVIS WITH IV CONTRAST SMALL ADULT	23	3	5	4	7	4	8	7	11	91	218	178	305	305	421	379	512
C/A/P	23	3	5	4	7	4	8	7	11	91	218	178	305	305	421	379	512
05.05 CHEST/ABD/PELVIS WITH IV CONTRAST MEDIUM ADULT	610	5	9	7	11	6	11	10	14	165	373	294	497	455	785	680	1044
C/A/P	610	5	9	7	11	6	11	10	14	165	373	294	497	455	785	680	1044
05.06 CHEST/ABD/PELVIS WITH IV CONTRAST LARGE ADULT	195	13	19	17	25	14	19	17	24	481	857	740	1157	1243	1764	1617	2174

C/A/P	195	13	19	17	25	14	19	17	24	481	857	740	1157	1243	1764	1617	2174
05.08 CHEST/ABD/PELVIS W/O IV CONTRAST MEDIUM ADULT	18	5	10	8	15	7	12	10	17	169	398	259	650	495	839	894	1096
C/A/P	18	5	10	8	15	7	12	10	17	169	398	259	650	495	839	894	1096
05.09 CHEST/ABD/PELVIS W/O IV CONTRAST LARGE ADULT	11	13	21	20	27	13	20	19	25	340	808	663	1064	1290	1763	1812	2300
C/A/P	11	13	21	20	27	13	20	19	25	340	808	663	1064	1290	1763	1812	2300
05.11 CHEST-LOW DOSE FOLLOW-UP MEDIUM ADULT	142	1	2	2	3	2	3	3	3	45	84	74	109	46	90	77	116
CHEST	142	1	2	2	3	2	3	3	3	45	84	74	109	46	90	77	116
05.12 CHEST-LOW DOSE FOLLOW-UP LARGE ADULT	31	3	5	4	6	4	5	5	7	128	194	160	246	137	201	162	247
CHEST	31	3	5	4	6	4	5	5	7	128	194	160	246	137	201	162	247
05.14 CHEST-LOW DOSE SCREENING MEDIUM ADULT	43	2	2	2	3	2	3	3	4	49	93	87	131	73	99	94	133
CHEST	43	2	2	2	3	2	3	3	4	49	93	87	131	73	99	94	133
05.17 CHEST-CTA FOR PE MEDIUM ADULT	231	3	6	6	7	4	7	7	8	123	202	193	271	135	243	207	293
STANDARD	231	3	6	6	7	4	7	7	8	123	202	193	271	135	243	207	293
05.18 CHEST-CTA FOR PE LARGE ADULT	95	9	14	13	17	9	13	13	16	310	466	442	598	324	540	479	643
STANDARD	95	9	14	13	17	9	13	13	16	310	466	442	598	324	540	479	643
05.20 CHEST-CTA FOR PE WITH ABD/PELVIS MEDIUM ADULT	15	5	7	6	7	6	8	8	9	239	285	263	311	423	587	517	678
PE-A/P-PHASIC	15	5	7	6	7	6	8	8	9	239	285	263	311	423	587	517	678
05.26 TRAUMA-CHEST/ABD/PELVIS MEDIUM ADULT	66	13	22	20	30	17	25	24	33	547	988	883	1444	1185	2044	1942	2581
C/A/P	66	13	22	20	30	17	25	24	33	547	988	883	1444	1185	2044	1942	2581
05.27 TRAUMA-CHEST/ABD/PELVIS LARGE ADULT	22	31	41	43	50	29	38	40	47	1072	1809	1701	2602	3243	4211	4448	4983
C/A/P	22	31	41	43	50	29	38	40	47	1072	1809	1701	2602	3243	4211	4448	4983
05.29 NON-GATED CTA (CHEST/ABD/PELVIS) MEDIUM ADULT	173	7	11	10	13	9	13	12	16	338	571	524	758	659	1232	1180	1641

1.25 CTA AX	169	7	11	10	14	9	13	12	16	348	566	524	747	664	1244	1195	1646
1.25 DELAYED AX	49	5	8	7	9	7	9	9	11	270	393	364	486	964	1535	1372	1927
1.25 NON-CON AX	143	8	12	11	15	10	14	13	17	398	639	612	867	829	1342	1254	1721
05.30 NON-GATED CTA (CHEST/ABD/PELVIS) LARGE ADULT	48	17	23	21	29	18	21	20	26	911	1341	1258	1721	1703	2993	2807	4237
1.25 CTA AX	43	16	24	21	29	17	22	21	27	931	1407	1288	1836	2070	3168	3173	4408
1.25 DELAYED AX	19	18	22	21	24	18	20	19	21	910	1201	1195	1405	3005	4098	4216	4989
1.25 NON-CON AX	42	15	22	21	29	16	21	20	26	911	1338	1374	1734	1808	3156	2959	4462
05.47 PROSPECTIVELY GATED CTA CHEST (NON-CORONARY) MEDIUM ADULT	42	7	11	13	15	8	13	15	16	238	345	365	456	500	619	607	728
1.25 NON-CON AX	25	4	7	6	8	5	8	7	9	136	229	219	285	548	650	643	725
PROSPECTIVE GATED CHEST	42	13	14	13	15	15	16	16	17	365	419	410	457	496	618	607	728
05.48 PROSPECTIVELY GATED CTA CHEST (NON-CORONARY) LARGE ADULT	10	26	27	26	26	25	28	26	30	758	832	827	896	847	1067	1094	1232
PROSPECTIVE GATED CHEST	10	26	27	26	26	25	28	26	30	758	832	827	896	847	1067	1094	1232
06.01 ABD/PELVIS SMALL ADULT	50	6	8	8	10	10	12	12	15	288	378	372	451	295	385	378	456
A/P	50	6	8	8	10	10	12	12	15	288	378	372	451	295	385	378	456
06.02 ABD/PELVIS MEDIUM ADULT	1085	6	10	9	13	9	12	11	15	293	503	451	662	313	537	473	690
A/P	1075	6	10	9	13	9	12	11	15	295	506	454	664	316	540	476	694
ABD	10	5	8	6	10	8	10	8	13	159	241	179	300	165	291	187	305
06.03 ABD/PELVIS LARGE ADULT	358	14	22	21	30	14	20	19	26	734	1194	1067	1661	797	1338	1198	1784
A/P	358	14	22	21	30	14	20	19	26	734	1194	1067	1661	797	1338	1198	1784
06.11 ABD/PELVIS-FLANK PAIN MEDIUM ADULT	100	7	11	10	14	10	13	12	16	283	486	412	606	304	505	430	637
FLANK PAIN	100	7	11	10	14	10	13	12	16	283	486	412	606	304	505	430	637
06.12 ABD/PELVIS-FLANK PAIN LARGE ADULT	34	17	24	22	31	18	22	21	26	782	1069	965	1374	804	1168	1067	1398
FLANK PAIN	34	17	24	22	31	18	22	21	26	782	1069	965	1374	804	1168	1067	1398
06.14 LOW DOSE RENAL STONE/FLANK PAIN MEDIUM ADULT	25	4	5	4	5	5	6	6	7	142	205	172	244	153	222	194	253
LOW DOSE FLANK PAIN	25	4	5	4	5	5	6	6	7	142	205	172	244	153	222	194	253

06.17 ABD/PELVIS-COLONOGRAPHY MEDIUM ADULT	154	2	3	3	4	3	4	4	5	100	174	155	230	226	372	329	459
5X3	154	2	4	4	5	3	5	5	6	125	205	194	264	226	372	329	459
DECUB COLONOGRAPHY	56	2	3	3	4	3	4	4	5	94	158	135	218	243	438	391	581
PRONE COLONOGRAPHY	111	2	3	2	3	2	4	3	4	76	140	121	182	212	361	315	425
06.18 ABD/PELVIS-COLONOGRAPHY LARGE ADULT	28	5	7	8	10	6	8	8	9	275	411	416	545	660	920	895	1113
5X3	28	6	8	9	10	7	8	9	9	374	446	466	572	660	920	895	1113
DECUB COLONOGRAPHY	13	3	7	6	10	4	7	7	10	187	387	345	542	640	958	949	1173
PRONE COLONOGRAPHY	15	5	6	6	8	6	7	8	9	280	363	340	471	684	847	870	1034
06.23 ABD/PELVIS-UROGRAPHY MEDIUM ADULT	157	7	12	10	15	9	15	13	18	269	509	427	662	665	1060	966	1378
PARENCHYMAL	155	10	15	14	20	14	19	18	24	411	662	583	856	667	1064	966	1382
WITHOUT	155	5	8	7	11	7	10	9	12	218	352	311	452	663	1064	970	1382
06.24 ABD/PELVIS-UROGRAPHY LARGE ADULT	38	15	24	21	32	15	23	20	31	631	1018	851	1415	1430	2168	2135	2548
PARENCHYMAL	38	22	31	31	39	23	31	31	37	906	1327	1388	1700	1430	2168	2135	2548
WITHOUT	37	11	16	16	19	12	15	15	18	468	684	691	844	1501	2209	2153	2550
06.26 ABD-LIVER-BIPHASIC MEDIUM ADULT	97	5	8	7	10	7	10	10	13	152	406	305	571	528	820	730	990
BIPHASIC	97	5	8	7	10	7	10	10	13	152	406	305	571	528	820	730	990
06.27 ABD-LIVER-BIPHASIC LARGE ADULT	39	12	18	17	24	12	18	16	22	383	928	677	1275	1281	1897	1681	2466
BIPHASIC	39	12	18	17	24	12	18	16	22	383	928	677	1275	1281	1897	1681	2466
06.32 ABD-ADRENAL GLAND: ADENOMA MEDIUM ADULT	14	5	8	7	11	8	12	11	15	111	180	121	166	127	336	186	320
WITHOUT	14	5	8	7	11	8	12	11	15	111	180	121	166	127	336	186	320
06.41 ABD-PANCREAS - NEOPLASM/ SCREENING MEDIUM ADULT	15	5	10	9	13	6	13	11	17	103	333	256	398	638	1021	839	1135
PANC-PHASIC	15	7	13	11	15	11	17	15	18	279	456	351	621	638	1021	839	1135
WITHOUT	15	2	4	4	5	4	6	5	6	56	102	89	121	638	1021	839	1135
06.44 CTA ABD-PANCREAS -	18	5	9	7	12	9	12	11	16	137	398	305	503	427	798	605	1172

NEOPLASM PRE-OP MEDIUM ADULT																	
PANC-PHASIC	18	5	9	7	12	9	12	11	16	137	398	305	503	427	798	605	1172
06.50 ABD/PELVIS- KIDNEY TUMOR MEDIUM ADULT	12	8	14	13	17	10	16	14	18	177	434	340	599	740	1527	1253	1978
DELAY	12	13	20	15	27	17	23	18	28	209	505	486	668	740	1527	1253	1978
VASCULAR	11	8	13	13	18	11	15	14	19	391	656	564	798	726	1330	1142	1650
WITHOUT	12	5	9	9	13	7	10	10	14	109	195	174	248	740	1527	1253	1978
06.53 CTA ABD-RENAL DONOR MEDIUM ADULT	39	5	9	7	12	6	11	9	14	101	281	204	360	544	871	776	1240
PARENCHYMAL PHASE	39	4	7	7	9	6	8	8	11	135	224	192	311	544	871	776	1240
VASCULAR PHASE	39	10	16	15	20	14	19	18	23	334	509	450	717	544	871	776	1240
WITHOUT	39	3	6	5	7	4	7	7	9	55	124	101	173	544	871	776	1240
06.54 CTA ABD-RENAL DONOR LARGE ADULT	10	8	15	12	18	9	15	12	19	229	446	334	627	1064	1384	1284	1604
PARENCHYMAL PHASE	10	9	11	11	13	9	11	12	13	284	351	322	415	1064	1384	1284	1604
VASCULAR PHASE	10	19	25	26	28	21	24	25	28	662	811	748	951	1064	1384	1284	1604
WITHOUT	10	6	9	7	11	7	9	8	11	135	201	203	249	1064	1384	1284	1604
06.56 ABD-SMALL BOWEL ENTEROGRAPHY MEDIUM ADULT	19	11	15	13	17	15	19	18	23	542	754	667	894	542	754	667	894
PARENCHYMAL PHASE	19	11	15	13	17	15	19	18	23	542	754	667	894	542	754	667	894
06.62 CTA ABD- MESENTERIC ISCHEMIA MEDIUM ADULT	11	4	9	8	14	6	10	9	14	206	451	377	752	598	1233	1029	1740
PARENCHYMAL PHASE	11	4	9	8	14	6	10	9	14	206	451	377	752	598	1233	1029	1740
06.83 ABD-LIVER-HCC MEDIUM ADULT	33	5	8	8	10	7	10	10	12	145	299	216	342	536	922	744	1205
3 MIN DELAY	33	5	7	6	9	6	9	8	11	127	201	183	241	527	895	715	1205
BIPHASIC	32	5	9	8	13	7	11	10	15	158	349	248	424	533	930	786	1213
06.84 ABD-LIVER-HCC LARGE ADULT	31	12	19	17	23	13	19	17	22	341	682	568	862	1314	2029	1853	2403
3 MIN DELAY	30	11	17	14	21	12	16	15	19	326	486	419	601	1308	2042	1855	2422
BIPHASIC	31	13	21	19	26	13	20	18	24	436	777	610	1078	1314	2029	1853	2403
07.02 LUMBAR SPINE (FEET FIRST) MEDIUM ADULT	68	15	29	28	38	22	35	35	45	434	843	766	1204	524	979	930	1386
L-SPINE W/O IVC	68	15	29	28	38	22	35	35	45	434	843	766	1204	524	979	930	1386
07.03 LUMBAR SPINE (FEET FIRST) LARGE ADULT	23	29	50	45	72	28	48	49	66	919	1523	1446	2013	919	2178	1508	2480
L-SPINE W/O IVC	23	29	50	45	72	28	48	49	66	919	1523	1446	2013	919	2178	1508	2480

07.05 THORACIC SPINE (FEET FIRST) MEDIUM ADULT	14	16	18	18	22	20	24	23	29	548	665	644	861	698	1009	858	1383
T-SPINE W/O IVC	14	16	18	18	22	20	24	23	29	548	665	644	861	698	1009	858	1383
07.08 THORACIC SPINE (HEAD FIRST) MEDIUM ADULT	20	17	25	21	34	20	28	26	36	593	991	845	1304	788	1222	1122	1750
T-SPINE W/O IVC	20	17	25	21	34	20	28	26	36	593	991	845	1304	788	1222	1122	1750
07.17 LUMBAR SPINE (WITH METAL) MEDIUM ADULT	19	23	42	36	65	31	56	47	75	662	1098	1087	1457	662	1147	1087	1457
L-SPINE W/O IVC	19	23	42	36	65	31	56	47	75	662	1098	1087	1457	662	1147	1087	1457
08.01 BONY PELVIS/HIPS/SI MEDIUM ADULT (NO METAL)	16	8	16	11	20	12	20	17	26	233	476	496	604	236	586	502	622
BONEY PELVIS	16	8	16	11	20	12	20	17	26	233	476	496	604	236	586	502	622
08.14 BODY PELVIS MEDIUM ADULT	18	7	12	12	15	9	14	14	17	175	340	307	534	260	397	347	564
PELVIS	18	7	12	12	15	9	14	14	17	175	340	307	534	260	397	347	564
09.01 ANKLE/FOOT/DISTAL TIBIA (NO METAL)	31	33	34	33	35	74	79	80	86	674	801	741	835	674	801	741	835
LOW EXT. W/O IVC	31	33	34	33	35	74	79	80	86	674	801	741	835	674	801	741	835
09.03 KNEE (NO METAL)	13	33	33	33	33	63	71	74	82	730	823	852	905	779	887	881	908
KNEE W/O IVC	13	33	33	33	33	63	71	74	82	730	823	852	905	779	887	881	908
11.01 PEDIATRIC BRAIN: ROUTINE (HELICAL MODE) 3-6 YR	11	20	27	25	30	22	27	27	31	404	517	488	573	404	517	488	573
HEAD W/O IVC	11	20	27	25	30	22	27	27	31	404	517	488	573	404	517	488	573
11.02 PEDIATRIC BRAIN: ROUTINE (HELICAL MODE) 0-3 YR	17	20	21	21	22	21	22	22	23	297	355	364	417	297	375	372	431
HEAD W/O IVC	17	20	21	21	22	21	22	22	23	297	355	364	417	297	375	372	431
11.04 PEDIATRIC BRAIN: HELICAL SCAN W/ANGLED AXIAL REF 0-3 YR	12	22	22	22	23	22	23	23	24	343	394	365	411	355	424	375	443
HEAD W/O IVC	12	22	22	22	23	22	23	23	24	343	394	365	411	355	424	375	443
15.09 CHEST WITHOUT IV CONTRAST 13-18 YRS	10	3	5	3	6	4	6	5	8	74	146	103	161	74	146	103	161
CHEST W/O	10	3	5	3	6	4	6	5	8	74	146	103	161	74	146	103	161
Grand Total	7529	7	24	15	31	9	27	16	32	251	595	487	791	359	907	642	1121

UW Dose Data by Body Region & Indication

The following UW dose data was compiled by body region and indication.

Protocol Names in BOLD followed by series level names corresponding to those protocols		Series Level Statistics												Total Study Statistics			
		CTDI				SSDE				DLP				DLP			
# of exams included in statistics provided after name		25pctCTDI	Mean CTDI	Median CTDI	75pctCTDI	25pctSSDE	Mean SSDE	Median SSDE	75pctSSDE	25pctDLP	Mean DLP	Median DLP	75pctDLP	25%	Mean	Median	75%
Ab/Pel	1468	7.04	13.02	10.52	16.10	9.50	14.30	12.87	17.61	17	339	673	531	367	729	567	890
Small	51	6.04	8.06	7.91	9.77	9.77	12.37	12.21	14.48	163	288	381	372	295	388	381	458
Medium	1068	6.20	10.07	9.04	13.12	8.63	12.30	11.61	15.47	17	299	509	456	318	544	479	704
Large	349	14.25	22.50	21.07	31.06	14.56	20.63	19.65	26.50	30	734	1202	1104	809	1345	1259	1779
C/A/P	855	5.35	11.14	9.06	14.89	7.37	12.58	11.11	16.54	27	192	485	362	505	1012	859	1336
Small	23	2.50	5.00	3.88	6.91	3.72	7.72	6.69	10.92	61	91	218	178	305	421	379	512
Medium	626	4.66	8.66	7.40	11.47	6.45	10.57	9.58	14.00	27	166	375	295	458	788	686	1059
Large	206	13.06	19.39	17.44	25.08	13.76	19.30	17.64	23.85	46	472	855	737	1241	1761	1617	2175
Chest	892	3.70	8.57	6.77	10.99	5.11	9.61	8.45	12.52	1	130	305	248	171	389	286	470
Small	52	3.52	7.55	8.08	11.31	5.34	9.63	10.43	13.51	1	126	274	274	152	351	320	419
Medium	682	3.42	6.40	5.65	8.60	4.65	7.78	7.34	10.32	1	122	233	210	153	289	244	368
Large	158	11.08	17.96	16.42	23.66	12.22	17.23	16.78	21.88	7	382	617	589	494	834	739	973
C-spine	182	27.21	36.02	32.55	40.36	59.27	69.72	64.88	79.20	316	578	790	715	665	1134	992	1465
Small	5	16.17	17.83	17.39	17.60	32.02	35.27	33.21	38.73	316	319	359	346	346	578	390	426
Medium	156	27.13	33.35	30.69	38.70	58.52	65.94	63.83	72.81	356	573	729	688	657	1074	906	1343
Large	21	55.05	60.32	61.93	66.30	98.76	106.19	104.16	109.31	981	1223	1349	1373	1418	1712	1556	2048
Head	1097	30.36	38.06	35.00	44.24	31.70	37.58	35.66	42.15	58	576	749	696	601	864	717	965
(blank)	1097	30.36	38.06	35.00	44.24	31.70	37.58	35.66	42.15	58	576	749	696	601	864	717	965
L-spine	95	16.68	32.92	31.42	43.83	22.70	36.99	36.41	48.06	129	452	971	910	550	1190	1085	1536
Small	3	14.62	22.70	20.01	29.44	18.89	26.84	22.01	32.38	129	335	535	540	618	1383	1106	2009
Medium	70	15.41	28.38	27.93	38.39	21.72	34.38	34.35	44.53	174	429	832	758	521	972	930	1362
Large	22	27.83	48.98	44.96	70.62	27.94	46.78	48.58	64.09	429	892	1480	1437	892	1856	1468	2450
Lung Ca	226	1.34	2.79	2.29	3.49	1.88	3.24	2.93	4.17	5	48	106	87	51	117	91	144
Small	3	1.21	1.69	1.22	1.94	1.89	2.57	1.98	2.95	48	49	58	50	49	58	50	63
Medium	185	1.21	2.24	2.05	2.94	1.69	2.76	2.62	3.56	5	46	86	77	47	92	81	117
Large	38	3.48	5.55	4.44	6.48	4.01	5.65	4.85	6.69	36	130	211	177	141	241	180	263
PE	333	4.22	7.89	6.50	9.69	5.27	8.40	7.55	10.21	46	146	277	231	163	326	249	386
Small	7	3.45	4.38	4.67	4.92	5.08	6.53	7.15	7.27	71	127	147	151	134	154	159	167
Medium	231	3.43	5.68	5.50	7.46	4.42	6.65	6.73	8.49	46	123	202	193	135	243	207	293
Large	95	9.09	13.50	12.85	17.13	9.24	12.81	12.95	15.82	57	310	466	442	324	540	479	643

Continued next page

Protocol Names in BOLD followed by series level names corresponding to those protocols	Series Level Statistics												Total Study Statistics			
	CTDI				SSDE				DLP				DLP			
	25pctCTDI	Mean CTDI	Median CTDI	75pctCTDI	25pctSSDE	Mean SSDE	Median SSDE	75pct SSDE	25pctDLP	Mean DLP	Median DLP	75pctDLP	25%	Mean	Median	75%
Peds																
Abd/Pel 15	1.29	3.00	1.56	2.34	2.64	4.46	3.17	4.24	24	37	93	52	38	94	52	89
Newborn 2	1.09	1.13	1.13	1.17	2.57	2.64	2.64	2.71	24	25	26	26	25	26	26	27
6mo-																
2.5yrs 1	1.38	1.38	1.38	1.38	3.17	3.17	3.17	3.17	37	37	37	37	37	37	37	37
3yrs-7yrs 3	1.97	2.13	2.38	2.42	3.64	3.89	4.07	4.22	51	64	72	77	67	74	83	85
8yrs-12yrs 6	1.20	1.54	1.41	1.78	2.33	2.87	2.70	3.05	25	39	51	49	41	52	49	54
13yrs-18yrs 3	2.44	8.56	2.72	11.77	4.45	9.84	4.65	12.63	95	104	260	113	109	263	113	343
Peds																
Head 43	20.71	24.36	22.11	25.07	21.73	25.07	23.29	25.57	175	358	442	400	360	455	410	536
0-3 27	20.53	21.44	21.70	22.66	21.53	22.31	22.48	23.98	175	338	371	364	338	385	372	424
3-6 16	21.77	29.64	28.13	37.16	24.18	29.89	29.50	34.76	325	410	572	546	410	572	546	701
Renal																
Colic 174	6.37	12.80	10.11	17.06	8.66	13.82	12.16	18.32	22	259	559	439	281	596	455	798
Small 7	6.29	9.67	8.92	10.54	10.54	14.08	14.18	16.46	125	251	416	380	251	416	380	462
Medium 125	5.17	9.77	8.53	11.89	7.34	11.56	10.81	14.47	22	210	428	357	236	449	389	554
Large 42	14.66	21.86	19.40	27.82	13.53	20.17	19.57	23.55	63	589	952	851	621	1063	926	1369

ACR DIR Data

External Benchmarking data: Compiled from ACR DIR percentile report available online at <http://www.acr.org/Quality-Safety/National-Radiology-Data-Registry/Dose-Index-Registry>

National Level Percentiles 2021

Body Part	Short Name Report	Age Group	Exam Count	CTDivol Max across Scans - 25th Percentile	CTDivol Max across Scans - Median	CTDivol Max across Scans - 75th Percentile	CTDivol Exam Total - 25th Percentile	CTDivol Exam Total - Median	CTDivol Exam Total - 75th Percentile	SSDE Max across Scans - 25th Percentile	SSDE Max across Scans - Median	SSDE Max across Scans - 75th Percentile	SSDE Exam Total - 25th Percentile	SSDE Exam Total - Median	SSDE Exam Total - 75th Percentile	DLP Max across Scans - 25th Percentile	DLP Max across Scans - Median	DLP Max across Scans - 75th Percentile	DLP Exam Total - 25th Percentile	DLP Exam Total - Median	DLP Exam Total - 75th Percentile
UPPER EXTREMITY	CT UE SHOULDER WO IVCON	Adult (Over 18)	22,191	34	19.7	26.2	14.6	20.6	29.6							331.1	438.3	596.3	139.6	448.1	621.5
UPPER EXTREMITY	CT UE W IVCON	Adult (Over 18)	8,222	8.7	12.1	18.7	8.5	13	19.6							292.9	428.4	543.8	300.5	455.7	571.2
UPPER EXTREMITY	CT UE WO IVCON	Adult (Over 18)	71,565	30	14.4	21.3	10.5	15.1	22							213.6	326.6	478	223.3	337.4	499.9
UPPER EXTREMITY	CT UE WO IVCON	15 - 18y	541	3.2	5.9	6.3	3.2	6	6.6							67.7	93.6	114.1	70.2	99.3	115.7
UPPER EXTREMITY	CT UE WO IVCON	11 - 14y	211	3.6	4.5	5.6	3.8	4.9	5.7							75.5	78.2	80.8	76.9	78.2	89.5
UPPER EXTREMITY	CT UE WO THEN W IVCON	Adult (Over 18)	729	7.8	11	13.2	8	11.1	14							281.6	363.5	398.4	320.1	363.5	412.4
UPPER EXTREMITY	CT UE WRIST	Adult (Over 18)	935	7.8	9	10.7	7.9	9	11							153.4	169	199.2	156.5	172.1	214.4
UPPER EXTREMITY	CT UE WRIST WO IVCON	Adult (Over 18)	4,189	5.2	8.5	11	5.2	8.5	11.7							85.7	128.3	182.4	86.5	133	183.7
UPPER EXTREMITY	CT UE LE KNEE WO IVCON	Adult (Over 18)	1,709	6.3	16.1	17.9	6.3	16.9	33							220	309.2	510.1	227.7	483.2	600.8
UPPER EXTREMITY	LOWER EXTREMITY																				
UPPER EXTREMITY	LOWER EXTREMITY	CT UE LE WO IVCON	Adult (Over 18)	2,241	6	12	17.5	6.3	12.9	29.8						165.9	272.3	510.1	175.2	445	560

