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National Radiology Data Registry

Executive Summary Report, January thru December 2022

Sample Corporate Account

Corporate ID: 100000

NRDR DIR® Dose Index Registry
AMERICAN COLLEGE OF RADIOLOGY

nrdr.acr.org

NRDR CTC™ CT Colonography Registry — American College of Radiology

NRDR GRID™ General Radiology Improvement Database — American College of Radiology

NRDR LCSR™ Lung Cancer Screening Registry — American College of Radiology

NRDR NMD® National Mammography Database — American College of Radiology

Acknowledgements

Code for automatic determination of patient size from localizer images that enables the production of Size-Specific Dose Estimates (SSDE) in the ACR Dose Index Registry is courtesy of JR Wells, Y Zhang and E Samei of the Duke University Clinical Imaging Physics Group.
(https://cipg.duhs.duke.edu/)

For more information please refer to Christianson O, Li X, Frush DP, Samei E. Automated patient-specific CT dose monitoring system: assessing variability in CT dose. Medical Physics 39(11): 7131-7139. 2012.
(http://onlinelibrary.wiley.com/doi/10.1118/1.4761871/abstract)

The processing of non-RDSR dose screens for the Dose Index Registry is courtesy of PixelMed Publishing, LLC. The open source code of the PixelMed dose-related tools can be found at pixelmed.com

DIR Executive Summary Report from the American College of Radiology

We are pleased to release the Dose Index Registry (DIR) Executive Summary report. This report also contains a preview of Qualified Clinical Data Registry (QCDR) report of DIR Non-MIPS measures.

Criteria for inclusion in the report

For an exam to be included in the report, it had to meet the following criteria:

1. The age of the patient to which the exam was administered had to be 18 years or lower for the pediatric reports and over 18 years for adult reports.
2. The name of the exam had to be tagged using the DIR Exam Mapping Tool or, alternatively, the RPID name and number had to be submitted electronically as part of the DICOM header.
3. An Executive Summary Report is provided for exams which have at least 2,000 and 10,000 total records across all facilities for pediatric and adult reports respectively.
4. Index data for the Top 10 Adult and Top 10 Pediatric exams are included in this report. Index data for all exams can be found in corresponding on-line reports.

The tables and charts in this report describe dose indices at the scan level. The three measures that we currently report are SSDE, CTDIvol and DLP. For example, for a CT Abdomen and Pelvis With and Without IV Contrast, if the scan for the 'Without' phase of the exam had a CTDIvol of 30 mGy and the scan for the 'With' phase had a CTDIvol of 25 mGy, then the CTDIvol per Scan would be 30 mGy. In cases where multiple scans were given for the same body region when fewer scans were required, the CTDIvol per Scan will underestimate the total CTDIvol. Timing runs or monitoring scans are excluded before identifying the scan with the highest dose index.

Components of the Report

Map of Facilities - The Map of Facilities shows all facilities that are participating in the registry during the report period.

Demographic Data - The bar charts describe demographic data of all the facilities that contributed data during the report period.

Adult Executive Summary Table - The Adult Executive Summary provides a quick overview of Your Facility's data for the most common adult CT exams and a comparison to the overall DIR values. For each of the three dose indices (CTDIvol per scan, DLP per scan and SSDE per scan) your facility values are compared to the DIR values. To access data for all exams (beyond the most common) please log into the DIR registry in the NRDR portal. Indices for all exams can be found in the Interactive Reports > CT Facility Comparison Report. Data can be filtered by Exam Type and Patient Age.

Adult High Volume Boxplots - Shows a snapshot of your facility's performance in the DIR top 10 high volume adult CT exams. There are 3 sets of boxplots, one for each dose index, representing the DIR values for an exam. Your facility median is depicted by a red line. Absence of red line means your facility did not perform that exam. The key of the numbered exams are given on the right hand side. SSDE only has values for body exams.

Pediatric Executive Summary Tables - The Pediatric Executive Summary provides a quick overview of Your Facility's data for the most common pediatric CT exams and a comparison to the overall DIR values by age groups. For each of the dose indices (CTDIvol per scan, DLP per scan and SSDE per scan) your facility values are compared to the DIR values for the corresponding age group. To access data for all exams (beyond the most common) please log into the DIR registry in the NRDR portal. Indices for all exams can be found in the Interactive Reports > CT Facility Comparison Report. Data can be filtered by Exam Type and Patient Age.

Pediatric High Volume Boxplots - Shows a snapshot of your facility's performance in the DIR top 10 high volume pediatrics CT exams by age groups. There are 3 sets of boxplots, one for each dose index, representing the DIR values for a particular exam for each age group. Your facility median is depicted by a red line. Absence of a red line means your facility did not perform that exam. The key of the numbered exams are given on the right hand side. SSDE only has values for body exams.

CY Year-To-Date Qualified Clinical Data Registry (QCDR) Preview Report - This report provides a preview of performance scores for QCDR measures used in the Centers for Medicare and Medicaid Services (CMS) Merit-based Incentive Payment System (MIPS). Within this report the measure scores are shown at the facility level. Individual physician and group level (by Tax-IdentificationNumber (TIN)) measure scores are shown in the NRDR MIPS Participation portal for groups registered and enrolled in the NRDR MIPS.

About Phantoms

Phantom Size - The value of the dose index that you report for each exam is relative to a particular phantom size. To make accurate comparisons, we standardize the values to a certain phantom size. For all head exams, we standardize to a 16cm phantom. For all body exams, we standardize to a 32cm phantom. The relationship of the two phantoms is $CTDI_{32}$ X 2.3 = $CTDI_{16}$.

For more information on DIR data processing refer to Bhargavan-Chatfield M, Morin RL. The ACR Computed Tomography Dose Index Registry: the 5 million examination update.

J Am Coll Radiol. 2013 Dec 10(12):980-3. doi: 10.1016/j.jacr.2013.08.030.
(https://www.jacr.org/article/S1546-1440(13)00560-7/fulltextf).

The dose indices reported can be affected by a number of issues that are not necessarily related to a non-optimal protocol. Before modifying any protocol, please consult your medical physicist.

Issues that may affect the dose indices include but are not limited to the following:

1. Protocols/orderables that are mapped to a given RPID, may not actually belong to the assigned RPID (e.g., a protocol mapped to a CT HEAD BRN WO IVCON might actually be a perfusion study).
2. If the phantom size is not recorded/transmitted, it is assumed that all body exams use a 32cm phantom and all head exams use a 16cm phantom, which may not be the case. This could affect CTDIvol in either direction (head exams could appear to be half of the true value; body exams could appear to be twice the true value).

Fundamentals of Radiation Dose

Term	Description	Unit
CT Dose Index (CTDIvol)	Radiation energy absorbed per unit mass; for CT, determined for a standard phantom and not a patient	gray (Gy) or milligray (mGy)
Dose Length Product (DLP)	Absorbed dose multiplied by the length of exposure; for CT, determined for a standard phantom and not a patient	milligray-cm (mGy-cm)
Size Specific Dose Estimate	A patient dose estimate which takes into consideration corrections based on the size of the patient	milligray (mGy)

CT Dose Index (CTDIvol) approximates the average radiation dose to a cross section of the phantom. Dose Length Product (DLP) is based on CTDIvol factors in the length of the scan.

In modern CT scanners, CTDIvol and/or DLP are reported for each CT scan. Although these parameters are tagged to individual patient exams, they do not represent the patient's dose but rather the radiation dose to one of two standard phantoms.

CTDIvol is primarily used as a quality assurance tool to compare the dose from techniques using the same size phantom and to compare CT scanner output from different manufacturers' equipment. It has been used to modify technical parameters in an attempt to lower radiation dose in general.

More recently, the American Association of Physicists in Medicine (AAPM) developed a new CT parameter, the size-specific dose estimate (SSDE) to more accurately estimate average cross-sectional dose to an individual patient by factoring in the size ofthe patient. This value is determined by applying a conversion factor, based on cross-sectional dimensions of the patient, to the CTDIvol.

For more information about SSDE please refer to http://www.aapm.org/pubs/reports/RPT_204.pdf. Several online educational programs on this topic are available that offer free continuing education. See the 'Image Wisely Radiation Safety Cases' on CT Dose and Size-Specific Dose Estimate (SSDE) (https://shop.acr.org/Default.aspx?TabID=55&ProductId=12363982) and Child-sizing CT Dose: Optimizing Patient Care through Quality Improvement https://www.acr.org/-/media/ACR/Files/Radiology-Safety/Radiation-Safety/WhitePaper_RadiationDose_2007.pdf

U.S. Diagnostic Reference Levels and Achievable Doses for 10 Adult CT Examinations

Using data from the American College of Radiology's Dose Index Registry, the world's largest registry of dose information, Kanal et al have established U.S. national dose levels for the 10 most common adult CT examinations based on patient size. The study establishes patient-size based diagnostic reference levels (DRLs) and achievable doses (ADs) for the 10 most common CT head, neck and body examinations. A summary table of ADs and DRLs for median size patients is presented below. Except for head and brain without contrast, all exams used water-equivalent diameter as an indicator of patient size. For head and brain without contrast, lateral thickness was used.

Healthcare facilities can use this information to effectively compare their patient doses to national benchmarks, optimize their exam protocols so that dose is commensurate with the size of the patient, and help avoid unnecessary radiation exposure.

References - 1. Kanal KM, Butler PF, Sengupta D, et al. U.S. Diagnostic Reference Levels and Achievable Doses for 10 Adult CT Examinations, Radiology 2017, ahead of print. (http://pubs.rsna.org/doi/abs/10.1148/radiol.2017161911?journalCode=radiology)

		CTDIvol (mGy)		SSDE (mGy)		DLP (mGy-cm)	
Exam Name	**Median Patient Size**	**DRL**	**AD**	**DRL**	**AD**	**DRL**	**AD**
Head and brain without contrast	14-16	56	49	.	.	962	811
Neck with contrast	18-22	19	15	.	.	563	429
Cervical spine without contrast	18-22	28	20	.	.	562	421
Chest without contrast	29-33	12	9	15	11	443	334
Chest with contrast	29-33	13	10	15	11	469	353
Chest pulmonary arteries with contrast	29-33	14	11	17	13	445	357
Abdomen and pelvis without contrast	29-33	16	13	19	15	781	639
Abdomen and pelvis with contrast	29-33	15	12	18	15	755	608
Abdomen, pelvis and kidney without contrast	29-33	15	12	19	14	705	576
Chest, abdomen and pelvis with contrast	29-33	15	12	18	14	947	779

U.S. Diagnostic Reference Levels and Achievable Doses for 10 Pediatric CT Examinations

Diagnostic reference levels (DRLs) and achievable doses (ADs) were developed for the 10 most commonly performed pediatric CT examinations in the United States using the American College of Radiology Dose Index Registry. Data on 10 pediatric (ie, patients aged 18 years and younger) CT examinations performed between 2016 and 2020 at 1625 facilities were analyzed. For head and neck examinations, dose indexes were analyzed based on patient age; for body examinations, dose indexes were analyzed for patient age and effective diameter. Data from 1,543,535 examinations provided medians for AD and 75th percentiles for DRLs for volume CT dose index (CTDIvol), dose-length product (DLP), and size-specific dose estimate (SSDE).

Healthcare facilities can use this information to effectively compare their patient doses to national benchmarks, optimize their exam protocols so that dose is commensurate with the size of the patient, and help avoid unnecessary radiation exposure.

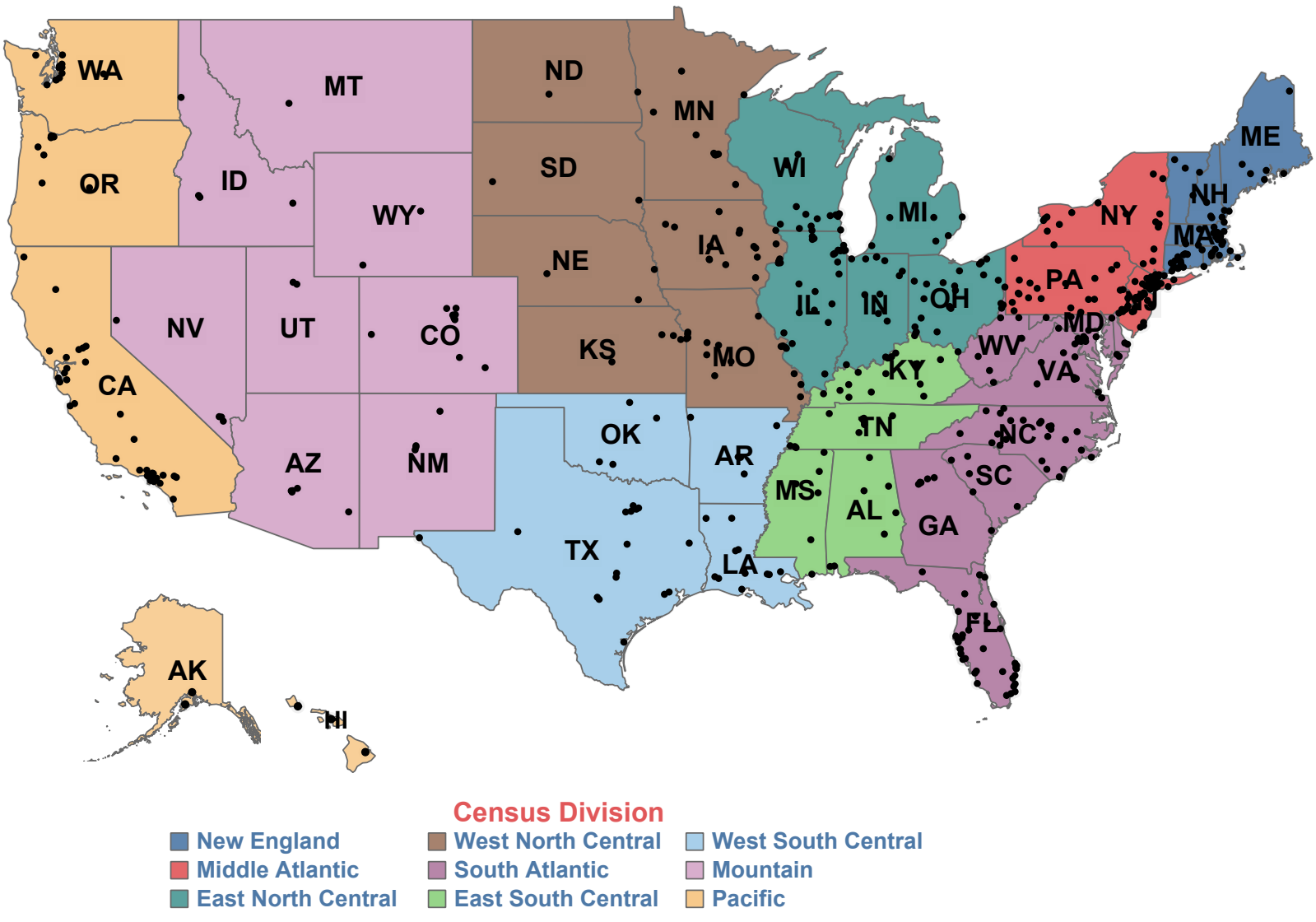
Of all facilities analyzed, 66% of the facilities (1,068 of 1,625) were community hospitals, 16% (264 of 1,625) were freestanding centers, 9.5% (154 of 1,625) were academic facilities, and 3.5% (57 of 1,625) were dedicated children's hospitals. Fifty-two percent of the patients (798,577 of 1,543,535) were boys, and 48% (744,958 of 1,543,535) were girls. The median age of patients was 14 years (boys, 13 years; girls, 15 years). The head was the most frequent anatomy examined with CT (876,655 of 1,543,535 examinations [57%]). For head without contrast material CT examinations, the age-based CTDIvol AD ranged from 19 to 46 mGy, and DRL ranged from 23 to 55 mGy, with both AD and DRL increasing with age. For body examinations, DRLs and ADs for size-based CTDIvol, SSDE, and DLP increased consistently with the patient's effective diameter.

Diagnostic reference levels and achievable doses as a function of patient age and effective diameter were developed for the 10 most commonly performed CT pediatric examinations using American College of Radiology Dose Index Registry data. These benchmarks can guide CT facilities in adjusting pediatric CT protocols and resultant doses for their patients.

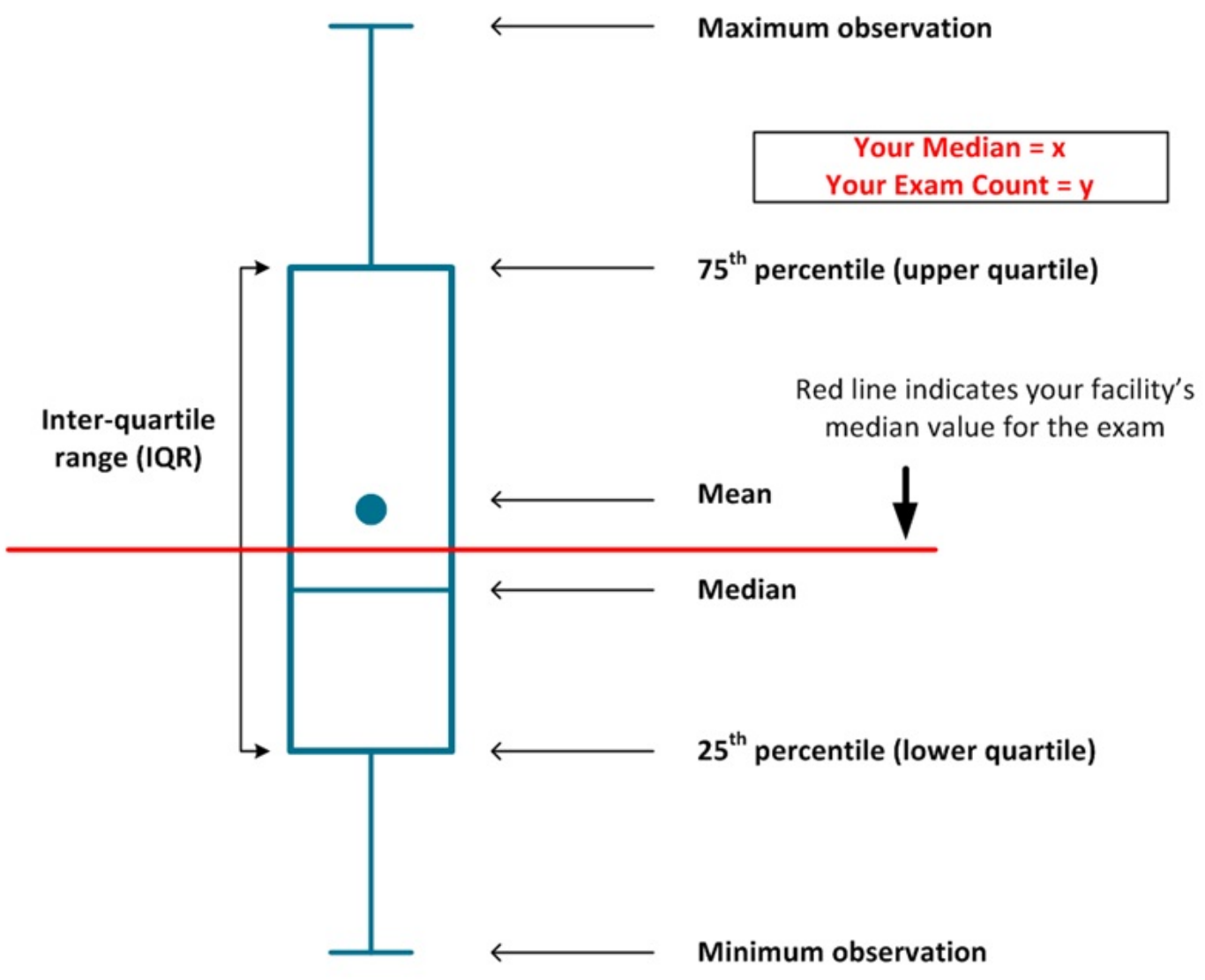
References - 1. Kanal KM, Butler PF, Golden D, et al. U.S. Diagnostic Reference Levels and Achievable Doses for 10 Pediatric CT Examinations. (https://pubs.rsna.org/doi/10.1148/radiol.2021211241)

DIR Corporate Sites That Submitted Data From January thru December 2022

(Total 602 Corporate Sites, US Sites are indicated by black dots)



Box-and-whiskers Plot



Executive Summary January thru December 2022 - Top 10 Adult CTDIVol

CTDIVol Max Across Scans

Corporate ID 100000

ALL DIR

RPIDShortname	N	YTD 2022 (Q1-Q4) (25-Med-75th)	N	Full Year 2021 (25-Med-75th)	N	YTD 2022 (Q1-Q4) (25-Med-75th)
CT ABDOMEN PELVIS KIDNEY WO IVCON	1,442	(9/12/19)	214,990	(10/13/16)	222,844	(9/12/15)
CT ABDOMEN PELVIS W IVCON	20,915	(8/13/21)	3,050,660	(11/13/17)	2,898,970	(10/13/17)
CT ABDOMEN PELVIS WO IVCON	8,519	(8/13/19)	1,264,136	(10/13/16)	1,465,495	(10/13/15)
CT C SPINE WO IVCON	5,739	(15/23/52)	754,191	(17/22/36)	763,071	(17/23/40)
CT CHEST ABDOMEN PELVIS W IVCON	4,174	(10/15/25)	669,536	(12/17/24)	642,844	(12/16/22)
CT CHEST PULMONARY ARTERIES W IVCON	3,859	(9/13/20)	677,447	(9/12/16)	602,616	(9/12/15)
CT CHEST W IVCON	6,332	(7/11/20)	771,999	(8/10/13)	717,646	(8/10/14)
CT CHEST WO IVCON	9,528	(6/9/14)	1,233,961	(7/9/12)	1,294,148	(7/9/11)
CT HEAD BRAIN WO IVCON	30,113	(44/53/62)	4,070,693	(44/50/57)	4,129,512	(43/50/57)
CT NECK W IVCON	1,811	(10/16/25)	247,280	(11/14/18)	238,831	(11/14/18)

Executive Summary January thru December 2022 - Top 10 Adult DLP

DLP Max Across Scans

Corporate ID 100000

ALL DIR

RPIDShortname	N	YTD 2022 (Q1-Q4) (25-Med-75th)	N	Full Year 2021 (25-Med-75th)	N	YTD 2022 (Q1-Q4) (25-Med-75th)
CT ABDOMEN PELVIS KIDNEY WO IVCON	1,442	(406/598/935)	214,684	(471/634/753)	222,675	(435/596/737)
CT ABDOMEN PELVIS W IVCON	20,924	(403/639/1037)	3,037,380	(524/666/826)	2,882,947	(512/654/819)
CT ABDOMEN PELVIS WO IVCON	8,530	(404/635/974)	1,258,954	(517/645/773)	1,457,605	(506/637/746)
CT C SPINE WO IVCON	5,730	(319/526/1045)	750,628	(362/500/765)	756,369	(362/505/868)
CT CHEST ABDOMEN PELVIS W IVCON	4,180	(516/839/1361)	662,783	(704/923/1179)	637,709	(675/903/1156)
CT CHEST PULMONARY ARTERIES W IVCON	3,859	(288/425/637)	677,457	(289/407/517)	602,293	(281/382/506)
CT CHEST W IVCON	6,335	(259/473/846)	767,658	(285/385/510)	713,174	(276/373/522)
CT CHEST WO IVCON	9,529	(200/323/505)	1,229,048	(254/333/428)	1,288,090	(245/324/414)
CT HEAD BRAIN WO IVCON	30,071	(750/943/1129)	4,046,854	(762/899/1035)	4,094,277	(758/899/1044)
CT NECK W IVCON	1,809	(288/430/643)	246,090	(304/405/502)	237,380	(306/402/505)

Executive Summary January thru December 2022 - Top 10 Adult SSDE

SSDE Max Across Scans

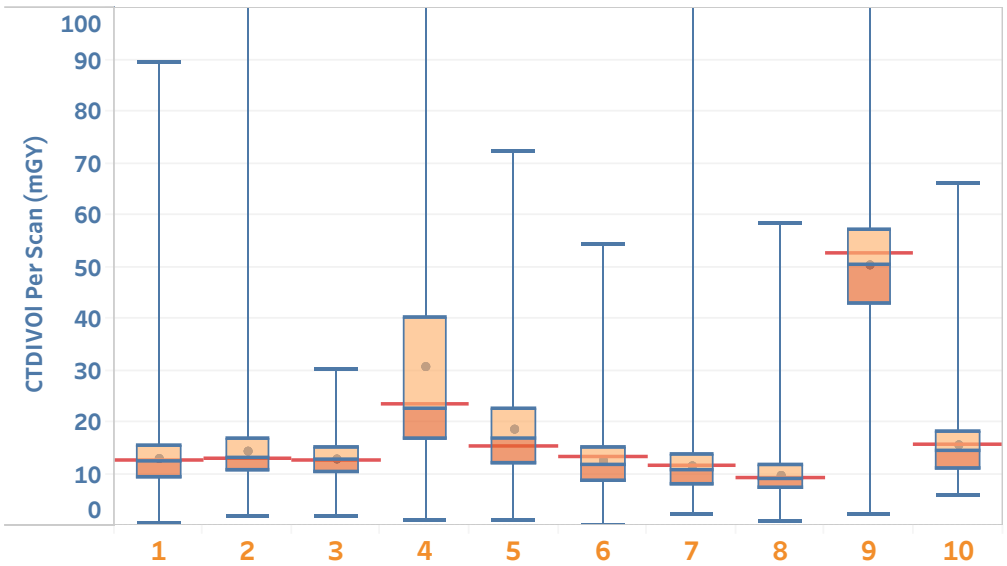
Corporate ID 100000 **ALL DIR**

RPIDShortname	N	YTD 2022 (Q1-Q4) (25-Med-75th)	N	Full Year 2021 (25-Med-75th)	N	YTD 2022 (Q1-Q4) (25-Med-75th)
CT ABDOMEN PELVIS KIDNEY WO IVCON	1,018	(10/13/18)	154,001	(11/13/16)	151,642	(10/13/16)
CT ABDOMEN PELVIS W IVCON	14,819	(10/14/21)	2,044,523	(12/14/18)	1,899,319	(11/14/18)
CT ABDOMEN PELVIS WO IVCON	6,188	(10/14/19)	816,445	(12/14/16)	921,911	(11/14/16)
CT C SPINE WO IVCON	484	(24/34/46)	N/A	N/A	N/A	N/A
CT CHEST ABDOMEN PELVIS W IVCON	3,225	(11/16/24)	475,903	(13/18/26)	441,759	(13/18/25)
CT CHEST PULMONARY ARTERIES W IVCON	2,691	(9/14/20)	455,368	(9/13/18)	402,534	(9/12/17)
CT CHEST W IVCON	4,474	(8/12/19)	500,174	(9/12/15)	462,774	(9/11/15)
CT CHEST WO IVCON	7,003	(7/10/14)	800,580	(8/10/13)	816,632	(8/10/12)
CT HEAD BRAIN WO IVCON	19,265	(30/40/55)	N/A	N/A	N/A	N/A
CT NECK W IVCON	292	(17/28/39)	N/A	N/A	N/A	N/A

Executive Summary January thru December 2022 - Top 10 Adult - Boxplots

Corporate Id : 100000

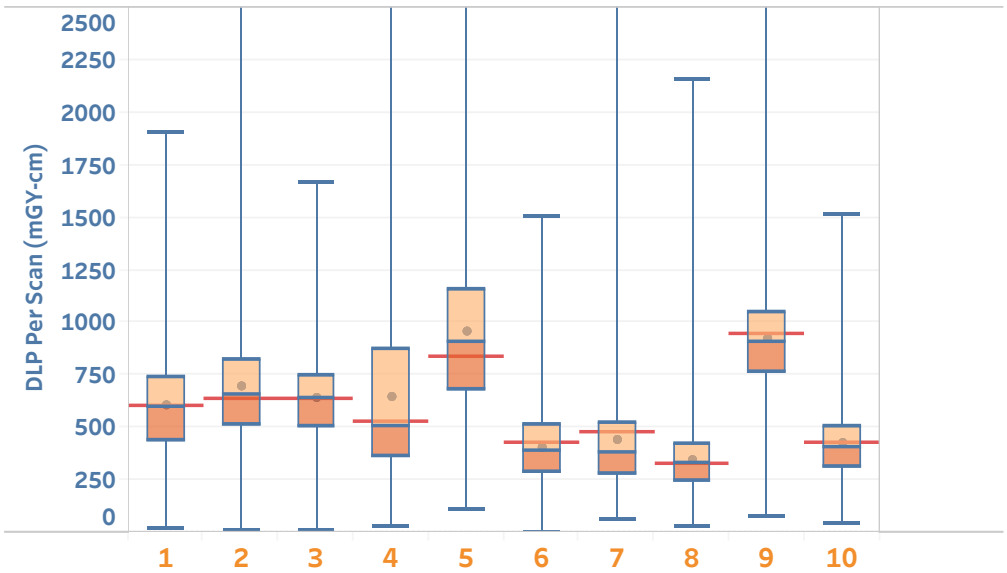
CTDIVol



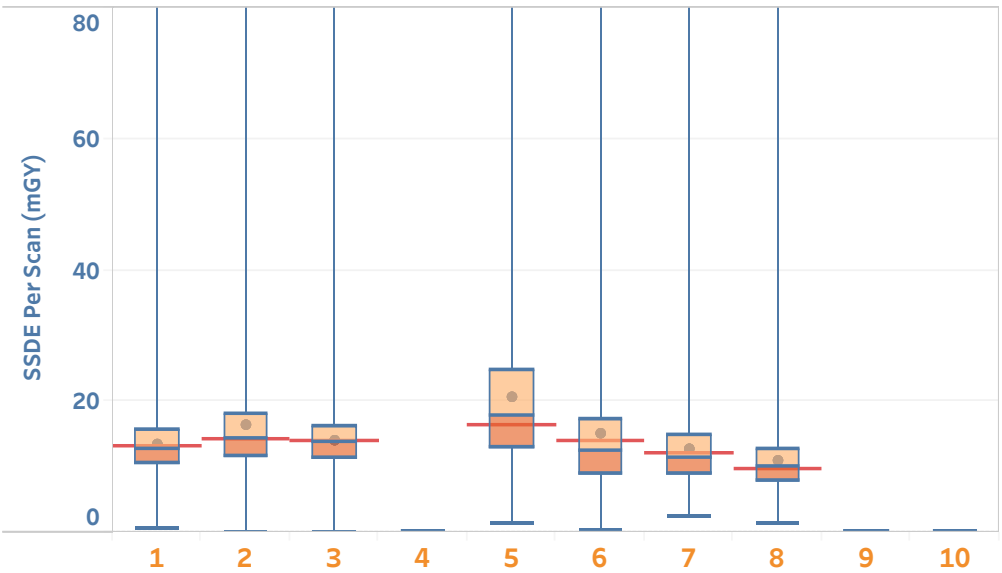
— Your Facility Median

1 CT ABDOMEN PELVIS KIDNEY WO IVCON
2 CT ABDOMEN PELVIS W IVCON
3 CT ABDOMEN PELVIS WO IVCON
4 CT C SPINE WO IVCON
5 CT CHEST ABDOMEN PELVIS W IVCON
6 CT CHEST PULMONARY ARTERIES W IVCON
7 CT CHEST W IVCON
8 CT CHEST WO IVCON
9 CT HEAD BRAIN WO IVCON
10 CT NECK W IVCON

DLP



SSDE



Executive Summary January thru December 2022 - Top 10 Peds CTDIVol

CTDIVol Max Across Scans

Corporate ID 100000 ALL DIR

RPIDShortname	Age Group	N	YTD 2022 (Q1-Q4) (25-Med-75th)	N	Full Year 2021 (25-Med-75th)	N	YTD 2022 (Q1-Q4) (25-Med-75th)
CT ABDOMEN PELVIS W IVCON	00-02	72	(2/2/4)	2,291	(2/3/6)	2,716	(2/2/5)
	03-06	137	(2/2/3)	6,351	(2/3/4)	7,589	(2/3/3)
	07-10	270	(3/4/6)	11,096	(3/4/6)	12,934	(3/4/5)
	11-14	544	(4/6/10)	21,487	(5/7/8)	21,515	(5/6/8)
	15-18	1,191	(5/8/12)	56,461	(6/8/10)	54,519	(6/8/10)
CT ABDOMEN PELVIS WO IVCON	00-02	15	(1/2/3)	566	(2/3/9)	752	(2/3/8)
	03-06	26	(2/3/4)	1,087	(2/3/4)	1,361	(2/3/4)
	07-10	42	(2/4/7)	1,747	(3/4/6)	2,205	(3/4/6)
	11-14	83	(4/7/12)	3,516	(5/7/9)	4,006	(5/6/8)
	15-18	267	(6/8/14)	11,413	(6/8/11)	14,014	(6/8/10)
CT C SPINE WO IVCON	00-02	42	(2/4/12)	1,706	(3/8/20)	1,516	(3/9/19)
	03-06	49	(3/6/16)	2,014	(4/7/20)	1,885	(4/7/21)
	07-10	48	(5/14/39)	2,285	(6/10/21)	2,313	(6/10/22)
	11-14	121	(7/12/22)	5,265	(10/16/29)	5,188	(10/16/36)
	15-18	354	(10/20/43)	16,365	(13/21/39)	15,420	(13/20/43)
CT CHEST ABDOMEN PELVIS W IVCON	00-02	24	(1/2/3)	820	(2/4/14)	874	(2/4/12)
	03-06	18	(2/2/3)	991	(2/3/7)	1,153	(2/3/6)
	07-10	19	(2/2/5)	755	(3/5/9)	944	(3/6/10)
	11-14	34	(4/6/10)	1,510	(6/10/16)	1,728	(6/10/15)
	15-18	88	(8/14/29)	5,466	(9/13/19)	5,381	(8/13/19)
CT CHEST W IVCON	00-02	79	(1/2/2)	3,113	(1/2/3)	3,032	(1/2/4)
	03-06	59	(1/2/3)	1,718	(2/2/4)	2,255	(2/2/4)
	07-10	50	(2/3/4)	1,545	(3/4/7)	1,865	(2/3/5)
	11-14	73	(3/4/10)	2,871	(4/6/11)	2,867	(4/6/10)
	15-18	170	(4/7/14)	6,691	(5/8/13)	6,557	(5/8/13)
CT CHEST WO IVCON	00-02	41	(1/2/2)	1,772	(1/2/5)	2,094	(1/2/5)
	03-06	31	(1/2/2)	1,203	(2/2/3)	1,654	(2/2/3)
	07-10	35	(2/2/3)	1,216	(2/3/5)	1,642	(2/3/5)
	11-14	103	(2/3/6)	2,519	(3/5/7)	2,722	(3/5/7)
	15-18	142	(3/4/8)	4,921	(5/6/9)	5,419	(5/6/9)
CT HEAD BRAIN WO IVCON	00-02	1,251	(15/22/28)	48,643	(17/22/28)	50,388	(17/22/29)
	03-06	634	(18/25/34)	26,782	(21/26/33)	28,568	(22/26/33)
	07-10	528	(22/30/36)	22,933	(26/32/40)	26,085	(25/32/40)
	11-14	778	(29/35/49)	36,480	(32/41/51)	40,300	(32/41/51)
	15-18	1,544	(36/47/58)	73,392	(40/48/57)	75,971	(39/48/57)
CT HEAD PARANASAL SINUSES WO IVCON	00-02	8	(6/11/13)	167	(4/8/14)	151	(5/10/23)
	03-06	10	(5/7/10)	345	(5/9/14)	408	(6/10/18)
	07-10	7	(6/7/9)	564	(8/12/18)	673	(7/10/19)
	11-14	23	(7/9/16)	969	(8/14/23)	1,081	(8/14/23)
	15-18	37	(8/13/18)	1,959	(9/16/25)	2,046	(9/15/25)
CT LE WO IVCON	03-06	5	(3/8/12)	147	(2/4/7)	132	(2/4/6)
	07-10	8	(4/9/11)	590	(4/6/10)	571	(3/5/9)
	11-14	43	(3/6/9)	2,114	(6/7/11)	1,970	(6/7/11)
	15-18	44	(4/7/12)	2,281	(6/9/13)	2,244	(6/8/12)
CT NECK W IVCON	00-02	45	(2/4/5)	1,371	(2/4/7)	1,420	(3/4/7)
	03-06	48	(3/5/6)	1,347	(3/4/6)	1,926	(3/4/6)
	07-10	26	(4/6/8)	1,142	(4/6/8)	1,772	(4/6/8)
	11-14	47	(6/7/11)	1,943	(7/10/13)	2,216	(7/9/13)
	15-18	153	(8/10/17)	5,837	(8/11/14)	6,352	(8/10/14)

Executive Summary January thru December 2022 - Top 10 Peds DLP

DLP Max Across Scans

Corporate ID 100000

ALL DIR

RPIDShortname	Age Group	N	YTD 2022 (Q1-Q4) (25-Med-75th)	N	Full Year 2021 (25-Med-75th)	N	YTD 2022 (Q1-Q4) (25-Med-75th)
CT ABDOMEN PELVIS W IVCON	00-02	72	(53/74/105)	2,267	(50/76/175)	2,699	(53/73/154)
	03-06	137	(60/91/120)	6,302	(66/93/122)	7,554	(65/88/123)
	07-10	270	(106/164/240)	11,054	(120/161/228)	12,903	(110/153/211)
	11-14	544	(194/282/465)	21,362	(246/309/393)	21,445	(235/288/376)
	15-18	1,190	(251/389/619)	56,186	(304/400/513)	54,310	(302/383/499)
CT ABDOMEN PELVIS WO IVCON	00-02	15	(28/59/76)	560	(51/80/278)	750	(47/80/216)
	03-06	26	(60/102/169)	1,082	(65/104/140)	1,360	(60/93/130)
	07-10	42	(82/153/261)	1,740	(107/157/246)	2,200	(111/161/236)
	11-14	83	(178/294/472)	3,496	(233/310/445)	3,998	(208/281/395)
	15-18	267	(266/410/693)	11,340	(303/387/513)	13,960	(298/390/496)
CT C SPINE WO IVCON	00-02	41	(22/52/177)	1,697	(56/132/350)	1,508	(50/139/326)
	03-06	49	(45/110/266)	2,006	(66/125/325)	1,878	(68/124/337)
	07-10	48	(99/272/744)	2,276	(109/189/393)	2,305	(116/194/423)
	11-14	121	(144/245/489)	5,245	(212/349/626)	5,174	(218/342/718)
	15-18	355	(239/451/921)	16,303	(294/448/835)	15,353	(295/443/866)
CT CHEST ABDOMEN PELVIS W IVCON	00-02	25	(49/77/101)	804	(66/137/695)	863	(66/110/407)
	03-06	19	(86/107/135)	975	(85/129/242)	1,136	(92/131/218)
	07-10	19	(99/134/190)	752	(143/241/381)	929	(157/248/380)
	11-14	34	(203/354/601)	1,502	(312/506/742)	1,721	(326/514/782)
	15-18	88	(421/773/1259)	5,417	(533/716/1032)	5,344	(498/693/1022)
CT CHEST W IVCON	00-02	79	(20/34/55)	3,095	(24/39/85)	3,024	(23/42/94)
	03-06	59	(35/50/109)	1,716	(45/72/118)	2,252	(44/63/106)
	07-10	50	(53/85/130)	1,542	(74/116/247)	1,863	(69/99/176)
	11-14	73	(89/141/367)	2,860	(139/221/444)	2,861	(137/209/396)
	15-18	170	(156/265/552)	6,670	(194/295/527)	6,542	(199/315/562)
CT CHEST WO IVCON	00-02	41	(15/25/35)	1,764	(21/40/99)	2,088	(23/39/103)
	03-06	31	(31/42/50)	1,203	(36/52/83)	1,654	(39/57/90)
	07-10	35	(57/66/83)	1,216	(62/88/144)	1,638	(56/81/141)
	11-14	103	(76/120/184)	2,512	(109/160/229)	2,723	(112/164/246)
	15-18	142	(93/162/287)	4,901	(171/233/328)	5,401	(174/236/324)
CT HEAD BRAIN WO IVCON	00-02	1,248	(225/322/430)	48,221	(264/358/459)	50,232	(268/348/446)
	03-06	631	(302/409/558)	26,624	(337/446/559)	28,480	(356/451/575)
	07-10	528	(381/537/633)	22,811	(436/556/685)	26,016	(438/552/692)
	11-14	778	(509/632/838)	36,290	(554/705/874)	40,172	(559/696/894)
	15-18	1,544	(630/807/1052)	73,024	(694/838/1007)	75,639	(688/844/1008)
CT HEAD PARANASAL SINUSES WO IVCON	00-02	8	(80/129/178)	163	(49/87/256)	150	(61/121/304)
	03-06	10	(77/87/100)	345	(71/126/233)	407	(85/145/261)
	07-10	7	(72/79/133)	559	(111/195/348)	671	(98/185/376)
	11-14	23	(107/142/265)	959	(138/234/396)	1,078	(131/228/386)
	15-18	37	(110/175/310)	1,946	(149/260/431)	2,044	(149/264/435)
CT LE WO IVCON	03-06	5	(109/110/206)	147	(46/95/162)	132	(48/85/133)
	07-10	8	(98/174/256)	589	(78/151/262)	571	(71/126/197)
	11-14	43	(55/123/248)	2,102	(133/192/306)	1,965	(140/188/308)
	15-18	44	(119/189/387)	2,263	(167/245/384)	2,238	(165/216/370)
CT NECK W IVCON	00-02	44	(25/66/92)	1,353	(46/72/135)	1,412	(46/76/144)
	03-06	48	(73/118/130)	1,328	(63/92/126)	1,914	(63/90/136)
	07-10	26	(84/146/193)	1,136	(95/138/195)	1,767	(95/131/196)
	11-14	47	(141/233/319)	1,934	(185/248/332)	2,202	(176/240/333)
	15-18	153	(225/305/468)	5,798	(232/301/416)	6,310	(227/306/406)

Executive Summary January thru December 2022 - Top 10 Peds SSDE

SSDE Max Across Scans

Corporate ID 100000

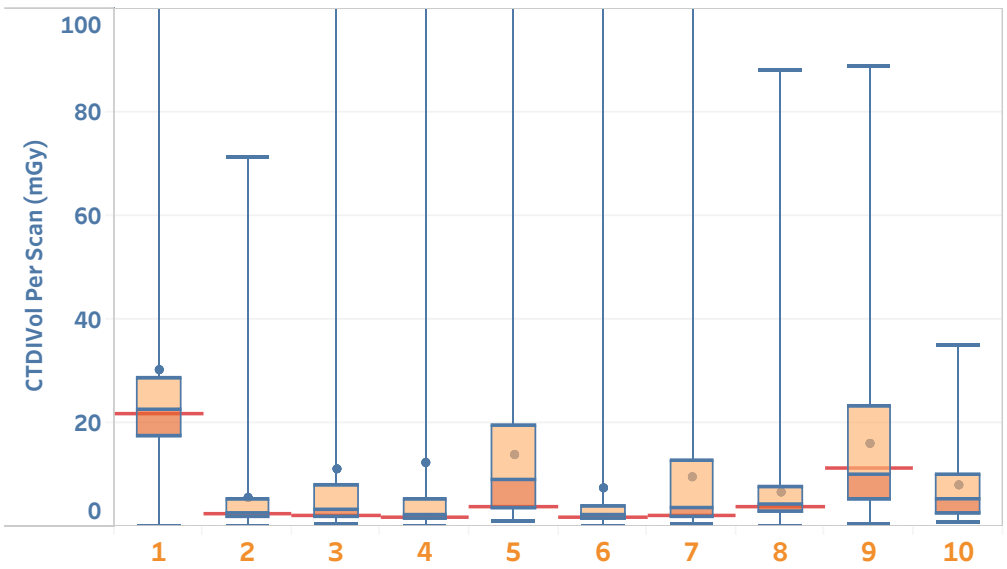
ALL DIR

RPIDShortname	Age Group	N	YTD 2022 (Q1-Q4) (25-Med-75th)	N	Full Year 2021 (25-Med-75th)	N	YTD 2022 (Q1-Q4) (25-Med-75th)
CT ABDOMEN PELVIS W IVCON	00-02	48	(4/5/10)	1,559	(4/5/10)	1,872	(4/5/11)
	03-06	96	(3/5/6)	4,186	(4/5/7)	5,013	(3/5/6)
	07-10	179	(5/6/9)	7,501	(5/6/9)	8,610	(5/6/9)
	11-14	374	(7/9/12)	14,562	(8/9/12)	14,451	(7/9/11)
	15-18	839	(7/11/14)	38,088	(9/11/13)	36,242	(9/10/13)
CT ABDOMEN PELVIS WO IVCON	00-02	9	(4/4/5)	427	(4/5/12)	549	(4/6/13)
	03-06	21	(4/6/8)	770	(4/5/8)	975	(3/5/7)
	07-10	26	(5/7/12)	1,235	(4/6/10)	1,473	(5/7/9)
	11-14	61	(6/9/15)	2,500	(7/9/12)	2,608	(7/9/11)
	15-18	193	(9/11/16)	7,772	(9/11/13)	8,991	(8/11/13)
CT CHEST ABDOMEN PELVIS W IVCON	00-02	14	(3/4/5)	545	(4/8/22)	595	(4/7/19)
	03-06	9	(4/4/5)	620	(4/5/10)	704	(4/6/10)
	07-10	12	(3/4/7)	471	(5/8/13)	596	(5/9/14)
	11-14	24	(6/7/13)	977	(8/13/18)	1,080	(8/12/18)
	15-18	48	(9/17/26)	3,599	(11/15/22)	3,660	(10/15/22)
CT CHEST W IVCON	00-02	54	(2/4/5)	2,394	(3/4/8)	2,195	(3/4/7)
	03-06	39	(3/4/5)	1,151	(3/5/7)	1,562	(3/4/6)
	07-10	40	(3/4/7)	1,117	(4/6/10)	1,295	(4/5/7)
	11-14	44	(4/5/8)	2,030	(6/8/13)	2,029	(6/8/12)
	15-18	116	(5/8/12)	4,558	(7/10/14)	4,436	(7/10/15)
CT CHEST WO IVCON	00-02	29	(2/3/4)	1,333	(3/4/7)	1,638	(3/4/8)
	03-06	15	(2/3/4)	839	(3/4/6)	1,219	(3/4/6)
	07-10	18	(3/3/4)	835	(4/5/8)	1,144	(3/5/7)
	11-14	71	(4/6/8)	1,726	(5/7/9)	1,873	(5/7/9)
	15-18	107	(4/6/10)	3,359	(6/8/11)	3,635	(6/8/11)

Executive Summary January thru December 2022 - Top 10 Pediatric - Boxplots

Corporate Id : 100000
Age Group : 0-2

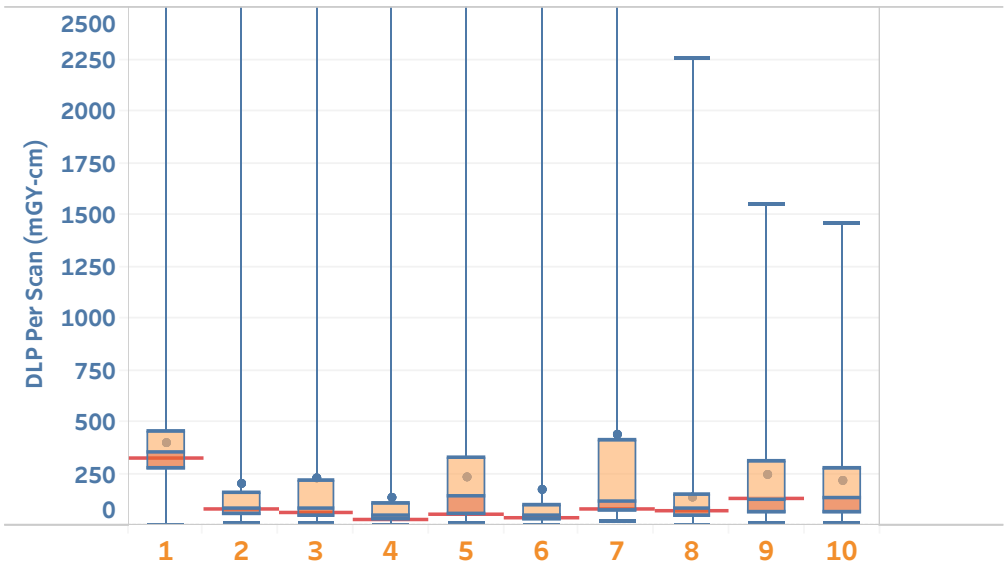
CTDIVol



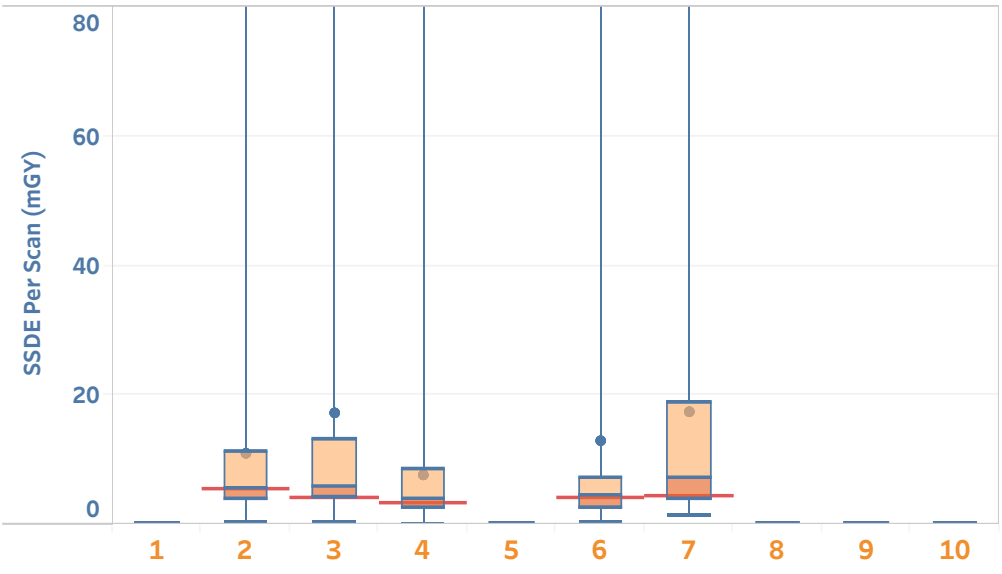
— Your Facility Median

1 CT HEAD BRAIN WO IVCON
2 CT ABDOMEN PELVIS W IVCON
3 CT ABDOMEN PELVIS WO IVCON
4 CT CHEST WO IVCON
5 CT C SPINE WO IVCON
6 CT CHEST W IVCON
7 CT CHEST ABDOMEN PELVIS W IVCON
8 CT NECK W IVCON
9 CT HEAD PARANASAL SINUSES WO IVCON
10 CT LE WO IVCON

DLP



SSDE

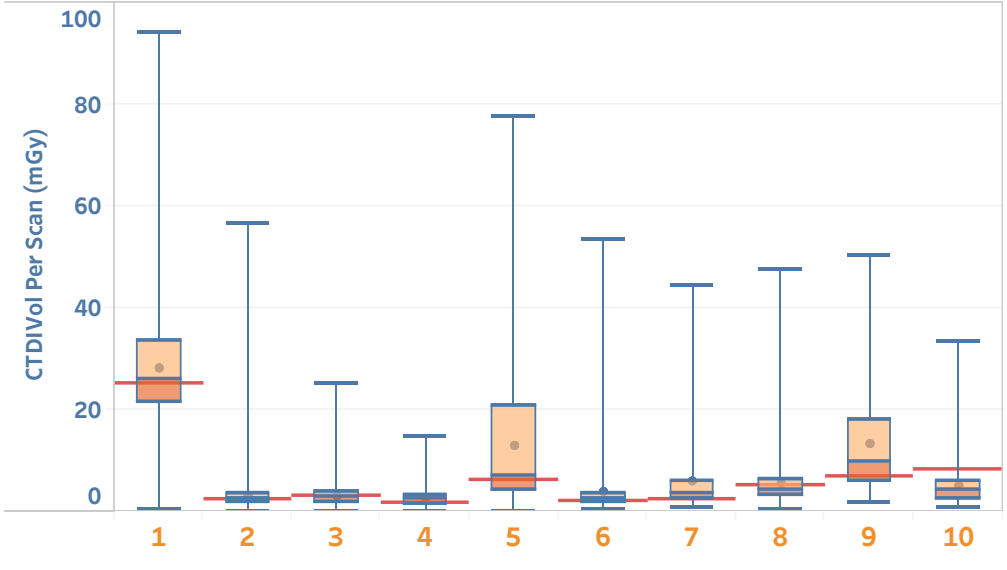


Executive Summary January thru December 2022 - Top 10 Pediatric - Boxplots

Corporate Id : 100000

Age Group : 03-06

CTDIVol



— Your Facility Median

1 CT HEAD BRAIN WO IVCON

2 CT ABDOMEN PELVIS W IVCON

3 CT ABDOMEN PELVIS WO IVCON

4 CT CHEST WO IVCON

5 CT C SPINE WO IVCON

6 CT CHEST W IVCON

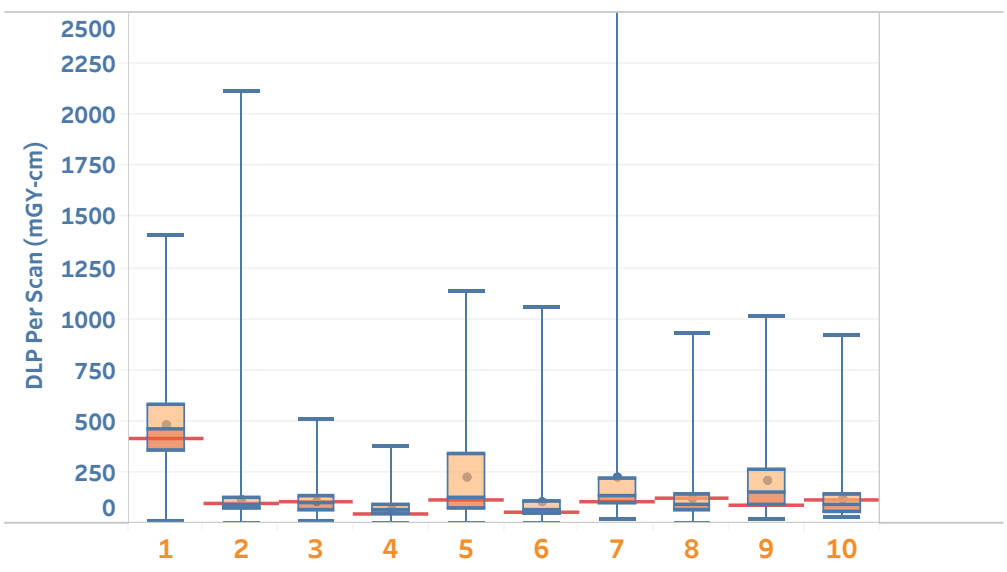
7 CT CHEST ABDOMEN PELVIS W IVCON

8 CT NECK W IVCON

9 CT HEAD PARANASAL SINUSES WO IVCON

10 CT LE WO IVCON

DLP



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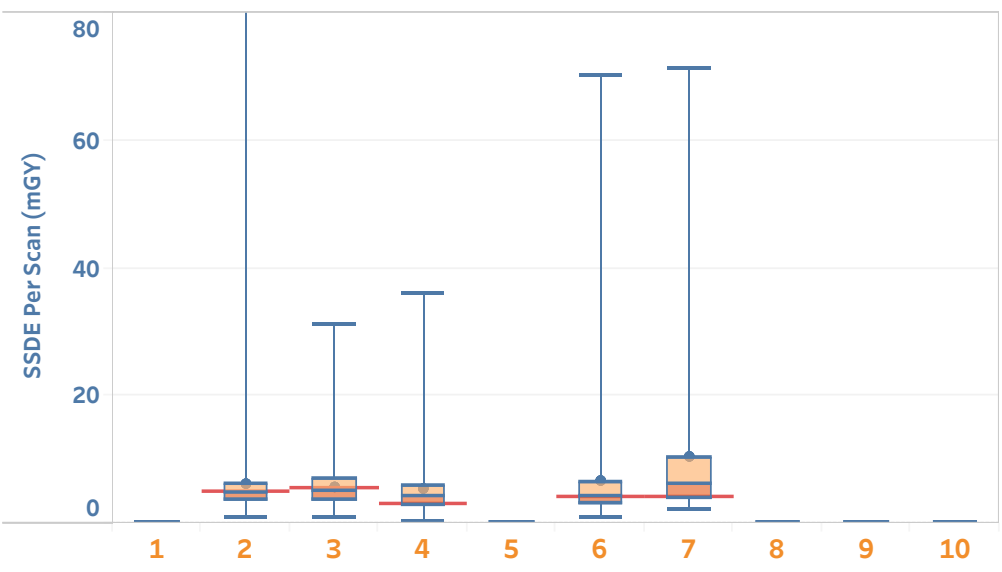
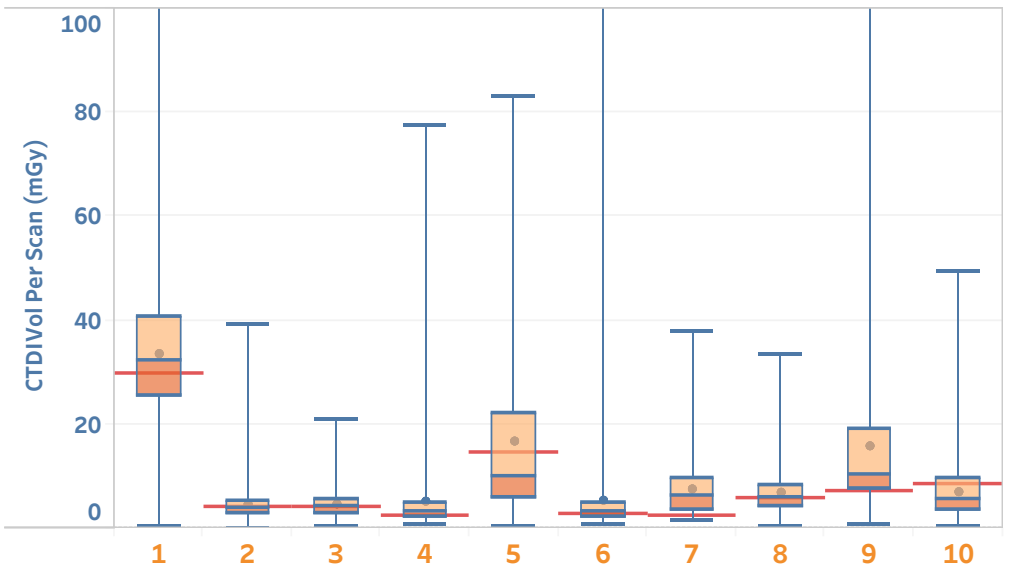


Executive Summary January thru December 2022 - Top 10 Pediatric - Boxplots

Corporate Id : 100000
Age Group : 07-10

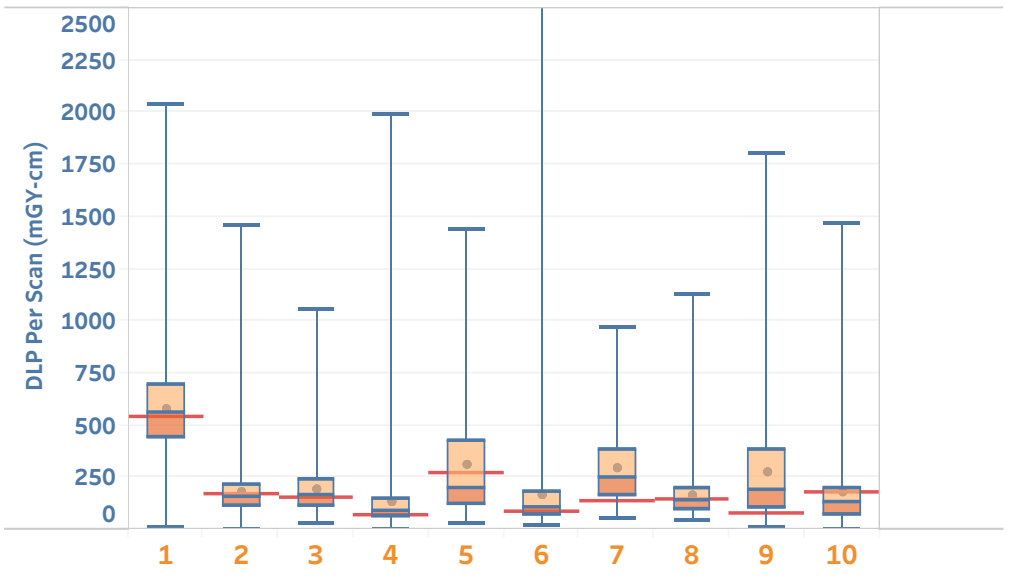
CTDIVol



— Your Facility Median

1 CT HEAD BRAIN WO IVCON
2 CT ABDOMEN PELVIS W IVCON
3 CT ABDOMEN PELVIS WO IVCON
4 CT CHEST WO IVCON
5 CT C SPINE WO IVCON
6 CT CHEST W IVCON
7 CT CHEST ABDOMEN PELVIS W IVCON
8 CT NECK W IVCON
9 CT HEAD PARANASAL SINUSES WO IVCON
10 CT LE WO IVCON

DLP



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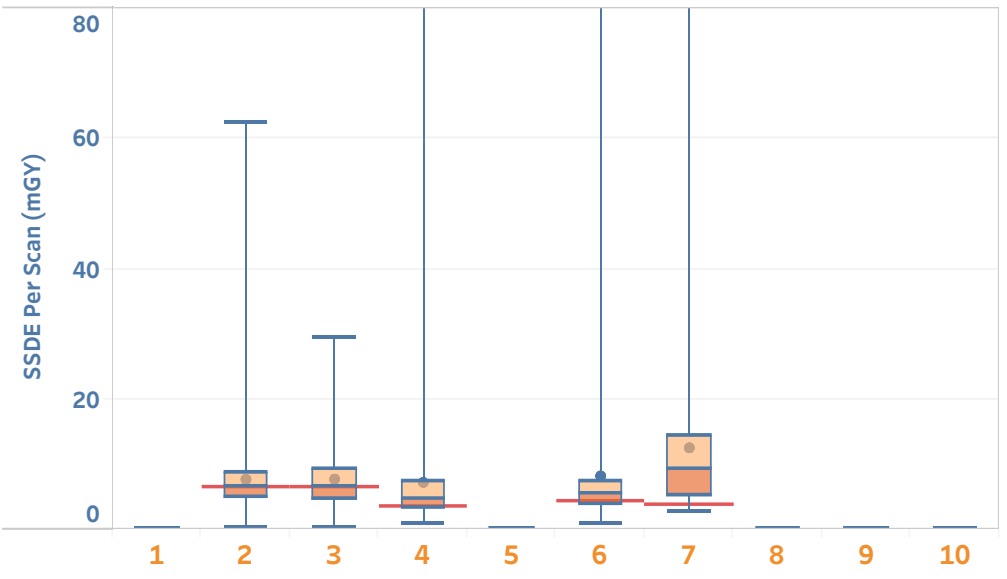
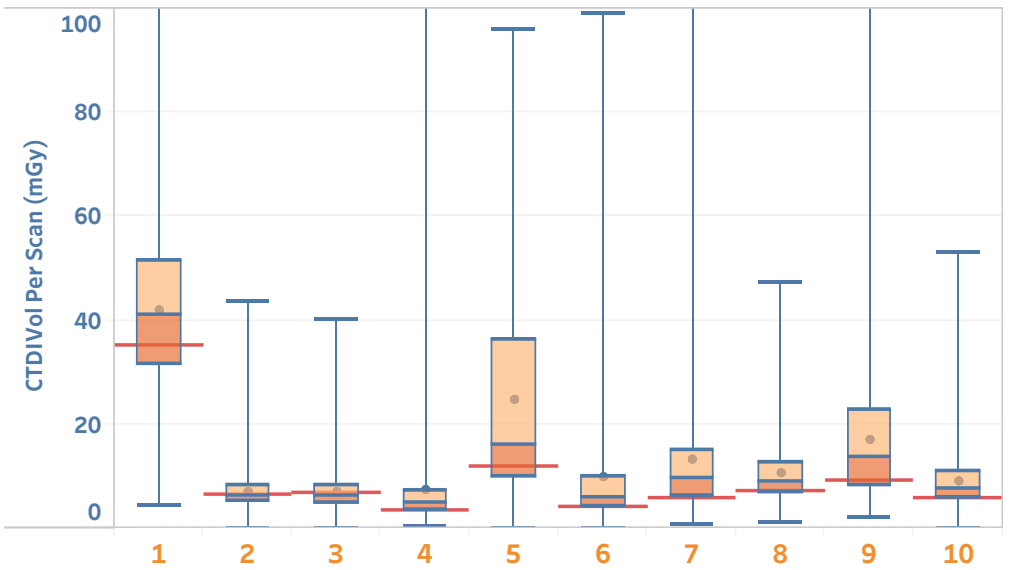


Executive Summary January thru December 2022 - Top 10 Pediatric - Boxplots

Corporate Id : 100000
Age Group : 11-14

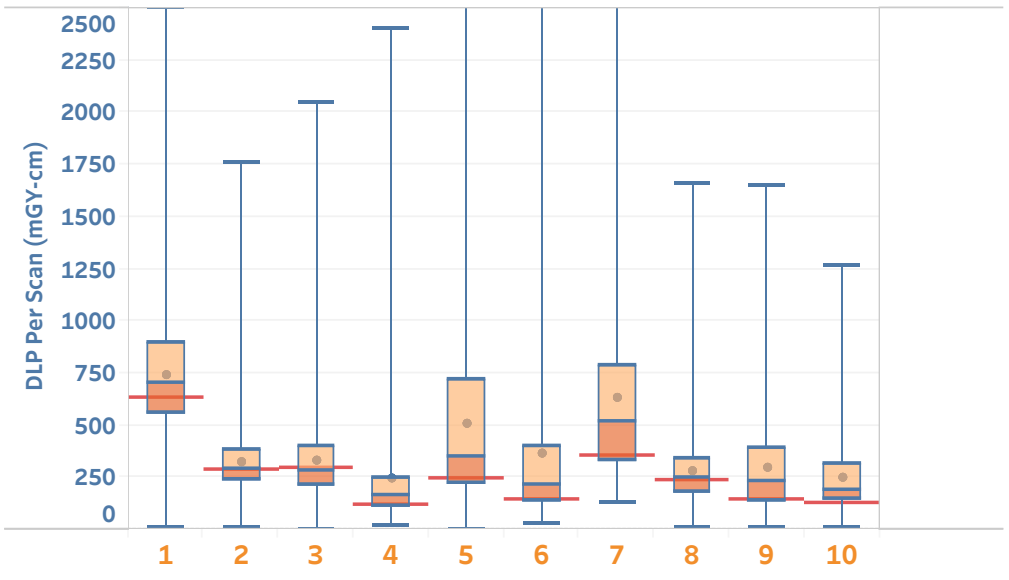
CTDIVol



— Your Facility Median

1 CT HEAD BRAIN WO IVCON
2 CT ABDOMEN PELVIS W IVCON
3 CT ABDOMEN PELVIS WO IVCON
4 CT CHEST WO IVCON
5 CT C SPINE WO IVCON
6 CT CHEST W IVCON
7 CT CHEST ABDOMEN PELVIS W IVCON
8 CT NECK W IVCON
9 CT HEAD PARANASAL SINUSES WO IVCON
10 CT LE WO IVCON

DLP



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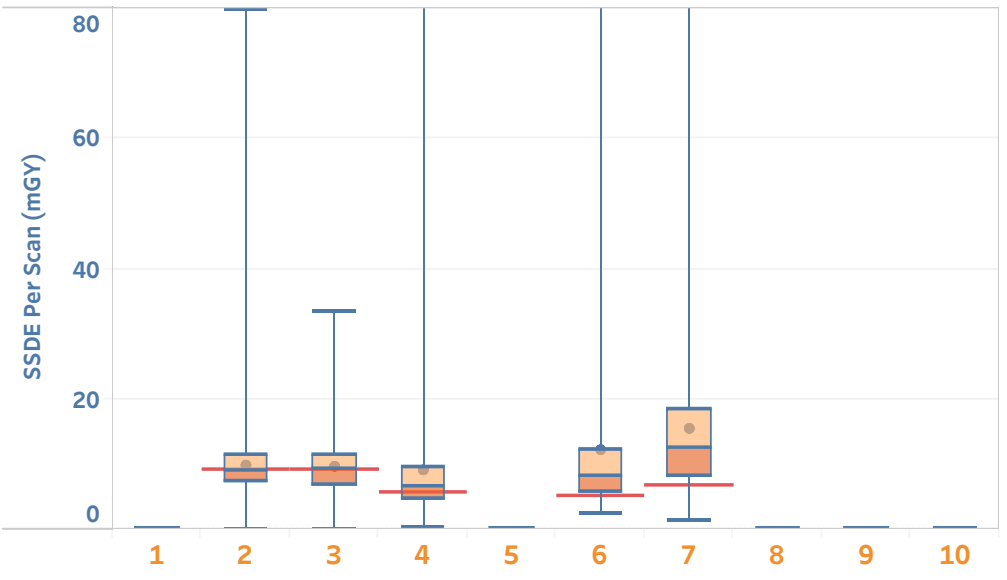
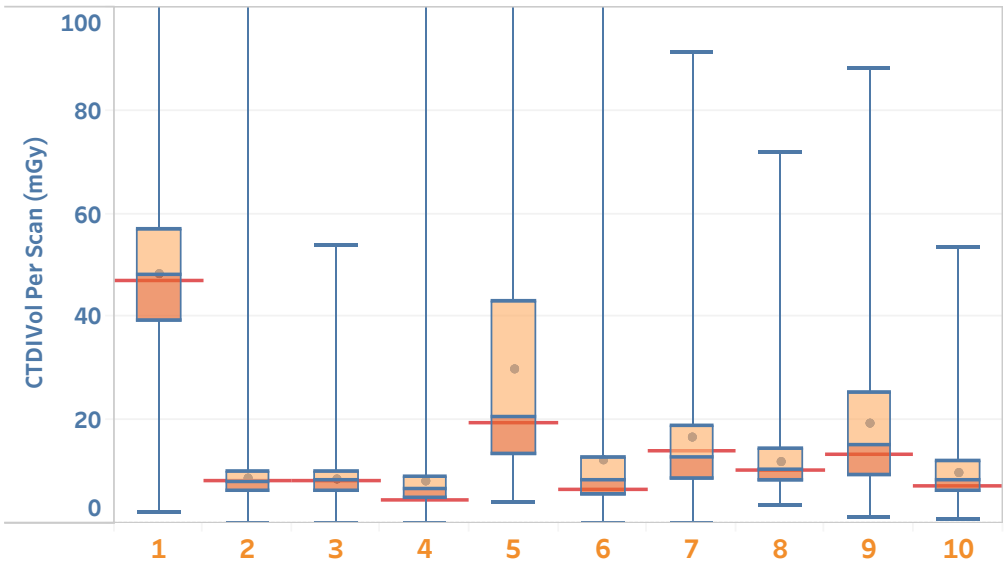


Executive Summary January thru December 2022 - Top 10 Pediatric - Boxplots

Corporate Id : 100000
Age Group : 15-18

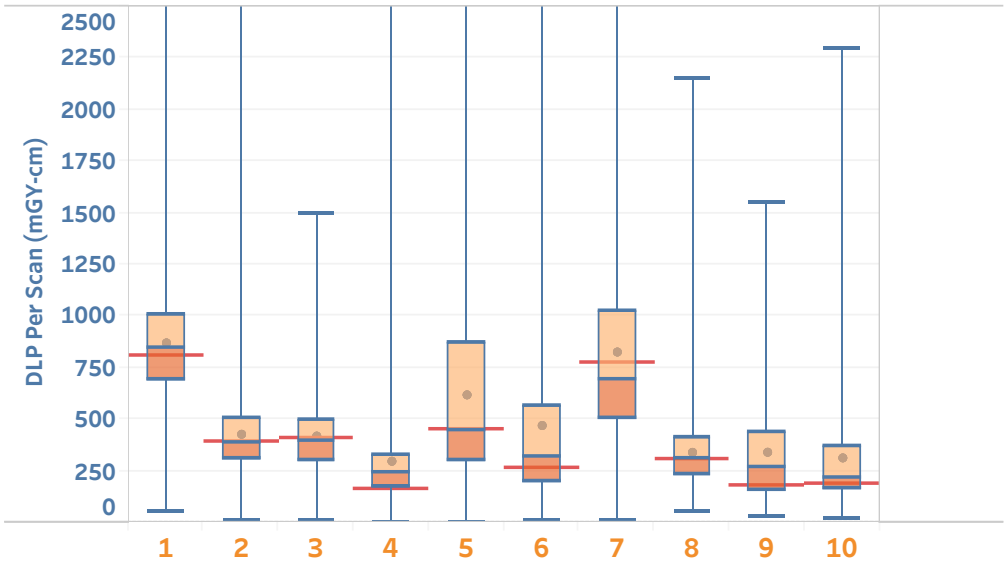
CTDIVol



— Your Facility Median

1 CT HEAD BRAIN WO IVCON
2 CT ABDOMEN PELVIS W IVCON
3 CT ABDOMEN PELVIS WO IVCON
4 CT CHEST WO IVCON
5 CT C SPINE WO IVCON
6 CT CHEST W IVCON
7 CT CHEST ABDOMEN PELVIS W IVCON
8 CT NECK W IVCON
9 CT HEAD PARANASAL SINUSES WO IVCON
10 CT LE WO IVCON

DLP



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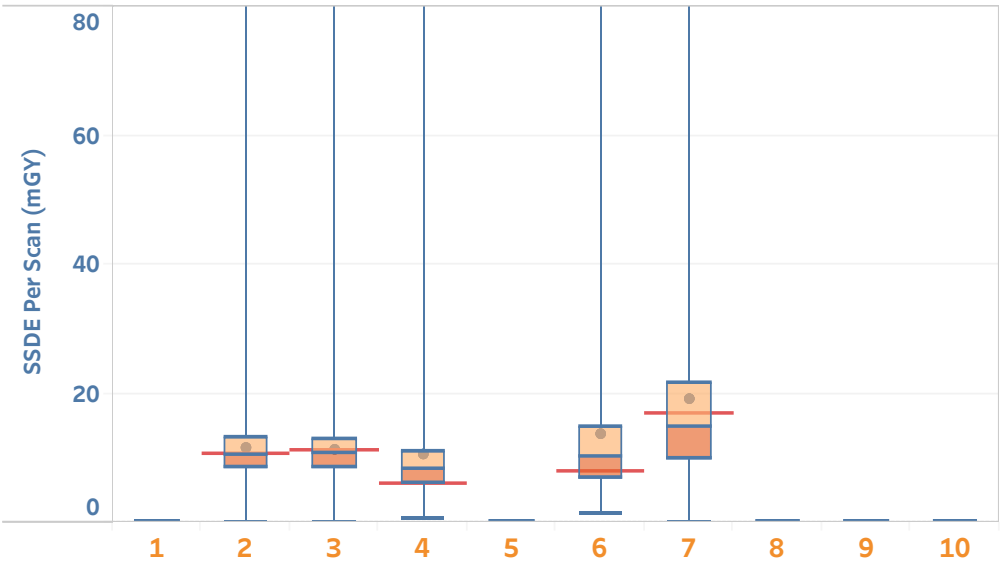

Calculating The QCDR Measures From DIR

The QCDR measures from 2018 have been combined into a single measure, detailed below.

Dose Length Product (DLP) is a standardized parameter to measure scanner radiation output to a patient and is a useful index to compare protocols across different practices and scanners.

Providing comparative data across exam types to a physician or site will help adjust imaging protocols to obtain diagnostic images using the lowest reasonable dose. While DLP itself is not a measure or estimate of actual patient radiation dose, it is closely related to doses received by patients.

The benefits of computed tomography are immense and certainly exceed the risks. However, this is only true when they are ordered appropriately and studies are optimized to obtain the best image quality with the lowest radiation dose.

	Title	Description
ACRad 34	Overall Percent of CT exams for which Dose Length Product is at or below the size-specific diagnostic reference level (weighted average for 3 CT exam types)	Weighted average of the 3 components
Component 1	Percent of CT Abdomen-Pelvis exams with contrast (single phase scan) for which Dose Length Product is at or below the size specific diagnostic reference level	Percent of CT Abdomen-Pelvis exams with contrast (single phase scan) for which Dose Length Product is at or below the size-specific diagnostic reference level. Note: Calculated at facility/TIN level and assigned to all NPIs who read CT under that TIN
Component 2	Percent of CT Chest exams without contrast (single phase scan) for which Dose Length Product is at or below the size-specific diagnostic reference level	Percent of CT Chest exams without contrast (single phase scan) for which Dose Length Product is at or below the size-specific diagnostic reference level. Note: Calculated at facility/TIN level and assigned to all NPIs who read CT under that TIN
Component 3	Percent of CT Head/Brain exams without contrast (single phase scan) for which Dose Length Product is at or below the size specific diagnostic reference level	Percent of CT Head/Brain exams without contrast (single phase scan) for which Dose Length Product is at or below the size-specific diagnostic reference level. Note: Calculated at facility/TIN level and assigned to all NPIs who read CT under that TIN

Benchmarking Methodology

QCDR measures from DIR calculate percentage of exams that are equal to or lower than the benchmark (size specific diagnostic reference level for DLP). Reports contain comparisons of each facility's score relative to other peer facilities.

For CMS reporting, physician or physician group performance is based on data across all locations at which they practice and will be benchmarked against other groups. The physician and group performance data is available in the NRDR MIPS participation portal for groups registered and enrolled in NRDR MIPS.

DIR Exam Level Benchmarking at Diagnostic Reference Levels (DRLs)

In 2017, ACR published U.S. Diagnostic Reference Levels and Achievable Doses for ten Adult CT Examinations (http://pubs.rsna.org/doi/abs/10.1148/radiol.2017161911?journalCode=radiology)

The size specific DRLs published in this paper for DLPs were used to calculate the percentage of a facility's exams that are at or below the published DRLs. The summary of the DLP DRLs from the published paper are given below for reference.

Head exams are categorized using lateral thickness from scout images submitted by facilities.
Body exams are categorized using the effective diameter that ACR calculates from scout images.

For now, if exams do not include thickness information because the facility did not submit scout images, they will be compared with the average DRL for that body part. Going forward, we intend to exclude exams for which we did not receive scout images.

DRL Tables

DRLs for Chest without IV Contrast exams, Abdomen Pelvis with IV Contrast exams

Effective diameter	Chest!DLP DRL	Abd Pelvis DLP DRL
21-25[a]	270	394
25-29	317	524
29-33	443	755
33-37	610	1056
37-41	760	1266
>=41	957	1598
All[b]	545	995

DRLs for Head Brain without IV Contrast exams

Lateral thickness	Head DLP DRL
12-14[a]	936
14-16	962
16-18	1020
18-20	1069
>=20	1192
All[b]	1011

[a]This category is used for all pediatric exams irrespective of the size. After ACR publishes the pediatric DRL paper, pediatric exams will be compared to pediatric DRLs.

[b]This category is used for adult exams where either the patient thickness was less than the smallest size category in this table or we did not receive a valid scout image to calculate patient thickness. These exams will be excluded from denominator as invalid exams.

DIR QCDR Measures

To calculate the denominator for each of the DIR QCDR measures we applied the following inclusion criteria:

1. Exams must be mapped to a RPID that corresponds to one of the three exam names used for measures
2. Exams must provide a non-zero value for both DLP and CTDIvol
3. Exams must have a DLP value greater or equal to CTDIvol
4. Exams must provide age
5. Exams must provide scout or localizer image to ACR in order for us to be able to calculate thickness

To calculate the percentage of exams that met the benchmarks for pediatric patients and for adults who had thickness below 12 cm for head or 21 cm for chest or abdomen pelvis we used the DRLs for the smallest category as shown below.

QCDR Measure	Thickness	DLP DRL
Abdomen/Pelvis	21-25	394
Chest	21-25	270
Head/Brain	12-14	936

MIPS Quality Measure Decile Scoring

For MIPS Quality Category scoring, CMS uses decile benchmarks (1-10) to compare physicians or groups to peers in order to assign a score for each reported measure.

For this DIR QCDR measure preview report, we created aggregate registry level decile benchmarks.

Your facility performance scores are ranked against the registry level decile benchmarks and assigned the associated decile rank.

As the DIR QCDR measures is proportional, higher percentages equal higher deciles and measure scores.

DIR QCDR Measure Preview - Your Facility (All Patients)

DIR QCDR Measure Preview - Your Facility (Pediatric Patients)

For patients age 18 or under we used the DLP DRL of the smallest size range of a body part to calculate the measure.
If the DLP used for a pediatric patient was greater than the DRL for the smallest-sized adult for a body part, that exam did not meet the performance benchmark.
In this table we show the percentage of pediatric exams that met the performance benchmark.
If the percentage in this category is very low, we recommend that you review your pediatric protocols with your medical physicist and/or radiologist.

[1]Denominator: Total number of exams that were mapped to one of the 3 exam names, had a non-zero DLP and a non-zero CTDIvol, CTDIvol<DLP and age was not missing
[2]Numerator: Total number of exams among the denominator that are at or below the size specific DRL
[3]Percentage at or below DRL: (Numerator/Denominator)*100

Maintenance of Certification (MOC): Practice Quality Improvement (PQI)

With the implementation of Continuous Certification and its annual look-back approach, diplomates must have completed at least one PQI Project or Participatory Quality Improvement Activity in the previous three years at each annual look-back.

A PQI Project or Activity may be conducted repeatedly or continuously to meet PQI requirements.
(https://www.theabr.org/diagnostic-radiology/maintenance-of-certification)

We are pleased to announce that our registries have been approved by the American Board of Radiology for fulfilling MOC Part IV requirements.

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Download your marketing toolkit today.

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