

What's NEXT?

The Nationwide Evaluation of X-ray Trends (NEXT) is a national program conducted to characterize the radiation doses patients receive and to document the state of the practice of diagnostic radiology. This program is a collaborative effort of the Conference of Radiation Control Program Directors (CRCPD), an association of state and local radiation control agencies, and the Food and Drug Administration (FDA) Center for Devices and Radiological Health (CDRH), with financial assistance from the American College of Radiology (ACR).

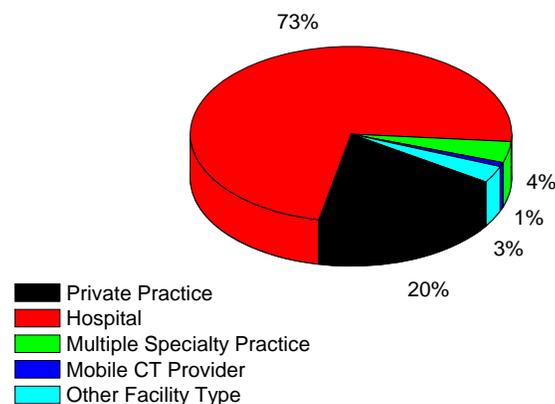
Each survey cycle, the Nationwide Evaluation of X-ray Trends (NEXT) program selects a particular radiological examination for study. A NEXT survey captures radiation exposure data from a nationally representative sample of U.S. clinical facilities. Facilities are randomly selected for voluntary participation, and site visits are performed by trained surveyors from the participating states' radiation control agencies.

During 2005 and through 2006, a NEXT survey was conducted of facilities that perform computed tomography (CT). The survey captured data regarding aspects of clinical practice, CT scanner characteristics, equipment features, and scanner radiation output measurements for estimation of patient dose. Surveyed facilities were also asked to complete a questionnaire detailing their CT scanning protocols for a number of routinely done examinations.

This brochure provides a summary of findings for a subset of surveyed facilities. A more complete statistical summary of the full sample set is in preparation, and the original, unedited dataset is available at <http://www.fda.gov/AboutFDA/CentersOffices/OfficeofMedicalProductsandTobacco/CDRH/CDRHTransparency/ucm202868.htm>. Further information on NEXT surveys is available from the CRCPD (<http://www.crcpd.org/Pubs/NEXT.aspx>) or from the Food and Drug Administration (<http://www.fda.gov/Radiation-EmittingProducts/RadiationSafety/NationwideEvaluationofX-RayTrendsNEXT/default.htm>); david.spelic@fda.hhs.gov.

The survey results contained herein are informational. The use of the information is at the discretion and risk of the reader. The mention of commercial products, their sources, or their use in connection with material reported is not to be construed as either an actual or implicit endorsement by CRCPD or FDA/CDRH.

Types of Facilities Comprising the Random Sample



74% of surveyed non-hospital sites were radiology practices. The remaining 26% provided CT services in conjunction with other medical services (e.g., oncology practice).

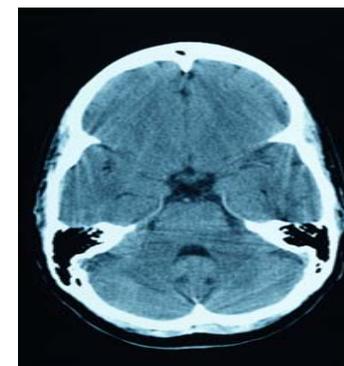
Weekly CT Exam Workload for Surveyed CT Unit

Facility Type	Weekly Exam Workload	
	Adult	Pediatric
Private Practice	62	2
Hospital	170	11
Multiple Specialty Practice	81	4
Mobile / Other	47	1

Average number of CT units per facility: private practice 1.1; hospital 1.8; multiple specialty practice 1.2, mobile 1.0.

Nationwide Evaluation of X-Ray Trends

Computed Tomography 2005 – 06 Preliminary Summary



Conference of Radiation Control Program Directors, Inc.

and the

U.S. Department of Health and Human Services
Food and Drug Administration

With financial assistance from the
American College of Radiology

Statistics are provided for a subset (N=40) of surveyed sites. These values are preliminary findings pending publication of final values for the entire surveyed population. Values for CTDI_{vol}, CTDI_{free-in-air}, dose-length product (DLP), and effective dose were calculated for the surveyed CT scanner, typically the most frequently used one. Facilities also completed a questionnaire that gathered additional information about adult and pediatric scan protocols. For CT systems that routinely employ an automatic-exposure control feature, the product, tube current - gantry rotation time (mAs) is an estimate for the average mAs over the course of the CT scanning sequence.

Survey Parameter	Adult Head	Adult Abdm + Pelvis	Ped Head (5 Yr)	Ped Abdm + Pelvis (5 Yr)
	25 th / median / 75 th			
CT scanner weekly exam workload	12 / 30 / 69	11 / 25 / 74	1 / 2 / 3.5	1 / 2 / 2
Selected kVp	120 / 120 / 140	120 / 120 / 120	120 / 120 / 120	120 / 120 / 120
Tube current- time product (mAs)	300 / 340 / 400	178 / 223 / 303	126 / 184 / 240	74 / 95 / 135
Gantry rotation time (seconds)	1.0 / 1.5 / 2.0	0.5 / 0.75 / 1.0	0.8 / 0.9 / 1.0	0.5 / 0.5 / 0.9
Acquisition slice thickness (mm)	2.5 / 4.5 / 5.0	1.5 / 2.8 / 5.0	2.3 / 4.1 / 5.0	1.1 / 1.5 / 5.0
Pitch*	1.0 / 1.0 / 1.0	0.9 / 1.0 / 1.4	1.0 / 1.0 / 1.0	1.0 / 1.0 / 1.4
Percentage of exams with 2 phases	3 / 10 / 23	5 / 10 / 30	0.0 / 0.0 / 0.04	0.0 / 0.0 / 0.3
CTDI _{free-in-air} (mGy)	69 / 88 / 103	35 / 53 / 75	34 / 47 / 58	21 / 26 / 32
CTDI _{vol} (mGy)	55 / 64 / 80	12 / 18 / 24	24 / 31 / 40	12 / 15 / 21
DLP (mGy-cm)	782 / 894 / 1145	426 / 660 / 904	300 / 383 / 499	299 / 382 / 543
Effective dose (mSv)	2.1 / 2.5 / 3.0	8.9 / 11.8 / 20.6	**	**

* For exams of the head, axial rather than helical scanning was predominantly used. In this case "pitch" was evaluated from the ratio of the patient-table increment per rotation to the overall width ($N \times T$) along the axis of rotation of the multiple (N) tomographic sections of acquisition thickness (T) simultaneously acquired per rotation.

** Insufficient data.

Annual Workload Projections

	Hospitals	Sites other than Hospitals
Number of sites with at least one CT unit	4707	3253
Average facility no. of adult exams per week	258.0	59.8
Average facility no. of pediatric exams per week	16.7	3.67
Total U.S. annual CT exam workload (millions):		
Adult	63.2	10.1
Pediatric	4.1	0.62
All CT exams (millions)	78.0	

Use the space below to enter your facility's values for the CT scanner frequently used to perform the indicated exams

	Adult Head	Adult Abdm+Pelvis	Pediatric (5 yr) Head	Pediatric (5 yr) abdm+pelvis
CT scanner / room no.				
Exams per week				
kVp				
mAs				
Pitch				
CTDI _{vol} (mGy)				
CTDI _{free-air} (mGy)				
DLP (mGy-cm)				
Percentage w/ two phases				