

Survey scope and structure

The U.S. Food and Drug Administration Center for Devices and Radiological Health (CDRH) collaborates with the Conference of Radiation Control Program Directors (CRCPD) in a unique federal-state partnership to characterize the radiation doses patients receive and to document the state of the practice of diagnostic radiology. Every few years the Nationwide Evaluation of X-Ray Trends (NEXT) survey program selects a particular radiological examination for study and captures radiation exposure data from a nationally representative sample of U.S. clinical facilities. In 2018-2019 a survey of chiropractic facilities that perform routine radiographic exams was conducted, capturing data from 184 randomly identified clinical facilities in 26 states. The surveys were performed by personnel from the radiation control agencies of participating states.

The survey consists of three components:

1. The Facility Questionnaire. This section is dedicated to the general facility practice, equipment types, radiation safety procedures, training of personnel, quality assurance and quality control practices.
2. The Survey Protocol. Trained NEXT surveyors collected data on equipment type, patient workload and type of performed procedures, and exposure techniques. The X-ray equipment was classified as digital radiography (DR), film/screen (F) or computed radiography (CR), depending on the detector type. Data was collected for adults, bariatric patients, and pediatrics.
3. The Patient Log Form. Data was collected for clinical exams performed at the facility, with details on each patient type and the technique factors used. The data captured in this section was used to calculate the average X-ray exposure for typical chiropractic examinations.

Data for your facility

The charts below, with values drawn from the NEXT survey of chiropractic facilities, can be used to compare your facility's practice with that of the US-representative survey sample for the X-ray **lumbar spine exam**. Almost all surveyed sites (99%) performed lumbar spine examinations with the patient positioned upright. The following survey results (separated by adult patients and children) are NOT recommended reference levels, but rather are statistical indicators of the state of chiropractic (for lumbar spine examination) at the time of survey.

Survey median values		
	Your Value	ADULTS
Source-to-Image (cm)		102
Exposure Time (ms) *		222
Tube Current (mA)		200
Clinical KVp		80

* For bariatric adults, survey data indicates an increase in exposure time to 365 ms (median value).

Survey median values		
	Your Value	CHILDREN
Source-to-Image (cm)		102
Exposure Time (ms)		100
Tube Current (mA)		200
Clinical KVp		72

In the table above, children are defined as patients 12 years of age or younger.

Nationwide Evaluation of X-Ray Trends

2018 - 2019 Survey of Chiropractic facilities



Conference of Radiation Control Program Directors

and

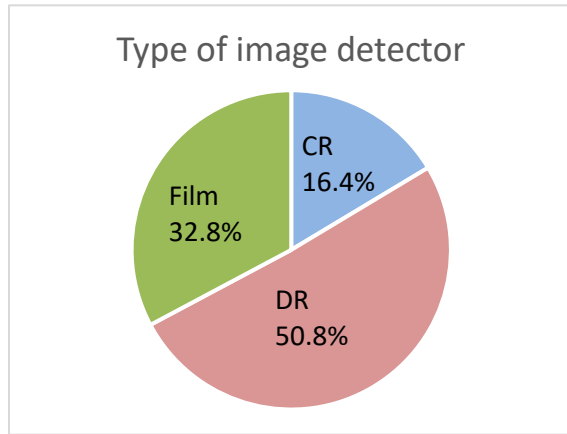
The Center for Devices and Radiological Health

U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES

Public Health Service
Food and Drug Administration

The Chiropractic Facility

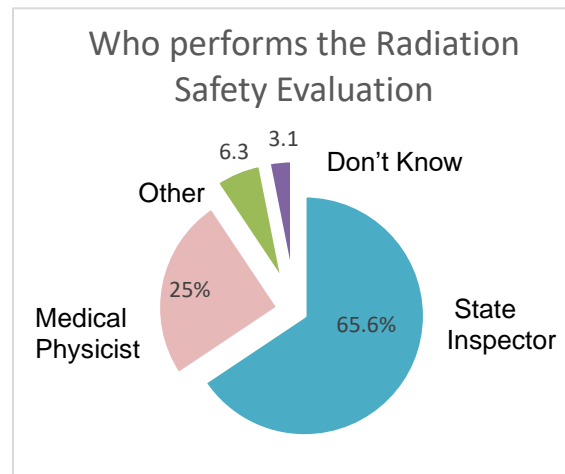
A total of 184 chiropractic facilities were surveyed in 2018-2019. Half of them used digital detectors for image acquisition (DR), and one-third employed film/screen technology (F). The remaining 16% used computed radiography (CR).



A typical chiropractic facility in the United States is equipped with 1 X-ray system intended for general radiography. Fluoroscopic imaging is usually not supported. On a weekly basis, the facility typically sees 100 adult patients and 6 children (median values). Each week, a total of six X-ray examinations are performed (three exams of the cervical spine and three of the lumbar spine). The X-ray exam of the cervical spine consists of two images (median value). For the lumbar spine, two images are usually taken, with the patient positioned upright. Although half of the surveyed X-ray units are less than 20 years old, the oldest encountered systems were installed dating back to 1970's. For the surveyed 94 facilities that still use film, the most popular brand is Fuji. The film processor mostly used is Konica, and the chemistry is typically refreshed every 4-6 weeks, depending on workload.

Radiation Safety and Quality Control

Most surveyed chiropractic offices indicated they adhere to aspect of good radiological health practice. Only very few sites (4.4%) acknowledged that a radiation safety survey was never performed or is past due. Radiation safety of the chiropractic site is usually evaluated by the state inspector or by a medical physicist.



The survey of 184 chiropractic sites indicated that most facility personnel who operate the X-ray system (85%) have radiation safety training, however only one-third of them wear a radiation monitor (badge). Seventy percent of personnel declared that they wear protective equipment, such as a lead apron. Only four surveyed chiropractic sites were keeping documented quality control procedures for their X-ray system. The vast majority of facilities rely on contracted X-ray specialists for a complete quality control. When a chiropractic X-ray system is inspected, image quality and patient doses are usually not evaluated.

Dosimetry

The surveyed sites were asked to complete and return the Patient Log form, describing clinical X-ray procedures for different patient types, along with the technique factors used. The majority of the chiropractic facilities provided the Patient Log data. These clinical exam data, combined with exposure measurements performed by the surveyors, were used to infer per-patient estimates for X-ray Air Kerma and derive the below provided exposure values.

X-ray Examination (adult patients)	Patient Exposure (mGy)
Cervical spine A/P	Median = 0.98 Mean = 1.16
Cervical spine lateral	Median = 0.79 Mean = 1.28
Lumbar spine A/P	Median = 2.98 Mean = 4.21
Lumbar spine lateral	Median = 8.60 Mean = 12.35
Thoracic spine A/P	Median = 2.13 Mean = 2.53
Thoracic spine lateral	Median = 4.94 Mean = 6.39

The information contained herein is for guidance. 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 implied endorsement by CRCPD or CDRH.

More information on the NEXT surveys is available from CRCPD (www.crcpd.org) or from the Food and Drug Administration (301-796-6631).