



**ANNUAL X-RAY INSPECTION REPORT 2010
RADIOLOGICAL HEALTH**

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EXECUTIVE SUMMARY

A total of 80 x-ray facilities were inspected in 2009. Out of the 80 facilities 34 were in full compliance at the time of the inspection.

The main areas of concern are the darkroom, changing viewbox light bulbs on a regular basis, satisfactory lead aprons, and screen cleaning. Chiropractic facilities need to record the technique factors for each patient (in their file or in a logbook) and perform the repeat rate analysis. Dental facilities need to keep watch on the kVp of their x-ray machines.

Annual dose rates to all operators of x-ray equipment of the facilities inspected were less than the maximum allowed limit of 5000 millirem. Annual dose rates to the public were less than the maximum allowed limit of 100 millirem except for one facility.

The entrance skin exposure to the patient was within the appropriate limit for all facilities.

The dose to the patient and the dose to the operator are decreased for all x-ray facilities that use faster speed film. This can be observed most clearly for the dental facilities. As the speed of the film increases from "D" to "F" the average dose per exposure decreases from 0.45 to 0.26 millirem. It should also be noted that the use of digital x-ray again decreases the average dose per exposure from 0.26 millirem for "F" speed film to 0.13 millirem for direct digital x-rays. Doses from computed radiography (CR) are similar to doses from F speed film (0.21 and 0.26 millirem, respectively).

It is expected that as more digital x-rays are used we will see decreases in the total facility noncompliances because darkrooms, safelights, film, and processing are no longer needed. Forty percent of dental, 17% of veterinary, 30% of medical, and 8% of chiropractic facilities are using digital x-ray.

OVERVIEW

To be conservative, exposures to the operator and public are measured at the configuration of highest exposure possible. Exposure to the public is performed by aiming the x-ray tube out of the exam room door from approximately the patient position for an x-ray exam and measuring the exposure at the doorway where the public passes by in the hall. Operator exposures are measured at the position the operator stands when making the exposure as indicated by the facility.

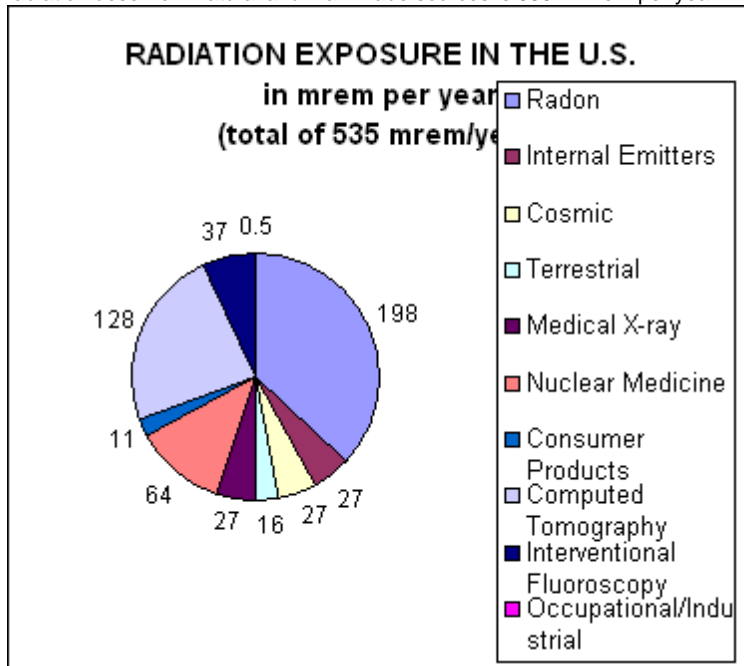
Operator and public exposures are measured in milliroentgen per hour using a Victoreen 471 ion chamber. The exposure per hour is converted to annual dose by converting hours to year and milliroentgen to rem using the number of x-rays the facility takes within a given period of time. 1 milliroentgen is equal 0.5 millirem (American National Standard Institute 6.1.1-1991) for whole body exposure from scattered radiation for the public and operators.

Patient exposures are measured in milliroentgen using an Unfors Xi. Patient exposures are converted from milliroentgen to millirem using the following factors based on the organ of greatest risk. Multiplication of the factor by the number of milliroentgen per exam results in the dose in millirem.

EXAM TYPE	FACTOR	ORGAN
Dental	0.0015	brain
PA Chest	0.1044	lung
AP Cervical Spine	0.0435	thyroid
AP Thoracic Spine	0.1044	lung
AP Lumbar Spine	0.1044	stomach/colon
AP Abdomen	0.1044	stomach/colon
AP Retrograde	0.1044	stomach/colon
Lateral Skull	0.0218	brain
Hand	0.0087	skin
Wrist	0.0087	skin
Arm	0.1044	bone marrow
Shoulder	0.1044	bone marrow
Leg	0.1044	bone marrow
Knee	0.1044	bone marrow
Ankle	0.0087	skin
DP Foot	0.0087	skin
Lateral Foot	0.0087	skin

Adapted from National Council on Radiation Protection and Measurements Report No. 116 tissue weighting factors and conversion factor from roentgen to rad of 0.87 rad/roentgen.

The average radiation dose from natural and man-made sources is 535 millirem per year.



Adapted from NCRP Report No. 160, 2009, Ionizing Radiation Exposure of the Population of the United States.

INSPECTION ITEMS

The following boxed sections indicate the individual items that are specifically looked at during an inspection for the following general groups: film/screen, processing, darkroom/safelight, personnel monitoring, patient shielding, collimation, timer, kVp and filtration, patient entrance skin exposure criteria, public exposure criteria, operator conditions, and physical condition (x-ray unit, shielding, etc.)

Some inspection items may pertain only to specific types of facilities. For example, repeat rate analyses pertain only to chiropractic facilities, whereas panoramic units pertain only to dental facilities. There are also inspection items that cover all facilities (e.g., registration of all x-ray units).

New facilities are not cited for non-compliant items. However, they are given a period of approximately one month to correct any non-compliant items found in the initial inspection.

Film/screen	Dental film is less than E speed Panoramic and cephalometric film speed is less than 400 Film is not protected from scatter radiation Film is not stored properly Film is exposed to chemicals Out of date film is used Film and screen types not matched No screen installation date is on outside of cassette Screen and cassettes are not of the same type or age Screen cleaning interval is inadequate Screen cleaning solution is not manufacturer recommended Cassette check is inadequate Film viewbox is not available Film viewbox is not cleaned periodically Viewbox bulbs are not of the same type Viewbox bulbs are not replaced annually Technique factors are not recorded in the patient log book Left/right markers are not used on clinical radiographs Clinical radiographs are not properly identified
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<p>Processing</p>	<p>Thermometer is not available for manual processing Timer is not available for manual processing Floating cover is not present for manual processing Sight devevelopment is used No evidence of daily log is kept Developing technique recommended by the manufacturer is not used Developer and fixer temperature are not maintained in limits Processor cleaning interval is inadequate Processor is not operating properly Clean-up film for panoramic and cephalometric films are not run</p>
<p>Darkroom/Safelight</p>	<p>Safelight bulb is greater than 15 W Safelight is too close to the work area Light leaks are detected in the safelight housing Light leaks are detected in the safelight lens Safelight is improperly filtered Darkroom is not light tight Darkroom is not free of dust and dirt Darkroom or daylight processor fog test results are unacceptable Daylight processor is not light tight</p>
<p>Personnel Monitoring</p>	<p>Personnel monitoring devices are required Control dosimeters are not properly used or stored Employee dosimeters are not properly used Employee dosimeters are not properly stored No evidence of employee review of records Personnel monitoring records are incomplete No radiation safety officer is designated for large practices Evidence of personnel holding film during exposure</p>
<p>Patient Shielding</p>	<p>Satisfactory lead aprons are unavailable Satisfactory thyroid shields are unavailable Satisfactory gonadal shields are unavailable Lead aprons are improperly stored Lead aprons are not checked annually for tears and holes Individuals holding patients are not protected Non-essential individuals are in the x-ray room during exposure</p>
<p>Collimation</p>	<p>X-ray beam is not restricted to the appropriate area X-ray beam is not restricted to the appropriate size Collimation is not used in taking radiographs Collimator light is not bright enough under normal room lighting Collimator light problems (e.g. mirror broken, mirror obstructed) Inadequate collimation is used for clinical radiographs</p>

Timer	Timer does not terminate exposure Timer activates at zero Timer is inaccurate Timer repeatability is unacceptable No deadman switch is available																																																																										
kVp and Filtration	kVp is greater than 10% of set value kVp is non-repeatable Filtration in beam is less than required																																																																										
Patient entrance skin exposure criteria	ESEC in milliroentgen for non-specialty radiographic examinations shall not be exceeded when technical factors for an average adult patient are utilized: <table border="1"> <thead> <tr> <th>Examination</th> <th>ESEC mR maximum</th> <th>ESEC mR recommended</th> <th>Body part thickness (cm)</th> </tr> </thead> <tbody> <tr> <td>PA Chest</td> <td>30</td> <td>15</td> <td>23</td> </tr> <tr> <td>AP Cervical Spine</td> <td>250</td> <td>175</td> <td>13</td> </tr> <tr> <td>AP Thoracic Spine</td> <td>900</td> <td>600</td> <td>23</td> </tr> <tr> <td>AP Lumbar Spine</td> <td>1000</td> <td>675</td> <td>23</td> </tr> <tr> <td>AP Abdomen</td> <td>750</td> <td>500</td> <td>23</td> </tr> <tr> <td>AP Retrograde Pyelogram</td> <td>900</td> <td>600</td> <td>23</td> </tr> <tr> <td>Lateral Skull</td> <td>300</td> <td>200</td> <td>15</td> </tr> <tr> <td>Dental (bitewing or periapical)</td> <td>700</td> <td>350</td> <td>not applicable</td> </tr> </tbody> </table> <p style="text-align: center;">OR</p> <table border="1"> <thead> <tr> <th>Examination</th> <th>Dose mrem maximum</th> <th>Dose mrem recommended</th> <th>Body part thickness (cm)</th> </tr> </thead> <tbody> <tr> <td>PA Chest</td> <td>3.13</td> <td>1.57</td> <td>23</td> </tr> <tr> <td>AP Cervical Spine</td> <td>10.88</td> <td>7.61</td> <td>13</td> </tr> <tr> <td>AP Thoracic Spine</td> <td>93.96</td> <td>62.64</td> <td>23</td> </tr> <tr> <td>AP Lumbar Spine</td> <td>104.4</td> <td>70.47</td> <td>23</td> </tr> <tr> <td>AP Abdomen</td> <td>78.3</td> <td>52.2</td> <td>23</td> </tr> <tr> <td>AP Retrograde Pyelogram</td> <td>93.96</td> <td>62.64</td> <td>23</td> </tr> <tr> <td>Lateral Skull</td> <td>6.54</td> <td>4.36</td> <td>15</td> </tr> <tr> <td>Dental (bitewing or periapical)</td> <td>1.05</td> <td>0.53</td> <td>not applicable</td> </tr> </tbody> </table> <p> ESE for all x-ray units in facility are not within 20 percent of one another. Exposure reproducibility is greater than 5% </p>			Examination	ESEC mR maximum	ESEC mR recommended	Body part thickness (cm)	PA Chest	30	15	23	AP Cervical Spine	250	175	13	AP Thoracic Spine	900	600	23	AP Lumbar Spine	1000	675	23	AP Abdomen	750	500	23	AP Retrograde Pyelogram	900	600	23	Lateral Skull	300	200	15	Dental (bitewing or periapical)	700	350	not applicable	Examination	Dose mrem maximum	Dose mrem recommended	Body part thickness (cm)	PA Chest	3.13	1.57	23	AP Cervical Spine	10.88	7.61	13	AP Thoracic Spine	93.96	62.64	23	AP Lumbar Spine	104.4	70.47	23	AP Abdomen	78.3	52.2	23	AP Retrograde Pyelogram	93.96	62.64	23	Lateral Skull	6.54	4.36	15	Dental (bitewing or periapical)	1.05	0.53	not applicable
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Public exposure	Public exposure exceeded - 100 millirem per year Public is not protected from scatter radiation																																																																										

Operator conditions	<p>Operator exposure exceeded - 5000 millirem per year</p> <p>Operator cannot observe patient during exposure</p> <p>Operator cannot monitor kVp, mA, time, mAs during exposure</p> <p>Operator is not protected during exposure</p> <p>Satisfactory lead gloves are not available</p> <p>Mobile or stationary exposure switch cord is less than 6 feet long</p> <p>Operator holds film in patient's mouth</p>
Physical condition (x-ray unit, shielding, etc)	<p>Console does not indicate tubes for multiple setup</p> <p>Panoramic unit does not reset before restarting</p> <p>Motion of panoramic unit is not smooth or is impeded</p> <p>X-ray tube head locks into position for panoramic and/or cephalometric unit</p> <p>Filters for soft tissue imaging for cephalometric imaging are not available</p> <p>Focal spot is not indicated on the x-ray tube</p> <p>Source to image distance is less than 7 7/8 inches</p> <p>Tube head is unstable</p> <p>Angulation indicator on x-ray unit is not functioning</p> <p>Typical exposure for x-ray unit is not posted</p> <p>Structural shielding is inadequate</p> <p>Door interlock system is not functioning</p> <p>Condition of high voltage and other cables is inadequate</p> <p>X-ray head leaks oil</p> <p>Wires are exposed on tube head</p> <p>X-ray exposure button is missing or broken</p> <p>Wires are exposed on exposure switch</p> <p>Preventive maintenance records for x-ray machines and processor are not kept</p> <p>Bare sheet lead on walls/doors is not covered</p>
X-ray unit is not registered	
Vermont State licenses are not displayed	
No documentation of LMP (chiropractic)	
Repeat rate analysis is not performed	

SUMMARY OF ALL INSPECTIONS

Total Number of Inspections Performed

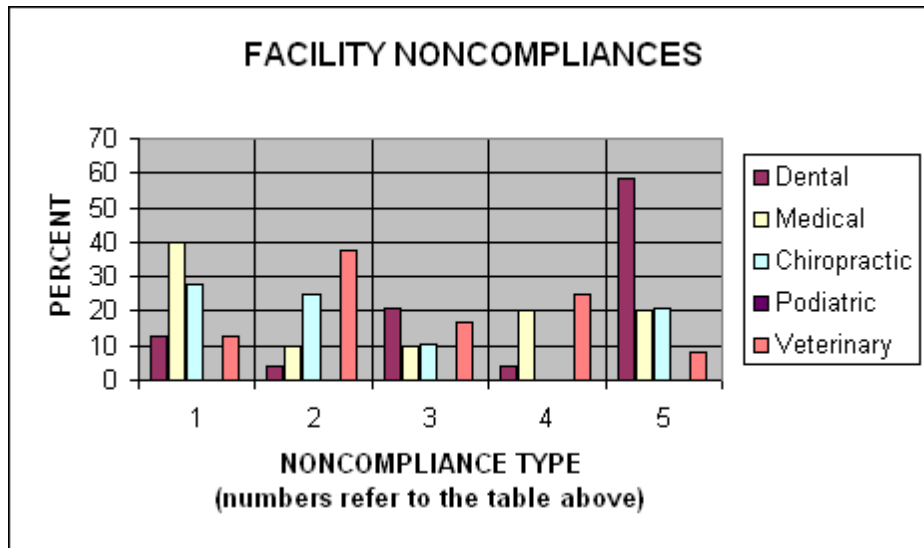
80

Total Number of Non-compliance Items

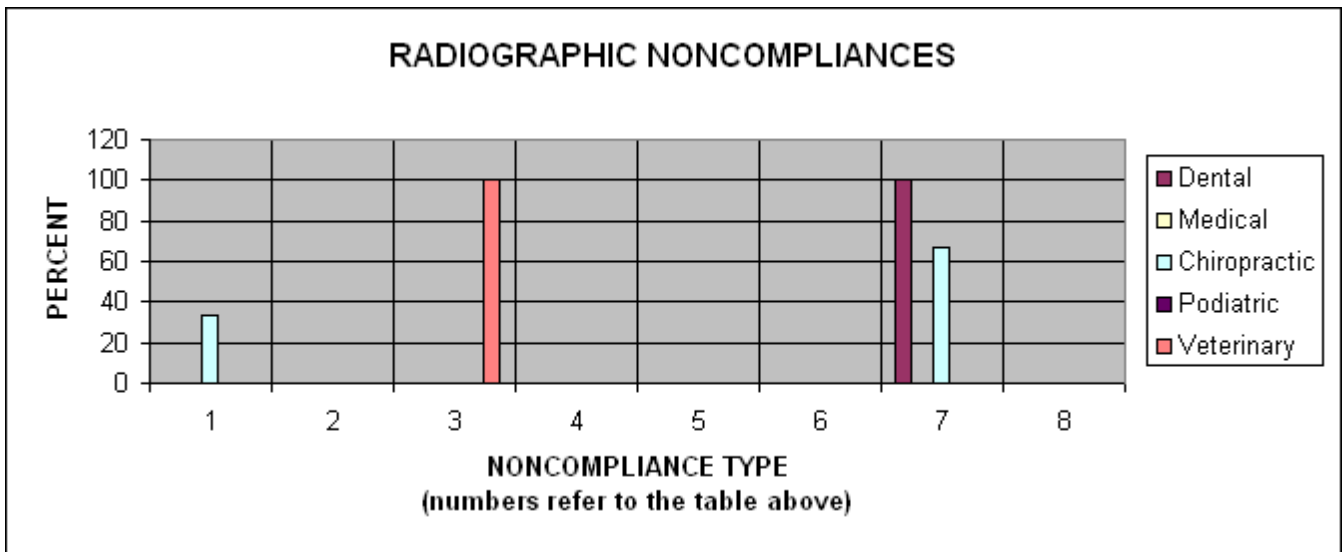
134

TOTAL NONCOMPLIANCES	134
Average number noncompliances per facility	1.7
Range of number of noncompliances/facility	0 - 9

TOTAL FACILITY NONCOMPLIANCES		PERCENTAGE OF TOTAL FACILITY NONCOMPLIANCES
1 Film/Screen	29	23.0
2 Processing	28	22.2
3 Darkroom/Safelight	17	13.5
4 Personnel Monitoring	9	7.1
5 Patient Shielding	32	25.4
6 License Not Displayed	0	0.0
7 Repeat Analysis Not Performed	11	8.7



TOTAL RADIOGRAPHIC NONCOMPLIANCES	8	PERCENTAGE OF TOTAL RADIOGRAPHIC NONCOMPLIANCES
1 Collimation	1	12.5
2 Timer	0	0.0
3 kVp & Filtration	2	25.0
4 Patient entrance skin exposure	0	0.0
5 Public exposure	0	0.0
6 Operator conditions	0	0.0
7 Physical condition (x-ray unit, shielding)	5	62.5
8 Unit not registered	0	0.0



Annual Dose to Occupational Worker		
Type of Facility	Average millirem per year	Range millirem per year
Dental	3.1	0.004 - 77
Medical	0.18	0.001 - 0.26
Chiropractic	0.05	0.001 - 0.69
Podiatric	na	na
Veterinary	0.07	0.005 - 0.45

Annual Dose to Public		
Type of Facility	Average millirem per year	Range millirem per year
Dental	7.2	0.022 - 66
Medical	2.9	0.0003 - 1.87
Chiropractic	0.24	0.0024 - 1.87
Podiatric	na	na
Veterinary	0.04	0.001 - 0.22

DENTAL INSPECTIONS

Total Number of Inspections Performed

38

Non-compliance Items

TOTAL NONCOMPLIANCES	27
Average number noncompliances per facility	1
Range of number of noncompliances	0-4

TOTAL FACILITY NONCOMPLIANCES	24	PERCENTAGE OF TOTAL FACILITY NONCOMPLIANCES
Film/Screen	3	12.5
Processing	1	4.2
Darkroom/Safelight	5	20.8
Personnel Monitoring	1	4.2
Patient Shielding	14	58.3

TOTAL RADIOGRAPHIC NONCOMPLIANCES	3	PERCENTAGE OF TOTAL RADIOGRAPHIC NONCOMPLIANCES
Collimation	0	0
Timer	0	0
kVp & Filtration	0	0
Patient entrance skin exposure	0	0
Public exposure	0	0
Operator conditions	0	0
Physical condition (x-ray unit, shielding)	3	100
Unit not registered	0	0

Dose to Patients Per Exposure

Exam Type	Average millirem per exposure	Range millirem per exposure
Intra-oral D speed film	0.45	0.25 - 0.73
Intra-oral E speed film	na	na
Intra-oral F speed film	0.26	0.13 - 0.41
Intra-oral Portable digital	0.18	0.11 - 0.36
Intra-oral CR digital	0.21	0.21
Intra-oral DR digital	0.13	0.07 - 0.26
Panoramic film	0.88	0.69 - 1.48
Panoramic digital	0.81	0.23 - 1.35
Cephalometric	0.042	na
Cephalometric digital	0.07	na
Cephalometric scanner	0.43	na
iCAT	1.5	na

Annual Dose to Occupational Worker

Exam Type	Average millirem per year	Range millirem per year
Intra-oral D speed film	4.85	0.013 - 25.8
Intra-oral E speed film	na	na
Intra-oral F speed film	3.3	0.004 - 77
Intra-oral Portable digital	0.99	0.15 - 3.5
Intra-oral CR digital	na	na
Intra-oral DR digital	2	0.006 - 32
Panoramic film	0.3	0.05 - 0.69
Panoramic digital	2.2	0.06 - 14.6
Cephalometric	na	na
Cephalometric digital	na	na
Cephalometric scanner	na	na
iCAT	na	na

Annual Dose to Public

Exam Type	Average millirem per year	Range millirem per year
Intra-oral D speed film	16.4	0.52 - 66
Intra-oral E speed film	na	na
Intra-oral F speed film	9	0.18 - 26.2
Intra-oral Portable CR digital	na	na
Intra-oral CR digital	na	na
Intra-oral DR digital	4.7	0.022 - 49.6
Panoramic film	0.9	0.13 - 1.39
Panoramic digital	7.7	0.29 - 40.4
Cephalometric	na	na
Cephalometric digital	na	na
Cephalometric scanner	na	na
iCAT	na	na

MEDICAL INSPECTIONS

Total Number of Inspections Performed

9

Non-compliance Items

TOTAL NONCOMPLIANCES	10
Average number noncompliances per facility	1
Range of number of noncompliances	0-4

TOTAL FACILITY NONCOMPLIANCES	10	PERCENTAGE OF TOTAL FACILITY NONCOMPLIANCES
Film/Screen	4	40
Processing	1	10
Darkroom/Safelight	1	10
Personnel Monitoring	2	20
Patient Shielding	2	20

TOTAL RADIOGRAPHIC NONCOMPLIANCES	0	PERCENTAGE OF TOTAL RADIOGRAPHIC NONCOMPLIANCES
Collimation	0	0
Timer	0	0
kVp & Filtration	0	0
Patient entrance skin exposure	0	0
Public exposure	0	0
Operator conditions	0	0
Physical condition (x-ray unit, shielding)	0	0
Unit not registered	0	0

Dose to Patients Per Exposure

Type of Exam	Average millirem per exposure	Range millirem per exposure
PA Chest	1.72	0.88 - 2.4
AP Cervical Spine	5.56	4.55 - 6.57
AP Thoracic Spine	11.8	6.39 - 13.3
AP Lumbar Spine	27	16.2 - 40.3
AP Abdomen	na	na
AP Retrograde	na	na
Lateral Skull	na	na
Type of Exam	Average millirem per exposure	Range millirem per exposure
Hand	0.12	0.041 - 0.266
Wrist	0.13	0.07 - 0.18
Arm	na	na
Shoulder	4.04	1.6 - 7.37
Leg	na	na
Knee	3	3 - 3.1
Ankle	0.16	0.06 - 0.27
DP Foot	na	na
Lateral Foot	na	na
Fluoroscopy		
Hand	na	na
Knee	na	na
Ankle	na	na
Foot	na	na
AP Lumbar	68	67 - 69
Fluoroscopy Spot Film	na	na
Sinus	na	na

Annual Dose to Occupational Worker

Average millirem per year	Range millirem per year
0.18	0.001 - 260

Annual Dose to Public

Average millirem per year	Range millirem per year
2.9	0.0003 - 8.75

CHIROPRACTIC INSPECTIONS

Total Number of Inspections Performed

24

Non-compliance Items

TOTAL NONCOMPLIANCES	71
Average number noncompliances per facility	3
Range of number of noncompliances	0 - 9

TOTAL FACILITY NONCOMPLIANCES	68	PERCENTAGE OF TOTAL FACILITY NONCOMPLIANCES
Film/Screen	19	27.9
Processing	17	25.0
Darkroom/Safelight	7	10.3
Personnel Monitoring	0	0.0
Patient Shielding	14	20.6
License Displayed	0	0.0
Repeat Analysis	11	16.2

TOTAL RADIOGRAPHIC NONCOMPLIANCES	3	PERCENTAGE OF TOTAL RADIOGRAPHIC NONCOMPLIANCES
Collimation	1	33
Timer	0	0
kVp & Filtration	0	0
Patient entrance skin exposure	0	0
Public exposure	0	0
Operator conditions	0	0
Physical condition (x-ray unit, shielding)	2	67
Unit not registered	0	0

Dose to Patients Per Exposure

Type of Exam	Average millirem per exposure	Range millirem per exposure
PA Chest	na	na
AP Cervical Spine	3.4	1.3 - 8.1
AP Thoracic Spine	19.5	9.5 - 34.4
AP Lumbar Spine	33.8	9.4 - 67.4
AP Abdomen	na	na
AP Retrograde	na	na
Lateral Skull	na	na

Type of Exam	Average millirem per exposure	Range millirem per exposure
Hand	na	na
Wrist	0.17	na
Arm	na	na
Shoulder	na	na
Leg	na	na
Knee	2.41	0.39 - 4.45
Ankle	na	na
DP Foot	na	na
Lateral Foot	na	na

Annual Dose to Occupational Worker

Average millirem per year	Range millirem per year
0.047	0.001 - 0.69

Annual Dose to Public

Average millirem per year	Range millirem per year
0.24	0.0024 - 1.87

PODIATRIC INSPECTIONS

Total Number of Inspections Performed

1

Non-compliance Items

TOTAL NONCOMPLIANCES	0
Average number noncompliances per facility	0
Range of number of noncompliances	0

TOTAL FACILITY NONCOMPLIANCES	0	PERCENTAGE OF TOTAL FACILITY NONCOMPLIANCES
Film/Screen	0	0
Processing	0	0
Darkroom/Safelight	0	0
Personnel Monitoring	0	0
Patient Shielding	0	0

TOTAL RADIOGRAPHIC NONCOMPLIANCES	0	PERCENTAGE OF TOTAL RADIOGRAPHIC NONCOMPLIANCES
Collimation	0	0
Timer	0	0
kVp & Filtration	0	0
Patient entrance skin exposure	0	0
Public exposure	0	0
Operator conditions	0	0
Physical condition (x-ray unit, shielding)	0	0
Unit not registered	0	0

Dose to Patients Per Exposure

Type of Exam	Average millirem per exposure	Range millirem per exposure
DP Foot	0.14	na
Lateral Foot	0.18	na

Annual Dose to Occupational Worker

Average millirem per year	Range millirem per year
0.012	na

Annual Dose to Public

Average millirem per year	Range millirem per year
0.0005	na

VETERINARIAN INSPECTIONS

Total Number of Inspections Performed

7

Non-compliance Items

TOTAL NONCOMPLIANCES	26
Average number noncompliances per facility	4
Range of number of noncompliances	0 - 6

TOTAL FACILITY NONCOMPLIANCES	24	PERCENTAGE OF TOTAL FACILITY NONCOMPLIANCES
Film/Screen	3	12.5
Processing	9	37.5
Darkroom/Safelight	4	16.7
Personnel Monitoring	6	25.0
Patient Shielding	2	8.3

TOTAL RADIOGRAPHIC NONCOMPLIANCES	2	PERCENTAGE OF TOTAL RADIOGRAPHIC NONCOMPLIANCES
Collimation	0	0
Timer	0	0
kVp & Filtration	2	100
Patient entrance skin exposure	0	0
Public exposure	0	0
Operator conditions	0	0
Physical condition (x-ray unit, shielding)	0	0
Unit not registered	0	0

Exposure to Animals Per Exam

Type of Exam	Average milliroentgen per exposure	Range milliroentgen per exposure
Dog chest	50.4	4.1 - 123
Dog abdomen	31.1	7.6 - 45
Dog extremity	6.4	3.6 - 10
Dog dental	165	34 - 296
Cat-o-gram	32.1	1.5 - 74
Cat chest/abdomen	12.2	12 - 12.5
Cat extremity	na	na
Cat dental	110	34 - 187
Horse hoof	14.9	13.6 - 16.2
Horse navicular	na	na
Horse fetlock/pastern/ankle	na	na
Horse carpus/knee	na	na
Horse hock	na	na
Horse gaskin/forearm	na	na
Horse canon	na	na
Horse stifle/hip	na	na
Horse spine	na	na

Annual Dose to Occupational Worker

STATIONARY X-RAY Position of Operator	Average millirem per year	Range millirem per year
Operator exposure at edge of table	7.5	5.3 - 10.8
Operator exposure at opposite ends of table	3.2	1.25 - 5
Operator exposure 3 feet from x-ray unit	2.4	1.2 - 5
Operator exposure 6 feet from x-ray unit	0.82	0.38 - 2
Operator exposure behind shield, wall, or door	0.12	0.005 - 0.45
Extremity exposure	26.8	13.3 - 38.2

PORTABLE X-RAY Position of Operator	Average millirem per year	Range millirem per year
Operator exposure holding unit	0.23	0.04 - 0.73
Operator exposure 3 feet from x-ray unit	0.06	0.025 - 0.097
Operator exposure 6 feet from x-ray unit	0.01	0.005 - 0.029
Operator exposure 9 feet from x-ray unit	na	na
Operator exposure at end of exposure cord	na	na
Operator exposure behind shield, wall, or door	0.02	0.005 - 0.054
Extremity exposure	0.46	0.26 - 0.63

DENTAL X-RAY Position of Operator	Average millirem per year	Range millirem per year
Operator exposure at edge of table	0.05	na
Operator exposure 6 feet from x-ray unit	0.0025	na
Operator exposure at end of exposure cord	na	na
Operator exposure behind shield, wall, or door	na	na
Extremity exposure	0.42	na

Annual Dose to Public

	Average millirem per year	Range millirem per year
Stationary X-Ray	0.08	0.002 - 0.22
Portable X-Ray	0.0016	0.001 - 0.0023
Dental X-Ray	0.0005	na

NOTE: na = not applicable