

1 Department of Health

2

3 Adopted Permanent Rules Governing Examination Requirements for
4 X-ray Equipment Operators

5

6 Rules as Adopted

7 4730.5000 APPLICABILITY.

8 After January 1, 1997, an individual operating X-ray
9 equipment for use on humans must pass an examination as
10 specified in parts 4730.5000 to 4730.5200 or part 4730.5400.

11 4730.5050 DEFINITION.

12 For purpose of parts 4730.5000 to 4730.5500, "individual
13 operating X-ray equipment on humans" means an individual who
14 exposes humans to ionizing radiation by being directly involved
15 with any part of the X-ray procedure from setting the equipment
16 exposure factors through processing the X-ray.

17 4730.5100 EXAMINATION REQUIREMENTS.

18 Subpart 1. General. To be approved by the commissioner,
19 an examination must test an individual's knowledge of:

- 20 A. basic radiation safety;
- 21 B. proper use of X-ray equipment;
- 22 C. darkroom and film processing; and
- 23 D. quality assurance procedures.

24 Subp. 2. Examination approval. A set of examination
25 questions based on the areas listed in subpart 1 must be
26 submitted to the commissioner for approval:

- 27 A. at least 60 calendar days before the examination
28 is held;
- 29 B. before the initial examination is used; and
- 30 C. whenever question content is changed or additional
31 questions are added to the question pool.

32 Subp. 3. Availability of examinations. An examination
33 must be offered at least three times each calendar year.

34 Subp. 4. Reporting examination results. Within 30

1 calendar days after an examination has been administered, a list
2 of all individuals who have passed the examination and those who
3 have failed the examination must be submitted by the
4 organization administering the examination to the commissioner.

5 **Subp. 5. Notice to individual.** Written notice to the
6 individual who took the examination on a specific date must be
7 provided by the organization administering the examination
8 within 30 calendar days:

9 A. indicating whether the individual passed or failed
10 the examination;

11 B. listing the areas in which the individual failed.

12 **Subp. 6. Examination security.** The identity of an
13 individual taking the examination must be verified by requiring
14 a picture identification at the time the individual takes the
15 examination.

16 **Subp. 7. Passing level.** The passing level for an
17 examination must be 70 percent.

18 **Subp. 8. Closed book examination.** An examination must be
19 a closed book examination.

20 **Subp. 9. Validity standards.** An examination must meet
21 validity standards for educational and psychological testing
22 specified in the American Psychological Association's "Standards
23 for Educational and Psychological Testing" (1986). The
24 "Standards for Educational and Psychological Testing" are
25 incorporated by reference, are not subject to frequent change,
26 and are available at the Minnesota State Law Library.

27 **Subp. 10. Examination questions.** An examination must:

28 A. consist of at least 75 multiple choice questions;

29 B. include the highest percent of questions on
30 radiation safety; and

31 C. vary and reorder questions each time an
32 examination is held.

33 **Subp. 11. Examination content.** An examination must
34 adequately address the topic areas listed in subpart 1.
35 Questions for each of the topic areas listed in subpart 1 must
36 include the information specified in items A to D:

- 1 A. radiation safety, including:
- 2 (1) the biological effects of radiation:
- 3 (a) somatic and genetic effects; and
- 4 (b) long-term and short-term effects;
- 5 (2) operator protection:
- 6 (a) patient protection; and
- 7 (b) gonad and room shielding and the use of
- 8 lead aprons and gloves;
- 9 (3) beam restriction methods;
- 10 (4) personnel monitoring:
- 11 (a) types of monitors available; and
- 12 (b) how to wear monitors;
- 13 (5) dose:
- 14 (a) maximum permissible dose for patient and
- 15 operator; and
- 16 (b) the concept of "as low as reasonably
- 17 achievable" (ALARA);
- 18 (6) radiation terminology:
- 19 (a) meanings; and
- 20 (b) proper use; and
- 21 (7) restraint and holding procedures and
- 22 precautions;
- 23 B. the proper use of X-ray equipment, including:
- 24 (1) radiographic equipment;
- 25 (2) the parts of the X-ray machine and X-ray
- 26 tube;
- 27 (3) the electronics and physics of X-ray
- 28 generation;
- 29 (4) grids and buckys;
- 30 (5) automatic exposure controls;
- 31 (6) identification of imaging failures;
- 32 (7) proper maintenance of X-ray equipment;
- 33 (8) image production;
- 34 (9) technique factors:
- 35 (a) kVp, mA, mAs time and distance;
- 36 (b) function and interaction of kVp, mA, mAs

1 time; and

2 (c) density, detail, contrast;

3 (10) cassettes and film compatibility; and

4 (11) technique conversion factors;

5 C. darkroom and film processing, including:

6 (1) both automatic or manual chemistry;

7 (2) fog;

8 (3) temperature and time relationship;

9 (4) identification of artifacts;

10 (5) handling and storage of film, chemistry, and
11 replenishing;

12 (6) safelights types, wattage, and compatibility
13 with film; and

14 (7) darkroom maintenance;

15 D. quality assurance procedures, including:

16 (1) the importance of quality assurance
17 procedures;

18 (2) how to do quality assurance procedures for
19 sensitometry and densitometry, screen tests, and fog test; and

20 (3) what corrective measures are appropriate.

21 4730.5200 REQUIREMENTS FOR FACILITIES USING X-RAY EQUIPMENT.

22 A registrant in a facility with X-ray equipment used on
23 humans must ensure that:

24 A. only an individual who has met the requirements in
25 parts 4730.5000 to 4730.5200 or 4730.5400 is allowed to operate
26 X-ray equipment; and

27 B. on request of the commissioner, written
28 verification that the individual who operates X-ray equipment
29 has met the requirements in parts 4730.5000 to 4730.5200 or
30 4730.5400 is available for inspection.

31 ~~4730.5300-EXEMPTIONS-~~

32 ~~An individual is exempt from the requirements in part~~
33 ~~4730.5000 or 4730.5500 if the individual holds a current~~
34 ~~Minnesota license to practice medicine, chiropractic, podiatric~~
35 ~~medicine, osteopathic medicine, or dentistry.~~

1 4730.5400 EQUIVALENT EXAMINATIONS.

2 Subpart 1. **General.** An individual shall be determined by
3 the commissioner to have met the requirements in parts 4730.5000
4 to 4730.5200 if the individual has passed any of the
5 examinations listed in this part.

6 Subp. 2. **Licensed dental hygienist examination.** If an
7 individual has passed the examination for the Minnesota dental
8 hygienist license, the individual shall be determined to have
9 met the requirements in parts 4730.5000 to 4730.5200 if the
10 individual's practice is limited as set forth in part 3100.8700.

11 Subp. 3. **Registered dental assistant examination.** If an
12 individual has passed the examination for the Minnesota dental
13 assistant registration, the individual shall be determined to
14 have met the requirements in parts 4730.5000 to 4730.5200 if the
15 individual's practice is limited as set forth in part 3100.8500.

16 Subp. 4. **Limited dental radiographic registration**
17 **examination.** If an individual has passed the radiographic
18 examination that complies with part 3100.8500, the individual
19 shall be determined to have met the requirements in parts
20 4730.5000 to 4730.5200 if the individual's practice is limited
21 as set forth in part 3100.8500.

22 Subp. 5. **Radiologic technologist registration**
23 **examination.** If an individual has passed the radiography
24 examination of the American Registry of Radiologic
25 Technologists, the individual shall be determined to have met
26 the requirements in parts 4730.5000 to 4730.5200.

27 Subp. 6. **Chiropractic radiologic technologist registration**
28 **examination.** If an individual has passed the radiography
29 examination of the American Chiropractic Registry of Radiologic
30 Technologists, the individual shall be determined to have met
31 the requirements in parts 4730.5000 to 4730.5200.

32 Subp. 7. **Radiologic technologist license from other United**
33 **States jurisdictions.** If an individual has passed a full or
34 limited license examination in radiography from other United
35 States jurisdictions, the individual may request that the

1 commissioner review the license examination to determine if the
2 license examination is equivalent to the examination described
3 in parts 4730.5000 to 4730.5200. If the examination meets the
4 requirements of part 4730.5100, the individual shall be
5 determined by the commissioner to have met the requirements of
6 part 4730.5000.

7 Subp. 8. Other professional registrations. If an
8 individual has passed a registration examination other than one
9 specified in this part, or an examination not approved under
10 part 4730.5100, the individual may request a determination of
11 equivalency according to the procedures and criteria in parts
12 4717.7000 to 4717.7050.

13 4730.5500 INDIVIDUALS OPERATING X-RAY EQUIPMENT DURING TRAINING.

14 An individual participating in a training course for
15 physicians, dentists, chiropractors, podiatrists, radiologic
16 technologists, chiropractic radiologic technologists, dental
17 hygienists, or dental assistants is exempt from the requirements
18 of part 4730.5000 for the duration of the training course.