Radioactive Material License Guide

Afterloader Requirements

Louisiana Department of Environmental Quality
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INFORMATION REQUIRED WHEN REQUESTING AN HDR AFTERLOADER IF ALREADY LICENSED FOR NUCLEAR MEDICINE

1. Submit an annotated drawing of the room or rooms and adjacent areas where afterloader will be used. Include shielding available and additional safety equipment.

2. Commit to the following:

   a. Access to the room housing the afterloading brachytherapy unit shall be controlled by a door at each entrance.

   b. The entrance to the irradiation room shall be equipped with an electrical interlock system that will cause the source to return to the shielded position immediately upon opening of the entrance door.

      The interlock system shall be connected in such a manner that the source cannot be placed in the irradiation position until the entrance door is closed and the source "on-off" control is reset at the control panel.

   c. Electrical interlocks on the entrance door to the irradiator room shall be tested for proper operation at least once a month. Records of test results shall be maintained for inspection by the Department.

   d. In the event of malfunction of the door interlock, the radiation device shall be locked in the "off" condition and not used, except as may be necessary for repair or replacement of the interlock system, until the interlock system is shown to be functioning properly.

3. Prior to initiation of a treatment program, and subsequent to each source exchange for the afterloading brachytherapy units, radiation surveys and tests shall be performed in accordance with the following:

   a. A radiation survey shall be made of:

      (i) The irradiator source housing, with the source in the shielded position. The maximum radiation levels at 10 cm from the surface of the source head shall not exceed 3 mR/hr.

      (ii) All areas adjacent to the treatment room with the source in the "irradiation" position. The survey shall clearly establish:

         (a) That radiation levels in restricted areas are not likely to cause

personnel exposure in excess of the limits specified in LAC 33:XV.410.

(b) That quantities of radiation in unrestricted areas do not exceed the limits specified in LAC 33:XV.414.

b. Records of the survey results shall be maintained for inspection by the Department.

4. That the following shall be performed only by persons specifically authorized by the Department, an Agreement State of the U. S. Nuclear Regulatory Commission to perform such services:

a. Installation and replacement of sources contained in the afterloading brachytherapy unit.

b. Any maintenance or repair operations on the afterloading brachytherapy unit, including work on the source safe, the source driving unit, or other mechanism that could expose the source, reduce the shielding around the source, or compromise the safety of the unit and result in increased radiation levels.

5. Following removal of the source, the licensee shall make a radiation survey of the patient with an appropriate radiation detection survey instrument to confirm that all sources have been removed. For surveys associated with HDR procedures, the licensee must use a portable radiation measurement survey instrument, capable of measuring dose rates of 1 mR/hr to at least 1000 mR/hr. It is important to use calibrated survey instruments with appropriate sensitivity, since the high exposure rates associated with these sources can easily overload some survey instrument detectors, resulting in a false low reading. This survey of the patient must be done whether or not there is any indication of radiation levels provided by an area radiation monitor. The surveys shall be performed **immediately after** completion of the therapy procedure before removal of the patient from the treatment room.

The required area monitor provides an immediate indication of a possible problem and thus serves a useful function as an early warning device. This area monitor will provide a visible indication of an exposed or partially exposed source, and must be observable immediately on entry into the treatment vault. It must be equipped with an independent source of backup power and checked with a dedicated check source for proper operation each day of use of the HDR device.

6. The licensee shall have written emergency procedures describing actions to be taken, including surgical intervention, should the source not return to the shielded container at the conclusion of treatment. The licensee shall not begin any treatment procedure for which a decoupled or jammed source cannot be removed

expeditiously from the patient and placed in a shielded condition. The licensee shall ensure that appropriate staff and equipment are available immediately, at the location that the HDR procedure is performed, to implement the written emergency procedures. Equipment shall include shielded storage containers, remote handling tools, and if appropriate, supplies necessary to surgically remove applicators or sources from the patient, to include scissors and cable cutters. The emergency source removal procedure should minimize exposure to health care personnel while maximizing safety of the patient.

7. During all patient treatments, both the authorized user **and** either the medical physicist **or** radiation safety officer must be physically present. Physical presence, for this purpose, is defined as within audible range of normal human speech.

8. The licensee shall ensure that personnel are trained in both the routine use of the HDR afterloading device and emergency procedures necessary to return the source to a safe condition. Training shall be provided immediately to new personnel and periodic retraining, not to exceed 12 month intervals, shall be provided for all personnel. The licensee shall retain records of this training for a period of 3 years.