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Task Group/Practice Parameter

The American College of Radiology and the American Brachytherapy Society practice parameter for the performance of radionuclide-based high-dose-rate brachytherapy

Beth A. Erickson[1,*], Nathan H.J. Bittner[2], Manjeet Chadha[3], Firas Mourtada[4], D. Jeffrey Demanes[5]

[1]*Medical College of Wisconsin, Milwaukee, WI, USA*
[2]*Tacoma Valley Radiation Oncology Centers, Tacoma, WA, USA*
[3]*Mount Sinai Beth Israel, New York, NY, USA*
[4]*Helen F. Graham Cancer Center & Research Institute, Christiana Care Health System, Newark, DE, USA*
[5]*UCLA Health System, Los Angeles, CA, USA*

ABSTRACT Brachytherapy is a radiation therapy method in which radionuclide sources are used to deliver a radiation dose at a distance of up to a few centimeters by surface, intracavitary, intraluminal, or interstitial application. This practice parameter refers only to the use of radionuclides for brachytherapy. Brachytherapy alone or combined with external beam therapy plays an important role in the management and treatment of patients with cancer. High-dose-rate (HDR) brachytherapy uses radionuclides such as iridium-192 at dose rates of 20 cGy per minute (12 Gy per hour) or more to a designated target point or volume. High-dose-rate (HDR) brachytherapy is indicated for treating malignant or benign tumors where the treatment volume or targeted points are defined and accessible.

Keywords: High-dose-rate brachytherapy; HDR brachytherapy; Radionuclides; Radiation therapy; Radioactive sources; Oncologic practice; Radiation oncologist

Preamble

This document is an educational tool designed to assist practitioners in providing appropriate radiation oncology care for patients. Practice Parameters and Technical Standards are not inflexible rules or requirements of practice and are not intended, nor should they be used, to establish a legal standard of care[1]. For these reasons and those set forth below, the American College of Radiology and our collaborating medical specialty societies caution against the use of these documents in litigation in which the clinical decisions of a practitioner are called into question.

The ultimate judgment regarding the propriety of any specific procedure or course of action must be made by the practitioner in light of all the circumstances presented. Thus, an approach that differs from the guidance in this document, standing alone, does not necessarily imply that the approach was below the standard of care. To the contrary, a conscientious practitioner may responsibly adopt a course of action different from that set forth in this document when, in the reasonable judgment of the practitioner,

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* Corresponding author. Practice Parameters and Technical Standards, American College of Radiology (ACR), 1891 Preston White Dr, Reston, VA 20191-4326. Tel.: 703-715-3491; fax: 703-264-5287.

E-mail address: berickson@mcw.edu (B.A. Erickson).

[1] Iowa Medical Society and Iowa Society of Anesthesiologists v. Iowa Board of Nursing, ___ N.W.2 d ___ (Iowa 2013) Iowa Supreme Court refuses to find that the *ACR Technical Standard for Management of the Use of Radiation in Fluoroscopic Procedures* (Revised 2008) sets a national standard for who may perform fluoroscopic procedures in light of the standard's stated purpose that ACR standards are educational tools and not intended to establish a legal standard of care. See also, Stanley v. McCarver, 63 P.3 d 1076 (Ariz. App. 2003) where in a concurring opinion the Court stated that ''published standards or guidelines of specialty medical organizations are useful in determining the duty owed or the standard of care applicable in a given situation'' even though ACR standards themselves do not establish the standard of care.

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The American College of Radiology will periodically define new practice parameters and technical standards for radiologic practice to help advance the science of radiology and to improve the quality of service to patients throughout the United States. Existing practice parameters and technical standards will be reviewed for revision or renewal, as appropriate, on their fifth anniversary or sooner, if indicated.

Each practice parameter and technical standard, representing a policy statement by the College, has undergone a thorough consensus process in which it has been subjected to extensive review and approval. The practice parameters and technical standards recognize that the safe and effective use of diagnostic and therapeutic radiology requires specific training, skills, and techniques, as described in each document. Reproduction or modification of the published practice parameter and technical standard by those entities not providing these services is not authorized.

Revised 2015 (CSC/BOC)**

** As of May 2010, all radiation oncology collaborative parameters are approved by the ACR Council Steering Committee and the ACR Board of Chancellors and will not go through the ACR Council (ACR Resolution 8, 2010). The effective date is displayed below: Development Chronology for this Practice Parameter: 1996 (Resolution 15), Revised 2000 (Resolution 23), Revised 2005 (Resolution 15), Amended 2006 (Resolution 16g, 36), Revised 2010 (Resolution 3), Amended 2014 (Resolution 39), Revised 2015 (CSC/BOC).

such course of action is indicated by the condition of the patient, limitations of available resources, or advances in knowledge or technology subsequent to publication of this document. However, a practitioner who employs an approach substantially different from the guidance in this document is advised to document in the patient record information sufficient to explain the approach taken.

The practice of medicine involves not only the science, but also the art of dealing with the prevention, diagnosis, alleviation, and treatment of disease. The variety and complexity of human conditions make it impossible to always reach the most appropriate diagnosis or to predict with certainty a particular response to treatment. Therefore, it should be recognized that adherence to the guidance in this document will not assure an accurate diagnosis or a successful outcome. All that should be expected is that the practitioner will follow a reasonable course of action based on current knowledge, available resources, and the needs of the patient to deliver effective and safe medical care. The sole purpose of this document is to assist practitioners in achieving this objective.

Introduction

This practice parameter was revised collaboratively by the American College of Radiology (ACR) and the American Brachytherapy Society (ABS).

Brachytherapy is a radiation therapy method in which radionuclide sources are used to deliver a radiation dose at a distance of up to a few centimeters by surface, intracavitary, intraluminal, or interstitial application. This practice parameter refers only to the use of radionuclides for brachytherapy. Brachytherapy alone or combined with external beam therapy plays an important role in the management and treatment of patients with cancer (1). High-dose-rate (HDR) brachytherapy uses radionuclides such as iridium-192 at dose rates of 20 cGy per minute (12 Gy per hour) or more to a designated target point or volume. High-dose-rate (HDR) brachytherapy is indicated for treating malignant or benign tumors where the treatment volume or targeted points are defined and accessible.

The use of brachytherapy requires detailed attention to personnel, equipment, patient and personnel safety, and continuing staff education.

The licensing of radioactive sources (radionuclides) and the safety of the general public and health care workers are regulated by the Nuclear Regulatory Commission (NRC) or by agreement states.[2] Medical use of radionuclides for therapeutic procedures must adhere to the constraints set forth by these regulatory agencies. Detailed descriptions of NRC licensing and safety issues can be found in the Code of Federal Regulations, Part 20 and Part 35. State requirements for the agreement states are found in the respective State statutes and regulations.

A literature search was performed and reviewed to identify published articles regarding practice parameters and technical standards in HDR brachytherapy.

Process of brachytherapy

The use of HDR brachytherapy is a complex multistep process involving trained personnel who must work in concert to carry out a variety of inter-related activities.

[2] An agreement state is any state with which the U.S. Nuclear Regulatory Commission or the U.S. Atomic Energy Commission has entered into an effective agreement under Subsection 274.b of the Atomic Energy Act of 1954, as amended (73 Stat. 689).