Recommended Practices for Reducing Radiological Exposure in the Perioperative Practice Setting

The following recommended practices were developed by the AORN Recommended Practices Committee and have been approved by the AORN Board of Directors. They were presented as proposed recommended practices for comments by members and others. They are effective January 1, 2007.

These recommended practices are intended as achievable recommendations representing what is believed to be an optimal level of practice. Policies and procedures will reflect variations in practice settings and/or clinical situations that determine the degree to which the recommended practices can be implemented.

AORN recognizes the numerous types of settings in which perioperative nurses practice. These recommended practices are intended as guidelines adaptable to various practice settings. These practice settings include traditional operating rooms, ambulatory surgery centers, physicians' offices, cardiac catheterization suites, endoscopy suites, radiology and interventional radiology departments, and all other areas where operative and other invasive procedures may be performed.

Purpose

Radiological procedures are an invaluable medical diagnostic and treatment tool and, if proper safety procedures are followed, create only minimal risks to both the patient and medical personnel. Ionizing radiation is useful for diagnostic, interventional, and therapeutic procedures. Ionizing radiation can damage living tissues and may produce long-term effects. Patients and personnel should be protected from unsafe levels of radiation that are not medically indicated because of the potential hazardous effects of ionizing radiation exposure on tissue over time. Evidence has demonstrated that ionizing radiation also can harm a developing embryo. The greatest risk is the development of cancer. Health care workers who do not protect themselves from scatter radiation are especially at risk when performing interventional procedures because of significantly increased exposure time and close proximity during the procedure.

Prevention of radiation injury requires the application of principles of physics and radiological safety standards. Policies addressing education, credentialing, and radiological safety and maintenance must be in accordance with national regulatory standards and manufacturers' documented instructions.[1]

The overall goal of a radiation safety program should be to keep the risks from ionizing radiation as low as reasonably achievable.[2] Time, distance, and shielding should be employed to keep radiation exposure within safe levels. The National Council on Radiation Protection and Measurements has established guidelines for total dose radiation limits for radiation workers. In 1995, the Conference of Radiation Control Program Directors, a nonregulatory organization, published recommendations for state regulatory agencies.[3] Each state develops and implements regulations governing safe use of radiation-producing equipment and radioactive materials. Using safety measures of limiting exposure time and using protective shields (eg, thyroid shields, lead aprons, protective eyeglasses) is addressed.[4] Radiology departments use both diagnostic and interventional techniques in a wide variety of invasive applications and are included in this recommended practice. Interventional radiology nurses assist with procedures that include, but are not limited to, intravascular repairs such as

- inserting stents;
- placing shunts;
- performing embolization procedures;
- performing genitourinary procedures (eg, percutaneous nephrostomy tube placement, stone obliteration, balloon dilatation);
- draining abscesses; and
- performing laparoscopic tumor biopsies.

A primary responsibility of the interventional radiology nurse is to protect personnel and patients from high doses of radiation used during these procedures.[4]

Low dose-rate and high dose-rate brachytherapy both use ionizing radiation and are included in this recommended practice. Brachytherapy is the use of radioactive isotopes to treat malignancies and benign conditions. The radioactive source is inserted close to the treatment site or tumor. This therapy is used to treat tumors of the head, neck, breast, cervix, prostate, and endometrium, and to treat obstructive esophageal and bronchial lesions. Delivering high dose-rate brachytherapy, including that which is used during cardiovascular revascularization procedures, requires limiting radiation exposure to the patient and personnel. Personnel should have a thorough understanding of the physical effects of radiation and the regulatory guidelines established to ensure patient and personnel safety.[5]