

Overview of Stereotactic Body Radiotherapy and the Nursing Role

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Stereotactic body radiotherapy (SBRT) is a rapidly emerging technology that enhances radiation therapy delivery. It allows for tightly conformed treatment fields and accurate delivery even with moving targets in the body. SBRT currently is used most commonly in treatment of medically inoperable stage I non-small cell lung cancers, as well as lung, liver, and spinal metastases. Studies to date are encouraging for increased local control with acceptable patient tolerance. This article familiarizes nurses with the use of this new technology and proposes the potential nursing role in maximizing patient preparation and follow-up care.

Stereotactic body radiotherapy (SBRT) is an emerging field of radiation therapy for treating tumors within the body. Traditionally, treatment of body tumors with radiation therapy is given in many small, daily doses primarily to reduce the potential for damage to normal tissue surrounding the tumor from ionizing radiation. Since the 1980s, advances in computer technology have resulted in the development of 3-D conformal treatment planning systems, which offer enhanced precision in defining the tumor (target) and reducing the radiation dose to the surrounding normal tissues. Further improvements in radiation beam delivery itself through intensity-modulated radiation therapy (IMRT) allows for even more precise shaping of radiation beams for treatment of irregularly shaped tumors (Chao, Perez, & Brady, 2002). Building on the technological advances of 3-D conformal radiotherapy and IMRT, SBRT is a hypofractionated delivery of radiotherapy, meaning the total dose of radiation is delivered in only one to five treatments. Hence, each dose is much larger than the standard daily radiation dose. This differentiates SBRT from conventional radiation given over many small doses with use of 3-D conformal planning and IMRT. Defining characteristics of SBRT include precise immobilization, the ability to reproduce accurate position from simulation to treatment, the ability to minimize normal tissue exposure, precise accounting of organ motion, extremely accurate targeting of the tumor and surrounding critical structures to avoid using stereotactic coordinates within the tumor or on the patient, and ablative dose fractionation delivered to the patient with subcentimeter accuracy (Timmerman, Kavanagh, Cho, Papiez, & Xing, 2007). This level of accuracy allows for the delivery of an ablative dose, which often is very high and not possible to deliver with standard radiotherapy because of potential for significant damage to surrounding normal tissue. This article will discuss how SBRT is beneficial to patients and outline the nursing care for patients receiving the treatment.

SBRT has its roots in stereotactic radiosurgery (SRS), which is a form of radiation therapy first conceived by neurosurgeon

At a Glance

- ◆ Stereotactic body radiotherapy (SBRT) is an emerging technology in cancer treatment offering possible improved patient outcomes; however, long-term or late effects still need to be assessed.
- ◆ SBRT research is ongoing and includes radiation dose escalation to establish optimal treatment parameters for patients with stage I non-small cell lung cancer, as well as lung, liver, and spinal metastases.
- ◆ Patients receiving SBRT are in radiation departments for fewer treatments than traditional radiation, necessitating the delivery of nursing care before and after treatment with other approaches.

Lars Leksell, PhD, in 1951 (Slotman, Solberg, Wurm, & Verellen, 2006). SRS includes delivery of a high dose of radiation in a single fraction to a small target with great accuracy through the use of precise patient immobilization and localization of the target via a three-dimensional coordinate system. SRS was first used to treat brain lesions because of the ability to use a stereotactic

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