

# Sperm Banking: Fertility Preservation for Male Patients With Cancer

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Sperm banking (SB) involves collecting and freezing sperm for potential future use. It is a simple, noninvasive way for male patients with cancer to preserve their ability to have biologic children. This article provides the information needed by nurses to effectively discuss SB with their patients.

## At a Glance

- Certain chemotherapy drugs, as well as testicular exposure to radiation, can impair sperm production.
- Before undergoing treatment that creates a risk of infertility, postpubertal male patients should be informed of their risk and offered the option of SB.
- The oncology team should initiate this discussion and provide patients with referrals to pursue SB, if interested.

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The expanding cancer survivor population has drawn increased attention to the late effects of cancer treatment and their impact on quality of life. The potential loss of fertility is of particular concern to young survivors. Sperm banking (SB), or sperm cryopreservation, is a simple, noninvasive way for male patients to preserve their ability to have biologic children in the future without delaying cancer treatment.

Guidelines from professional organizations recommend that, early in the treatment planning process, oncology clinicians should inform patients of the risk of infertility from treatment, discuss options for fertility preservation, and refer interested patients to reproductive specialists (Coccia et al., 2014; Ethics Committee of the American Society for Reproductive Medicine, 2013; Fallat & Hutter, 2008; Loren et al., 2013; Pentheroudakis, Orec-

chia, Hoekstra, & Pavlidis, 2010). Oncology nurses can play a significant role in these discussions, but they need knowledge and skills to do this effectively.

## Background

SB involves collecting and freezing sperm for potential future use. Male patients obtain a semen specimen by masturbating. After analysis to ensure the presence of viable sperm, the specimen is placed in vials, frozen, and stored. Even after several decades, thawed sperm can produce a live birth (Katz, Kolon, Feldman, & Mulhall, 2013).

## Candidates

All postpubertal male patients receiving cancer treatment and at risk for infertility should be offered SB. SB is not an

option for prepubertal boys because they do not yet produce mature sperm.

Treatment with certain chemotherapy drugs, as well as testicular exposure to radiation, can impair sperm production. The effect of chemotherapy depends on the agents used (alkylating agents, platinum analogs, and anthracyclines are the most toxic) and the cumulative dose (Ginsberg, 2012; Howell & Shalet, 2005; Magelssen, Brydøy, & Fosså, 2006; Meistrich, 2009; Wallace, 2011). The effect of radiation depends on the volume of testicular tissue that is exposed and the cumulative dose. At the greatest risk are patients receiving radiation directly to the testes or experiencing significant radiation scatter from treatment directed toward the pelvic and inguinal regions; those receiving fractionated doses of more than 1.2 Gy are particularly at risk (Pasqualotto & Agarwal, 2013; Wallace, 2011). Although many men recover sperm production after treatment, some have reduced sperm count (oligospermia) and some have no sperm in their semen (azoospermia). For men with recovered sperm production, recovery usually occurs within one to three years but can take longer, depending on the toxicity of the therapy (Meistrich, 2009).

Pelvic surgery and radiation can cause injury to ducts, blood vessels, and nerves, potentially resulting in erectile or ejaculatory dysfunction (Magelssen et al., 2006). These patients may produce sperm, but they cannot transfer it to their female partner through intercourse. Patients at risk include those who have undergone retroperitoneal lymph node dissection without the use of nerve-sparing techniques, as well as those who have experienced surgery for or radiation treatment to any pelvic tumor close to reproductive structures.