Purpose: To provide an understanding of fertility preservation among individuals faced with the potential loss of fertility secondary to treatment for cancer and other medical conditions.

Background

- Successful cancer treatment in younger patients may lead to infertility.
- Nearly half (48%) of oncologists would be willing to sacrifice 1% to 5% of disease-free survival in a potentially curable cancer if a treatment offered better fertility outcomes; 42% of patients were thought to feel similarly. (Forman)
- Cryopreserving embryos, gametes or gonadal tissue may preserve fertility.
- Cytotoxic chemotherapy and irradiation may cause significant irreversible damage to the testes and primordial sperm cells leading to severe oligo- or azoosperma.
- Ovarian damage is drug and dose dependent and is also a function of the patient’s age at the time of treatment.
  - Smaller doses of chemotherapeutic agents increase the risk of ovarian failure as the patient ages.
  - Alkylating and platinum-based agents pose a significant risk to reproductive potential.
- Ovarian and/or uterine damage may result from total body, abdominal or pelvic irradiation and is related to the dose, fractionation schedule and age of the patient.
- In situ and some early invasive cancers in the female may be managed conservatively with surgery or hormone treatment and would not require the need for cryopreservation.
- GnRH agonists have been proposed as means to protect human oocytes from gonadotoxic doses of chemotherapy, but large clinical trials are needed for efficacy confirmation.
  - In breast cancer patients, fertility preservation procedures are typically performed in the 2-4 week interval between removal of the tumor and initiation of adjuvant chemotherapy.
  - IVF requires several weeks of preparation and involves ovarian stimulation which may or may not be suitable for a given circumstance
    - A combination of letrozole in combination with rFSH maybe a practical approach when high levels of estrogen are a concern particularly in cases of positive estrogen/progesterone tumor receptors.
  - The collection of immature oocytes for immediate cryopreservation or in vitro maturation followed by cryopreservation or fertilization followed
by embryo cryopreservation is experimental, but should be a consideration where timing is critical or where there is a contraindication to exposure to the high levels of estrogen engendered by ovarian stimulation regimens.

- Pregnancy following a diagnosis of breast cancer does not appear to result in worse outcomes. (Kim 2011)
- To date, no increase in chromosomal abnormalities, birth defects or development deficits have been noted in the limited number of children born from cryopreserved oocytes or transplanted ovarian tissue. (Wada)
- Pregnancy outcomes following the thaw and transfer of cryopreserved embryos do not differ from other frozen embryo transfer cycles. (Wada)

### Client Target Population

**Client/Target Population**

This guideline applies to men and women about to undergo treatment of cancers that may render them infertile or sterile, but who wish to preserve their ability to conceive children at a later date, using their own gametes.

This guideline also applies to patients being treated with chemotherapeutic agents for non-malignant conditions such as autoimmune diseases and collagen-vascular disorders.

Consideration may be given to people at risk for infertility/sterility due to exposure to environmental or occupational hazards.

### Clinical Management

**Pre-treatment**

- Consultation with the treating oncologist is mandatory prior to seeking approval for fertility preservation.
- The risk posed by pregnancy on cancer recurrence must be considered prior to approval for fertility preservation. (Kim 2006)
- If treatment involves a minor informed assent and parental informed consent must be obtained by the treating physician.
- Directives as to the disposition of cryopreserved tissue should be in place.
  - Posthumous use of cryopreserved reproductive tissue must adhere to legal guidelines and directives.

**Treatment**

- Ovarian stimulation, oocyte retrieval, fertilization and embryo cryopreservation is an accepted and proven approach to fertility preservation.
- Oocyte cryopreservation, ovarian tissue cryopreservation and ovarian transplantation are considered experimental techniques. (Robertson)
  - Oocyte cryopreservation is gaining more acceptance, particularly for women without a male partner or suitable donor.
  - Ovarian transposition prior to pelvic radiation has proven benefit.
  - Ovarian tissue cryopreservation followed by orthotopic (to the ovary) or heterotopic transplantation represents an approach whose future is uncertain as no live births have been reported to date using this
Cryopreservation of sperm prior to cancer treatment is the most common strategy to preserve male fertility.

All requests for coverage for fertility preservation should be approved by the Medical Director.

Fertility preservation for non-medically necessary situations (e.g., lack of a partner, desire to delay childbearing) is not covered.

**Bibliography**


**Revision History**
The following are approved changes incorporated into the revision numbers indicated below.

<table>
<thead>
<tr>
<th>Revision</th>
<th>Date</th>
<th>Description of Change</th>
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<tr>
<td>1.0</td>
<td>07/11/2011</td>
<td>Converted from training document to job aid format –ekb</td>
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<tr>
<td>2.0</td>
<td>10/02/2012</td>
<td>Updated and converted to guideline format – lpw</td>
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