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**Fertility Preservation in Women with Cancer: A Review of Current
Methods and Recent Advances**

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Abstract

Background: Advances in cancer survival have increased attention to reproductive outcomes after treatment. Chemotherapy, radiotherapy, and some surgical procedures may impair ovarian reserve, induce premature ovarian insufficiency, and compromise future fertility.

Objective: To review fertility preservation options for women with cancer and identify major factors influencing selection of an appropriate strategy.

Methods: Published evidence and current recommendations on fertility preservation were reviewed. Embryo and oocyte cryopreservation, ovarian tissue cryopreservation, ovarian transposition, fertility-sparing surgery, and ovarian suppression were considered in relation to indications and limitations. Patient age, cancer type and stage, treatment timing, and gonadotoxic potential were also considered.

Results: Oocyte, embryo, and ovarian tissue cryopreservation are established fertility preservation approaches. Counseling should occur as early as possible, preferably before cancer treatment, with timely, coordinated input from oncology and reproductive medicine specialists and shared decision-making. In selected patients, fertility-sparing surgery and ovarian transposition may be appropriate. Gonadotropin-releasing hormone agonists may have an adjunctive role, particularly in women with breast cancer, but should not replace established preservation methods.



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Conclusion: Early referral and individualized counseling can meaningfully expand reproductive options for women with cancer. Multidisciplinary decision-making, consideration of patient preferences, and equitable access to specialized services are essential components of comprehensive fertility care.

Keywords: Fertility Preservation - Women with Cancer - Oocyte Cryopreservation - Ovarian Tissue Cryopreservation - Chemotherapy

1. Introduction

The global burden of cancer continues to rise, with an estimated 19.3 million new cases diagnosed in 2020 worldwide. Among these, a substantial proportion occurs in women of reproductive age, defined as those between 15 and 49 years. Breast cancer, cervical cancer, hematological malignancies, and gynecological cancers represent the most common cancer types affecting this demographic. Concurrent with the increasing incidence of cancer in young women, there have been remarkable improvements in early detection, treatment modalities, and overall survival rates. The five-year relative survival for many cancers diagnosed in women of reproductive age now exceeds 80%, transforming what was once considered a terminal illness into a chronic or curable condition for a growing number of patients.

This epidemiological shift has brought reproductive health outcomes to the forefront of oncological care. Cancer treatments, while potentially life-saving, carry significant risks to female fertility through multiple mechanisms. Alkylating chemotherapy agents, pelvic and abdominal radiotherapy, and certain surgical interventions can irreversibly damage ovarian follicles, deplete the ovarian reserve, and lead to premature ovarian insufficiency. The resulting infertility can have profound psychological, emotional, and social consequences for young women who have not yet completed their childbearing aspirations. Studies consistently demonstrate that fertility-related distress ranks among the most significant concerns for reproductive-age women facing cancer diagnosis and treatment.

In response to this clinical imperative, the field of oncofertility has emerged as a multidisciplinary subspecialty dedicated to preserving reproductive potential in cancer patients. Over the past two decades, significant technological advances have expanded the armamentarium of fertility preservation techniques available to women with cancer. Established methods include embryo cryopreservation, oocyte cryopreservation, and ovarian tissue cryopreservation, each with distinct indications, success rates, and limitations. Additionally, fertility-sparing surgical approaches and ovarian transposition offer preservation options for



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selected patients with gynecological malignancies or those requiring pelvic radiation. The adjunctive role of gonadotropin-releasing hormone agonists during chemotherapy continues to be investigated, with emerging evidence supporting their utility in certain clinical contexts.

However, the availability of multiple preservation options does not guarantee their appropriate utilization. Numerous barriers exist at the patient, provider, and healthcare system levels that may impede timely access to fertility preservation services. These include lack of patient awareness, insufficient provider knowledge or referral practices, financial constraints, logistical challenges related to urgent treatment timelines, and geographic disparities in access to specialized reproductive medicine centers. Furthermore, the selection of the most appropriate preservation strategy requires careful individualization based on patient age, cancer type and stage, planned treatment regimen, available time before treatment initiation, and personal preferences regarding future family building.

Professional guidelines from major oncological and reproductive medicine organizations, including the American Society of Clinical Oncology (ASCO) and the European Society of Human Reproduction and Embryology (ESHRE), provide comprehensive frameworks for clinical decision-making in this complex area. The most recent ASCO guideline update (Su et al., 2025) and ESHRE guideline (Anderson et al., 2020) represent authoritative sources that synthesize the available evidence and offer evidence-based recommendations. These guidelines emphasize the importance of early and ongoing fertility counseling, multidisciplinary collaboration between oncology and reproductive medicine teams, and patient-centered shared decision-making.

This comprehensive review aims to synthesize the current evidence on fertility preservation options for women with cancer, with specific attention to the major clinical, patient, and treatment-related factors that influence the selection of appropriate preservation strategies. The review draws upon published evidence, recent professional guidelines, and a critical appraisal of the literature to provide clinicians with a practical framework for fertility preservation counseling and decision-making. We examine the established techniques of embryo, oocyte, and ovarian tissue cryopreservation, along with fertility-sparing surgery, ovarian transposition, and the use of GnRH agonists, considering their respective indications, success rates, limitations, and safety considerations. Ultimately, we emphasize the importance of early referral, individualized counseling, and equitable access to specialized fertility preservation services as essential components of comprehensive cancer care for young women.

2. Methods

This narrative review was conducted through a comprehensive search and synthesis of published evidence on fertility preservation in women with cancer. We systematically reviewed the available literature, including original research articles, systematic reviews, meta-analyses, and clinical practice guidelines. Our search focused on the established fertility preservation techniques: embryo cryopreservation, oocyte cryopreservation, and ovarian tissue



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cryopreservation, as well as fertility-sparing surgery, ovarian transposition, and ovarian suppression with gonadotropin-releasing hormone agonists.

The most recent ASCO guideline update (Su et al., 2025) and ESHRE guideline (Anderson et al., 2020) served as primary reference frameworks for evaluating current recommendations. We critically appraised these guidelines alongside systematic reviews and meta-analyses that synthesized evidence on live birth rates following fertility preservation (Fraison et al., 2023), ovarian tissue cryopreservation outcomes (Erden et al., 2024), oocyte cryopreservation in cancer patients (Massarotti et al., 2017), GnRH agonist use during chemotherapy (Lambertini et al., 2018), and safety of fertility preservation techniques in breast cancer (Arecco et al., 2022). Additional evidence was examined on ovarian transposition (Moawad et al., 2017), fertility-sparing surgery for cervical cancer (Kuznicki et al., 2021), and ovarian stimulation with letrozole in breast cancer patients (Azim et al., 2008).

The following factors were considered in relation to fertility preservation decision-making: patient age, ovarian reserve markers, cancer type and stage, planned treatment regimen (chemotherapy, radiotherapy, surgery), gonadotoxic potential of the proposed therapy, and timing of fertility preservation in relation to cancer treatment initiation. Safety considerations, including potential estrogen exposure from ovarian stimulation in hormone-sensitive cancers, were also evaluated. The review synthesizes the current evidence to provide practical guidance for clinicians involved in fertility preservation counseling and care.

3. Results

3.1 Established Fertility Preservation Techniques

3.1.1 Oocyte and Embryo Cryopreservation

Oocyte and embryo cryopreservation represent the most established and widely utilized fertility preservation techniques for women with cancer. Both methods involve controlled ovarian stimulation to promote the development of multiple mature oocytes, followed by transvaginal oocyte retrieval under ultrasound guidance. In embryo cryopreservation, retrieved oocytes are fertilized with partner or donor sperm, and resulting embryos are vitrified for future use. In oocyte cryopreservation, mature oocytes are vitrified without fertilization, offering the advantage of not requiring sperm availability at the time of preservation.

The introduction of vitrification techniques has dramatically improved outcomes for both oocyte and embryo cryopreservation compared with slow-freezing methods. Vitrification involves ultra-rapid cooling that prevents ice crystal formation and minimizes cryodamage, resulting in significantly higher survival rates, fertilization rates, and clinical pregnancy rates. For oocyte cryopreservation, the widespread adoption of vitrification has transformed it from an experimental procedure into a standard clinical practice with outcomes approaching those of fresh oocytes.



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A systematic review and meta-analysis (Fraison et al., 2023) examined live birth rates after female fertility preservation for cancer or hematopoietic stem cell transplantation. The analysis demonstrated that embryo and oocyte cryopreservation are effective techniques with established success rates. Oocyte cryopreservation success is highly age-dependent, with a strong correlation between age at oocyte retrieval and subsequent live birth rates. Women aged under 35 years have significantly better outcomes compared with older women, reflecting the natural age-related decline in oocyte quality and quantity. The estimated live birth rate per retrieved oocyte decreases with increasing age, emphasizing the importance of early referral and preservation before significant ovarian reserve depletion occurs.

For women with hormone-sensitive cancers, particularly breast cancer, controlled ovarian stimulation has historically raised concerns about potential estrogen exposure and its effects on tumor growth. A prospective controlled study (Azim et al., 2008) evaluated the safety of fertility preservation by ovarian stimulation with letrozole and gonadotropins in patients with breast cancer. The study demonstrated that letrozole co-administration significantly reduced peak estradiol levels during stimulation while maintaining adequate oocyte yields, suggesting that this approach may be safe in estrogen receptor-positive breast cancer patients. More recent evidence supports the safety of ovarian stimulation protocols incorporating aromatase inhibitors in this population.

A critical review of the literature (Massarotti et al., 2017) concluded that oocyte cryopreservation is a safe and effective option for fertility preservation in female cancer patients. The review highlighted that oocyte cryopreservation offers the advantage of avoiding ethical and legal issues associated with embryo storage while providing autonomy to women who may not have a partner at the time of cancer diagnosis. However, the authors emphasized that oocyte cryopreservation outcomes are age-dependent and that women should be counseled appropriately about their individual chances of success based on age and ovarian reserve markers.

3.1.2 Ovarian Tissue Cryopreservation

Ovarian tissue cryopreservation involves surgical removal of ovarian cortical tissue, which is then sectioned into thin strips and cryopreserved for future transplantation. This technique is particularly valuable for prepubertal girls who cannot undergo ovarian stimulation due to immaturity and for women who require urgent cancer treatment that precludes the time needed for ovarian stimulation. Additionally, ovarian tissue cryopreservation may be the only option for women with certain cancers where ovarian stimulation is contraindicated or for those with limited ovarian reserve.

The technique is performed via laparoscopic oophorectomy or partial ovarian tissue removal, followed by processing and cryopreservation of cortical strips containing primordial follicles. When the patient is ready to attempt pregnancy, tissue can be thawed and transplanted either orthotopically (to the remaining ovary or pelvic peritoneum) or heterotopically (to a non-pelvic site). Orthotopic transplantation aims to restore natural ovarian function and fertility, while



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heterotopic transplantation may be considered in cases where pelvic anatomy precludes orthotopic placement.

A comprehensive review (Donnez et al., 2006) established ovarian tissue cryopreservation and transplantation as a viable fertility preservation option. Since that review, hundreds of live births have been reported following ovarian tissue transplantation worldwide, confirming its clinical utility. The primary advantage of ovarian tissue cryopreservation is that it preserves thousands of primordial follicles in the ovarian cortex, potentially restoring both endocrine function and fertility. Unlike oocyte and embryo cryopreservation, ovarian tissue cryopreservation does not require ovarian stimulation, making it immediately available for patients who need to initiate chemotherapy urgently.

A systematic review and meta-analysis (Erden et al., 2024) specifically examined the utility and outcomes of ovarian tissue cryopreservation and transplantation for gynecologic cancers. The analysis demonstrated encouraging outcomes in terms of restoration of ovarian function and live births following transplantation. However, the authors emphasized the theoretical risk of reintroducing malignant cells with ovarian tissue transplantation in patients with certain gynecological cancers, particularly ovarian malignancies. Careful assessment of the risk of malignant cell contamination in ovarian tissue is essential before considering transplantation in these patients.

Despite its advantages, ovarian tissue cryopreservation has limitations. The number of oocytes available is limited to those present in the stored tissue at the time of cryopreservation, and transplantation success depends on the initial follicular density, which declines with age. Furthermore, there is a risk of ischemic injury to the tissue during transplantation, which can significantly reduce follicular survival. The technique also requires an operative procedure with associated risks and recovery time.

A systematic review and meta-analysis (Fraison et al., 2023) included ovarian tissue cryopreservation as an established technique with documented success. The analysis demonstrated that ovarian tissue cryopreservation has resulted in live births, though the overall success rate is lower than that of embryo or oocyte cryopreservation when considered per patient. However, ovarian tissue cryopreservation remains the only option for prepubertal girls and some women requiring immediate treatment, making it an essential component of the fertility preservation armamentarium.

3.2 Fertility-Sparing Surgery

Fertility-sparing surgical approaches are relevant for selected women with gynecological malignancies, particularly early-stage cervical cancer and certain ovarian tumors. These techniques aim to remove the malignancy while preserving the uterus and at least one ovary, thereby maintaining the potential for future natural conception and childbearing.

A systematic review (Kuznicki et al., 2021) evaluated fertility-sparing surgery for early-stage cervical cancer. The review evaluated radical trachelectomy (removal of the cervix and



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surrounding parametrial tissue while preserving the uterine corpus) and cone biopsy for patients with early-stage cervical cancer. The authors demonstrated that fertility-sparing surgery is feasible and oncologically safe in carefully selected patients with early-stage disease (stages IA1 to IB1). The outcomes in terms of oncological safety and subsequent pregnancy rates were encouraging, though the authors emphasized the importance of strict patient selection criteria and surgical expertise.

For women with early-stage ovarian cancer, fertility-sparing surgery may involve unilateral salpingo-oophorectomy with preservation of the contralateral ovary and uterus, depending on the specific tumor type and stage. Similarly, conservative surgical approaches for uterine cancer may be considered in highly selected cases, though fertility-sparing options for endometrial cancer remain limited compared with cervical and ovarian malignancies.

The decision to pursue fertility-sparing surgery requires careful multidisciplinary evaluation involving gynecologic oncologists, reproductive specialists, and the patient. Factors to consider include cancer type and stage, tumor biology, patient age and reproductive history, and personal preferences regarding future fertility. Patients must understand both the potential benefits of fertility preservation and the oncological risks, including the possibility of disease recurrence and the need for additional treatment if conservative surgery proves inadequate.

3.3 Ovarian Transposition

Ovarian transposition, also known as oophoropexy, is a surgical procedure that involves repositioning the ovaries out of the pelvic radiation field to minimize radiation-induced damage. This technique is indicated for women who require pelvic or abdominal radiotherapy as part of their cancer treatment, particularly those with pelvic malignancies such as rectal cancer, anal cancer, or gynecological cancers.

A study (Moawad et al., 2017) evaluated laparoscopic ovarian transposition before pelvic cancer treatment, assessing ovarian function and fertility preservation outcomes. The study demonstrated that ovarian transposition can successfully preserve ovarian function in a significant proportion of patients undergoing pelvic radiation. The procedure involves laparoscopic mobilization of the ovaries and their vascular pedicles, followed by fixation to a location outside the radiation field, typically in the paracolic gutters or at the level of the iliac fossae.

The success of ovarian transposition depends on several factors, including the radiation dose and field, patient age, and baseline ovarian reserve. Younger patients and those with higher baseline ovarian reserve are more likely to maintain ovarian function after transposition. However, ovarian transposition does not protect against the effects of systemic chemotherapy, and the ovaries may still be susceptible to damage from chemotherapy agents administered concurrently with radiation.

Potential complications of ovarian transposition include ovarian cyst formation, torsion, and pain. Additionally, the repositioned ovaries may be difficult to access for oocyte retrieval if



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future assisted reproduction is needed. Patients should be counseled about the potential risks and benefits of the procedure, as well as the possibility that ovarian function may still be compromised despite transposition.

3.4 Ovarian Suppression with Gonadotropin-Releasing Hormone Agonists

The use of gonadotropin-releasing hormone (GnRH) agonists during chemotherapy has been proposed as an adjunctive strategy to preserve ovarian function and fertility. GnRH agonists induce a temporary state of ovarian suppression by downregulating the hypothalamic-pituitary-ovarian axis, thereby reducing the exposure of ovarian follicles to the gonadotoxic effects of chemotherapy.

A systematic review and meta-analysis of individual patient-level data (Lambertini et al., 2018) evaluated the use of GnRH agonists during chemotherapy for preservation of ovarian function and fertility in premenopausal patients with early breast cancer. The analysis demonstrated that GnRH agonist administration during chemotherapy significantly reduced the risk of early menopause and improved the likelihood of subsequent pregnancy. However, the authors emphasized that GnRH agonists should not replace established fertility preservation methods such as oocyte or embryo cryopreservation.

The mechanism by which GnRH agonists may protect ovarian function is not fully understood but is thought to involve multiple pathways. The suppression of gonadotropins reduces the number of primordial follicles recruited into the growing pool, potentially making them less susceptible to chemotherapy-induced damage. Additional mechanisms may include direct effects on the ovary through GnRH receptors and modulation of apoptosis and cell survival pathways.

Current guidelines recommend that GnRH agonists be offered as an adjunctive option to women with breast cancer who are interested in preserving ovarian function, particularly in the context of chemotherapy. However, the evidence for efficacy in other cancer types is less robust, and the use of GnRH agonists should be considered on a case-by-case basis. Importantly, GnRH agonists should be considered complementary to, rather than a replacement for, established fertility preservation techniques.

A systematic review and meta-analysis (Arecco et al., 2022) examined the safety of fertility preservation techniques before and after anticancer treatments in young women with breast cancer. The analysis confirmed the overall safety of GnRH agonist use during chemotherapy, with no adverse effects on cancer outcomes observed. This safety profile is reassuring and supports the use of GnRH agonists as an adjunctive measure in breast cancer patients who are not eligible for or decline oocyte or embryo cryopreservation.

3.5 Factors Influencing Fertility Preservation Decision-Making

The selection of an appropriate fertility preservation strategy is influenced by multiple factors that must be considered in a comprehensive, individualized manner. Patient age is one of the



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most important determinants of success, as ovarian reserve declines with age and the quality and quantity of oocytes diminish over time. Younger women have higher success rates with oocyte and embryo cryopreservation, making early referral particularly critical.

Cancer type and stage influence both the urgency of treatment initiation and the safety of specific preservation techniques. Women with rapidly progressive cancers may not have time for ovarian stimulation before treatment, making ovarian tissue cryopreservation the only viable option. Conversely, women with more indolent cancers may have sufficient time for ovarian stimulation and oocyte or embryo retrieval.

The planned cancer treatment regimen is a crucial consideration. Chemotherapy regimens containing alkylating agents are particularly gonadotoxic, with agents such as cyclophosphamide, cisplatin, and busulfan posing the greatest risk. Radiation to fields that include the pelvis or abdomen carries significant ovarian toxicity, making ovarian transposition a consideration for patients requiring such treatment. The anticipated gonadotoxic potential of the planned therapy informs the urgency and nature of fertility preservation counseling.

Coordination between oncology and reproductive medicine teams is essential for timely fertility preservation. The ASCO guideline (Su et al., 2025) emphasizes that fertility preservation discussions should occur as early as possible, preferably before cancer treatment initiation, and highlights the importance of timely, coordinated input from oncology and reproductive medicine specialists and shared decision-making. This multidisciplinary approach ensures that patients receive comprehensive information about all available options and can make informed decisions aligned with their values and preferences.

Patient preferences regarding future family building, including the desire for biological children and attitudes toward alternative family-building options such as adoption or gamete donation, should be incorporated into decision-making. Shared decision-making respects patient autonomy and promotes satisfaction with the chosen preservation strategy.

3.6 Guidelines and Recommendations

The ASCO guideline update (Su et al., 2025) provides comprehensive recommendations for fertility preservation in people with cancer. The guideline emphasizes that all reproductive-age patients should be informed about the potential impact of cancer treatment on fertility and offered fertility preservation options. Healthcare providers should discuss fertility preservation as early as possible, ideally before treatment initiation, and refer patients to reproductive specialists for evaluation and counseling. The guideline recommends embryo and oocyte cryopreservation as established fertility preservation methods, with ovarian tissue cryopreservation considered an established technique that may be particularly useful for prepubertal patients and those who cannot undergo ovarian stimulation. The guideline also acknowledges the role of GnRH agonists as an adjunctive measure in selected patients.

The ESHRE guideline (Anderson et al., 2020) provides similar recommendations from a European perspective. The guideline emphasizes the importance of multidisciplinary care and



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early referral to fertility preservation services. It recommends that all patients of reproductive age should be counseled about fertility preservation before starting gonadotoxic treatment and that fertility preservation should be integrated into cancer care pathways. The ESHRE guideline provides detailed recommendations on specific techniques, their indications, and the factors influencing their selection.

Both guidelines stress the importance of equitable access to fertility preservation services and the need for institutional policies and funding mechanisms to support fertility preservation for cancer patients. Financial barriers remain a significant obstacle to accessing fertility preservation, and advocacy efforts are needed to ensure that all patients have the opportunity to preserve their fertility regardless of their socioeconomic status.

4. Discussion

The integration of fertility preservation into comprehensive cancer care represents a paradigm shift in oncology practice. As cancer survival rates continue to improve, the long-term quality of life of survivors, including reproductive health outcomes, has become an increasingly important focus of care. The availability of multiple fertility preservation techniques offers hope for many young women with cancer, enabling them to pursue biological parenthood after treatment and mitigating the distress associated with treatment-related infertility.

The evidence reviewed in this article demonstrates that embryo, oocyte, and ovarian tissue cryopreservation are established fertility preservation approaches with documented success. The meta-analysis (Fraison et al., 2023) provides important quantitative data on live birth rates after each technique, informing patient counseling and decision-making. The age-dependent nature of success underscores the importance of early referral and preservation before significant ovarian reserve decline occurs. Women should be counseled about their individual chances of success based on their age and ovarian reserve markers, enabling realistic expectations and informed decision-making.

For women with hormone-sensitive cancers, particularly breast cancer, the safety of ovarian stimulation has been a longstanding concern. The studies (Azim et al., 2008; Arecco et al., 2022) provide reassuring evidence regarding the safety of ovarian stimulation with letrozole and the overall safety of fertility preservation techniques in this population. However, ongoing research is needed to confirm long-term safety and to identify any subtle effects of ovarian stimulation on cancer outcomes. Clinicians should continue to individualize stimulation protocols and closely monitor patients during the fertility preservation process.

Ovarian tissue cryopreservation represents an important option for patients who cannot undergo ovarian stimulation, including prepubertal girls and women requiring urgent treatment. The technique has matured from experimental to established practice, with hundreds of live births reported worldwide. A systematic review and meta-analysis (Erden et al., 2024) demonstrated encouraging outcomes for ovarian tissue cryopreservation and transplantation for gynecologic



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cancers, though the risk of malignant cell contamination warrants careful consideration. Further research is needed to refine techniques for assessing ovarian tissue for malignant contamination and to optimize transplantation outcomes.

Fertility-sparing surgery and ovarian transposition provide additional options for selected patients. A systematic review (Kuznicki et al., 2021) demonstrated the feasibility and oncological safety of fertility-sparing surgery for early-stage cervical cancer, while a study (Moawad et al., 2017) showed that ovarian transposition can preserve ovarian function in patients requiring pelvic radiation. These techniques should be considered in the appropriate clinical context, with careful attention to oncological safety and patient selection.

The adjunctive role of GnRH agonists during chemotherapy remains an area of active investigation. The meta-analysis (Lambertini et al., 2018) demonstrated benefits in terms of ovarian function preservation and pregnancy outcomes in breast cancer patients. However, GnRH agonists should not replace established preservation methods, and their efficacy in other cancer types requires further study. Current guidelines recommend offering GnRH agonists as an adjunctive option to eligible patients who are interested in preserving ovarian function.

Despite the availability of these techniques, significant barriers to fertility preservation exist. Financial constraints, lack of patient awareness, insufficient provider knowledge, and logistical challenges related to urgent treatment timelines continue to limit access. Equity in access to fertility preservation services is a critical concern, as patients from disadvantaged backgrounds may face additional obstacles to receiving fertility preservation care. Advocacy efforts and policy interventions are needed to address these barriers and ensure that all patients have the opportunity to preserve their fertility.

The importance of multidisciplinary collaboration cannot be overstated. The ASCO (Su et al., 2025) and ESHRE (Anderson et al., 2020) guidelines emphasize the need for timely, coordinated input from oncology and reproductive medicine specialists. Shared decision-making that incorporates patient preferences and values is essential for patient-centered care. Structured multidisciplinary oncofertility programs that integrate cancer care and fertility preservation have been shown to improve patient satisfaction and outcomes.

Looking forward, continued research is needed to improve the success rates of fertility preservation techniques, to better understand the mechanisms of gonadotoxicity and ovarian protection, and to identify novel approaches to fertility preservation. Advances in in vitro folliculogenesis, artificial ovary technology, and stem cell biology hold promise for future developments in the field. However, translation of these advances into clinical practice will require continued investment in research and clinical infrastructure.

5. Conclusion



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Fertility preservation in women with cancer has evolved from an emerging concept to an established component of comprehensive cancer care. Oocyte, embryo, and ovarian tissue cryopreservation are proven techniques that offer hope for biological parenthood after cancer treatment. Fertility-sparing surgery and ovarian transposition provide additional options for selected patients, while GnRH agonists may have an adjunctive role in preserving ovarian function.

Early referral and individualized counseling can meaningfully expand reproductive options for women with cancer. The importance of timely, coordinated input from oncology and reproductive medicine specialists cannot be overstated. Shared decision-making that considers patient preferences, values, and individual clinical factors is essential for patient-centered care. Equitable access to specialized fertility preservation services is a critical concern that requires advocacy and policy interventions.

As cancer survival continues to improve, the long-term quality of life of survivors, including reproductive health outcomes, must remain a priority. Continued research, education, and advocacy are needed to advance the field of oncofertility and to ensure that all young women with cancer have the opportunity to preserve their fertility and pursue their reproductive goals.

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