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## Choosing Life When Facing Death: Understanding Fertility Preservation Decision-Making for Cancer Patients

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### Framing the Paradox: Understanding Reproduction in Current Society

On a fundamental biological level, humans are programmed to reproduce; hormonal and physiological influences are reinforced by social pressures and structures that urge parenthood in most cultures. The inability to reproduce usually causes distress and suffering among men and women alike. The advent of assisted reproductive technologies such as embryo/egg banking and in vitro fertilization has changed the face of reproduction, offering the possibility of parenting to a wider range of individuals who formerly were unable to reproduce. Although these controversial technologies have arguably blurred the boundaries of what it means to be a family or to parent a child, their wide use reveals that reproduction, particularly biological reproduction, holds great value. People find parenting their own genetic child compelling. Apparently a deep desire to propagate our own germ line is part of who we, as people, are.

The emergent discipline of oncofertility, an intersection between oncology and fertility, recognizes that cancer patients and cancer survivors have legitimate concerns about their fertility. Common cancer treatments such as chemotherapy and radiation pose a great threat to reproductive functioning, and infertility is an all too common side effect of cancer therapy. Oncofertility addresses these concerns, using both existing fertility preservation technologies and developing new techniques to accommodate the unique concerns of cancer patients. These new technologies place the patient in a somewhat precipitous position, paradoxically thinking about procreation at a time when one's own life is at stake.

Elements of this paradox, however, are not new. Rather, technology has engendered a new instantiation of this ancient intersection of procreation and death. Maternal mortality was a historical threat facing pregnant women, yet did not deter the majority of women from attempting childbirth. Although maternal mortality has largely been eradicated in the Western hemisphere, childbirth remains a prominent risk for women in the global South. Each year across the globe there are more than half a million pregnancy-related deaths, with most women readily assuming the risks associated with childbirth [1]. Likewise, fathers have demonstrated their drive to reproduce in the face of an uncertain future, often leaving their wives with child when they embark for war. World War II provides a case in point: in the 1930s the birthrate in the United States hovered between 18.4 and 19.2 live births per 1,000; it increased to 22.7 in 1943, the height of the wartime baby boom [2, 3]. Today, it is becoming more and more common for soldiers, both male and female, to bank gametes before leaving for war, a modern twist on the old practice of siring before leaving for war [4]. Certain fertility preservation facilities even offer discounted rates for soldiers and the nation's "first responders" – firemen, policemen, paramedics, and emergency medical technicians – wishing to preserve their sperm [5]. This drive to procreate in the face of

adverse circumstances has manifested itself in human populations across both temporal and geographical boundaries and continues to impact reproductive choices.

Modern reproductive technologies are presenting cancer patients, practitioners, and society with a new version of this universal dilemma: how to procreate successfully when faced with death. This crisis is shared between the human, animal, and plant kingdoms, as evidenced by particular animal and plant species. In the animal kingdom, male octopuses die within a few months of mating and female squid often die right after their offspring hatch. More dramatically, the female praying mantis eats the male praying mantis to initiate copulation, and the female black widow spider eats the male black widow spider post copulation. In the plant kingdom, annual plants such as corn, lettuce, pea, and marigold usually die within 1 year of germination. The hemp plant dies soon after it flowers. Certain species within the plant and animal kingdoms demonstrate a similar reproductive resilience as seen in humans, opting to pursue procreation when facing an uncertain future.

While the fundamental issues at stake have historical roots, the personal accounts, experiences, and patient cases represent novel facets of familiar themes. Oncofertility emerged from the unmet, compelling desire for fertility preservation options as expressed by cancer survivors themselves. This commentary explores fertility preservation for cancer patients, analyzing the unique intersection of life and death that these individuals face and reflecting upon the potential mechanisms that drive these profound reproductive decisions. It begins with a discussion of fertility preservation for women facing a cancer diagnosis, commenting on motherhood and maternal instinct and how these concepts are understood both in society at large and among cancer patients. An assessment of fatherhood in the face of cancer follows, including a discussion about the role of the father in current society and how the responsibility of fatherhood is managed by male cancer patients. Fertility preservation for pediatric cancer patients is examined next, highlighting the specific concerns and considerations for this vulnerable population. The latter portion of this chapter is devoted to understanding *how* cancer patients manage the inherent life/death confrontation in making fertility preservation choices, *what* coping mechanisms may come into play in this process, and *who* can help these patients navigate these complex decisions in the clinical setting.

## Motherhood in the Face of Cancer

Women facing a cancer diagnosis have fewer and less successful options to preserve their fertility compared to males, placing them in a precarious position regarding their ability to procreate in the face of cancer. While some female cancer patients may be able to delay cancer treatment to pursue embryo or egg banking, more severe cancer diagnoses as well as other circumstances (such as a lack of partner or sperm donor) may prohibit women from taking advantage of these more successful techniques. Pre-pubertal females are not eligible for embryo or egg banking. For the women still desiring biological motherhood, investigational techniques such as ovarian tissue cryopreservation provide hope for a future pregnancy, but, as of yet, fewer guarantees of success. The popularity of oncofertility clinical trials demonstrates that not only are women interested in these investigational techniques (even though they know the methods may never reach fruition) but they are also actively pursuing them<sup>1</sup> (Gerrity, September 3, 2009, Personal conversation). What factors drive these decisions and how is the crisis of facing death mitigated by the desire to produce life?

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<sup>1</sup>Of the approximately 300 women who requested fertility preservation consultations at Northwestern University in the past year and a half, approximately 75 chose to pursue a fertility preservation intervention, including embryo banking ( $n=53$ ), oocyte banking (15), and ovarian tissue cryopreservation ( $n=7$ ) (Gerrity, September 3, 2009, Personal conversation).

Fertility preservation efforts must be undertaken before the initiation of cancer treatment, at a time when a woman's body is disease-laden. A woman pursuing fertility preservation is thus seeking to secure her physical capability to produce a new life during a time when her body cannot necessarily sustain its own life. The juxtaposition of life and death and of health and disease is an extraordinary example of the core instinct to mother. In the face of famine, warfare, and devastating diseases such as HIV/AIDS, females have shown that the instinct to give birth and create life is sustained [6]. But why? And how? Does one's fear for one's own survival sometimes outweigh the desire to create a future life?

To explore these questions we started with this one: what is driving these maternal desires? Some argue that this "maternal instinct" is something women are born with; others contend that society grooms women to become mothers. Both interpretations hold merit, and each can offer insight into the mechanisms that play out during fertility preservation decision-making for cancer patients. This section will explore and outline each interpretation, emphasizing the relevance of these concepts in the context of fertility preservation decision-making and describing how they almost certainly work together in this instance.

The desire to become a mother is often presented as an innate characteristic, a mammalian manifestation of hormones and impulses that urges women to reproduce. As S. Philip Morgan and Rosalind King describe, humans have genetically determined forms, sensitivities, and physical and emotional reactions that encourage sexual activity; these are underlying genetic predispositions that have sustained our species throughout time [7]. While the biological underpinnings of this desire are debatable (a desire for sex could easily be misinterpreted as or confused with a desire for motherhood), it is indisputable that complex and shifting physical, psychological, and emotional changes develop in maternal physiology during pregnancy [8]. Without this biological programming, humans would probably have perished many eras ago. This underlying genetic drive that shapes the pregnancy experience and parenting strategies thereafter is shared among the human and animal kingdoms. Mothering (and parenting) strategies are remarkably consistent across a diverse array of species, including monkeys, mice, seals, birds, and spiders, suggesting a highly conserved set of genes that drive them and pointing to potential underlying physical similarities in the birth process and development of parenting habits [9].

In humans, intense hormonal changes characterize pregnancy, with human chorionic gonadotropin hormone (hCG), human placental lactogen (HPL), estrogen, and progesterone playing major roles. Changing hormone levels can contribute to a variety of changing emotions. While pre- and postnatal hormonal changes are involved in the rapid onset of mammalian maternal behavior at birth, there is no known formula or combination of these hormones that ensures the "mothering" instinct in women [10]. Individual women respond differently to each pregnancy and birth experience. While there are biological influences apparent in pregnancy desires and behaviors, these forces do not act alone; social forces, pressures, and structures often reinforce both maternal desires and parenting behaviors.

Our current social structure is indeed rooted in a defined role of "mothering," a sexual division of labor in which women parent and men are active in the labor force. Sociologist and psychoanalyst Nancy J. Chodorow argues that people talk about a man "mothering" a child but are not likely to talk about a woman "fathering" a child; if this is the case, being a mother is not limited to giving birth, and the roles of "mother" and "father," although grounded in biology, are also social [11]. While fathering is primarily defined as a siring role, mothering entails a lifelong care-giving role, and motherhood is not limited to the singular event of childbirth. Biological impulses may urge women to have children, but society guides them in developing parenting habits and designating family structure.

As medical ethicist Janice G. Raymond describes, motherhood is fundamentally relational [12]. Although a biological capacity, motherhood occurs within a social, political, and historical context. If motherhood is shaped by sociocultural factors, then the desire to partake in this greater social role must originate at least in part from society. Perhaps, as postulated by psychologist Daphne de Marneffe, the maternal desire may not be created by a social role but is indeed supported by one, namely the gender role of women [13]. If this is the case, then the plausible biological and hormonal impulses to mother are sustained and supported by society. In this way, a combination of biological and social factors may lead women to deeply desire their own biological children and guide them in nurturing and “mothering” their offspring. But what drives women to desire and accept this role of a mother?

de Marneffe argues that the desire to mother is not only the desire to have children, but also the desire to care for them, and that maternal desire is, “the longing felt by a mother to nurture her children; the wish to participate in their mutual relationship; and the choice, insofar as it is possible, to put her desire into practice” [13]. But from where does this “longing” originate? Raymond contends motherhood has been constructed as an instinct, a biological bond with a child, or an unquestioned state of being that is the essence or pinnacle of female existence [12]. It is reasonable to assume that each of these features describes a part of what drives and constitutes motherhood. Therefore, we assume that a combination of biological, physiological, and social factors interact to influence reproductive choices.

Given the importance of motherhood to many women, it is easy to imagine a cancer patient taking preventative steps to ensure that she has an option to become a biological mother. The various forces (both biological and social) driving this desire or impetus to mother are crucial in understanding how to counsel and advise female cancer patients who are contemplating fertility preservation. The more complicated question of how an individual woman manages this decision to prepare for a future life when her own existence is in jeopardy will be assessed in more depth after exploring fertility preservation among both male and pediatric cancer patients.

## Fatherhood in the Face of Disease

Pubertal and post-pubertal male cancer patients facing a cancer diagnosis have a comparatively easy and effective option to preserve their fertility: they can bank a sperm sample and leave it frozen for decades until they are ready to become a father. The technology for freezing and thawing sperm is well established, successful, relatively inexpensive. Men choosing to bank their sperm are responding to a counterpart reproductive impetus as seen in women. While the parenting desire in males shares commonalities with that in females, this drive is based on indistinct, sex-specific biological influences and gender-specific social influences.

Conventional wisdom claims that men have a stronger sex drive than women, with biological processes, particularly the substantial gender difference in testosterone, implicated in determining sex drive differences between men and women [14, 15]. This view of the male sex drive has historical roots but is also supported by quantitative biological evidence. Charles Darwin remarked that “males, with their superior strength, pugnacity, armaments, unwieldy passion and love songs, are almost always the more active and most often, the initiators of sexual intercourse” [16]. On a genetic level, demographer Lawrence C. Shimmin, along with colleagues, found supporting evidence that the evolution of DNA sequences in higher primates is male driven [17]. Biologists Rama S. Singh and Rob J. Kulathinal echoed this finding, evidencing how genes that possess sex-specific effects on male fitness accumulate to a much greater extent [18]. These specific genetic

predispositions in the male may play a role in influencing men to desire biological children. Male biological and hormonal impulses to procreate may be driven by these underlying evolutionary mechanisms – safeguards that ensure propagation of the male gene and maintain men’s interest in procreation.

How do biological and genetic influences translate into parenting behavior in men? Craig Rypma argues that similarities in parental behavior observed across cultures are indicative of biological (e.g., hormonal) influences, while perceived cultural differences in fathering can be viewed as learned responses resulting from social adaptations [19]. In an analysis of expectant fathers, psychologist Anne E. Storey found that men had similar stage-specific differences in hormone levels as women, including higher concentrations of prolactin and cortisol in the period just before the births and lower postnatal concentrations of sex steroids (testosterone or estradiol). Although these data do not offer functional proof of hormonal involvement in paternal behavior, they nevertheless suggest that men exposed to appropriate stimuli undergo hormonal changes around the birth of their child that may facilitate the expression of paternal behavior [9]. Storey concludes that the apparent testosterone decrease in men during the postnatal period may enhance paternal responsiveness by reducing men’s tendencies to engage in non-nurturing behaviors [9]. In sum, men’s desire to reproduce may be accounted for by biological and hormonal impulses, evolutionary-driven genetic expressions that ensure survival for and propagation of the male gene. These biological and hormonal factors probably contribute to a man’s decision to preserve his fertility even when faced with cancer. However, they cannot fully explain this behavior. Sociocultural influences must be explored as well.

As Lawrence M. Berger and colleagues argue, a purely biological-based conception of fathering is likely to have limited utility for fully explicating the parenting practices of both biological and social fathers<sup>2</sup> [20]. Indeed, socioeconomic, relationship, and personality factors combine and interact to influence fathers’ involvement in child care [14]. In this way, the role of the father is not limited to his biological contributions, but extends to his relational roles in providing care for both the child and his family as a whole. A man’s expectations of his role as a father, then, can arguably originate from social expectations and norms of fathering in general. The context in which men care for their infants and the meanings they create from their fathering experiences are frequently influenced by societal expectations [21].

The success of the available fertility preservation technologies is higher and the risks are lower for men when compared to women. As with women, biological and social influences compel men to become biological parents. Although the science of oncofertility is focused on mitigating the gender gap in terms of successful fertility preservation technologies, this should not justify overlooking male needs. Men have independently demonstrated that they too value their potential to procreate when faced with a cancer diagnosis, exhibiting a similar drive to reproduce as women [22]. The factors driving men to protect their ability to father are both biological and social. Recognizing these influences is crucial to helping men navigate fertility preservation decision-making in the clinical environment.

## A Transgenerational Perspective

While the parenting instincts of men and women are relatively clear, the desire to parent among pediatric and adolescent cancer patients is a more complicated issue. Childhood cancer survivorship is on the rise, and these young cancer patients can now anticipate a life

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<sup>2</sup>Social parent, as used here, refers to a parent who is responsible for everyday caretaking of a child but is not necessarily biologically related to the child [20].

after disease. As this growing population begins to age, they will be faced with the consequences of cancer treatment, including potential infertility. Though scarce, some fertility preservation options are currently available for this cohort. Ejaculation can be stimulated in young boys and the resulting sperm cryopreserved<sup>3</sup> [23]. Pre-pubertal boys have fewer options; testicular tissue biopsy can be used to gather immature and developing sperm, but this technique is still investigational and offers no guarantees or assurances that a young boy will be able to father a child in the future<sup>4</sup> [24]. Pre-pubertal girls have only one option, ovarian tissue cryopreservation, which is also considered an investigational technique with no guarantees for a future baby.

Fertility preservation choices are particularly complicated for the pediatric and adolescent patients for a number of reasons. First, the young child may not be intellectually, emotionally, or psychologically developed enough to comprehend the situation and understand the implications of their decisions. Since children develop at different rates, no age-specific guidelines exist on when it is appropriate for young patients to make their own autonomous reproductive health decisions. For this reason, parental influence may drive decisions for the pediatric patient, with child assent and parental consent complicating decision-making. Second, both parents and physicians may have trouble viewing a young child as a future sexually mature being and thus find it difficult to make reproductive decisions on behalf of the child. Finally, as children mature, they may feel altered pressures to procreate because their parents invested time, money, and effort to preserve their fertility many years prior. For these and other reasons, parents and physicians alike play a key role in influencing the reproductive future of pediatric and adolescent cancer patients.

In deciding to pursue fertility preservation for their child, parents must act quickly, as fertility preservation efforts have to take place before cancer treatment can begin. Justifying this potential delay in treatment is a heavy task, as it may not always be clear what is in the best interests of the child. The nascent autonomy of the child may be compromised as parental and provider wishes for a child's future fertility may overshadow the expressed choices of the child. Parents and healthcare providers will often need to make heavy choices on behalf of young cancer patients, choices that will change the child's reproductive and sexual future.

Parents and providers may respond to fertility preservation choices for young cancer patients based on their own experiences with mothering and/or fathering, as well as perceived social stigmas that they fear the young patient may face once of reproductive age. Young patients who advocate for autonomy to make their own decisions may be responding to social influences, hints of biological urges, and perceived future desires to parent. Depending on the age of the young cancer patient, psychosocial reasoning may also come into play during the decision-making process. Understanding the forces driving these decisions is necessary for proper advising of young patients, if they are to be suitably voiced, represented, and advocated for.

The majority of pediatric and adolescent cancer patients will survive their disease, resuming their lives post-cancer with few lingering complications. Oncofertility technologies are intended to allow these young patients the option to become a biological parent should they wish. Fertility preservation for pediatric and adolescent cancer patients, however, is not a straightforward decision, as it often requires a delay in treatment and may not result in the

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<sup>3</sup>Two techniques can be used to stimulate ejaculation in young boys: penile vibratory stimulation, which is noninvasive and simple, or electro-ejaculation, which is more complicated and requires general anesthesia [23].

<sup>4</sup>Although this option requires invasive procedures, parents of boys surviving childhood cancer have indicated that this option is both desired and accepted [24].

potential to parent. Relevant concerns about surgical complications, treatment delays, future side effects, and false hope need to be addressed as they are raised by parents and young patients alike.<sup>5</sup> Clinical support teams composed of doctors, social workers, psychologists, and ethicists need to be available to help the patient, parent, and provider triad navigate these decisions.

## Decision-Making: Confronting Life and Death Simultaneously

Male, female, and pediatric cancer patients affirm the value of their fertility when choosing fertility preservation in the face of a cancer diagnosis, reflecting individual and social desires, expectations and influences. Although it is clear that cancer patients desire options and opportunities to preserve their fertility, the decision-making process at the point of cancer diagnosis remains unclear. How is the balance between life and death mediated and when does this balance become upset? When does the value of one's own life outweigh the value of a future, imagined child? It is difficult to answer these questions, but we can speculate that psychosocial coping mechanisms may come into play during the decision-making process, buttressing the biological and social impetus to preserve one's fertility.

Gynecologists Sibil Tschudin and Johannes Bitzer argue that cancer, as a life threatening diagnosis, may evoke fear of death and coinciding feelings of suffering, pain, dependence, and loss [25]. Fertility, on the other hand, is associated with new life, hope, joy, pride, strength, optimism, sense in life, and growth. The hope associated with fertility preservation thus represents the opposite of a cancer diagnosis. Perhaps the positive emotions associated with fertility preservation overshadow the negativity brought about by a cancer diagnosis; in the face of despair, people turn to a possibility of hope and cling to an imagined future to confront their dire present. Further, an imagined future of infertility can be as crushing as a cancer diagnosis. Both men and women have the capacity for relentless self-blame, guilt, and shame when it comes to losing something as instinctive and personally and socially important as the ability to have children [26]. Infertility often compromises self-esteem, identity, sexuality, and self-image [25]. Cancer patients may be eager to protect themselves against future emotional grief by preserving their reproductive options. Fertility preservation may be a preventative effort, an assertion that the future can offer a return to a normal life post-cancer.

Current cancer patients may also conceptualize parenting as a beneficial endeavor. de Marneffe argues that parenting is a creative act like no other, one of life's greatest pleasures for women; the act of motherhood enlivens a woman and allows her to discover parts of herself that simply would not exist were it not for her relationship with her growing child [13]. Psychologist Garret D. Evans and child and family development expert Kate Fogarty describe the benefits of being a father to include the enjoyment of secure relationships, enhanced coping skills, larger support networks, more pride in one's job, and greater self-confidence [27]. In this way, cancer patients are not only preventing future distress but are, in a way, trying to ensure future happiness.

But the future fertility of the currently ill patient is by no means guaranteed. Ovarian cryopreservation is still an experimental technique, and even women who opt for embryo or egg banking are not promised a healthy pregnancy and baby. These developing technologies leave room for heightened expectations and, ultimately, false hope. In an effort to protect their future happiness, cancer patients may actually be setting themselves up for future

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<sup>5</sup>As used in this chapter, "false hope" describes the circumstance when (a) expectations and response strategies are based on illusions rather than reality, (b) inappropriate goals are pursued, and (c) poor methods or strategies are used to achieve desired goals [31]. False hope becomes a concern for young cancer patients who undergo ovarian tissue cryopreservation or testicular tissue biopsy as these techniques are both currently in development and may never be successful.

emotional distress. These individuals may be presuming a parenting role that they eventually will not be granted.

Bioethicists John D. Arras and Jeffrey Blustein argue that it is irresponsible to have a child if you cannot meet child-rearing responsibilities, and psychologist Lisa Cassidy claims that people who anticipate not being excellent parents should not parent at all [28, 29]. But we assert that fertility preservation patients are not irresponsible when electing fertility preservation. They are not making the decision to have a child, but rather protecting their potential to parent. Judgments pertaining to an individual's parenting decisions must be withheld until the individual has taken the steps necessary to actually become a parent. Since fertility preservation for cancer patients is an emerging field, few pregnancies have actually been attempted using the experimental techniques developed specifically for cancer patients (such as ovarian tissue cryopreservation).<sup>6</sup> In our experience with patients from our own programs, patients demonstrated considerable thought about both the actions of attempting to preserve their fertility and the choice of when (if ever) to parent. As patients are not choosing to attempt pregnancy at the time of cancer diagnosis (or even shortly thereafter), they are attributing a value to their future, imagined self, an individual who may be more fit to parent.

Cancer patients who choose to preserve their fertility are making a statement that they value their reproductive capacity and options. In the face of a potentially fatal cancer diagnosis they show optimism for the future and assert their potential to parent. Options are preferred over no options, even if outcomes remain uncertain. Fertility preservation choices may be a coping strategy for patients facing a cancer diagnosis, providing hope for a return to a normal life post-cancer.

Psychologists Stephanie Jean Sohl and Anne Moyer define proactive coping as a method of assessing future goals and setting the stage to achieve them successfully, a process through which one prepares for potential future stressors, possibly averting them altogether [30]. Aspiring to a positive future has been found to be distinctively predictive of wellbeing. In the moment of decision-making, biological impulse combines with social pressures and psychological reasoning to influence patient's choices. The intersection of these forces is likely complex, but recognizing that psychological factors are at play as well can help to inform practitioners and patients as to how to make the best choice for each individual.

## Implications and Conclusions

Male, female, and adolescent and pediatric cancer patients who choose to pursue fertility preservation in the face of a cancer diagnosis demonstrate faith and attribute value to their capacity to reproduce at a time when their physical bodies are at risk of not supporting their own lives. Modern science is offering a new option to cancer patients, an option that forces patients to think about creating a new life at a time when their own life is being questioned. New oncofertility technologies follow a greater scientific and medical trend that is challenging definitions of parenting, dissociating parenting from historical limitations, and offering the potential to parent where there previously was none. As such, new conceptualizations of parenting will surface as cancer survivors begin to parent post-cancer. Patients, practitioners, and society alike need to be aware of these new paths to parenthood and understand that they are new manifestations of an old theme: the desire to be a parent. Understanding the biological, social, and psychosocial roots of these parenting desires can

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<sup>6</sup>Many successful pregnancies have resulted from well-developed fertility preservation techniques such as sperm banking and IVF, among both the general population and cancer survivors as well. Fewer pregnancies have been attempted using ovarian tissue cryopreservation as the technique is still considered experimental.



hopefully help healthcare practitioners in best counseling their patients during the decision-making period and thereafter.

The novelty and immaturity of oncofertility technologies reflect the uncertainties of these techniques in clinical practice. Should these technologies prove unsuccessful for the majority of cancer survivors, the medical community will shoulder the blame. Oncofertility in clinical practice necessitates a team of interdisciplinary scholars, including scientists, physicians, social workers, psychologists, ethicists, and so on to come together and share their expertise in how to best counsel cancer patients interested in fertility preservation. Fertility preservation for cancer patients presents a new face to a familiar theme, affirming the universal desire to parent among a previously unacknowledged population. These expanding technologies have the potential to change the trajectory of cancer survivorship. Reflective and critical scholarship must accompany scientific and medical advances in a continuous and focused effort, examining how cancer patients process this complicated decision and how cancer survivors react to their choices years down the line.

Oncofertility technology allows humans to further distance reproductive options from biological constraints, raising fears about regulation and ownership of reproductive materials. The long-term storage of genetic material complicates decision-making for cancer patients, since ownership of the material in the event of death needs to be decided before the patient undergoes fertility preservation. Fertility preservation choices should be made in a supportive and informative environment, with legal experts present to help patients understand their rights and establish ownership stipulations for reproductive materials in case of adverse events. Advance planning is necessary to prevent future complications. Although wishes may change over time, individuals remain legally bound to their original choices. Patients (or their partners) who change their minds need to be counseled on their decisions and provided with coping strategies to come to terms with their choices.

Male and female cancer patients, both adult and pediatric, should not have to make fertility preservation decisions alone. Rather, they should have access to guidance, support, and trained professionals to help them navigate this intersection of life and death. Fertility preservation decision-making for cancer patients is not a single event but rather a larger journey, an emotional experience that is influenced by biological, social, and psychosocial forces interacting with modern medicine. Healthcare providers must be aware of the underlying mechanisms guiding these decisions in order to provide the best care for their patients both at the time of cancer diagnosis and years later, when parenting desires may resurface.

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