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# Contraceptive utilization and counseling among breast cancer survivors

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## Abstract

**Purpose—**To explore contraceptive counseling and utilization among breast cancer survivors.

**Methods—**This is a cross-sectional study. We enrolled reproductive-aged women with a history of breast cancer for a cross-sectional study. Participants were recruited via the Athena Breast Health Network and via the Young Survival Coalition's social media postings. Descriptive statistics were calculated to understand utilization of and feelings about contraceptive methods before, during, and after breast cancer treatment.

**Results—**Data presented here are from an online survey of 150 breast cancer survivors who completed the survey. Seventy-one percent (n=105) of respondents reported being sexually active and not pregnant during their primary cancer treatment (surgery, chemotherapy, and/or radiation). Of these, 90% (n=94) reported using any form of contraceptive, and the most common method was condoms (n=55, 52%). Respondents reported that safety concerns had the biggest influence on their contraception method choice. Sixty-one percent (n=92) reported receiving contraceptive



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Compliance with Ethical Standard

**Conflict of interest** The authors declare that they have no conflict of interest.

**Ethical approval** All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards.

**Informed consent** Informed consent was obtained from all individual participants included in the study.

counseling by their oncologist either before or after treatment, however 49% (n=45) of those did not receive a specific recommendation for a contraceptive method. Of respondents who reported receiving contraceptive counseling from their gynecologist, 44% (n=35) reported that their gynecologist specifically recommended a copper intrauterine device (IUD). The majority of respondents (n=76, 52%) wanted their oncologist to discuss contraceptive options with them and preferred to receive this counseling at the time of diagnosis (n=81, 57%).

**Conclusions—**Breast cancer survivors in this study remained sexually active across the cancer care continuum and predominantly used condoms as their contraceptive method during treatment. Breast cancer patients would prefer contraceptive counseling from their oncologist at the time of their cancer diagnosis.

**Implication for Cancer Survivors—**Education efforts in the future should focus on initiatives to improve comprehensive contraceptive counseling at the time of diagnosis by an oncologist.

### Keywords

Contraceptive; Breast cancer; Reproductive health; Family planning

## Introduction

Reproductive-aged breast cancer survivors have many unique considerations when making decisions about contraceptives, which may put them at risk for choosing methods that do not align with their reproductive goals [14]. Hormonal contraceptives are contraindicated for survivors during the first five years after breast cancer regardless of hormone receptor status [5]. Additionally, breast cancer survivors with specific types of breast cancer are commonly prescribed endocrine therapy for five or more years, during which pregnancy is contraindicated due to tamoxifen's teratogenic effects. Previous studies have found that some cancer survivors believe that they are incapable of becoming pregnant, fail to use any contraceptives or to use less-effective contraceptives, which puts them at risk for unintended pregnancy [1–3]. However, studies have not focused on the experiences of breast cancer survivors. In a recent qualitative study, breast cancer survivors reported safety concerns and misinformation that may influence their decisions [6].

Given the recommendations to avoid pregnancy and hormonal contraceptives as well as the reduced number of contraceptives available to breast cancer survivors, contraceptive counseling that is tailored to each woman's needs, concerns and cancer history would be ideal. Currently, these women may be only receiving contraceptive counseling to avoid hormonal methods but may not be getting additional counseling about methods that are effective and consistent with individual desires. The United States Medical Eligibility Criteria (USMEC) for contraceptive use rates condoms and copper IUDs as the only safe options for women with a history of breast cancer within 5 years. After five years, the classification changes for "USMEC 4: A condition that represents an unacceptable health risk if the contraceptive method is used to USMEC 3: a condition for which the theoretical or proven risks usually outweigh the advantages of using the method [5]." These recommendations do not change based on the hormone receptor status [5]. It is imperative that breast cancer survivors receive accurate counseling to help them make informed

contraception decisions. However, little is known about the timing and content of the contraceptive counseling that they receive from their various clinicians. In addition, little is known about breast cancer survivors' contraceptive counseling preferences. Any insight into these topics will help inform patientcentered care and potentially decrease the incidence of unintended pregnancy in this population.

Contraceptive counseling has the potential to facilitate the selection of safe contraceptives that will prevent unintended pregnancy across the cancer care continuum [2,3]. Prior studies revealed that only 56–65% of reproductive-aged survivors received contraceptive counseling after their cancer diagnosis [2,3]. A retrospective chart review of 211 reproductive-aged female breast cancer patients receiving chemotherapy treatment at a university cancer center revealed that only 10% had documented contraceptive counseling [7]. While a greater proportion than these documented cases may have received counseling, research to date suggests that breast cancer survivors are not receiving adequate counseling about safe and effective contraceptives during or after cancer treatment [2,3,7].

Contributing to the challenge of providing adequate, patient-centered counseling to breast cancer survivors, there is also scant research about their contraceptive preferences and concerns. Few studies have sought to understand how and from whom these women are receiving contraceptive counseling during and after their cancer treatment. Therefore, the objective of the current study was to identify reproductive-aged breast cancer survivors' contraceptive practices, contraceptive counseling needs, and counseling preferences across the cancer care continuum. Secondarily, we sought to gain insight about breast cancer survivors' concerns and barriers related to contraceptive decisions that could inform tailored contraceptive counseling.

## Methods

### Study Design and Data Collection

Between March 2014 and March 2015, we enrolled reproductive-aged female breast cancer survivors to complete a web-based survey. Eligible women had a history of breast cancer within 5 years and were 18–50 years old at the time of enrollment. Women were recruited, with approval, from the University of California Athena Breast Health Network registry and from posting on the Young Survival Coalition's social media sites. The Athena Breast Health Network is a collaboration between the five University of California Medical Center breast programs (University of California Irvine, University of California Los Angeles, University of California San Diego and University of California San Francisco) and Sanford Health (13 mid-west hospitals) to promote standardized and innovated approaches to breast cancer care [8]. Women were recruited only from the local UCSD Athena registry. The Young Survival Coalition is a national organization supporting young women diagnosed with breast cancer. We relied on patient-reported dates of diagnosis or dates logged in the Athena Breast Health Network Registry to determine eligibility. We sent a link to the survey to participants who met the eligibility criteria. The survey was developed with input from women with a history of breast cancer, and based on questions from prior research [2,3]. The survey had a 73 questions and took approximately 30 minutes to complete and was pre-tested for readability and inclusion of appropriate answer choices by breast cancer survivors.

No personal identifiers were collected and all responses were anonymous. This study was approved by the Human Research Protections Program at the University of California San Diego.

## Measures

### Demographics

Participants self-reported their demographic characteristics such as age, race, education, and their cancer history, including questions about estrogen receptor (ER) or progesterone receptor (PR) status, treatment received, and recurrence. Respondents were also asked about any prior pregnancies and about unintended pregnancy since the diagnosis of breast cancer.

### Contraceptive Use

Participants were asked if they were sexually active before diagnosis and during treatment as well as about their contraceptive method during these time periods. Women also reported if they were currently sexually active, their contraceptive method and their pregnancy intention. The contraceptive options included: female sterilization, male sterilization, contraceptive implant, hormonal intrauterine device, copper intrauterine device, shots, birth control pills (with estrogen and progestin), progestin only birth control pills, pill unknown type, contraceptive patch, contraceptive ring, male condoms, diaphragm, cervical cap, sponge, not having sex at certain times, withdrawal, foam or no method.

Participants were given the option to select as many contraceptive methods as were appropriate, and were categorized by the highest tier method reported. The participants were also asked about the biggest influence on their contraceptive method choice. For those who reported not using contraceptives, they were asked an additional question about the main reason for non-use.

### Perceptions about Copper IUDs

Participants were asked a series of questions to assess their perceptions of copper IUDs. An example of a question included was, “Getting a copper IUD is the best protection against pregnancy for breast cancer survivors.” All questions were measured on a 5-point Likert scale (1 = *Strongly Disagree* to 5 = *Strongly Agree*).

### Contraceptive Communication

Participants were asked if a healthcare provider advised them to avoid pregnancy and if they were given a reason to avoid pregnancy. The response options included a) Yes and the reason was because pregnancy could affect my risk of cancer recurrence b) Yes and the reason was the cancer treatment during pregnancy could affect the baby c) Yes contraception was discussed but the reason was not explained d) No it was not discussed. Additionally, participants were asked if their surgeon, oncologist, and/or gynecologist discussed contraception with them before cancer treatment, after cancer treatment, or not at all. For example the participants were asked: My surgeon discussed birth control with me a) Yes, it was brought up before surgery b) Yes, it was brought up after surgery c) No d) Unsure. If they reported their provider did discuss contraceptives either before or after treatment,

participants were asked what contraceptive was recommended. For example the participants were asked: In terms of contraception, my surgeon a) did not make a specific contraception recommendation b) recommended a Copper IUD c) recommended condoms d) recommended the diaphragm e) recommended female sterilization f) recommended my partner get a vasectomy or unsure. Participants were asked this same question with regards to recommendations from their oncologist and gynecologist. Additionally, women were asked their preferences for which health care provider they wanted to talk with about contraceptives and when they would prefer to have contraceptive discussions.

### Data Analysis

Descriptive statistics (means, standard deviations, frequencies, and percentages) were calculated for all variables of interest. For participants who recalled that they were sexually active before and/or during treatment and participants who reported being currently sexually active, we conducted a series of chi-square tests to compare contraceptive tiers within each time category. Statistical comparisons were conducted between tiers of methods rather than individual methods for statistical power. We also conducted a series of chi-square tests to compare whether participants reported talking to their surgeon, oncologist, and/or gynecologist before treatment, after treatment, or not at all. Among those who reported talking to their providers either before or after treatment, we calculated frequencies and percentages for the types of contraceptive method recommended. All analyses were run using Stata version 13.

## Results

### Participant Characteristics

A total of 181 women submitted responses to the questionnaire. The final sample for the present analyses included 150 breast cancer survivors who completed the entire questionnaire. Most of the respondents were from the Young Survival Coalition via social media post therefore we were not able to obtain a response rate of eligible participants from this particular group. The response rate from the Athena Breast Health Registry was 33%. Participants were 37 years old on average with a standard deviation of 6 years and most (n=129, 85%) had a college degree or greater (Table 1). Over 80% (n = 94) of women reported a previous pregnancy. Of those women with a prior pregnancy, five (5.32%) had an unintended pregnancy after their breast cancer diagnosis. These pregnancies resulted in three live births, one miscarriage, and one still birth. A majority of women reported past or current chemotherapy (n=117, 78%) and/or radiation therapy 61% (n=9) and 62% (n=93) of women were on endocrine breast therapy at the time of the survey. Overall, those who completed the entire questionnaire and those who did not complete it did not differ significantly in their demographic, cancer, or reproductive characteristics.

### Sexual Activity and Contraceptive Use

Most participants reported being sexually active with a male partner before (n=142, 95%) during (n=106, 71%), and after (n=127, 85%) their primary cancer treatment. Among those who were sexually active and not trying to become pregnant, most reported using a contraceptive method before (n=115, 94%), during (n= 94, 90%), and after (n= 103, 83%)

their cancer treatment. The most common contraceptive methods the year before cancer treatment were pill/patch/ring/injectable, and male condoms were most common during and after treatment (Table 2). After cancer diagnosis, there was a transition from higher tier, more effective methods, to lower tier methods as well as a transition from hormonal to non-hormonal methods. For all time points there were significant differences in contraceptive method choice when the methods were grouped by level of efficacy ($p<0.001$). The most common reason for method choice during and after treatment was the safety given their breast cancer diagnosis. Sixty-one percent (n=92) of women reported concern that prior birth control pill use contributed to their diagnosis of breast cancer and 85% (n=78) of those reported that this concern influenced their current contraceptive method choice.

Six and a half percent (n=8), 10% (n=11), and 17% (n=21) of sexually active participants who were not seeking pregnancy were not using any contraceptive in the year prior to cancer diagnosis, during treatment, and currently, respectively. The most common reasons for not using contraceptives prior to cancer treatment were not thinking about it or didn't care if they got pregnant 25% (n=2) and breast-feeding or being in a postpartum period 25% (n=2). Believing that they were unable to get pregnant was the most common reason for not using a contraceptive during 63% (n=7) and after treatment 71% (n=15).

### Perceptions about Copper IUDs

Among sexually active women using contraceptives, only about 3% (n=4) of women reported using a copper IUD prior to their cancer treatment. This proportion rose to 10% (n=11) during cancer treatment and 23% (n=29) after completing treatment (Table 2). Copper IUD use increased across the cancer care continuum however participants reported being concerned about the copper IUD. Twenty-two (n=33) percent of participants thought that having a copper IUD would put them at risk of infection and 21% (n=23) thought that having a copper IUD could impact their fertility.

### Contraceptive Communication

Twenty-three percent of participants (n=35) reported that they did not discuss the need for contraceptives after their cancer diagnosis with any health care provider. Among the participants who reported that a health care provider did discuss contraceptives (n=115, 78%), the most common reasons given were that cancer treatment during pregnancy could affect the baby (n=63, 55%) and the pregnancy could affect their risk of cancer recurrence (n=31, 27%). Some women reported that, while pregnancy prevention was discussed, the reason to avoid pregnancy was not explained (n=21,18%).

Over half of participants reported discussing contraceptives with their oncologist (n=92, 61%) and/or gynecologist (n=80, 53%), but only 37% (n=55) reported talking with their surgeon about contraceptives (Table 3). Although 70 women reported that their gynecologist did not discuss birth control with them, 90% of these women reported either not having a gynecologist (n = 9) or having a gynecologist but not seeing them during this time (n = 54). We found significant differences between the discussion and timing of contraceptive conversations between health care providers. Specifically, 63% said that their surgeon did not discuss contraceptives with them while 47% and 39% said their gynecologist and

oncologist did not discuss contraceptives, respectively. Surgeons and oncologists discussed birth control more often before treatment while gynecologists discussed birth control both before and after treatment. Among those who had these discussions, 32%, 51%, and 61% of women reported receiving a specific contraceptive recommendation before treatment from their surgeon, oncologist, and gynecologist, respectively. Among those who had these discussions after treatment, 0%, 53%, and 84% reported a specific recommendation from their surgeon, oncologist, and gynecologist, respectively. Of those who received a specific recommendation, all three health care providers most commonly recommended the copper IUD (Table 3). Only 5% (n=7) of participants reported receiving the same contraceptive method recommendation from all three health care providers.

Fifty-one percent (n=76) of participants reported that they would prefer to speak with their oncologist about contraceptives compared to 33% (n=48) of participants reported preferring to speak with their gynecologist (Table 4). Fifty-seven percent (n=84) of participants reported that they would prefer to discuss contraceptives at the time of their breast cancer diagnosis (Table 4). Additionally, 67% (n=101) reported that an informational pamphlet with basic information about contraceptive options for breast cancer patients/survivors would be a useful resource. When participants were asked how they preferred to receive contraceptive information, their responses were 46% (n= 69) from a person during a clinic visit/doctor appointment, 27% (n=41) internet pamphlet, and 21% (n=32) on a paper pamphlet, respectively.

## Discussion

Many reproductive-aged breast cancer survivors remain sexually active, but are not planning or ready to have children [2]. Despite the risk of unintended pregnancy during and after treatment, most are not using highly effective contraception to prevent pregnancy [2]. This study provides more insight into reproductive-aged breast cancer survivors' contraceptive use patterns, influences on contraceptive method choice, and their preferences for contraceptive discussions with their health care providers. This insight can help direct future efforts to improve patient care and help facilitate safe contraceptive decisions that align with breast cancer survivors' family planning priorities.

Similar to other studies, our results indicate that most women remain sexually active during and after cancer treatment, and that their patterns of contraception use change over time [2,3]. Participants reported relying primarily on condoms during cancer treatment, putting them at greater risk for unintended pregnancy than if they used a more effective method. More women may depend on condoms for pregnancy prevention during breast cancer treatment in an attempt to avoid hormones, but their options could also be expanded to other non-hormonal methods with adequate contraceptive counseling. The Society of Family Planning recommends the copper IUD as a safe and highly effective contraceptive method for women with a history of cancer [9]. In addition, the USMEC places breast cancer patients use of copper IUDs in Category 1 which means "A condition for which there is no restriction for the use of the contraceptive method [5]."

Many reproductive-aged female cancer survivors are uncertain about their fertility status, and have related unmet information needs and concerns [10–14]. This uncertainty may also be associated with lower uptake of contraception after cancer. Among sexually active women not seeking pregnancy in our study sample, 10% reported no contraceptive method during treatment and 17% reported no method currently, putting them at risk for unintended pregnancy. Similar to prior studies, the most commonly reported reason for not using contraceptives during and after cancer treatment was that women believed that they were unable to get pregnant [15,16]. Although many breast cancer survivors are exposed to gonadotoxic treatment, the impact on their ovarian function and subsequent reproductive late effects vary widely and women's own perceptions of their fertility can change over time [15,17–23]. Women's perceptions of their infertility risk may overshadow concerns about unintended pregnancy. Because the high risk of unintended pregnancy in this population and complex nature of family planning after breast cancer, it is critical for clinicians to include a discussion of fertility status when providing contraceptive counseling to this population [1,2,4].

After primary cancer treatment, a significant proportion of participants reported use of copper IUDs. While this option may not be desired by all breast cancer survivors, it is possible that safety concerns could hinder copper IUD use among some women who would have otherwise chosen this method. Participants in this study expressed concerns about the copper IUD, such as pain during placement, which are similar to concerns among the general population [24]. Participants also expressed concerns about the potential infection risk of using a copper IUD. The current IUDs are safe to use among immunosuppressed women including women with cancer, lupus, and history of solid organ transplant [5]. It is possible that improved contraceptive counseling could address such misconceptions.

Surprisingly, many participants did not discuss contraception with their gynecologist (47%), oncologist (39%), and/or surgeon (63%), indicating significant room for improvement. Our results also suggest that women may be less likely to see a gynecologist around the time of their cancer diagnosis and treatment, providing fewer opportunities for discussion of contraception. Interestingly, the majority of women in this study reported receiving inconsistent contraceptive recommendations from the health care providers that they did talk with, which could impede decision-making. Furthermore, when pregnancy prevention was discussed with participants, it was most frequently in the context of preventing potential teratogenicity to an unintended pregnancy, echoing the findings from a qualitative study on this topic [6]. In the qualitative study, women reported that their healthcare providers made them fearful of getting pregnant, but did not spend time reviewing which specific contraceptives were safe and effective [6]. Following a patient-centered care model, it is important to start off with open-ended questions regarding the patient's priorities for choosing a contraceptive method [25]. The results of this study suggest a gap in consistent and comprehensive patient-centered contraceptive counseling for women facing breast cancer.

In the current study, most participants would have preferred to discuss contraceptives at the time of their diagnosis during a conversation with their oncologist. A preference to have the specialist address contraception is a similar finding to other contraceptive studies among

women with medical conditions such as solid organ transplant patients [26]. Patients may feel more comfortable addressing contraceptives with the specialist with whom they have an established patient-provider relationship. Little is known about oncologists' knowledge and comfort in discussing contraceptives. An exploration of the oncologists' comfort in providing contraceptive counseling could inform approaches to improve oncologists' capacity and willingness to discuss contraception. Most participants also reported that they would have benefited from an informational pamphlet about contraceptive choices after breast cancer. Providing patients with an educational pamphlet and oncologists with contraceptive counseling tools could improve patients' and oncologists' shared decision making about contraception after the diagnosis of breast cancer.

This study is not without limitations. First, the study sample is not representative of all reproductive-aged breast cancer survivors given women self-selected to participate in a study about contraception. Since we recruited from the Young Survival Coalition, these women may be highly motivated, which may contribute to the high rate of IUD. The study population is predominantly white women with a college or graduate education, which limits the generalizability of the results. In comparison to white women, a higher proportion of non-white women are diagnosed with breast cancer before age 50, with a peak in their 40s [27,28]. However, our study recruited only a small proportion of non-white survivors, who may have different perspectives and preferences for contraception [28]. We did not explore if participants' receptor status impacted their contraceptive choice. The USMEC guidance does not alter contraceptive safety on receptor status. In addition, recruitment occurred online and could, therefore, not capture the viewpoint of women without internet access. Another limitation is that this was a cross-sectional study that took place after completing cancer treatment, so there may be recall bias. This study is unique because it specifically looks at breast cancer survivors' sexual activity, contraceptive use, and contraceptive counseling at different time points in relation to when their cancer was diagnosed and treated. Although this study is descriptive in nature, it provides novel insight on patients' perspectives and contraceptive use after breast cancer, which can help inform clinical practice and future research. Further studies are needed to confirm and build upon the results of this study.

This study sheds new light on when and how reproductive-aged women with a history of breast cancer want to discuss contraception, which can inform tailored counseling. Despite the fact that most women will remain sexually active during cancer treatment, our results indicate that a large proportion of participants did not talk about contraceptives with their health care providers. Additionally, many of these participants did not receive counseling about specific contraceptives that are safe and effective such as the copper IUD. Participants expressed a preference to discuss contraceptives at the time of diagnosis, and preferred their oncologist to provide this information. Future interventions could focus on improving oncologists' knowledge and comfort in providing contraceptive counseling and potentially providing interested patients with referrals for provision of certain method such as IUDs with their gynecologist. Our results also suggest that improved coordination of care, and particularly family planning services, between oncologists and gynecologists could be beneficial. One possibility is peer-to-peer training, where gynecologists partner with oncologists to increase their confidence in providing initial basic contraceptive counseling

and knowledge about when to refer women for more complex contraceptive counseling and care [30]. Additionally, better educational resources including pamphlets, online print, and online videos to supplement physician-led discussions may be important. Lastly, studies that further explore women's unmet needs, concerns about contraceptives, and barriers to contraceptive counseling after cancer could assist in the development of tailored counseling approaches to support the reproductive health among breast cancer survivors.

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**Table 1:**

Demographics

| | N | Frequency | Percent |
|---|---|---|---|
| **Age – Mean (Std. Dev.)** | | 37.3 | 5.6 |
| **Race** | | | |
| White | | 128 | 85.3% |
| Black | | 4 | 2.7% |
| Hispanic | | 8 | 5.3% |
| Asian/Pacific Islander | | 9 | 6.0% |
| Other | | 1 | 0.7% |
| **Education** | | | |
| High School or less | | 12 | 8.0% |
| Associates, Trade, or Some College | | 9 | 6.0% |
| College | | 69 | 45.0% |
| Graduate or Professional | | 60 | 40.0% |
| **Prior Pregnancy** [a] | | | |
| Yes | | 94 | 62.7% |
| No | | 54 | 36.0% |
| **Type of Surgery** | | | |
| Lumpectomy | | 44 | 29.3% |
| Unilateral mastectomy | | 28 | 18.7% |
| Bilateral mastectomy | | 72 | 48.0% |
| No surgery | | 6 | 4.0% |
| **Either ER or PR Positive** [b] | | | |
| Yes | | 107 | 71.3% |
| No | | 39 | 26.0% |
| Missing | | 4 | 2.7% |
| **Past/Current Chemotherapy** | | | |
| Yes | | 117 | 78.0% |
| No | | 33 | 22.0% |
| **Past/Current Radiation Therapy** | | | |
| Yes | | 92 | 61.3% |
| No | | 58 | 38.7% |
| **Current Hormone Therapy** | | | |
| Yes | | 93 | 62.0% |
| No | | 57 | 38.0% |

| | N | Frequency | Percent |
|---|---|---|---|
| **Recurrence** [c] | | | |
| Yes | | 6 | 4.0% |
| No | | 143 | 95.3% |

[a] 2 “Don’t Know/Not Sure” responses not shown

[b] 4 “Don’t Know” responses not shown

[c] 1 missing

**Table 2.**

Contraceptive Changes Over Time

| | | Year Prior to Diagnosis [ab] | During Cancer Treatment [c] | Currently |
|---|---|---|---|---|
| **Not Sexually Active** | | **8 (5.3%)** | **44 (29.3%)** | **23 (15.3%)** |
| **Sexually Active Seeking Pregnancy/Pregnant** | | **19 (12.7%)** | **1 (0.7%)** | **3 (2.0%)** |
| **Sexually Active Not Seeking Pregnancy** | | **123 (82.0%)** | **105 (70.0%)** | **124 (82.7%)** |
| Tier 1 | Sterilization | 8 (6.5%) | 12 (11.4%) | 20 (16.1%) |
| | Hormonal or Unknown IUD | 11 (8.9%) | 4 (3.81%) | 3 (2.4%) |
| | Copper IUD | 4 (3.3%) | 11 (10.5%) | 29 (23.4%) |
| Tier 2 | Pill, Patch, Ring, or Injectable | 65 (52.9%) | 2 (1.90%) | 2 (1.6%) |
| Tier 3 | Male Condoms | 26 (21.1%) | 55 (52.4%) | 36 (29.0%) |
| | Withdrawal and/or Rhythm | 1 (0.8%) | 10 (9.5%) | 13 (10.5%) |
| Tier 4 | No Method | 8 (6.5%) | 11 (10.5%) | 21 (16.9%) |

Note: The percentages given for contraception methods are out of the sexually active women not seeking pregnancy. Women could select more than one option, but were categorized according to the highest tier method reported. Statistical comparisons were conducted between tiers of methods rather than individual methods for statistical power.

[a] Significant difference between methods use year prior compared to during treatment, $p<0.001$

[b] Significant difference between methods used year prior compared to current use, $p<0.001$

[c] Significant difference between methods used during treatment compared to current use, $p<0.001$

**Table 3.**

Contraceptive Discussions and Recommendations

| | Surgeon [ab] | Oncologist [c] | Gynecologist |
|---|---|---|---|
| **Did not discuss contraceptives with me or unsure if discussed** | **95 (63.3%)** | **58 (38.7%)** | **70 (46.7%)** [*] |
| **Discussed contraceptive before treatment** | **53 (35.3%)** | **73 (48.7%)** | **36 (24.0%)** |
| Copper IUD | 11 (20.8%) | 20 (27.4%) | 11 (30.6%) |
| Condoms or Diaphragm | 5 (9.4%) | 14 (19.2%) | 7 (19.4%) |
| Male or Female Sterilization | 1 (1.9%) | 3 (4.1%) | 4 (11.1%) |
| Unsure of recommendation/ No specific recommendation | 36 (67.9%) | 36 (49.3%) | 13 (36.1%) |
| Missing | 0 (0.0%) | 0 (0.0%) | 1 (2.8%) |
| **Discussed contraceptive after treatment** | **2 (1.3%)** | **19 (12.7%)** | **44 (29.3%)** |
| Copper IUD | 0 (0.0%) | 8 (42.1%) | 24 (54.6%) |
| Condoms or Diaphragm | 0 (0.0%) | 2 (10.5%) | 8 (18.2%) |
| Male or Female Sterilization | 0 (0.0%) | 0 (0.0%) | 5 (11.4%) |
| Unsure of recommendation/ No specific recommendation | 2 (100.0%) | 9 (47.4%) | 7 (15.9%) |
| Missing | 0 (0.0%) | 0 (0.0%) | 0 (0.0%) |
| **Total** | **150 (100.0%)** | **150 (100.0%)** | **150 (100.0%)** |

[*] Of the 70 women who reported that their gynecologist did not discuss birth control, 90% reported either not having a gynecologist (n=9) or having a gynecologist but not seeing them during this time (n=54)

[a] Significant difference between when contraception was discussed by Surgeon compared to Oncologist, p<0.001

[b] Significant difference between when contraception was discussed by Surgeon compared to Gynecologist, p<0.01

[c] Significant difference between when contraception was discussed by Gynecologist compared to Oncologist, p<0.001

**Table 4.**

Preferences for Contraceptive Discussions

| | Frequency (%) |
|---|---|
| **Preference for <u>whom</u> to talk with about contraceptives** [a] | |
| A peer who has also been diagnosed with breast cancer | 9 (6.1%) |
| A nurse | 3 (2.0%) |
| My gynecologist | 48 (32.7%) |
| My oncologist | 76 (51.7%) |
| My primary care doctor | 7 (4.8%) |
| My surgeon | 4 (2.7%) |
| **Total** | **147 (100.0%)** |
| **Preference for <u>when</u> to talk about contraceptives** | |
| At breast cancer diagnosis | 84 (57.1%) |
| Before treatment | 26 (17.7%) |
| After treatment | 10 (6.8%) |
| After the resumption of my periods | 9 (6.1%) |
| Not interested in discussing with a health care provider | 18 (12.2%) |
| **Total** | **147 (100.0%)** |

[a] 3 missing