



Physician Perspectives on Fertility Preservation Discussions with Premenopausal Breast Cancer Patients: Results from a Multihospital Health Care System

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ABSTRACT

Background. Ten percent of new breast cancer diagnoses occur in premenopausal women, and oncologic therapies may compromise fertility. Thus, fertility preservation discussions (FPDs) and referral to fertility specialists are imperative prior to initiation of therapy. A previous retrospective chart review showed 45% FPD rates at our institution. The aim of this study is to investigate physician perspectives and limitations regarding FPD.

Methods. An electronic survey was distributed to 30 surgical, medical, and radiation oncologists across ten regional hospitals. Questions addressed provider demographics, and barriers to and facilitators of FPD.

Results. The survey response rate was 63.3%. Only 31.6% of physicians reported “always” documenting FPD. Respondents opined that the physician prescribing systemic therapy was the most appropriate person to provide FPD. Patient age, treatment with chemotherapy, and patient desire for FPD were more likely to increase FPD ($p < 0.0001$, $p < 0.05$, and $p < 0.0001$, respectively). The majority of physicians (84.2%) expressed intent to increase FPD rates.

Conclusions. Fertility preservation is an integral aspect of breast cancer care, requiring thorough discussion and clear documentation. This study identified that physicians believe the medical oncologist is the most appropriate person to have FPDs with patients and that empowering patients to bring up fertility concerns may improve rates of FPDs. Education of physicians and patients about fertility preservation techniques is likely to improve FPDs.

Ten percent of new breast cancer diagnoses occur in premenopausal patients.¹ Approximately 50–60% of premenopausal cancer patients desire future fertility, and the average childbearing age has continued to increase.^{2,3} Premenopausal women are likely to receive fertility-compromising treatment including chemotherapy and endocrine therapy. Systemic therapy may result in ovarian suppression, premature ovarian insufficiency, and infertility. With adjuvant endocrine therapy currently recommended for 5–10 years after diagnosis, there is also significant delay in child-bearing. Fertility preservation must also be considered for patients with *BRCA* gene mutations who may require risk-reducing salpingo-oophorectomy (RRSO). Current National Comprehensive Cancer Network (NCCN) guidelines recommend RRSO at age 35–40 years for patients with *BRCA1* mutations, age 40–45 years for *BRCA2* mutations, or as soon as child-bearing is complete. Therefore, it is imperative that premenopausal breast cancer patients are aware of the risks of infertility, as well as options for fertility preservation and assisted reproductive technology such as oocyte and/or cryopreservation. It is recommended that fertility

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preservation discussions (FPDs) occur early and are well documented for all premenopausal patients with breast cancer.^{4,5}

In our own contemporary retrospective chart review of 227 premenopausal women (aged 18–40 years) diagnosed with breast cancer between 2005 and 2015, we found that less than half of patients had documented FPD. The review was conducted between October 2016 and May 2017 at two institutions in a large metropolitan area. Patients who received FPD were more likely to be referred to a fertility specialist, pursue a consultation, and proceed with FP compared with those without documented FPD.⁶

This finding is in keeping with other studies that have shown FPD rates ranging between 26 and 55%. When FPDs occur, only half of patients recall the discussion, highlighting the importance of clear communication and repeated discussions. Patients and physicians have reported barriers to FPD including focusing on cancer treatment, unclear communication from providers, and the high cost of FP. The majority of women with documented FPD express interest in FP.^{2,7,8}

To understand physicians' perceptions, and facilitators of and barriers to FPD, and to design a future effective intervention, we developed a questionnaire that was distributed to physicians of different specialties participating in multidisciplinary breast cancer care across our hospital network.

METHODS

This study was approved by Medstar Georgetown University Hospital's institutional review board. Survey participants gave implied consent by completing the anonymous and voluntary questionnaire. The study was conducted in line with the Declaration of Helsinki.

Physician Questionnaire

An electronic questionnaire (see Supplementary Material) was created using REDCap software and distributed to 30 providers across a ten-hospital regional network, including nine community hospitals and one multidisciplinary cancer center. Participants were identified through our institution's Cancer Network provider list. This included surgical oncologists, medical oncologists, and radiation oncologists (MD and DO), advanced practice providers (APPs), and nurse navigators. The final analysis included only those surveys completed by physicians in order to focus on physicians' FPD practices and to compare specialties. Responses from nurse navigators, APPs, and incomplete surveys were not included in final analysis. The survey queried provider demographics and characteristics

of their practice, including department, number of years practicing (serving as a surrogate for provider age), number of patients seen per week, and percentage of patients in the practice with breast cancer.

A Likert-like scale was used to assess providers' perceptions of their own fertility counseling; For example, participants were provided the statement "I ___ counsel patients on fertility preservation," in which they filled in the blank from the choices given: never (1), rarely (2), sometimes (3), frequently (4), or always (5). This method was used to assess the frequency of FPD documentation, frequency of fertility specialist referrals, how often FPD is an integrated part of treatment discussions, as well as potential barriers to and facilitators of FPD.

Respondents ranked the importance of several patient factors and how likely they were to influence FPD occurrence. Respondents ranked factors as "least important" to "most important," corresponding to a scale of 1–5. These factors included patient demographics (age, marital status, number of children), insurance status (serving as a surrogate for socioeconomic status), cancer characteristics (stage, intended endocrine therapy, intended chemotherapy), and patient desire for FP.

Finally, the survey queried physicians' attitudes toward FPD and future plans to utilize FPD following the survey, by responding to statements on a Likert scale (from "strongly disagree" to "strongly agree").

Statistical Analysis

Provider demographics were analyzed qualitatively. Means and standard deviations are presented for continuous variables. Analysis of variance was used to compare responses among physicians for rank-order and Likert-scale questions.

RESULTS

Physician Demographics

The questionnaire had a 77% response rate (23 providers) and a 96% completion rate. Four out of 23 responses (two APPs, one nurse navigator, and one incomplete survey) were not included in final analysis (see "Methods" section). The final analysis included the 19 physicians who responded to the questionnaire (63.3% response rate, 100% completion rate). All respondents identified themselves as MDs. The majority were surgical oncologists (47.7%), followed by medical oncologists (36.8%) and radiation oncologists (5.3%). Surgeons reported the most years in practice, with 66.7% practicing for over 10 years and an average of 15.4 years. Medical oncologists reported the

highest percentages of breast cancer patients in their practice, more than 75%. Table 1 summarizes these findings.

FPD Practices by Specialty

Analysis of variance yielded significant differences among providers regarding their FPD practices. Medical oncologists were significantly more likely to provide FPD (mean response = 4.57, where “never” = 1 and “always” = 5), and radiation oncologists were significantly less likely to do so (2.67) when compared with surgeons (3.89) ($p < 0.001$). Radiation oncologists were also significantly less likely (2.67) to refer patients to fertility specialists when compared with surgical (4.44) or medical (4.23) oncologists ($p < 0.0001$). Radiation oncologists were also less likely to integrate fertility into treatment discussions (2.0) when compared with surgical (3.89) or medical (4.43) oncologists ($p < 0.001$). Surgical oncologists reported that the patient initiates discussions on FP significantly more often (3.56) when compared with medical oncologists (2.86) ($p < 0.001$). All three provider types responded that they “sometimes” to “always” have time for FPD with no significant difference between the mean response for each group. In addition, all providers reported that they “rarely” to “sometimes” provide educational materials for patients regarding FP, with no significant differences between providers. Most physicians reported that the patient initiates FPD “sometimes” (63%). Figure 1 summarizes these findings.

Factors Influencing the Likelihood of FPD

Patient age, treatment with chemotherapy, and patient desire for FP were most likely to influence the likelihood of FPD ($p < 0.0001$, $p < 0.05$, and $p < 0.0001$, respectively).

Patients’ marital status, insurance status, and number of children at time diagnosis were significantly less likely to influence FPD rates ($p < 0.0001$, $p < 0.0001$, and $p < 0.05$, respectively). Cancer stage and intended endocrine therapy did not significantly influence the likelihood of FPD. Table 2 summarizes these findings.

Eighty-four percent of providers either “agreed” or “strongly agreed” that electronic medical record reminders may increase FPD rates. Additionally, 95% of providers “agreed” or “strongly agreed” that patient education materials on FP in the office would be helpful. Most providers (74%) believed that the physician who provides fertility compromising therapies should be responsible for FPD. Following the survey, 84% of providers plan to increase FPD rates and documentation.

DISCUSSION

The aim of this study is to explore providers’ attitudes towards FPD. The results showed that medical oncologists are viewed by breast cancer providers as the most appropriate team member to provide FPD. Interestingly, our survey elicited that time was not a barrier to FPD. Patients were more likely to receive FPD if they were young, treated with chemotherapy, or if they initiated FPD. However, all specialists were willing to improve their own FPD frequency and felt that patient educational materials would help that effort, for which we list recommendations below.

The most recent guidelines from the American Society of Clinical Oncology (ASCO) recommend that providers be prepared to initiate FPD and refer to fertility specialists when appropriate.⁸ In addition, it has been shown that early referral to fertility specialists prior to chemotherapy may lead to more successful FP. It takes approximately 4–6 weeks to complete ovarian stimulation for oocyte

TABLE 1 Provider demographics

	Surgical oncologists (N = 9)	Medical oncologists (N = 7)	Radiation oncologists (N = 3)
Mean years in practice	15.44 (11.78)	10.14 (9.81)	12.33 (11.02)
Number of patients per week (%)	1–25 (33)	1–25 (14)	1–25 (66)
	26–50 (22)	26–50 (43)	26–50 (33)
	51–75 (33)	51–75 (43)	51–75 (0)
	76–100 (11)	76–100 (0)	76–100 (0)
Percentage of practice in breast oncology (%)	1–10 (0)	1–10 (0)	1–10 (33)
	11–25 (0)	11–25 (0)	11–25 (0)
	26–50 (33)	26–50 (14)	26–50 (33)
	51–75 (33)	51–75 (14)	51–75 (0)
	> 75 (33)	> 75 (71)	> 75 (33)

Data listed as means and standard deviations unless otherwise specified

FIG. 1 Provider perspectives on FPD practices by specialty. Data presented as means. Statistical significance ($p < 0.05$) is indicated by an asterisk (*)

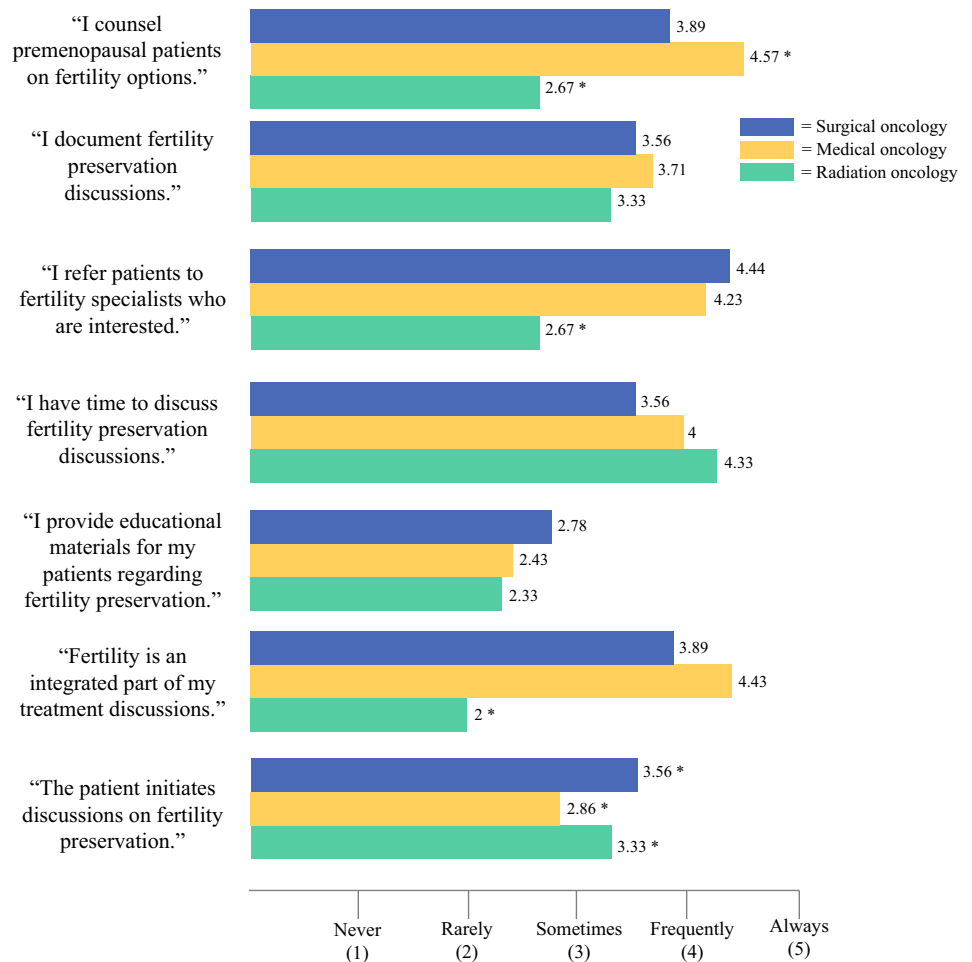


TABLE 2 Results from questionnaire ranking factors influencing likelihood of FPD from least important (1) to most important (5)

	Score	p value
Age	4.58 (0.77)	< 0.0001
Stage	3.11 (0.99)	NS
Number of children	2.47 (1.22)	< 0.05
Marital status	1.58 (0.96)	< 0.0001
Endocrine therapy	3.11 (1.10)	NS
Chemotherapy	3.84 (1.12)	< 0.05
Insurance status	1.21 (0.54)	< 0.0001
Patient desire	4.42 (0.77)	< 0.0001

Scores presented as means and standard deviations
NS not significant

harvest. Thus, early FPD decreases the delay in treatment.⁹ We reviewed the websites of organizations such as the American Society of Clinical Oncology, American Cancer Society, and National Comprehensive Cancer Network, finding that most organizations endorse FPD and the need for a multidisciplinary approach.¹⁰⁻¹⁴

There is significant room for improvement of breast surgeons' role in FPD. In our study, 78% of breast surgeons and 74% of all providers surveyed deferred FPD to those physicians providing potentially fertility compromising therapy. In literature, 36% of breast surgeons never or rarely discussed fertility issues. Fifty-one percent thought referral to a fertility specialist was not their responsibility.¹⁴ However, breast surgeons are frequently the first to meet the patient and deliver a diagnosis, putting them in a unique position to educate patients on the effects of treatments on fertility and preservation options.

The majority of providers (84%) agreed that the patient's desire for FPD was one of the "most important" influences on FPD. This was also demonstrated in a study of Canadian breast surgeons which determined that 25% of providers discussed fertility only if mentioned by the patient.¹⁵ This highlights the need to increase patient awareness and education.

It should be noted from our findings that one-third of surgeons reported breast cancer care to make up 50% or less of their clinic, suggesting that they may manage a variety of tumors on a daily basis, requiring knowledge of

multiple chemotherapy regimens and their associated risks (Table 1). With this in mind, we suggest several methods below to increase FPD. Offering multiple methods allows physicians to choose the most feasible option for their clinic.

One way to ensure that patients are queried regarding their interest in future fertility is to add a field regarding fertility to patient intake forms. This is an unbiased way to assess patient interest in fertility. At our institution, the breast surgeons share a common intake form, and in the section regarding obstetric and gynecologic history we specifically ask, "Are you interested in future fertility?" This facilitates discussion in two ways. Firstly, it brings fertility to the forefront of the patient's mind, and secondly, it reminds the physician to address fertility.

Another way to ensure that physicians address fertility is to add a reminder in the electronic medical record (EMR); 84% of providers agreed EMR reminders would be helpful in facilitating FPD. If adopted, however, we encourage institutions to make the inclusion criteria for such a reminder broad so as to include all premenopausal women, and not simply limit the criteria to those we may perceive are most likely to benefit.

Finally, respondents reported that patient education materials would facilitate FPD. The American Society for Reproductive Medicine (ASRM) provides resources for both patients and clinicians. A comprehensive 20-min video aimed at educating patients regarding their fertility is available at the ASRM website at <https://www.reproductivefacts.org/resources/educational-videos/videos/full-length-videos/videos/fertility-preservation-for-cancer-patients/> or through their YouTube page at https://www.youtube.com/watch?time_continue=941&v=li2xFMN1YM8.^{16,17} This video also serves as a primer for those physicians who are unfamiliar with FP options. In addition, The Oncofertility Consortium, a National Institutes of Health (NIH)-funded resource maintained in conjunction with Northwestern University, provides printable FP guides for patients and providers found at www.savemyfertility.org.¹¹

Limitations

Limitations to this study include selection biases such as voluntary response bias and nonresponse bias, whereby those who voluntarily participated in the survey and those who did not may differ in opinion. Social desirability bias may have also played a role. The limited depth of questioning was aimed to increase response rates but may not give an adequate portrayal of the barriers to and facilitators of FPD; For example, it is helpful to know that time in the office was not a barrier but that perhaps the most significant barrier was that members of the multidisciplinary team felt someone else was a better person to provide FPD. In addition, the survey in

this study did not query the gender of each provider. It will be useful in the future to know whether FPD frequency varies between female and male providers.

The strength of this study is that it facilitated efforts to improve FPD at our institution. We believe our findings are applicable across a wide range of healthcare institutions because literature supports that there is global room for improvement of FPD rates.

CONCLUSIONS

The results of this study provide additional insight into why fewer than half of young women have documented FPD during breast cancer treatment. All members of the multidisciplinary team should feel empowered to start FPD. Breast surgeons, who are often an initial point of contact after diagnosis, are well positioned for a more active role in patient education. To facilitate this, one might consider utilizing common intake forms that elicit a patient's desire for FPD, implementing EMR reminders, or increasing availability of patient education materials in clinic. Tumor boards may also provide opportunities for increased FPD awareness among various providers. It may be beneficial if reproductive endocrinologists are invited to join such discussions, as they will provide additional perspectives on FP. Educating and empowering patients and providers to discuss this issue will increase FPD rates and referral to fertility specialists.

Future studies might consider implementing one of the strategies above to determine its effects on FPD rates. Additionally, a future study may survey providers at a national level to determine how geographic location, patient population, and different hospital settings might affect FPD.

AUTHORS' CONTRIBUTION M.C.M., A.J.B., and E.V.T. assisted with study design, data interpretation, and article creation. M.H., L.M.B. and S.S.T. assisted with study and survey design. R.T. assisted with article preparation. All authors gave final approval.

DISCLOSURE None.

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