OBJECTIVE
To compare cryosurvival rates between remote collections with NextGen kit (offsite) and onsite collection of semen samples from infertile men and those with cancer.

METHODS
Prefreeze and post-thaw sperm motility, total motile sperm, and percent cryosurvival rates were compared between samples collected from infertile men onsite at the Andrology Center (n = 10) and samples collected from infertile patients at home (offsite; n = 9), which were shipped by NextGen to our laboratory. A second group (n = 17) consisted of 10 semen samples from cancer patients collected onsite, which were compared with 7 semen samples from cancer patients shipped by the NextGen. All semen samples were assessed within 18 hours of collection.

RESULTS
In the infertile men, percent cryosurvival rates were similar with NextGen compared with those of onsite collection (53.14 ± 28.9% vs 61.90 ± 20.46%; P = .51). Similarly, in the cancer patients, all 4 parameters were comparable between the onsite and NextGen. Cryosurvival rates were also similar between NextGen compared with those of onsite collection (52.71 ± 20.37% vs 58.90 ± 22.68%; P = .46).

CONCLUSION
Cancer patients can bank sperm as effectively as men banking for infertility reasons using the NextGen kit. UROLOGY 85: 1339–1346, 2015. © 2015 Elsevier Inc.

Cryopreservation of human spermatozoa has emerged as an important area in assisted reproductive technology programs and oncology programs. Patients are often referred for semen banking, followed by assisted reproductive techniques, when pregnancy is desired.1-5 The American Society of Reproductive Medicine Ethics Committee and the American Society of Clinical Oncology both recommend that physicians counsel all cancer patients about options available for fertility preservation before treatment.4,5 Advances in diagnostic techniques and therapies have dramatically improved cancer survival rates,6 and the current cure rates for patients with testicular cancer and lymphoma are as high as 90%.7 Because it is difficult to predict the precise impact the cancer therapy will have on an individual’s fertility, patients should have the opportunity to preserve their fertility before treatment.

Approximately, 70,000 adolescents and young adults, aged 15-39 years, are diagnosed with cancer each year in the United States.8 Many of these young men desire future fertility, and more than three-quarters are without children at the time of their cancer diagnosis.9,10 Furthermore, there is a strong desire to be notified of options for fertility preservation among young men diagnosed with cancer, and fertility has been identified as an important issue for all cancer patients.10,11 However, sperm cryopreservation is underused, and referrals to fertility specialists are inconsistently offered across the United States.12

Cryopreservation of sperm also impacts fertilization potential by increasing the concentration of free radicals.13 After freezing and thawing, the sperm motility further decreases by 25%-75%.6 Loss of sperm function, oxidative stress, apoptosis, and deoxyribonucleic acid (DNA) fragmentation are commonly observed after thawing.14,15 Therefore, it becomes crucial to carefully review sperm banking protocols to ensure the highest level of sperm cryosurvival. Factors such as maintenance of proper temperature and the specific diluent used affect the viability of semen specimens during transport.16 Repeated freeze-thaw processes negatively affect sperm quality and may also worsen any underlying sperm defects.17,18 There are many challenges that these men experience. For many, sperm collection in a laboratory may be embarrassing or uncomfortable. Traveling to other cities or neighboring states from their homes for sperm banking creates an emotionally traumatic experience for the patients.19 Furthermore, the delay caused by waiting for infertility test results heightens patient
anxiety,20 Some of these problems can be alleviated by collecting a semen sample in a private setting and directly shipping it to a central laboratory for testing and storage. We have recently developed a specialized sperm collection and transport kit (NextGen®, Path-Tec, Columbus, GA). It is a first-of-its kind product evaluated in a clinical setting and specially designed primarily for men with cancer who are about to undergo treatment (surgery, chemotherapy, and radiation therapy), which can render them infertile.

The aim of this study was to evaluate the quality of semen samples collected and shipped overnight from different states (offsite) and delivered to our Andrology and Reproductive Tissue Bank the next day via NextGen kit. We compared the baseline semen parameters in samples collected onsite (Andrology laboratory) vs those collected offsite and shipped by NextGen. We chose to study cancer patients and infertile men as these groups request cryobanking most frequently. Furthermore, many of these men are young, unmarried, and in their reproductive years and desire to father their biological children.

**METHODS**

**Patients and Semen Samples**

On study approval by the institutional review board, semen samples were collected from men with a history of infertility (group 1; n = 19) who presented for infertility treatment or were diagnosed with cancer. All infertile patients were seen by an andrologist or urologist and they had a diagnosis of male-factor only. Female-factor was excluded in these couples. Similarly, all cancer patients who banked onsite had testicular cancer as the main diagnosis. A consent form was provided to each subject, and the purpose of the study was clearly explained. Semen samples were collected in the Andrology laboratory (onsite) from 10 infertile patients, and 9 semen samples were collected from infertile patients and shipped by NextGen (offsite).

The inclusion criteria were as follows: (1) all subjects were attending the male infertility clinic for fertility issues; (2) all were evaluated for proven male-factor infertility as assessed by the male infertility specialist; (3) all underwent history, physical, and laboratory evaluation; and (4) the female partners of the infertile men had undergone gynecologic evaluation and female factor was ruled out on a fertility workup.

Participants were excluded if there was a history of smoking and/or illicit drug use. In addition, participants were not included if they presented with azoospermia, cryptorchidism, and/or incomplete semen analysis results.

A second group consisted of cancer patients (n = 17) who were in the process of initiating cancer treatments. Of these, 10 semen samples were obtained from cancer patients onsite, and 7 semen samples were collected from cancer patients (offsite) and shipped by NextGen. Patients were included if they had a strong desire to bank specimens before initiating cancer treatment and excluded if there was an absence of motile sperm in their ejaculate.

**Standardization and Shipping of NextGen Kit**

We investigated the effects of overnight shipment in NextGen Home Banking Kit on human sperm motility and viability. The patients were counseled over the phone. The NextGen kit was mailed only to those men who were referred by their physicians: that is, fertility specialists or oncologists. The patients were counseled on the phone by the laboratory staff and then asked to review and sign a “Semen Collection and Storage Agreement.” This agreement provided details of semen cryopreservation procedure and infectious disease testing. The infectious disease testing (human immunodeficiency virus, sexually transmitted disease, and so forth) was part of the legal document, read and signed by each patient. The patient was asked to complete the required testing done closer to their home and mail or fax the results to the laboratory within 2 weeks of collection. We standardized the media and kit constructions, as well as the proper cooling components, necessary after 24-hour incubation periods at 37°C for offshore shipment of semen samples. The kit is composed of a collection cup and transportation media, ice sleeves, foam inserts, ice packs, Styrofoam packing box, and the outer box. Sample collection and shipping instructions were included in the kit, as well as clear written instructions. On receipt of the kit, patients are instructed to place the collection cup, ice packs, freezing sleeve, and refrigeration media in a freezer for at least 12 hours. On the day of collection, before semen collection, the refrigeration medium and collection cup are removed from freezer and allowed to thaw to room temperature for 60 minutes. The seal is broken from the sterile collection cup, and the semen sample is deposited by masturbation only. Use of lubricating gels is not recommended. After sample collection, the entire contents of the refrigeration media (5.0 mL) are added to the collection cup. The cup is sealed securely and gently swirled to mix the contents. The cup is then placed in the kit—along with ice bricks, which are placed on the outside of the foam layers. Finally, the kit is sealed. The completed kit is placed inside a cardboard container and sealed. All samples were shipped overnight and were received by the Andrology laboratory the next morning.

**Processing of Semen Samples**

Once the samples were received, the refrigeration media were removed by centrifugation at 300g. Prefreeze count and motility were performed as per the established World Health Organization 2010 criteria.21

**Cryopreservation of Semen Samples**

After complete liquefaction, semen samples were mixed with an equal volume of 10% glycerol-based cryoprotectant (glycerol-egg yolk-citrate medium) in 4 equal supplements and plunged into liquid nitrogen.22 For thawing, the cryovials containing the semen samples were removed from the liquid nitrogen tank and allowed to thaw at room temperature for 5 minutes. The samples were then incubated for 20 minutes at 37°C. After thawing, sperm concentration and motility were evaluated and recorded.

**Statistical Analysis**

Offsite samples collected by NextGen and onsite collections between infertile patients and cancer patients were compared with respect to quantitative parameters using Wilcoxon tests. Quantitative variables are summarized as mean ± standard deviation and interquartile values. Associations with categorical variables such as collection sites were analyzed by the Fisher exact test or the chi-square test. Associations with quantitative and ordinal variables such as percent motility, total motile sperm (TMS), and percent survival were assessed with the
motility (percentile], 28.0 [11.2-39.1]) for infertile patients.

**RESULTS**

Difference between Semen Parameters—Offsite Collection vs Onsite Among Infertile Men

The distribution of semen parameters for all infertile patients (group 1) is shown in Table 1. The overall sperm characteristics between the offsite collection via the NextGen and onsite collection for infertile patients were within normal limits. For offsite collections (NextGen), the average prefreeze motility was 56.26 ± 18.51%, and the average prefreeze TMS concentration (×10⁶ sperm) was 59.46 ± 42.76 for infertile patients. For onsite collections, the average prefreeze motility was 42.30 ± 15.88%, and the average prefreeze TMS concentration (×10⁶ sperm) was 32.41 ± 28.22 (median [25th-75th percentile], 28.0 [11.2-39.1]) for cancer patients. Among post-thaw samples of infertile men, percent cryosurvival rates were comparable in group 1 samples shipped via NextGen and onsite collections. Percent cryosurvival rates were comparable in both groups collecting offsite vs those collecting onsite (P = .51; Fig. 1).

**COMMENT**

More than 50% of cancer patients desire future fertility, and of those, more than three-quarters are without children at the time of their diagnosis. At present, semen banking is the gold standard for fertility preservation in men diagnosed with cancer. Less than a quarter of cancer patients bank sperm, and the most common reasons for not doing so is lack of information, time, high costs, and lack of convenient facilities. Hence, there is an urgent need to evaluate alternate methods of cryopreservation available to young male cancer survivors. Young et al and Zavos et al have successfully used remote semen collection for therapeutic purposes. Young et al and Zavos et al have successfully used remote semen collection for therapeutic purposes. Young et al and Zavos et al have successfully used remote semen collection for therapeutic purposes. Young et al and Zavos et al have successfully used remote semen collection for therapeutic purposes. Young et al and Zavos et al have successfully used remote semen collection for therapeutic purposes. Young et al and Zavos et al have successfully used remote semen collection for therapeutic purposes. Young et al and Zavos et al have successfully used remote semen collection for therapeutic purposes.

In a previous study, remote semen collection kits have also displayed significant potential to maintain semen samples from cancer patients for 24 hours before cryopreservation. The kits included a media solution containing Tyrode solution, human serum albumin, and penicillin-streptomycin. The kits maintained the semen specimens at 4°C-5°C in a temperature-regulated box containing chiller packs for 24 hours during overnight shipping. Although sperm motility was affected in the samples collected remotely, the ability of spermatozoa to withstand freezing and thawing was usually maintained. This is attributed to prolonged exposure of spermatozoa to exogenous protein supplement. We have earlier standardized the NextGen kit components (unpublished study). This included the transport media, the cooling components, and the effect of overnight shipping on sperm function. We tested 2 transport media—refrigeration media and human tubal fluid. The refrigeration media were selected. For the cooling conditions, 5

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**Table 1.** Prefreeze and post-thaw sperm motility, total motile sperm, and cryosurvival rates in infertile men using NextGen

<table>
<thead>
<tr>
<th>Parameter</th>
<th>NextGen</th>
<th>Onsite</th>
<th>P Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Infertile men</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Motility (%)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Prefreeze</td>
<td>56.26 ± 18.51</td>
<td>42.30 ± 15.88</td>
<td>.09</td>
</tr>
<tr>
<td>Post-thaw</td>
<td>27.6 ± 13.6</td>
<td>27.90 ± 17.07</td>
<td>.90</td>
</tr>
<tr>
<td>TMS (×10⁶ sperm)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Prefreeze</td>
<td>59.46 ± 42.76</td>
<td>32.41 ± 28.22</td>
<td>.12</td>
</tr>
<tr>
<td>Post-thaw</td>
<td>44.3 (33.1-85.0)*</td>
<td>28.0 (11.2-39.1)*</td>
<td>.57</td>
</tr>
<tr>
<td>Cryosurvival (%)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Prefreeze</td>
<td>53.14 ± 28.9</td>
<td>61.90 ± 20.46</td>
<td>.51</td>
</tr>
<tr>
<td>Post-thaw</td>
<td>46.5 (32.9-66.0)*</td>
<td>60.5 (47.8-77.2)*</td>
<td></td>
</tr>
</tbody>
</table>

TMS, total motile sperm.

Values are mean ± standard deviation or *median (25th-75th percentile). P < .05 was considered significant by the Wilcoxon rank sum test.

Wilcoxon rank sum test. All analyses were performed with use of R, version 2.3.1 (The R Foundation, www.R-project.org). P values < .05 were considered statistically significant.
different combinations of ice packs were tested to study which combination best maintain the desired temperature during the overnight shipment of the NextGen kit. The cooling sleeve and 2 Tech Pack (Polar Tech Industries, Inc.) ice bricks were selected. To test the overnight shipping condition on the semen quality, sperm motility, total sperm motility, and sperm membrane integrity were tested in simulated shipped condition (37°C for 24 hours) and overnight shipped samples. Although there was a significant decline in the 3 parameters, the cryosurvival rates were comparable (50%) under the 2 test conditions. Thus, we have validated conditions that facilitate the overnight shipment of semen samples with the preservation of various sperm parameters.

Our study included both cancer and infertility patients. These were actual patients who resided out of state. Therefore, it was not feasible for them to travel and provide semen sample onsite. Hence, they could not serve as their own controls. Although there was a wide range in the number of TMS count before freezing in cancer patients, however, it was not statistically significant. The wide range in the TMS can be explained by the etiology of the disease, that is, testicular cancer patients, which is different than the general infertile population. Majority of these patients were oligospermic at the time of diagnosis. Furthermore, the dysfunctional germ cells or the precursors to malignancy present within the testicular tissue and the disease itself can also affect sperm quality and fertility. Our results showed no differences in change from prethaw to post-thaw TMS or motility between the offsite and onsite groups in infertile men and cancer patients. We observed no significant differences in the cryosurvival rates of semen samples collected offsite and transported via the NextGen kit to our Andrology Laboratory and Reproductive Tissue Bank. When compared between infertile and cancer patients—the 2 types of patients who are most likely to use sperm banking services—the NextGen kit showed promising results in preservation of sperm parameters. Sperm banking is a highly valued service that should be offered to both infertile and cancer patients. Cancer patients bank for longer time periods than infertile patients. Although onsite semen collection in cancer patients is important, the remote collection kits could be offered as an adequate alternative to onsite collection.

Our results demonstrate that cancer patients can bank sperm as effectively as men banking for infertility reasons. Our goal was not to merely establish the absence of a difference in the study groups but to establish the following: (1) if the NextGen kit is suited for shipment of semen samples from long distances using a commercial courier, and (2) if we can recover reasonable number of motile sperm from these samples after their shipment in frozen condition. We have successfully demonstrated that the overnight shipment of semen sample using the NextGen kit is feasible and a viable option for patients in remote locations who do not have ready access to sperm banking facilities. We have further shown that under standardized shipping conditions using the overnight shipping, all samples retained the motility after removal of the cryopreservative at the time of post-thaw analysis. It is important to mention here that sperm motility was retained in each and every sample that was shipped via NextGen kit before and after freezing.

Figure 1. Differences in semen parameters between offsite and onsite groups in infertile patients. (A) Difference between prefreeze and post-thaw percent motility. (B) Difference between prefreeze and post-thaw total motile sperm. (C) Percent cryosurvival (n = 7 offsite and n = 10 onsite collections). (Color version available online.)
Table 2. Prefreeze and post-thaw sperm motility, total motile sperm, and cryosurvival rates in cancer patients using NextGen

<table>
<thead>
<tr>
<th>Parameter</th>
<th>NextGen</th>
<th>Onsite</th>
<th>P Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cancer patients</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Motility (%)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Prefreeze</td>
<td>35.29 ± 11.97</td>
<td>39.60 ± 16.67</td>
<td>.33</td>
</tr>
<tr>
<td>Post-thaw</td>
<td>19.14 ± 11.91</td>
<td>22.10 ± 12.4</td>
<td>.66</td>
</tr>
<tr>
<td>TMS (×10^6 sperm)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Prefreeze</td>
<td>9.94 ± 11.34</td>
<td>94.72 ± 206.42</td>
<td>.20</td>
</tr>
<tr>
<td>Post-thaw</td>
<td>6 (2.9-11.9)*</td>
<td>13.2 (5.1-51.3)*</td>
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<tr>
<td></td>
<td>13.04 ± 17.92</td>
<td>25.26 ± 46.05</td>
<td>.77</td>
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<td>4.5 (2.4-15.8)*</td>
<td>7.9 (3.2-15.9)*</td>
<td></td>
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<tr>
<td>Cryosurvival (%)</td>
<td>52.71 ± 20.37</td>
<td>58.90 ± 22.68</td>
<td>.46</td>
</tr>
<tr>
<td></td>
<td>52 (41.5-67)*</td>
<td>62.5 (50.8-69.8)*</td>
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</tbody>
</table>

Abbreviation as in Table 1.
Values are mean ± standard deviation or *median (25th-75th percentile). P < .05 was considered significant by the Wilcoxon rank sum test.

To our knowledge, this is the first report comparing offsite and onsite and sperm parameters in both fertile and cancer patients. Men diagnosed with cancer are suspected to have gonadotoxic exposure such as chemotherapy or radiotherapy, often reside at remote locations, or are unable to travel to a sperm bank laboratory. Thus, we suggest that a better option for cancer patients would be semen collection in the privacy and comfort of their homes, followed by analysis at a centralized andrology laboratory. We also demonstrated that sperm motility is preserved during shipping. In men with normal semen parameters, sperm freezing on average decreases motility by 25%-75%, which is attributed to oxidative stress. Although usually not a significant problem for fertile men without illness, spermatozoa from men with cancer have been shown to be particularly sensitive to oxidative stress and damage from cryopreservation. Our results show that the NextGen kit preserved sperm parameters, thus providing strong support for its efficacy.

Despite a significant decline in semen quality, the sperm parameters were adequate for cryopreservation. As long as there are motile sperm in the sample before freezing, we can advise the patients to bank. This is similar to the requirements of spermatozoa by the embryologists and the gynecologists in patients banking fresh “onsite” specimens. The frozen specimens can be used for procreation using the intruterine insemination or assisted reproductive techniques. In samples with extremely small number of motile sperm available after freezing, the patients will benefit with in vitro fertilization (IVF) or intracytoplasmic sperm injection (ICSI).

Post-thaw sperm parameters help determine the number of available sperm for selecting the appropriate fertility treatment. Previous studies have suggested that specimens with high sperm concentration, motility, and intact sperm DNA can be stored in relatively large aliquots suitable for intrauterine insemination. On the other hand, specimens with poor sperm motility and high DNA damage may be stored in multiple small aliquots suitable for further fertility treatment. Recent studies indicate no difference in pregnancy outcomes between ICSI success rates when using fresh vs cryopreserved sperm. Timely cryopreservation is critical because in some cases, >1 visit will be required to cryopreserve sufficient numbers of sperm, or there may be urgent need to start therapy. We have optimized our protocol for the best recovery of healthy sperm and investigated several strategies to further enhance post-thaw recovery of spermatozoa. The limitations of the present study include the following: (1) small sample size, (2) heterogeneity of the population, (3) lack of semen analysis before the overnight shipping of the sample using the NextGen kit, (4) inadequate matched control group, and (5) finally, the patients were counseled over the phone and then asked to review and mail the “Semen Collection and Storage Agreement” by mail. The most significant strength of our study is the comparison of onsite and offsite sperm banking in both cancer patients and infertile patients who banked at our institution.

CONCLUSION
A specialized sperm collection and transport kit (Next-Gen) has been recently developed at the reproductive tissue bank at the clinic. This is an innovative, first-of-its kind product evaluated in a clinical setting and specially designed for men with cancer who are about to undergo treatment (surgery, chemotherapy, and radiation therapy), which can render them infertile. Patients can collect semen sample in the privacy of their own home and ship the samples overnight to the Andrology Laboratory for further processing and storage. Collecting semen at home and transporting the same overnight reduces emotional anxiety, need to travel from geographically distant places (different cities or states), and is cost effective. Semen parameters are comparable between the NextGen offsite collection and the control group of onsite collection in cancer patients. The NextGen kit provides a convenient method for men to ship their samples to the clinic from any part of the United States, especially in cancer patients with a need to preserve their fertility and in infertile men.
Acknowledgment. The authors are grateful to the Andrology Center technologists Debbie Garlak, Carmen Caraballo, and Larry Harmych for scheduling the study subjects and Jeff Hammel, senior biostatistician, for his contribution to data analysis.

References

The long-term impact of cancer treatment on reproductive function has become increasingly relevant in recent years given the number of successful treatment options. The American Society of Clinical Oncology and the American Society for Reproductive Medicine recommend that, when possible, at-risk patients bank sperm before gonadotoxic cancer therapy. Despite these guidelines, sperm cryopreservation before the initiation of cancer treatment remains underused. Unfortunately, some men do not have access to a sperm banking facility because they either live far away or are too sick to travel. Therefore, it is critical that we identify a reliable and an efficient method to cryopreserve sperm at a remote location. The authors present a pilot feasibility study of a sperm banking kit (NextGen; Path-Tec, Columbus, GA) that can be used at home or at a site away from the sperm banking facility. This study appears to be the first study to evaluate the outcomes after sperm cryopreservation attempted at a remote location. Several kits similar to NextGen have been marketed for sperm cryopreservation (OverNite Male (ReproTech, Ltd.), Priority Male (Cryogenic Laboratories, Inc. part of Fairfax Cryobank), and @Home). However, none of the providers appear to have published their outcomes.

Although there are benefits to sperm banking at a remote location, there exist some concerns. A semen analysis, which is performed routinely at a sperm banking facility before cryopreservation, cannot be performed if sperm is cryopreserved at a location without an andrology laboratory. It is well known that both cancer and cryopreservation can affect semen parameters, in particular, sperm motility. Therefore, the opportunity is missed to counsel men on results of semen analysis before cryopreservation. Nevertheless, the clinical message is important. Fertility preservation before undergoing cancer therapy is critical and should be evaluated and counseled by an expert in fertility preservation. If men have access to an andrology laboratory or a sperm banking facility, a semen analysis should be performed before cryopreservation. However, if accessibility is an issue, the sperm banking kit is an option that can be used as a last resort, provided the patient is appropriately counseled regarding the benefits and limitations of cryopreserving sperm at a remote location.

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REPLY

We read with interest the thoughtful comments by the authors into the need for fertility options for cancer patients. NextGen® (Path-Tec, Columbus, GA) Remote Home Sperm Banking Kit is an innovative, product evaluated in a clinical setting and specially designed for men with cancer who are about to undergo treatment, which can render them infertile. Many of these men often reside at remote locations and do not have ready access to sperm banking facilities or often times are unable to travel to a sperm bank laboratory.

In a recent update of the fertility preservation options for cancer patients as recommended by the American Society of Clinical Oncology Guidelines, the unanimous decision was that cryopreservation is an effective but an underused option for fertility. The American Society of Clinical Oncology (ASCO) guidelines recommend that “all health care providers (including medical oncologists, radiation oncologists, gynecologic oncologists, urologists, hematologists, pediatric oncologists, and surgeons) should address the possibility of infertility with patients treated during their reproductive years (or with parents or guardians of children) and be prepared to discuss fertility preservation options and/or to refer all potential patients to appropriate reproductive specialists.” Although the initial concern of the patients is cancer diagnosis, they must be advised regarding the potential threat to their fertility as early as possible in the treatment process and of their options for fertility preservation.

The most significant strength of our study is the comparison of onsite and offsite sperm banking in both cancer patients and infertile patients who banked at our institution. We have successfully demonstrated that the sperm motility was retained in every sample shipped via NextGen kit, thus providing strong support for its efficacy. Although, the semen quality cannot be tested before freezing, however, as long as there are motile spermatozoa in the semen sample before freezing, we can advise the patients to bank. This is similar to the requirements of spermatozoa by the embryologists and the gynecologists in patients banking fresh “onsite” specimens. The frozen specimens can be used for procreation using the intruterine insemination or assisted reproductive techniques (ART) techniques. In samples with extremely small number of motile sperm available after freezing, the patients will benefit with in vitro fertilization (IVF) or intracytoplasmic sperm injection (ICSI). Recent studies indicate no difference in pregnancy
outcomes between ICSI success rates when using fresh vs cryopreserved sperm. Onsite banking should always be the first option and NextGen the last resort after the patient has been appropriately counseled. Educating both the patient and the health care providers of the availability of NextGen kit option is vital.

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