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**Lisa Garvin**: Welcome to Cancer Newsline, a podcast series from the University of Texas MD Anderson Cancer Center. Cancer Newsline helps you stay current with the news on cancer research, diagnosis, treatment and prevention providing the latest information on reducing your family's cancer risk. I'm your host Lisa Garvin and today our subject is oncofertility or the preservation of fertility in cancer patients who might want to bear children after their cancer treatment. We have two guests to speak on that today. First we have Deborah Holman, who is an advanced practitioner nurse in women's health here at MD Anderson and Donna Bell, who is a nurse practitioner in pediatrics. So, Debbie, we'll start with you. Oncofertility is a fairly new term; is it not?

 **Deborah Holman**: That's correct, yes. It comes from reproductive endocrinology and oncology and fertility doctors working together to educate people about fertility preservation and do fertility preservation procedures as well as present them with their options for family building after their treatment.

 **Lisa Garvin**: Because I know MD Anderson has had fertility preservation programs for quite a long time but it sounds like we're bringing this together as a united front.

 **Deborah Holman**: This program has been here for about two and half, almost three years. Prior to that I believe patients were referred to infertility practices outside the institution.

 **Lisa Garvin**: Oncofertility. So typically with patients we're approaching them. Typically, when is the best time to approach them?

 **Deborah Holman**: As soon as they get here just about. The earlier we can see someone the more options we have to offer them. So when someone comes for their initial consultation that would be a great time to bring the topic up and start talking about it. They may not be interested but if they are for a lot of people time is of the essence in terms of preservation.

 **Lisa Garvin**: What is the typical patient that you see, adult patient, that would come asking for fertility measures?

 **Deborah Holman**: Well, today for instance I had a patient from the breast cancer service who came and wanted to know what her options were for fertility preservation before she started her chemotherapy and that was the first thing she was going to have in her treatment was neoadjuvant chemotherapy and she would have surgery and radiation. And she was interested in knowing whether she was a candidate to do fertility treatments like in vitro fertilization to retrieve her eggs, fertilize them and then freeze embryos so that she could use those in the future after her treatment was finished.

 **Lisa Garvin**: And, Donna, you deal with pediatric patients so obviously the parents would be making these types of decisions. Do you find that parents are thinking about that? They have so much to think about when their child has cancer but do they think about fertility?

 **Donna Bell**: Yes, it's one of the major questions that they have because as they receive the news of this devastating diagnosis they're looking into the future and what does the future hold for their child. So they have so many hopes and dreams for their child and one of them is the ability to bear children in the future. And so they do have many questions in regards to what will their fertility be in the future.

 **Lisa Garvin**: And with children, of course, we see a lot of leukemias, a lot of brain cancers and also testicular cancer tends to strike younger people as well. What are the typical cancers where parents are asking about fertility?

 **Donna Bell**: Well, I would first say that even in younger children but also in adolescents and young adults, which we see which that falls under the realm of pediatrics many times and so sometimes it is the parent, sometimes it's the adolescent or young adult as they look into the future and make considerations about treatments that they have these questions about their fertility, but I would say that any patient that has a cancer diagnosis is a candidate to have this talk, to talk about their fertility. What are the risk associated with their cancer in regards to their fertility? Are there options for preservation? Are they a candidate for preservation? What does the reproductive horizon look like for them after treatment, which I think that's the other population of patients that we see a lot of in pediatrics is the patients who are survivors. And so now they have these questions about this is the treatment that I received and now what does my fertility horizon look like.

 **Lisa Garvin**: Debbie, do you find that there are certain diseases or chemotherapies, are there certain things we know are going to affect fertility, be it cancer types or treatments?

 **Deborah Holman**: Well there are certain treatments that will affect fertility and some diseases, ovarian cancer, testicular cancer, brain tumors that can affect the pituitary gland or the hypothalamus; those are diseases that typically can impact fertility. But also chemotherapies such as alkylating agents and very intense regimens that they use for say stem cell transplant will often cause loss of fertility.

 **Lisa Garvin**: You obviously work in gynecologic oncology. Women I think are top of mind because they're the one who bear children, but are men thinking about their fertility as well?

 **Deborah Holman**: Yes they are and we see men also. Men will also be getting chemotherapy sometimes radiation. For instance with colorectal cancer they'll be getting radiation to treat that and that can affect their fertility. So we counsel the men too and can send them to free sperm preferably a couple of samples before they start their treatment. We always want to do fertility preservation before treatment starts because as soon as you have chemotherapy or radiation that's affecting the DNA in all the cells in your body but particularly sperm and eggs are very sensitive to that.

 **Lisa Garvin**: What sort of collection methods are you offering? Let's start with men I mean that's the easiest I mean you're just collecting sperm samples. You said that you wanted to get a couple of clean ones before --

 **Deborah Holman**: -- we like to get a couple of sperm samples frozen. We actually send them out. We don't have the facilities at MD Anderson at this time to be able to freeze sperm here but we send them to a couple of practices in the city not far from here where they can go and collect their sample and it can be frozen and we can get a report on it later that we call them with. We'd like to get a couple of samples because sometimes when men are very ill with their cancer, it can affect their semen parameters. We don't get a report sometimes quickly enough that we can tell them, well, you need to go back or this looks sufficient. With our assisted reproductive technologies that we have now we don't need a very high sperm count to be able to offer people options for fertility afterwards.

 **Lisa Garvin**: And how do you approach that subject with children? I mean, you know, especially young boys? I mean obviously the parents make the decisions but harvesting sperm and eggs is obviously probably different in children?

 **Donna Bell**: Well, we have options for children that are prepubertal and postpubertal so that's the first division that kind of happens in that population. And so, yes, boys who have undergone puberty can bank sperm and it really is this conversation with the family which takes in regard their, where they are as a family, what the maturity is of the child, what previous conversations they've had in regards to sexuality and reproduction. And so it's very much just conversation between the family, the patient and the provider in regards to how we take that approach of speaking to young boys about banking sperm, but we do have those conversations often and the nice thing is that our team has those conversations quite frequently and so we're very comfortable. So the more comfortable you are the more comfortable the patient is the more comfortable the parent is going to be with these conversations. And we do have young men who are very concerned about this and want to be able to preserve their fertility and they are very grateful for the opportunity to have this conversation. This was one of the things I always say: this conversation matters.

 **Lisa Garvin**: And what about young babies that have cancer? And we'll talk about boy babies for now. How does that work?

 **Donna Bell**: So there are some experimental approaches at freezing testicular tissue. We currently don't have any of those protocols open here at MD Anderson, but there are other centers that do freeze testicular tissue in hopes that in the future they'll be able to grow some of those stem cells and be able to offer young boys fertility options in the future.

 **Lisa Garvin**: Because typically sperm, viable sperm, doesn't develop until right at puberty, correct?

**Donna Bell**: Correct.

 **Lisa Garvin**: Okay. And let's switch the conversation to women. They obviously have more choices and what are the typical choices that we offer to women for preserving their fertility?

**Deborah Holman**: For preservation we offer them in vitro fertilization, freezing eggs or freezing embryos. So there's a distinction between the eggs and the embryos where the embryos are the fertilized eggs. Not everyone wants to freeze embryos for various reasons. The problem with in vitro fertilization is it takes two weeks to do. So, we have to have that period of time to be able to do it. It can take up to three weeks depending on how they respond to the medications and it's daily injections of fertility drugs monitoring with ultrasounds and blood tests to check hormone levels and then at the end of that an egg retrieval, which is a small surgical procedure. Those are the gold standard for freezing eggs or freezing embryos for fertility preservation. There are other options open that are considered more investigational. For instance, ovarian suppression, ovarian tissue freezing, those are investigational methods of fertility preservation, but we also discuss other options about how to build a family after treatment if they don't have ovarian function left.

**Lisa Garvin**: So I guess we need to explain for people who may not know that in vitro fertilization is actually taking the sperm and the egg and putting them together in a lab to --

 **Deborah Holman**: -- that's correct. That's correct. It's not your traditional way of conceiving but it's a very common procedure now in fertility treatment.

 **Lisa Garvin**: Is saving embryos versus saving eggs, is one better than the other or are they about the same?

 **Deborah Holman**: Embryos freeze and thaw a little bit better than eggs do but we have new techniques for freezing eggs now where they freeze them very quickly so they are less likely to form ice crystals inside the egg. The egg is mostly water in the inside part of the egg and they can be damaged by ice crystal formation, but we have new techniques now that freeze them very quickly and they seem to do better and fertilize better.

 **Lisa Garvin**: Now if this happens in a child that may not be having babies for another 15 years is that issue when the time between their treatment and the time they want to have children?

 **Donna Bell**: Well, first I'll speak to what Debbie just spoke to in regards to the freezing of the oocytes or the eggs. That's been a huge advanced for our pediatric population, our young adult population because they don't, before we really didn't have the standard of care was to freeze embryos alone and, yes, they could freeze eggs but, you know, the technology wasn't as good at thawing those out. So that was sometimes a barrier for families for young ladies in regards to, you know, the thought of having to pick donor sperm because obviously they don't have someone to at their young age somebody to freeze embryos with or to make embryos with. And so now that they're able to freeze eggs that's really opened the door to many young women to feel comfortable and feel like this is something that in the midst of what I'm going through I really feel comfortable in proceeding with this because I'll be freezing eggs to use in the future and so that has had a huge impact for us in our practice.

 **Lisa Garvin**: Is there a cost to perceiving sperm and eggs and does insurance cover it?

 **Donna Bell**: So there is a cost and many times that become a challenge for patients and families. Most of these procedures are not covered by insurance and so there are other resources out there. Fertile Hope is a resource that we often refer our patients to and there are other organizations that help carry some of that burden for patients and families, but many times they are looking at having to absorb some of the costs themselves. Now one thing I often say is that's not always a barrier for them to bank. They feel like there's a great, they feel there's a lot of value in doing so. And so they find avenues to be able to finance these procedures.

 **Lisa Garvin**: Any idea how expensive this can be?

 **Deborah Holman**: I think it depends on the practice they go to. Live Strong has an agreement with several practices in the Houston area and across the country where they offer discounted prices for egg freezing or embryo freezing. With the assistance from Live Strong the discounted price that's offered by say Dr. Woodard's practice is approximately $6,000 to freeze eggs and closer to $7,000 to freeze embryos. Those are the current prices and I'm not quoting exactly because I don't have the exact amounts and that includes the monitoring during the fertility medications and it covers the egg retrieval as well as freezing the eggs or embryos for one year and then there's a yearly charge, which is a couple of hundred dollars after that. Medications are, for the fertility treatment are donated by two of the fertility medication drug companies and they will, they're very generous and generally donate enough to get a patient through a cycle where they have very little out of pocket costs for the medications, which can actually be quite costly for people. So there's a fair bit of assistance. Live Strong does have an income level that they won't give you assistance if you make above a certain amount of money. In my experience, most people qualify quite easily for assistance.

 **Lisa Garvin**: Oh, that's good news, yeah, because I know there's a cost there. MD Anderson is being proactive about oncofertility I'm guessing. Are we seeing this kind of clinic or practice in other major cancer centers? So it's not unusual?

 **Deborah Holman**: No, no, no. That is one of the, you know, this emerging field of oncofertility and in the adolescent young adult world this is one of the areas that has emerged and there are teams around the country that are addressing these issues of oncofertility in patients.

**Donna Bell**: I think patients have been concerned about it in the past and have asked about it but whether there was a place to send them that would be able to see them quickly enough and perform the procedures quickly enough so they could get on with their treatment that was a different matter.

 **Deborah Holman**: And when studies have looked at, you know, is oncofertility a concern for patients and families the literature has strongly stated that it is. And then they looked at what are some of the barriers in getting patients and families to those resources. And in some of the studies oncologists said, yes, I'm a cancer expert; however, I'm not a reproductive health expert. So who can I refer them to that is trustworthy that will help shepherd me and my patient through this journey of preserving their fertility in the future? And so our, you know, we're uniquely positioned with Dr. Woodard and the adult oncofertility service here because we do have that expertise here. And so we do have somebody who works very well with the oncologist and not only what are their reproductive options but what is their cancer treatment and how does their reproductive options fit into what lies ahead in regards to their cancer treatment and how can we optimize them receiving the treatment and yet also address these questions that they have and help them in preserving their fertility for the future? So we're just in a great place to be able to offer those services to patients and families.

 **Lisa Garvin**: So what happens if somebody has been treated for cancer and didn't think about banking their sperm or eggs? What happens then?

 **Deborah Holman**: We will frequently see them and re-evaluate their fertility; their ovarian reserve for women or semen analysis for men and then counsel them accordingly depending on what those results are. If they have a shortened window of fertility, which frequently happens after cancer treatment, then we can advise them you really want to get started on doing something now. You can bank eggs or embryos now or you can bank sperm because we don't know how long your reproductive window may last. But there are options for people who don't regain their fertility after their treatment there's options such as using donor eggs. So eggs are donated by another woman who goes through the IVF treatment, donor sperm, donor embryos where couples who are finished building their families through fertility treatments don't want to destroy their embryos that they have frozen and they'll donate them to other couples to use. There's, of course, adoption and some women who have hormone sensitive cancers or who have had a hysterectomy may want to use a gestational carrier to carry a pregnancy for them. So there are options for having a family. It may not be what people initially thought it was going to be. Everyone thinks they'll have their own biologic child, but there are so many ways to have a child to love and you don't have to be genetically related to your child to love them.

 **Lisa Garvin**: In closing, Debbie, what advice do you have for people who are coming into cancer treatment who want to have children later on.

 **Deborah Holman**: Please come and see us as soon as you get here, as soon as you can. Please think about this. We have all kinds of educational material on our website and we'd be happy to talk to you but the earlier we can see you the better in terms of your options.

 **Lisa Garvin**: And, Donna, what about parents of your pediatric patients that you see? What sort of advice do you have for them?

 **Donna Bell**: Voice that question. Ask your oncologist what are my options, what's my child's risk for infertility in the future and what are my options in regards to fertility and do you have somebody who specializes in talking to families and patients in regards to their future fertility.

 **Lisa Garvin**: Great. Thank you. Very interesting topic. Thank you ladies. If you have questions about anything you've heard today on Cancer Newsline, contact Ask MD Anderson at 1-877-MDA-6789 or online at mdanderson.org/ask. Thank you for listening to this episode of Cancer Newsline. Tune in for the next podcast in our series.

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