Scott Redding: Welcome to the 3 Ps of Cancer podcast, where we'll discuss prevention, preparedness, and progress in cancer treatments and research, brought to you by the University of Michigan Rogel Cancer Center. I'm Scott Redding. We're here with Michigan Medicine Dr. Molly Moravek and Erin Ellman to talk about fertility options for cancer patients. Molly is a reproductive endocrinologist and the director of the Fertility Preservation Program. She's currently conducting research in the longterm outcomes of cancer patients who underwent fertility preservation compared to those that did not. Erin is the fertility preservation coordinator at the Rogel Cancer Center and usually the first contact in the program. Welcome, Molly and Erin. Can you explain what exactly is fertility preservation?

Molly Moravek: Sure. So it's exactly what it sounds like. It's our efforts to preserve a woman's fertility for the future. That's often in the case of a cancer patient who is undergoing some sort of treatment that may affect her fertility, or a male cancer patient who may have a treatment that affects his sperm. And the idea is if we can freeze eggs or freeze sperm prior to the damaging treatment, then maybe we give them more reproductive options in the future.

Scott Redding: So you kind of went into a little bit of some of the patients, but who really benefits from fertility preservation?

Molly Moravek: Yeah, I would say men and women of reproductive age. Obviously there are some ages above which women could no longer benefit from fertility preservation, but certainly, the vast majority of the patients we see in the program are cancer patients. But there is also patients with other disorders, whether it be neurological, or rheumatological, who might need chemotherapy for their disorder that we also see in our program. And then some women or men need to preserve their fertility for social reasons, and we can do that as well.

Scott Redding: Currently, what is the typical patient that you see on a daily basis?

Molly Moravek: I would say our typical patient is a young female cancer patient, just because the process there is a little more complicated. So it requires them to spend more time with us. Usually either their surgical oncologist or their medical oncologist has sent them to us because the patient has expressed interest in having children, and they're worried what their chemotherapy might do to it.

Scott Redding: So are most of the patients you see via physician referral? Are they more self-referral because they're just not sure? How does your typical patient get to you, and what would that patient look for in trying to find a fertility preservation program?

Molly Moravek: So most come through Erin, so maybe I'll let her answer that.

Erin Ellman: Yeah, it's a little bit of both. We do get referrals from physicians. I'm based in the cancer center, so I can meet with patients during their clinic appointment to provide more information and kind of the ball rolling to connect them to the specialists and services that are appropriate for them. And then also patients can contact us on their own if they have concerns. I have a direct phone number that patients can access to get connected to our program and get things started that way too.

Scott Redding: So patients come in, obviously first to you, it sounds like, Erin. What are some of the biggest questions you hear? I gotta assume financial situation has to be a big one.

Erin Ellman: Sure. Cost is a huge concern for many of our patients. Unfortunately, we don't have a lot of good luck with insurances covering sperm banking or egg freezing. So we do work with resources to help patients make fertility preservation a reality, to try to help with the cost of the services, with medications they might need. Part of my role is to help them navigate the process and also the financial piece to help get them the services that they need.

Scott Redding: What are some of those resources that might be available for patients looking to do this?

Erin Ellman: One of the biggest resources that we work with is the Livestrong Program. So Livestrong helps patients with a cancer diagnosis who meet income criteria to obtain those services at a discounted rate. And for our female patients, they also help provide medications for fertility preservation that can be extremely expensive without insurance coverage.

Scott Redding: As we talk about patients, what type of cancer patients do you see? Do you see more men? Do you see more women? Is it primarily someone with breast cancer? What are the kind of patient makeup that you see in the program?

Erin Ellman: I would say our patients are pretty evenly divided between male and female. We see a number of patients on the female side from our breast cancer clinic, also patients with blood cancers, and sarcoma is another big referral source. And then on the male side, in addition to those groups, also testicular cancer patients are frequently referred to us.

Scott Redding: And I know sarcomas, and there's a lot of childhood leukemia as we hear about. Your patients that come in off of that, are they patients that had already had cancer as a child, or are they maybe newly diagnosed patients, and they're young adults?

Molly Moravek: I think that brings up a really good point. I would say the majority of our patients are newly diagnosed, and looking to preserve fertility before treatment, which is the most effective way to do things. That said, we're seeing an increase in childhood cancer survivors who either were too young or too overwhelmed at

the time of their diagnosis to even really ask about fertility or understand what was happening to their fertility, and are now curious about their fertility potential.

Molly Moravek: And the interesting thing about that group is that even some of them who have return of ovarian function, it may not be longterm. And so there is an opportunity for us to intervene in some of these cases. We do have a group of teenage girls, who survived cancer at a young age, who are now a freezing their eggs in their teenage years to use in their twenties or thirties.

Scott Redding: How do you have that conversation with a teenager, whether it's a male or a female? Because I know that boys who have blood cancers would be candidates. How do you have that conversation either with them or their parents about thinking about fertility preservation at such a young age?

Molly Moravek: Yeah, it's awkward. There's no way around that. But I think there's so many ranges of maturity in these kids, and I think having gone through something like that and survive something like that makes a lot of these kids a little more medically savvy, a little more comfortable talking about their bodies. In some cases we have to kick the parents out of the room so that we can get a real answer from the child. In other cases they've already discussed this at home and it's a very open, honest conversation. I think something that I've had to learn is using less technical terms with that group, and maybe making more jokes about bodily functions. And then that usually breaks the ice for us.

Erin Ellman: And I think most of the time, no matter how awkward the conversation is, by the end the response is that the patients and families are glad to have had the conversation, rather than to have not known.

Scott Redding: So when you're talking with the patients, whether they're teenagers, their parents, or they're young adults, or even adults in their mid to late twenties, early thirties, how do you explain to them the entire process and what to expect through this process?

Molly Moravek: Sure. So it's very different for men and women. I'll let Erin maybe talk about the process for men.

Erin Ellman: Sure. So for our male patients, we give them some education about how their potential treatment plan may impact their fertility. And patients who are interested in sperm banking prior to their treatment can set up an appointment with us. They come to our lab at the Center for Reproductive Medicine and provide a semen sample. Samples are provided through masturbation at our lab and are then analyzed and frozen. So the patient receives information usually that same day about the results of their semen analysis, and guidance about how that sample could be used in the future to create a family.

Molly Moravek: And then from the female side of things, if we see a patient before she starts treatment, she actually has a few options. One of those options is a medical treatment with something called a GnRH agonist that sort of helps quiet her ovaries, almost like when she was prepubertal or postmenopausal. The thought being that if chemotherapy and radiation attack rapidly dividing cells, if we can make the ovaries quiet, maybe they won't be as susceptible to the chemotherapy.

Molly Moravek: Another option is egg or embryo freezing, which is a much more involved process. It does require delaying chemo for about two to three weeks, because a woman has to undergo stimulation of the ovaries so that we can get as many eggs as we possibly can to either then freeze the eggs or create the embryos.

Molly Moravek: And then a third option is an experimental option that is not currently offered at the University of Michigan, but we can certainly make referrals to other institutions. And that's actually taking out all or part of the ovary and freezing the ovary for future use. Both sperm, and eggs, and embryos, as far as we know, can be frozen indefinitely. So even if we freeze a 13-year-old's eggs, if she decides she doesn't want kids until she's 40, it's just as good at 40 as it would have been at 25.

Scott Redding: What would someone look for if they're looking for fertility preservation or any kind of infertility help? What kind of provider or program should they be looking for?

Molly Moravek: Sure. So I'll start with infertility maybe, because that one's easier. If you're just looking for infertility treatment, I think you just want a clinic that has a long track record, that has good success, that has other resources available to you, such as social workers or financial counselors, because the fertility journey is stressful and long. And so if you have a single practitioner with no other support around them, I think that makes it more difficult for patients.

Molly Moravek: From a fertility preservation standpoint though, I think you need even more. When I first came to the institution, it was very important to me that we created the coordinator role, which is what Erin fulfills, because there are so many moving parts for these cancer patients. They're figuring out imaging studies, and chemotherapy appointments, and maybe radiation, and surgery, and now we're throwing fertility in the mix as well. And it's just too much for a patient to handle and keep track of all of that. And so Erin basically serves both as an assistant to the patients, but also as a liaison between oncology, and surgery, and a reproductive endocrinology because there's just too many moving parts for us to put all of that in the patient's lap.

Scott Redding: So I know in various different areas here at the Rogel Cancer Center, as well as other cancer centers around the country, they have patient navigators. So in essence, you're basically a patient navigator for fertility preservation.

Erin Ellman: Yeah. And I think when it comes to fertility preservation, one of the most important things is to get patients through fertility preservation as quickly as possible because we don't want to delay their cancer treatment any longer than we have to. So being able to provide that coordination to avoid those delays is helpful to the patients and also to the providers who want to get that treatment started as soon as possible.

Scott Redding: You're the hub to the spoke of their treatment.

Molly Moravek: Yes. I hope so. That's the goal.

Scott Redding: So I know I just referred to you as the hub to the spoke. What type of areas make up those spokes? I know we talked about there's radiographs, there's surgery, there's different things, but who really makes up this team that the patients are involved with?

Molly Moravek: I think our program is a beautiful example of how different departments can come together and do the best thing for the patient. And so certainly when you're talking about egg freezing or sperm freezing, that requires reproductive professionals. And so the women come through the Department of Obstetrics and Gynecology. The men, we have urologists who help us interpret semen analyses, or help counsel the patients about their risk, and then obviously all the providers in the patient's cancer team as well.

Molly Moravek: And so I think maybe the easiest way to describe it would be a breast cancer patient who has come in, she's had cancer confirmed on biopsy, and so the surgical oncologist has sent her to me. Maybe she hasn't had surgery yet, so she doesn't know yet whether or not she's even going to need chemotherapy. And so this requires coordination between surgical oncology and when they're going to do that surgery, medical oncology and what chemotherapy she will need, if any, and then often radiation therapy is involved as well. And so those right there are possibly four different departments that are participating in this patient's care.

Scott Redding: You mentioned that, in your example, about the patient comes in, sees the oncologist or the surgical oncologist, and then gets referred to you. Is that a typical way that a patient comes to you, or when does a patient normally come to you when they start thinking about fertility preservation?

Molly Moravek: I think we're very fortunate that the majority of our patients do see us before they start treatment. And I think a lot of that is to the credit of Erin and her relationship with the Cancer Center, and those physicians having a quick contact at the time of diagnosis or at the time of initial consultation. I really try to stress to our oncologists that the earlier a patient gets to us, the more options they have. We certainly do see patients after they've started treatment. Unfortunately, a lot of options are off the table once treatment has started. That said, some patients just want to know what's going to happen. They just

want counseling about what this is going to do. And so we're very happy to see those patients and at least provide that counseling.

Scott Redding: It's probably best for patients if they are of a child-bearing age and they've been diagnosed with cancer, that they should probably at least seek out some information before the treatment starts?

Molly Moravek: Absolutely.

Scott Redding: We've talked about kind of right now where things are for a patient when they come in and what to expect. Is there any research or clinical trials that are happening, or just even research in general of how fertility preservation can be advanced moving forward?

Molly Moravek: Yeah, I think there's a few areas that people are interested in. As you mentioned in the beginning, there's still ongoing convincing that needs to be done that we're not hurting patients by delaying their chemotherapy by a couple weeks. And so a lot of research is dedicated to showing equivalent outcomes between patients who did or didn't pursue fertility preservation.

Molly Moravek: Another big area of research is that ovarian tissue freezing that I said, because we're not still 100% sure of the best way to use that tissue. Right now most commonly the tissue's put back in the patient. But is it possible that we could just grow the eggs in the lab, like we do an IVF procedure, and maybe create embryos in the lab and put one embryo back at a time, therefore not requiring another surgery? And so there's a lot of research in that area as well.

Molly Moravek: Two other areas, I think, are both under the category of defining risk. And so right now when a patient comes in to us, we counsel her that the risk of chemotherapy to her depends on which chemotherapy it is, how much she gets in total, how old she is, and what her ovarian reserve, or how many eggs she has even before she starts is, but that often will lead to a risk percentage. I might quote a woman a 30-70% risk of ovarian failure. And that's a very frustrating number for women, because 30% is very different than 70%.

Molly Moravek: And so I think sort of in the era of personalized medicine, there's a lot of attention on us being able to better pinpoint who really needs fertility preservation and maybe who doesn't. Similarly, after cancer treatment, trying to be able to pinpoint when we need to intervene with fertility preservation before a woman runs out of her eggs.

Scott Redding: As it relates to breast and ovarian cancers, we hear a lot about people taking some steps because they've been diagnosed with having the BRCA gene mutation, of getting mastectomies even before they've had breast cancer, or having their ovaries removed before they've been diagnosed with ovarian cancer. Is there anything along those lines of someone that maybe has been

told that they have that gene but haven't gotten the disease yet, to be thinking about or talking about as it relates to fertility preservation?

Molly Moravek: Yeah, I think we've started seeing a lot more of those patients as well, in part because genetic testing is getting so advanced, and also because we learned more about prophylactic surgeries to help prevent the cancer from ever happening in the first place. And understandably, a lot of these patients don't want to pass this risk on to their children. And so we can test embryos with something called preimplantation genetic testing for monogenic diseases is the full name. And basically as long as we have the mutation report for that individual patient, we can then test her embryos that she would have to create in our lab, and help her prevent passing that gene on to her offspring.

Scott Redding: Well, I think this has been really informative, and I really appreciate the time today. If you were to leave our listeners with one key important information or fact, what would that be, Molly?

Molly Moravek: I think for me, it's not to be afraid to ask. I think a patient might feel that fertility is a funny thing to ask about when they're facing chemotherapy. It might seem small to them, but really the earlier the patient can get to me, the more options I have to provide them. And so if they're curious, they should ask, and then let us take it from there. Don't worry about it being another burden on them. They just need to ask the question.

Scott Redding: Erin, what would your parting thoughts be?

Erin Ellman: I think definitely echoing that statement, the sooner patients can contact us, the sooner providers can refer patients to us, the more we can help. And I think we've seen, over the last couple of years in particular, significant growth in the number of patients who have been referred to us, and the number of patients we've been able to help with fertility preservation. So looking forward to continuing that growth and helping more patients with this very important topic.

Scott Redding: Great. Well, thank you both very much today, and again, great information. Thanks.

Molly Moravek: Thank you.

Erin Ellman: Thank you.

Scott Redding: Thank you for listening, and tell us what you think of this podcast by rating and reviewing us. If you have suggestions for additional topics, you can send them to cancercenter@med.umich.edu, or message us on Twitter at @UMRogelCancer. You can continue to explore the 3 Ps of Cancer by visiting rogelcancercenter.org.