

# 05| Pediatric Cancer: The Role of a Neuropsychologist (Part 1) – With Dr. Christine Trask

October 1, 2018



This is an audio transcription of an episode on the Navigating Neuropsychology podcast. Visit [www.NavNeuro.com](http://www.NavNeuro.com) for the show notes or to listen to the audio. It is also available on the following platforms:



**Speakers:** Christine Trask, John Bellone, Ryan Van Patten



**Intro Music** 00:00



**John Bellone** 00:17

Welcome, everyone, to Navigating Neuropsychology: A voyage into the depths of the brain and behavior. I'm John Bellone...

**Ryan Van Patten** 00:23

...and I'm Ryan Van Patten. Today we talk to Dr. Christine Trask about the impact of childhood cancer in cognition and development. Christine is both board certified in clinical neuropsychology and she also has the subspecialty board certification in pediatric neuropsychology as well. She has extensive experience in neuropsychological assessment in kids who are afflicted with various forms of cancer.



So, obviously, this episode is directed a bit more towards people who work with kids on a daily basis, but John and I actually think that adult focused practitioners are likely to really benefit from what Christine has to say. That's because, these days, most children with cancer survive into adulthood, fortunately. So it's very possible that we, as adult focused clinicians, will see people with histories of childhood cancer in our clinical work.

You'll also notice that we split this interview into two episodes and this is similar to what we did with neuroimaging. The conversations that we have tend to be quite lengthy. This is simply because we want to be thorough, we want to leave no stone unturned. We want to give you our listeners all of the breadth and depth that we possibly can with each and every topic. But 90 minute episodes might seem a bit intimidating or overwhelming to listen to, so we've been breaking them up into two parts. Still, we're open to feedback and ideas. Do you want one longer episode or two shorter ones? Email us and let us know at [feedback@navneuro.com](mailto:feedback@navneuro.com). For now, we give you Christine Trask.



**Transition Music** 02:04



**John Bellone** 02:14

We have Christine with us here. Welcome to the podcast. We're really fortunate to have you with us today.



**Christine Trask** 02:19

Thank you so much for having me.



**John Bellone** 02:21

We'll just jump right into it then, if that works. We're curious to know how you became interested in pediatric neuropsychology. What was the trajectory of your training and specialization in this area, just broadly?

**Christine Trask** 02:33



I always say that mine was not a very direct path, a little bit more circular than a lot of folks. My family has some background in medicine, so I was interested in medicine and particularly within oncology. I started thinking a little bit about that, but quickly realized I didn't care so much for biology or chemistry and med school was probably not going to be the best choice for me. In college, I had started studying memory with one of my professors and was very intrigued by that. And that really spurred me on to look more at that. Again, my path wasn't direct. So I started off working more with adults in behavioral medicine related to oncology. Then I realized I really enjoyed working more with children and moved into child clinical psychology. Then I realized I still wanted that medical piece to come back and found neuropsychology to be the perfect blend of all my different areas of interest.

**Ryan Van Patten** 03:25



We're also interested in your thoughts about the field of pediatric neuropsychology broadly. Any field has areas of strength and places where there could be improvements. Off the top, do you have suggestions or ideas about where the field can develop going forward?

**Christine Trask** 03:41



I think pediatric neuropsychology is a little different than adult neuropsychology. Adult neuropsychology has become a more unified field, with a lot of folks having very similar training. A lot of focus is on the neuropsychology core component of it. People coming into pediatric neuropsychology have come in from a lot of pathways. Sometimes people see that as a downside, because people have more variability in their training and more variability in how they practice neuropsychology. But I actually think that's a benefit to the field, particularly as neuropsychology continues to evolve. We're struggling now as payers are looking at what we do and trying to understand the worth of neuropsychology. I think when the field gets too narrowly focused, we're not good at evolving and adapting to the change that's out there. Pediatric neuropsychology has a little bit of a benefit because we function in the schools, we function in hospitals, we function in private practice - we have a little bit more diversity to draw from to help us balance out some of those changes that are happening.

**John Bellone** 04:45



You're a little bit unique because you have both the clinical neuropsychology board certification and the subspecialty pediatric neuropsychology certification. I'm curious

why you have both boards. What are the advantages? What does one give you that the other doesn't?

**Christine Trask 05:03**



I think it really speaks to, again, how the field evolved. The field evolved to recognize neuropsychology and primarily from an adult focus. So the first board that developed was this generic neuropsychology board, which they assured people would take into account pediatric interests and really reflect pediatric neuropsychology as well. When I first started, board certification was just really that board. So I did that board certification. And in preparing for it, it definitely didn't feel like it was tapping all of what I did on a day to day basis. Whereas my adult colleagues, when they were preparing, they would say, "Well, it's just what I do every day. It's the type of case I see every day. It's the type of material I work with every day." And I would say, "Well, there's little bits of it in that assessment, but it doesn't feel like what I do every day."

So when they finally recognized that pediatrics was unique, and really sought to establish, what would it mean to say that you specialized in working with pediatrics, I felt like that was a better representation of who I was as a professional. So then I sought to pursue that. So it's something you first have to get the regular board certification to be eligible to get the pediatric sub specialization category. So I just couldn't stop and I just kept going at that point in time.

**Ryan Van Patten 05:25**



That seems like a little bit of an imbalance, right? I wonder, do you see there being changes in how the board is structured going forward? I could see there being adult neuropsychology board certification and a pediatric certification.

**Christine Trask 06:35**



I think there's always this struggle in the field of how to represent what everybody does, when people do come at it from different ways. I do have a couple of colleagues who are really lifespan people, who say they do pediatrics and they do adults, and the current setup does suit them well because it really does capture what they do. In terms of percentages, they're still more of the adult based practitioners and most programs when you go to study neuropsychology, you're going to start at it from an adult perspective and then learn pediatric second. But I do think that it's really been beneficial that the board has stopped to think about what's unique for pediatrics and is there some way to really feel like that's more greatly captured and represented in what they're doing.



**John Bellone** 07:20

So being focused on working with adults, I really don't know much about that subspecialty. Can you tell us a little bit about the process of the exam? I don't know much about it.



**Christine Trask** 07:28

If you know the board certification process to begin with, you have the three components: you have a written exam, you have work samples, and then you have an oral exam. After you pass that for the adult portion, you basically get to do it again in a slightly smaller format specializing in children. So you take another written exam focused more on pediatric issues. You then have to submit another work sample of a pediatric case, which is defined as under the age of 16, 16 or under. You have to submit additional letters of recommendation from people that are pediatric specialists. The only difference is you don't have to do the oral. If that is all reviewed well, then you're given that certification at that point in time.



**John Bellone** 07:29

Sounds like a lot of work. [laughs]



**Christine Trask** 07:52

[laughs] And the one little downside too, for me, just in terms of timing, is that the adult board has grandfathered the people in so that they don't have to be recertified or maintain their certification. But the pediatric portion was established so much later that anyone doing pediatrics has to do the maintenance of certification.



**John Bellone** 08:37

I see. I do want to get to oncology eventually. [laughs]



**Christine Trask** 08:39

Yeah, that's fine. [laughs]



**John Bellone** 08:40

But I think people will be really interested in this. Do you suggest that most people pursue that? Or who do you think should?



**Christine Trask** 08:48

I think it's a really interesting question about who it's going to benefit. I think, as a field, if we think about it, not as the individual perspective, but the field's

perspective, there's benefit to the field to really establishing what is the requirement for someone to be in this field? What is their level of knowledge? What should their practice look like? Having some level, saying people should be at this level or above. So I think it benefits the field to try to have this and pursue this.

On an individual basis, the people that it helps the most are people that are really doing clinical work in two primary areas. One is within the hospital academic setting. Many institutions have recognized this as a certification. So many institutions are asking for people to have that to show that, again, we have people at the highest level of training and background. Then the other group are people that do forensic work because it becomes a shorthand when you're in the court system to be able to say that you're appropriately trained by being able to say you have that certification.



**John Bellone** 09:48

Makes sense.



**Ryan Van Patten** 09:50

Yeah. I think we can start to transition to oncology now.



**Christine Trask** 09:53

Sure.



**Ryan Van Patten** 09:54

So, I'm interested in this. We talked about pediatric neuropsychology, but you also have all this expertise in pediatric oncology. How did you find your way there?

**Christine Trask** 10:04

It was really where my interest started for neuropsychology, with this medical background. An interest in how, when children became sick, how did families adapt, and how did families change, and how did an illness affect the child and the family.



And oncology was an example that cut across that and worked in all the different areas that I had worked in. And basically, I had always known that was the area that I was most interested in. So when I went to conferences, I looked out for those talks. I made sure to get as much experience as I could in those areas. But it really wasn't until I came here, where my position really allowed me to attach to an oncology department and form that relationship, that I was really able to get a

whole nother layer of training and experience for it. Most of that has come on the job with the folks in the oncology department that I've worked with.

**John Bellone** 10:54



In your experience, how common are pediatric cancer referrals in most hospital settings? Are these relatively common across most hospital practices? Or are they only in particular clinics?

**Christine Trask** 11:05



I would say, across hospital practices, they're really quite common. When you think of pediatric neuropsychology, the bread and butter of the medical side of cases we'd see would be epilepsy, some degree of head trauma, concussion or head injury, and then oncology would be the next largest group. So for pediatric neuropsychologists that work within a medical setting, it's going to be a pretty common issue that will come up.

**Ryan Van Patten** 11:30



Yeah, it's helpful. It's a good segue. I think it'd be helpful for us to go through a little bit of basic biology and talk about cancer a little bit. [laughs]

**Christine Trask** 11:39



As best I can. [laughs]

**Ryan Van Patten** 11:40



We're psychologists, so. [laughs]

**Christine Trask** 11:41



Exactly, exactly. [laughs]

**Ryan Van Patten** 11:43



Obviously, there are many different types of cancer overall and we're not going to cover all of them. Based on my limited knowledge, what I found in the literature is, for neuropsychologists, brain cancer, obviously, is relevant. Then there's also leukemia, specifically, ALL, acute lymphoblastic leukemia. I'm wondering if you could speak to those. What populations you see most commonly and if there are any other subtypes of cancer I left out.

**Christine Trask** 12:11

Those are the two most common that we would be seeing, both for reasons of incidence but also in terms of applicability for neuropsychology. So, leukemia is the most commonly occurring childhood cancer. That's going to be the largest group of children who have a cancer diagnosis. Brain tumors are usually the second largest group. Children with brain tumors are probably at the greatest risk for neurocognitive difficulties, both from the cancer itself but also from the treatment.



Then children with leukemia are at what I would call a more moderate risk, most of them. Again, it's mostly from the treatment itself. There are other children that sometimes also benefit from neuropsychological assessment. It usually has to do with the types of treatments that they've received. So we say whenever a child has received radiation therapy that's directed to the head, or they've received any chemotherapy agents that we know cross the blood-brain barrier, particularly in the way they've been administered, like intrathecally, then those are the children that are going to be at slightly increased risk for neurocognitive issues.

There's some agents that also have secondary effects - chemotherapy agents that can impact hearing. So some children also benefit from assessment, not from direct impact on cognition, but the way hearing can impact a child's cognitive development.

**John Bellone** 13:33



Maybe we should define a couple of the terms that just came up. So "intrathecal" is injecting directly into the spinal canal. So that gets taken up through the cerebrospinal fluid and has direct access to the brain, it doesn't have to go through the blood-brain barrier. Then also to define leukemia - my understanding, please correct me if I'm inaccurate here, but the lymphoblastic part of acute lymphoblastic leukemia refers to overproduction of immature lymphocytes, a type of white blood cell, which is why it's sometimes referred to as acute lymphocytic leukemia.

**Christine Trask** 14:11



Right. So there are three major types of blood cells - white blood cells, red blood cells, and platelets. Leukemia comes out of the production of the white blood cells from the bone marrow. It initially starts as a lymphoblast, which is how it sometimes gets the name of lymphoblastic leukemia, and then it evolves into two types of lymphocytes as well as killer cells. The lymphocyte is usually what gives it its secondary name. You can either have B-cell lymphocytes or T-cell lymphocytes.

The majority of children will have B-cell or pre-B-cell ALL, but there are some children that will have T-cell ALL. It's a slightly different disease.

**Ryan Van Patten** 14:52



Okay. So we've talked about a couple of the most common types of cancer we'll see. Can you briefly run through risk factors for cancer in children broadly and any knowledge you might have of mortality rates?

**Christine Trask** 15:04



The risk factors for children are really largely unknown. The majority of children develop cancer for no known reason. We do know that a small percentage of them have genetic risks for cancer. I believe they would say about 5% of children have some genetic predisposition for cancer. Many of them are cancer genetic subgroups, like Li-Fraumeni. But some children, like children who have Down Syndrome, are at an increased risk for some cancers as well. There really isn't any other well-identified cause for childhood cancer, with the exception of rare instances where there has been mass radiation exposure. So children in Chernobyl, children in Japan did have increased risk of cancer after those episodes. But we haven't really clearly identified other environmental factors that are, again, a clear risk for childhood cancer.

**Ryan Van Patten** 16:01



Early on in the process, when a child first starts to show symptoms, what's the general medical workup you usually see when they're looking at differential diagnosis and trying to characterize the cancer?

**Christine Trask** 16:13



Many times it can take a while for them to really have high worry that it's a cancer. A lot of these early symptoms can look like your typical viral illness - kids being a little bit more fatigued, maybe looking a little pale, a fever that doesn't quite go away, an infection that doesn't quite go away, a little bit of vomiting. And, in the childhood world, these are things that can happen pretty commonly. So it's usually when these things are persisting and lasting some time. Usually, they'll then start with bloodwork - start looking at white cell counts, things of that nature. After that, they have to look at bone marrow when they really have a concern, especially for leukemia. For the other cancers, it's going to be some type of imaging work done - a brain MRI, something like that - to look for a tumor.



**John Bellone** 17:04

It might be helpful to talk through a couple of the different types of the brain-specific tumors. I know some of them are a little less common.



**Christine Trask** 17:16

There's always a little bit of discussion in the field about when should we call it "cancer" when there's a brain tumor. They're often considered benign if they're not actually invading brain tissue. They're taking up real estate in the brain, but they're not actually going into the brain tissue. The most common form is an astrocytoma and those we see most regularly. Those are often benign, where they have a clear margin and are not really infiltrative. In contrast, the other more common malignant tumor we'd see is a medulloblastoma. That tends to grow very rapidly and will invade brain tissue. Ependymomas are another major group that we see in terms of types of brain tumors.



**John Bellone** 17:59

These are all primary tumors? These don't metastasize from other areas?



**Christine Trask** 18:03

Correct. That's the difference between adult brain tumors and childhood brain tumors. Most childhood brain tumors, the cancer is starting in that brain tumor, that's where the cancer has begun. Whereas for most adults, or many adults, their brain tumor is arising from a cancer in another part of the body. So it's metastasized to the brain, but didn't start in the brain.



**Ryan Van Patten** 18:25

You alluded to this earlier, but often the trajectory of a cancer diagnosis in a child, it sounds like the symptoms often start out nonspecific, right?



**Christine Trask** 18:35

Yes.



**Ryan Van Patten** 18:36

My understanding, when I'm putting together the process of how a child comes to be diagnosed with cancer, is they have these nonspecific symptoms, maybe their symptoms persist where they're thinking maybe a virus or not, the parent takes the child and gets bloodwork, and then is there a lot of variability in when a child is

diagnosed? Is it often difficult to diagnose? Or does it usually come pretty quickly after the CBC?

**Christine Trask** 19:02

I think it partly depends on whether we're talking about leukemia or a brain tumor. Leukemia is diagnosed most often when children are about 3 and 4 [years old]. So one of the challenges there, too, is children aren't very good reporters of their symptoms, which makes it also a little bit harder. So it isn't uncommon, I would say in my experience, to see that kids have had some symptoms for a couple of weeks, a couple of months. It does take usually some time for both parents to have more concern and physicians to have more concern because many of the symptoms are so common and nonspecific.



Brain tumors can be a little bit different. Particularly because you can get, you know, gait instability, you can have changes in eye movements, things that can be more of a clear sign that look more unique or more different. Sometimes those are picked up a little bit sooner in that sense. But a lot of it depends on the nature of the brain tumor and the location of the brain tumor in terms of how quickly it gets picked up.



**Ryan Van Patten** 19:59

A lot of variability.



**Christine Trask** 19:59

Yeah.



**John Bellone** 20:00

The earlier you pick it up, the better the prognosis?

**Christine Trask** 20:03

Generally. But some of these childhood brain tumors are very, very slow growing. So some children we'll see, we will have guessed they will have had this tumor for quite some time - you know, years and years before it manifests enough to create a symptom. [For] many of those children, the difference of diagnosing a month earlier or a month later is really not going to make much impact in terms of their treatment or their prognosis.





**John Bellone** 20:31

That'll be nice for parents to know.



**Ryan Van Patten** 20:33

Is it your impression that tumors or cancer in general progresses more slowly in children as compared to adults?

**Christine Trask** 20:40

I think that would be a hard statement to make across the board. They're very, very different illnesses that they have. Leukemias are so common in childhood, but they're not so common in adults. It tends to be more virulent in adults when it occurs in adults.



Brain tumors, though, on the other hand, depending on the type of brain tumor, some of the childhood brain tumors are, I think, more benign in some ways, or we have a larger group of benign tumors. But you also run the risk of having a greater impact because you have a developing child where it can affect a lot of different layers of systems.

**John Bellone** 21:17



Why don't we transition into some treatments for cancer. We'll stick with the physical mechanisms first, and save the cognitive effects for later. I'm curious to hear all different types of treatments, but maybe [we can] start with surgery because that's what a lot of people think about.

**Christine Trask** 21:37



Certainly when we think of a brain tumor, if it is particularly a more benign or slow growing tumor, surgery is going to usually be the first line of treatment that we'd be thinking about. It all depends on the location - if it's resectable in terms of its location or not. If it is, that's going to be the primary preferred treatment. So something like a JPA, a juvenile pilocytic astrocytoma, is often in the location more towards the back of the brain that makes it easier to get it from a surgical standpoint. So surgery might be the only treatment that's needed for that. The leukemias, on the other hand, are not going to have a surgical aspect to their treatment. Most brain tumors, if they are more invasive, are then going to also involve some degree of chemotherapy or radiation.



**John Bellone** 22:29

Do you have a sense for how surgeons weigh the risks and benefits of the procedure? It seems like a difficult decision.



**Christine Trask** 22:34

I do not have to make those decisions myself, which I'm thankful for. But I have heard some of our neurosurgeons here discuss it and really try to sift through their thinking. A lot of it has to do with what are the potential risks from where that tumor is located or the approach they have to take, and what are the symptoms that are currently experienced. Many times if a child has a known tumor, particularly if it's slow growing, but does not have symptoms - so it hasn't made an impact - they may be more reluctant to pursue surgery or additional surgeries for that tumor. Because, again, there's going to be some risk involved with that approach. But if, on the other hand, the child's beginning to have very clear symptoms, they're going to be more aggressive in what they do. Whenever tumors are located near the life support areas of the brain, many times then it becomes a situation where the surgeon will not be willing to do surgery for that.



**Ryan Van Patten** 23:30

Yeah. I have a little bit of experience with this in epilepsy resection surgery. I get the impression that there's some variability across surgeons, too, in terms of how aggressive versus conservative. Obviously, there's pros and cons to both, but has that been your experience?



**Christine Trask** 23:47

Very much so. We see it probably the most with the tumors that are again more in the back part of the brain. We know that the closer you come to the vermis when you're doing surgery, you have risk for certain sequelae, sometimes referred to as "cerebellar mutism" where children can have a loss of language and some emotional changes as well. Some surgeons feel very comfortable in having a good sense for themselves of how close they can come to the vermis and will be quite aggressive in that approach. And other surgeons feel that they'd rather err on the side of not running that risk and then are a little bit less aggressive. So many times when children have tumors in locations that are equivocal in that way, people will get multiple opinions. Go to see multiple surgeons to see what their rationale is, and what they would be comfortable doing.



**John Bellone** 24:37

We can transition into radiation. We're going to have to separate out ALL, leukemia, from brain tumors. Maybe you could talk a little bit about that.

**Christine Trask** 24:49

I'll talk a little bit first about leukemia and when radiation is used. What used to be the mortality factor for leukemia was when the leukemic cells were basically in the brain and started crossing that barrier. So cranial radiation was initially used as a way to kill off those leukemic cells. But we also know that cranial radiation has one of the more toxic effects on the brain and thinking. And so there's been a real movement within treatment of leukemia of trying not to use cranial radiation unless it's really necessary. The main group that that would be reserved for at this point in time is when you have T-cell leukemia. That tends to be a slightly more aggressive form of childhood leukemia, so you're more likely to see cranial radiation used. And because it's not a targeted area, it's the blood, it's going to be whole brain [radiation]. So it's going to be radiation directed across the whole brain system.



With brain tumors, you have the opposite effect. You want a target. You want to hit the tumor, you don't want to hit the whole brain. There's different techniques that have been used, either by trying to shape the radiation pathway or the types of radiation that are used, to try to minimize how much damage is done to the rest of the brain.



**John Bellone** 26:05

Do you have a sense of what the rate of leukemia entering the brain is?

**Christine Trask** 26:15

Historically, before we developed radiation as a treatment, only about 10% of children survived leukemia. So it would eventually cross and would kill the majority of children. Now we have about somewhere between 95 to 98% survival rate in leukemia. It's all about being able to target leukemia and keep it from entering the brain. So there is a huge impact about being able to do that.



**John Bellone** 26:42

And that's largely because of the chemotherapy?



**Christine Trask** 26:45

It started with radiation. So when we first started treating children with cranial radiation for leukemia, there was a huge improvement and the jump was about to 50% survival rate. But, again, then there became this constant shifting of how we could still improve mortality, but also take away morbidity in terms of the side effects. And chemotherapy has played the crucial role in being able to do that.



**Ryan Van Patten** 27:11

Something about radiation that some of our listeners may have a question about - I'm going to sort of lay this out and then take a stab at it. I'm curious if I'm right or wrong, Christine. So thinking just generally, exposure to radiation can cause cancer and then we use radiation to treat cancer. It may seem like a bit of a paradox there. My understanding is that - we're talking about radiation, high energy ionizing particles, which can damage biological tissue. If you're exposed to it, it can damage DNA and later lead to cancer. But then we harness that as a treatment and direct it towards the cancer cells, thus ideally, killing those off. Obviously, healthy cells can get caught in the crossfire, hence the side effects. But it sounds like across time, not surprisingly, we're moving towards more accurate and precise radiation treatments that hit less healthy cells, thus have better outcomes. Is that generally accurate?



**Christine Trask** 28:09

Yes. So the group that I think you can see this most clearly in are children with neurofibromatosis, or NF1. They're the group that really has the tendency for exposure to radiation to lead to cancer production. So as a result, in most of those children, even though they may develop brain tumors, people will be very reluctant to ever use cranial radiation to treat those tumors. For other children, though, radiation has been so effective in being able to destroy that tissue. They keep trying to find ways to conform or shape the radiation pathways so that it's really just targeting the tumor. Proton beam radiation, which is one of the newer forms, is really that attempt at figuring out, even if we can keep the path narrow, is there some way that we can sort of turn on and turn off the radiation so that there's less of an entrance and less of an exit from that pathway.



**John Bellone** 29:10

Does the dose matter?



**Christine Trask** 29:13

Like everything in cancer treatment, it's all about the dose. The higher the dose, the greater chance you have of killing what you're trying to kill. But the higher the dose, the greater chance you have of hurting what you don't want to hurt. That's the constant tension within the field - how to maximize the benefit and try to minimize the harm that's happening.



**Ryan Van Patten** 29:34

It's such a balancing act.



**Christine Trask** 29:35

Yes. I really have great respect for my colleagues that have to make those decisions on a daily basis.



**John Bellone** 29:40

Yeah. So the radiation regimen is typically a low dose fractionated over many different administrations.



**Christine Trask** 29:48

For most of them. Although some children, again depending on their tumor, may have more of the stereotactic radiation approach, which will be a high dose for a very brief period.



**Ryan Van Patten** 30:01

It's such a scary thing to think about exposing your brain to ionizing radiation, but, you know, extreme circumstances call for extreme measures.



**Christine Trask** 30:09

Yeah. And it is very effective in what it does. That's the struggle, especially for brain tumors. It usually works better than many of the chemotherapy agents.



**John Bellone** 30:22

But that's not the case for leukemia, right? Maybe we can transition to talking about chemotherapy and how that field has progressed over time.



**Christine Trask** 30:30

Really, it is this combination of different agents. They have the same idea behind radiation. You want to target a cell that's rapidly dividing and sort of kill or neutralize

the cell that's rapidly dividing, while trying not to hurt that many other cells that are good cells that are rapidly dividing. They use combinations of chemotherapy agents to try to do that - to try to find a way that's best going to target and approach the cells that are rapidly dividing.

**Ryan Van Patten** 31:01



It sounds like, based on the brief background reading I've done, that the contemporary chemotherapy regimens for ALL have really made a huge difference. Currently, survival rates and outcomes are much better than they used to be.

**Christine Trask** 31:14



Yes. Many times leukemia is really held up of [as an example of] what can happen when medical institutions really work together. This real leap in advancement and understanding happened because, across the country and across the world, pediatric practitioners got together and said, "Well, let's treat children all the same way so that we can share this information and really understand quickly." Because within small settings, you may only have a couple of kids with cancer at a given time. So it's hard to see those patterns or recognize those patterns. But if everybody works together and they share their data, then you can see those much more quickly and much more readily.

**Ryan Van Patten** 31:52



It sounds like a great model for other areas of medicine and psychology to pull from.

**Christine Trask** 31:56



It is. I mean, I think there's always struggles whenever you try to get that many people together to agree on how things are going to work and what the criteria are going to be. But we really have seen the benefit from that in terms of the outcome. It's really advanced the field quite quickly, as they've shared that information.

**John Bellone** 32:12



It also seems like contemporary chemotherapy is a relatively inexpensive form of therapy. So maybe for lower income or middle income countries, where there is a higher population of children and thus higher rates, it might be better. Is that your sense?

**Christine Trask** 32:32



One of the challenges, though, is that chemotherapy usually lasts for a much longer period of time. So a chemotherapy regimen for leukemia is going to last for two years, maybe three years. That's a lot of administration of medication. We've had periods of time where some of those chemotherapy agents are short, there's not enough supply. And that becomes a real challenge of how to manage that. They have to sort of triage and figure out who's going to be most needed to receive that agent at that point in time. So there are challenges with that as well.

**Ryan Van Patten** 33:07



Yeah, for sure. So we've covered some of the basics of the three most common treatments targeted towards cancer. And we've talked a little bit along the way about some side effects. Maybe in particular with chemo and radiation, in my mind, there are some general side effects that most people know about. Can you talk about some of the overlap, but then some side effects that are unique to chemo versus radiation?

**Christine Trask** 33:30



I think for both chemotherapy and radiation, the areas of the brain that are the last to develop - a lot of the executive functions, the speed of processing, being able to switch attention rapidly, some of the organization of material to encode [information] - are problems that we can see across both types of treatment. Children that have radiation do seem to be also a little bit more at risk for visual problems, things that are generally more considered to be on the right side of the brain. Children with brain tumors also can have specific deficits or problems depending on the tumor location, which will be different from children with leukemia.

**John Bellone** 34:10



I'd like to maybe transition into asking you some questions related to neuropsych evaluations with these populations. Why don't we start with the clinical interview. Can you tell us how you set up the interview? How many family members do you like to have in the room? Should the child be present?

**Christine Trask** 34:28



A lot of that's going to depend on the family themselves and what their preferences are. So I usually try to set up the interview or intake on a day different from testing so that we can have some flexibility for how we manage it. Within oncology, I think there's been a real effort made to include children in their treatment at the level that they can understand. So many times children really do have some understanding of

their illness or what's been going on and many of them do have a greater ability, I think, to participate in some of those interviews. But it's usually the family's decision. I leave it up to the family about when they want the child to participate and how much. I always tell them if they want the child to participate the entire time, we can. But, usually, my guidance would be that for children under the age of 12, I often will do at least some portion of the interview alone with the parents, without the child present. And then as they get older, they get more involved in that portion of it as well.

**Ryan Van Patten** 35:29



Do you have any clinical pearls in terms of how to talk about cancer to children? Obviously, there's a lot of caveats and moderators, like age and intellectual development, those sorts of things. But how do you approach speaking directly to the child and telling them about it?

**Christine Trask** 35:43

I think it's always a good approach to be honest. So what you're talking about is trying to keep it a clear true message, but changing the complexity of what you're talking about. When children are very young, they may be told that they have something that's called cancer that the doctors are going to work on treating. They're going to be getting medicine that may make them sick, and sort of what sick might feel like. And why people are doing these things to help them.



As they get older, they may understand. They may be told that, you know, you can understand that a cell is dividing. And what cancer means is when the cells are dividing too quickly and we're trying to control that. And then as they get older, still, they can get a more complex understanding of it. But we really do encourage kids to understand this. Not be told, "Oh, no, there's nothing wrong." You know, I think children understand that something doesn't feel right or it seems different for them. It's good to really be truthful with them, so that they can also trust that you're their partner in this and on their side as well.

**Ryan Van Patten** 36:46



That's really important. Clearly, you've thought a lot about that. I think it's something, as psychologists, that we can bring to the table, which is helpful.

**Christine Trask** 36:54



I think most pediatric oncology centers are very thoughtful about this. That's something that I've seen across the country. That sometimes really differs from

people that work with adult populations versus child populations. There's been a real movement within child medicine of making sure children understand what's going on and trying to prepare them for procedures or things that are happening and working on that adjustment factor. So children spend time, you know, when they have to have radiation, at being able to visit that suite - what is it going to look like? What are they going to be asked to do? - before they actually receive treatment.

**John Bellone** 36:54



I think that transparency is so important at the developmentally appropriate level, of course. Are there any background questions that you include in these kinds of interviews that you don't include and others?

**Christine Trask** 37:43



I wouldn't say that I don't include, but that I might look at more closely. I'm always very, very aware of when there's a family history of cancer. Again, there's that small group of children that do have genetic predisposition for cancers. So it's very important for me, if a child has leukemia and if their parent has had breast cancer or ovarian cancer or if there's other cancers that are running in the family, for us to think about whether there's a potential genetic component to that. It's also really important for me to try to tease apart cancer-related issues from other developmental issues. I still really need to know that developmental history in a lot of detail so I can understand what was the developmental course or track of the child before all of this started as well. And then really understanding how the family coped with the cancer diagnosis. What changes did they make in the family at the time? How may that also interact with what's going on at the present time?

**Ryan Van Patten** 38:39



For genetic risk and getting the family history, it sounds like any cancer subtype in a family member would increase the risk, at least to some extent?

**Christine Trask** 38:50



Not necessarily. It's just that it's so complex. The different genetic conditions that are out there have clusters. So breast and leukemia and ovarian, there's a cluster that sort of coincides with that. But there's multiple different clusters. It doesn't mean that any cancer increases the risk, it's really looking at the pattern. Do we see this same grouping of cancers coming together within family members? Most families will have a family member somewhere with cancer, but we're really looking at multiple family members or similar types of cancer.



**Ryan Van Patten** 39:27

Yeah, that makes sense. Sort of how we think about psychopathology, right? If you have an externalizing disorder, then a family member is at higher risk for another one. Some things are more closely related to others. So having that thorough family history allows you to paint the picture and get an idea as to this child's risk.



**Christine Trask** 39:43

But I think one of the things that's sometimes a misconception in the popular media is that clusters of cancer are unique. So just because a family member has prostate cancer and the child has leukemia, those aren't necessarily linked. You can have groups of children that have cancers, but if they're not the right types that would be linked together, that just sort of an artificial coincidence. It doesn't necessarily mean that they're related.



**John Bellone** 40:16

So that's it for Part 1 of Pediatric Oncology. Stay tuned for Part 2, which will be released in two weeks, on October 15.

And now, Ryan and I want to announce the results of the monthly raffle that we've been talking about. So, by random selection, Keisha Sanders has won an Oxford Series AACN book of her choice. She has 11 different books to choose from, including the mild TBI book by Mike McCrea, the MCI and dementia book by Glenn Smith and Mark Bondi, the board certification book by Kira Armstrong and colleagues, and other books. Congratulations, Keisha. And thank you so much to everyone who left us a rating on iTunes. We really appreciate it.

We will be having another raffle next month, so leave us a review on iTunes and send us an email at [feedback@navneuro.com](mailto:feedback@navneuro.com) with the name you left the review under so that we know how to contact you. Then listen in at the end of the November 1st episode to see if you won. You can find step by step instructions on how to leave a review by going to [navneuro.com/itunes](http://navneuro.com/itunes).



**Ryan Van Patten** 41:24

Well, that's it for now. Don't forget to visit our website at [navneuro.com](http://navneuro.com) and post questions or comments about any of our episodes. We would love to get a lively discussion going. As always, thanks so much for listening, and join us next time as we continue to navigate the brain and behavior.

**End of Audio** 41:42

**Note:**

The Navigating Neuropsychology podcast and all the linked content is intended for general educational purposes only, and does not constitute the practice of psychology or any other professional healthcare advice and services.

No professional relationship is formed between us, John Bellone and Ryan Van Patten, and the listeners of this podcast. The information provided in Navigating Neuropsychology in the materials linked to the podcasts are used at listeners' own risk. Users should always seek appropriate medical and psychological care from the appropriate licensed healthcare provider.