The Lead in Peds

Transcript: Season 1, Episode 7 – Breaking Barriers: Emerging Therapies in Pediatric Brain Tumors

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Guests: Dr. Roger J. Packer, MD & Dr. Adriana Fonseca, MD

Dr. Nathan Kuppermann (00:00):
Children's National Hospital is leading a team of global experts coming together in real time to solve the toughest cases of pediatric brain tumors. Progress and hope aren't distant dreams. There are breakthroughs happening right now. Welcome to The Lead in Peds, a podcast where we explore the cutting edge of pediatric research and clinical care. I'm your host, Dr. Nathan Kuppermann, Chief Academic Officer and Chair of Pediatrics at Children's National Hospital. Today we're focusing on one of the most challenging and rapidly evolving areas in pediatric medicine brain tumors. Joining me are two children's national leaders who are recognized experts in their field. Dr. Roger Packer, the Gilbert Distinguished professor of neurofibromatosis and director of both the Brain Tumor Institute and the Gilbert Neurofibromatosis Institute and Dr. Adriana Fonseca, attending neuro oncologist and director of the Rare Brain Tumor Program. Together we're going to discuss how global collaborations and emerging technologies from precision medicine to focused ultrasound are reshaping the future of care for children with brain tumors worldwide.

(01:09):
Dr. Packer, Dr. Fonseca, thank you both for being here. Before we get into the serious stuff, I'd like to start with just a little bit of a lighter note. I actually had a very crazy week the last two weeks where I had two events on airplanes where I was called to serve as a physician and as physicians we are called in a number of ways, a number of places to care for patients. Just wondering what is each of your most memorable events being called to action as a physician? And let me start with you, Roger.

Dr. Roger Packer (01:39):
I graduated medical school and got married a couple of days later and then went on my first plane ride transatlantic. I'd never been on a plane. I'm in my mid-twenties and I'm really full of myself because I just graduated medical school and we're sitting down and suddenly there's an announcement over the loudspeaker. Is there a doctor on the plane? Now I know there's probably 50 doctors on the plane, but I'm theoretically a doctor. So of course I jump up and they look at me a little weird and they say, come back and we find this woman really writhing in pain and I make a diagnosis on the spot and I have no idea if I'm right still to this day that she had a kidney stone infection. And they said, great, what are you going to do about it? That was a really good question. I've been a doctor for about three hours. I started walking up and down the plane asking

if anybody has narcotics, they can give me so I could give it to this lady. There were about eight people who suddenly give me their diol or their codeine and I had this pack of pain medications. They pulled back to this woman and she took them and about half an hour she was smiling. Her kidney stone attack went and I said, this was really not the smartest thing I've ever done in my life.

Dr. Nathan Kuppermann (03:07):
Adriana, how about you? Memorable event, plain or otherwise anywhere?

Dr. Adriana Fonseca (03:11):
One of the things that I always remember when I finished med school, we actually had to go to do some kind of general kind of medicine service and I actually worked for about a month in the Air Force base in Bogota and I just always remember because it's so very different to what I feel comfortable today doing because it was just like seeing soldiers and seeing young men with ingrowing toenails and other kind of regular issues. And when I look back it is always one of those things that I remember in a very odd way. I don't know how at the time it just seemed like a very normal thing to do. But looking back it is very different to what I do now and what I feel like I'm knowledgeable about.

Dr. Nathan Kuppermann (03:58):
That's awesome. That's actually one of the great joys I think about being a physician without being overly dramatic about it. We kind of are front row center in the theater of life. I like to say we get called in a variety of circumstances, but let's get to the heart of the matter for today's episode. And Roger, I'm going to start with you. If you could sort of give us just the overall landscape of pediatric brain tumors in terms of the evaluation and treatment of children where we have been and where we have come, just an overall introduction, that would be great.

Dr. Roger Packer (04:32):
What we understand about childhood brain tumors is much different than we did 20, 25 years ago. Childhood brain tumors are made up of a myriad of different kinds of molecular subtypes. So there isn't one childhood brain tumor, there's 30 40 sub varieties and they're much different molecularly, they arise in different areas of brain, they arise in different ages. And the reality of life, even though we've made some really great strides over the past couple of decades and I've been involved in some of those protocols and Children's National has helped lead some of those protocols where we've risen from Medulloblastoma the most common embryonal tumor survival from 40% at five years to 80% at five years where we've transitioned away from chemotherapy and radiation therapy to oral molecular targeted therapy for low grade Lomas. Despite all of those positives, what haunts me is that pediatric brain tumors remain the leading cause of morbidity and mortality of all forms of childhood cancer. And that's this landscape and you can't talk about brain tumors as one entity. Each of them has their own prognosis, their own approach,

and then for some we just have not changed the story for the past 50 years despite the positives in other areas.

Dr. Nathan Kuppermann (06:07):
Lemme just follow up and ask you just where do you think is the biggest opportunity for progress that most excites you? And again, we'll be getting into details further, but what area?

Dr. Roger Packer (06:18):
In the last 10 years we've learned more about pediatric brain tumors, their biology, their drivers than we've known ever before. What excites me is that we understand them better, not perfectly but better, but we have not yet. And many of them translated that into new or more effective therapies. So the excitement is the same as the frustration here. We understand them better yet we can't translate in some areas and that's where we have to be innovative. We have to do things differently, we have to do things faster.

Dr. Nathan Kuppermann (06:58):
Adriana, let me turn to you and what are your thoughts about the biggest challenges that we face in children with brain tumors?

Dr. Adriana Fonseca (07:05):
One of the biggest challenges is that some of these tumors that are more common and we do have a lot more information and we now know a lot of the biology. There are others that they're very rare and for that reason we don't have that information and we haven't been able to make as much progress because those are so rare. But when you put them together, they actually make a big proportion of patients with brain tumors that we see. So some of the things that we've done at Children's National as well, and part of what we do in the rare Brain Tumor program is actually try to kind of understand all those rare entities so we can actually tackle them in a faster way because my patients that come in with those rare brain tumors don't have decades to wait for us to figure out in the current pace.

Dr. Roger Packer (07:58):
And just one thing to add on to that is that even though, and Adriana is completely correct, they're rare and they're individual, we finally have the techniques for the first time to sort of individualize care where that's appropriate. Most of our care was grouping patients and treating them all the same way. The excitement also is that the possibility of true personalized medicine. I know it's overused tremendously for these rare brain tumors or even for some of the commoner brain tumors that have different sort of sidesteps molecularly. We have the techniques for the first time to understand in real time that they're different and how we can moderate therapy and use these molecular targeted therapies, the immunotherapy and everything else. We just have to

get smarter in figuring out how to put this all together and figure out what makes sense and very honest what doesn't make sense so we can keep going down the same rabbit holes.

Dr. Nathan Kuppermann (09:04):
Adriana, I'm going to ask a sort of follow-up question to you. We like to say that children are not just little adults with a lot that we do in pediatric emergency care, and I'm just wondering how does that resonate in pediatric brain tumor care?

Dr. Adriana Fonseca (09:18):
Well, everything that's kind of like my cornerstone kids are not little adults and definitely brain tumors in children are not the same, not the way that we approach them in terms of treatment, but biologically. So first we have to remember that kids are still developing and when they are developing in the brain, everything that we do is going to have some consequence in that kind of learning and brain development. So everything that we do in all the therapies that we have to choose, we'll have some impact and we want to make sure that we take into consideration that when we are selecting treatments and when we're just giving our patients the best possibilities and best treatments, I have to think about my patients, not about how I only treat this tumor now, but how can I treat this tumor the most successful way with the least amount of side effects and with the biggest possibilities for him or her to be able to achieve everything that they want to do in the future. We also know that biologically the tumors that we see in pediatrics are completely different than the ones that we see in adults. So we cannot use the same approaches for pediatric brain tumors that we use for adult brain tumors because they are literally completely different diseases.

Dr. Roger Packer (11:01):
We've sort of flipped the script on this a little bit. Normally in medicine it works out in adults and then you take it down to pediatrics and you hope there's a correlation and sometimes there isn't. Sometimes there isn't. But if you take a look at how the real advances that have done in pediatrics because of the relative rarity of individual tumor types, the pediatric community, the brain tumor community that decided 15 years ago that they were not going to wait for government or agencies to ban them together. They were going to ban together on an international level and molecularly analyze all our pediatric subset tumors and now the adult groups are sort of following in the directions we're going for. We had to do it out of necessity. And the people to convince to go with us initially were the drug companies and the vice companies because why would you do this in a five-year-old? You got to test it for the first next three years in a 40-year-old. Well, as Adriana said very nicely, these five-year-olds are dying. They don't have the time to wait. And at the same time, those drugs may be more effective in the younger patient because it's a different biology and we know the biology because we've studied the molecular genetics on a necessity, but that's where the change has gone.

Dr. Nathan Kuppermann (12:34):
That's a perfect segue because now I want to get into some specifics about new technologies and new treatments. So Roger, I'm going to turn to you at the start. Could you describe what is low intensity and high intensity focus ultrasound?

Dr. Roger Packer (12:49):
Simplistically, ultrasound is a wave and people have been using ultrasound diagnostically for years for pregnancies, evaluating abdominal masses. Everyone knows that the ability to focus the ultrasound in different frequencies and knowing those different frequencies have a different impact on the brain, they can disrupt it, they can heat it, they can change the blood vessel relationship between the brain and the blood vessels. The blood-brain barrier is a major step up. Where it was not applicable to pediatrics or for brain tumors is you couldn't get through the skull. So the only way you could get in there is by raising a skull flap. How long are you going to keep that skull flap open? There were better ways diagnostically than ultrasound to make diagnoses, but could you use its ability to heat disrupt or do other things therapeutically? And then when the techniques became possible only about five, seven years ago to reproducibly go through an intact skull and able to focus the ultrasound, suddenly it opened a new era or a new approach of what we could do with focus ultrasound.

(14:13):
It's a high frequency ultrasound really. You're using the ultrasound in a very detailed tight manner to heat the brain to destroy brain tissue and to do what the surgeons always talked about, which is noninvasive neurosurgery through an intact skull. Sort of crazy to thing. It's an oxymoron, noninvasive neurosurgery, but it's the reality of what it is. And then there are other applications. Why couldn't we do this for deep-seated pediatric tumors and use that capability in different ways? And that's where it's been very exciting. And Children's National was the first to put a focus ultrasound high and low into a children's hospital only about three to four years ago. So it's very exciting and it's a really great new technique. It has limitations, but it has lots of applications.

Dr. Nathan Kuppermann (15:14):
It's intuitive what the benefits are of high intensity focused ultrasound over putting metal to tissue. But what are the downsides?

Dr. Roger Packer (15:23):
The first thing you've got to go through the brain and there are some areas that are difficult to target, they're still able to target and only some machines can target in those areas. The heating can heat the brain and you have to have cooling devices to keep the brain cool, and you have to have real time monitoring of what you're doing to the brain. The biggest risk, especially when you get into high frequency, is you cause brain swelling in a very tight area of the brain, high

real estate and brain swelling in the wrong place and you have no access to remove that tissue because you haven't done a s skull flap. So you say, well, why do neurosurgeons give an noninvasive things? Why can't I do it? Well, they said you can as long as you can fix the brain if there's a problem there, if you can open the skull and relieve the swelling at which time I say very nicely, you do the procedure, we'll watch you.

Dr. Nathan Kuppermann (16:17):
And I'm just going to add just for our listeners, when you talk about a skull flap, that's when the surgeons basically cut a flap of the bone of the skull to open it up. It obviously gives you access to the brain, but also a way to relieve pressure in the brain as well.

Dr. Roger Packer (16:31):
That's exactly right. And those were available five, 10 years earlier and there was a French group doing that by raising a flap, getting a bone flap and putting the transducer there, but they could only do it for a couple of days because you would keep it up there, it's going to get infected. This is the ability to go back multiple times for therapy and hopefully less infection, noninvasive.

Dr. Nathan Kuppermann (16:54):
Let's talk a little bit about low intensity focused ultrasound. I know it's a way to open up the blood-brain barrier again for our listeners. The brain has a way of protecting itself with these very tight junctions in the blood vessels and whatnot to not allow toxic substances and whatnot to enter the brain, but to get chemotherapy and other therapies to get into the brain. This new technology emerged. So why don't you talk a little bit about that and how that's transformed tumor care?

Dr. Adriana Fonseca (17:24):
The intensity of the ultrasound waves allows us to get different effects in the tissue that we're targeting. So with low frequency focused ultrasound, we actually don't heat. So the effect is different. When we pair it with microbubbles, what we actually do is actually move those microbubbles so fast that they just get crazy. And when you have them within the blood vessels, what we do is we actually mechanically kind of interrupt those junctions between the cells like blood vessel cells and therefore make that connection between the blood, the blood brain barrier between the blood and the tumor barrier truly a lot more loose. And therefore it's almost like opening the doors of that big fortress that we are and we haven't been able to access for decades. So that ability to open the doors allows us to put our Trojan horses in a way with our chemotherapy agents or with our immunotherapy and actually have access to tumors that historically have been really difficult to target or they are in different areas of the brain that have been protected in a very special way compared to other areas of the brain or other tumors in other areas of the brain where we haven't been able to deliver some of those medications.

(18:53):
So in the study that we have at Children's National, that's exactly what we do. We use the focus ultrasound and allows us to go into the brainstem of patients with a very deadly tumor, DIPG, allowing us to open that fortress and delivering chemotherapy that we know that has been effective killing the cells. The other thing that is important is you have to think about the barriers. Therefore a reason is there to protect your brain. Obviously at this point is protecting the tumor, but we don't want to leave the brain unprotected from the things that don't supposed to go in there. So the other positive thing about this procedure is that it's actually temporary. So we open the barrier only for a short period of time while we're delivering the medications that we want and then within a few hours that barrier is kind of back to where it's supposed to be. Allowing those patients to have the protection that they need against the things that we don't want getting in there.

Dr. Nathan Kuppermann (20:00):
For our listeners and viewers. And for me, can you define DIPG? I know it's an important brain stem tumor. Just define what that stands for.

Dr. Adriana Fonseca (20:09):
It stands for diffuse intrinsic pointing glioma is a high grade glioma. So at malignant or very fast growing tumor that is located in the brainstem or the pons and the pons is kind of the most important part of our brain. It just controls not only our brain, but it controls our heart, our breathing, like all the fibers that go down into our legs and arms, they go through that. So it's very important powerhouse of our brain.

Dr. Nathan Kuppermann (20:37):
So when we talk about opening up the blood brain barrier, we talk about traditional chemotherapies, but we know that some are by definition they can be toxic to other tissues. Of course we're trying to get to the tumor. So talk a little bit about immunotherapy, if you don't mind, and molecular profiling and any other sort of novel therapies that you're particularly excited about to be used in conjunction with a low intensity focused ultrasound.

Dr. Adriana Fonseca (21:03):
So a couple of things. I think if you think about diagnostics and the ability of trying to make noninvasive diagnostics, we have been working over the last decades and trying to make diagnosis on CSF where patients, for example, in these very delicate areas of the brain, don't need to go and get a biopsy like with a needle, but actually making the diagnosis on the CSF and be able to have the molecular markers maybe find some targeted alteration that we can target with medications in terms of treatment and immunotherapy, that's another big objective because immunotherapy has worked really well in certain tumors, in some particular brain tumors has worked really well, but in the majority of the brain tumors has not been able to be as successful

in extra cranial tumors or in that particular brain tumor that we use it for. And we think it's because the immune cells or the monoclonal antibodies or the immunotherapy that we can just get into that site has some difficulty getting in.

(22:11):
So again, opening that blood limb barrier and opening that door for those therapies to get and reach the tumor at higher concentrations and being able to be more effective is one of the ways that we can use a focused ultrasound. Same thing with targeted therapies. If we actually find a targeted therapy that works really well for a tumor, but we're unable to get it to that place, opening that blood brain barrier and just getting that targeted therapy to where we needed to go in higher concentrations will have better effects. And obviously we may be able to use lower kind of systemic doses and with that less side effects that the patients have to experience because we actually are in a way getting smarter and being able to deliver those targeted therapies in a targeted way. And I think that's how we can actually personalize the treatments that we provide to our patients.

Dr. Nathan Kuppermann (23:05):
We talk about precision medicine in AI, in all realms of pediatric care, adult care, it's obviously having a major role in emerging role in everything that we do in medicine. So Roger, first let me ask you around precision medicine, things like genomic sequencing and whatnot, how is precision medicine transforming pediatric tumor care?

Dr. Roger Packer (23:26):
To go back to the first point, these are multiple different kinds of tumors and we didn't understand how many different kinds and how many different molecular types until we did the precision medicine. So now for diagnosis for the majority of our patients, we need to know the specific molecular subtype of the tumor. This kind of genomic medicine has changed completely how we're diagnosing, how we're classifying the tumors and how we're getting them set up towards different therapies. The next step is to use that information and to use molecular targeted, the other kinds of therapies to give you a more effective therapy. The drugs are getting more specific. The molecular targeted therapies used to be called dirty drugs because they used to hit five different targets or 10 different targets molecularly. Now they're getting to be tighter. That's both good and bad. If you want to hit lots of targets, you want a dirty molecular targeted therapy. But if you have only specific pathways, there are a barren in these tumors, then you want to hit that one pathway and not hurt is a Adrian what says the rest of the brain that is very dependent on some of these targets and pathways for normal brain development. This is sort of a balance act.

Dr. Nathan Kuppermann (24:44):

Let me ask you about AI or artificial intelligence. As you know, it's changing the way we practice medicine. We're learning about the appropriate guardrails and whatnot. So how is AI changing or improving the care of children with brain tumors? And I'll ask you a kind of tag along question is, do you see what are the upcoming clinical trials in pediatric brain tumor care that incorporate perhaps AI precision medicine?

Dr. Adriana Fonseca (25:12):
So I'll go to the first question first about AI and how we integrating. So for example, AI can help us with diagnosis, help us with diagnosis not only pathologically but also with MRIs and images. And a lot of efforts have been made in collecting a lot of MRI images to be able to correlate what the diagnosis is and how patients are going to do and outcomes. So I think that's a big contribution that I think AI can help us and help us accelerate that understanding. In terms of diagnosis, it has been more and more used for understanding a lot of the pathological images and histological images. What that helps is actually helps us get a diagnosis a lot sooner with way less resources. So some of our colleagues in NIH have been really working a lot in AI and developing kind of algorithms that allows us to make diagnosis only in the h and e or just the regular stains like the pink and purple stains that we get at the beginning of the surgery and at the beginning of the pathological kind of studies.

(26:24):
So we have a very good idea of what type of tumor we're dealing with just the next day after surgery. Generally we actually have to wait for six weeks sometimes to be able to get some of this genomic and methylation results. So be able to have a quicker turnaround and a better idea of how to treat that patient is very useful. And it also helps because this is something that could be available in a much easier way and like other areas with not as many resources as globally, not everybody and not all the countries will have access to sequencing and the ability to characterize the tumors the way that we do it. So providing this and just making this diagnosis, it actually may improve the care and the possibility to making accurate diagnosis globally and in a quicker way now treatment. So if I think about treatment, one of the things that we do and we've done over the last few decades is that trying to create that personalized medicine, I want to understand the aggressiveness of the tumor so I can actually match to the aggressiveness of my therapy.

(27:43):
I don't want to give very little therapy to a tumor that is very aggressive and vice versa. But there might be little subtleties and the images and the pathological information on the genomic information that AI can help us put together. And just commenting a little bit of what Roger said about the precision medicine, that it hasn't been able to be translated as quickly as we want. I think it's just how we can just put all those things together. How can we just put all this tools and new technology and new treatments and immunotherapy and targeted therapies together to attack

those cells. Because at the end of the day, what I want is just being able to offer more options that are better, more accurate, more precise, and with less side effects.

Dr. Nathan Kuppermann (28:29):
So as we're slowly coming to a close, I'm going to ask each of you a separate question about a different aspect of research and that's collaboration. I'm a big believer in research networks because I think the really difficult challenging questions to answer, particularly for children with uncommon conditions, you have to collaborate. So let me first ask you, Adriana, what was sort of the inspiration around the creation of the International Brain Tumor Program and how has that translated into progress in research and clinical care?

Dr. Adriana Fonseca (29:03):
So the inspiration was actually starting to see a lot of these rare brain tumors and not having a lot of options to offer in a lot of understanding of what they were. When I was a resident, I actually started a program with South America and I started seeing through this program that there was a particular rare brain tumor dicer one sarcoma that they used to, or they diagnosed a lot more frequently in Latin America than what I was seeing in Canada in North America. And also you have to remember that it is only rare if I look in a very specific box. If I open my boxes and I start looking everywhere and put all those rare things together, they may not be as rare as we think. And that's where collaboration becomes so important. As I said from the beginning, we don't have the time.

(29:52):
My patients don't have 20 years for me to figure out what works. They need this now. So I think that was the inspiration and that's basically what we do in the BR Brain tumor program. We work across the globe and with many countries in South America, north America, we work very closely with the European team that has the same kind of program there and researchers that we are working together. We have almost weekly meetings. We have an international tumor board where patients can actually be presented in real time and we can just make a plan, a treatment plan for them with all the experts in one place. So we're trying to, instead of just going a step by step and just making a decade process, we're just trying to move things forward as fast as possible and just getting everyone at the same table.

Dr. Nathan Kuppermann (30:48):
So Roger, let me ask you, you've obviously been involved with collaborative research for a long time. Just give us a little bit of history of Children's National and its role and participation in collaborative networks and how it's affected the way we treat children at Children's.

Dr. Roger Packer (31:03):

We've been blessed with having a lot of great people here and we're actually part about every major pediatric brain tumor consortium nationally and internationally. The Pediatric Brain Tumor Consortium, the Pediatric Neuro-Oncology Consortium, these are all consortiums built around the world for both brain tumors and neurofibromatosis. One of the limitations of those consortiums is that between the development of the drug and moving it to the patient and getting into the clinical trials and getting it through all the hoops usually is about a seven to 15 year process at best, sometimes 20 years. As you might know that we were approached by a family of a patient whose child had one of the more common theoretic forms of medulloblastoma, but had a subgroup where once the tumor comes back, the vast majority of children will die from that would no other alternatives. So that donor said, if I gave you X amount of money, how would you change the world?

(32:18):
And we said, I can't change the world, but we can maybe do things a little differently. And we were going to have not a program that went in a stepwise fashion from discovery to early trials to late trials, we were going to try to do things concurrently and very focused with the audacious goal of having a clinical trial ready to go. Within two years of initial discovery, we were going to put together the best people from around the world, some at children's, some are not from all around the country and they were going to have to buy one mindset. You work together, you share your data completely. And our goal is not a study in five years, we want a transformational study, something that can go from zero control to the majority of patients alive within that two year period. We didn't know if we could pull this off, but that was the goal and that was the funding and that was the development of something called the Medulloblastoma Initiative or the Cure Group four Consortium.

(33:30):
And remarkably, within a two year period, we have two new therapies that are now open and two others that will open within the next 12 to 18 months. And why did people join the consortium? Because the honest truth is those researchers sitting in the laboratory are not only doing it so their grants can get funded, they want to see their work translated rapidly. So given the people the opportunity to work together actually worked out pretty well. We don't know if we're going to cure more children, but I can tell you we have two products studies that are about are accruing patients within a two and a half year period, which is of a record time. So I think the future of how we work with ai, when molecular targeted with everything else, all the rules got to get thrown out. This is not how we did things 30, 40 years ago. We got to be faster, we got to be smarter. We got to let AI decide whether a drug is going to get through the blood brain barrier because of its structure, not because we're going to spend two years studying it, an animal model, we're just going to have to do things differently or we're going to be saying the same thing, childhood brain tumors at a leading cause of death and morbidity of all childhood cancers. That's not a good enough approach.

Dr. Nathan Kuppermann (34:57):
So I want to turn a little bit to the human side of this for each of you and I have really two questions that I'd love to hear your thoughts. First of all, what keeps you inspired to continue the work? And then we have to really acknowledge, I mean this sort of work brain tumors and children is a very emotionally taxing and draining for both families and for yourselves. So can you just comment on that human side that is your inspiration and how you care for the emotional side, both of the families and children and for yourselves? Lemme start with you, Adriana.

Dr. Adriana Fonseca (35:31):
I do think it's a privilege to be part of that and I feel really lucky to be part of every single family and every single of my patients. I love them, all of them. They are my inspiration every day, right? I want to do everything in the absolutely best I can for each of them with the tools I have and the tools that I have invented because I want to create those for them. One of the motivations is that I want to make this better in every patient that I see. I hope that I'm doing absolutely the best that we can and we're always giving them the best chances, but I'm also learning everything and I'm learning for the next patient and make it better. And I truly believe we are in such a privileged place and time that allows me to learn so much and then be able to move things forward and is a privilege and a responsibility at the same time that I take very seriously.

(36:34):
Being able to share all their emotions and their feelings and the journey, whatever that is, is I find it such a big part of my job and I treasure it very much. And I also want to be there for them even when I'm unable to make it all go away. And I think that is another part and I see that as another big part of my job. I need to be there for them in any capacity I can. So I think that's the human and the part that has actually helped me get going. And the other part is the fact that I have a wonderful team of people that I work with. It's like I wouldn't be able to do this by myself. We have an amazing team of neuro oncologists, neurologists, psychiatrists, nurse practitioners, nurses. It's such a big team behind every single patient that is not just us. It's not just me. It's always a big team that is going for each of our patients. And I think that helps too, right? It to, it would be much harder if it was just me or if it was just one person going through it.

Dr. Nathan Kuppermann (37:45):
Such a blessing to work with great people and great teams and Roger, let me turn to you and get the same question.

Dr. Roger Packer (37:50):
Yeah, everything that Adriana said is absolutely correct. I mean, it's extremely important the team we've built and how we support one another, but there's some simple, it's sort of, to me, there's a couple of simple issues here. You've got kids dying. I have an opportunity and a

privilege to work in a place where we might make a difference, and I have the honor that these families have bestowed on me to try to help their child. So how can't I get up in the morning to do that? That's sort of a pretty selfish thing if I couldn't do that. The other part is how do you keep doing it? I mean, families give you phenomenal strength as much as it hurts me. They're going through this on a day-to-day basis. They have a risk of having a child who is going to go to college who might not get through high school or worse scenario, they might have a kid who is not going to live for more than 18 months.

(38:57):
They're the ones where the heroes aren't they? They're the ones who are feeling this. I'm one removed. I may have compassion. I hope I do. I may care, but I've got to remember it isn't happening to me. It's happening to them. And that's what we got to remember. It isn't, oh, woe is me that I take care of children with brain tumors. Oh, I'm in a position that I might help and God knows when I leave, I can go home and hug my kids and my grandkids. They may not have that option, and there is a difference. No matter how it impacts us, there is a difference.

Dr. Nathan Kuppermann (39:41):
Great. With that, I want to thank you Dr. Roger Packer, Dr. Adriana Fonseca, for sharing your wisdom, your insight, your humanity, really with me and with us here on the lead in peds. Really, it's been an honor and I'm sure our listeners have been enlightened by this discussion. Thanks again.

Dr. Roger Packer (40:02):
Thank you.

Dr. Adriana Fonseca (40:03):
Thank you so much.

Dr. Nathan Kuppermann (40:04):
Thank you to Dr. Roger Packer and Dr. Adriana Fonseca for joining us and sharing your deep and powerful expertise. Today we explored how collaboration, technology, precision medicine, and AI are transforming the care of children with brain tumors. From the International Brain Tumor Program to focus ultrasound and AI driven approaches, it's clear that the future holds tremendous promise for these children and their families. Thank you for listening to The Lead in Peds. Be sure to subscribe and share this episode with anyone who wants to learn how pediatric research and innovation are reshaping care at Children's National Hospital and beyond.

** This podcast has been edited for clarity. Some content may have been altered to enhance the listening experience. **