The Lead in Peds

Transcript: Season 1, Episode 6 – Cutting Edge: Precision and Progress in Pediatric Surgery

Host: Nathan Kuppermann, MD, MPH

Guest: Anthony Sandler, MD

Dr. Nathan Kuppermann (00:00):
What if surgery for kids could be virtually painless? What if the tools we use to treat the smallest patients were designed just for them from the ground up? What if those "what ifs" are already becoming reality? Welcome to The Lead in Peds, a podcast from Children's National Hospital in Washington, DC where we explore the breakthroughs - both in research and in clinical medicine - shaping pediatrics. I'm your host, Dr. Nate Kuppermann, Chief Academic Officer and Chair of Pediatrics. Today I'm thrilled to welcome Dr. Anthony Sandler, Chief of Surgery at Children's National Hospital. Under his leadership, children's National has become a hub for surgical innovation, from pioneering minimally invasive surgery to advancing robotics and precision medicine. He also directs the Sheikh Zayed Institute for Pediatric Surgical Innovation, where his research focuses on immunotherapy and training T cells to target cancer cells, an approach that could transform how we treat pediatric tumors. Tony, it's great to have you here.

Dr. Anthony Sandler (01:05):
Thank you very much, Nate. It's great to be here. I'm honored for the interview. I also want to take the opportunity to thank you for everything that you do for children, especially in research and driving our academic agenda. Thank you.

Dr. Nathan Kuppermann (01:16):
Thanks, Tony. It's really great to have you here. By the way, I'm calling you Tony, because I know you're a subscriber to this podcast and you realize that even though you are Dr. Sandler, we're informal on the show. So, if it's okay, I'm going to call you Tony. You're going to call me Nate, and we're going to start that way.

Dr. Anthony Sandler (01:33):
That sounds great, Dr. Kuppermann.

Dr. Nathan Kuppermann (01:35):
Yeah, very good. Okay, the first thing I want to open with is in these podcasts, this is the sixth one we've recorded here at Children's National. We're always looking for some commonalities between me and the podcast E, the guest, the expert, which is you today. And one thing that you and I know, because we've discussed this before, we were both point guards in basketball. Okay? I made it through the high school level, and I know you played in college, but it was South African basketball and not US basketball, but really important basketball and oh, oh my

goodness. Look at this picture that just appeared there. There you can see I'm not actually the bald guy standing up. I'm the guy on the right with a lot of hair. Point guard Polytechnic High School in Pasadena, California in 1976. But we've shared this, Tony, that I would posit that being a point guard is great preparation for being a chair of surgery like I was chair of emergency medicine because the way I look at it is as a point guard, you have to be able to listen really carefully. You have to be able to communicate really well, and you have to have not only forward vision, but great lateral vision, peripheral vision. What do you think about that?

Dr. Anthony Sandler (02:48):
I love that. I think that's great, and you have to be a leader as well because you're bringing the team down on the offense. I will say though, looking at that picture, you're definitely out doomy with the hairstyle, but the question is, would you have outdone me with the three pointers?

Dr. Nathan Kuppermann (03:03):
Yeah, I don't know. I have to say back then you didn't get three points for the big perimeter shot, but that was my shot. However, the point guard, as you know, was not to make yourself look good. It was to make everybody else look good, to feed the ball to the right person at the right place so that they score the points and then the team looks really good.

Dr. Anthony Sandler (03:22):
I found the difference in our point guarding. Actually, we did get three points in my day. That's such a big difference. I thought we were much closer.

Dr. Nathan Kuppermann (03:32):
A little bit of time difference. Very funny. The other thing that I want to mention is that we have daughters. I know you have a son in addition to daughters. I have three daughters. Okay. They're lovely and they're great, but none of them are going to be physicians. You have two daughters who are on their past becoming board certified physicians. And tell me just a little bit about them, and I know they've been greatly influenced by you and your wife, Nancy, who's an ENT physician. Give me your thoughts about your children.

Dr. Anthony Sandler (04:05):
When Nancy and I went through our careers, we must have not realized it really enjoyed ourselves because it's interesting that our daughters, and we never ever pushed them to medicine at all. Both had this affiliation. So, when we came home, we must've been happy, we must've been in good moods, we must've discussed some things that really got their interest, and it seems that that became somewhat of a family business to some extent. So, although it wasn't an intentional thing, it's actually fun just to see them follow in our footsteps and actually continue the career of healthcare.

Dr. Nathan Kuppermann (04:42):
I'll add you and Nancy have done things right because children don't follow what their parents do unless they see their parents enjoying it and conveying it in a way that resonates. And I have to mention something to my daughters. One of them runs a startup, sort of a philanthropic startup that helps institutions do good work, including around healthcare. But the middle one, she is an entertainer. She's a budding Broadway singer dancer because scientists and physicians need to be entertained as well. And the one thing we share about our third child, so we each have three children. Mine is much younger. She just graduated from high school, but she is a budding robotics engineer, which we'll be talking about on this podcast. So, it's great to hear about your family. And now let's get down to business.

Dr. Anthony Sandler (05:33):
Likewise. Thanks. This is going to be a fun session.

Dr. Nathan Kuppermann (05:37):
So Tony, you recently spoke at the Axios Future of Health Summit about the future of medicine and how medicine is in a golden age. Can you tell us a little bit about how that applies to pediatric surgery and pediatric surgical research?

Dr. Anthony Sandler (05:53):
Yeah, the Axios interview was kind of fun, and I did speak about a golden period, a golden age. I think there's so much innovation in healthcare in general that obviously will affect pediatric care and the way we manage children both surgically and non-surgically.

Dr. Nathan Kuppermann (06:09):
In general. This is something that I think is true both in your field, pediatric surgery, in my field, pediatric emergency medicine, that research in pediatrics in general has lagged behind research in adult medicine. Can you tell us a bit about how Children's National, and specifically in your area, how we're really flipping the script on that?

Dr. Anthony Sandler (06:29):
We've been trying to really focus on developing innovations in children. Most innovations are driven by the business around innovation, and I think that it’s obviously necessary to really take ideas and concepts and move them to patient care. But it is fair to say that at Children's National specifically, we're targeting innovations for children first, and then hopefully those innovations will have an impact on the adult market as well. So instead of doing it on adults or what most research has done towards adult care, and then there's a trickle-down effect to children, we're trying to flip that upside down. And really the emphasis is on childcare, child wellness, and then move, and hopefully some spinoffs can go up to the adult care after that.

Dr. Nathan Kuppermann (07:18):
Let's go to the history of pediatric surgical innovation at Children's National. About 15 years ago the Institute for Pediatric Surgical Innovation was established at Children's National. Can you tell us just a little bit about the history of where it came from and where it's going both in terms of clinical care and research?

Dr. Anthony Sandler (07:38):
We were very lucky to get a very generous gift from the United Arab Emirates to start a institute of Pediatric surgical innovation, which became the Sheikh Zayed Institute of Pediatric Surgical Innovation at Children's National Hospital. And that institute was really a thought, a concept that was based on trying to change the way we do pediatric surgery. Myself and Dr. Kurt Newman, who was our prior CEO at the time, he was the chief of surgery. We met with a local donor. He loved the idea and then sort of spun out to United Arab Emirates, and they were very willing and very keen to help support it. The concept of that institute was really trying to make pediatric surgery more precise, less invasive and pain-free. And that was the mantra that we try to live by. So a lot of the developments, a lot of our movement in the Sheikh Zayed Institute was all about trying to reach those goals. The Sheikh Zayed Institute itself now has really extended itself and really is a resource for the halt of Children's National Hospital from nursing to pediatrics and of course to surgery. But the premise is the same, to do better for children by using technologies that can advance the entity.

Dr. Nathan Kuppermann (09:01):
Let's talk about the groundbreaking research that you've been involved with in immunotherapy and training T-cells to target tumor cells. Tell us a bit about that and how it fits into the greater mission of pediatric surgical innovation.

Dr. Anthony Sandler (09:16):
Back to the Sheikh Zayed Institute, to take a broad sweep at it, we do basic science, which is the wet lab, and my own interest is in cell therapy and immunotherapy, but we also have a group that does artificial intelligence, a group that does devices. We all actually do devices and then we follow that up with robotic surgery. So, to start off with my own cell therapy and immunotherapy, I've been working on vaccines, cancer vaccines for about 25 years. And it's actually interesting because initially my concept in basic science research after I finished my fellowship was to try and transfect eyelet cells so that they would reject or combat T cells that are trying to reject them. So we actually put a gene into the eyelet cells, and we were thinking that this gene is going to make a big difference. It's going to prevent T-cells from killing them, and that then would be a way to transplant pancreas tissue eyelet cells in patients with diabetes.

(10:24):

And it turns out that those eyelet cells were rejected even faster than anticipated. So, a completely opposite effect. But that opposite effect resulted in my career in cancer research. So, we said, well, if we could do that with the eyelid cells and make them be rejected by the immune system, I'm sure we can find a way to get the immune system to target cancer. So we've initially started off with a vaccine approach trying to make tumor vaccines, and in that approach of making a tumor vaccine, we've figured out a way to make cancer cells immunogenic and immunogenic, meaning that the immune system can recognize them as non-self, almost sort of see them as a foreign body, something invading the system that shouldn't be there. So, we created a method for making cancer cells immunogenic, which we used in our vaccine strategy. And the vaccine strategy worked quite well, but it would've been a long shot to try get that to patients, giving them actual cancer cells even though they've been attenuated, even though they've been damaged to actually give.

(11:32):
That is a bit of a challenge. And I think we've had a hard time through the FDA. So, what we ended up doing is figuring out a way to do it in the lab. So, we take the cancer cells, we make them immunogenic, we take the immune cells, and we've done this in many patients now where we take their own peripheral blood mononuclear cells, the PBMC, and we train their immune cells in the lab against the cancer to make a very robust and aggressive anti-cancer response. And in doing so, we figured out that it is the T-cells, which are the soldiers of the immune system that we can actually train and make very toxic for cancer cells. So that's kind of where we are. We've done this in about 12 to 13 patients using their own cancer and their own blood cells and training their own blood cells. And then we've done these in preclinical models where we've seen fantastic results with actually combating tumors. So, our goal now is in the next year or two is actually we've written the proposal, the protocol, to actually take it to patients and through our GMP facility at Children's National to really create a therapeutic approach to cancer.

Dr. Nathan Kuppermann (12:46):
Tony, I just want to clarify for our listeners and our viewers, one little abbreviation that you mentioned, GMP. So, for the listeners out there, GMP means good manufacturing practice facilities. These are the facilities where we make these specialized T cells to fight tumor cells. Do I have it right?

Dr. Anthony Sandler (13:05):
You have it right. The GMP facilities, the level of the laboratory that are good for human practice.

Dr. Nathan Kuppermann (13:11):
What you describe here, how in the future will this compliment surgery for pediatric cancers and decrease the actual need for surgery? Will this eventually replace surgery for pediatric cancer?

Dr. Anthony Sandler (13:26):
The question is when would you use these cells, and will it completely replace cancer? I think there's certain tumors that are isolated that are localized that the best way to get rid of them is to take them out. But most cancers, most cancers of any significance, have circulating cancer cells throughout the body. And I've always lived with the concept. Maybe it's true, maybe it's not, but I've worked with the concept that no patient has ever cured their cancer without a significant immune response without a significant immunity with memory immune cells so that if these cancer cells reemerge your immune system takes care of them, I think that's the true cure. So, there's many ways of looking at this. Firstly, you could imagine removing the tumor, getting the tumor down to minimal residual disease as the term we use, and then giving your immune therapy instead of chemotherapy after the surgery. You could also, if the T-cell, wherever that is effective, give them upfront, but I think it's going to be a combination. Many of these tumor solid tumors that we deal both with children and adults are pretty extensive. And so debulking or getting rid of them to the best ability you can is probably the answer before you give the mopping up chemo radiation or nowadays immunotherapy. And I think that's the exciting future.

Dr. Nathan Kuppermann (14:45):
What I'm going to ask you to do is just philosophize a little bit here because what I would love to hear talk about is the overlap between pediatric surgery, oncology and what we're talking about here is precision medicine.

Dr. Anthony Sandler (15:00):
The craft of surgery has its limitations. Cold steel can only cut out what you can see, and you cannot chase cells with a knife. That's the common saying. So, adding in precision medicine, adding in the concept of targeting that specific cancer for that specific patient to me is very appealing. And then adding in the concept of some kind of advanced immunotherapy using this, exploiting the system's best cells that are used to protect us and using them and training them to target the cancer is really a combination of all three strategies. And I think that certainly is the future of healthcare.

Dr. Nathan Kuppermann (15:42):
Let's talk a little bit beyond your own research. So, beyond your research, it's very clear that technology and medicine, and in this case pediatric surgical care, are very deeply intertwined. So, talk to me a little bit about technology that's going on there at the Sheikh Zayed Institute, things like AI and other aspects of technology that you are most excited about for the future.

Dr. Anthony Sandler (16:07):
Well, obviously artificial intelligence is in every realm of life right now, and I think that in medicine it'll be transformative. And if I think sort of from a clinical perspective, the patients,

and I've had these ideas for many years now, but I think the capabilities of artificial intelligence are really getting there. One of the things that really irritates me if I have to go see a doctor is sitting in a waiting room reading some dumb magazines waiting for the physician to see me. If we fly on an airplane nowadays, the airline will tell you what gate to be at, what time to be there and what's expected if there are any delays. And that's exactly what we should be doing for patients in clinical consultation. If they're going to come to my clinic and they're going to sit around waiting, it's a waste of their time.

(16:59):
They should be updated, they should be told when they're going to see the doctor and when they are called to see the doctor, they should go straight back into the clinical room or the examination room where I'm going to see them. So that's in the preclinical environment. In the clinical environment, we all know that electronic health records have somewhat moved things forward but also be in the bane of our existence in healthcare. I cannot understand why the electronic health record is simply used to document and to bill. It should be an active system that helps physicians with their care. In other words, if I'm going to see a patient with appendicitis in the emergency room, I should just put in the appendicitis. We know there's technology now that can actually record my conversation, my examination, and generate a note for me. But more than just generating a note, it should be able to inform the operating rooms that this patient's being admitted, it should tell the booking office that this patient's going to need a bed.

(18:04):
It should order the labs that are necessary or the x-ray studies, and so actually facilitate the care of the patient. And then of course, the next phase of AI is trying to determine how can it facilitate the care of the patient to come to the right diagnosis to facilitate the right treatment. And that is well within the capabilities. We have a group doing image analysis in our Sheikh Zayed Institute that can read a scan better than we can. They can enhance the scan. We have a system where there's a very low Tesla MRI system and they can enhance that MRI that you get. That takes a few minutes to the level of a 1.5 Tesla MRI and it's a little portable system. So those are the kind of innovations in artificial intelligence and technology. And then finally, if you're thinking about it, when the patient's going to leave the hospital, why doesn't it generate the note for discharge or on a daily basis? The notes that we generate nowadays are so excessive. They're copies of the prior date, they should have summaries from each day that goes to the next day. And with the specific changes and lives of the physicians will be so much better. And you know what, Nate will be able to focus again on taking care of the patient and not the documentation in the chart. So, I think it's a very exciting time, but we have to get a few years into this before we can actually see the benefits of it.

Dr. Nathan Kuppermann (19:32):

You've really kind of very comprehensively articulated the potential power of AI in clinical care. I'm just going to tag on one question is, and this is an area that both you and I are passionate in besides AI and clinical care, where do you see AI in research for future care, shall we say? Where is that going? Where do you think are the pressing issues that we should be researching with regard to AI?

Dr. Anthony Sandler (19:57):
That is absolutely critical as well and very, very exciting. In fact, I think you and I have actually discussed, if I want to review the last hundred patients that we did a specific procedure on right now we have to go pull those charts for every parameter we want to look at. We have to go find that parameter. We then have to do an analysis of all the data that could be done in minutes by large language models and artificial intelligence. It would facilitate an evaluation of the way we've been managing things very, very quickly, rather than waiting for maybe 20 students to go through these charts over days and hours and create the data. Of course, artificial intelligence is also very helpful for research. In my own experience, I've compared two molecules. How do they work? Now, there is some concern that there is a little bit of imagination from the artificial intelligence systems, but that's where physicians need to come in and actually understand and control and evaluate the references that the artificial intelligence pools. But it would take me, you probably remember when we used to go to Medicus.

Dr. Nathan Kuppermann (21:06):
Index Medicus

Dr. Anthony Sandler (21:06):
Index Medicus,

Dr. Nathan Kuppermann (21:07):
Index Medicus

Dr. Anthony Sandler (21:07):
I can hardly remember it, right? And it would take a day to find two articles. Now, I mean with artificial intelligence, you can get so fast, so quickly in such short time. And then of course, how artificial intelligence fits into all the devices that we make into all the robotics that we do. It's going to be critical for healthcare as we move forward.

Dr. Nathan Kuppermann (21:28):
And actually, you said the word devices, and that just leads me to my next question. You talk about the institute which you run that is deeply involved with devices. Can you just talk a little bit more about what devices are being explored, what sort of research around new devices you're doing? At the institute,

Dr. Anthony Sandler (21:47):
We make little devices, simple little devices, and that's really one of the unique parts of our institute. We have clinicians and we have engineers, and the clinicians bring the ideas to the engineers and the engineers bring the know-how to translating that idea. And so, we've made little devices that are quick wins for anchoring tubes in different parts of the body. It seems silly, but no, it's a significant problem. For example, gastrostomy tubes, they fall out all the time and then the child has to come back to the emergency room and sometimes it's misplaced in the emergency room, and that can be disastrous. If we have anchoring devices that facilitate and support the tube that won't fall out, we make an incredible impact. So those are some of the small things. We have a group of folks working on a pain device to monitor pain in children.

(22:36):
You can't ask them how much pain you're in, you give them a smiley face, a level of one through 10. But if you could actually get a better feeling, a better understanding of the pain that the patient is suffering specifically, but even non-surgical pain, I think that would be an incredible breakthrough. And there's a lot of work going on in that area. We have a group that looks at technologies to enhance what the surgeon can see. Your eyes can only see so much, but there's all this technology around laser spec, multis, spec depolarizing imaging, and Richard Charles, one of our investigators that has created a technology to look at the blood flow in tissues without any dyes just by laser spec technology and looking at the oxygenation and the saturation of the tissues. They've done some remarkable work identifying nerves that your eyes can't see, and these are ways to facilitate and help you in the operating field. And then of course, fluorescence is another type of technology that they use with fluorescent cameras that can actually use fluorescent dyes to highlight specific areas like the urinary tract or the bile ducts, for example, gallbladder surgery. So, all these technologies are facilitating the capabilities of the surgeon and it’s incredibly exciting to do that.

Dr. Nathan Kuppermann (23:58):
Let me just interject because when we started the conversation, we were talking about flipping the script and starting with research in children as opposed to adults. So, for example, the gastrostomy tubes and other of these novel ideas that you're researching, can those be parlayed into adult medicine? Again, flipping the script?

Dr. Anthony Sandler (24:17):
Absolutely, and those are the ideal products. So, devices that will actually get legs and move forward because the market for children is really not big enough. So, if you can have a market with emphasis on children that then bleeds out to the adults, I think that there'll be a big enough market to really push these things forward. The other thing I wanted to talk to you about Nate, is as far as devices, is augmented reality. I mean, augmented reality has so many opportunities. One

of our groups in the laboratory is looking at ways to take imaging and fuse it with laparoscopy or your own vision through a HoloLens where you can look at the patient instead of having to look at an image when you're doing an intervention. Another example that I'm very excited about is sometimes when we have big tumors, they're very intertwined and very involved in multiple structures, both vital and non-vital.

(25:13):
And now using all these virtual reality Google type glasses, or I don't want to be specific Apple glasses, HoloLens, whatever, you can actually segment from your CT MRI or ultrasound and take those images in a 3D way, put them into this imaging technology, and then you can move the patient around and actually look at it from different angles. You can remove parts like the bones or the bladder to really get you a good view of where the tumor is and what it's going to do when you're going into the operating to try and resect it, maybe for partial liver transplant, something like that. There's a lot of opportunities and all these things facilitate the care that we're going to give and enable the surgeon to do a much better job.

Dr. Nathan Kuppermann (26:00):
I saw you at Axios where you were demonstrating augmented reality in a demonstration of vascular access. Again, for our listeners, getting catheters into blood vessels, you want to just talk a little bit about that, but also you mentioned what other imaging modalities will that be applied to? And you mentioned MRCT, are there other imaging modalities?

Dr. Anthony Sandler (26:24):
That imaging modality that you spoke of is really what I was talking about. Looking at the patient through your HoloLens, and you look below it, you see the patient and you see the blood vessel because an ultrasound is showing you where the blood vessel is and you can specifically target it. So, it's a very clean and ergonomic way of looking at getting access to the vessels. But there are other technologies. For example, if you're doing laparoscopy, you only see the surfaces when you're looking through the camera in the abdomen, you only see the surface of the structures. And by actually putting an ultrasound probe on the laparoscope, you can actually look into the deep tissues and in that way find lesions that you perhaps want to target with a minimally invasive approach. So, there's a lot of work related to that.

Dr. Nathan Kuppermann (27:12):
There's one last area of technology that I want to discuss with you, and that's robotics. I know that the Shake Eye Institute is doing work on robotics and innovation around that. Love to hear your thoughts about where is that taking us to the future. For example, 10 years from now, can you and I be podcasting together while the robots, they're at Children's National doing the surgery and we're just here talking about it, but where are we going with robotics?

Dr. Anthony Sandler (27:39):
I think we'll have to oversee it if that's the case, but I mean, it's the same concept as autonomous vehicles do. We believe that autonomous vehicles will actually have their day, and I do think it's probably around very close around the corner. So, the concept of surgery really has gone from big open procedures to laparoscopy to smaller procedures, and now almost with robotics, you could imagine autonomous procedures where the robot actually does the critical parts of the surgery, and I think that's a reality. I think we actually, our group is working on two different technologies. One is to do cholecystectomy, which means gallbladder removal and do it autonomously. And there's work that's actively going on with us as well as Hopkins as a collaborative effort to really get that model going. So, you can imagine when we started laparoscopy in abdominal surgery, it started with the gallbladder resection, the cholecystectomy.

(28:40):
So, wouldn't it be great if we started robotics with a cholecystectomy? And it's not just a matter of doing it for technology's sake, it's really a matter of trying to do it safer for the patient's care. There still is a complication with injuring the common bile duct in gallbladder surgery, which is a grave complication. It's not deadly, but it has a lot of morbidity associated with it. And if you could have a robotic system that is capabilities above that of the surgeon, then why wouldn't you allow that to go forward? Yeah. Another area we are looking at is tumor resection from kidney. So, when we do these tumor resections, it's quite bloody. It's quite difficult. You have to get the whole kidney freed up and controlled, and then you resect that area. If you could have a robot, do it at a much faster speed, at much more efficient technology than that perhaps is going to be the future.

Dr. Nathan Kuppermann (29:37):
Just looking ahead, let's say a decade, 10 years, what do you think is going to define pediatric surgery besides the fact that your two daughters may be going into pediatric surgery, although I would highly recommend pediatric emergency medicine, but we'll leave it up to them. And I know your son, as you mentioned, the biomechanical engineer who will have an important role in the future of medicine. What are your thoughts in the next 10 years?

Dr. Anthony Sandler (30:02):
Thank you for bringing my family into it. My wife is an ENT surgeon. I have two daughters, one who's a fourth-year orthopedic surgery in the army, and the other one's a third-year medical student. But I have a son who's doing computer science and bioengineering, and perhaps he says he is not going to medicine, but perhaps his impact on medical care in the future will be even more than my daughter's. The reason I say that is because so much of this technology, of the technology that we've discussed in this podcast is going to be applied to patient care, and I think it's going to make an incredible change on everything that we do in healthcare, and it's not necessarily bad. I'm hoping that it's all going to be good.

Dr. Nathan Kuppermann (30:46):
You and I talk about this a lot with AI. I see a lot more good than bad with AI, but of course, we have to use the appropriate guardrails and all of the technology that we are using of these technologies, which is going to be the most transformative for us in the next decade. Is it going to be AI? Is it going to be robotics? Is it going to be just the combination of them? Do you have a feeling of which one is going to be the biggest driver?

Dr. Anthony Sandler (31:12):
Yeah, I think it is definitely the combination. I think they are all going to have their role in different aspects of the care that we deliver specifically in surgery. Everything is becoming more advanced. We are using technologies that were unimaginable, and I can only imagine what it's going to be in 50 years' time. Unfortunately, I will not be able to see that. But I think it's a very exciting time how we've taken all this technology that's really been for other things, for other purposes, artificial intelligence, robotics, imaging technologies, and how we combining them all together to really advance the care that we give to our patients. I think it is incredibly exciting, and I think the future is very bright.

Dr. Nathan Kuppermann (32:20):
Before we close this part of our interaction, I want to bring it back to family and your two daughters who are entering the field of medicine. What is the most exciting part that you see that they're going to be dealing with challenges and excitement you think is the defining issues for them coming into medicine?

Dr. Anthony Sandler (32:18):
Well, I think we all went into medicine to really take care of patients, and I think besides all this technology, my hope is that they'll be able to actually do better for their patients, take more time with their patients, spend more time dealing with their patients than worrying about churning through the patients so that they can get their notes done and basically don't drown in all the administrative work around what we do. So my hope is it's something simple like that, that they're going to get back to basics by using incredibly advanced technology.

Dr. Nathan Kuppermann (32:53):
That's outstanding, thanks Tony. Today we explored how advances in surgical innovation, technology, and targeted therapies are transforming pediatric surgical care making procedures safer, less invasive, and more precise. It's clear that the future of surgery, especially for children, is brighter than ever for our patients, their families, because of the work of people like Dr. Tony Sandler and his team. Thank you for joining us on this episode of the Lead in Peds. If you enjoy this conversation, please subscribe to our show wherever you get your podcasts, and share with

anyone who wants to better understand how pediatric research and innovation are transforming care at Children's National, and communities around the globe.