Transplant Contraindications - Pediatric Grand Rounds-2-21-25-Meeting Recording

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59m 30s

◉ **Kamat, Deepak M** started transcription

Kamat, Deepak M 0:24

Good morning and welcome to pediatric grand rounds.

It's 7:30 and it's time to start our grand rounds.

The CME code is in the chat box, and we'll try to repeat it as many times as possible during the.

A presentation.

It's my great pleasure to introduce this morning's grand Round speaker, Doctor Daniel Ranch.

Who is clinical associate professor in the division of Nephrology in the Department of Pediatrics at UT Health, San Antonio.

He currently serves as the medical director of pit kidney transplantation for the University Health Transport Institute and Mali and Carlos Alvare Center for transplantation, hepatitis Surgery and Innovation.

He's a fellow of American Society for transplantation.

A designation which recognizes those Members who have demonstrated both an exceptional commitment to the field of transportation as well as outstanding service to the society.

Doctor Ranch earned his Bachelors of Science degree in Microbiology and molecular genetics from the University of California and Los Angeles.

He then received his medical degree from Chula Long Khan University in Bankst.

Own training in Las Vegas, NV.

At the University of Nevada School of Medicine and in his pediatric nephrology for University of California, San Francisco, but ran joined the UT Health San Antonio faculty in 2010, and his research has focused on improving long term outcomes in pediatric transplantation and the care of AD.

And young adult kidney transplant patient Doctor Raj, thank you very much for accepting our invitation. And the floor is yours.

Ranch, Daniel 2:08

Your doctor come up for that?

Very nice introduction and thank you everyone for joining this morning.

My name is Danny Ranch, and I'll be talking about transplantation pediatric kidney transplantation at our institution.

Partly to Toot our own horn, but also to make sure that you know our our own teammates here know all the great things that all of our divisions are doing for our institution. 'cause sometimes, you know, we're kind of siloed.

Not everyone gets to see the great work that that's happening behind the scenes, so.

I'll start with this first photo here.

This is actually from 2/20/20 and the transplants to celebrating its 5005 thousandth transplant surgery, and they celebrated with an all women surgical team, which which is fantastic and historical.

So. So that's why I put that there.

So all right, I do have few disclosures, meaning that I probably have too many slides, a lot of content I want to go through.

But I'm gonna try and go through the first several slides quickly 'cause I wanna get to the media to talk.

It was hard to do that without some background, so otherwise I have no financial relationship this close.

I will be discussing some off label medications and all the patient images will be were used with permission so.

Also, another disclosure, I'm completely biased towards transplantation having been a kidney donor myself.

So everything I say take with a little bit of grain of salt, I guess.

All right, so learning objectives for today will be.

I'll be reviewing the epidemiology and presentation of communities in the country, briefly review the benefits of community transplantation and the process that our patients go through and hopefully spend most of time the talk actually talking about what we've done for the field.

Ted Cieslak 3:52

I didn't look Brittany.

Ranch, Daniel 3:55

And what the future holds and what I hope to get our our program involved in going forward.

So pediatric kidney failure in us, this is a pretty famous patient Emmy. She came to us several years ago as a baby. She'd presented to another hospital soon after birth with current infections and sepsis. And they initially couldn't figure out why.

And eventually someone noticed that.

Oh, she has a lot of protein in her urine and couple that with the fact that she had a very low demon levels that were persistent.

And so came to us and finally was diagnosed with a congenital form of nephrotic syndrome, which is a cause of her kidney failure.

So to give some background on kidney disease in the USI do hear somebody's mic on.

Sorry it's a.

You know it's a big but under recognized problem.

The estimates are currently that they're about 20 some odd million people in the country affected with any type of chronic kidney disease. But today we're talking about kidney failure, so.

There are about 800,000 people in the country with full kidney failure.

Unfortunately, about half a million are on.

Chronic dialysis and the rest of those are either on either receive the transplant or, you know, on just palliative care, unfortunately, and not only that, there are about 100,000 new patients with end stage kidney disease in each year in the country, and this map is showing.

The you know prevalence of end stage kidney disease in the country. The dark areas represent a higher prevalence and of course down here in South Texas, we are one of the leaders in the kidney failure.

Oh, and hopefully something will fix in the future.

In adults, most common cause of kidney failure is diabetic kidney disease.

We know that's a big problem. It's been ongoing problem, but also other causes include hypertensive sclerosis, different forms of glomerular nephritis and cystic kidneys like autosomal dominant polycystic kidney disease.

And so a lot of these patients are on dialysis and people might ask well, why can't you just do dialysis?

Because you know you're cleaning the blood, you're keeping them alive.
And actually unfortunately dialysis is not a normal state.
So chronic inflammatory state where?
Probably providing just a bare minimum to keep.
People alive or help me out to get to transplant. So and you know, this day I'm gonna show a lot of day here from the United States real data systems, which is basically our registry for all patients on dialysis and transplant in this country. And this graph is.
Knowing that survival over time by modality and hemodialysis in this case is much worse compared to those who receive the kidney transplant over time.

HAZEL CERENIO 6:27
H.
Play.

Ranch, Daniel 6:36
So and this has been shown, could you could please mute please if you just logged on and this has been shown over shown over and over again that transplant offers a significant survival advantage compared to Dallas and that's why we promote, you know, transplant as a priority.

HAZEL CERENIO 6:36
72 people.

Ranch, Daniel 6:53
When patients have.
Kidney failure. Most commonly, they're dying from cardiovascular disease, most often arrhythmia and and sudden cardiac arrest. And then with the advent of COVID-19 2020, that actually popped up as a common cause of death as well, too.
Also just quick note, dialysis end stage renal disease care is under Medicare and it's expensive, but it's been shown consistently that compared to chronic dialysis care which say for hemodialysis about $100,000 per person per year.
Kidney transplant after initial surgery, cost is much cheaper over time.
So another reason you know we prioritize transplant here so that if we know that transplant is better, why don't we just transplant everybody?

Well, the problem is there's about 90,000 people in this country at any one time waiting for kidney transplant.

But so far today we're only doing about 25,000 transplants a year.

So you can see that backlog and what that translates into is that.

Typically, adults are waiting about 5 to 8 years on dialysis before they get a transplant on the waiting list, and depending which area of the country, and So what I'll say while we do more living trans living donor transplants, which I'll talk about later in talk.

Which would be fantastic, but we're only doing about 6000 living donor transplants per year.

Also, we're adding about 40,000 new patients with kidney failure to the transplant waiting list every year. And the reason that list isn't going up faster 'cause people are dying every day waiting for a kidney transplant.

So these are all barriers to know why can't we solve this problem?

And then additionally, and fortunately, transplanted kidneys don't last forever.

On average, they're lasting about 15 to 25 years, depending on the type of transplant.

And so those patients, especially our kids, will need additional transplants in their lifetime.

Let's see.

So. So fortunately in kids, the numbers aren't as drastic.

There's about 5600 kids in the country living with kidney failure and the good thing is the majority of them have a kidney transplant in Gray here.

The rest are on dialysis, but reprioritize our kids in terms of getting a transplant, especially on the waiting list, which is why the numbers are different. And also there's less patients overall.

Otherwise, in this country we see about 800 new cases per year.

And then Texas, that comes out to about 770 to 100 new cases per year on average.

In kids.

The cause of kidney failure are somewhat different from our adult counterparts and kids. Congenital anomalies of the kidney and urinary tract, meaning renal, urinary tract, developmental abnormalities are the most common cause of kidney failure, followed by glomerular disease such as FSGS, cystic or hereditary disease such as aut.

Recessive polycystic kidney disease or your immune related diseases like lupus, associated nephritis.

And also unfortunately, in kids with kidney failure, they're acting like old people.
I say old people 'cause. I'm a pediatrician, right?
That's how we talk to our patients. But unfortunately, when you have kidney failure, your mortality is higher than the general pediatric population, whether that's any type of dialysis, even transplant, which is provides a much better advantage. And I'll harp on over and over again, but still much higher.
Than the general pediatric population. This data is, you know, over 10 years old, but it still holds true, unfortunately, where?
Kids in our country, typically in general population pass away from accidents, homicides, suicides. But our patients on kidney failure die from, you know, older, patient, older people, diseases, cardiac disease, infections, cancer with cardiac disease typically being the most common cause.
And so, you know, people try to predict, you know, what would happen to these patients depending on the on, you know, their modality for treatment with kidney failure. And so in this country, if the general population after you're born, you're expected to live about into your 70s, right.
However, if you are born as a child with kidney failure and you're on chronic dialysis, it's estimated that you only live in two your 20s.
Which is ridiculous, right? Because.
That's compared to like a the lifespan of a healthy 5060 year old.
So how do we improve that?
And we found that transplant significantly predicted improve that.
Survival into the 50s or 60s, which is great, but still worse than the general population.
And that's why we're still actively working to find ways to improve our transplant care.
And so the message typically is, I say most, if not all the frauds believe that kidney transplantation should be the goal for all people with kidney failure.
It's just, you know, how do we overcome the barriers to achieving that goal?
So this is a little Emmy.
That baby saw earlier with the nefarious arm kidney failure and at Halloween event at the hospital some years ago. And normal kid, right, so.
And just a quick clinical Pearl.
So when do you suspect kidneyses and kids?
Now when they come up to the end of the when they come in the ER or hospital sick

and they're not urinating and they swollen, no, that's easy, right?

That's easy to pick up, but what about the more subtle cases? The things you can watch for, especially out in the outpatient world?

You know, subtle signs that maybe there's something going on that could be caused by.

Can disease no unexplained failure to thrive.

Typically can be assigned probably some underlying metabolic acidosis not picked up.

Persistent proteinuria typically is a harbinger of of kidney disease, different from intermittent proteinuria.

So that's why we also when you send patients, that's just recheck it.

But actually you know that's because that's what we're looking for is how, how persistent, how abnormal is that finding, so unexplained hypertension.

So hypertension, that's not due to say being overweight.

Or whatnot.

And then positive family history sometimes can be clues. That, oh, excuse me, this patient may have risk for certain genetic kidney disease, like out port syndrome or autosomal dominant polycystic kidney disease.

And sorry, my voice is shaking a little bit because it is now probably down to 50° in my office. My space heater went out so, but we'll we'll push through.

So all right, so key transplant.

So I'm just doing some background and key transplantation and also I'm going to try and go a little bit quickly so I can get to.

The rest of the talk but.

So there are obviously many people.

Who have made giant contributions to the field transplantation, but I'm just gonna highlight a couple here.

So Doctor Joseph Murray from.

Mass general, he performed the very first successful human kidney transplant in the 1950s and note, and this is probably for the students in the resident you know, he, you know this is, you know, classical medicine, right.

So he was a surgeon in the army treating patients with burns.

Back then.

And he noticed that, you know some.

You know, when he tried to do skin grafts to for patients with severe burns that allow

them would reject them and they wouldn't.
They wouldn't take any.
Wondered why and so and then when he came back and joined mass general, he actually joined a team that was working on trying to save people with kidney failure.
Because it's 1950s, there's no chronic dialysis, right?
So or it was ill leaf available for a select few.
And their goal was to try and cure kidney disease. And they thought that transplantation was going to be the key.
Yeah, way back in the in the 50s and 60s, so.
And eventually he had a patient who had kidney failure, had a twin brother who was willing to donate identical twin brothers willing to donate his kidney.
And so went through a lot of, you know, you know, ethical dilemmas and whatnot, but eventually got him transplanted. And it worked.
And this image here on the right shows Doctor Murray with the donor Ronald, at the transplant games, which is basically Olympics for kidney donors, organ donors.
50 years later, Joe and both were actually doing well. So.
Very, very nice to see you. And Doctor Murray actually won a Nobel Prize with the the rest of the team in the 1990s, so.
Additionally, Doctor Paul Terasaki from UCLA, he was actually a zoologist by training and was studying the immune system and studying skin grafts in the initial in animal models. Initially in baby chicks, you know, trying to figure out why they weren't take right so and eventually as he joined.
UCLA was working with the Department of Surgery and got and, you know, trying to figure out. Well, there's got to be something in the blood.
You know something related to immune system that's causing these rejections and eventually.
Figured I was antibodies and the HLA antigen system and he's the one who developed a very important test called the complement dependent set of toxicity or CDC assay that helps us determine is this donor and our patient going to be compatible by comparing their their serum serum S.
So looking for reaction. So his discovery for a huge step forward in providing safe kidney transplant for our patients.
And then of course I donate institution.
We have our own transplant pioneers too. If you don't know on the left. Here. Doctor Glenn house, he.

The transplant surgeon and he started our liver transplant program here back in 90s. Also, him and Doctor Seguro are here on the right.

They did the very first split liver transplant in the region here and Doctor Segaro, after spending who knows how many years, you know, leading our institution and then the UT system as a whole. As Chancellor came back because.

You know he couldn't shake his love for taking care of kids and for surgery, so came back and got our pediatric liver transplant program going. And so these two gentlemen have really grown our transplant programs as a whole into, you know, our not only pediatric, but adult kid.

And lung transplant programs are nationally renowned and are living liver donor program, especially on the adult side is is world renowned so.

And it's all due to, you know, their their leadership and vision.

All right, so very briefly, who actually can get a transplant when, you know they're ready.

So thighs is important because excuse me, when?

We're transplant K is the vast majority of our patients are getting one adult kidney. So it's one adult kidney going to a kid.

So that adult case typically about 11:50 centimeters in length, about a hundred 5200 grams in in weight. And so the child has to be big enough to be able to receive that kidney.

And also for the vessels to be large enough so that they can do their Nas MOC safely.

So we'll say that kit has to be the size of about a normal one year old.

Which, when you have your bone, kidney failure's actually hard to get to and statistically most kids who start dialysis as as a baby don't get to that size until they're two years old.

So you can see that is that delay for getting a transplant.

Also, you don't want to transplant too early because crappy kidney still does.

Is still better than transplant kidney with medications and so.

So we'll typically wait until the kidney function's getting down to below are level of what we call kidney failure, end stage renal disease, which is a less than 15 minutes per minute for body surface area, so.

You need to have your vaccinations up to date and especially our live vaccines because currently we don't believe it's safe to give live vaccines after solid organ transplantation, especially kidney transplantation.

So it's important to get those in on time, otherwise the vast majority of our inactivated vaccines are safe to give before or after transplant.
We screen for psychosocial.
Uh concerns umm to make sure there's no barriers that might prevent a successful transplant because you'd have to have your care afterwards.
Have to get your medications to be able to drive here for your visits.
So we'll it's a pretty rigorous evaluation process and then sometimes their underlying disease may warrant waiting time.
So we have some immune condition that we want to die down or they have urological disease that needs to be corrected surgically before it's safe to plug in the kidney.
No.
Contraindications and it says absolute here, but at least in Pediatrics, typically no contraindications. Absolute. We're going to evaluate pretty much every case to make sure that there's we've explored every pathway to transplant for that child. But in general, if you have severe irreversible heart or lung disease, typ.
You know, obviously placing Kitty in that environment is not going to work, active or recent malignancy and typically want to see our patients who are cleared from malignancy for at least two years.
Some would say three years.
Other terminal illness which is changing all the time, right?
Now we used to say patients with Duchenne muscular dystrophy or spinal muscular atrophy would be contraindicated, but now their potential treatments for that so that you know that's changing over time.
So then obviously active infection relative contraindications include severe obesity, unresolved psychosocial issues, special mental health disorders that aren't treated.
And then rarely lack of vascular access. Do we've had some patients where they're born and they don't have.
Normal intra abdominal vasculature for kidney anastomosis.
No. All right.
So you're, you know, you go through that, you're ready for a kidney.
You know, when do we do it?
What types of kidneys can you get so the two ways you can get a kidney are either from the waiting list or from a living donor, which I'll talk about. And actually we at our center, at least we do prioritize trying to get our patients transplanted right in.

That window where the kins are failing, you know, GFR is less than 15, but they haven't started Dallas since yet.
And we hope to have them ready at that time to do what's called a pieto transplant, meaning you're skipping dialysis. And we believe that the benefits are one you can avoid dialysis, right? If you talk to a parent who's had a child on home dialysis for a year.
They'll tell you it's it's a horror, right?
Waking up every night with the machine alarming and so forth.
So trying to save them that pain if we can, and then at least through many observational studies, improved graft and patient survival.
So that's something we we.
Continue to to prioritize. Here at our center and and other centers too.
What?
We prioritize living donation over a kidney from the waiting list, meaning kidney from a healthy donor, which I'll have slides on later. But it's been shown time and time again.
These are different decades of study from.
Kidney transplant and it's been shown that living donor transplants last longer over time compared to deceased donor catabolic donor transplant.
So that's just basically every decade of study that we had.
So that's why living donation is also very.
Strongly promoted nowadays for for transplantation.
But otherwise, you know, if you're a child and you don't have a living donor, that's OK.
We can still get a kidney from the waiting list, and fortunately different from the adults where their typical wait time is 5 to 8 years on dialysis. Our kids in this country probably wait about six months on average, and that's going to depend on other factors. Please M.
If you just log on that other factors such as blood type time on dialysis.
Your age.
This.
Reactive antibiotic period is a test to help predict reactivity with other potential donors in your area or community.
And so basically the higher that number, the higher it is to match with the potential donor in, in, in the the donor pool and then where your center's located because

some centers are busier than others, have a higher population, larger waiting list and so forth.
For these surgical side.
Kidneys in adults and older kids, if we are placed, actually what's called extra retroperitoneal in the eliac plasma and showing this image on the left here.
So you see this hockey stick looking incision in the lower quadrant and the kidney's actually placed in the Elias outside the peritoneal cavity.
The vessels are hooked up to the external ELAC vessels for the most part, and then the readers plug in the bladder and they found this, you know, type of placement.
With this type of placement, people recover much faster because you're not in the peritoneal cavity. There's minimal to no bowel standing, so the recovery is really quick.
So I would say on average the adult patients they're in and out of the hospital by, you know, maybe three days or so.
Now for our smaller kids.
Our babies, probably kids under you know, 1520 kilos.
The kidney's won't fit.
There also may be their vessels are small, so their place actually intra abdominis.
So you're going to see a midline scar instead.
And then the kidneys are hooked up to the aorta IVC.
And so that's going to be that recovery is going to be more like an X lap where there's more bowel stunting and ilias and so forth.
Also.
At our center, we place our urectral stent, which is a plastic double J stent that spans the renal pelvis down the ureter to the bladder just helps to keep that anastomosis open.
That's taken up by our urology colleague, Dr. Jessica, gets at about four to six weeks afterwards and sometimes not all times.
Sometimes we have the original or native kidneys removed and some indications include having they still have persistent urinary reflux. That's that could lead to more infections.
Their old kinneys make too much urine 'cause. You can have kidney failure but still have normal urine output or even polyuria. And we're worried that might cause dehydration. That could lead to thrombosis.
They still have still have severe proteinuria from the native kidneys from, say, from

nephrology syndrome, that could increase the risk for vomple depletion, thrombosis and sometimes, you know, just refractory hypertension.
They're on four or five medications and a lot of times taking out the kidneys in the situation will help to to improve that.
So that's a surgical kind of surgical part of the transplant.
And then just quick blurb, note me a special medications are really important like any other transplanted organ, the organ doesn't work without continuous medication exposure to calm down the immune system, prevent recognition and rejection of that transplanted organ.
Our patients are typically on three drugs, tackle Miss Mycophenolostro, cellcept and then steroids, and so always tell parents. Don't let anybody stop your medications or change your medications without letting us know.
And I think that's really just the key point is.
Make sure that if you have a transplant patient, your clinic that you see these medications on their list and if something needs to change, please just let someone on transplant team know so that we can work with you.
The hospital course.
On average, our kids are in the hospital for five to seven days total, including about two night ICU stay. Every just monitoring their kidney function and adjusting medications level, a medication levels and then their recovery is mostly like any other surgical patient. They have to stool normally, but.
They eat and drink normally and make sure their pain is controlled.
Sure, they're walking like this guy that this guy's post op day one, he's ready to go carrying his.
Fully uromere there at the time, and then the really important parts of the hospital course.
Our transplant education, making sure parents are comfortable with all the new medications their child is taking, the care when they call us and they're discharge planning.
And the follow up as well unfortunately is pretty rigorous, at least in the beginning.
But it's important because we wanna make sure that we're leading, you know, they'll have a good long term outcome, but we see them twice a week in the first month and then weekly for the second and third month they get ultrasound guided percutaneous biopsy of their new kid.
At the three month Mark, so I have to come back in the hospital and with all these

clinic visits to get labs every single time, we don't have any better way to monitor.
Kidney health or kidney function? Drug levels yet?
So they just get stuck every single time.
Time, unfortunately, until some enterprising student in the audience, you know, goes the Elizabeth Holmes route and invents, you know, micro blood testing at home. But without the the cheating and faking data part now and then. Even long term, our patients are seen at least every three months with.
Labs to monitor their kidney health. So it's it's a lot of work, but but it is important for, for, for marching grasshopp and we screen for infectious complications signs of of kidney.
Rejection actually typically are silent.
So it's when we really depend on our labs.
All right, so I flew through that and.
A little bit behind my own timeline, so, but we'll see how much we get through since also we have faculty meeting afterwards.
Alright, So what?
What the what's our program?
You know what's our role in in pediatric community transplantation in the US?
And she can see on the map here.
Actually, San Antonio, we serve pretty much everything West of us because you know, our colleagues at UT, Houston and Texas Children's, they're busy with their.
What 8?
9 million people in the Houston area staying with their colleagues at UT Southwestern and Dallas and Fort Worth. There's a program disc go to Corpus Christi and they cover, you know, a lot of the lower grio Grand Valley, but nothing else West of us. And so we trans.
Everyone from our our team mates in Austin.
Program in El Paso as far north as Lubbock and Amarillo, all the way down to Laredo.
So we get referrals from this whole area, which is important, right, because we want to serve as many people as we can.
And in addition to serving the people of San Antonio and Bear County.
But it's a lot of it's a lot of work by my team, a lot of marketing visits, phone calls to to, you know, build new relations and maintain those relationships and their trust.
And that's probably why a lot of our patients actually prefer our center to some of the other larger centers because you know when they call or when the physicians

calls was an issue, they know that we're going to pick up the phone and from what we've heard from.
Some people.
Those some of those other centers, they don't always pick up the phone.
Right. So when you're stuck out in the boonies with a transplant kid and they're sick and you gotta know what to do, obviously you wanna have that, that backup available.
So, so kudos to my team for for all that work that basically happened seven days a week.
And that, you know, culminates in.
Our transplant program, being a top kidney transplant program in the country and that's been going on for years, actually even probably even before I showed up.
But this is from 2024 showing PD pediatric kidney transplant volumes in the country.
They'll sit at a high volume. Centered is doing more than 10 transplants a year, so and out of probably at least 70 if not 80 active pediatric kidney transplant programs in the country.
We have consistently been in the top 1015 over over you know as as long as I can remember, which is and that's you know in doing no small part to all the work that my transplant coordinators and the transplant team do so. And when you do this.
When when you're performing this well, no other other program, other people notice.
And so it's led to a lot of great collaborations with other other centers as well.
Also, you can't just do a bunch of kidney transplants without having good outcomes.
And so we are mantra directly under the department, Health and Human Services.
And but we've met or exceeded benchmarks set by them pretty much every year.
And the popular bench, or the common benchmarks being patient and grassroval.
One in three years and we we've done exceptionally well pretty much every year.
So once again this happens because of our.
Hard work of our teams.
All right, so.
Just things still aren't perfect though.
So what some other issues we've tried to tackle to improve our care of our pediatric kidney transplant patients, some common themes that pop up include, you know, addressing the donor shortage, improving the long term outcomes and can't talk about chronic illness without talking about teenagers. But so at.

University Health Transplant institute. We've really focused on increasing and promoting living donation, not just for kidney, but also for other organ.
For liver as well in both adult and Pediatrics.
Because you know that's gonna be one major way to help fix or help decrease the burnout of a donor shortage.
This graph shows here that over time, the total number of transplants we've done in the country have increased.
Dramatically, which is great. That's fantastic.
But this Gray line here is a number of living donor transplants. And sure, there's a little bit uptick here. And then COVID didn't help but definitely has not increased as much as the the, the this disease donor.
So this is something that you know, we should work to improve and on the pediatric side, it's the same story. This graph here shows that over time, living donor kidney transplants have a better survival compared to the C Stoner in purple.
But compared to the number of deceased during transplants happening, the number of women doing transplants has not increased over time.
And so recognizing this.
The Institute Institute of Program Start a program called the Champion for Life program, knowing that, you know, if somebody has kidney failure, you know how many of them are going to be brave enough to go out there. And you know, you know, put on, put on social media.
That their kid needs an Oregon or you know how many patients have the means to put up billboards around town saying, hey, I need a kidney or I need a liver. So and so this team basically helps families do that.
Helps them to tell their story and get the word out.
So that they're more comfortable. And so that even maybe their neighbors or their loved ones are aware that, oh, I know this person, they have kidney failure.
Maybe I can help because I'm healthy so.
And it's a lot of work.
It's a lot of calls once again, but it's culminating in a lot of in a lot of great stories.
You Remember Me from earlier? Her donor Lori, is actually one of our own.
Transplant corners.
They saw her story and decided to get tested.
It was a match and donated to her. This young lady here.
Shut up. Another hospital emergency room with a cough and then her life changed

overnight.
She was actually found to be in kidney failure.
Had to start dialysis right away and once we got her story out, over 100 people from her hometown sign up to be screened to be a potential living donor.
And she eventually got transplanted as another famous patient of ours.
Here Matthew. He was a baby born that I had kidney failure soon after I actually had a transplant initially. But it failed earlier.
Than expected, unfortunately.
But then, as he was looking for a second kidney, his story got out there and his first grade teacher actually end up being a match and end up donating to him.
And finally, in this little boy here is came all the way from El Paso because we found a donor.
An unselfish donor called Altristic donor from around here who's willing to donate to any child who is in need.
And he ended up being a match. And. And this was at an event we call a living donor reveal, where recipients get to meet, meet their living donors. If if the both parties are willing.
So very touching and tier filled event. So how?
And also with all that work, you know it's led to something that I'm still most proud of, that our program has accomplished so far, which is back in 2022. Our program did the most pediatric kidney transplant.
Kidney transplant in the entire country. You know the amazing feat for our, you know, relatively smaller program and it wouldn't happen with all hard work of our of our coordinators and our team mates and you know support from the transplant leadership.
And but when we didn't quit there and actually in 2024, this data just came out, we did it again.
We're basically right there at top with Louie children. Cincinnati Children's shown is national.
Yeah. And you know, and this is all because because of the hard work of our team, you know and and once again when you do this, people notice programs notice.
This was an oral abstract presented at our national Transplant Conference, the American Transplant Congress back in 2023, presented by one of our fantastic surgical residents, Kelly Harrell, and the team, and basically outlining, you know, how did we grow our living donor transplant program because other.

Programs had tried and failed.

They want to know. So. So it's a great way to get our name out there.

Error in the community, in the country and also build build new collaborative relationships.

So, so who can be a living donor?

It's basically anyone who is healthy.

You can be healthy and be a ****** like our own.

Doctor Kelly hitchman here.

Sorry, I said.

******, I said twice.

Now Doctor Kelly Hitchman is our HLA lab director. So she's basically the gatekeeper. She, in terms of making sure that our donor and recipient pairs are going to be a good match, a safe match. And, you know, working with our team and our populations, you seen the the.

Great things that we were doing, I was inspired herself to.

So unselfishly donate an organ to somebody in need.

And so she did that.

And then, because she's a ******, promptly climbed Mount Kilimanjaro with another team of donors just to prove how.

How awesome.

She is so, but you don't have to be that awesome to be a donor.

You just have to be adult healthy.

If you're going to donate to someone, you don't have to be a blood relative and actually a common myth is that you know they're gonna take your kidney and run away with it.

You actually can dictate who you want to donate your organ to.

Or if you just wanna do it to anybody in need, you know, and the benefits of living donation include your getting someone transplant. So you're getting them off the list.

Get them off dialysis earlier.

You also bring them spot on the transplant waitings because that kidney that may have gone to them now is gonna go to somebody who is waiting because you got a kidney from a living donor. So as I've shown before, they have better transplant outcomes overall, and it's been.

Shown time and time again that actually donors basically have a normal life after

after they donate.
Oh wow.
So please goes go find someone need and sign up to be a living donor.
But if for some reason you can't, you can always register to be an organ donor as well.
And you do do that through the donatelife.org website.
Also you can do it at the DMV when you're renewing your license.
I didn't know this.
You can actually do it when you're getting or renewing your hunting or fishing license.
So and finally you can do it through your iPhone help app as well too.
There's a way to sign up that way?
You know. All right, So what about improving long term outcomes?
We're actually, we've shown time and time really good at getting kidneys in their kids and having them survive and do well. The first few years.
But how do we extend it out into twenty 30-40 years right now?
Things that affect long term kidney outcomes include the quality of the donor itself, donor organ itself, and fortunately for kids, we actually they are actually prioritized for the least damaged or best quality donated kidneys.
HLA matching talked about preventing graph rejection and then medication adherence, so you're not going to be talking about teenagers, right?
Well, so in terms of matching?
So when you're trying to see if a donor recipient pair are a compatible match, we do something called a physical cross match where you basically have the serum samples of two parties to see if there's a reaction, and if there is, if there. If there is, then you. Don't transplant that pair. But if there isn't, then you proceed. However, that that and that's very simplified by the way, so.
However, that you know testing takes time too, and so that's probably another four or five hours waiting with the kidney.
The donated kidney out of the body, on ice or on a pump machine.
Before you can get transplanted, which leads to potentially more damage and so you know, how do we how do we make that better, how we shorten that time. And so in the adult world, they started, you know, once they're able to characterize patient's HLA profiles or pattern.
Through software, they started doing this testing actually virtually, and had been

shown that doing that testing virtually.
Very, you know, very closely match the results you would get from the actual physical test with the blood samples.
But it's much faster.
Obviously you don't have to wait for the blood sample.
Wait for the test and there are a couple other pediatric centers doing encounter, but no one had published this.
So he said.
Well, I mean, we're doing this.
How come we don't?
Why don't we just compare and see what we've got in the past?
So. So we looked at our historical cohort and the light blue here where they had just additional physical cross matching and compared it to our patients using you know those virtual what we call virtual cross matching software and seeing how they did over time. And we found that.
There was.
Difference in their survival and also no difference in the rejection.
So basically using this virtual cross to matching our software method of matching patients was shown.
We showed as safe in kids too, so.
And like I said, the other centers are doing it and we actually have a new. This was presented at the American Transplant Congress and National Transplant Conference last year and actually won best poster for that session.
And we have an updated data to to send for this year's conference as well.
L2O what about graft injury monitoring?
So our traditional test for.
Kidney health is the cranning right?
But unfortunately it's fair. When it's abnormal, it's pretty specific that there's some type of kidney problem going on, but it's not the most sensitive test.
It doesn't change that quickly, so so OK if you just logged on, you could please mute please.

JF **Jane Fried** 40:00
I lost.

I lost the thing. ****.
The code.

Ranch, Daniel 40:07
But otherwise, so it's a.
It's a basically a late marker of kidney injury. So in our search for earlier markers of injury to a transplanted organ.

Jane Fried 40:15
Did this last week.

Ranch, Daniel 40:18
We're actually using relatively older technology, which is, you know, decades ago they discovered that there is some cell free DNA.
This free DNA floating around in the plasma called cell.
Free DNA and then eventually people found the researchers found that there's also when you have a transplanted organ, there's also.
Free floating DNA in the blood from that organ as well, and found that when there is injury to that organ, say a kidney, that.
That amount of free floating DNA from the organ seems to rise.
And so they started using that test as a marker of injury to a transplanted kidney and found that when it's high, that means that there's some likely some kind of injury going on and probably rejection.
And so we were one of the 1st and we published this a year or so ago. One of the first centers to to demonstrate this in addition to colleagues out of UT Houston and Cedar Sinai and Wasu.
That so if you're looking at self redna percentage.
Here in our patients who were quiescent or had no rejection, they had basically normal levels of donor derived self renew, which it typically will say is less than 1% for patients who had some kind of rejection had significantly higher levels.
And also we showed that you know when you had rejection, it was high.
He did a biopsy and then you started treating them.
We actually showed that that marker would actually improve.
So as a marker of hopefully adequate treatment.
And so there's a been a wealth of additional research on this marker, plus additional

markers.
And we're continuing to work on this as well in our population, but we're just, you know, searching for for earlier and early markers of graft injury, kidney transplant injury, because creatinine is just too too slow.
So all right.
Teenagers.
So one of the most common causes of long term graph dysfunction or late rejection is incomplete or complete medication non adherence. You miss a few doses.
Your drug levels go down.
The immune system ramps up and starts to recognize that.
The foreign body, which is a transplanted organ and then leads to rejection and decrease life of the transplant over time.
So, so not unexpected studies from the prior have shown that adherence is high in teens or at least over 50% in some studies, more common in teenagers compared to younger children when they've done surveys to figure out well, why is this happening?
Actually, unfortunately, lack of parental supervision was one of the most common reasons.
Parent child conflict, right?
So so all the normal teen things that they, they go through effects their medication adherence to and so that just ongoing ongoing ways to try and improve that which I have some subsequent slides. But in the meantime, how can we potentially monitor for that? So so this is.
Study by Doctor Kim Piburn, our own colleague and one of our recently graduated residents, Rohit George, who's actually a nephrology fellow at UT Southwestern now.
So.
Doctor Piburn had published on the variability over time of our attack alignments, drug levels and that association with the development of antibodies as a marker of the the immune system starting to recognize the kidney and causing damage.
And so they hypothesized. Well, what if we use that high variability level plus high levels of that free floating DNA or SELFRE DNA as markers of?
Risk for.
Developing rejection mean developing these antibodies that could cause damage to the kidney and they found in their pilot study that those patients who had low variability mean consistent drug levels or low levels of cell free DNA they did fine.

They didn't develop these bad antibodies, but those who had high variability indicating, you know, inconsistent, incomplete medication taking and a higher level set for Renee, that that was.
Highly associated with developing antibodies and you know likely.
Rejection. So that's one way to, you know.
One way to screen for you know who's doing badly before we actually see evidence of damage, mean cram change or something else to try and catch these problems and fix them as early as possible.
All right, so now moving into teens. So how can we better support our teens?
Because our goal is to get our teenage all of our teenagers with chronic illness to become.
Healthy young adult patients with chronic illness, right? So.
But it's a sniffing challenge and we've known this for decades.
This is one example of study ten years ago, looking at 10 year graph survival over time by age at transplant.
And this, of course, this dip here is our or our teenagers, unfortunately.
So patients transplant teenagers did worse over time compared to younger or older patients.
And once again, why is that?
They even did a this this study actually has one of the best titles I've seen in the paper.
So they were surveying young adult patients to see if they were hearing none 2/3 report that they were taking their medications consistently. But by testing actually 2/3 were not taking their medications consistently. However, when they did their, you know, quality of life testing, they were very.
Happy so.
Hence the title.
Young adult transplant patients not inherent and happy.
Also, this is a pretty, you know, Offsiteed study looking at brain imaging of imaging of the brain and maturation over time.
So for simplicity sake, the purple areas are more mature.
Areas of the brain and this is over time, by age, from 5:00 to about 20 years of age, and they showed that.
Neuro maturation, you know, goes on and on, actually into the third decade of life, the areas that develop early or vision hearings in the motor. But the important areas

for executive functioning, the frontal lobes, the prefrontal cortex, actually developed last. And these are important functions related to plan.
Problem solving.
So basically all you know, keeping A-Team from doing something bad, keeping a person from doing something bad and making bad decisions, right?
And they've used this as an argument for. Well, no, even our, our, our young adults aren't ready to handle some of these issues on their own.
So as you know, pediatric doctors, should we be sending these patients into the adult world and seeing them?
You know, fail right away.
So so that's been ongoing battle but also.
You know, as an important point, when we're talking about adults and young adults.
Clinics and inpatient units to help support them because you know they I I believe they need help still you know? So at our center.
I'm gonna move along real quick here since I don't want 15 minutes.
So at our center, we did a we're trying to figure out what's happened, what had happened to some of our prior graduates into the adult world after kidney transplant. And out of about 85 recipients, we're only able to find out the status on about 2820.
We were able to reach 13, we found out.
Unfortunately, 2 passed away at that time.
We've done the study and then got the status on another 13 patients and it was pretty sad.
Unfortunately, about of the 13.
Patients who had failed kidneys, nine of them, were still on dialysis at the time of the survey.
Not all of them were relisted for transplant, so and had to figure out why.
And only one was retransplanted.
And then just asking about their basic, you know, their general life, most of them are still living with their parents.
A small portion of them that were employed.
And a lot of them had comorbidities that, you know, adults typically have with chronic illness, hypertension, diabetes, but also mental health.
Is with the most common being anxiety, depression.
So. So it's kind of a sad picture to see and once you know, how do we better serve

this population and is still a work in progress.
So one thing we're doing is using this tool developed by Doctor Maria Faris and her team out of Newburgh, North Carolina.
Basically, we assess them at each visit.
To find weaknesses in their understanding of their illness, their medication, their their health management, reproductive health so that we can have our team members work with them.
On those specific issues with the hopes of training them to be a successful young adult transplant patient.
Also, we have a monthly pediatric organ transplant support group.
So teenagers with both kidney and liver transplants, they meet with.
It's run by our one of our psychologist, Dr. Elliott Lopez, and basically it's a safe space for teenagers to come and and hang out.
Share their stories with each other and and you know, probably air some of the grievances as well.
So and still trying to find a way to turn this into a research results as well, but in the meantime, that's that's what we're doing. That another thing we're doing to try and help these these teenagers cope with with having a chronic illness for the rest of their.
Lives.
Alright, last set of slides.
So what's the future? What?
Am I hoping that our program can be involved in going forward?
Because you know, it's either coming or it's here and oh, I forgot to take this out.
Sorry, but you know so and then with the recent merger with UTSA, there's that open up some additional opportunities for some of these. So. So everyone's read about pig kidney transplantation or you know transplantation in the country is very prominent in news and for good reason.
Because it's brand new and the researchers I worked on this for for decades. But one of the major limitations was, you know, you're taking an organ from a different species, right?
And so with that comes antigens that our bodies would attack and damage the graphs and also do notic infections that could potentially cause trouble in the human recipient. So.
And the real breakthrough for moving this forward was CRISPR gene editing.

Because we're in the past.
That's when you're trying to gene edit and organ it.
Take years to breed those those animals and organs. But now, with CRISPR gene editing, it takes months.
And so that's why things have moved more quickly in recent time.
The first transplant pig to human transplant was done at mass general about a year or so ago, and fortunately that patient only about two months.
But actually didn't die from the transplant process.
Die from cardiac disease and then this patient in this article here from January 25th this year.
I believe this was an NYU patient.
Got an organ and so far admitted through now three months. And then surgeons at mass general just performed the 2nd transplant just about a couple weeks ago.
So it's here.
The FDA has cleared the path for clinical trials and you know, both UTSA and UT Health San Antonio have, you know, advanced animal research care facilities.
So hopefully that's something that we could.
Explore in the future.
Another novel therapy was sequential.
Stem cell and kidney transplant.
So if you get stem cell or bone marrow transplant from a donor and then get an organ from that same donor, we actually don't need immune suppression, right?
'Cause there's no foreign bodies, there's no foreign tissue anymore.
So and it's been done sporadically and this is just one example.
In specific population actually by Doctor Pyburn's old mentor Paul Grim at Stanford.
So they had these patients with a rare immune deficiency, Shim Kis.
I forgot what it's called.
Someone doctor Infante will tell me, but, but yeah, so they have this T cell deficiency, and then they actually die from infections and kidney failure.
And so they were able to.
Initially, do a half identical stem cell transplant for these patients from a donor, and then afterwards, after the transplant, graft it.
Then they would do a kidney from that same donor and these patients did not need long term use oppression and their kidneys so far have have done well.
So the the hard part is though you know, how do you do a stem cell bone marrow

transplant without killing the patient, right?
Because it's a lot of.
Conditioning and there's a risk for infection. Also risk for grasp for graft versus host disease afterwards.
So that's one of the main barriers still. So right, I'm gonna fly. Actually. Car T therapy is here as well, so.
Training our own cells to attack bad cells in our body and in the case of transplant, when you get rejection, you gonna have memory cells making these bad antibodies that attack the donor, the transplanted kidney. And so using car T to to get rid of those cells is.
Is here.
We're still looking for additional biomarkers, not only for looking for graft injury, but also as markers of monitoring graft help that this test is normal.
Yes, your transplant ordinance likely doing well. And then for rejection monitoring and treatment and monitoring as well.
So if we have, say, somebody has rejection, how do we know that we've adequately treated because the only true way to diagnose?
Rejection know what's going on?
Kidney is to do a biopsy every single time, which is definitely not easy for.
A small screaming child, right?
So so are there other bond markets who could use as a as a as a alternative would call liquid bot that would tell us exactly what's going on. And so there, there are a lot of active research in those fields too.
And finally, probably pretty far off but.
Researchers have also worked for years, for decades with pluripotent stem cells.
Try and grow organs like the kidneys.
I don't think we're anywhere close yet, but once again.
UTSA and UT health have 3D3D bioprinting capabilities.
So something potentially enterprising student could explore in the future.
So all right.
So I'll finish with the last couple slides, so.
We all know that everything, you know, everything we have now, you know, we've gotten this far because of our predecessors.
And you know where they were willing to to get their hands dirty in toilet. Way to make sure that their patients were better, but also to advance the field.

And so that's a mindset of our team as well is you know what?
Can we do to continue that our patients are getting better?
And make sure that you know our the next generation of of of doctors and and medical providers doesn't repeat the mistakes that we've made.
And then finally, none of this happens without the entire team.
So this is I probably most of the transplant institute that is a pretty good turn out.
Without.
You know the vision, Doctor Segro and Dr. Health and our transplant leadership know they they ingrain from the beginning in our culture that pediatric transplant was important. And that's why we've had the success we've had 'cause they supported us the entire way.
So so anytime you see a transplant team member, please.
Say hello.
Recognize them because they're working 24/7 to make sure that our patients with organ failure are are have a chance at a normal life so.
And I'll finish there. Thank you.

Kamat, Deepak M 55:16
Thank you, Doctor Raj, for educating us on can you transfer us and other issues related to them?
Let's see.
We have 5 minutes exactly for the discussion, so anybody has any questions, comments.
Before we go to faculty meeting.

Sanders, Robert Scott 55:52
Doctor Ranch, I have a few questions for you.
If that's OK.

Ranch, Daniel 55:56
Yes, Sir. Doctor Sanders.

Sanders, Robert Scott 55:57
Good morning.

Ranch, Daniel 56:00

Thank you.

Sanders, Robert Scott 56:00

In regards to like adherence with medication after the transplant and the teenager group, you did talk obviously talked a lot about that.

Is there any like ongoing like research in that areas as to things that might help improve that cause?

And that that type of research could reach into a lot of different areas as well with medication adherence.

And then the second question is a little further out there, but is there ever going to be an artificial kidney?

Ranch, Daniel 56:24

Mm hmm.

Great questions.

Thank you very much for those.

So the first question yes is you know, we've tried everything and you're right, it's not just transplant and teenagers, it's any chronic illness.

And I'd shown that in the previous talk where it's our patients with diabetes, lupus, you know, asthma, cystic fibrosis, you know, how do we successfully get them into adult care without them dying.

And.

You know, years ago I proposed trying to start a multidisciplinary clinic where basically, people, teenagers would come for training to become good patients.

But obviously there's a lot of logistics and funding bearers to that, but that's, you know, that's something that some centres have done with varying degrees of success.

Ongoing technology type research projects pill bottles that have sensors so they can be tracked when they're opening.

People try to think of pills actually contain a sensor. So.

They can actually know when patients are actually getting the medications into their bodies, trying to find other ways to monitor drug levels at home versus having to come to the lab every time.

Yeah, all all different things that people tried with varying success.
So definitely a lot more work to do so and for your second question, artificial kidney.
That research has kind of gone quiet.
One of my mentors actually was involved in a project years ago, where is basically a small implantable device that would go in the leg and.
Hook up to the the the femoral vessels there and drain it and and the fluid actually drain into I think into peritoneal cavity but basically provide enough dialysis without an external machine or catheter for about three to six months and people will just have that device reimplanted or.
Exchanged out every three six months, and when they did a survey at the time, patient definitely preferred that to having a catheter or fistula and coming in Center for dialysis.
So, but that kind of went quiet and I think one of their.
Two of the issues, one was clotting.
Right 'cause. It's a a foreign body hooked up to the vasculature and two just getting adequate filtration with with the technology they were using.
So I'm sure the research is ongoing, but I haven't heard any update since.


Sanders, Robert Scott 58:40
Awesome. Thank you very much. Appreciate it.


Ranch, Daniel 58:42
Thank you.


Kamat, Deepak M 58:43
Any other questions, comments. We have two more minutes before we go to faculty meeting.
I don't see anything so.
Arrange. Thank you very, very much for educating us regarding pediatric kidney transplants.
Thank you all for attending this morning's rounds.
We'll see you again next Friday at the same time, please join the faculty meeting, which will start in about two minutes. Thank you.
Have a wonderful Friday.

Ranch, Daniel 59:16

Thank you everybody.

Kamat, Deepak M 59:17

Wonderful weekend.

◉ **Kamat, Deepak M** stopped transcription