

Nancy:

Thank you so much Jack and good afternoon to everyone from San Diego, California. My name is Nancy Marlin and I have polycystic kidney disease. I am the extraordinarily grateful recipient of a transplant from a living donor. And through my experience, I learned so much about kidney transplants and kidney donation. And I want to share what I learned with you to hopefully, that you can benefit from this, I do want to acknowledge again that I am a transplant recipient. I'm not a health care professional. I have no financial relationships to disclose. But there are two resources that I found particularly helpful when I was learning about living donation, the living kidney donor, kidney stone or network and reassignments books.

So, if you want more information, these are sources I highly recommend to you. Okay, I've organized this in terms of seven steps you need to take to find your living donor and get a transplant. The first is to commit to actively seek a living donor. And this, this is so deceptive. It sounds so easy, because of course, I'm going to commit to find a living donor. But as we'll see, finding a living donor requires a great deal of work. And it's a great deal of difficult work. So, let me just step back for a moment and say, well, why should you actively commit to secret? If you look at the reality of your situation with polycystic kidney disease, you likely have or will have at some point kidney failure. There are only two options for renal replacement therapy, dialysis or transplant.

Transplant is by far the best option in terms of both the quality of your life, also the quantity of life, how long are you going to live. So, if you've decided you want a transplant, there are two options there. There's a deceased donor transplant or a living donor transplant. And I want to share some data with you that I think speak to the importance of finding a living a transplant for a living donor. These are data from last year kidney transplants in this country. The good news is there were 24,670 kidney transplants, over 18,000 from deceased donors and almost 6000 from living donors. And if you go on the UNO's website, that's this the citation for this at the bottom of the slide, they will tell you this is a record here the sounds great. But then we sadly know there's a dark side to this, there aren't enough kidneys.

So, during the same year 4700 people died while they were on the waitlist for kidney. And what I think is almost never publicized is the almost 4000 people removed from the waitlist, because they became too sick to transplant. So, you could be waiting for years, and then be told you're not you're no longer healthy enough for the surgery. That's because dialysis is very debilitating, its life saving absolutely. Because before prior to dialysis several decades ago, people like us would just die, there was no therapy. But over time dialysis is very debilitating, to your body. And people have to be removed from the waitlist tragically after waiting for some time. So, I share these data with you not to scare you, although I think they're quite frightening.

But so, you can make an informed decision about whether you do want to pursue finding a living donor. And of course, as we all know, the waitlist is very long, you can wait many years for a deceased donor because there are almost 90,000 people right now on the waitlist for kidney. So, finding a living donor is a difficult process emotionally. You're going to be put in situations where you feel very vulnerable. You're going to go through an incredible range of emotions. It's very important. That's why this commitment is so important. These emotions are all normal, you should anticipate they're going to happen and you just have to be committed to continuing to find a living donor. It can be a lengthy process. Time is a critical dimension in kidney patients. You don't want to wait till you feel sicker or feel you have to do it to start seeking a living donor.

But I can tell you from my own experience and talking to so many others, a living donor donation kidney is an extraordinary the worthwhile experience. You have a functioning kidney you feel healthy, you're back to doing most of the things you were able to do prior to your to having kidney failure. So, this first step of commitment is, again, deceptive. But it's very, very important. Educate yourself about living donation, you don't have to be an expert, you have experts in your transplant center and with your nephrologist. But as we'll see, what you're going to be doing is having conversations with people about living donation. And as soon as you start having these

conversations, they have questions. Why can't get a kidney from someone who died? How can someone live with one kidney? Who pays for all of this? So, you have to have a basic level of information to be able to respond to people to have an informed conversation.

So, let's go over just some of the basics at the level you need to know there are multiple advantages of a kidney from a living donor versus deceased donor. The kidney is transplanted scheduled soon as the donor is approved. And I mean, really has soon I got a call with my donor one afternoon she finally been approved through her evaluation; she was going to the selection committee the next day. That next day, I got a call from my transplant coordinator to schedule my pre ops and the transplant which occurred a few weeks later. So, this gets you off, or helps you avoid dialysis. Again, you could have a transplant prior to dialysis that's called a pre-emptive transplant. And this could occur as soon as the donor is approved. A kidney from a living donor lasts longer. On average lasts several years longer than one from a deceased donor that's terribly important, usually functions immediately. Sometimes the deceased donors have euphemistically called sleepy kidney where it takes a while to start functioning again, more, more dialysis, more anxiety.

Transplant is a scheduled operation; you're not sort of perpetually on call waiting for the transplant center to contact you. Nor you called in the middle of the night, we have to rush around and worry about jobs or childcare or whatever. And then it shortens the wait time for others on the list because you get off the list. So, there are quite a few living donors. There's one, one major disadvantage, and that is that you must find the living donor. That is, you can receive great care in your transplant center or your dialysis center or with your nephrologist. But there they can't find you a living donor. That's your role and your responsibility. So, who can be a living donor, it can be someone related or unrelated. It's interesting, if you look back at the history, the first living kidney donor transplant in this country was done in 1954.

At that time, there weren't all the immunosuppressive drugs that we have now. So, you had to basically have the same immune system as the other

person. And that meant you had to have an identical twin. So, it was quite limited who could get a living, donor transplant that has changed over the subsequent decades. So, now that the drugs the medications you take to suppress your immune system are good that you don't have to be genetically related to the donor. And in fact, right now, about 40% of living donors are not genetically related. You have to be in very good physical and mental health that will be very closely examined by the transplant center. There are certain types of conditions that will rule you out because the donor would be at higher risk for kidney problems in the future or just at high risk for surgery. minimum age of 18.

Most transplant centers will say there's no maximum age it depends on the health of the individual, of course, their kidney functioning, I know of donors in their 70s and I've heard of a few in their 80s and they have to be freely willing to donate. This is absolutely critical. You cannot pay for kidney buying and selling organs is illegal. The person can't be, you can't make them feel guilty or try and coerce them. They have to be freely willing to donate and again the transplant. Surgery for a living donor is done laparoscopically, minimally invasive surgery, really in a incredibly small incision that can pull the kidney out through, but this requires shorter hospital stays in a shorter recovery time. My own donor stayed overnight in the hospital went home the next day. She recovered very quickly. In fact, she went to her yoga class that weekend, which I know is not medically recommended.

But again, it does require much shorter recovery and time in the hospital. The kidney then is transplanted into the recipient, usually in the lower right hip area connected to the blood vessels and your bladder. And for most people who lose their kidneys, that's diabetics and high people with hypertension, their quote, native kidneys, or original kidneys will just atrophy. Well, that isn't the case for us, we tend to capillary large kidney, so sometimes those kidneys are removed at the same time as the transplant. Other times, if they're causing problems, they may be removed a bit later. Now, this is just based on questions I've received following the transplant living donors, they don't take special medications, that's the recipient, you'll be on

immunosuppressants for the life of the Organ, not on a restricted diet, that's people on dialysis, they can drink alcohol, they can have children, and we know they live as long as others.

In fact, they live longer than the general population. Because they're screened and they're, they're quite healthy. So, that's who can be a donor who can be your donor, again, depends on your immune system. And the three basic categories or looked at are your blood type, antibodies and antigens. And again, we've heard a lot about antibodies and antigens during Covid. Basically, the antigens that are foreign to your body, not the normal markers on your cells, but foreign ones, you'll produce antibodies, which will try and protect you. And that's swell when it's a virus or bacteria. But when those antigens, these foreign antigens are from kidney tissue, this foreign tissue in your body, you don't want those antibodies because that will lead to rejection. So, there's a lot of testing that goes on with your antibody levels and antigens and your blood type.

This these are the basic blood type compatibility, if you have A, compatible with A and O and so forth, there are a few subtypes that if you fall into that category, your transplant center will certainly let you know. And the plus or minus the Rh factor is irrelevant for transplant. Everything related to the evaluation, the surgery, the hospitalization for the donor is paid by the recipient's insurance. So, there are no costs to the donor for any of that. But there may be costs incurred relating to taking time off from work. Or if you have to arrange for childcare or travel costs. If you don't live locally, it's perfectly legal if you have the resources to reimburse the person for those costs. Again, you can't buy or sell the organ but that's perfectly legal. And if you don't have resources, there are other types of programs that your transplant center might be able to connect you with that can help with that. There are several types of living donation, we usually just think of what's called directed.

That is, Jack gives me his kidney. That's a directed one person to the next. That's directed donation. But starting in the year 2000 period exchanges began. This greatly enhanced the opportunities for living donation. That is if

you have a donor who's perfectly healthy and suitable for donation, but it's not compatible with you. You could go if the donor agrees into one of these exchanges. For example, the simplest example is let's say here, I'm recipient a buck a wine, I have A obviously give that A blood, that's my blood type. And I have a donor who's perfectly healthy and suitable, but he's got B blood type, we're not compatible in terms of that. But then there's another pair over here with the opposite situation. Here's recipient, two, with B blood has a donor not compatible with A blood and you switch them and I'm giving you the very simplest example.

This can go into multiple swaps or switches, as it's called, again, greatly enhancing possibilities for living donation. And the last category and there's no good name for this. It's called non-directed or altruistic. I mean, all donors are altruistic or good Samaritan or something. These are people who they hear of the need for kidney donation. They contact a transplant center they say I'm happy to donate one of my kidneys, but I don't know of anybody who needs one. Those Altruistic donors will often start these chains that you may have used to get a lot of publicity about where they'll donate to one person. That person's donor will donate to the next and it goes on. So, there are many types of living donation. But the takeaway point here is, you don't have to have someone who's compatible, that can be worked out, you have to have someone who's suitable and willing to donate.

Okay, so that's the level of knowledge education you have to have about living donation to have these conversations. Now let's get into how do you have these conversations. Step three is you're going to write and practice your story. This is what you're going to be sharing with people, your story, your need for a kidney. And people aren't going to know you need a kidney unless you tell them I've had lots of people say things to me like, well, I'm on dialysis. If people wanted to donate to me, they know I'm on dialysis. And they would don't assume that people don't know there's a difference between dialysis and transplant, they may not even know that living donation is a possibility. You need to tell them you need to share your story. In doing so

you're not asking anyone to donate, you are sharing your story you're telling about your need.

And there are three characteristics I think are important for your story. One is it needs to be concise. And by concise, I mean, you need to be able to say at less than a minute. It should be compelling. It should be heartfelt this is your health and your life. And of course, it has to be accurate. So, if you think of what you might include in your story, certainly you want something about your kidney disease, maybe about how dialysis is affected your will affect you something about how long the waitlist is why family members can't donate, which is sometimes friends will ask that and that's often a problem.

Of course, if you have polycystic kidney disease, because its genetic, maybe a description of laparoscopic surgery, some personal aspects, you want to see your children or grandchildren grow up. And that you could avoid, again, a pre emptive transplant or stop dialysis with a living donor. So, I'm going to take a moment to share my story with you to give you a sense of a story. And it sounds very straightforward now when I say it, but it took me a while to actually write it and feel comfortable and practice it when I was actually going through this process.

My story is I have a genetic kidney disease. It's very serious. It killed my mother when she was in her 50s. It contributed to the death of my youngest sister when she was in her 40s. And it probably my maternal grandmother, my mother's mother, although it wasn't diagnosed at the time, my kidneys are now failing to the point where I'm going to need either dialysis which would be awful, or a transplant. With the waitlist for transplant, I'm told for me could be seven to 10. The wait for transplant could be seven to 10 years because there are over 90,000 people on the waitlist. So, what I'm hoping for is to find a living donor, someone who would give one of their kidneys to me. That's my story. Again, it's less than a minute. I hope it's compelling. It's certainly heartfelt. And it's that's all accurate.

So, I want to just take a moment here because it's easy to listen to this stuff to read about this stuff. But I want you to switch a little bit into Active mode.

I want you to just now jot down three things you will put in your story doesn't have to be from this list. Although you want something about kidney disease and living donation. I'm just going to be quiet for a moment, but jot down three things right now. Okay, first of all, again, we can't take long, but it's hard to do, isn't it? And what I'm hoping you take out away from this breakout session is you if you don't have a story already, you really start working on practicing writing, writing your story. Okay, then you got your story. Next thing you got to do is share your story. And once again, to the emotions.

I've had so many people tell me, I'm a private person. I don't do that. The truth is we're all private people in this regard. We don't usually think of our medical situations and information as personal and private. We don't go around telling everyone so you will feel uncomfortable. You're fully vulnerable takes courage, but again, you have to stay committed to actively seeking that living donor. And the wonderful part is you will find people who want to help. I can tell you from personal experience, because I shared my story with lots of people, it does get a bit easier after you've done it for a while but it's never. I think it's important to really think through when you're going to have that conversation, you want the appropriate setting. I'm focusing now on one-on-one conversations; We'll talk about some other options in a few moments.

But you want a setting where you can talk privately talk isn't something you just do in passing, some you're having lunch or having coffee, you can sit and talk privately with someone and use an appropriate transition to your story. I think it's a bit much just launch into your story. I use the transition when people would say Hi, Nancy, how are you doing? What's going on? My transition was I'm dealing with a serious medical condition, then people would say what? And then I would tell my story. Other people have used transitions, like, there's been something I've wanted to share with you. Do you have a moment? Or can I talk to you about something really serious? That anyway, I think it's important to frame that discussion. So, people know something, something important is coming.



So, who do you share your story with either emphasize this first group of family and friends and by friends, I don't mean best friends, I mean, people you would feel it would be normal to talk to them on an individual basis. But you need to go beyond usually that group. But this group is where you're most likely to find donors. That's why it's so important. But then they're also affiliated groups. You may not think of it in these terms, but you're affiliated with lots of groups, you've got a workplace group, you may have a faith community, military groups, volunteer organizations, high school contacts, even very loosely affiliated groups, if you donate blood, or your you rescue dogs or something, these are groups that you could communicate with about your need.

And I'll show you in a moment, some examples of how you might do that. Then you've got social media, this is extraordinary in terms of what it can do to get out your story and get out your message. Because you can have friends repost, they repost things go out to very large numbers of individuals. And then there's the general public. And for these last two social media and the general public, I would just urge you to be cautious. Because every one of you almost everyone I know who's done social media and the general public, you get a lot of strange calls, you get calls immediately, with people wanting to sell you their kidneys, you get calls from people who want say they're going to help you and then they disappear.

So, you just have to be very cautious about these last two groups, although lots of people find donors that way. Here's some examples of for example, with an affiliated group. Here's a flyer that was made for someone he's in emergency medical services. And you can see this was really tailored to giving out to people at work and in his community. This is something from Facebook. And the more creative you are on Facebook; the more things get reposted they go viral. Here's somebody who used their dog Cooper doodle, to talking about the guys need. And he found a donor from Facebook. You can communicate your needs to the general public through several mechanisms, car signs. This somebody at my transplant center, who shortly

before I was transplanted, received a kidney from someone who saw sign at our car at Costco.

So, you never know where these donors are going to come from yard signs. Billboards is of course these get more expensive. This is in LA a couple of years ago, you can't read this very well. But it says you can't legally buy a kidney. So, he bought this billboard to save our donors life. And these types of things. Don't it's not usually the people driving by but again, they get reposted on social media, and someone from Reddit and I don't even know really what read it is came forward and was his donor. And then their T shirts. This guy on the right is the king of T shirts. He's the one to start this several years ago at Disneyland he'd been on dialysis for few years he wore this t shirt again got reposted everywhere. He said he got hundreds of calls again a lot of strange calls, but he found a donor through this.

And on the other the left it's his father of three again, that's a good you want emotional hooks. This was at a baseball game. had people come forward found a woman who was approved to donate she was not compatible and they entered into paired exchange. I'm not talking T shirts, but I like this one. Because Donate Life, the group that encourages organ donation has these T shirts with different categories, say donor recipient, they have one this is waiting. And this is a great conversation started, people say, what are you waiting for. And then again, a different response here a different message. And I could go into launch into your whole story. But a very short response of like, I've been approved for kidney transplant, waiting to find a living donor, someone who had donated a kidney to me.

And then you want to give them something, a follow up, you could say, could you help me get the word out and you give them a business card, you might have a website that you've done or contact information for the transplant center. Ask at your transplant center, if they use the National Kidney Registry, microsite, this is a fabulous resource. And they'll do all that for you. They create a website, they have coaches who really are good at doing this, they give you business cards. So, be sure to ask about if that's available at your transplant center. Then you have to be prepared for the responses.

You've done all this. And it's very hard again, emotionally, for example, I shared my story initially with some friends who I've known for a long time, and I thought surely these people will be my prime candidates for being donors.

And sometimes, for example, they would say, oh, I'm sorry to hear about that Nancy, and just change the subject. So, it's really quite devastating. You have to be prepared for this emotionally. There were other responses that were quite surprising. Someone who had one kidney, which is about 750 people are born with only one kidney. And other reasons we know living with one kidney is absolutely fine. Probably the most surprising was a woman I didn't know very well. Well, I shared my story. She said, Nancy, I'd like to help you, but I donated my kidney years ago. So, you have to be prepared for the responses. But all these people, even if they're not going to be donating, you can ask, can you help me get the word out? Could they write to people? Could they repost things? So, they can be extremely helpful. Finally, you will have some people from these conversations and this is this is the miracle part of it.

After you've had, not initially the first conversation but after you've talked to people for a while about donation, they start saying, well, maybe I could be your donor, what do you have to do. And that's when you refer potential donors to the transplant center. There's an initial screening almost all the time. Now it's done online, to see if people have ruled out again, because they have conditions that would preclude them because they may have kidney problems themselves, then they can be evaluated. This is very important note, the donors must initiate contact with the transplant center, you can't go in and say, find the attract on these people. They have to initiate contact. If people don't live close by a lot of the preliminary particular the bloodwork can be done locally.

And I've heard it called the astronaut or executive physical. I mean, people pay 10s of 1000s of dollars for this executive physical. And that's what you get, because it's looking at everything, especially your kidney functioning. And again, the psycho social functions. The donor evaluation, the transplant centers are very selective as they appropriately should be because you don't

want to do anything that would potentially create any harm for your donor. So, as a result, many donors are disqualified. This again, this is this is so hard, emotionally, you're euphoric. Someone has said they're going to be your donor. And then you find out they've been disqualified and you're just despondent. But these people can be incredibly effective advocates for you. Because they can say, I'm trying to help my friend, find a kidney.

I can't do it. I was disqualified, I'm determined to help find, so they can really be very, very strong advocates, and realize the evaluation may take time. But then, after all of this comes the nice step seven, which is the transplant, this is me, my pre Covid hair being wheeled into the operating room. And oftentimes people before operations aren't nervous. I was thrilled. This was after all this work. This was finally happening. I just was so excited that I was getting this transplant. And everybody's recovery is different. I literally woke up in the recovery room. And the chronic fatigue I'd had for so long because of my, my kidney failure was gone. I actually, although I was still under general anaesthesia, and I had the incision, I felt better than I had in so long.

Now following the transplant, you go home with a big bag of medicines, because you're really heavily suppressed at that time. And you're on anti-everything, antibiotics, antivirals, antifungals. And you're going to be seeing your transplant center a lot in the first few weeks following this, because they're adjusting your meds, they're monitoring all your functions, especially your kidney functioning, they're dealing with any side effects of the immunosuppressants. But if you're like me, you're happy to do all that because you want to do anything to protect this amazing gift. So, in conclusion, I hope you will be committed to seek that living donor. Realize this is your health and your life. There are 1000s of living, donor donations every year 1000s. This system worked for me, and it can work for you. So, I'll conclude with, there's a kidney out there for you. Go find it.

Jack: Nancy, thank you so much for this presentation. As a reminder to the attendees, please keep your microphones muted and type any questions you have into the chat. All right, let's begin the Q&A. I have one question in the

chat specifically, from Nancy Boyle, her question revolves around paired exchange programs. She specifically mentioned that she has PKD and type O blood and her husband has type B, can he donate his kidney, and I receive a type O from a pair exchange program. And my assumption is that the next part of the question is or is it more complicated than a blood match? Are there other factors involved?

Nancy: There are other factors involved. Again, these antibody and antigen levels have to be looked at for everyone. But yes, it's certainly possible to enter a paired exchange and there are repositories of these pairs who are trying to get paired up. So, this is something when you have an incompatible donor as in this case, because an O can only receive from an O, then you could enter one of these exchanges and your husband could donate would donate to someone else. And then it turned you would receive a kidney and the other factors that are involved because it is more than just blood type would be accounted for in that.

Jack: Right. Anybody else? Please drop your questions in the chat. We have a few more minutes. Let's see here. Any more questions coming out? Here we are, is it possible to challenge a donor disqualification? Or has anyone had any success with any kind of appellate process? This is from Whitney Brown.

Nancy: I don't know about challenging the donor decision at a particular Transplant Center. I do know about people who have listed in another transplant center because the transplant centers have a great deal of autonomy in terms of their decisions. So, I know of people in both two situations, not where they haven't been accepted as a transplant candidate at one center and they weren't another. And the same thing with a donor, a donor who wasn't accepted at one transplant center that was at another. Now the problem is, of course, you don't easily know this in advance. But that is I say, I don't know of a challenge situation. But I do know of other transplant centers who have been, who have different standards and have accepted donors or recipients that others have not.

Jack: Thank you. I have a question in the chat. An interesting question. This voucher program is two questions. One from Jim Keiser. One from Lynn, use check. Do you have any information about a one-year voucher for a kidney?

Nancy: This isn't again, it's very much determined by your transplant center what type of voucher programs they may enter into, I think when a common one is, say you have a relative who is older and wants to donate to a younger person who doesn't yet need the kidney. But the concern is for the first time the person wouldn't need the kidney, the person might be too old or have other problems to donate.

So, there are ways you can do that sort of donation and time where the person donates, and then they would have a voucher to get one for one that person does need a kidney. There are other type of voucher programs where people are concerned well what if someone my family needs this and I know of one where you can name up to five family members. So, if they ever need a kidney type of thing, so that you would donate and then anyone who would need a kidney would get one. So, there are variations on the voucher programs, but you need to talk to your transplant center to see what they actually were involved with.

Jack: Okay, thank you very much. That's so interesting to see, I wasn't actually aware of these voucher programs. And there are a couple of questions in the chat about the specifics. But it sounds like those individuals need to speak with their transplant centers, or their policies specifically, what about getting matched with the transplant center? What do you look for in a transplant center, besides just geography, I guess is a big one. But do you have any information on that?

Nancy: Geography is a big one, because as I mentioned, you're going to be going to that transplant center a lot. Now, for the initial transplant. Again, if you don't live close by, you're not going to be able to get there in time if you're getting the deceased donor type of route. So, that's important. And also, you have so many appointments afterwards, that the geography is very important, then you also in my opinion, you want to look at the number of transplants that

they do. And you can find all that on that that website that I mentioned earlier, UNOS.org. You have to prowl around a bit. But if you look at data, and then they have data reports on everything, for example, I live with or three transplant centers. And one of the things I wanted to look at is who has older donors because I was older when I received my transplant, I assumed my donor would be older, though it turned out she was bit younger.

So, I looked on the website and was able to find who had a lot of old, you can find everything on there for center data. So, I would look for centers that do a lot of transplants. You're always I think better off if you have people who have been there a while. So, you've teamed together that works really well. And also, if you have particular concerns such as I did for an older, they do older living donors, you can find information they are.

Jack: Can you repeat that website name again? We had a question in the chat.

Nancy: It's UNOS, United Network for Organ sharing.org. And you'll find enormous amounts of information there. But you have to look under you have to again, prowl around a bit you hit data, and then data trends. And then it gives you everything you want national data, you want center data, you want state data, and by all organs because they're dealing with all organs, not just kidney, so you can find that information there.

Jack: That's wonderful. And I'm sure the living kidney donors' network that you mentioned earlier, also has some excellent resources. I'm going to drop that one in the chat as well, for anyone curious. Let's see if we have any more questions before we let out, we may finish touch early. But oh, here's a question. What happens if a match hasn't been found in seven years? It sounds like this individual been looking for a while. Maybe? Do you have any advice for people who've been struggling with this process after they've already reached the commitment step?

Nancy: Struggling at the process to find a donor or they have an incompatible donor?

Jack: To find a donor?

Nancy: Yeah, that's hard. You just have to keep looking, there really are people out there and you have to find them. And I think systematically going through, have you really talked personally, to all the people you could talk to? Have you asked them to help you? Have you put in as I said, these groups that you're loosely affiliated with, I mentioned giving blood? If you did that, you can make up a flyer like I've donated now I need a donation and blood donors or donor oriented.

For example, I went to a yoga studio for many years. I asked the owner, could we put something and they did a monthly newsletter, because most of the people there at least we were on saying hello type terms. So, you really just have to keep at it. There are people out there. As you can see, there are just 1000s of people who do this every year. But sometimes it takes quite a while to find a donor that first flyer I showed you about the person who works in emergency surgery or emergency operations. I think he's still looking for a donor also. So, you're not alone. It takes time, but it does happen.

Jack: Okay, and the last question that I have is actually a part two to that first question is a little more specific or maybe a little bit outside the scope of this breakthrough but if an individual is 100% PRA that is a Panel Reactive Antibody, I'm assuming pickings are generally not donor. Recipient candidates but I'm not sure do you have any information on that?

Nancy: No, the PRA, Panel Reactive Antibody, it goes from actually zero to 99. And it's based on a broad panel of antibodies will give you a sense of how many kidneys in general, you would be able to accept. For example, if you have a PRA of zero, you can accept them all. If you have a PRA of 50, about half the kidneys, you would not be able to accept because of your antibody levels.

Now, people who have very high antibody levels they're called highly sensitized people, they will actually get a little bit of a boost in terms of the waiting time on the ceaseless because there's when a kidney comes available, they could use they're going to get some priority. The other thing that can be done is there are treatments to lower your antibody levels and you again need to talk to your transplant center. This isn't done at all transplant centers



amniocentesis where they actually are filtering your blood to reduce the antibody levels to help you get a transplant. So no, it's not impossible. It is more difficult, but it's certainly done.

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