

Preemptive Transplants

Clifford Miles: So, my name is Clifford Miles. I'm a transplant nephrologist. And I work with the transplant program here in Omaha. And I'm delighted that people are tuning in, and it was kind of the end of the day. It's on Saturday and I appreciate people making the effort also in the morning, I found the laser pointer tool in my presentation. So, watch out.

So, I don't, I don't know what to say with this, I wanted to disclose that I do participate in a research study with Polaris that this talk has nothing to do with that I saw that they were involved with one as a sponsor for the Kinect, so I thought I'd throw that out there otherwise, nothing to disclose.

Well, we'll try to cover it here, hopefully in about the next thirty or thirty-two minutes. So, we have some time for Q&A for these items, I really want to talk about the benefits not only of kidney transplantation but what we refer to as preemptive kidney transplantation, starting with a definition, talk a bit about barriers to receiving a kidney transplant prior to dialysis.

And then, frankly, some of the controversies that surround it because I've given a similar talk in the past and some of its I don't know if it's changed, or if I'm just getting older, but there are some things about that, I think we should, we should dwell on for a few minutes. And just sort of start kind of this proverbial 10,000-foot view, I think this is one of the issues that we deal with, with kidney disease in general in this country. And that is just sort of an epidemic that continues to grow.

And if you kind of extrapolate the number of people in this country with kidney failure out to where we are, now, we're really close to about a million people. And that's if you just define kidney failure as being either on dialysis have some form or having a kidney transplant. This data is from the United States renal data system. And I have a couple of slides It's great it's a public website, a great wealth of sort of statistical information about kidney disease. But I think it's important to remember to keep in mind that the number of people with end-stage kidney disease is really just a small fraction of the people in need of therapies like transplants.

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So, that in Haynes project, I guess, has been going on for a long time. And it's an effort to follow a large number of people in this country and sort of like observational study, like watch what happens and then collect demographic and clinical information. And then like events, health events, actually don't how many people it's 10s of 1000s, if not hundreds of 1000s of people in this country.

And it's really been a useful wealth of data on Americans. And so, again, the US already has worked with and needs to find some stuff adding, so, the estimate is about between 14 and 15% of the population has chronic kidney disease of some form, and it's a huge number of you multiply it times the population, so nearly 50 million people are the estimate of that number, If you just focus on people with significant protein in their urine, or a quite low kidney function like a stage, if you're familiar with the stages, like stage three or four chronic kidney disease, those are people that are really at higher risk of progressing to end-stage.

And that's, you know, so it's a smaller number than 47 million, but it's somewhere between eight and a half and 9 million people. And to me, that's really the scope of the sort of problem how many people are really talking about that need therapies like dialysis, like transplant, sort of coming in that sort of near future. So, these are basically kind of overview of the options of treatment for kidney failure for the end-stage. And probably people here are aware of hemodialysis, peritoneal dialysis, and transplantation. Then there's in the center and now more and more home hemodialysis and then live donor and deceased donor kidney transplantation.

Kidney transplant is generally followed as the treatment of choice and I sort of think of I'm sort of a simpleton, I sort of think of three reasons why that is. One is that generally, people can expect to live longer if they have a kidney transplant. So, again, from the USRDS, the blue lines are the life expectancy, with a kidney transplant compared to the sort of gold lines life expectancy on dialysis. And then it's shown here displayed over different age groups. The point being that kind of no matter how old you are, for people who receive a kidney transplant, the expectation is that they are going to live longer. Quality

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of Life has been looked at a number of times by a number of groups and has consistently shown that across the various sort of realms of quality-of-life transplant dominates dialysis from a quality of life standpoint. And I think the reasons maybe are I don't want to say they're obvious but generally easier to travel easier to hold a job, interact with family, fewer dietary and fluid restrictions, and then for pediatric patients, sort of restoration of growth and development, things like that. So, quality of life is another advantage.

And then we don't always talk about the cost of health care, although maybe we talk about it more and more in the last five to ten years. But again, so, this is over time cost per patient per year, to whomever and obviously, Medicare shoulders the cost of a lot of end-stage kidney disease, which means we all share in the cost of this. So, the gray bar is the cost per patient per year to take care of somebody with our kidney transplant. Red is parents needle dialysis, and I think this is naming some color like that is hemodialysis.

And so, there's a significant difference in that no, one caveat is the first of the year, someone gets a transplant as expensive and most, most estimates are in the 100 \$125,000 for that year, but every subsequent year cost significantly less for us to take care of someone with a kidney transplant on average. And so, when you take those three sorts of things together, people are likely to live longer, they're likely to live better.

And it actually costs less to do I think it's pretty well founded to say it's probably the treatment of choice and a couple of snapshots that people from out of your pop culture or whatever that have received kidney transplants and maybe tentative and been public about their life before and after kidney transplant. And so, yeah, one of the issues and it's also why sort of why don't we transplant everybody? It's a great question.

And hopefully, someone wonders that this is the number of kidney transplants done per year, over time in the United States. And a couple of comments I would make about these numbers, the biggest of which is that there's been some increase here the last couple of years, I think should know number, I think it was about 27,004 2021, which is great. That's a lot of

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kidney transplants. But I just got through telling you that there are probably million several million people that would be considered in need of a kidney transplant. So, we're falling short, to say the least.

Generally, about twice as many deceased donor transplants here in red as there are living donor transplants. And then this is a saw, I started my career right about here. Hopefully, you all thought that I started here. And that's not true.

And this is like the first decade of me doing this job is sort of kind of depressing, because remember, the number of people with kidney failure was going up rapidly linearly during that time. And here we sat, doing kind of the same number of kidney transplants. So, it has started to improve recently, but it's still again, like fall short of the real, real need. So, I want to talk a little bit a couple of slides about paradigms. And this is sort of the way probably providers are taught maybe it's the way people that work in clinics are taught maybe it's the way people who are outside of medical care are taught about kidney disease is that there's a whole bunch of people who have chronic kidney disease a growing number of talks about and there's this sort of focus, okay, my kidney function is getting worse I need to prepare for dialysis. And I'll bet a lot of you are familiar with the fistula first push that was going on for a while.

So, you prepare for dialysis, start dialysis and then you get to dialysis, and seems as well, you should think about getting a kidney transplant, so you go get a kidney transplant. Many of you know that's not quite that easy because to get transplanted there has to be some way you get referred to a kidney transplant hospital like ours or anywhere. And then the transplant center is going to evaluate you and that has its pros and cons and is in and of itself the entire session we can get and then you're added to this thing called the waitlist. Which doesn't sound that great and then you get yourself to kidney transplant. But remember with so many people that need transplants and relatively very few transplants being done, there's that's what the waitlist is all these people that have been told.

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Yes, whatever we agree you would benefit from a kidney transplant. That's the good news, the bad news is there are always other people that are sort of got here first and are in line, and you're going to get on the waiting list. And so, as that has grown, the median time people wait is now up to like four years. And that's it varies a lot across the country, which, again is another thing we can have a little talk about, but median across the country for four years. And so that error was pretty long from when you're added to the waiting list to any transplant. There's been a number of studies in the literature over time, that have shown that the longer people are on dialysis, the sort of more bad things can happen one issue, but also interestingly, it impacts how people do after their kidney transplant.

So, people that have been on dialysis longer, actually fare worse after their kidney transplant, I couldn't find good pictures from the article. But I guess that's just the point is that interestingly, so, if people wonder, when people vulnerable wait one year versus some of the waits three or four years, the group that waited longer has more trouble and more rejections, and they have more they, frankly, they die sooner than people that experienced less dialysis. So, what maybe we should think about is doing this a little bit in a different way.

And I've tried to model some of my own practice, but also our transplant programs practice around this, which is to try to, I guess, I would think of as getting upstream and saying, maybe it's not fistula first, but maybe it's sort of transplant first get people who we think are at higher risk of progressive kidney disease, lots of protein, their urine, low kidney function, but not so low if they're actually needing to start dialysis, and have them think about kidney transplant and be referred and be evaluated, and be added to the waitlist, and maybe get them transplanted before they ever actually have to go to dialysis. And that, in a nutshell, is sort of the definition of preemptive kidney transplantation.

And so, it's some of this is intuitive. And yet, there's actually been studies that show that it's better, but you can sort of, think about it if you don't have to go get either a peritoneal dialysis tube inserted, which is surgery or go on

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officially created, which is a surgery, or via a dialysis catheter put in which is associate and all sorts of evil, then that's probably good. But there's some other interesting stuff.

But people tend to not have what we call delayed graft function where they, the new kidney doesn't work right away, and you may need dialysis and while you're waiting, and then stuff that's harder to explain, like, why is there less rejection in people who have never had dialysis. It showed just a little bit of sort of data to back this up.

So, these three lines, this is patient survival after kidney transplant. And what it's showing is that people in the red line had the sort of, they were broken into thirds, and they say this is the third who was on dialysis but had the least dialysis time, compared to idle, that must be black and green, I think of those two colors. Those are the second third and the third amount of time on dialysis before they had their kidney transplant.

You can see there's some separation out here, meaning that less dialysis was associated with people dying less frequently if I said that correctly. But what's really interesting, this line up here is that people would never have dialysis. And so, now so that's anybody out there likes numbers, as much as I do with this will be considered a big difference in the sort of survival experience of people by amount of dialysis with no dialysis being clearly the outlier and the outlier in the positive direction.

So, this is going to dwell on this slide for a little bit. So, the study is a little older, I acknowledge that but the concept here I think, is great. So, if you think of the top of the box up here as sort of normal field grade your quality of life, functional status is whatever you want to call it, good normal. So, chronic kidney disease is not a picnic. I think you're starting to have symptoms, maybe it's fatigue, maybe it's the need, frankly, to go see doctors and go have blood drawn and have tests done which no one likes to get poked and stuff like that. So, that so the quality of life and functional status is decreased a little bit by chronic kidney disease.

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And then if you follow us or light blue line for individuals who start dialysis that's, that's a big deal. So, you have to have some sort of surgical procedure to do dialysis again, like PVC tube or fistula or line placement. Often, with a hospitalization not always but frequently involves a hospitalization. And then people kind of get established on dialysis, and they get used to it, and they kind of get their routine back together. And they plateau in this area, which is, so they're better than they were. But they're not back to pre-dialysis. And they're not back to, I hate the word normal, we'll call it normal.

And then they get to consider yeah, to get a kidney transplant, which you have to have surgery and being cut by the surgeon hurts and you're back in the hospital, and you're getting your blood drawn. And so, you go down again, and you're sort of functional status. And you recover finally down here, which I wish transplant was up here. But it's not it's involves seeing people like me and having your blood drawn and taking medicine and things like that. So, it's better than dialysis, as the studies showed. But you had to go through these two big divots to get there.

So, the red line is pre-emptive. transplant in sort of broad strokes, you take out this chunk with a dialysis initiation. So, you have surgery, which hurts, and you have to be in the hospital and have to get your blood drawn, you have to take medicines, but you only have one big divot. And the mathematician in me wants everyone to see this sort of funny, a weird shape that would be it's like a, it's like a pair of fangs, there's nothing but this area under the curve difference.

These are all of the benefits from like a functional quality of life standpoint, that pre-emptive transplant is associated with the “excuse me” same group, and I'll spend less time on this slide, the same group walked through basically a financial model of this because starting dialysis is expensive. Getting a kidney transplant is expensive. So, if you could just skip the one and have only the transplant, it ends up being cost-effective, kind of like we talked about earlier.

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But they actually walk through and put numbers to this and sort of prove that beyond just like the sort of concept hand waving that I'm doing. So, again, older people, but so, the numbers will be different, but the concept would still hold true today. And so, sometimes things just seem obvious if you have a therapy where people are going to live longer and have a better quality of life. And it's going to cost less that sounds good. So, sort of like we compare dialysis to transplant, if you compare transplant to pre-emptive transplant, you again have another layer of benefit across these different realms.

And so, that's great, but then you kind of get to the reality. And so, again older data, but the relative benefit will be the same. So, as this study looked at a decade's worth of kidney transplants, and there are about 140,000 totals that they looked at only about 17% were done pre-emptive. And it's hard because of the waiting list thing. I think one should expect that relatively few pre-emptive transplants are done from deceased donors. But even from living donors, less than a third of the transplants done during that decade were done before people started dialysis, which I think is really interesting. I would shout out to the PKD community that historically, the performance has been a little better. But still, half of the people who had an identified living donor still ended up starting dialysis before they had their kidney transplant. So, room for improvement exists.

And so, we all spend some time thinking about sort of why is, what are the barriers to having people go through this paradigm where they get to sort of skip out on the dialysis part of kidney disease experience. I think to me, the biggest issue is just delayed recognition of chronic kidney disease. And that's not to blame patients. That's the blame all of us like as a system. There're just laws, and its people don't get chest pain or whatever, there's generally either no symptoms or vague symptoms or nonspecific symptoms associated with kidney disease.

And so, it's harder to recognize when it's becomes delayed. And then there's evidence of this so even people who are known to have chronic kidney disease in reduced kidney function, there are delays in being referred and being seen by a kidney disease specialist. And there's this is impacted on a

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lot of ways, but some of it is disease education and health literacy issues. And again, that's not always on the patients.

I think that there is plenty of evidence that health care providers outside of nephrology may not always be clued into the importance of referring someone with kidney disease to a nephrology clinic. And then really, to me, if you're talking about a barrier to pre-emptive, kidney transplants, it's this failure to identify a living donor. And maybe I should have put in their lives identify living donor early enough to make a difference.

So, with respect to disease recognition, this data again came from that in the Haynes database, and then the USRDS worked with him to try to make this make sense to people like us who think about kidney disease. So, I think this line here, sort of all comers, which isn't that useful, but seeing the early stages of kidney disease, again, not many symptoms, what they are is known to have is nonspecific generally look at this, like less than 20% of people with stage three kidney disease are even aware when they were surveyed that they had kidney disease.

And if you jump up to stage four, so these are people that to me need to be thinking about this need to be making plans need to be thinking about who could donate a kidney to me, here's like just over half, maybe approaching two-thirds of people which leaves a huge bunch of people who aren't even aware that they are in need. And then interestingly, even people who are on the brink of needing dialysis or transplant still on all of them know that they have kidney disease.

Wayne Smith: Hello. Ten minutes.

Clifford Miles: Thanks. So, I'll say so other people who have developed kidney disease, and this is back in 2014. So, a quarter of and just a record of them actually like wandering the hospital not knowing that they had kidney disease and left on dialysis, which is a huge number. And in a pretty small fraction actually had seen an apologist, but not wanting to really do any, any real good, there is a and then fully a third, or only a third, I guess, I should say actually had an

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established relationship, but because I think it probably takes a year to really get some of this stuff thought through and planned out. And interestingly, just, as an aside, included never group are some surprises. So, we as healthcare providers, at the very least ought to recognize some diabetes is at risk of kidney disease.

And yet a quarter of people who had diabetic kidney disease didn't know it until they needed dialysis, which I think is appalling as **Macaulay Culkin** [00:27:50] was that. So, just a couple of bullet points that kids didn't know, someone can refer for a transplant, really, at any level of kidney function. You can be listed at any level of kidney function to which probably even fewer people knew where the 20 comes, a lot of people have heard of this, this GFR, creatinine clearance of 20.

That's just to be eligible to accumulate waiting time on the list. You can be referred by yourself or by your primary care provider or by whomever, we actually end up referring some of our own patients, which is awkward. And then you can go beyond the list and be on hold. And you still accumulate waiting time in that position. So, to kind of get I've warned you that there's so many Oh, my goodness before I've sort of done with my talk, then we talk about DNA.

But there are a couple of things I want to talk about real quick. So, where is the conference? So, I send you can be referred to any level of candy bar, which is just true. But can you be transplanted too early? And it's? Maybe it depends, but I would say probably and so I guess, if you start at the extreme as someone who wasn't going to live long enough to need dialysis, then transplanting them probably didn't really do them any good. And I think if you get into extremes, it becomes less interesting.

So, what about a little more nuanced, so you have two individuals who have GFR 19. So, they're huge for almost headed towards stage five, they to me should really be in a mode of thinking about a transplant but also, willing to do dialysis, if not. So, if you take that person, and they're eligible to be referred, they're eligible to be listed. And actually, they would accumulate

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the waiting time. So, they could actually get either a deceased donor or living donor kidney transplant, if you take them right away and transplant them. And they have an average outcome.

And we can argue about what average is I just said once, call it fifteen years for simplicity's sake, then this is kind of when their kidney transplant is going to fail, if you if we pretend time is going from the left to the right across the screen. So, if you have the same, - I guess this person is blue. So, they're not the same individual, but someone in the same position and you say okay, great, nice to meet you. Let's put you on the waiting list. Let's put you on hold and just wait and see what happens.

This purple arrow becomes the arrow kind of interest because probably both these people felt okay, they probably didn't have any terrible lab problems or whatever. So, you can hold off and then you have a kidney transplant, and you have an average outcome, kind of further sort of down the road in time people would get and so, there's definitely some benefit to the individual to society to the payers in trying to time this appropriately, which is why I'd say yeah, you can get transplanted too early. And you can, is that better or worse than being too late.

So, the other area of controversy that I think is really important and obviously has gotten more and more deserved attention in this country and really across the world is the disparity in how we apply health care based frankly on what color people's skin is. So, if you look at the number that percent of people who are transplanted pre-emptively this the blue lines people who identify the types of white and the green lines people identify as black and then the other seems like not the greatest sprain but suit, so this is a huge difference.

In the percent of what I just got through telling you I think is the best therapy and associated being trained explains actually the mechanisms of getting to the waitlist. And there are big disparities, again, by skin color, and who's getting on the waiting lists because you can't get transplanted pre-emptively if you can't even get to the waitlist pre-emptively. And this I had the fake the, your society's scientific people sent me this because this is hot off the press.

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Nick, it was actually April, either April or May of 2022. So, this is people who have polycystic kidney disease. Who missed this a super small, I get that. But this is the odds of having a pre-emptive kidney transplant by skin color across these networks. If you're not familiar with networks, they're like a geographic distribution of the United States. So, this would make up the entire country geographically, if all the dots were on this line that would say, it wouldn't matter what color skin was black versus white, everyone was getting pre-emptive transplants at the same rate.

Look at this, all the dots are to the left, which means no matter what part of the country you live in, you're less likely to get a kidney transplant if you're black compared to if you're white. And this is for people who identify as Hispanic, the same patterns are compared to white. So, the odds are less all across the United States. This was huge, so the controversy becomes if you have a therapy that you believe is better, but you know, it's not being used. I'll just going to say fairly, should we continue to push it.

And there have been people who say no, if you say like, if this is what happens, then we should just cut it off and say you can't get a kidney transplant, at least a deceased donor transplant pre-emptively. If this is how we're going to administrate our country, that sounds I don't know, really severe and stuck with whatever I'm looking for.

But you can see an argument for that. And I think that's I want to like bring that out. I'm sorry, I'm just baiting people to get into the Q&A about this. So, I'm just to sort of conclude and see if it worked, I got some people to ask questions. And take-home points, you know, chronic kidney disease, instead, of skin disease, are associated with higher mortality. And there's a growing prevalence of people in this profession. And it's expensive. And we all need to sort of think about how we're going to deal with this.

Pre-emptive transplant is associated with a better outcome than it is more cost-effective. It's really not being done increasing. It's I took that slide out. But over time, we're not really doing a lot better at getting people to transplant, and pre-emptively in there are disparities in the application of this

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therapy that I think is really important. And so, barriers that we all need to be thinking about and trying to fix. I would you still put this awareness of chronic kidney disease across the board, on all levels, just trying to drive home the fact that how can we take care of people who don't know that they're sick, I guess, promote early referral to a nephrologist and to transplant centers.

And then really, kind of just keep trying to fix these problems that we keep finding where our delivery of care is, is not fair, basically, across different groups of people. And always, always, always, the way out of this is living kidney donation for any individual, as a group as a larger business society, we have a lot of work to do with a deceased donation. But why tell people how you want to get out of this problem is to find a living kidney donor, as hard as that can be. So, I think I made it. This slide. I think you've probably seen this a couple of times by now through the course of the last couple of days.

Promoting the registry, which I think is a great thing. And yeah, we made it so now, Chad's going to lay it out a whole.

Wayne Smith: Lot, Clifford tots of fascinating information there that I'm sure it's going to present. We've actually got some questions already in the Q&A. Just ask people to remain on mute, if you wouldn't mind unused the chat box, and then we'll get through as many of these as we can. So, going back when you were talking about that you know, the number of transplants someone commented, do you think the increase in recent transplants has been due to the opioid crisis and I'm guessing that refers to more cadaver kidneys being available?

Clifford Miles: Yeah, absolutely. So, the increase in transplants is the result of a lot of things. One has been sort of trying your best to promote living donation, if you remember the number of living donors was starting to come up a little that. Also, the organ procurement organizations, which are really involved with, talking to potential donor families and managing potential deceased donors, and then draw, getting through the allocation process.

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There's been a lot of focus on their performance. And there's, again, an entire weekend where the talks about the performance of opioids. But yes, the opioid crisis has contributed to that. And it's, trying to bring some positive out of enormous tragedy. I would also say that you know, the COVID pandemic was interesting because, for many months, there was a lot of hesitation about using organs from people who had died from COVID. And sort of in retrospect, now that we think we understand it better, there was some lost opportunity.

But some of the just in the last six months, some of the surgeon transplant has been from people who died from COVID. So, the opioid epidemic obviously accounted for a much larger fraction than COVID. And the opioid epidemic is still going on. So

Wayne Smith: So, he's asking about, whether organizations campaigning to promote, people to sign up to be donors on driver's licenses. I mean, some people commented, that California's got to Washington State has a program as well, is there a national program that you're aware of?

Clifford Miles: To promote donation? So, I mean, the donate life like you see the green and blue, whenever flag, billboard, and Cetera, is, I think, technically national, but I think it's disorganized. I think that as a nation, you can't drive down the street and not see something about heart disease or cancer. And I complain about this all the time because you don't see big billboards, saying that kidney disease is a huge problem. And we need to focus on the donation, I would love to see that I don't think that there's a cohesive national effort to drive home to the general public the importance of organ donation.

Wayne Smith: So, the interesting question here about the fistula first practice, what, what is the likelihood that it will be required if someone is a good candidate for preemptive, transplant,

Clifford Miles: The officially required. So, that gets into some of the nuance, because when you think of that slide right, where I take a patient with GFR of 19, who feels okay in their labs, or otherwise, okay, I really encourage them to do a couple

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of things. One is to keep working with their nephrologist and keep like being assessed both by like labs and sort of like global health, regularly every couple of months, at least, so that we don't end up in a district. Just be careful, still starting dialysis with a dialysis catheter is still bad, and nothing about preemptive transplant takes away the fact that starting with a catheter is bad.

But if people identify a living donor, and the donor gets evaluated and sort of confirmed to be a candidate to donate, I will actually tell people not to get official and maybe unpopular sometimes with their nephrologist, because I think that we have control as many variables as we can control at that point. And as long as everyone's sort of paying attention, and in communicating, I really think that you can consciously not get a fistula if you're prepared well enough.

Wayne Smith: So, I've got one here, I've got no context on this question. So, I'm just going to read out the item, there was a recommendation from the NIH report to eliminate wait time pre-dialysis to increase equity. What do you think of that?

Clifford Miles: Well, that yeah, so, that's what I was getting. I heard it in a couple of different forums, I don't know if I can make my slides go backward. Let's see if I'm smarter. Sort of this here, so. So, if someone has waitlisted, pre-emptively, that means that they haven't started dialysis. But most November, you can be waitlisted and not have a GFR of 20. So not all of these people are accumulated waiting time, but let's just presume that these people are between dialysis and a GFR of 20. So, they're accumulating waiting time but they're not on dialysis.

So, what this slide is really showing is that a bunch of white people are accumulating waiting time more so than people who are black or of other race, in so the comments that have come out with should you have to kind of think about because it's, that is one way to fix this, it's just that we can't do it. So, no one can get it. So, we can't if we can't do it fairly, it's like, like being a parent, you can't do it fairly, you can't do it.

And just say you start accumulating anytime you start dialysis. And that way, you sort of take away but it's, it would be conscious, we would consciously be saying, we know this is good. Remember, people live longer, they cost less. It's associated with fewer rejections and what have you to be transmitted pre-emptively. But if we can't do it fairly, maybe it's worth it to just stop doing it. The first time I heard that I was like, that sounds extreme. And the more you think about it, you're like, maybe it's okay, though. And I, I don't know the answer. But I think it's a really interesting thought.

Wayne Smith: And it's a great point, we've got to hear, you know, why not consider the fact that if you transplant someone when they're persons at their healthiest, that they will end up with a better outcome?

Clifford Miles: Yeah, that's kind of my point about my stick figures where mystic figures go. So, that's the competing argument is yeah, maybe this isn't so bad. But you don't really confidently move this line further to the right of this line. But it's never been done like it like no, sorry, it's been done a lot has never been studied closely to actually compare because you could you can imagine, okay, take COVID vaccination. So, the bunch of randomized trials, some people got actual vaccines, some people got non-vaccine, and they compared them. So, you see how they did.

So, you could envision a trial where you have a bunch of people that are randomized to do this, and a bunch of people, but you'd never do that you never get a trial like that to run in this country, or probably anywhere in the world. But it's tempting, I mean, I see the logic. But I think that there's more emphasis on trying to maximize the use of your native kidneys. That's why we call native kidneys and say, if people are feeling okay, in their labs, or otherwise, okay, then they're still doing okay, but right, you don't want to transplant them after they've gotten sick, so becomes a little like playing chicken, you have to know when to swerve. And that's hard. And so, the easy thing to do is to not play chicken, transplant people, I'm not sure it's the best thing to do.

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Wayne Smith: Like I was starting to run out of time now so, I'm going to pick a few from the list of put it you if and identify live donor is older, so over 50 years old, then is this a factor in transplanting pre-emptively If so, if the live donor has been identified as older?

Clifford Miles: Sort of I mean, I think that there's evidence that the cats have, Kevin, I'm just going to say so the worst approved living donor would be generally comparable to some of the best-deceased donors if you just think of like transplant course and transplant outcome. Just because as transplant hospitals and donor living donor programs go, if we're actually worried about the person donating neither for their own health nor for the function of the kidney, then probably shouldn't let them donate.

So, the other piece of this, I think, is important. And I didn't study the agenda closely enough. But hopefully, people have heard of paired kidney exchange when our practice would be because it because think I'm envisioning the question is, what if you're 25 and your donors are 55. Like, it's like, child and parent would be a great example, sort of adult child and parent. impaired kidney exchange, we'd be like, great, so happy to have a donor.

Let's go into an exchange and find another pair who is sort of in the opposite position where the parent wants us to call, it needs a transplant, and the adult child wants to donate and swap you. And that's so when paired kidney exchange started was all about like, blood group mismatch and stuff like that. The idea of biologic incompatibility is much broader than the immune components on it. So, we've looked at age just like everything else in terms of biological compatibility. And I hope that that answers the question, sort of.

Wayne Smith: I think it's got time for one more is the data on the demographics of what population finds out that they're in late-stage kidney disease, or can you follow without prior warning? That's qualify, but it's a relationship with a disparity in health insurance and the inability to access medical care.

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Clifford Miles: Across the board. Yeah, I don't have a slide I'd have thought that it's across the board so people from lower socioeconomic status legally like Zip code. So, it's a sort of a lot of data based on like median household income by Zip code. Zip codes with lower median income are referred later, they're more likely to start dialysis without pre-dialysis nephrology care. If you look at private versus public insurance, same disparities, skin color, it just sort of across the board, we can find these differences in the delivery of care and some sort of preemptive transplant just become one more in a litany of specific questions that you find that there are these differences.

Wayne Smith: Okay, we've gone through as many of the questions as we could apologies if we didn't get to yours. Any final closing comments before we close cliff?

Clifford Miles: I just want to thank everybody for sticking it out on a Saturday afternoon or evening, depending on which time zone you're in.

Wayne Smith: Okay, thanks, everyone, for being here. We appreciate your attendance. Please don't get to take the survey for this session. Thanks again. And please join us for the next plenary session updates from the foundation which will begin at quarter to the next hour. We know that in the end, folks, thanks for sticking with us. Thanks for your time. Bye.

Clifford Miles: Thank you.

[Audio End] [00:48:04]