Welcome to the Methodist University Hospital Transplant Institute, affiliated with the University of Tennessee Health Science Center. Today’s live internet broadcast showcases a living donor kidney transplant. In the past, people on the transplant waiting list could expect their wait for a donor kidney to last months, even years. Today, however, with the help of a growing list of living donors, transplant surgery is now considered a proactive treatment option for patients diagnosed with kidney disease, shortening waiting times and saving lives.

OSAMA GABER, M.D.

Kidney failure is a progressive disease. Very few people just wake up in the morning and have kidney failure. Most people have deterioration of kidney function that lasts between months and years, so there’s always an opportunity to intervene with transplantation before someone has made it dialysis. These are the group of transplants we call pre-emptive transplants.

NARRATOR

Over the next hour, viewers will learn more about living kidney donorship and the way the gift of a kidney can make a dramatic difference in someone else’s life. You will also have the opportunity to interact with the surgeons by sending email directly to the OR, using the MDirectAccess button on the screen.

BARRY MARSHALL

Hi. I’m Barry Marshall, administrator of the Methodist University Hospital Transplant Institute in Memphis, Tennessee. On behalf of our team, I’d like to welcome you to today’s event. During this webcast, we hope to provide you with some education regarding transplantation and organ donation. We hope this webcast helps patients with kidney disease, potential donors, and physicians to learn more about transplantation and organ donation. Now, let’s go live to the OR.

OSAMA GABER, M.D.
I want to welcome everybody to this live broadcast from the operating rooms of the Methodist University Hospital. I’m Dr. Osama Gaber, Director of the Transplant Institute at the Methodist University Hospital, which is a partnership between Methodist Healthcare and the University of Tennessee. One of the major goals of the Transplant Institute is to promote transplantation and treatment of patients with chronic kidney disease and end stage renal failure. To achieve this goal, we are putting on this broadcast to help educate the public in regard to kidney transplantation from living donors, its benefits, and a new concept that we are trying to promote for all people with kidney disease, which is pre-emptive transplantation; that is, making it to transplantation before one reaches dialysis. Today, to help me demonstrate this to you, are two excellent world-known surgeons, Dr. Nosratollah Nezakatgoo, our Donor Surgeon and Assistant Professor at the University of Tennessee in Memphis. Dr. Nezakatgoo is in the donor room, where he is performing the donor nephrectomy; that is, he’s taking out the donor kidney. I would like him to introduce himself and his team.

NOSRATOLLAH NEZAKATGOO, M.D.

Hi. I’m Dr. Nosratollah Nezakatgoo. I’m Assistant Professor of Surgery at UT, Memphis, Tennessee, and I’m one of the transplant surgeons in this team. Now we are doing a living, related donor nephrectomy with mini-incision technique that we are using a hybrid of laparoscopic technique plus old, conventional technique with completely different and modified new approach that has given us the opportunity to get advantages of both techniques. I am introducing Dr. Roberto Gednali, a transplant fellow and hepatobiliary surgeon; and Dr. David Smith. Today they are helping me. At this time, we are ready to remove the kidney. Both vessels are completely mobilized. All the kidney is mobilized and the ureter is transected.

As you are watching, the kidney is very active and producing a lot of urine at this moment.

OSAMA GABER, M.D.

As you can see, Dr. Nezakatgoo is demonstrating to you the surgical field. We want to take you now to the recipient surgeon, Dr. Santiago Vera, Professor of Surgery at the University of Tennessee in Memphis, who is going to be performing the implantation of the kidney transplant and I would like Dr. Vera to introduce himself and his surgical team.

SANTIAGO VERA, M.D.

Welcome, everybody. I am Santiago Vera. I have Dr. Hosein Amiri and Dr. Pabego from anesthesia. I have Ms. Meriwether and Ms. Sheila, who are the nurses in the operating room.

OSAMA GABER, M.D.
Thank you, Santiago. We will now ask Dr. Nezakatgo to just give us an update of where he is with the surgical dissection of the donor kidney.

NOSRATOLLAH NEZAKATGOO, M.D.

Before that, I should introduce Dr. Judith Ruiz, who is doing an excellent job from the anesthesia team. Now I’m showing the latest condition of this kidney. This is a young lady that volunteered to donate this kidney. We have mobilized the left kidney completely, as you are watching from the laparoscopic camera. We have mobilized the vein. This is the adrenal gland and this is the gonadal vein that has been transected and divided. This is the aorta and this is the renal artery that is completely mobilized. This is the ureter that is transected and producing a good amount of urine at this time, as you are watching.

We are ready, with coordination of the recipient room, to transect the vessels and transfer the kidney to the back table and perfuse the kidney on the back table. After cleaning the kidney, it is immediately moved to the recipient room. This is the advantage and beauty of living related kidney transplant, that there is no lag time between donor and recipient operation. This kidney immediately will be implanted in the recipient and more than 98% of the time there is immediate function.

OSAMA GABER, M.D.

This is really what we are aiming for, which is immediate function of the transplanted kidney. I wanted to explain to the viewers the stages that you had to go through in terms of the operation. Clearly to get the donor to surgery, we’ve had a whole lot of people working on making sure the donor is ready. This is a 28-year-old niece giving a kidney to her aunt. Our transplant coordinator, Pam Manning-McClure, has been instrumental in making sure that all the safety precautions that are needed in terms of a donor workup would be taken care of.

Clearly not all the donors that we have are relatives. Actually, if you look at the graphic that I’m showing here, over the past several years, the number of unrelated donors has increased dramatically, from about 47 or so per year to almost 1,200 per year, so almost anyone can donate a kidney if they’re so inclined. Clearly this couldn’t have happened, this increase in the number of unrelated donors, without the assistance and the safe practice of living donor surgery, not just in Memphis, but in everyplace in this country and the world. Dr. Nezakatgo had mentioned some of the advantages of a living donor kidney. I think you can see here that there is no waiting time. You can see that we have some improved kidney and patient graft survival with the living donor kidney, so I’m not going to take too much time after that. It seems like the operation is going well and we’re almost ready to go to the period of time where we are very critical here in the operating room as we remove the kidney. I am ready to then show you some information regarding the safety of the donor and sort of tell you what you have missed because the operation really has started a little while ago.
The operation is quite a safe operation. The mortality and morbidity rates for this operation are no different from that of having any general anesthetic, so for the thousands of surgeries that have been done all over this country, there have only been very few mortalities recorded. This is really a very important thing for us because we wouldn’t advocate this operation. In fact, here in Memphis, this operation has been extremely safe for our patients, even with regard to things like wound infections, which are almost nonexistent in our living donor population. Because of that, we really are very eager to show the tape that we have prerecorded for you that discusses some of the issues of patient safety from some of our physicians here in the transplant institute.

HOSEIN AMIRI, M.D.

The technique of taking the organ out from somebody who is alive and would like to be a donor has advanced so much that these operations, in the hands of experts, are safe. The advantage is that they do not need to get on a waiting list and they get a better quality of organs. As I said, in the hands of a center that they have been doing it for a long time, it’s a safe operation. Of course, there is discomfort of the operation. There may be some pain postoperatively. There may be some minor complications. But these are not comparable when you think of what you are doing. You are donating part of your body to somebody that you love. You care for them. You would like to help them and see that they are doing better.

JUDITH RUIZ, M.D.

It’s nice being part of a team with a common goal, which is taking care of the patients and doing something very special. The monitoring that we use for a donor is standard monitoring that is used throughout the country and the world, but we also use something here that is a sticker that goes across the patient’s forehead that helps us monitor the patient’s EEG or electroencephalogram and that gives us some information about how much anesthesia we’re giving a patient. In addition to that, the recipient gets a central line placed that usually goes in the big vein in their neck, the internal jugular vein, and that monitor helps us determine what the fluid status is in the patient so we can make sure that the new kidney is getting an appropriate amount of volume.

OSAMA GABER, M.D.

Clearly the safety of the donor and the recipient is very important for us, particularly donor safety. Of course, we do everything here that is possible to do that. I would like to encourage everyone watching the webcast to email us with their questions. We will try to get as many questions answered as possible without interrupting the surgical team. Now, since we’re almost ready to remove the kidney from the donor and move it to the recipient room, I’d like to show the audience from a prior pre-taped segment, how have we gotten to this point in terms of the surgery itself.

The first part of the procedure starts with making the incision in the donor. The donor is usually a healthy person and the positioning of the donor in the operating room is usually
in the lateral position; that is, the donor lies on the side because the kidneys are closer to the back than to the front. The tape that you’re seeing has been made from a donor that has donated the right kidney. Of course, today we’re using the left kidney. The differences are minute, but there are some anatomical differences that make the incision on the right side slightly bigger. You can see this is about a 7 cm, 7.5 cm incision. Usually in the left kidney, like we’re doing today, we’ll have a 6 cm incision.

Once the skin cut is made, after it’s been measured, there is dissection of the tissues right under the skin to expose the muscles. One of the great advantages of our technique is that we don’t cut any of the muscles, so the donor can recover quickly and go back to full employment in a very short period of time, so the muscles are basically spread apart using these retractors and lifters. This allows us to use the laparoscopic instruments in the retroperitoneum; that is, behind the abdominal wall cavity, which we think is a little bit safer for the donor. As you can see, all of the focus is on safety for the donor.

Here Dr. Nezakatgoo is placing the lifter. It’s now showing the kidneys are covered with fat that we call Gerota’s capsule. Depending on how much fat one has, there is a certain amount of fat around the kidney that has to be removed. Here, in this donor, we are removing some of the fat that is around the kidney. Then the laparoscopic instruments are being placed in the wound, which allows the donor surgeon to be able to look both in the wound and also on the laparoscopic camera. The advantage of the laparoscopic camera, besides allowing us to work through very small incisions, is that it also magnifies the field.

Now, in the recipient operating room, the one who is getting the kidney, the incision is made in the groin and the incision is started by a skin incision, then a dissection through the different layers of the muscles of the groin. As you know, we don’t actually take out the diseased kidneys. We leave them in place. The transplanted kidney gets placed in the groin, based on the blood vessels that pass from the abdomen, going over the abdomen and into the leg.

We’re back again in the kidney donor operating room. This is still the taped segment. You can see the surgeon, Dr. Nezakatgoo, is operating using a combination of laparoscopic and direct dissection techniques, as you can see from the monitor behind him, in dissecting the vein, exposing it so he can get both the artery and the vein. Now, the kidney had one blood vessel going to it and one coming out of it and we try to separate those safely, without inducing any bleeding, using a variety of techniques. Here what you’re seeing is using this diathermy heat knife that basically burns the tissues. The advantage is, both tissues, when they get separated, there is no bleeding on both sides. Here’s a glimpse of the vein of the kidney that takes the blood away from it. The artery is right on top of it. The dissection is carried out laparoscopically to expose both the artery and the vein using the diathermy knife.

The white instrument that you see is a suction and it does have a light on top of it and an irrigation port so that we can suck any blood or tissue fluid that accumulates and at the same time clean it. Of course, you see the scissors here dissecting on top of the vein,
which is very delicate, and the surgeon trying to bet behind the vein so he can separate the kidney from the donor’s blood vessels in preparation for transecting that; that is, cutting it so the kidney can be taken out of the body.

This is a very delicate dissection that has to be done with extreme care. You can see here a plastic tape being placed around the vein. This way, the surgeon knows that he is completely behind it and there is no attached tissue so when we cut the kidney out, it can come immediately out of the donor’s body.

Following that, there is dissection around the kidney artery itself, which allows freeing of the artery. Here is a picture. Of course, we know that the urine which comes out of the kidney passes through a tubular structure called the ureter, which goes into the bladder so that the body can excrete the urine to the outside. That structure has now been ligated and we’re using these ties to tie the ureter up.

Clearly the coordination between the recipient and the donor operating room is very important. What we try to do is do this operation in two rooms side by side so that the kidney can come out of the donor and directly go into the recipient. This lack of what we call ischemia time, lack of time when the kidney doesn’t have blood flow, is what is, for the most part, responsible for the excellent results we have from living donation.

Now I think we are almost ready to see the removal of the kidney. We’re going to go to Dr. Nezakatgoo in the donor room to see him cutting the donor renal artery and vein and removing the kidney graft for transplantation.

NOSRATOLLAH NEZAKATGOO, M.D.

Here I just wanted to show that this is the kidney and these are the vessels and now I’m going to apply the right angle clamp. This is the artery that is transected. We use endoloops x 2 to secure it. This is the second one. This takes just less than 1 minute. After this, we will go to the band. This is completely done. This is the clamp that is applied over the vein. Now the kidney is out and we can go to the large camera shot to show the kidney being lifted. This is the kidney that is out and we are moving to the back table.

OSAMA GABER, M.D.

The kidney now is being placed in a container full of ice because one of the ways to preserve kidney function, since there is no blood flow there, is to really cool it down. Dr. Nezakatgoo, can you tell us what you’re seeing?

NOSRATOLLAH NEZAKATGOO, M.D.

This is the renal artery. I dilated that and then we open the solution.

OSAMA GABER, M.D.
The solution that Dr. Nezakatgoo is putting in is a very cold physiologic solution, lactated ringer’s with some Heparin, which prevents the blood from clotting. The idea is to cool the kidney’s core temperature down very quickly so it can tolerate even the very short period of time that it takes to transfer it from one room to the next.

NOSRATOLLAH NEZAKATGOO, M.D.

Here the vein is shown that is pouring out all the residual blood and gradually this kidney will get completely clean.

OSAMA GABER, M.D.

You can see that as the flush continues the blood that was in the kidney has now cleared and the fluid that is coming out is clear of any blood and Dr. Nezakatgoo is making sure that we take the blood out and that there is plenty of ice around the kidney. As we said, the preservation of the viability of the kidney depends on cooling the core temperature down to about 40°C and that’s very important for kidney preservation. We actually do that if the kidney is to be preserved for much longer periods of time. We use different solutions but we use the same principal of hypothermia, which is very important for kidney preservation.

Once the donor surgeon is happy with the degree of flush of the kidney, then the kidney will be transferred into the recipient room, where the recipient team is ready to reattach the artery and the vein back into the recipient. Then finally, once the blood has flowed into the kidney, the next step would be attaching the ureter, the tube that takes the urine out, into the bladder of the recipient.

One of the greatest advantages of the live donor kidney transplantation is this lack of no perfusion time or ischemic time, which is not available to us in deceased donor kidneys. The average time that it takes to take a deceased donor kidney from a donor that has died and transplant it is somewhere around 24 hours, which is quite a long period of time that makes the quality of the kidney function not as good as you would see with the living donor kidneys. As you will see today, the living donor kidney transplant may be on the average of 30-45 minutes of ischemic time.

What Dr. Nezakatgoo is doing now is repairing a hole that was found in the vein of the donor kidney. He does that using these very fine sutures. I don’t know if the viewer can see it because they are very small, but these are called 6-0 sutures. The number, the bigger it gets, the smaller the suture is, so this is a relatively small suture that he’s using to repair the hole in the vein, which is important to maintain the caliber of the vein open and the blood flowing through it.

This is quite a delicate procedure. You can see, of course, the importance of having a team of people that are trained, working with you. I know both surgeons have introduced their surgical teams, both anesthesia and the surgeons, the fellows, the residents in
While Dr. Nezakatgoo is working on this, I would like to show you a slide that demonstrates why kidney transplantation is important for patients with chronic kidney disease, on dialysis. If you look at the slide on your screen, the survival of patients who reach end stage renal disease and need dialysis is depicted here. This is the 10-year survival. You can see that the 10-year survival of patients with kidney failure is about 47.5%, so once the patient reaches dialysis, after 10 years of dialysis about half the patients die. This is clearly not because of the dialysis, because dialysis is such a great thing. It keeps those patients alive and, without it, they would not survive even a few days. So once the patient gets a transplant from a deceased donor, a donor that has died, the 10-year survival of those patients improves by about 13% to 60%. However, if you’re lucky enough to be able to get a kidney from a living donor, the 10-year survival is almost 85%, which is a phenomenally large number compared to the severity of the chronic disease related to renal failure.

Now Dr. Nezakatgoo is moving the kidney. He’s wrapping it up in the plastic bag and he is going to cover it with ice. While we’ve moving the kidney, I’d like to answer a viewer’s email. He said, how significant is the risk for damaging the kidney itself or making an accidental hole in it? How can you repair these things? I think this is a great question because actually our viewers saw a great demonstration on how you deal with that. Here, the most important thing is to not have it happen, but repair is always possible.

Here is the kidney being delivered to the recipient operating room. The hands now holding the kidney are those of Dr. Santiago Vera, who is going to do his own inspection of the kidney prior to putting it into the recipient.

As you can see, Dr. Vera is now inspecting the blood vessels. This is the renal artery that is the vessel that takes the blood into the kidney and he performed a very delicate sort of stretch or dilatation of the renal blood vessel. He makes sure that the length he has is enough for him to perform the anastomosis or the hook-up, as we call it. You can get slightly more length by freeing the tissues around the artery. That is what he’s doing right now, a very delicate thing.

He is now looking at the renal vein, which is the vessel that takes the blood out of the kidney. You can see that the vein is very much thinner walled, so it requires a lot of delicacy in handling it.

SANTIAGO VERA, M.D.
Now I’m going to test the lie, see where the kidney will fit in this abdomen. I’m determining the best lie for the kidney. We have excellent length of limbs, excellent length of vessels.

OSAMA GABER, M.D.

One of the advantages that we have today of doing this operation is our recipient, who is 44 years old, has only been on dialysis for three months. The reason she has been referred so early for transplantation is clearly because of the good care of her referring nephrologist, Dr. Mark Stegman, one of the nephrologists here at the University Hospital. This brings an important point about the timing for which patients are referred for transplantation. You see from the graphic that I have on the side, the survival advantage that patients receive from transplantation when they have the kidney pre-emptively; that is, before they even reach dialysis, this divides patients into two groups. In red are the patients who get transplanted after about two years on dialysis and in the blue, these are the patients who get transplanted if they haven’t been on dialysis or, at most, have spent about 6 months on dialysis. The difference in the 120-month survival is just phenomenal. It’s a difference between 34% and 66%. The five-year success rates are 28% difference, between 60% and 88%, so I think that’s why we here at the Transplant Institute are really pushing very hard to educate everyone about pre-emptive transplantation.

Now we’re at the stages of preparing the recipient’s blood vessels. Clearly before we do the anastomosis, there’s some stitching. It has to control the blood flow to these vessels so it doesn’t bleed. That’s what he’s doing now, putting these clamps on the blood vessels in order to stop the blood flow so that he can do his anastomosis.

While Dr. Vera is doing that, I will answer an email from one of our viewers, who is asking what is the purpose of taking the extra time to cool the kidney down? The reason is all of our body organs require a continuous supply of nutrients through blood flow. Once you stop the blood flow that goes to the kidney, then there is no more supply of nutrients, so any metabolic activity results in the cell, using its own structures to generate the metabolism and a breakdown into the cell wall structures so that the cells would swell up and just basically die. That’s why we take the time to cool down the kidney. As I said, we do that not just for living donors, but also for cadaveric donors.

This is Heparinized solution that Dr. Vera is putting into the blood vessels to prevent formation of any blood clots while he’s working. He is using a special needle. We call it the olive tip because it actually has a tip that resembles an olive. He is now making the venous hole identical in size to the size of the donor vein. As we said, the great advantage for this recipient is the fact that we are doing this transplant after a very short period of time on dialysis, which you can see on the graph that I have on the side here, affords the best not just graft survival, but actually patient survival advantages for anyone who has chronic kidney disease, so the lesson to take here is that we really have to push to have patients who are known to have deteriorated kidney function to get to this point, which is having a living donor transplant pre-emptively.
Kidney disease is a very slowly progressive disease. Actually, there are 5 stages of it. The fact of the matter is, even before people reach dialysis, which is stage 5, the majority of patients, like 47%, have died from cardiovascular reasons, so we really stress the importance of doing transplantation early. Of course, without living donors, this cannot be done.

To get a living donor transplant really depends on the ability of the donor and recipient to understand the process of transplantation. You’re seeing some very beautiful stitching here, done by Dr. Vera, but I want to introduce you to a clip that we have taped prior to this operation, of our pre-transplant coordinator and some of our donor and recipient interviews.

DEANANNA BROWN, R.N.

The pre-transplant coordinator is to kind of meet the recipient at the door of their program, their entry point. We take care of their medical history. We coordinate their testing and evaluation along the guidelines of our protocols. We kind of hold their hand through the process. At the beginning of the health history with the recipient, we do ask if there are any potential donors and encourage people to talk to their family and their friends and let them know that they’re being evaluated for transplant and explore those opportunities.

The most rewarding part of working with donors and recipients is to really get to be part of something wonderful that somebody is doing for somebody else, just because they love them.

DAVID JUDKIS

I was diagnosed with polycystic kidney disease in 1981. I was 24 years old. Over the last few years, my condition had gradually gotten worse. Last fall, during a routine checkup, my doctor said that my numbers had really deteriorated, so it was time to look into transplant. I live a full life. I have a full-time job, a great job that I enjoy. I fully intend to go back to it as soon as this is over with, so it was certainly the best option for me.

SCOTT NORRIS

I worked as an EMT on an ambulance service and quite frequently we’d take patients to dialysis that couldn’t go themselves. It’s not really a good lifestyle. It takes a lot out of them. They can’t do much afterwards; they’re so tired and drained. I didn’t want to see him go through that.

Don’t be afraid to talk to people about it because there’s always somebody out there willing to help. The transplant list is so long and normally people are on there a number of years before even getting matched to a donor. I got two, so I tell people I didn’t get him anything for Christmas, so I needed to make up for it.
FRANCESCA EGIDI, M.D.

When you’re dealing with patients who have chronic disease, such as renal dysfunction or transplantation, you follow these patients for a long time. Surprisingly, you connect your life to their life, so it’s kind of a long-term friendship and also you need to create some kind of faith in what you’re doing, and trust. They need to trust me and this is very important. That is what is making me very happy.

OSAMA GABER, M.D.

Now we are continuing to watch the progress of this recipient operation. You’ve seen the kidney removed from the donor. Now the recipient surgeon, Dr. Santiago Vera, is performing the implantation of the kidney. During the time that he is working, I think again the most important thing that we can stress is the fact, like you have heard from the patient and recipient, that chronic kidney disease is a very progressive disease. It takes a really long time for kidney failure to develop and there are plenty of opportunities for referring patients to dialysis and transplantation before their condition deteriorates and getting those patients transplanted. The living donor is just such a beautiful thing, to have someone that loves you enough to come in and decide that they want to give you a kidney. I tell my patients all the time that what you leave behind is not just the legacy of the kidney that you gave to the recipient. It’s also the legacy of a family or a church group or a community where there is so much love as to allow this most important gift to transfer from one person to the other.

While Dr. Vera is suturing, I think it’s about time to maybe go back to Dr. Nezakatgoo in the donor room. Okay, I’m told that we can’t go back there quite yet, so we’re going to continue to enjoy the beautiful handiwork of Dr. Vera and continue to talk about the advantages of living donation. I wanted to show two graphics here. One shows the survival of the kidney itself. We know that kidneys, basically after transplantation, some of them are lost to rejection and to problems related to immunology; that is, the recipient body trying to get rid of the kidney. You can see that living donor kidneys have a significant advantage over deceased donor kidneys in terms of survival. That is also the same and it’s actually very profound when you look at the patients themselves, if they get a living donor kidney, survive much better and that’s mostly related to kidney function and related to the fact that there’s so much less illness and much more return to physiological situation after a living donor kidney.

We see the recipient kidney now. ½ of the renal vein has been anastomosed. You can see the back wall of the vein, almost completely done. Now Dr. Vera is going to move into suturing the front wall of the vein. I think this is a good time to go to the donor room to get an update from Dr. Nezakatgoo on the donor condition.

NOSRATOLLAH NEZAKATGOO, M.D.
Now I’m in the stage of closure of the muscles. Actually, in this technique we mentioned that we don’t cut the muscles. We split the muscles and I’m showing the stage of approximating the inner layers of the abdominal muscles. After this step, I’m going to approximate the most superficial layer and then we will see the really small caliber, small size of the wound at the completion of the procedure, which makes this technique attractive enough that we are continuing this technique. I hope that we will be able to accomplish our results in the near future with our technique and this will be adopted by other surgeons also, as the advantages of pure laparoscopy technique with conventional technique and we are very comfortable with the results and satisfaction of the patients in follow-up.

Now I am closing the inner layer. After this step, I will close the last layer.

OSAMA GABER, M.D.

Now we will go back to the recipient room to follow Dr. Vera and his placement of the kidney. I got an interesting email from a viewer, who asks, can the person who receives the kidney ever get pregnant? Actually, I want to broaden this question. Can a person who donates a kidney or receives a kidney ever get pregnant? The answer to both is, of course, yes. There is actually a very large registry that records all the cases of pregnancy and child delivery after transplantation, which I think is now close to 2,000 cases. We in our transplant program, not just kidney recipients, but kidney and pancreas recipients and actually liver transplant recipients, have gotten pregnant and had children and of course it is a great occasion for us to see that. It is important to stress that a donor can also become pregnant after donating. Actually, what we tell these donors, we have data to follow for 20 and 40 years that shows that one can live a normal and healthy life with uninephrectomy; that is, one kidney having been removed. So there is no decrease in life expectancy, ability to get pregnant, the scope of activities that one can do. In fact, one of the very important things that we have to stress is that the donors continue to live a 100% normal life. They don’t have any dietary restrictions. The only thing that I have ever had to stop a donor from doing is I had somebody who was a kidney donor who was a boxer and clearly I told him that it would be better to find another sport because being hit in your one kidney that is left may not be a very good idea. So I think this is the only time we have had to change some activity that the donor would like to do.

You can see now Dr. Vera is almost ready to put the last couple of stitches into the anastomosis or hook-up of the renal vein. This is the blood vessel that is going to take the blood out of the kidney. We start by doing that first because it is the more delicate vessel, so we want it to lie just perfectly and then we can put the renal artery after that.

Now, one of the things that I would like to stress is that kidney disease is something that has signs and symptoms. People who feel like they may have kidney disease should actually seek medical help. In fact, we have an email from one of our viewers that asks, are certain people more at risk for kidney failure than others? I think the answer to that is yes because there are quite a few kidney diseases that are associated with high blood pressure, so if you have high blood pressure or a family history of it, you should actually
look into your kidney function. Diabetics, people with diabetes, have a high chance of having kidney disease. If you have diabetes, you should really, just as you look at your blood sugar, look at your kidney function. That is very important. The treatment of kidney disease with transplantation, in general, is a very multidisciplinary issue. It requires a large team of people to work together and you can see what we strive for, for example, at the Methodist University Hospital Transplant Institute is to put together a team of not just surgeons. We, of course, have nephrologists, pathologists, anesthesiologists, cardiologists, pulmonologists, also some medical specialties that take care of the patients. The nursing team is also very large and includes coordinators that take care of the patients pre- and post-transplant, nurse practitioners. Of course, we have a very large staff that starts from the admitting office all the way to the post-discharge care, so it is a complex process that is very important to maintain the transplant program functioning. There are lots of other people, social workers, discharge planners, case managers. It’s a very large group of people that gets to be involved in kidney transplantation. Part of the reason is that the transplantation process, as you can see from the graphic that I am showing you as Dr. Vera continues to work in the operating room, is a pretty complex process. It involves multiple steps that are aimed at finding the appropriate donor and recipient pair to do a transplant. What we try to do is we try to remove the barriers that prevent people from having appropriate donor kidneys.

Even though the surgeons have most of the fun, working in the operating room and doing these very delicate procedures, we do have a large number of people working on the team that make sure that this is happening and happening correctly. One of the very important people on the team is the transplant nephrologist, who makes sure that the patients are well cared for before and after transplantation.

FRANCESCA EGIDI, M.D.

The first part of my role is in the pre-transplant evaluation of the patient. In this case, I evaluate medically to make sure the patient is okay from the cardiac standpoint, the pulmonary standpoint, and particularly my role is to see if the patient does not have some active disease, such as autoimmune disease, that might still recur in the kidney transplant. The other thing that I am doing, and this is probably my main job, is to take care of all the medical problems that the patient is having after the transplant, like hypertension, diabetes, hyperlipidemia, and all the side effects that could be related to the immunosuppression.

RUSSELL WHITE, PHARM. D.

Coordination of medication regimens with the physicians, the surgeons and nephrologists, it’s really a team effort. We get several questions. The patients ask me...we’ll call them up and give them a set schedule and they’ll say, this really doesn’t work for my day. What can we do about it? We rearrange things so that it suits their day. We make sure the patients are able to take all their medicines when they need to, on time.
I myself had a heart transplant in 2001, so for me, I really find it important that I have to stress, please take your medicines. For me to be here to do what I do, I have to really stress to patients that you need to take your medicines every day. You need to take them...if they’re 12 hours apart, take them 12 hours apart. If you don’t take them with food, don’t take them with food. I go over it over and over again.

OSAMA GABER, M.D.

Dr. Vera is still working on hooking up the blood vessels. I got an email from Scott Norris and I am happy he allowed me to use his name on the air. Scott was the donor that we saw on the tape and what he said is, I was a donor two weeks ago and I can say the pain is pretty much gone. The process of spreading the muscles is great, a lot less pain. Thanks, Dr. Nezakatgoo. Thank you, Scott, for giving the gift of life to your recipient and for being brave enough to go through this. We think that all of our donors are just great people, out of this world, and we really appreciate their sacrifice. Without them, of course, none of this could have been possible.

Now you can see the artery being placed in the position in which it is going to be anastomosed.

SANTIAGO VERA, M.D.

Here the iliac vein comes on top of the iliac artery, so it makes the attachment a little deeper than what I would like.

OSAMA GABER, M.D.

A few delicate moments here as Dr. Vera decides on the way in which he is going to reattach this artery. It almost makes me want to give up the microphone and go help him, but I guess somebody is going to have to continue doing this. As you saw on the tape that we just rolled for you, the importance of the multidisciplinary team cannot be overemphasized, really.

Another area where this living donor issue becomes very important and the pre-emiptive transplantation is very important is for the diabetic patient. I want to talk very briefly about this slide. You can see that this is a study which had been done about 4 years ago. You can see the caption at the bottom that tells you what the reference is, if you want to look at it. It shows the projected years of life with and without transplantation for diabetic and non-diabetic patients. It is very clear that we gain additional years of life by giving someone a transplant, particularly in the diabetic population. As I said, diabetes is a very slowly progressive kidney disease, when it causes kidney disease, so there is really good reason why we should encourage all diabetic patients to check their kidney functions so that they have a chance to get transplantation before they reach dialysis.

The other question is whether there is a risk of rupture. There is a small risk of rupture at the site where you can see the anastomosis being performed. There are two main
reasons that I can think of. One is technical failure, that some of these sutures that you see would break, which is, of course, very, very rare because these are the sort of sutures we do most of our hook-ups with. We have been doing that for years, so they are well tested to tolerate the blood pressure and so forth. The other risk would be that of an infection, which is clearly not a very good thing for the transplant patient because we give them medications to suppress the immune system so they don’t have rejection. Of course, if they were to develop infection at the site of the procedure, there is a possibility of having a rupture of the blood vessel. In the past, this has happened with small frequency, but in the past several years, as I showed you on the graphic, the results have improved so dramatically. The reason the results have improved so dramatically is because we have better immunosuppressants, better antibiotics, better surgical techniques, so that such complications do not occur with any frequency at this time.

Another important question was what is the recovery time for such a procedure for both the donor and recipient? The donors usually leave the hospital about 48-72 hours later. The recipient leaves the hospital at around the same time and, I think, return to normal activity really depends on the personality, character, and so forth. We have had people that were able to fly home, if they have come in from a far away location to give a kidney, within about a week to 10 days from the donation. Most people I tell them they will be able to go back to their activities, if it does not involve very heavy lifting or anything that is extremely physical, somewhere between 3 and 6 weeks after both the donation and transplantation. Of course, we encourage everybody to stay active during that time so that they don’t lose muscle strength and don’t become deconditioned during the period of recovery.

As Dr. Vera is working on hooking up the kidney artery and vein, I want to show you why we go through all of the risks and hassles promoting living donation and looking for living donors. This is a slide that shows the national numbers from the United States, the number of cadaver donors and the number of people adding to the transplant waiting list. You can see that the blue line keeps going up almost endlessly, while the number of cadaver donors has risen very slightly over the past 15 years. The gap is so huge that the waiting time is just phenomenal for people who are waiting for a transplant. Of course, as we have shown, the impact of wait on their survival is just not good. Now, the only good point is that nationally, we have been doing more living donor transplants. This is just about the only hope for the large number of patients that are reaching end stage renal failure.

There’s a beautiful shot of both the artery and the vein, now being anastomosed. You can see both vessels coming out of the kidney and going toward the recipient’s vessels, a very beautiful shot.

I have another question from a viewer asking, can an adult donate a kidney to a baby? The answer is, of course, yes. We have actually done transplants in babies that are even a few months old. We can put an adult kidney there. Of course, there are some precautions that you need to go through, but it beats taking a small baby and putting them on dialysis, if at all possible. Clearly, if you look at the graphic that I have on the side, it emphasizes
the point of why we need living donor transplantation. The blue is the waiting time for patients from the transplant list. If you just project that, which I did for you, continued the line at the same level, the waiting time becomes just phenomenal, so it is very important to stress the fact that we actually do need living donation as the only means by which we are going to be able to prevent the complications that are associated with kidney failure.

This webcast is our effort to try to educate about living donation and remove some of the barriers that we have for transplantation and for people understanding the process of donation because we think that the majority of the barriers are really in knowledge. There is a tremendous fear regarding the process. People are afraid of large, huge incisions, lots of pain, inability to work. I think we have been showing everyone that the operation is simple and safe. That, I think, could stimulate a whole lot of people to think of all the loved ones that are on dialysis and think if they could give them a kidney. We are almost ready to let the blood flow back into the transplant kidney.

The next question I got from one of the viewers is do we actually remove the older, diseased kidneys? The answer is no. We don’t remove it. How often do we need to do that? I think it’s about maybe 15-20% of the recipients will need the old kidney to be removed because of problems with these kidneys, either because they get infections or cause high blood pressure, so in some of them we just do surveillance. It is very important to know, if a diseased kidney is going to stay in the body, if somebody was on dialysis, there is a higher than normal chance for these kidneys to develop tumors, so we really need to get good surveillance of them.

Here is another viewer that she says her husband had a transplant seven years ago, by actually our team, and what is the average lifetime for a transplant kidney? As you can see from some of the graphics that we have shown, the kidney half-life...this is a technical term. We say that the half-life of the kidney is the time in which half of the kidneys will make it to, for living donor kidneys, is now between 15 and 17 years, so there is an expectation that lots of these grafts will survive more than that, which is, of course, an excellent outcome.

The next question I think is very important. What if I have a donor but the blood type is not the same? As I said when we talk about various transplantations, there are some physiological barriers, like a blood type that is not matching or the recipient having antibodies to the donor. We now have protocols, not just in our center but all over the nation, to do either donor exchange programs where people can exchange donors. If I have a donor that has a different blood type and you have a donor that has a different blood type, we can exchange donors or we can desensitize the recipient with the blood type that is consistent with his donor blood type so they can receive the transplant. The idea is to break down the barriers to donation because we know that the best chance of survival of the recipient is related to them getting a transplant and a living donor transplant at that, so most of us are...

Dr. Vera is making final preparations now to perfuse the kidney. He inquires about the amount of fluid given, the blood pressure and the pulse, to make sure that everything is
ready for the perfusion of the kidney. We want to make sure that the blood pressure is adequate to perfuse the kidney and give it a good amount of blood flow so that it starts making urine immediately. This is the moment, of course, that most of our viewers have been waiting to see, which is the clamps removed and the kidney now coming back to life.

The final sutures now being placed and tied and we’re ready to show you the blood returning to the kidney. As I said, the kidney has now been cooled down to 40°C. It was at first at 37°C. Once the blood goes in, hopefully we will be able to see the urine coming out of the kidney. Unfortunately, since the time for the broadcast was only one hour, we are just hitting the limit where we are going to have to stop, but we should be able to see the kidney now being perfused.

By the way, what Dr. Vera was doing was holding onto the kidney from the fat that surrounds it. This is really just meant to prevent people from holding onto the kidney with their hand during surgery to prevent the kidney temperature, the core temperature, from going up.

The clamps are being removed. See the blood now flowing into the vein. The arterial clamp is also removed. You can see the blood flowing into the kidney. Some bleeding in the fat that surrounds the kidney. Now the kidney has blood flowing through it. This is the moment, of course, that we have all been waiting for. Now we are going to start warming the kidney up by putting warm water over it. The idea here is that when you add warm water, the blood vessels will dilate. We are giving the recipient extra fluid to make sure there is enough blood flow to fill the kidney up and start the urine production. The next step will be to anastomose or hook up the ureter, the tube that takes the urine into the urinary bladder of the recipient. Because of the time constraints, we’re going to show you that on a tape.

SANTIAGO VERA, M.D.

Looks great. I like it.

OSAMA GABER, M.D.

Dr. Vera really likes it. Now we’re going to give some diuretics, things that promote urine flow, so that we can have the kidney making urine. As I said, we are going to go to tape to look at the final step of the operation, which is stitching the ureter back into the urinary bladder and the final closure of the incision. As we roll into the tape and end our webcast, I want to thank our sponsors for sponsoring this webcast and clearly thank all of the people who have made this webcast possible, from the people in the operating room to the nurses and administration.

Here is the ureter being now shaped for placement into the bladder. This is not the live shot, but this is a pre-taped shot that we wanted just to show you the last step of the operation. Again, 6-0 stitches are placed in the ureter and now are going to be placed in
the urinary bladder. A plastic tube is placed in the ureter to make sure that the anastomosis stays widely patent and urine flows into the direction of the bladder. The most important part of this is reconstructing what we call an anti-reflux tunnel because clearly the ureter now, we don’t want the urine to go back into the kidney as the bladder gets full, so we bring back the muscle of the bladder and put it on top of the ureter to create a valve that prevents backflow of the urine into the kidney.

This is the end of the operation, showing the completion of the ureter anastomosis and the creation of the final anti-reflux tunnel that prevents urine reflux. The last step of the operation is taking a biopsy of the kidney, which is very important to look at the structure of the kidney. Of course, it gives us an opportunity to compare in the future, when the recipient needs biopsies, the difference in the structure. This is clearly an important point for making a baseline for the kidney function. The biopsy site is closed by a stitch so that there will be no bleeding. After the stitch is placed, we’re going to place drains into the wound and close the incision, which will complete this operation.

Here are the closure stitches, now closing the muscles. These are the final steps now in the closure. As I said, we are showing you this from tape, closing the muscles. We try to close in 2 layers so that we can get a good closure on top of the kidney. On the side of your screen, there was the drain that basically removes any tissue fluid that needs to come out from the site of the surgery and now the muscles are being closed. Finally, the skin is going to be closed. That is usually done either with sutures or staples. In the tape segment that we have for you, we have done that with staples.

So finally, I want to thank everybody who participated in this. Again, I thank our sponsors, our nurses, our operating room staff, everybody at the Methodist University Hospital, and hope that we have provided enough education for our viewers and that many people will use this to dispel a whole lot of the notions and fears about living donation, so people can now recognize that it is a standard therapy for patients with kidney failure.

Dr. Vera is now going back into trying to stop some of the bleeding around the kidney. I want to, again, as I said, thank all of the people who made this possible, our sponsor, Estella, and all of the team that we have here in the operating room. We wish everybody with kidney disease the best of health and hope that this tape will participate in making enough education possible to the public to understand kidney disease and the possibility of its treatment by transplantation. Thank you very much.

HOSEIN AMIRI, M.D.

Hopefully one day we will have enough live donors that the number of people who are on the cadaveric list will decrease so much that we will be able to transplant everybody.

NARRATOR
This has been a live webcast of a living donor kidney transplant, performed live from the Methodist University Hospital Transplant Institute, affiliated with the University of Tennessee Health Science Center. For more information, to make a referral, or to make an appointment, click on the buttons below.