0:04

all right it is about quarter after the hour so i'll start with the introduction

0:10

um welcome everyone thank you for joining us my name is dean lotito and i'm the chapter coordinator for the

0:15

pkd new england chapter i'll be your hospitality host for the session you've joined dialysis 101. before we

0:22

get started uh if you have any questions during the presentation please type them into the chat box

0:28

and i'll collect them during the presentation and we'll address as many questions as possible during the q and a session we do ask

0:34

that you keep your mic from muted throughout the entire session so that to ensure good audio quality for everyone involved

0:41

i'm very pleased to introduce our speaker for this session dr benjamin d cowley jr the chief of nephrology and

0:47

hypertension ou regence professor and john gamel professor of in polycystic kidney disease at the

0:54

university of oklahoma health sciences center dr cali it's my pleasure to turn the presentation over to you

1:00

thank you dean and uh thank you to all of you who are joining us

1:06

um i'm hoping that much of what i'm going to tell you is review

1:12

obviously many of you are already dealing with some degree of renal impairment and i'm hoping that

1:18

your care team has started to discuss some of these issues with you because i think

1:24

the more you know before you get there the better off you're going to be able to deal with what's coming

1:29

um this is the obligatory disclaimer the pkd foundation uh would like to emphasize

1:36

that what we're doing is for educational purposes we're certainly not making any specific recommendations for individual patients

1:43

um the people involved involved in these presentations

1:49

including myself have no financial relationships to disclose certainly not

1:54

with respect to what i'm going to be discussing and with that we will proceed

2:01

um what i'd like to do over the next 30 to 45 minutes is talk a little bit about what kidneys

2:08

do talk about the consequences of deterioration of kidney function

2:14

talk about when kidney failure reaches end stage and we'll talk a little bit about why that may not be the greatest

2:20

term in the world will at least mention transplantation because i'm also a transplant physician

2:26

and i truly believe that transplantation is the best way to treat chronic kidney

2:32

disease it is not a cure but i think it is a more effective treatment than dialysis

2:38

having said that dialysis is frequently necessary we'll talk about what dialysis does and

2:44

what what it does not do we'll talk about how dialysis works

2:49

we'll talk about different types of dialysis and how you may might make a choice and then we'll talk about how to stay

2:55

healthy while you're on dialysis so hopefully as i said

3:02

this is review but what do kidneys do well obviously our kidneys produce urine what's urine

3:08

it's water it's electrolytes things like sodium potassium calcium phosphate

3:13

and acid and it's waste products toxins in addition to producing urine our

3:20

kidneys either both produce hormones and they respond to hormones they produce a hormone called

3:26

erythropoietin which promotes blood formation they activate a form of vitamin

3:32

d which is important in maintenance of healthy bones and our kidneys produce renin which is a hormone that's important in blood

3:38

pressure regulation when kidney function deteriorates you

3:44

have a disruption in urine production water and salt water and sodium begin to

3:50

accumulate that causes high blood pressure which many of you probably already have if it's severe enough it can cause

3:57

shortness of breath and it can cause swelling we obviously try and avoid all three of

4:02

those things and we do that through a variety of ways one we ask you to restrict salt intake

4:10

even if you're healthy restricting salt intake is is perfectly healthy to do the amount of

4:15

salt that's necessary to stay healthy is minuscule compared to what most americans take in that's frequently

4:23

not enough we give medicines called diuretics that encourage your kidneys to get rid of

4:28

salt and water and then as your blood pressure becomes more difficult to control we may add

4:34

medications to help control your blood pressure excuse me yes should we be seeing your

4:40

slides at this moment oh yes you should thank you for saying something um that

4:46

was a zoom faux pas uh there we go thank you for saying

4:54

something somebody should have said something um so as as we were saying

5:02

um water and salt accumulation causes

5:07

high blood pressure shortness of breath and swelling we treat that with sodium restriction diuretics

5:13

as well as blood pressure medication control of blood pressure is extremely important and

5:22

lack of blood pressure control uncontrolled blood pressure will accelerate deterioration of your kidney

5:27

function in addition it will increase your risk of high blood pressure and strokes so blood pressure control is extremely

5:36

important in addition um as kidney function

5:43

deteriorates further um you have disruption and electrolyte

5:50

regulation are you guys still seeing my screen i hope dean no i'm not uh you're not all right let

5:57

me know let me try a different chair here

6:04

which is that i'm waiting

6:09

you got it i don't see it i'm seeing a slide that says when kidney function deteriorates is

6:15

that that's what we need i don't

6:22

um as your kidney function deteriorates not only do you tend to accumulate salt and water you

6:28

tend to accumulate other things such as potassium potassium when it accumulates to high

6:34

levels can cause amyloid heart rhythms which are potentially dangerous we treat that by asking you to return

6:39

dietary potassium in addition diuretics which encourage salt and water

6:45

excretion by your kidneys will also attend at least with certain diuretics to cause potassium excretion in your

6:51

urine if that's insufficient we will sometimes temporize

6:56

by giving medications that will bind potassium in your intestines such as kayexalate, lokelma

7:02

and veltassa these buy us time they're probably not good long-term

7:07

solutions but they can buy us time um and allow us to avoid either dialysis

7:14

or transplant and could help control potassium

7:21

and then other electrolytes become disrupted

7:27

our kidneys are important in regulating or activating vitamin d as i mentioned

7:34

vitamin d deficiency causes lack of absorption of calcium from the intestines so you become calcium

7:40

deficient that leads to abnormal bone metabolism will sometimes give

7:45

dietary potassium supplementation as well as vitamin d supplementation

7:51

as your kidney function deteriorates your kidneys become impaired in their ability to excrete phosphorus or phosphate same thing

8:00

that leads to abnormal bone metabolism it can accelerate cardiovascular disease and it can cause itching

8:06

to treat that we have you restrict dietary phosphate and we give you medicines to bind

8:12

phosphorus in your food so that you don't absorb them called phosphate binders something that

8:19

everybody's pretty fond of not really and then finally

8:24

our kidneys become impaired the ability to get rid of acid acid accumulation has a variety of uh

8:30

detrimental effects including abnormal bone metabolism and we will frequently give you

8:36

alkali literally things like sodium bicarbonate to neutralize acid and once again limit

8:43

the effects of acid accumulation and then finally as kidney function

8:50

becomes disrupted and urine production is disrupted you tend to accumulate waste products

8:55

toxins there are a variety of toxins many of which aren't very well characterized they can cause a variety of

9:02

things from benign to serious they can cause bad breath they cause itching

9:08

as they become more prevalent as they accumulate to higher levels they cause loss of appetite

9:14

which leads to weight loss and malnutrition which is obviously a bad thing they can ultimately cause nausea and

9:21

vomiting if we aren't if we aren't paying attention and we don't intervene they

9:26

can cause inflammation of internal organs such as uh the heart which causes pericarditis

9:31

they can cause intestinal bleeding it can lead to disruptive brain function with the

9:37

difficulty concentrating and confusion and then if it becomes very severe you can have seizures now obviously we

9:44

tend to intervene before these more serious consequences happen but these are the serious consequences

9:51

of voice box accumulation from kidney impairment

9:56

in addition as your kidney function deteriorates you have disruptive hormone production you have erythropoietin deficiency we

10:03

obviously can give supplemental or erythropoietin vitamin d vitamin d is disrupted and

10:10

frequently renin is produced in excessive excess levels leading to more difficult blood pressure

10:16

control so as kidney functions deteriorating we

10:22

monitor a variety of things and this is true across the entire continuum of kidney function from

10:29

you know minor kidney dysfunction all the way to end stage kidney disease we monitor your volume status and your

10:35

blood pressure we monitor your nutritional status we'll monitor blood chemistries that are associated

10:42

with bone disease we'll manage anemia caused by deficiency of erythropoietin

10:48

and we will monitor waste product removal by your kidneys as well as after you start dialysis all

10:55

of these things are monitored before you begin dialysis and they're monitored

11:00

after you begin dialysis so what happens when kidneys reach end

11:06

stage and i in some ways i think end-stage kidney disease also known as end-stage renal disease is

11:13

a somewhat poor choice of words and the reason why i say that kidneys can still function

11:19

but really what's happening is your kidneys are no longer functioning well enough to keep you healthy and so when kidneys

11:27

reach what we think of as end stage you need either a transplant or dialysis

11:33

and as i mentioned i think transplant is really a better way to treat end stage kidney disease it's

11:40

not a cure but it's a better way of treating end stage kidney disease but you know not everybody can get a transplant as

11:48

quickly as they would want and sometimes transplants don't always work as long as we would want

11:55

um the one thing i would add is that even if you start dialysis your remaining kidney function may be

12:02

important in helping to maintain your volume status as well as to assist in waste product removal

12:08

so residual kidney function is something we actually do pay attention to

12:14

how do we ultimately determine when end-stage kidney disease occurs well

12:20

quite simply it's when things are no longer controllable you either have uncontrollable fluid accumulation

12:26

you have uncontrollable potassium accumulation you have uncontrollable acid

12:31

accumulation and you have dangerous toxic accumulation what we call uremia

12:38

now we obviously want to avoid uremia we don't want you to have a seizure before we start you on dialysis

12:44

so we monitor these things and try to intervene before serious consequences occur now typically

12:51

people begin to get into trouble or we begin to become seriously concerned about end-stage kidneys disease when

12:58

kidney function reaches about 10 to 15 percent of normal we don't we don't want to wait until

13:04

then to have a plan it's it's important to try and have a

13:09

plan well before you reach end-stage kidney disease because there are things we can do to prepare prepare you for dialysis if

13:16

it's necessary and if you're fortunate you may receive a transplant before you need dialysis

13:22

the best way for that to happen is what happened for dean which is to receive a transplant from a living donor

13:29

but whether it's a living donor a deceased donor it's in your best interest to receive a transplant before you need dialysis

13:38

there's some things that dialysis does not do and and i want to emphasize this dialysis alone

13:45

will keep you alive but it will not keep you healthy to stay healthy with end stage kidney

13:51

disease requires either a kidney transplant and medications

13:56

and changes in your diet or it requires dialysis and medications and changes in

14:02

your diet whether you get a transplant or whether you're on dialysis you're going to require medications as well as changes

14:08

in your diet to stay healthy you can stay healthy with end stage kidney disease

14:14

but it requires more than just transplant or dialysis

14:19

there are some things dialysis definitely does not do it does not remove phosphate effectively

14:24

as i mentioned before phosphate accumulation causes bone disease it actually increases the risk of death

14:31

so we restrict diet we ask you to restrict dietary phosphate and take phosphate binders

14:36

in addition we'll give you vitamin d and related drugs to try and control some of the effects of phosphate

14:43

accumulation dialysis does not correct anemia we give supplemental iron and we give

14:49

supplemental erythropoietin to try and avoid anemia

14:55

in fact the one of the major advances in control and treatment of end-stage kidney

15:00

disease when was when the gene for erythropoietin was cloned and supplemental or erythropoietin

15:07

recombinant erythropod became available and then finally dialysis will control

15:13

fluid accumulation but it will there are limits if if you gain fluid excessively

15:20

we may have trouble removing that excess fluid with dialysis so we ask you

15:25

to restrict dietary and fluid intake and almost uniformly

15:33

high blood pressure hypertension will require medications in addition to dialysis

15:40

so what does dialysis actually do well dialysis allows us to remove fluid but as i

15:46

mentioned there are limitations and allow us to remove chemicals in that fluid

15:51

electrolytes salt sodium potassium and acid and it allows us to remove

15:57

toxins we strive to do that in a way that avoids dramatic

16:02

shifts in electrolytes and fluids and we strive to do it in a way that interferes with your life to the

16:08

limited extent that we can of at least to the extent that we can avoid it

16:15

how does dialysis work all types of dialysis require some sort of

16:20

access to the patient and we'll talk a minute about how that varies between different types of dialysis

16:27

and then you need a membrane across which fluid and waste products are filtered and i'll show you a picture

16:32

here in just a minute you require a dialysis solution what we call dialysate to collect fluid waste

16:40

products and since that dialysate is going to be in contact with the patient it requires

16:45

sterile constituents sterile water and sterile chemicals and

16:50

then dialysis requires regular monitoring of patient status

16:55

we monitor how effectively we're removing waste products we monitor your electrolytes we monitor

17:02

blood pressure and volume status we monitor your nutritional status and then we monitor your well-being

17:09

we want you to feel well when you're on dialysis

17:15

as i mentioned dialysis requires a membrane across which waste products remove it's what we call

17:21

a semi-permeable membrane shown here in yellow this membrane has small holes in it

17:28

which allows small constituents like toxins electrolytes and water to move from the

17:34

blood into the dialysis fluid what we call a dialysate but larger molecules such as cells like

17:41

red blood cells and white cells and protein do not move across this semi-permeable membrane that's why

17:47

we call it semi-permeable it only allows small constituents into the dialysate which we then discard

17:56

there are different types of dialysis you can think of different types of dialysis in a couple ways one

18:03

where do you do it some people dialyze at home some people dialyze in a center or a

18:08

dialysis clinic and then you can think about different types of dialysis what we call modalities

18:14

hemodialysis or what some people would call blood dialysis and then peritoneal dialysis and we're

18:20

going to talk about both with hemodialysis blood is removed from

18:26

the patient pumped through a dialyzer an artificial kidney and then returned to the patient

18:32

fluid electrolytes and toxins are removed by the dialyzer and in this case the semi-permeable

18:38

membrane is artificial and manufactured this is a picture of a typical

18:43

artificial kidney what we call a dialyzer the blood goes through the center and the dialysate goes in an opposite

18:50

direction if you cut this stylizer and cross-section there are thousands this is this is

18:56

amplified to make it uh or magnified to make it visible there are thousands of little

19:04

hollow fibers inside the hollow fibers blood runs and then outside the hollow

19:10

fibers dialysis runs surrounding these hollow fibers and it's these hollow fibers

19:16

that have the semi-permeable membrane so that waste products and fluid move from the

19:21

blood into the dialysis space and are discarded

19:27

typical with typical hemodialysis we've got about 150 to 200 milliliters of blood out of

19:34

the body at any one time most people have about five liters or five quarts of blood in their

19:40

bloodstream and you've got 40 plus quarts or 40 liters of fluid in your system

19:48

waste products accumulate in all 40 quarts and if we've only if we've only got one cup of blood out

19:54

of your body and we want to cleanse 40 quarts of fluid we gotta run a lot of a lot of

19:59

cups of blood through the dialyzer we typically run the blood at three

20:05

to five hundred milliliters a minute at one to two cups per minute thus access to your blood treat the

20:11

bloodstream becomes critically important in emergent situations if we have to

20:18

dialyze someone emergently we can literally put a temporary catheter either in the neck or in the

20:24

groin it's got two sides to it one side we withdraw the dirty blood

20:30

the other side we return the clean blood this can be used immediately

20:36

but it's very temporary it's not the kind of thing you can leave the hospital with and it carries a significant risk of

20:43

infection another type of catheter what we call the tunnel tough catheter i would still

20:49

call temporary although it can it can be used outside the hospital

20:54

with a tunnel cuffed catheter the catheter enters the skin tunnels in the fatty tissue underneath

21:00

the skin and then enters a vein in the neck between where it enters the skin and where it enters the vein there's a

21:06

fiber cuff scar tissue grows into that cuff to anchor it so it won't fall out and forget

21:12

and provide a barrier against infection but that barrier is not perfect even a

21:17

tunnel cuff catheter has a significant risk of infection and they tend to clot and they tend just

21:23

not to work well it's not a good long-term solution although unfortunately some people

21:29

do use tunnel cuff catheters for an extended period of time this is the type of catheter you could

21:36

use loose used leave the hospital with but it's not a good long-term solution

21:44

somewhat better long-term solution is to use an artificial blood vessel what we call

21:50

a graft with a graft what we're doing is we're connecting artery

21:55

to a vein with an artificial blood vessel this once this is placed we like to

22:02

leave it in place for a week or two for it to for the and the uh incisions to heal

22:08

and to allow this to sort of settle in but when it's ready to use within you know a week or two or three we put

22:15

one needle in to withdraw the dirty blood a second needle to return the clean blood

22:21

only when you're on dialysis in between dialysis there's nothing there but skin

22:26

a graft is a good way of a better way of doing dialysis in a tunnel tunnel catheter but they have a finite

22:34

lifetime these don't last you know 10 to 15 years they'll last three or four years

22:40

you know if you're lucky the best thing to have is an arterial

22:45

venous fistula and with an artery venous fistula what the surgeons do is they correct connect an artery

22:52

directly to the vein bypassing the capillaries and in this situation the pressure in the artery is

22:58

directly transmitted to the vein the vein gets larger the wall of the vein gets thicker

23:04

and once that's mature once again we put one needle into withdraw the dirty blood a second needle

23:09

to return the clean blood only when you're on dialysis [Music]

23:16

in between dialysis sessions there's only skin i knew a young man who used the same fistula for 26 years

23:23

he had the type of kidney disease that actually occurred in transplants he had a recurrence of his disease in

23:28

his transplant he did not have pkd pkd is not recurring transplants by the way

23:35

but he had recurrent disease and lost his transplant so he stayed on dialysis for 26 years using the same fistula

23:44

this is basically the tesla of dialysis hemodialysis access if

23:51

if you can get a good fistula it will be your lifeline and the risk of infection with either a

23:57

fistula or a graft is significantly less than with a tunnel catheter

24:02

this is what it looks like this is a standard dialysis machine this is a dialyzer

24:09

the red the red the red tubing you see one is to remove blood

24:15

from the patient the other is returning the clean blood to the patient and basically you sit and relax and

24:22

either read the newspaper or watch television or simply snooze

24:30

insert in center dialysis when you go to a dialysis clinic typically you'll do dialysis three times a week

24:36

either monday wednesday friday tuesday or tuesday thursday and saturday typically for three to four hours of the

24:43

session it results in fairly rapid removal of fluid and waste products

24:48

and rapid correction of electrolytes one thing you need to think about in between dialysis sessions you've got

24:55

two and over a weekend three days to gain salt and fluid we've got three to four hours to take it off

25:01

one of the things that makes people feel bad is if they gain too much fluid and it becomes difficult to remove it

25:09

there are certain dialysis clinics that will do dialysis at night once again typically three hours or

25:16

three times a week typically eight hours per night while you sleep in the session

25:22

at least a more gradual removal of fluid waste product and gradual correction of electrolytes

25:27

some people prefer this it's not available in every dialysis clinic or every town

25:33

but it is an option for some patients alternatively you can do hemodialysis at

25:40

home and studies have looked at comparing home dialysis including home hemodialysis to in-center

25:46

hemodialysis patient patients that dialyze at home typically have better nutrition

25:52

they end up in the hospital less frequently they have improved survival they're less more independent

25:58

they tend to be more active and they typically have a better sense of well-being to some extent there's probably a

26:04

selection bias meaning people who dialyze at home tend to be a little bit more stable

26:10

and they tend to be more engaged in their own care and so that's probably part of the reason why

26:16

people who dialyze at home tend to do somewhat better in the past we did use standard

26:24

dialysis machines for people to dialyze at home there are probably a few programs that still do that

26:30

for that to happen you're using a regular dialysis mission in a home and you have to have a special water

26:36

purification system in your home one of the things that's necessary to do hemodialysis is you need

26:42

very pure water it not only needs to be sterile or at least very clean you can't

26:48

have any other constituents in it or they'll get into the patient and make the patient sick

26:55

there are newer home hemodialysis systems that include pre-prepared hemodialysis solutions

27:02

or a unique system that will prepare dialysis in the home and a newer hema dialysis

27:08

machine regardless of whether you're doing traditional home hemodialysis or using this new system

27:15

you typically need to have a trained partner because one of the side effects of dialysis is you can develop low blood

27:21

pressure and you need someone to give you fluid if your blood pressure gets low you may not be able to give yourself

27:27

some saline with some of these newer hemodialysis systems people

27:33

will do more frequent dialysis they'll do dialysis four and five times a week with shorter sessions not all programs

27:40

actually require a partner in addition there are some programs that

27:46

will allow people to dialyze at night at home and once again that's a more

27:51

gradual type of dialysis and not all programs require a trained partner for that

27:58

this is a this these are some pictures of one of these newer home hemodialysis machines

28:03

and as i say it it includes these uh come with pre-prepared either

28:08

pre-prepared sterile dialysis solution or a unique dial uh system this

28:17

black box here you see underneath the machine that's actually preparing dialysate

28:22

once again if you're doing it short and frequently you may not require a partner and if you do it at night you

28:29

may not require a partner complications of hemodials include

28:34

cramping if we have to take off too much fluid that can also cause your blood pressure to fall people sometimes

28:40

develop headaches they have nausea and vomiting they feel washed out they get abnormal heart

28:46

rhythms and they get infections many of these side effects are a function of how much

28:51

fluid you gain or whether you're not careful with your diet and so many of the complications are

28:58

limited if the patient's careful about their diet and their fluid accumulation

29:05

the other major type of dialysis is what we call peritoneal dialysis and the reason why we call it peritoneal

29:11

dialysis is there is an empty cavity in your abdomen called the peritoneal cavity it's lined

29:17

by a peritoneal membrane and this peritoneal membrane acts as the semipermeable membrane that we need to

29:24

do dialysis once again it allows us to remove excess fluid electrolytes and toxins

29:30

and it's done at home there's no need for a helper and what you do is you exchange fluid

29:37

you put clean fluid in your abdomen for a period of time waste products and excess fluid move

29:42

into your abdominal cavity you throw away the dirty fluid and then you do it all over again

29:48

these exchanges can be done either manually or by an automated machine at night

29:56

this is a picture from the side of your peritoneal cavity your abdominal organs are in gray and

30:03

this dark area is the peritoneal cavity it's typically relatively empty there's some lubricant

30:09

to allow your intestines to wiggle around while they're digesting your food but it is a potential space to do

30:16

peritoneal dialysis we have the surgeons put a catheter this picture doesn't show it quite so

30:21

well but what happens is that catheter enters the skin tunnels in the fatty tissue under the

30:27

skin and then it enters the abdominal cavity between where it enters the skin and where it enters the abdominal cavity

30:33

there's a cuff scar tissue goes into that cuff to anchor it so it doesn't fall out

30:38

and to provide a barrier against infection

30:44

this shows the system this is a drain line where you drain the

30:50

the dirty fluid once you've drained the dirty fluid you clamp this line you open this up and you put clean flow in it flew it in

30:57

and then you disconnect i'll show a picture of that here in just a moment when you

31:04

do peritoneal dialysis there's several things that have to be determined one how much do you put into your abdominal

31:10

cavity typically it's between two and three quarts per exchange

31:15

we'll need to determine how many exchanges per day that's typically a function of how effectively we're

31:20

removing waste products and once again we monitor that and then we'll talk about the the doctor will

31:28

typically determine the type of dialysis although frankly very few people do

31:33

manual exchanges anymore this is how peritoneal dialysis first started it was all manual but as as automated

31:40

machines became available the vast majority of patients do automated dialysis at night

31:47

the patient and the doctor together determine the type of dialysis solution that's used and what i mean by that the

31:55

way we withdraw fluid from the patient into the abdominal cavity

32:00

is by varying the amount of sugar varying the amount of glucose that's in the peritoneal dialysate fluid

32:06

that glue that glucose that sugar sucks fluid from the patient into the

32:12

abdominal cavity and then you throw it away by having different concentrations of glucose you can vary the amount of fluid

32:19

that's removed in addition there's a newer molecule called icodextrin which is even more effective

32:26

at fluid removal that's used in selected circumstances that you and the physician will determine

32:33

this is a picture of someone doing what's called chronic ambulatory peritoneal dialysis

32:40

basically the manual exchange is done by the patient and this is how this is how peritoneal dialysis started

32:46

basically in this the patient always is carrying fluid there's fluid in the abdominal

32:51

cavity except when the patient's doing an exchange in between exchanges the catheter is

32:58

hooked to nothing it's just basically taped up to your abdomen when it's time to do an exchange

33:04

you wash your hands you put on a mask you connect yourself to a system that has an empty bag in a full bag

33:11

you you open a clamp the fluid in your abdomen fills this empty bag once the empty bag

33:18

is full you clamp the line going to the ink to the drain bag and then you open a clamp where this

33:25

clean dialysis fluid enters your abdomen this is dirty fluid this is clean fluid so what you're doing is you're draining

33:32

dirty fluid and replacing it with clean fluid and you typically do that four to five times

33:37

a day it takes about 15 to 20 minutes to do a manual exchange

33:43

i've had a few patients do this because they thought it fit their lifestyle better but it's unusual that patients do and

33:50

capd anymore most people will use an automated machine

33:55

that cycles fluid in and out of their abdomen while they're sleeping basically you hook yourself up to a

34:01

machine at night and the machines you know puts a couple liters of fluid in your abdomen for two

34:08

to three hours automatically drains it and then does it all over again

34:14

now not all patients can achieve adequate toxin and fluid removal with an automated cycler

34:20

will sometimes use hybrids sometimes we'll use have a patient use a cycler at night and then it'll have them carry fluid

34:26

during the day and maybe even do a manual exchange in the middle of the day so there are sort of variations in

34:32

between automated dialysis as well as a manual exchange or capd

34:40

complications of peritoneal dialysis one sometimes the the peritoneal membrane or

34:47

the peritoneal cavity simply is inadequate for removing toxins

34:52

sometimes it doesn't adequately provide adequate fluid removal and because of this peritoneal dialysis

34:58

may not remove may not work for all patients we monitor how effectively we're removing waste

35:04

products just like we do with hemodialysis and we obviously monitor how effectively removing fluid

35:11

one of the other complications of peritoneal dialysis is infections you know you're putting fluid into it

35:17

into the abdominal cavity and so there's it's the fluid in the abdominal cavity is warm

35:23

it's wet and it's full of sugar those are ideal ideal ways to grow

35:30

bacteria and and fungi yeast and so you have to be very careful to try and

35:36

avoid contaminating yourself and then finally malnutrition is a complication of peritoneal dialysis

35:43

every time you throw away dirty fluid you're throwing away about an egg's worth of

35:48

protein there's in the absence of peritoneal dialysis with a normal abdominal cavity

35:54

there's fluid trafficking through the abdomen and it's very rich in protein it basically goes into the abdomen and goes

36:01

right back out typically through the lymphatics when you put a peritoneal dialysis catheter into the abdomen and put fluid

36:08

in there you're interrupting that traffic so every time you throw every time you drain and

36:14

throw away peritoneal dialysis fluid you're throwing away about an egg's worth of protein and so

36:20

you need to be able to eat effectively eat eat protein to try and

36:26

avoid malnutrition this is your event staff checking in with 10 minutes remaining

36:32

in your session we are just about done that's perfect timing people

36:38

ask about the artificial kidney and i i we don't have time to talk about this in detail what i would say is that

36:46

there are a couple of types of artificial kidneys that people are trying to develop they are still very experimental there's

36:53

something called the wearable artificial kidney which is still very experimental there

36:59

was a study published back in 2016 where they screened over 400 patients

37:06

they were hoping to enroll 10 patients they ultimately only enrolled seven

37:12

only five of them completed 24 hours with the wearable artificial kidney but it did

37:19

basically prove that you could do this this is what it looks like it's you know basically a fancy fanny

37:27

pack with a dialyzer and a whole lot of other you know pieces of equipment hooked to a

37:34

belt but you know it's it's it's you know proof of concept that you can

37:40

miniaturize some of these things and potentially have it go with the patient

37:45

so the other holy grail is what would be called the bioartificial kidney

37:50

which is a hybrid between actually human cells which is shown here

37:57

which would line this particular hollow this this canister and you have

38:03

blood going through here you filter fluid and then that filtered fluid goes

38:08

through this this second cartridge which processes the fluid using

38:15

real human cells and it's basically the the goal is to design really sort of an

38:21

artificial kidney using human constituents

38:26

and ultimately the idea is to develop one that can be implanted into a patient blood going through the

38:33

artificial kidney back clean blood going back into the patient and then processed fluid going

38:39

to the bladder this is really conceptual at this point although they the the people that are trying to

38:45

develop this did recently within the past year to publish a study in which they

38:52

implanted something like this with human cells into a a non-human

39:01

animal basically they were able to implant human cells into a non-human

39:06

animal the cells are basically protected from the environment so you

39:13

can the cells are not attacked by uh the recipient either whether it would be human or a non-human animal

39:20

so this remains something very experimental but people always ask about it

39:25

it is not anywhere close to being a replacement for dialysis and it's not

39:31

anywhere close to being a replacement for a transplant how do you choose what type of dialysis

39:38

you do some of it's a lifestyle issue what fits your lifestyle better some of it may have proximity to the

39:44

closest dialysis center depending on whether you live an urban or a rural area if you're going to do home dialysis you

39:50

may need a partner limitations of the peritoneal cavity may limit your ability to do peritoneal

39:56

dialysis if you've had multiple abdominal surgeries that may prevent you from doing peritoneal dialysis

40:03

in addition you have if you're doing hemodialysis you have to be able to gain reliable access to the bloodstream

40:12

typically pkd patients are reasonable candidates for any either one of these types of dialysis but this typically needs to be

40:19

individualized with discussions between the patient and the physician

40:24

one of the things that we frequently forget to tell people because we take it for granted is that people switch between different

40:31

types of dialysis all the time if you're doing perineal dialysis you develop a severe infection we may have

40:38

to remove the perineal dialysis catheter and you may have to switch to hemodialysis for a period of time

40:44

alternatively if you're doing hemodialysis and you have difficulty maintaining vascular access

40:50

you may switch to perineal dialysis for a period of time people go back and forth but doing

40:55

different dialysis modalities all the time so staying healthy with end-stage kidney

41:03

disease dialysis alone will keep you alive but it will not keep you healthy

41:09

to stay healthy with end-stage kidney disease requires either a kidney transplant

41:15

and medications and changes in your diet or dialysis and medications and changes

41:22

in your diet um regardless of whether you have a transplant or whether you have or

41:28

whether you're doing dialysis you were increased with for vascular especially cardiovascular disease so

41:35

it's important to try and control sodium and phosphate it's important to control high blood pressure

41:42

it's important to control lipids including cholesterol and triglycerides it's important to exercise to the extent

41:49

that you are able and for god's sakes don't smoke

41:55

anyway i appreciate your time and attention and i will certainly be happy to answer

42:02

any questions which any of you might have once again thank you for your attention and i hope you enjoy the rest of the

42:08

conference thank you dr colley uh we do have a couple of questions and again as a reminder please keep your microphones

42:14

muted and typed the questions to the chat chat box so a couple of questions came in what gfr should you start planning

42:20

for dialysis on transplant that's one question um i think that depends a little bit upon how rapidly

42:27

your kidney function is deteriorating i think planning for dialysis or planning for transplant or dialysis

42:33

is probably a good thing to at least begin doing once your gfr gets down below

42:39

30 because it doesn't happen immediately what if if

42:44

you're going to receive a transplant there's an evaluation process you need to go through even if you have a living donor there's

42:50

an evaluation process they need to go through technically if you're gonna if you're having to wait for a deceased donor

42:56

transplant you won't become eligible for a deceased donor transplant until your gfr

43:02

is less than 20. but there's no reason to wait until it's less than 20

43:07

to begin preparing for a transplant once again as i mentioned um if you're going to do dialysis we

43:15

need to either uh place vascular access or place a peritoneal dialysis catheter

43:21

um if a fistula sometimes takes months to mature

43:26

and it doesn't always work the first time so but you know having a fistula beforehand um or well before you need it is a good

43:33

idea especially because a fistula can last you many years i wouldn't place a graft long before you

43:39

need it because they have a finite lifetime apparently dialysis catheter probably doesn't need to be placed

43:45

more than a you know a few weeks you know or maybe a few months before you begin dialysis

43:51

but you need to begin thinking about it once your gfr gets down below 25 to 30. so guys good follow-up here

43:59

who does this monitoring your nephrologist this question is you should be doing all this work with your nephrologist right

44:04

that's correct the the person who's going to monitor you for and you should be beginning to have

44:10

discussions with your nephrologists about you know when should we start talking about or transplant when should we start

44:16

talking about dialysis your nephrologist will be able to give you that type of information

44:24

someone asked if they're going through a trans planning on a transplant but they need dialysis for a short period of time

44:31

would you recommend a chest cath or a fistula in that case that's if you're really convinced

44:39

i mean and the problem is you can never be certain that you're going to get a transplant if you're if you're very convinced that you're

44:46

going to get a transplant fairly quickly a tunnel dialysis catheter is not the end of the world

44:52

the problem is unanticipated things can happen you know if you've got if you think you

44:57

have a living donor that living donor may not be a suitable candidate and for sure if you're waiting for a

45:03

deceased on her kidney there's never any certainty so if if

45:08

you're absolutely certain that your living donor is not gonna you know have a problem

45:13

a tunnel catheter is not the end of the a world is always a better way of doing

45:19

dialysis especially if it's going to be for any extended period of time but a fistula has to be done well ahead

45:25

of time the advantage of a tunnel dialysis catheter once we place it we can use it

45:30

immediately all right well that's all the questions we seem to have now uh it's the end of

45:37

the hour um i want to thank you dr cali and thank everyone for joining and please

45:43

enjoy the rest of the conference everybody stay healthy and stay safe good luck to you all

45:49

please don't forget to complete the survey i'm sorry there's a survey in the chat window so please complete it so we can continue

45:54

to improve thank you everybody good luck to you all right now

49:27

thank you all for joining dialysis 101 we hope that you enjoy the rest of the

49:42

conference