

Nephrology

320.240.2206

1200 Sixth Avenue North, St. Cloud, MN 56303

Agenda

Kidney Overview

Kidney Disease

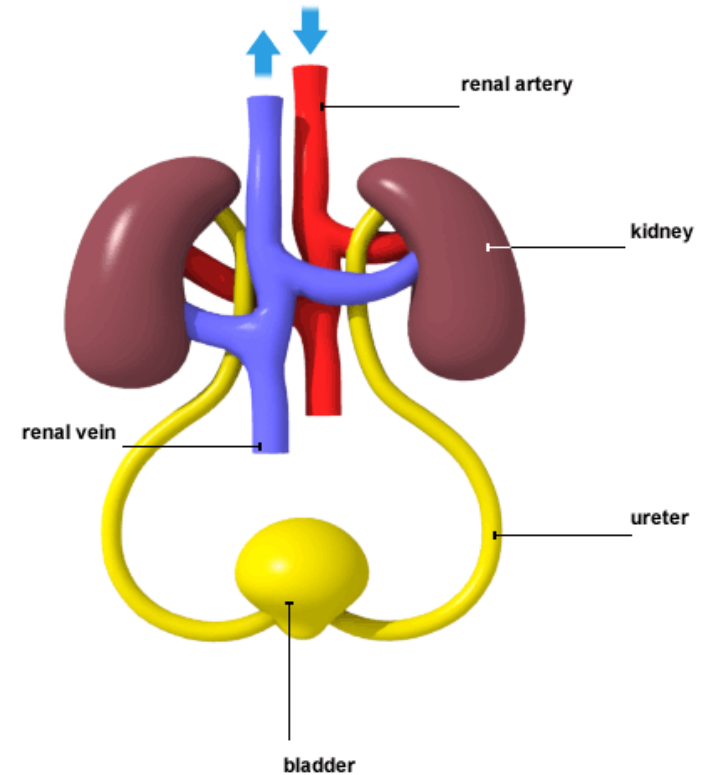
Living With CKD

Treatment Plan

Next Steps

Educate you about kidney disease

Providing you with information that helps you **take an active role in your treatment**



Kidney Overview

Why are kidneys important?

How do kidneys work?



Kidneys filter your blood...

..and do so much more

- Control blood pressure
- Remove extra water
- Promote red blood cell (RBC) production
- Help maintain healthy bones
- Assist acid/base equilibrium

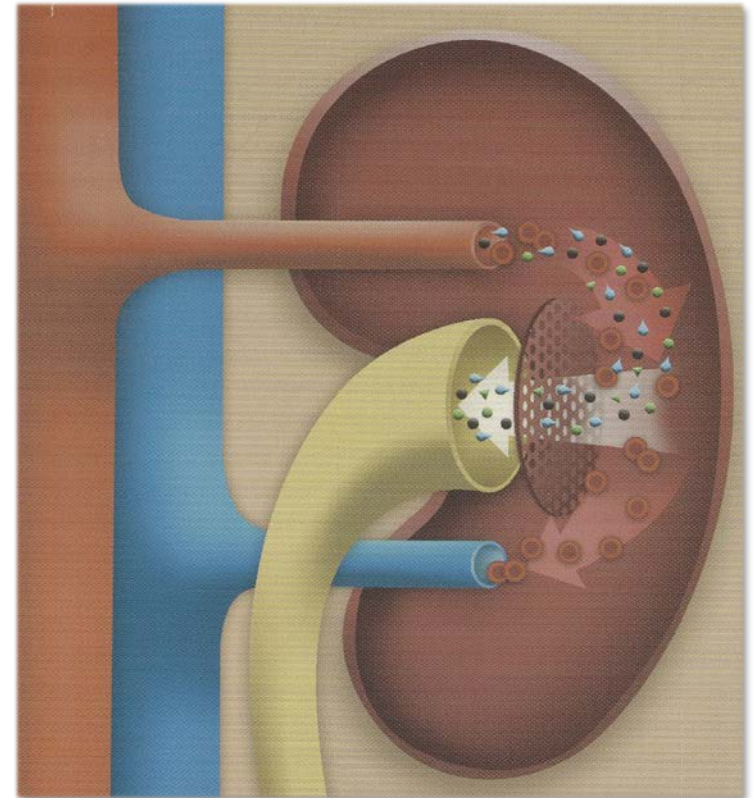
Kidney Overview

Why are kidneys important?

How do kidneys work?



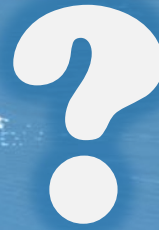
- Blood flows into the kidneys through an artery
- Blood is cleaned by passing through tiny filters inside the kidneys
- Waste and extra fluid move out of the body as urine
- Cleaned blood returns to the body through veins



Kidney Overview

Why are kidneys important?

How do kidneys work?



What are two ways that your kidneys help keep you healthy?

Kidney Disease

What is kidney disease?

Signs, symptoms & causes

Stages of CKD



Chronic Kidney Disease (CKD) is the gradual loss of kidney function over time

Early detection and treatment can **slow down** progression

The root cause of CKD is often difficult to pinpoint and there are many factors that cause kidney damage

- Decreasing ability to maintain body's balance of water and chemicals
- Increasing occurrence of complications like weak bones, high blood pressure, anemia, and others
- Increases risk of heart and blood vessel disease
- Can lead to kidney failure

Kidney Disease

What is kidney disease?

Signs, symptoms & causes

Stages of CKD



Most people **do not** have any severe symptoms until their kidney disease is advanced and their kidney function is significantly decreased

- Increased thirst
- Tired, less energy
- Poor appetite
- Trouble sleeping
- Muscle cramps at night
- Swollen feet & ankles
- Puffiness around eyes
- Dry, itchy skin
- Urinate small amounts more often
- Unpleasant taste in the mouth

Kidney Disease

What is kidney disease?

Signs, symptoms & causes

Stages of CKD



Diabetes

A condition that affects how your body turns food into energy

Type 2 diabetes is the number one cause of kidney failure

Ask Questions – Take Action

- Blood vessels and kidney filters are damaged by high blood sugar
- Damaged kidneys begin leaking small amounts of protein into the urine
- Over time, this damage increases protein in the urine and decreases the kidney's ability to clean blood
- More water and salt are retained leading to swelling

Kidney Disease

What is kidney disease?

Signs, symptoms & causes

Stages of CKD



High Blood Pressure

Blood pressure measures how hard blood pushes against your arteries as it moves through your body

High blood pressure (hypertension) is the number two cause of kidney disease

Ask Questions – Take Action

- High blood pressure moves blood through vessels with too much force damaging blood vessels and kidneys
- Damaged kidney filters can not clean blood effectively
- Waste remains in blood further raising blood pressure
- Most people have no symptoms

Kidney Disease

What is kidney disease?

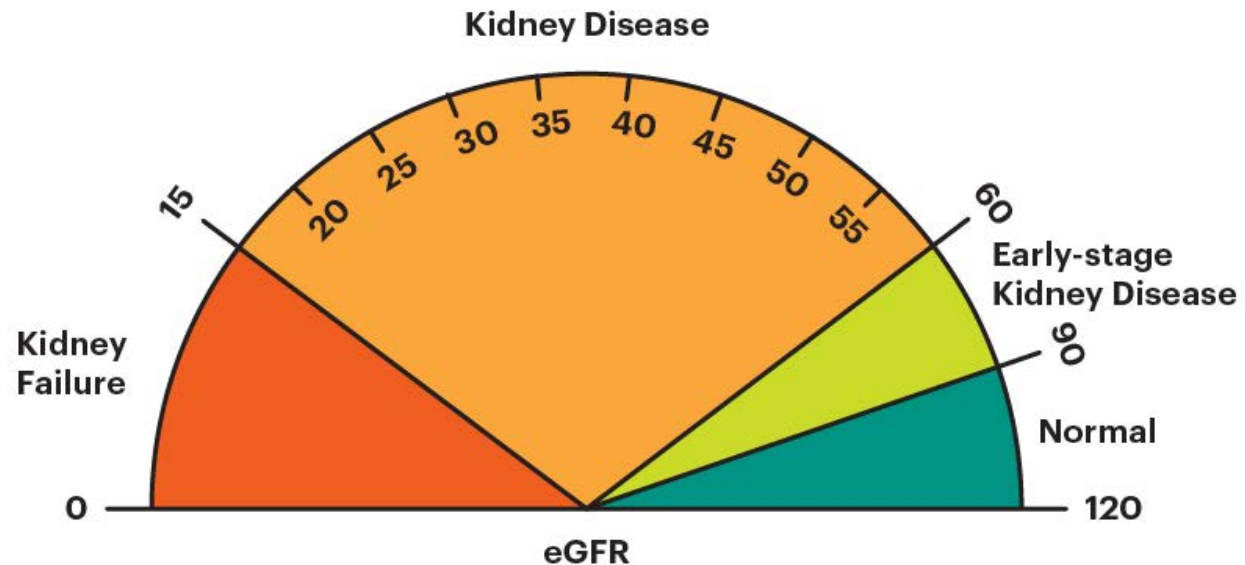
Signs, symptoms & causes

Stages of CKD



Level of kidney function is determined by estimating the glomerular filtration rate (**eGFR**)

- Reported as a single number indicating kidney function potential
- Changes over time and naturally decreases with age



Kidney Disease

What is kidney disease?

Signs, symptoms & causes

Stages of CKD



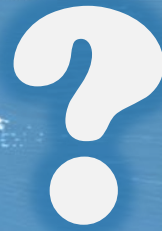
Stage	Description	GFR
1	Potential kidney damage with normal kidney function	> 90
2	Kidney damage with mild loss of kidney function	60-89
3a	Mild to moderate loss of kidney function	45-59
3b	Moderate to severe loss of kidney function	30-44
4	Severe loss of kidney function	15-29
5	Kidney failure	< 15

Kidney Disease

What is kidney disease?

Signs & symptoms

Stages of CKD



What is your eGFR?

Living With CKD

Knowing your
options

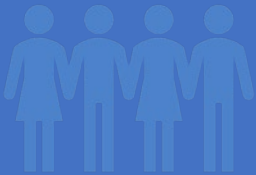
Comorbidities

Functional
Impairments

Coping

Taking control

Advance care
planning



There is no cure for chronic
kidney disease (CKD)

**Our goal is to slow the
progression of the disease**

This is a complex disease and
requires that you become
actively involved with your
health care

- **Educate** yourself about kidney disease
- **Understand** what your options are
- **Regularly visit** with your health care team
- **Follow** your established treatment plan

Living With CKD

Knowing your options

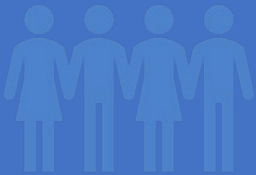
Comorbidities

Functional Impairments

Coping

Taking control

Advance care planning

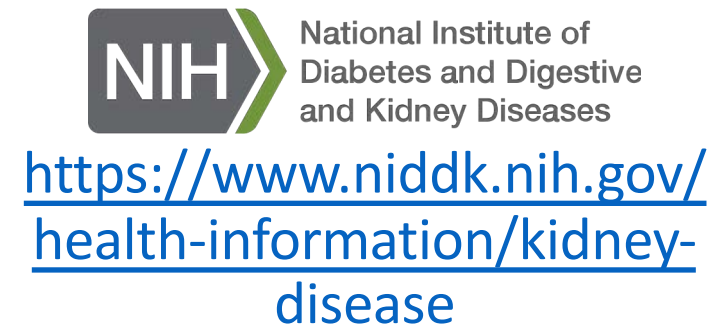


Your CentraCare team educates you on what options you have going forward

Ask Questions – Take Action



V231013



Living With CKD

Knowing your
options

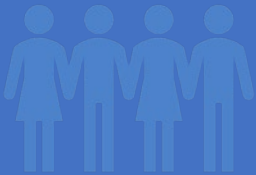
Comorbidities

Functional
Impairments

Coping

Taking control

Advance care
planning

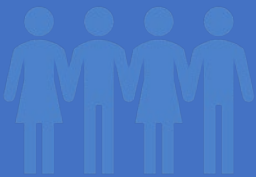


Anemia

A lack of healthy red blood cells
(RBC)

Ask Questions – Take Action

- RBCs have a short lifespan
- Failing kidneys cause the RBC lifespan to decrease even more
- The kidney's ability to stimulate production of more RBCs decreases



Bone Mineral Disorders

A condition when your kidneys are unable to keep calcium and phosphorus in balance

Healthy kidneys transform Vitamin D to a hormone that helps your digestive system absorb calcium

Ask Questions – Take Action

- Parathyroid glands make the parathyroid hormone (PTH)
- When parathyroid glands sense low levels of calcium in the blood, they release PTH
- PTH causes the bones to release more calcium into the blood
- This results in weakened bones

Living With CKD

Knowing your
options

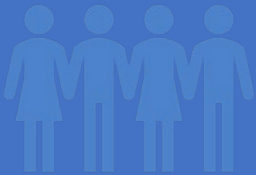
Comorbidities

Functional
Impairments

Coping

Taking control

Advance care
planning



Cardiovascular Disease

Any problem that reduces the ability of your heart to pump blood through your body

Heart disease is the most common cause of death among patients with CKD

Ask Questions – Take Action

- Kidney disease increases the risk of cardiovascular problems including heart failure, arrhythmias, & stroke
- Cardiovascular disease and kidney disease share many of the same risk factors
- Prevention and effective treatment are the key to slowing down progression

Living With CKD

Knowing your
options

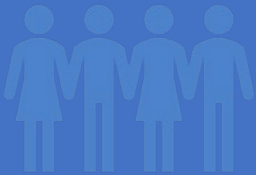
Comorbidities

Functional
Impairments

Coping

Taking control

Advance care
planning



Fluid Overload

Failing kidneys are unable to filter excess fluid and waste properly resulting in fluid build-up in your body

Most common in later stages of chronic kidney disease

Ask Questions – Take Action

- It is also common in people with heart disease
- Treatment can be hard on your kidneys
- Requires that you implement fluid restrictions

Living With CKD

Knowing your
options

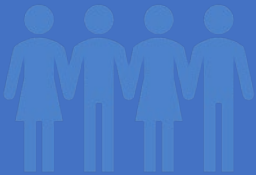
Comorbidities

Functional
Impairments

Coping

Taking control

Advance care
planning



Peripheral Neuropathy

Pain, pins & needles sensation,
numbness, tingling, burning
sensation

Commonly located in feet or
hands

Most common cause is
diabetes

Ask Questions – Take Action

- Reversal is only possible when problem is addressed immediately when it develops **before** it causes permanent changes or damage
- Prevention and effective treatment are the key to preventing permanent damage

Living With CKD

Knowing your
options

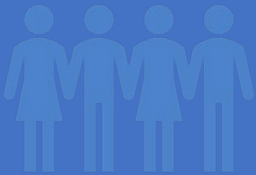
Comorbidities

Functional
Impairments

Coping

Taking control

Advance care
planning



How does high
blood pressure
impact your
kidneys?

Living With CKD

Knowing your
options

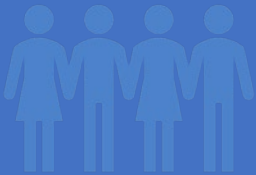
Comorbidities

Functional
Impairments

Coping

Taking control

Advance care
planning



Functional impairments are
common with CKD

Challenges include physical,
psychological, social, and
spiritual aspects

Ask Questions – Take Action

- Bring up your emotions and challenges to your healthcare team
- Expand and strengthen your support team



<https://www.rsnhope.org>

Living With CKD

Knowing your
options

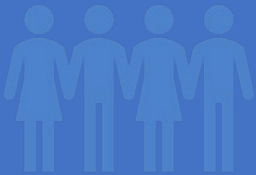
Comorbidities

Functional
Impairments

Coping

Taking control

Advance care
planning



Adjusting to life with kidney disease is challenging

Nearly **every** person with kidney disease struggles with emotions or a feeling of hopelessness at times

Ask Questions – Take Action

- Fear, anger, and depression are all very real feelings
- Discuss your feelings with family, friends, and your health care team
- Regular exercise can boost your mood
- Seek professional counseling



<https://www.centracare.com/services/behavioral-health-services/>

Living With CKD

Knowing your
options

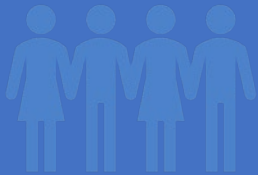
Comorbidities

Functional
Impairments

Coping

Taking control

Advance care
planning



The more you know
about your disease,
the more empowered
and in control
you will be

**It is possible to have a long
and rewarding life while
dealing with kidney disease**

Ask Questions – Take Action

- As CKD progresses, become more proactive and make lifestyle changes
- Understanding and recognizing complications enables you to take action
- Keep a journal of challenges and successes
- Always take time to bring up issues with your health care team and ask questions

Living With CKD

Knowing your
options

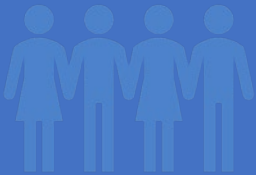
Comorbidities

Functional
Impairments

Coping

Taking control

Advance care
planning



It is never too soon to make
your health care wishes
known

What do you want?

What do you NOT want?

Ask Questions – Take Action

- Discuss with family, friends, and your health care team
- Develop a Health Care Directive
- Include wishes related to artificial kidney options



[https://www.centracare.com/
about-us/
advance-care-planning-acp-](https://www.centracare.com/about-us/advance-care-planning-acp-)

Living With CKD

Knowing your
options

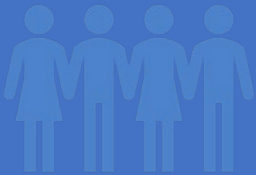
Comorbidities

Functional
Impairments

Coping

Taking control

Advance care
planning



How are your
bones impacted
by kidney
disease?

Treatment Plan

Overview

Your health care goals

Lab tests

Lifestyle changes

Medications

Immunizations

Kidney replacement options



Your CentraCare team prescribes a treatment plan tailored specifically for you

Your treatment plan will change over time as your kidney disease progresses

Ask Questions – Take Action

Based on

- Your health care goals
- Your lab test results
- Your disease progression

Might include

- Recommended lifestyle changes
- Prescribed medications
- Recommended immunizations
- Kidney replacement options

Treatment Plan

Overview

Your health care goals

Lab tests

Lifestyle changes

Medications

Immunizations

Kidney replacement options



Your kidney disease is *your* kidney disease

Learn all you can about your health and your options

Make informed choices about what treatment you want

Ask Questions – Take Action

- **Discuss** your priorities with your health care team
- Your CentraCare team will **tailor** your treatment plan with you at the center
- **Follow** the established treatment plan
- It is your right to accept or refuse treatment options

Treatment Plan

Overview

Your health care goals

Lab tests

Lifestyle changes

Medications

Immunizations

Kidney replacement options



Your CentraCare team will regularly schedule your lab work

Knowing and understanding your test results allows you to make informed decisions

Ask Questions – Take Action

Typical lab tests for kidney disease fall into five families

- Kidney function
- Anemia
- Electrolyte
- Bone disease
- Urine

Lab Tests

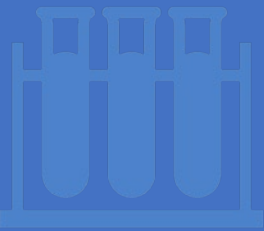
Kidney Function

Anemia

Electrolyte

Bone Disease

Urine



How clean is your blood?

Blood Urea Nitrogen (BUN)

Urea nitrogen remains in your blood as your kidneys fail

BUN	(mg/dL)
Goal	5-25

Creatinine

Creatinine remains in your blood as your kidneys fail

Creatinine	(mg/dL)
Goal	0.5-1.5 (m) 0.5-1.3 (f)

Glomerular Filtration Rate (eGFR)

GFR					
Stage 1 ≥ 90	Stage 2 60-89	Stage 3a 45-59	Stage 3b 30-44	Stage 4 15-29	Stage 5 < 15

Lab Tests

Kidney Function

Anemia

Electrolyte

Bone Disease

Urine

Are your red blood cells healthy?

Hemoglobin (Hgb)

Decreases and your body starves for oxygen as your kidneys fail

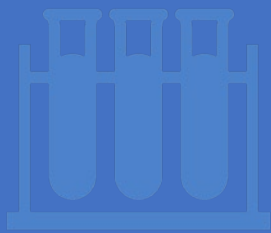
Hgb	(g/dL)
Goal	11-12

Iron Stores

When iron levels are low, your body struggles to make red blood cells

Ferritin	
Goal	100-800

TSAT	
Goal	20-50%



Lab Tests

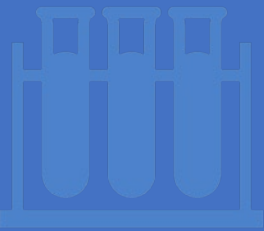
Kidney Function

Anemia

Electrolyte

Bone Disease

Urine



Are key minerals in balance?

Potassium (K)

Low or high levels can result in death

K	(mEq/L)
Goal	3.5-5.3

Sodium

As your kidneys fail, excess sodium remains in your body leading to high blood pressure

Sodium	(mEq/L)
Goal	135-145

Bicarbonate (HCO₃)

Failing kidneys are not able to maintain balanced acidity levels in your blood

HCO₃	(mEq/L)
Goal	22-26

Lab Tests

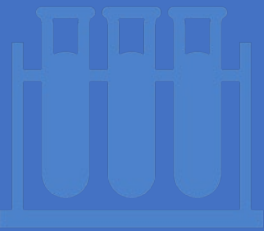
Kidney Function

Anemia

Electrolyte

Bone Disease

Urine



Are you at risk of developing renal bone disease?

Parathyroid Hormone (PTH)

High levels cause your body to pull calcium out of your bones

PTH	<i>(pg/mL)</i>
Goal	70-110

Calcium

Required for building and maintaining strong bones, healing wounds, and more

Calcium	<i>(mg/dL)</i>
Goal	8.6-10

Phosphorus

As your kidneys fail, excess phosphorus remains in your body

Phosphorus	<i>(mg/dL)</i>
Goal	2.5-4.5

Vitamin D

Helps your body absorb calcium

Vit D	<i>(ng/mL)</i>
Goal	30-80

Lab Tests

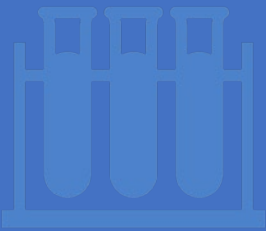
Kidney Function

Anemia

Electrolyte

Bone Disease

Urine



What about my urine?

Microalbuminuria

Failing kidneys allow protein to leak into the urine

Microalbuminuria (mg/L)
Goal < 12

Albumin-to-creatinine ratio

Failing kidneys allow protein to leak into the urine

Albumin-to-Creatinine Ratio (mg/g)		
Goal < 17 (m) < 25 (f)	Microalbuminuria 17-250 (m) 25-355 (f)	Albuminuria > 250 (m) > 355 (f)

Treatment Plan

Overview

Your health care goals

Lab tests

Lifestyle changes

Medications

Immunizations

Kidney replacement options



Modifications you might make to your habits or routines

Takes time and requires dedication

Set realistic goals
One step at a time
Find your “why”

Ask Questions – Take Action

- What things in your diet are good for your kidneys and what things should you limit?
- Do you need to limit the amount of water you drink?
- Is it okay for you to exercise?
- If you smoke, stop!
- Closely monitor other health problems like diabetes or high blood pressure

Treatment Plan

Overview

Your health care goals

Lab tests

Lifestyle changes

Medications

Immunizations

Kidney replacement options



Living with kidney disease usually means taking medications

Follow all medication instructions exactly as prescribed

Always discuss new medications with you health care team

Ask Questions – Take Action

- Medications vary and include
Blood pressure medications
Diuretics
Phosphorus binders
- Avoid common over-the-counter medications
- Some medications require reduced dosages
- Use caution when using herbs, dietary supplements

Treatment Plan

Overview

Your health care goals

Lab tests

Lifestyle changes

Medications

Immunizations

Kidney replacement options



Kidney disease leads to reduced immunity

Prevention is the key

Ask Questions – Take Action

- Wash your hands...multiple times...throughout the day
- Consider receiving
COVID-19
Seasonal flu
Hepatitis B
Pneumonia
Shingles
Tetanus, diphtheria, and pertussis (Tdap)

Treatment Plan

Overview

Your health care goals

Lab tests

Lifestyle changes

Medications

Immunizations

Kidney replacement options



Despite the best treatment and your best efforts, kidneys fail

When kidney disease progresses to Stage V, we have to look at alternatives

Ask Questions – Take Action

Dialysis removes waste and fluid from your blood

- Hemodialysis uses an external machine
- Peritoneal Dialysis uses your abdominal lining

Transplantation places a healthy kidney in your body

- Living donor
- Deceased donor

Comfort Care

Treatment Plan

Overview

Your health care goals

Lab tests

Lifestyle changes

Medications

Immunizations

Kidney replacement options



What are your
health care
goals?

Next Steps

Part II

Come back for Part II

Learn about treatment options for kidney failure so that you are prepared to make the best choice for you

- Details about treatments?
- How will I pay for treatment?
- Can I travel and work?
- Will my lifestyle change?



Nephrology

320.240.2206

1200 Sixth Avenue North, St. Cloud, MN 56303