



End Stage Kidney Disease: Understanding Your Options

Outline

What the Kidneys Do

Chronic Kidney Disease

Treatment Options: Benefits and Points to Consider

Normal Kidney Function



Kidney function can be broken down into four main actions:

1. Regulation of Water Balance

- The kidneys can remove excess water from the blood or keep it when needed.

2. Filter Out Waste Products

- The body naturally produces wastes (urea and creatinine) when breaking down protein. The kidneys remove these wastes from the blood and get rid of them in the urine.

3. Keep Body's Minerals Balanced

- The kidneys balance minerals including calcium and phosphate, which helps to keep the bones strong. They also balance other minerals such as sodium and potassium, which are important for many things including heart and muscle function.

4. Production of Hormones

- Hormones are special chemicals the body makes to help it do certain things. The kidneys produce hormones that help control blood pressure, red blood cell production and calcium balance in the body.

Chronic Kidney Disease

- Chronic kidney disease (CKD) is the presence of kidney damage, or a decreased level of kidney function, for three months or more.
- Risk factors include smoking, diabetes, high blood pressure and heart disease.
- CKD can range from mild to severe.



Potential Symptoms and Complications of moderate to severe CKD

Symptoms	Long-term Complications
Poor sleep; fatigue	High blood pressure (hypertension)
Poor appetite; altered taste	Blood disorders (example anemia)
Itch	Bone disease
Nausea; vomiting	Heart disease
Trouble breathing	Sexual dysfunction
Trouble concentrating	Reduced fertility
Restless legs	Decreased quality of life

What is GFR?

- Your kidney function is measured by your Glomerular Filtration Rate (GFR).
- GFR is an estimate of how well your blood is filtered by your kidneys. If your GFR is low, it means your kidneys are not filtering as well as they should.
- It is an APPROXIMATE estimate (not precise) of the % of kidney function remaining.
- There are 5 stages of CKD (1=mild; 5=advanced), based on the GFR.



Kidney Function, Symptoms and Treatment

Mild Kidney Disease

- a. Usually no symptoms
- b. Monitor bloodwork and try to slow worsening of kidney function by managing blood pressure

Moderate Kidney Disease

- a. Early symptoms may occur and could include tiredness, poor appetite and itching
- b. Monitor bloodwork and try to slow worsening of kidney function
- c. Learn more about CKD and treatment options

Severe Kidney Disease

- a. Symptoms may worsen
- b. Monitor blood work and try to slow worsening of kidney function
- c. Discuss and plan for treatment choice (transplant, dialysis or conservative care)

End-stage Kidney Disease

- a. Symptoms may include fatigue, nausea, difficulty breathing and itchiness
- b. Monitor bloodwork and try to slow worsening of kidney function
- c. Action transplant, start dialysis or continue with conservative care

End Stage Kidney Disease Treatment Options

- Kidney Transplant
 - Living Donor
 - Deceased Donor
- Home Dialysis
 - Home Hemodialysis
 - Peritoneal Dialysis
- In-center Hemodialysis
- Conservative Care



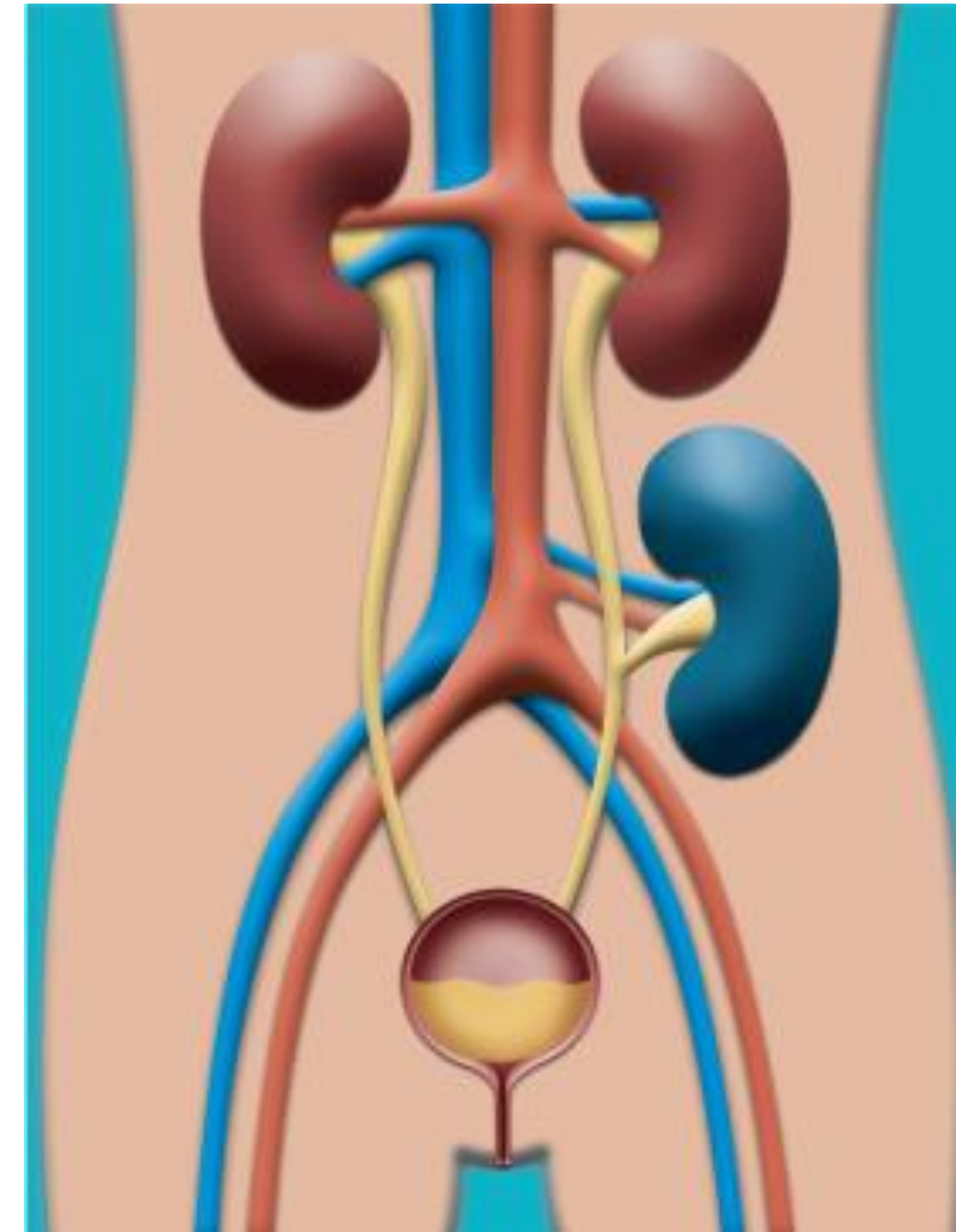
When is it time to start dialysis?



- Decision is individualized and made based on how you are feeling and what your bloodwork shows (amount of build-up of waste products)
- When your GFR is **10**, your kidneys are functioning at **approximately 10% of normal**. At this level of kidney function, dialysis may be needed to maintain health.
- Dialysis may be started sooner if you have symptoms that impact your health, wellbeing and overall quality of life. This will need to be discussed with your kidney doctor.

Kidney Transplant – What is it?

- A kidney transplant is an operation that places a healthy kidney from a carefully selected donor (living or deceased) into the body of a person with advanced CKD
- The advantages of transplant include **living longer with improved quality of life** and **fewer restrictions** compared to dialysis



Kidney Transplant – Eligibility

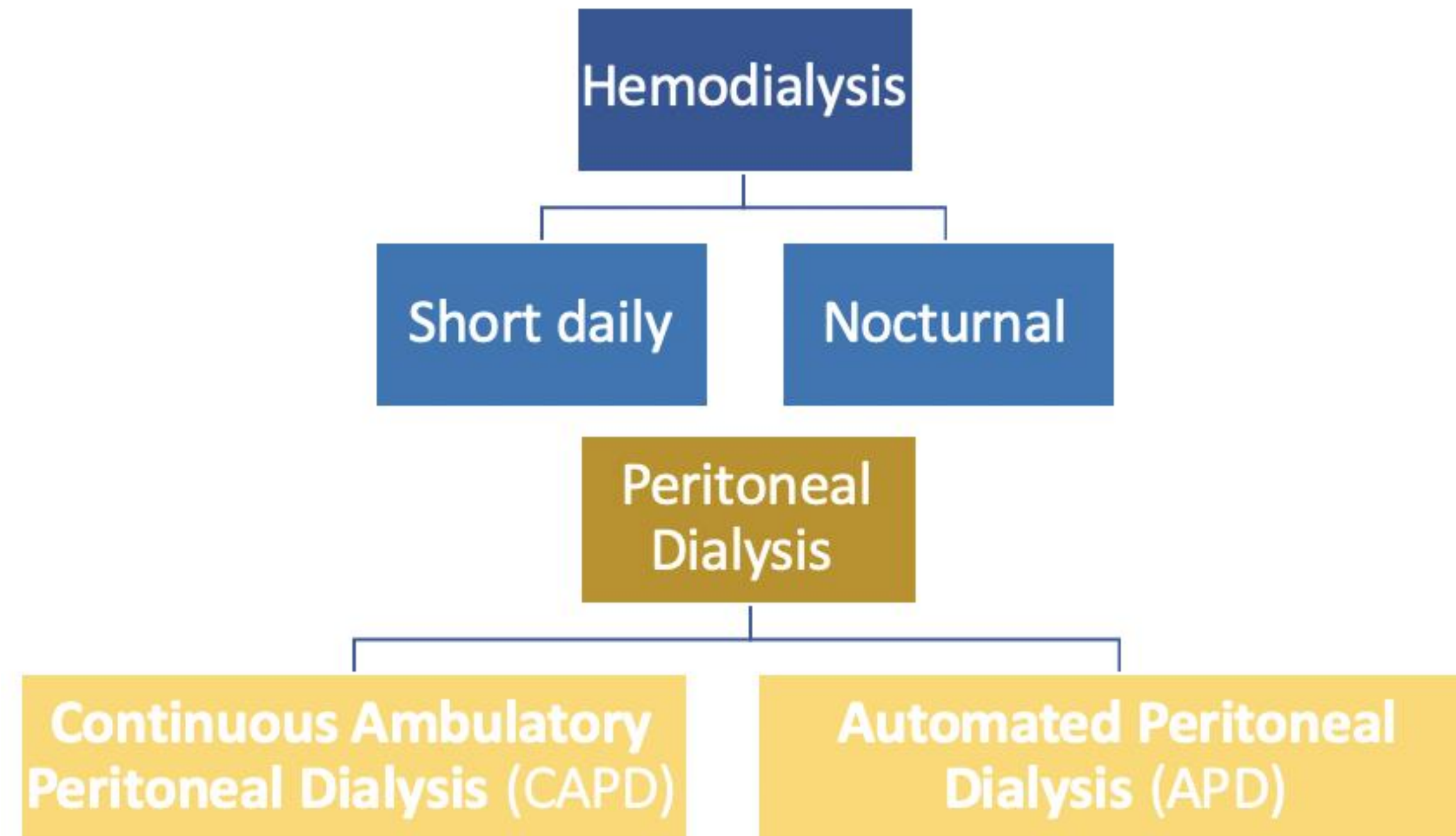


- If a patient chooses to be considered for kidney transplant, a detailed assessment will follow.
- Patients with any of the following conditions will need careful investigation by the healthcare team:
 - Heart disease
 - Peripheral vascular disease (example previous leg ulcers)
 - Gastrointestinal disease (example inflammatory bowel disease)
 - Lung disease
- A patient may not be eligible if:
 - They have major medical illnesses or are unlikely to survive the surgery
 - They will struggle to follow the post-transplant requirements
 - They have active cancer or a recent history of active cancer

Kidney Transplant

	Living Donor	Deceased Donor
Description	<ul style="list-style-type: none"> - Related or unrelated - Donors can be anonymous 	<ul style="list-style-type: none"> - Donation proceeds after death is confirmed
Consent	<ul style="list-style-type: none"> - Donor provides consent 	<ul style="list-style-type: none"> - Donor's family provides consent
Wait-Time	<ul style="list-style-type: none"> - Proceed once investigations completed - Can have transplant before dialysis is needed 	<ul style="list-style-type: none"> - Patient must be registered on waiting list - Typically 3-6 years from dialysis initiation to transplant
Post-Surgery Quality of Life	<ul style="list-style-type: none"> - Kidneys from living donors usually last longer, and have fewer complications, than kidneys from deceased donors 	

Home Dialysis – Types



These are dialysis therapies that may be completed in the comfort of your home.

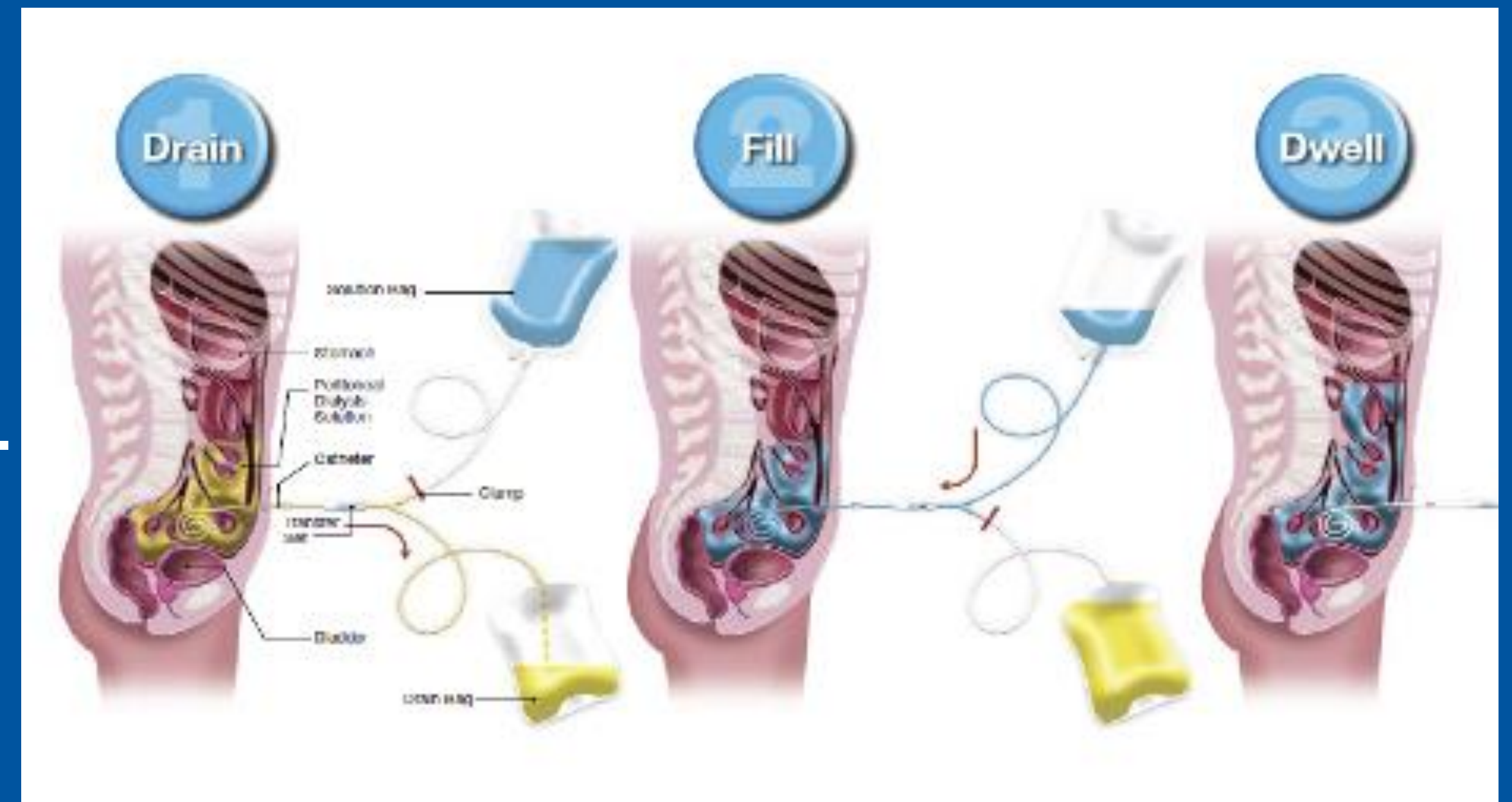
Home Dialysis – Peritoneal Dialysis (PD)



- Dialysis fluid - dialysate - enters your abdomen (peritoneal cavity) through a surgically inserted tube/catheter.
- PD uses the inner lining of your abdominal wall to clean your blood.
- Excess water and wastes pass from your blood vessels into the dialysate.
- The dialysate is then drained from your peritoneal cavity and discarded.

Home Dialysis – PD Catheter

- PD catheter insertion is generally done under general anesthesia.
- The PD catheter is inserted below and to one side your belly button. Your own skin and tissue will help keep it in place.
- PD can be started after 3-4 weeks of healing.
- It is important to take good care of this site to prevent infection.





Home Dialysis – PD Types

- There are two types of PD:
 1. Continuous Ambulatory PD (CAPD)
 - The dialysate in your abdomen is exchanged several times per day (example morning, lunchtime, dinnertime and bedtime). Each exchange takes about 30 minutes.
 2. Automated PD (APD)
 - This is carried out by an automatic cycler machine every night while you sleep. Some dialysate is usually left in your peritoneal cavity for the day.



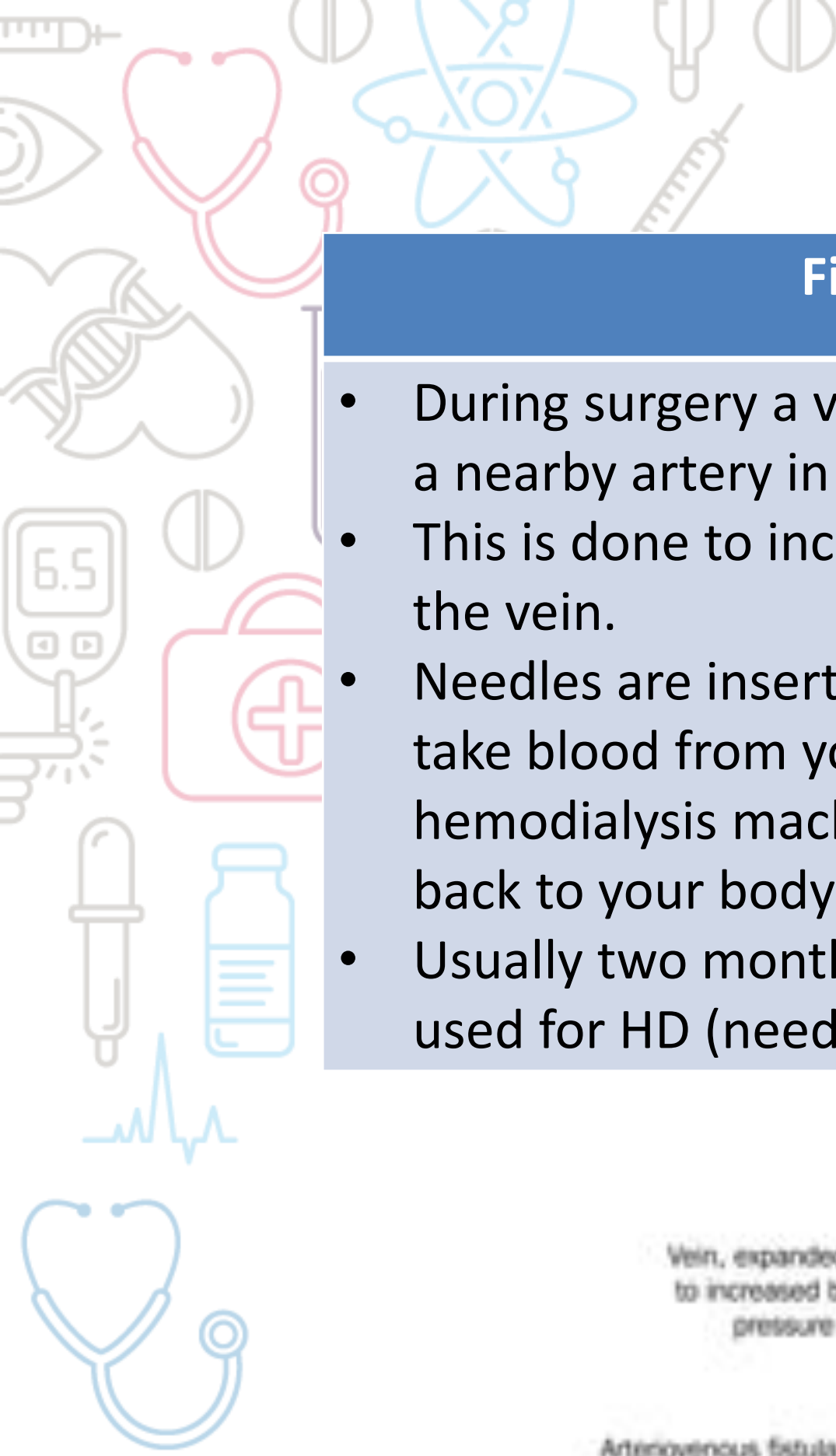
Home Dialysis – PD Benefits and Points to Consider

	Benefits	Points to Consider
<p>Continuous Ambulatory Peritoneal Dialysis (CAPD)</p> 	<p>BOTH:</p> <ul style="list-style-type: none"> • Simple and easy to learn • Independence • Fit treatment around your lifestyle • Preserves residual kidney function • Reduces exposure to hospital acquired infections including COVID-19 • Needle-free treatment • Portable and flexible • Mimics natural kidney function • Gentle on heart • Less dialysis side effects and no recovery time • Less fluid and diet restrictions <p>CAPD:</p> <ul style="list-style-type: none"> • No electricity required, which may make camping or traveling easier <p>APD:</p> <ul style="list-style-type: none"> • Treatment at night = freedom during the day 	<p>BOTH:</p> <ul style="list-style-type: none"> • Space required to store supplies • Permanent catheter in your abdomen • Some chance of infection <p>CAPD:</p> <ul style="list-style-type: none"> • Consumes more time during the day
<p>Automated Peritoneal Dialysis (APD)</p> 		

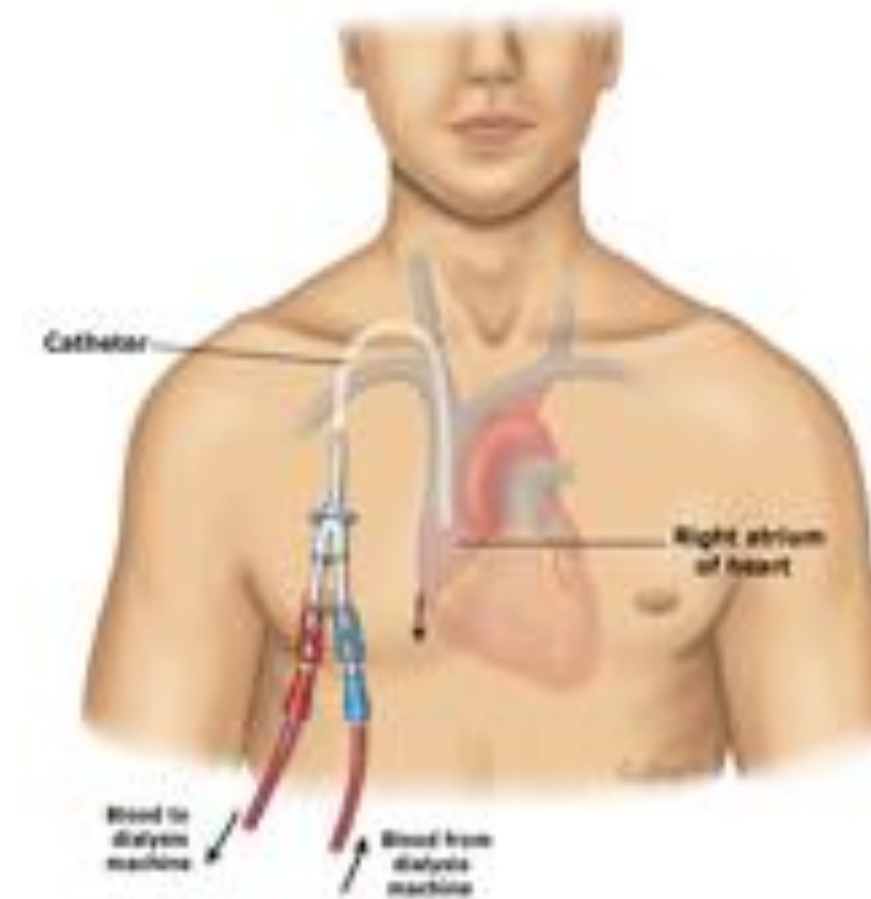
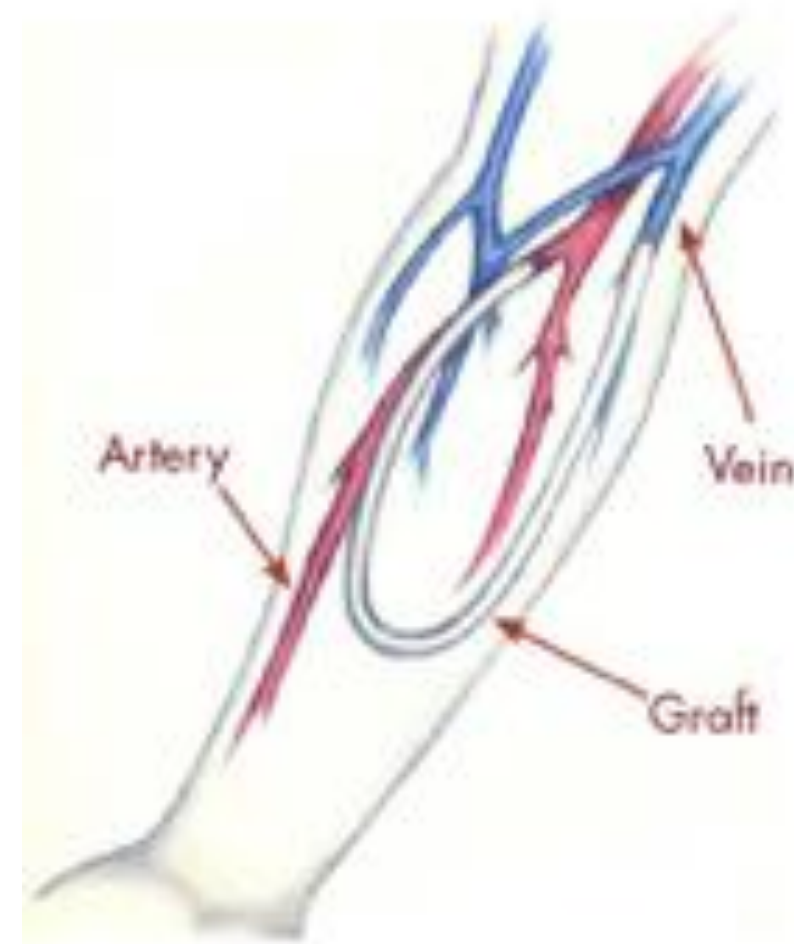
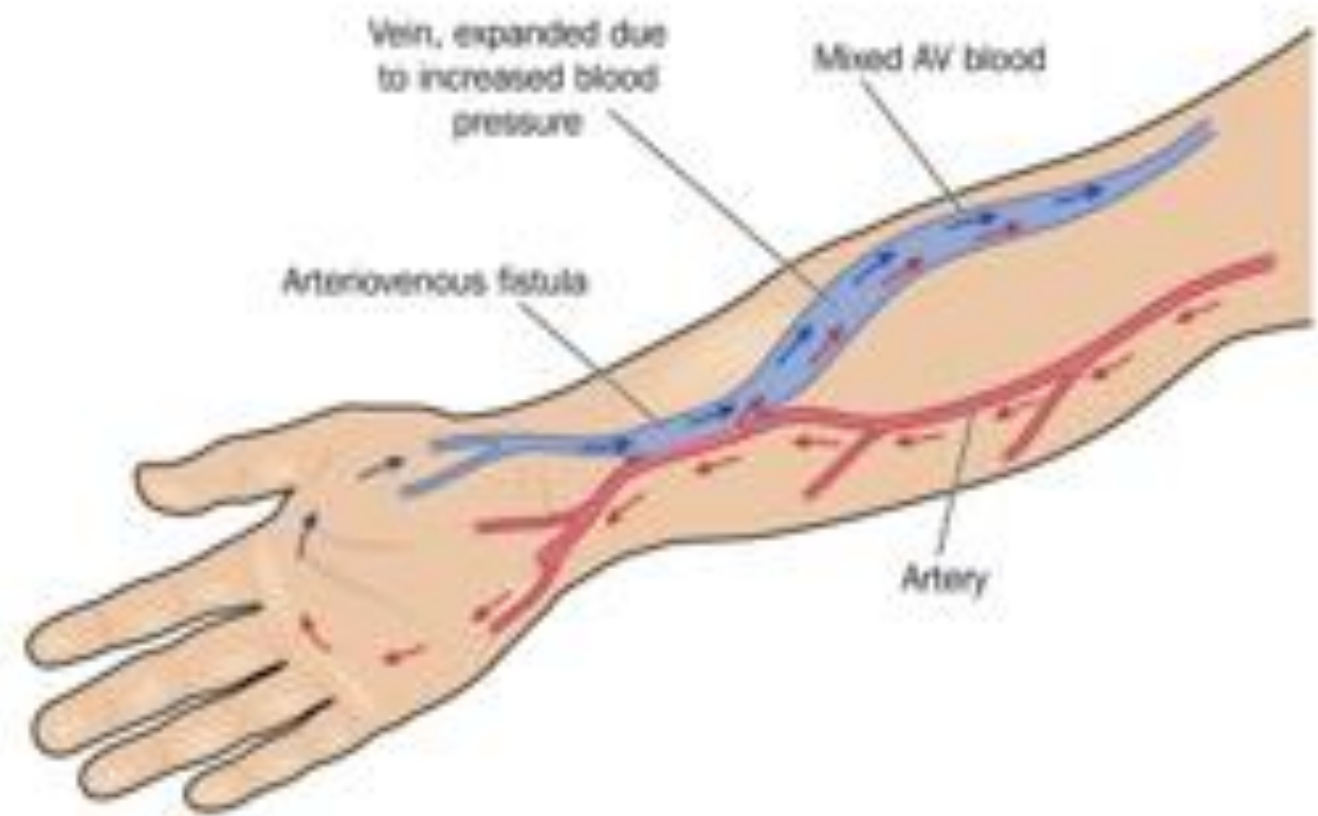
Hemodialysis – What is it?

- Hemodialysis (HD) uses a dialyzer (filter) to remove excess water and wastes from your blood. HD requires a way to get to your blood. This is called vascular access.
- There are 3 kinds of vascular access.





Fistula	Graft	Catheter
<ul style="list-style-type: none"> • During surgery a vein is connected to a nearby artery in the arm. • This is done to increase the blood flow in the vein. • Needles are inserted into the fistula to take blood from your body to the hemodialysis machine/dialyzer and then back to your body again. • Usually two months before fistula can be used for HD (needs time to develop). 	<ul style="list-style-type: none"> • During surgery a small, soft, plastic-like tube is used to connect a vein to an artery in the arm. • Needles are inserted into the graft to provide an access to the hemodialysis machine. • Can be used for dialysis just days after the procedure. 	<ul style="list-style-type: none"> • A flexible tube is inserted into a large vein (usually your internal jugular vein, a blood vessel in the side of your neck). • This tube provides an access to the hemodialysis machine. • There are higher risks of infection with this type of access.



Home Dialysis - HD

- Home HD includes:
 - **Nocturnal**
 - Dialysis treatment done while you sleep, usually 5 times per week
 - **Short Daily**
 - Shorter dialysis treatments done during waking hours, 6-7 times per week.

Home Hemodialysis

	Benefits	Points to Consider
Short Daily	<ul style="list-style-type: none"> • Less fluid and diet restrictions • Rare dialysis side effects • Minimal recovery time • Increased waste clearance • More energy 	<ul style="list-style-type: none"> • Increased utility cost (Home Hemodialysis Utility Grant available) • Takes up more free time during waking hours
Nocturnal	<ul style="list-style-type: none"> • Liberal fluid and diet intake • Rare dialysis side effects • No recovery time • The most waste clearance of all dialysis options • More energy • Easier on your heart and body • Less medications needed • Awake hours are free • Improved fertility and pregnancy outcomes for women 	<ul style="list-style-type: none"> • Increased utility cost (Home Hemodialysis Utility Grant available)

In-center HD



- For people who are unable to do dialysis at home, HD is offered at the Kingston General Hospital and various satellite sites
- A trained nurse will connect to you to the HD machine
- You will have to travel to the center for treatment
- 3 days/week
- Treatment usually lasts 4hrs, excluding preparation and post-therapy time
- Individuals receiving in-center HD have a daily fluid limit and a restricted diet to help manage fluid and waste build-up between treatments

In-center HD Satellite Sites



Napanee



Belleville



Picton



Brockville



Smiths Falls



Bancroft



Weeneebayko

In-Center HD

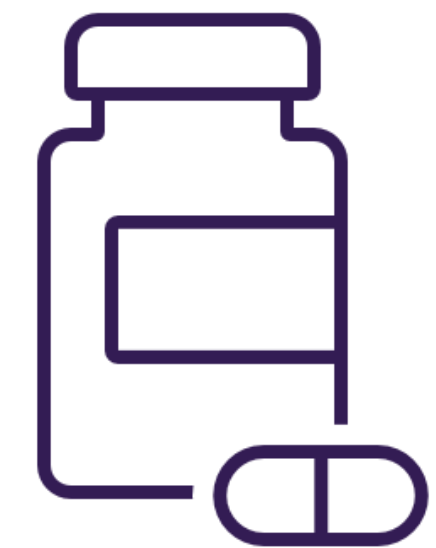
Benefits	Points to Consider
<ul style="list-style-type: none">• Support from health care providers• No home utility costs	<ul style="list-style-type: none">• Cost of transportation/parking• Fixed treatment schedule• More side effects (example low blood pressure, cramping)• Restricted diet and fluid intake• Significant recovery time from each treatment• Major fluctuations in body fluids and blood pressure between treatments, which can cause:<ul style="list-style-type: none">• Electrolyte imbalances• Stiffening of blood vessel walls• Increased heart-related complications

Dialysis Comparison

	Peritoneal dialysis		Hemodialysis		
	CAPD (Home)	APD (Home)	Short Hour Daily (Home)	Frequent Nocturnal (Home)	In-Centre
Days/Week	7	7	6-7	5	3
Times/Day	4 exchanges	0 *done at night	1	0 *done at night	1
Typical Treatment Time	Approx. 30 minutes per exchange	8-10 hrs	Approx. 3 hrs	Approx 7 hrs	4 hrs + travel time
Side Effects?	Less	Less	Less	Less	More
Recovery Time	/	/	/	/	Several hours

Conservative Care (Non-Dialysis Supportive Care)

- This is for patients who choose not to pursue kidney transplant or dialysis treatment
- The focus is on quality of life and symptom control
- The healthcare team will help you:
 - ❖ Use medication and diet to slow kidney function decline
 - ❖ Manage symptoms
- The team is also there to provide support for you and your family as you plan for the end of life (palliative care team may become involved)



Conservative Care Continued – Why People Choose This



- Have other serious medical conditions that are life-limiting
- Feel the burden and discomfort of dialysis outweighs the potential benefits
- Feel they will have a greater quality of life for the remaining time they have
- Doctor recommended as they feel dialysis will not provide further benefit

Things to Think About When Choosing Your Dialysis Treatment

- Independence:
 - Do you prefer to manage your own health?
- Lifestyle:
 - Do you work or are you in school?
 - Do you have young children or grandchildren?
 - Do you like traveling or want to travel more?
- Restrictions & Side Effects:
 - In-center HD has more restrictions overall and you are more likely to experience dialysis side effects
- Home environment:
 - How far away is your home from the nearest treatment center?
 - Do you have support at home?
 - Do you have storage space for supplies in your home?



Peer Support Group

- The Kidney Connect Program
- To request peer support, call: 1-866-390-PEER (7337) or use online form
- You can speak with someone who understands what it is like to live with kidney disease and is willing to share their personal experience with you.



Great Resources for You

- kidneydialysis.ca
- kidneycampus.ca (See Dialysis Snapshot Quiz)
- www.homedialysis.org
- www.ontariorenalnetwork.ca
- www.kidney.ca
- www.giftoflife.ca



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Kingston Health
Sciences Centre

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- Baxter Corporation

The logo for Baxter Corporation, featuring the word "Baxter" in a bold, italicized, blue sans-serif font.

- Fresenius Medical Care Canada

The logo for Fresenius Kidney Care, consisting of a stylized blue icon of three downward-pointing chevrons to the left of the text "FRESENIUS KIDNEY CARE" in a bold, blue, sans-serif font.

Glossary

- **Anemia:** A deficiency in red blood cell, the amount and quality of hemoglobin, decreased hematocrit or a combination of these.
- **Anesthesia:** Local and regional anesthetics eliminate the sensation of pain to a specific part of the body without loss of protective reflexes or consciousness. The goals of general anesthesia are analgesia (pain relief), amnesia/hypnosis (forgetfulness), suppression of autonomic and sensory reflexes, and skeletal muscle relaxation.
- **Blood pressure:** the force of the blood acting on the walls of the blood vessel
- **Cancer:** uncontrolled and unregulated growth of cells

Glossary

- **Chronic kidney disease:** the progressive, irreversible destruction of the kidney, leading to loss of function, usually classified into 5 stages, depending on the glomerular filtration rate.
- **Dialysate:** Dialysate solution is a nonsterile aqueous electrolyte solution that is similar to the normal levels of electrolytes found in extracellular fluid with the exception of the buffer bicarbonate and potassium.
- **Dialysis:** a process used to correct fluid and electrolyte imbalance in renal disease
- **Diverticulitis:** the inflammation or infection in the pouches of the intestine
- **Electrolyte:** substances that present as ions in solutions, essential for the body to function normally

Glossary

- **Fistula:** A passage that is formed between parts of the body
- **Glomerular filtration rate (GFR):** the amount of the blood filtered by the kidney in a set amount of time
- **Graft:** an access made by using a soft tube to join an artery and vein for the purpose of providing access for dialysis
- **Hemodialysis (HD):** a type of dialysis that uses a machine to remove waste product and excessive fluid from the body by pumping the blood through an artificial membrane inside the hemodialysis machine
- **Hernia:** a bump of the organ (usually intestine) through an abdominal opening or a weakened area of the walls of cavity where it is normal contained
- **Inflammatory bowel disease (IBD):** an autoimmune disease characterized by inflammation and ulceration of the digestive system

Glossary

- **Ischemic heart disease (IHD):** Ischemia is the inadequate blood supply to a local area due to the blockage of the blood vessels supplying the area, therefore an organ is not receiving the necessary blood and oxygen. Ischemic heart disease is caused by narrowed coronary arteries that supply blood to the heart muscle.
- **Palliative care:** Medical care that relieves pain, symptoms and stress caused by a serious illness to improve the quality of life.
- **Peripheral Vascular Disease:** Peripheral vascular disease is divided into peripheral artery disease (PAD) and peripheral venous disease. PAD may require critical care admission for an acute thrombotic (clot) occlusion or after a vascular surgical procedure. PAD can occur in any peripheral artery (blood vessels in the arms and legs). It is especially painful in the arteries that supply the lower extremities.

Glossary

- **Peritoneal Dialysis (PD):** a type of dialysis that uses the body's peritoneal membrane. Dialysis fluid is infused into the peritoneal cavity, excessive fluid and waste product can then pass through the membrane into the dialysis fluid, which is drained out of the body.
- **Uremia:** a combination of signs and symptoms from the buildup of waste products and excessive fluid from kidney disease.
- **Restless leg syndrome:** a syndrome characterized by unpleasant sensory and motor abnormalities of one or both legs
- **Seizures:** a temporary, uncontrolled electrical activity of the brain that disrupts normal function