

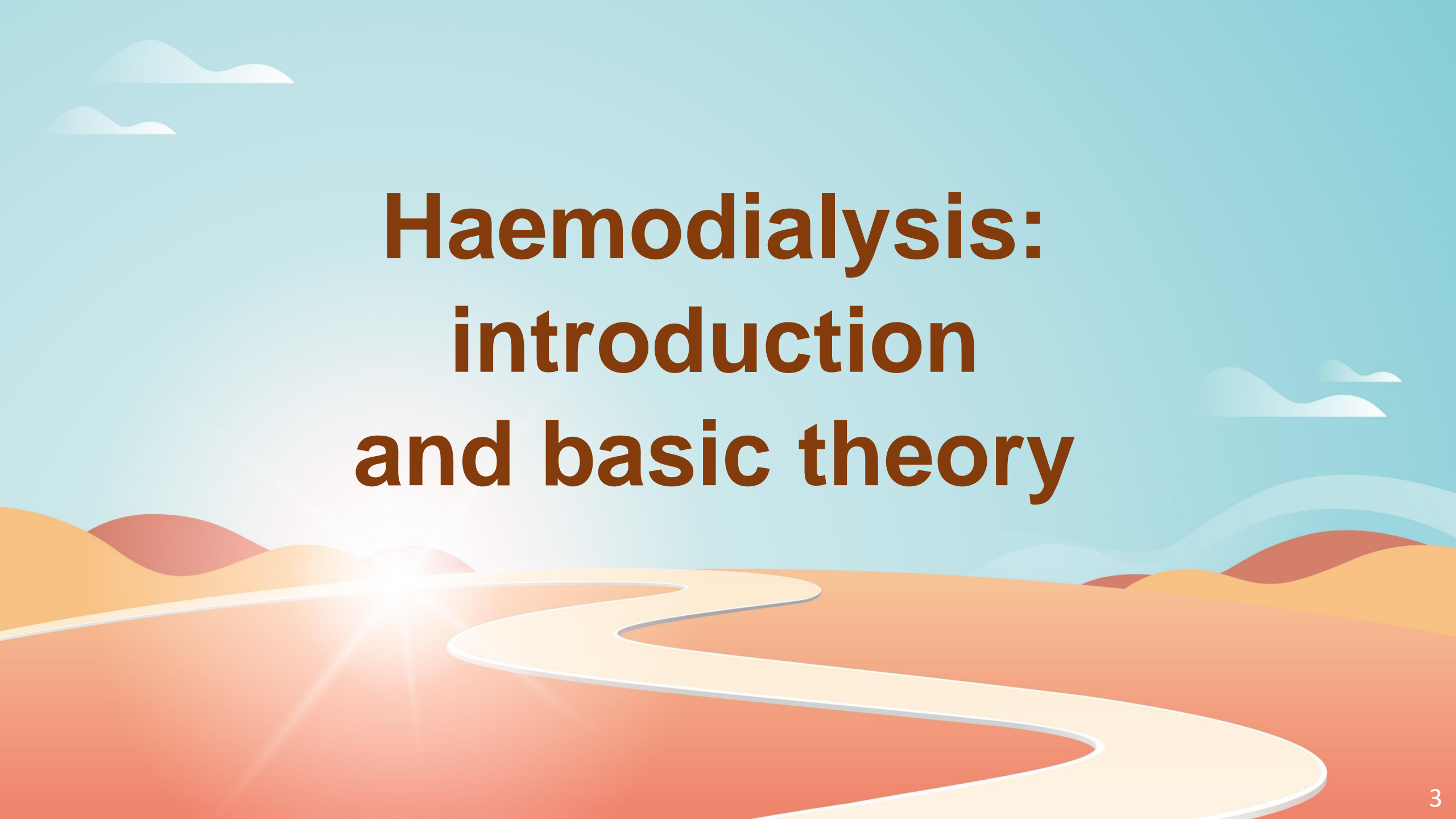


Everyone talking - A life journey with your kidneys
First series 5th episode: 30 Nov 2021

The doubts about Haemodialysis

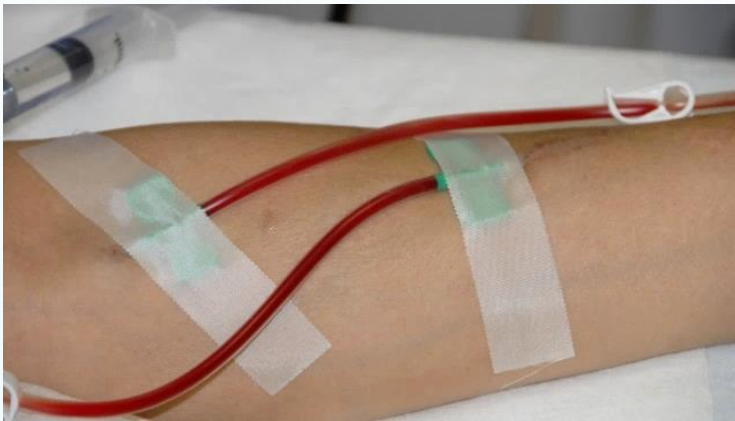
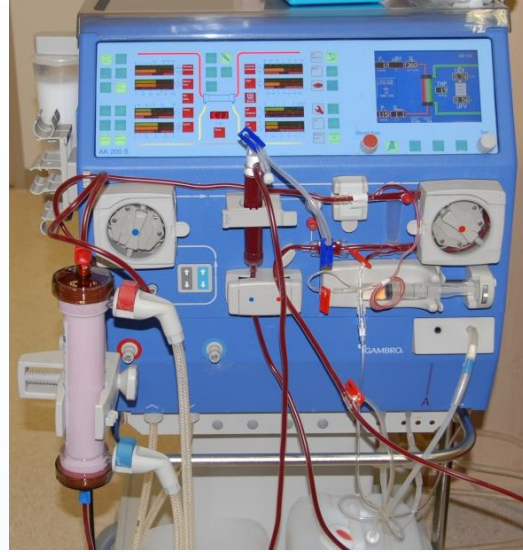
Guest speakers: Dr. Maggie Mok, Ms. Janet S C Li
Host: Dr. Samuel Fung Ms. Maggie Lee



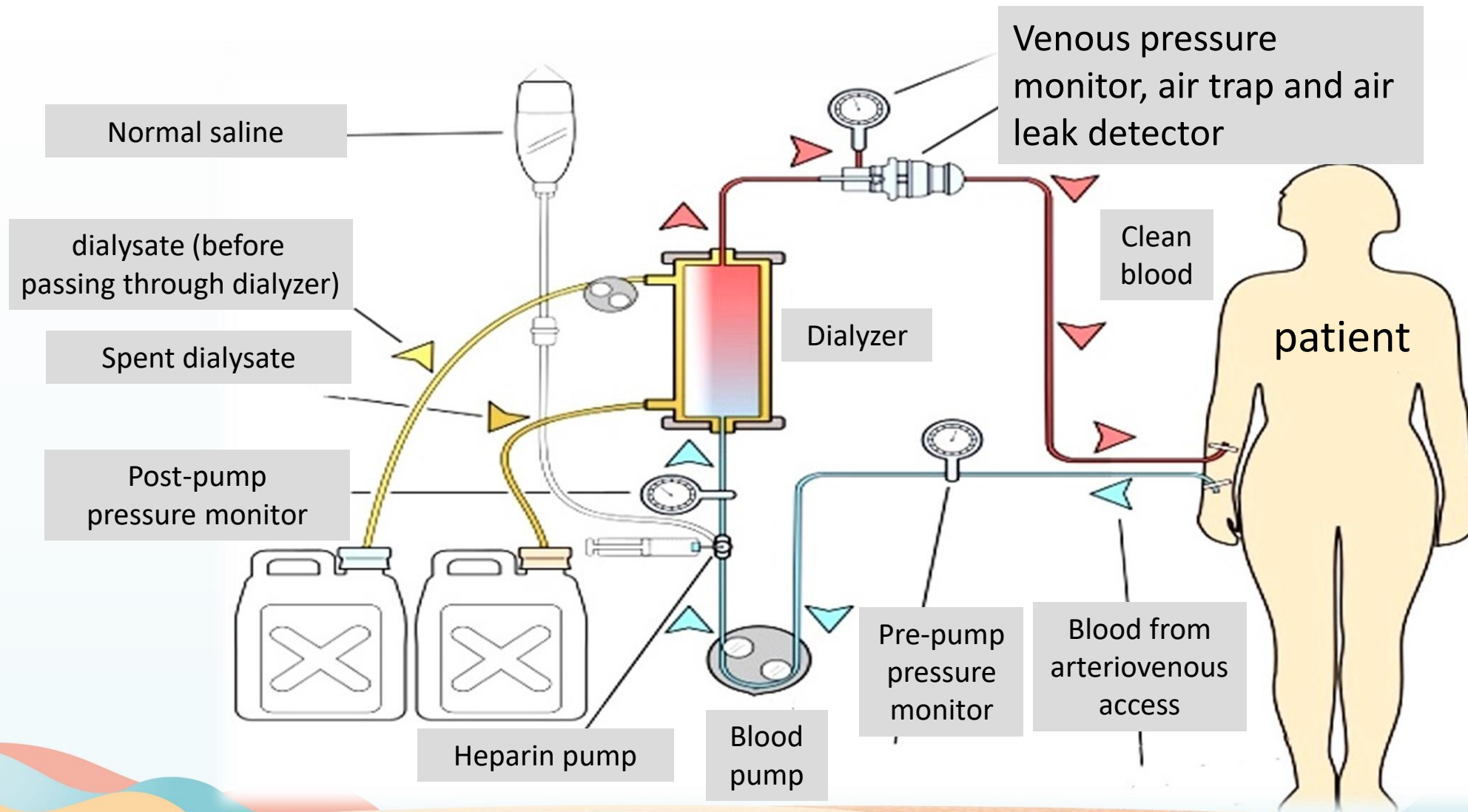
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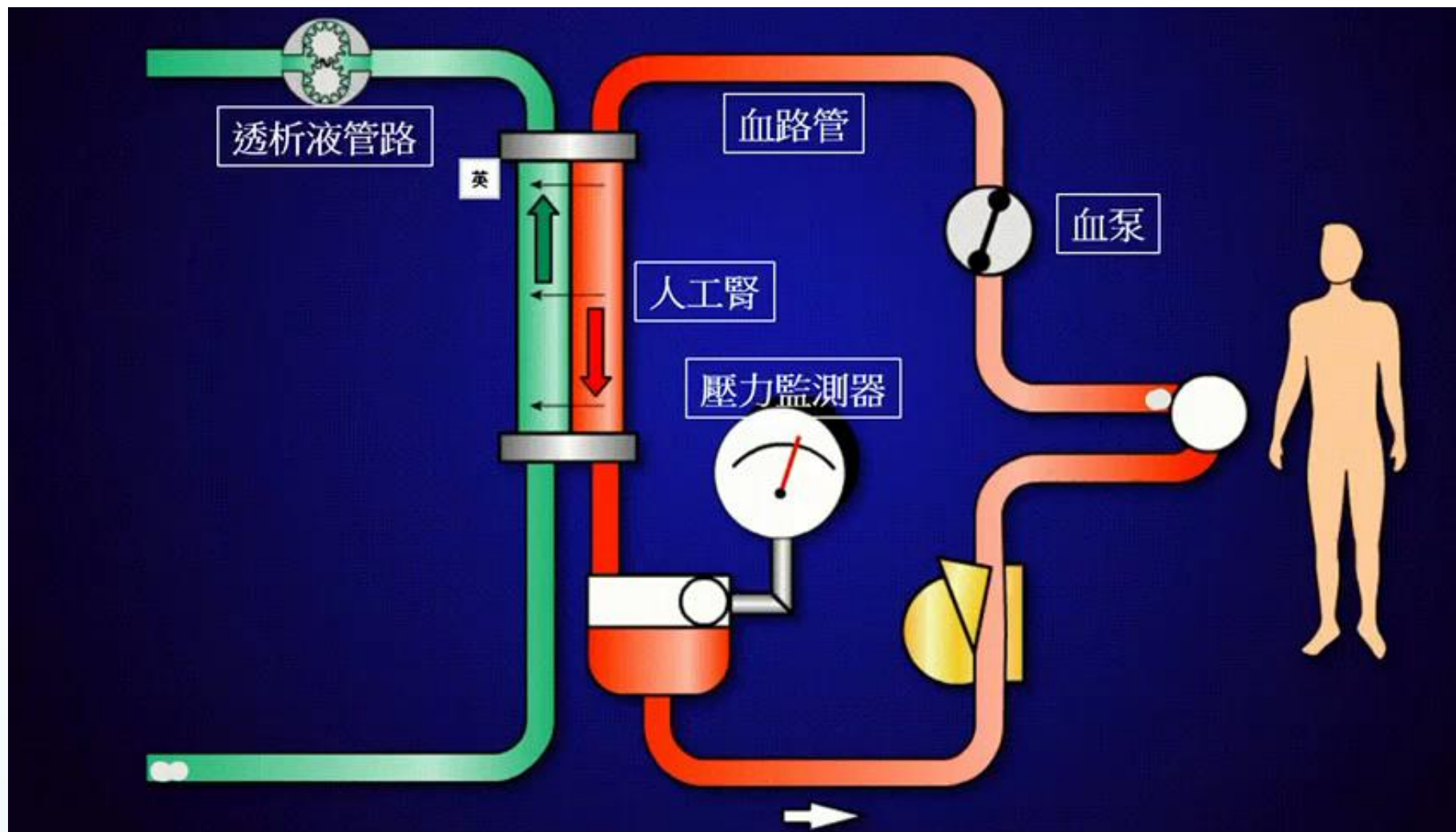
Haemodialysis: introduction and basic theory

What is haemodialysis?



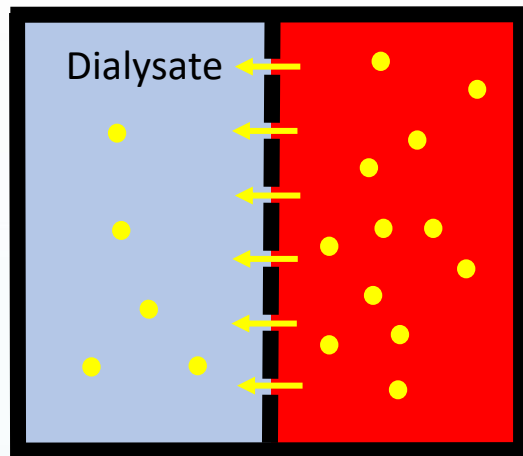
What is haemodialysis?





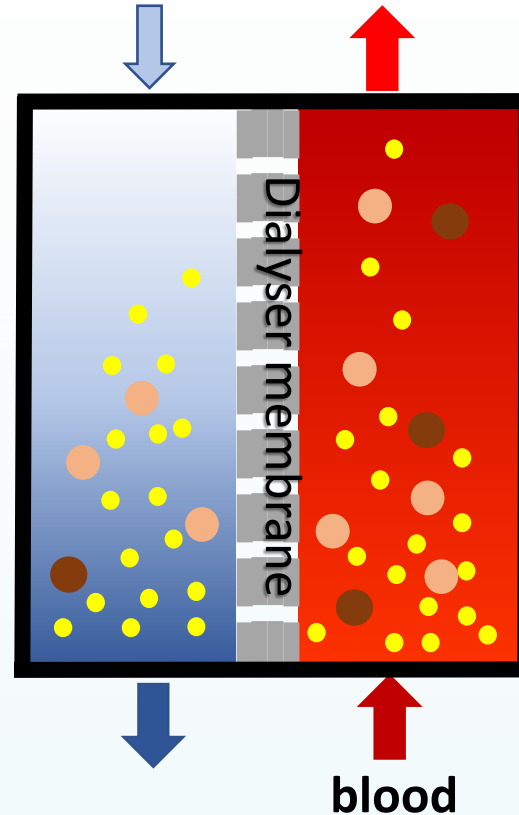
Principles of Haemodialysis

Diffusion

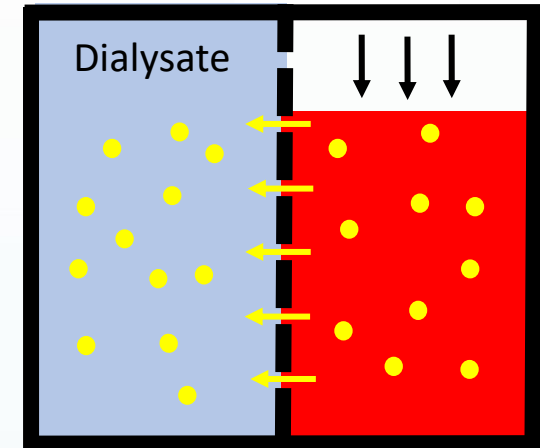


Uremic waste products will pass from blood to dialysate down a concentration gradient


dialysate



Convection



Dialysis machine will exert pressure to the blood so that excess fluid will pass from a high osmotic gradient down to a low osmotic gradient, carrying larger uremic waste products together

The background is a stylized landscape. A winding path in shades of orange and yellow leads from the bottom left towards a bright sun on the horizon. The sun creates a lens flare effect. The sky is a light blue with a few white clouds. The hills in the background are also in shades of orange and red.

Haemodialysis Service in Hong Kong

Haemodialysis Service in Hong Kong

- Hemodialysis units in public hospitals under the Hospital Authority
- Hemodialysis Public-Private Partnership Programme
Patients can choose to receive hemodialysis service in hemodialysis centers in the community
- Charity funded hemodialysis units
- Home Nocturnal Hemodialysis subsidized by the Hospital Authority and the Hong Kong Kidney Foundation and Hong Kong Jockey Club
- Hemodialysis units in private hospitals



Acute haemodialysis service

- For treatment of patients with drug overdose, renal failure with complications such as fluid overload, metabolic acidosis, hyperkalemia, uremia
- A temporary central venous catheter has to be inserted for hemodialysis
- Treatment in hospital



Higher treatment risk
Do not delay dialysis
treatment

Long-term chronic haemodialysis

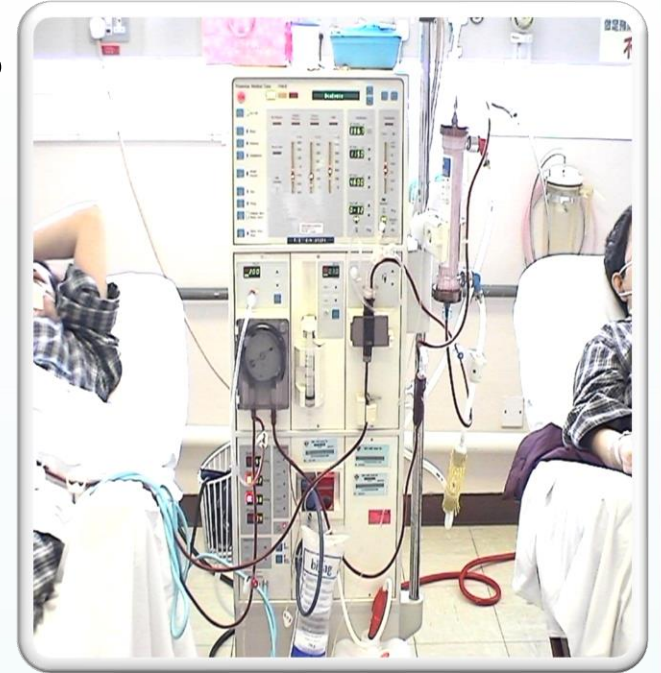
End-stage renal failure patients requiring long-term hemodialysis:

- Not suitable for peritoneal dialysis
- Failure of peritoneum
 - Inadequate waste or fluid clearance
 - Multiple episodes of peritonitis
 - Other health conditions rendering the patient unsuitable for peritoneal dialysis



Long-term chronic haemodialysis

- Need to create an arteriovenous access by surgery or implant a central venous catheter
- 2-3 hemodialysis sessions per week, 4-6 hour per session
- Need to return to hemodialysis unit regularly and on time for treatment

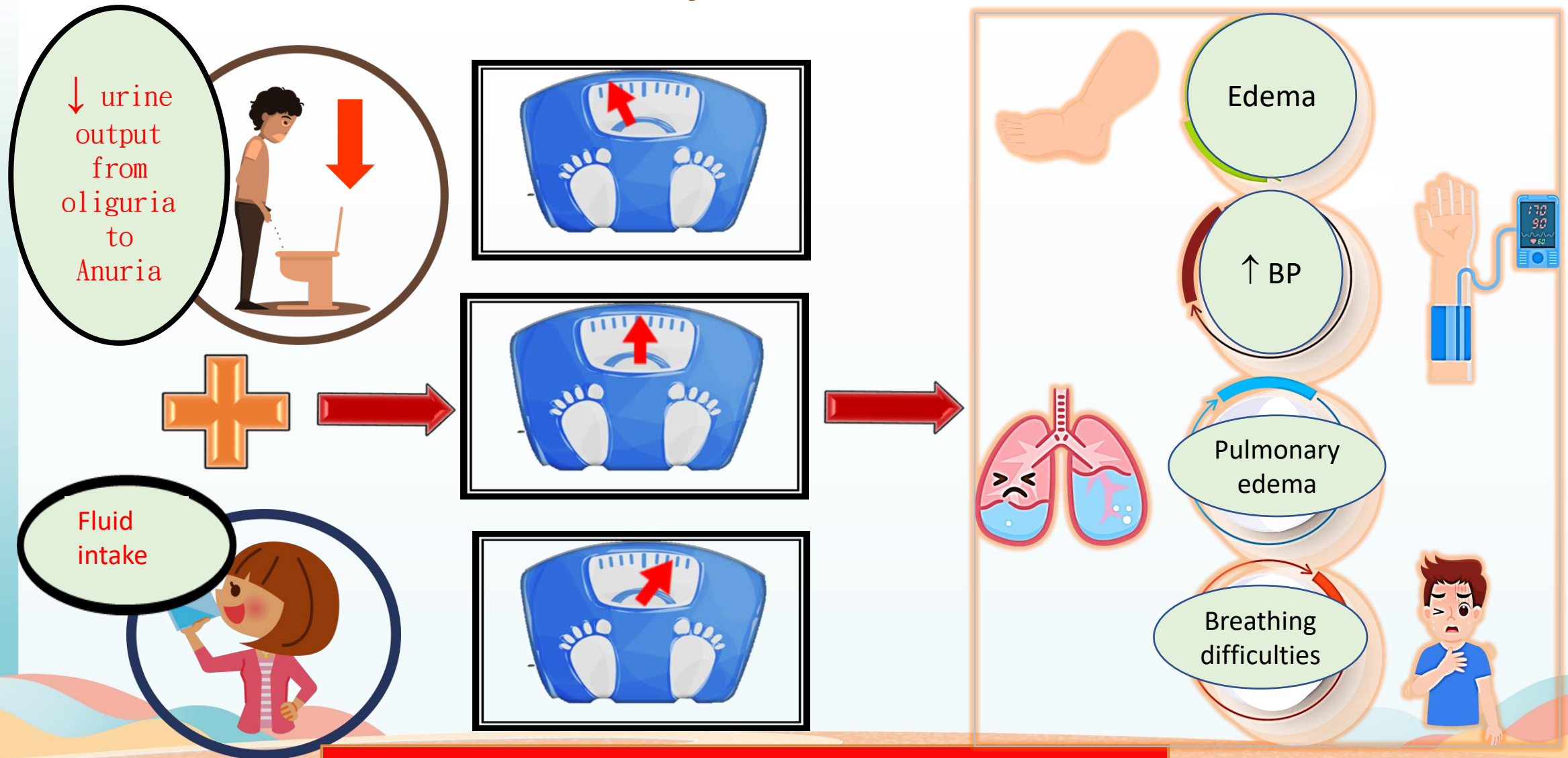




Patients on Haemodialysis

Special attentions !

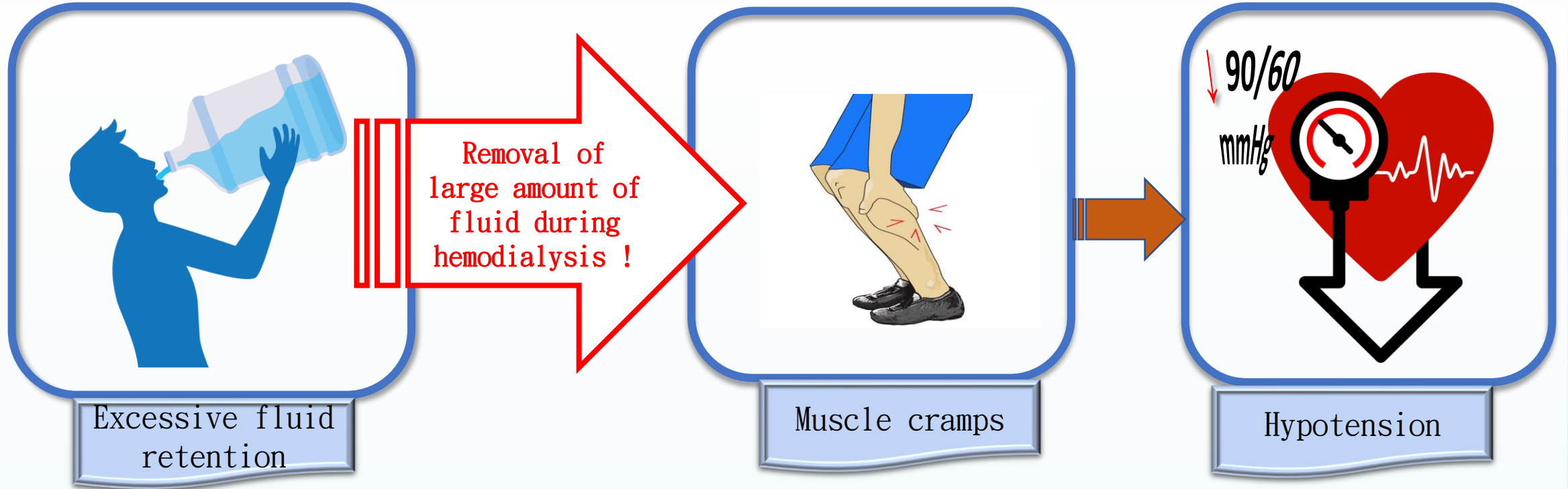
Limit daily fluid intake(1)



Surge in Inter-dialytic Body Weight (IDBW) due to fluid retention

Dreamstime.com

Limit daily fluid intake(2)



Limit BW gain to $\leq 1\text{kg}$ per day
between dialysis treatment

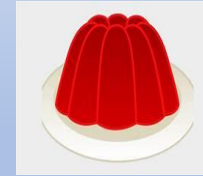


Limit daily fluid intake(3)

Fluid
intake



=



Optimal UF Goal setting is 2-3kg per each HD treatment
Target post HD weight = Dry Weight

UF (ultrafiltration)

What is Dry weight (DW) ?

DW is the Body weight without any extra fluid
When excessive fluid is removed from body;
With no signs of overhydration nor dehydration;
BP within normal range.

Misconception about Dry Weight

Overhydration → increase in body weight (↑ BW) 

• ↑ BW = Overhydration ?  

↑ **Muscle; fat; fluid** → **weight gain !!!**

Dehydration → decrease in body weight (↓ BW) 

• ↓ BW = Dehydration ?  

↓ **Muscle; fat; fluid** → **weight loss !!!**

Reasons for normal weight loss:

- Poor appetite
- Physical discomfort
- ↓ muscle mass
- ↓ fat deposits
- ...





























Reasons for normal weight gain:

- Good appetite
- ↑ muscle mass
- ↑ fat deposits
- ...

Dry Weight

- Not a constant value.
- Continuous assessment & adjustment is required.

Avoid foods high in Potassium

HIGH POTASSIUM FOODS		
Fruits	Vegetables	Other
<small>Serving size: ½ cup fresh or canned or 1 small piece 1/4c dried fruit</small>	<small>Serving size: ½ cup cooked or 1 cup raw</small>	
 Oranges & Orange Juice	 Bananas	 Greens (Beet / Spinach)
 Kiwi	 Mango	 White & Sweet Potatoes
 Cantaloupe	 Tomatoes & Tomato Juice	 Chocolate
 Nectarines	 Artichoke	 Nuts & Seeds
 Dried Fruits	 Avocado	 Milk & Soy Milk
 Raisins	 Broccoli	 Yogurt
 Pomegranate	 Squash Winter & Summer	 Raisin Bran
	 Pumpkin	 French Fries & Potato Chips
	 Bok Choy	 Salt Substitute
		 Coconut Water & Coconut Milk



<https://www.printablee.com>

Signs & Symptoms

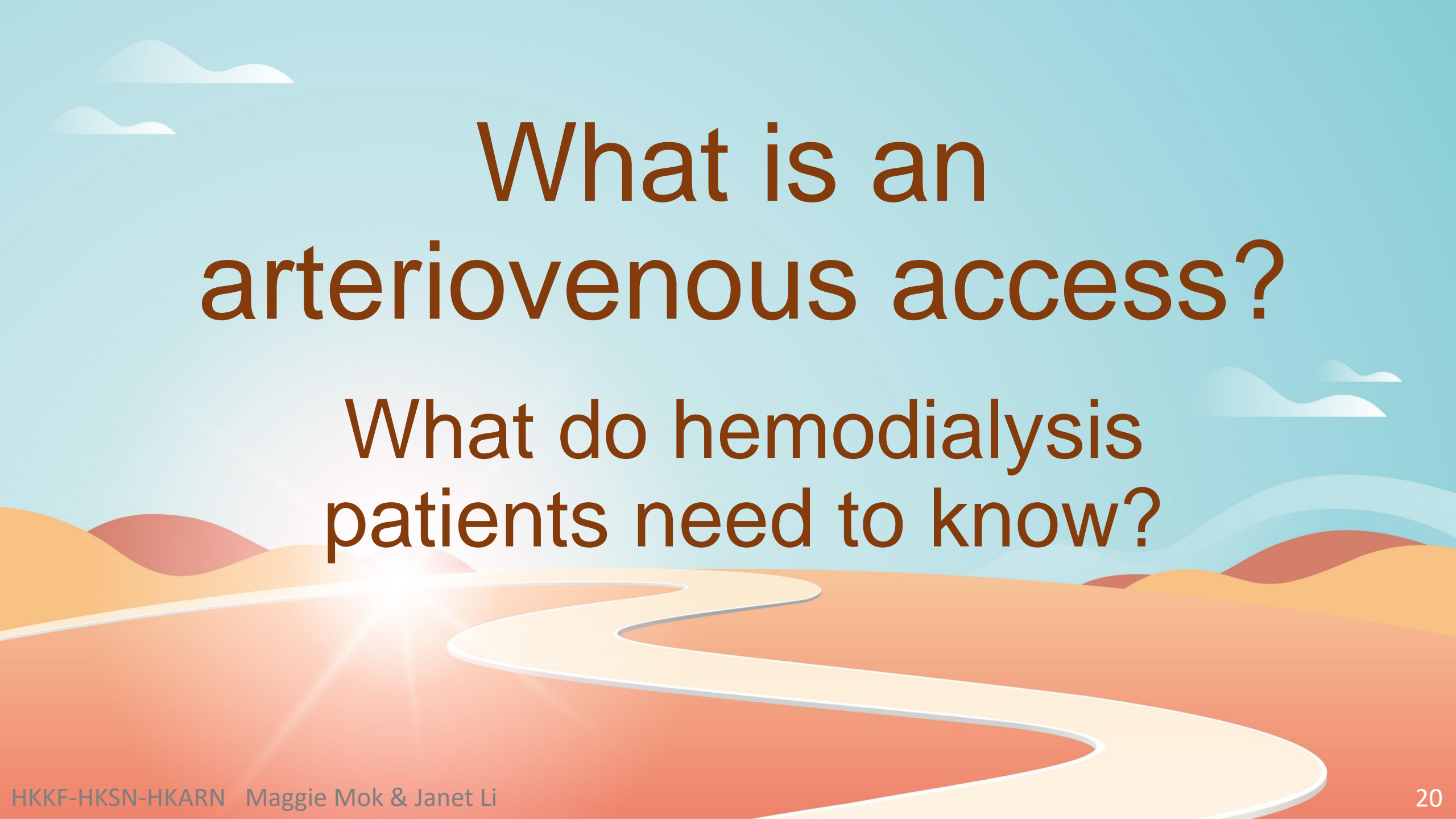
Muscle weakness; Numbness & tingling
Nauseas & vomiting; stomach pain; diarrhea



Irregular
heartbeat



Cardiac arrest

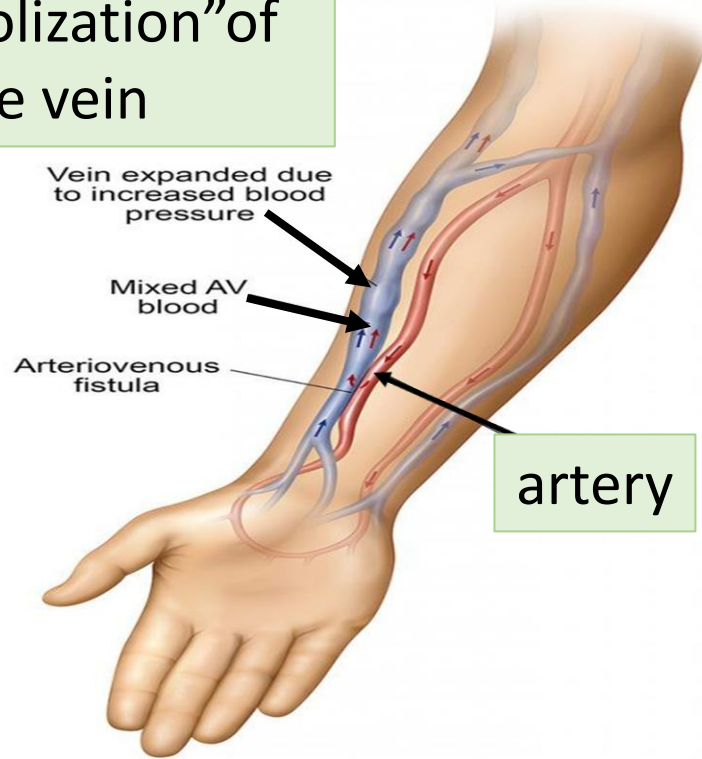
The background of the slide features a stylized landscape. A winding path in shades of orange and yellow leads from the bottom left towards the center. The path is bordered by rolling hills in various shades of orange, red, and yellow. In the upper left corner, there are a few white, fluffy clouds against a light blue sky. A bright sun is positioned on the left side, partially obscured by the path, creating a lens flare effect with rays of light extending across the scene.

What is an arteriovenous access?

What do hemodialysis patients need to know?

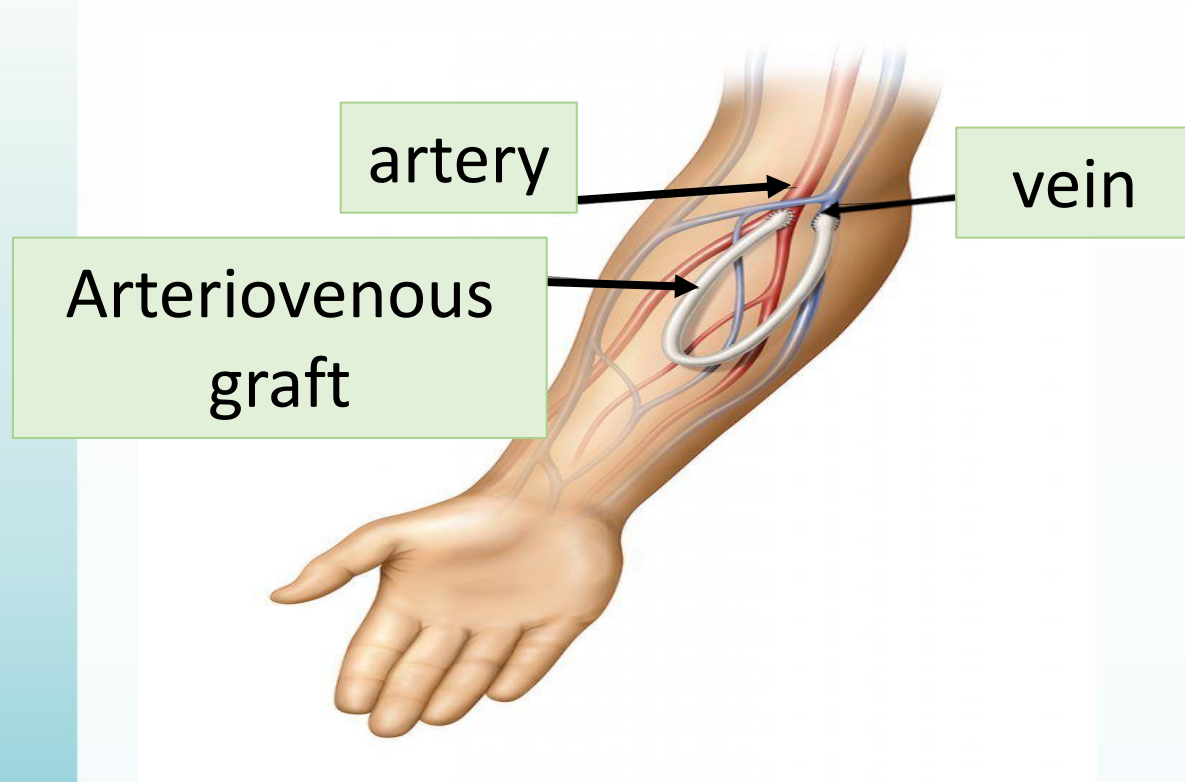
Arteriovenous fistula

“Arteriolization” of
the vein



Requires 4-8 weeks
for maturation to
be ready for use

Arteriovenous fistula



Requires around 4 weeks for maturation.
Suitable for those with small vessels

Vascular Access (lifeline) - Daily checks



Arteriovenous
Graft (AVG)



Arteriovenous
Fistula (AVF)



Inspect

- Note for any oozing of blood, hematoma (particularly post HD)
- Signs of infection: redness, swelling, pain, warmth, pus around the site, and fever



Touch

- Feel for the 'thrill' which is the motion of the blood flow.
- Report to dialysis center ASAP if unable to feel the usual buzzing or if it weakens.



Listen or use a stethoscope

- Normal sound is called the 'bruit' , a whooshing noise.
- Report to dialysis center ASAP if unable to hear or change to a whistle-like sound.

Vascular Access (lifeline) - Daily checks



Arteriovenous
Graft (AVG)



Arteriovenous Fistula
(AVF)

Care of fistula/graft

- Keep the skin over AVF/G clean.
- Avoid injury to the AVF/G.
- Protect access arm:
 - Ensure no obstruction of blood flow.
 - No blood pressure taking, blood taking or IV infusion.
 - Avoid sleeping on access arm.
 - Avoid wearing tight clothing, jewelry or watch.
- Cover the puncture sites with clean gauze / band-aid for at least 6 hrs post HD & keep dry to avoid infection.

Excessive fluid removal
during HD

Severe dehydration

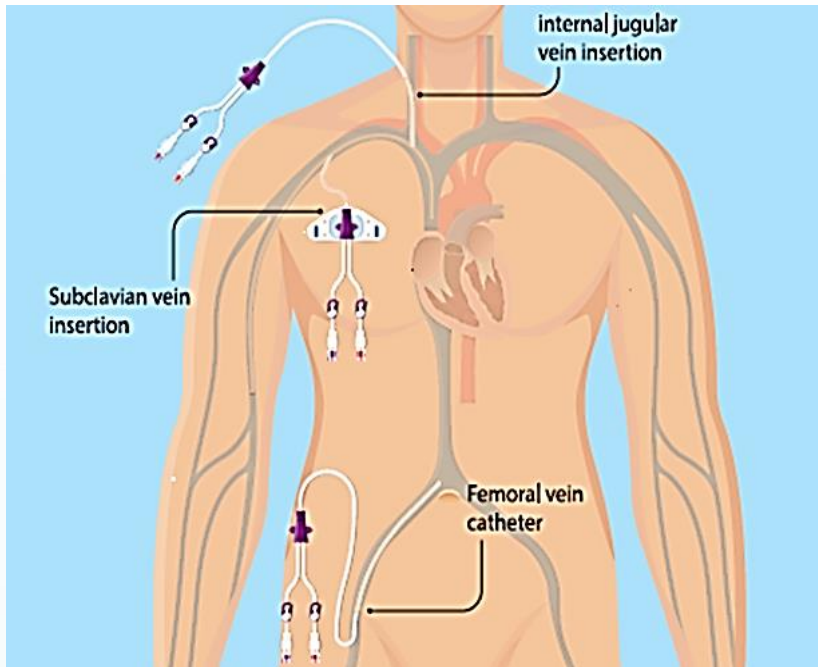
&

Hypotension at any time



AVF/G THROMBOSIS

Central venous catheters



- Usual positions: internal jugular vein, femoral vein, subclavian vein
- Can be used immediately
- For those requiring urgent hemodialysis or for long-term use in those who are unable to create an arteriovenous fistula/graft

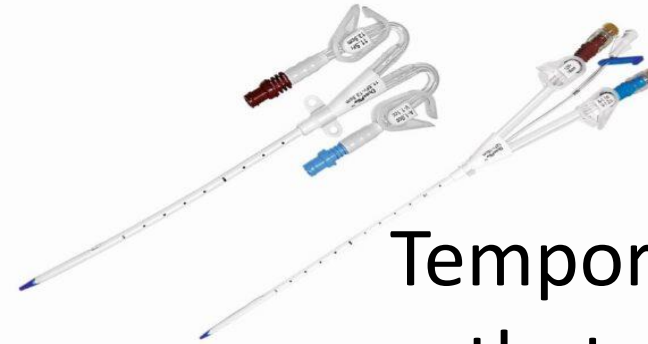


- *High infection risk*
- *May damage blood vessels leading to venous stenosis*

http://www.medcompnet.com/products/long_term/split_cath.html IskuHealth.com

<https://www.kidneycareuk.org/about-kidney-health/treatments/dialysis/haemodialysis/inserting-your-tunnelled-haemodialysis-catheter-permcath/>

Central venous catheters



Temporary hemodialysis catheters

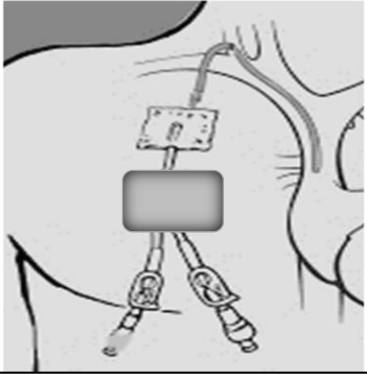


Hemodialysis catheters for longer term use



http://www.medcompnet.com/products/long_term/split_cath.html Iskushealth.com
<https://www.kidneycareuk.org/about-kidney-health/treatments/dialysis/haemodialysis/inserting-your-tunnelled-haemodialysis-catheter-permcath/>
<https://meditechdevices.com/products/nephrology/dialysis-catheter/>

Central venous catheters (lifeline) - Daily checks



Internal Jugular catheter



Femoral dialysis catheter



Observation:

Keep the dressing dry & catheter clean ◦

Monitor daily body temperature, observe for S/S of infection such as pus or blood stained dressing ; fever; redness, crust , pain & swelling at exit site.

If found, Inform dialysis center ASAP



Avoid :

Dampening the catheter dressing, cover it with plastic when shower, Do not take bath.

Pulling of catheter- not to wear pull-over tops

Sleeping on the side of catheter ◦



Abnormal events:

Sudden swelling of neck, breathing difficulties, catheter falls out or slips partially out.

Attend A&E ASAP ◦

The background of the slide is a stylized, colorful illustration. It features a light blue sky with a few white, fluffy clouds. In the foreground, there's a bright sun or light source on the left, casting a warm glow and creating a lens flare effect. A winding, light-colored path or road curves through a landscape of rolling hills in shades of orange, yellow, and red. The overall style is clean and modern, with a focus on warm, inviting colors.

Haemodialysis

Is it good or bad?

What are the complications??

Advantages of haemodialysis

- **Rapid** clearance of uremic waste products and fluid
- More effective in renal failure patients who are pregnant, sepsis or obese



This Photo by Unknown Author is licensed under CC BY-SA

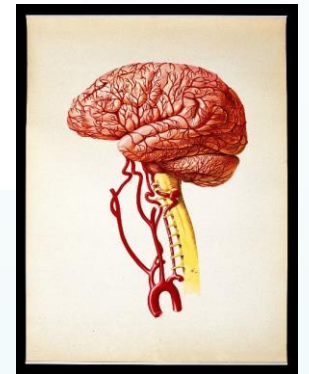
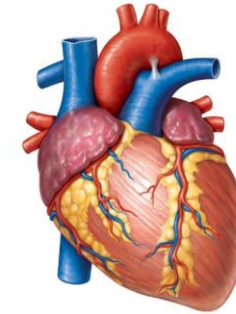
Advantages of haemodialysis

- Need to return to hemodialysis units 2-3 times per week
- May feel discomfort after hemodialysis, complications of hemodialysis
- Expensive, need more medical manpower and resources
- More restrictions in fluid and diet



Complications of Hemodialysis





1. Low blood pressure
2. Muscle cramps
3. Dialysis disequilibrium syndrome
(early after starting haemodialysis treatment)
4. Complications related to vascular access
- infection, bleeding, thrombosis
5. Air embolism
6. Risk of cardiovascular diseases, arrhythmia,
stroke during haemodialysis treatment





What is Home Haemodialysis ?



	Hemodialysis center	Venue		Home HD  
	<p align="center"><u>Unlimited Quota</u> Must fulfil the treatment criteria according to HKHA Hemodialysis policy</p>	<p align="center">Quota & Selection Criteria</p>		<p align="center"><u>Limited Quota</u> A joint partnership program by HK Hospital Authority & Charitable funding Selection criteria is required</p>
	<p align="center">2–3 treatment /week 4-6 hours/treatment To follow the center schedule</p>	<p align="center">Treatment schedule & Flexibility</p>		<p align="center">Treatment at alternate night 6–9 hours /treatment Self -schedule</p>
	<p align="center">Achieve target</p>	<p align="center">Adequacy of dialysis</p>		<p align="center">Usually above target</p>
	<p align="center">Not important</p>	<p align="center">HD knowledge</p>		<p align="center">Very important to learn</p>
	<p align="center">More restriction</p>	<p align="center">Dietary restriction</p>		<p align="center">Less restriction</p>
	<p align="center">Not require</p>	<p align="center">Home modification</p>		<p align="center">May require</p>
	<p align="center">~ 1000-1500/ month</p>	<p align="center">Expenses HK\$</p>		<p align="center">~1000 -1700/month</p>

Home Haemodialysis

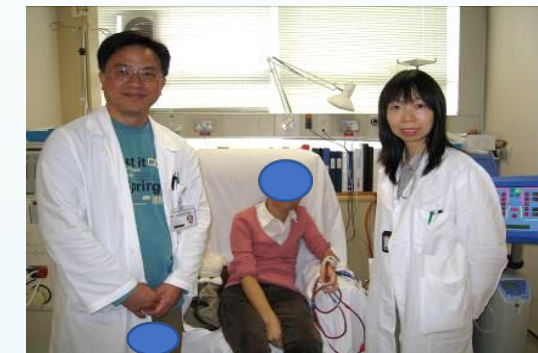
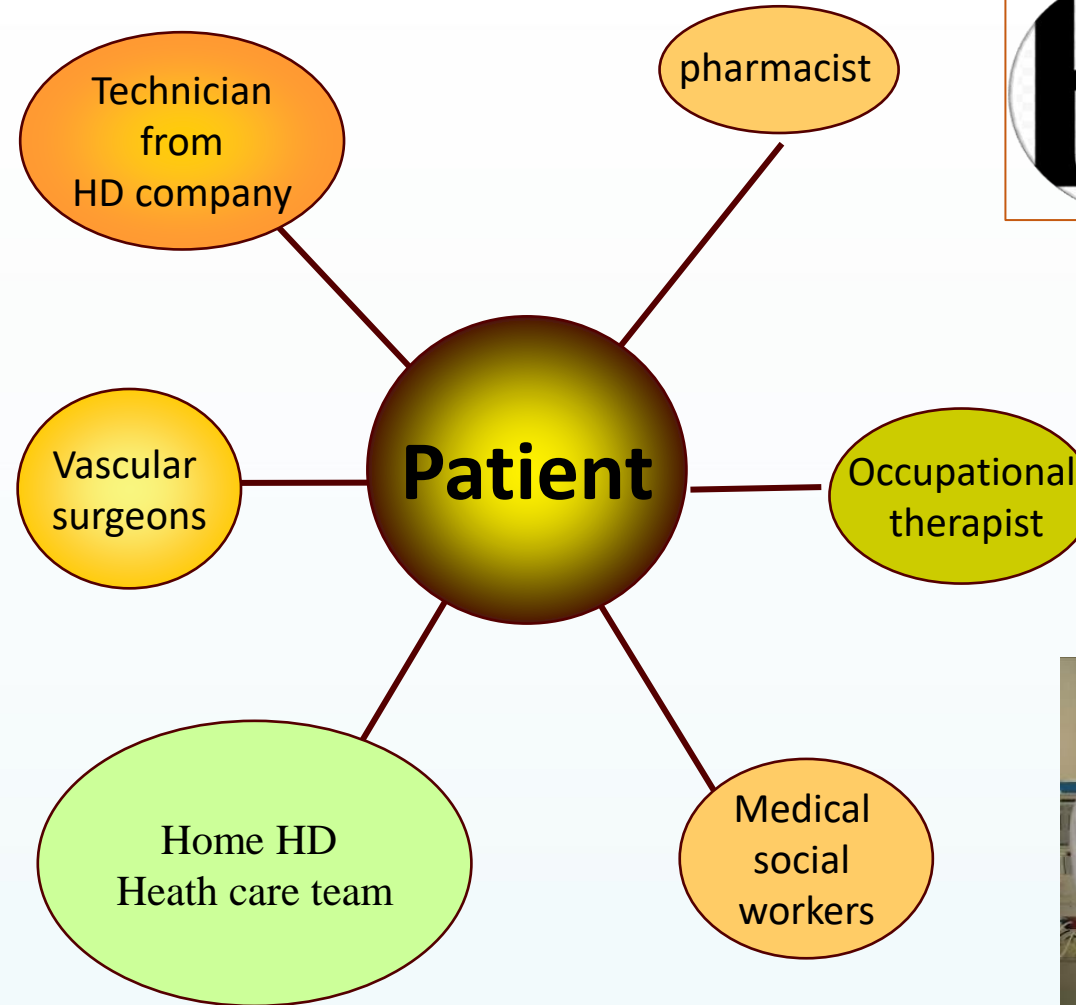



Advantages of home haemodialysis

- As treatment is “slow”, there is less discomfort (e.g. muscle cramps, unstable blood pressure) compared to conventional hemodialysis
- As treatment is “longer” and “more frequent”, clearance of larger waste products such as phosphate, are more effective
- Better blood pressure control, reduce anti hypertensive agent requirement
- Less anemia and reduce erythropoietin requirement
- Less ventricular hypertrophy and improves cardiac function
- Better quality of life



Home Hemodialysis – Collaboration of Multidisciplinary teams



The background is a stylized landscape. It features a light blue sky with a few white, fluffy clouds. In the foreground, there are rolling hills in shades of orange and red. A bright sun is positioned on the left side, casting a strong glow and creating a lens flare effect. A winding, light-colored path leads from the bottom left towards the center of the image.

Who are eligible to Home HD therapy ?

Pre-requisites for home haemodialysis (1)

After assessment by medical team :

- Health condition is fit for home hemodialysis
- Positive attitude and normal social life
- Understand the advantages and requirements of home hemodialysis
- Confident in learning the procedure (including self-needling)
- Healthy financial condition
- Enough space at home for the dialysis machine, reverse osmosis machine and other appliances
- Living with family and family support is preferred
- Willing to follow advices from medical staff

Pre-requisites for home haemodialysis (2)

Fits the criteria set by the Hospital Authority and the 2 charity organisations

Hong Kong Jockey Club Charities Trust



- Quota limit
- Has received peritoneal dialysis before (“PD first policy)
- high risk peritoneal dialysis patients:
 - Peritoneal failure
 - Multiple peritonitis
 - Health condition unsuitable to continue peritoneal dialysis

Hong Kong Kidney Foundation



- Quota limit
- for work or daily living needs
- Requires assessment of financial assets

The background is a stylized landscape. A light blue sky with a few white clouds is at the top. Below the sky, there are rolling hills in shades of orange and red. A bright sun is positioned on the left side, casting a strong glow and creating a lens flare effect. A winding, light-colored path leads from the bottom left towards the sun, curving through the landscape.

Home Modifications

The art of compromise for HHD

Before



After



Pipelines for water inlet & outflow drain



HHD accessories storage



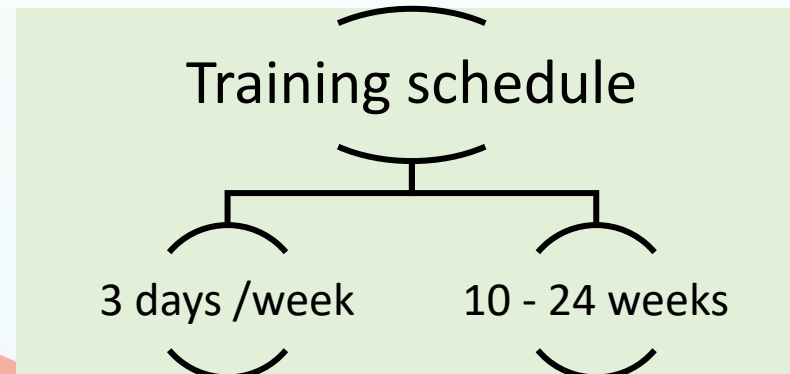
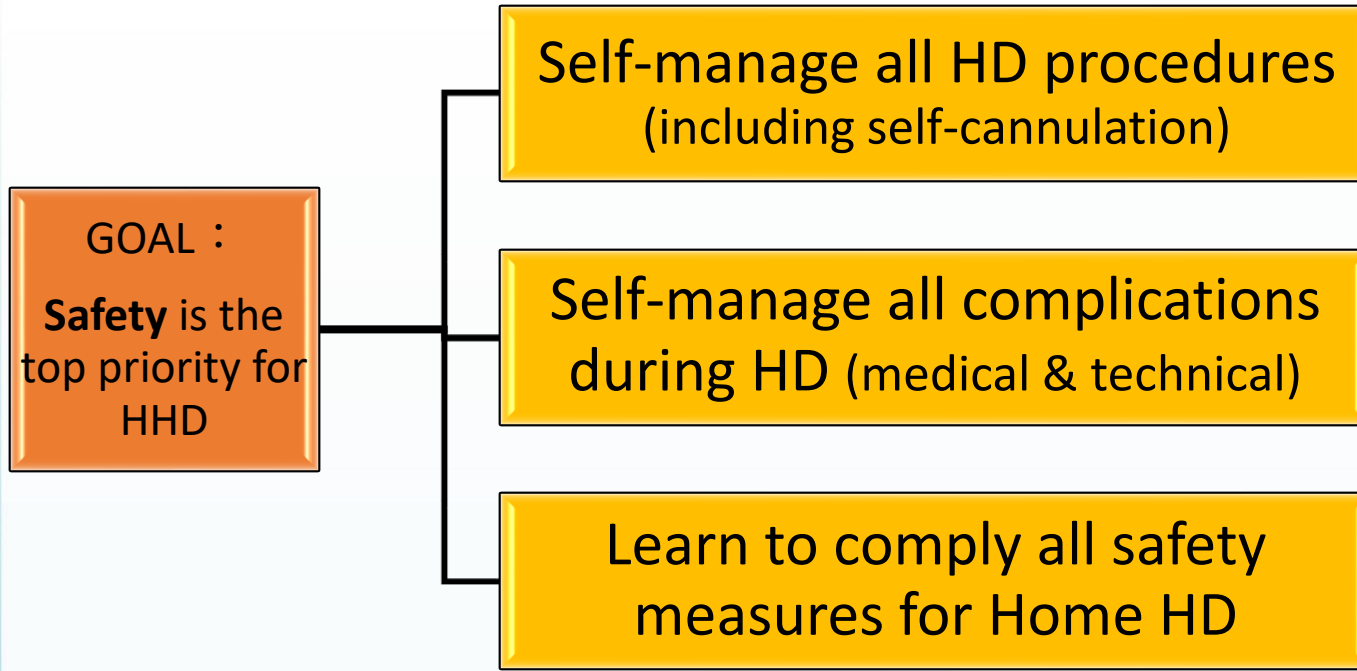
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HHD Training Program

What are included in the program ?

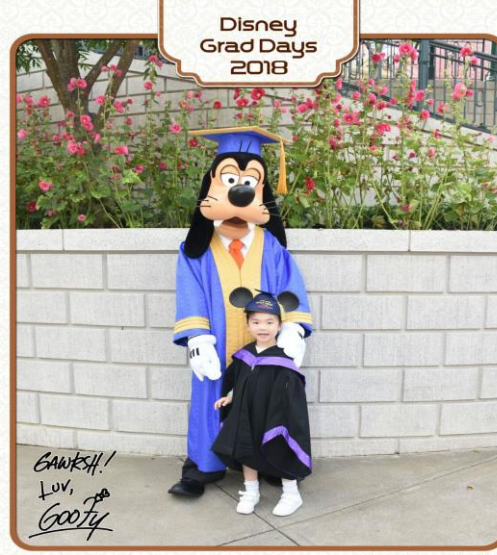
Is it safe to do HD at home ?

Training program





An extraordinary mother - First born baby from a patient on NHHD in HK



Photos sharing is approved by baby's family

Host organiser: Hong Kong Kidney Foundation

<https://hk kf.org.hk/>



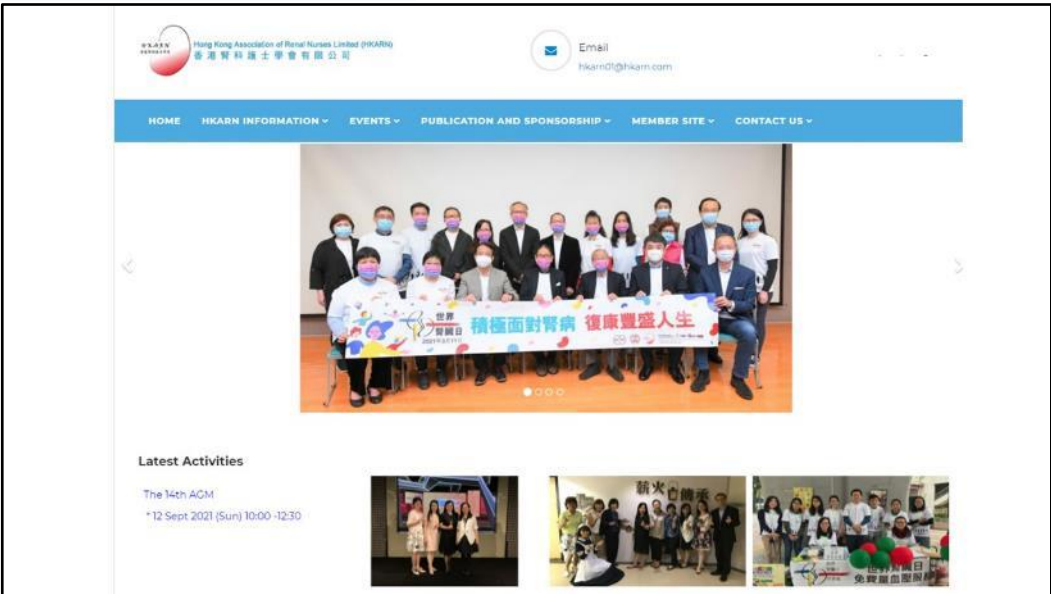
Co-organisers: Hong Kong Society of Nephrology

<https://www.hksn.org/>



Co-organisers: Hong Kong Association of Renal Nurses

<https://www.hkarn.com>



Partner: Alliance for Renal Patients Mutual Help Association

<http://www.arpmha.org.hk/>



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