

Role of the Clinical Pharmacy Technician

Improving Outcomes for Renal Patients

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Disclosure







- I have no actual or potential conflict of interest in relation to this program or presentation
- I have not received any financial or in-kind support from any commercial organization

Outline

- Background information
 - Chronic Kidney Disease
 - Hemodialysis
 - Peritoneal Dialysis
- Medication reviews
 - Who? When? Why? How?
- Emergency Preparedness
- 2021 Flood response
- Patient Case
- Expanding the role

Chronic Kidney Disease

- Definition: presence of kidney damage or decreased glomerular filtration rate for three or more months, irrespective of the cause¹
- Most common causes:
 - Poorly controlled Diabetes and Hypertension
- Other less common causes
 - heart failure
 - liver failure
 - Autoimmune
 - recent UTIs
 - obesity
 - reduced kidney mass
 - polycystic kidney dx
 - recurrent acute kidney injuries
 - multiple myeloma
 - chronic urinary obstruction

STAGES OF CHRONIC KIDNEY DISEASE		GFR*	% OF KIDNEY FUNCTION
Stage 1	Kidney damage with normal kidney function	90 or higher	 90-100%
Stage 2	Kidney damage with mild loss of kidney function	89 to 60	 89-60%
Stage 3a	Mild to moderate loss of kidney function	59 to 45	 59-45%
Stage 3b	Moderate to severe loss of kidney function	44 to 30	 44-30%
Stage 4	Severe loss of kidney function	29 to 15	 29-15%
Stage 5	Kidney failure	Less than 15	 Less than 15%

Chronic Kidney Disease

- As eGFR worsens, patients are at higher risk of complications
 - Fatigue
 - Pruritis
 - Poor appetite, taste changes, and nausea
 - Anemia
 - Impaired immune response and Infections
 - Hyperparathyroidism and Bone Disease
 - Progression of chronic kidney disease
 - Acute kidney injuries
 - End-stage kidney disease
 - All-cause and cardiovascular mortality

Kidney Care Clinics

- Multidisciplinary team
 - Nephrologist
 - Nurse
 - Social worker
 - Dietitian
 - Pharmacy Technician
 - Pharmacist
- Typically patients are referred when $\text{eGFR} < 30$

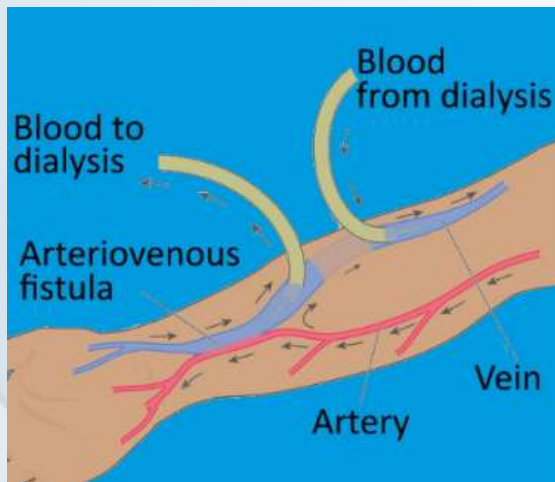
Treatment Options

- Kidney transplant
- Conservative Management
- Hemodialysis
 - Including Home Hemodialysis
- Peritoneal Dialysis

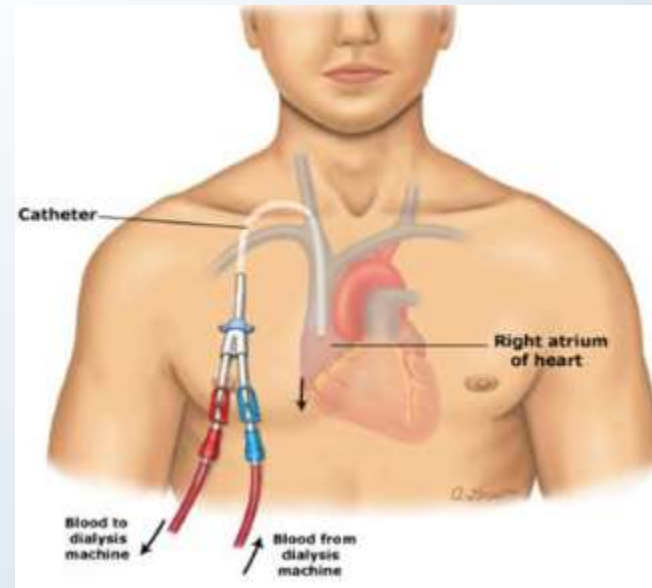
Hemodialysis

- Dialysis occurs via a fistula or a central venous catheter ("Permcath") and a dialysis machine

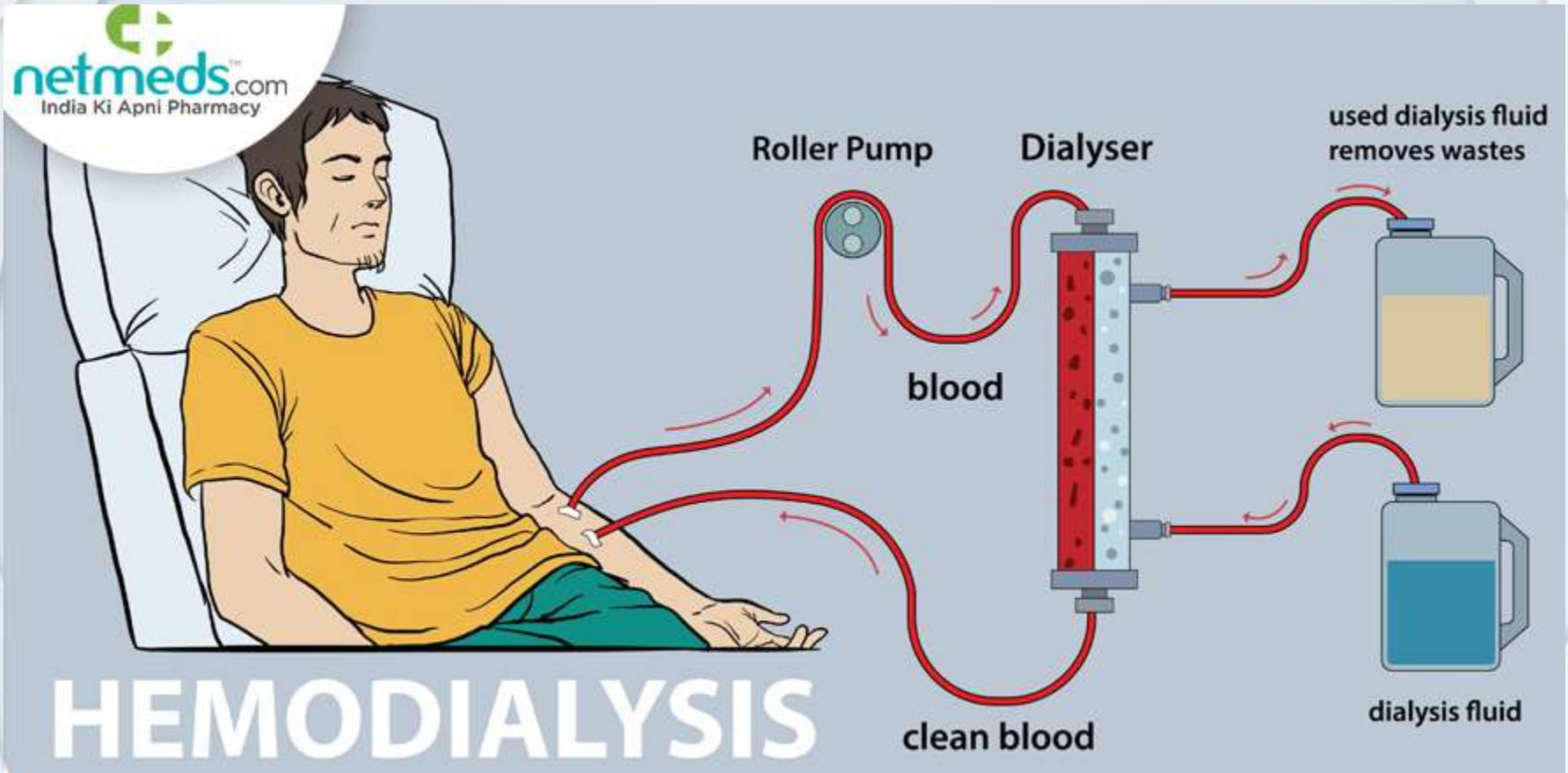
- **Fistula**



- **PermCath**



Hemodialysis

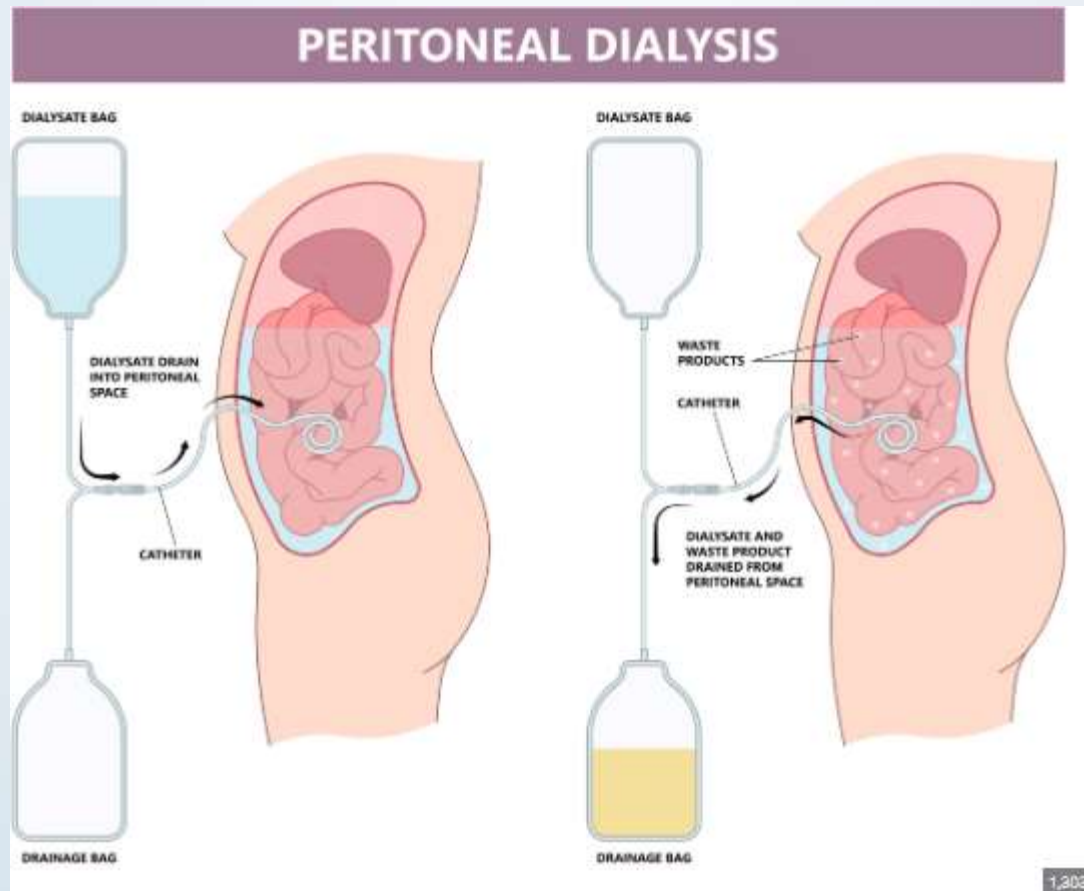


Hemodialysis



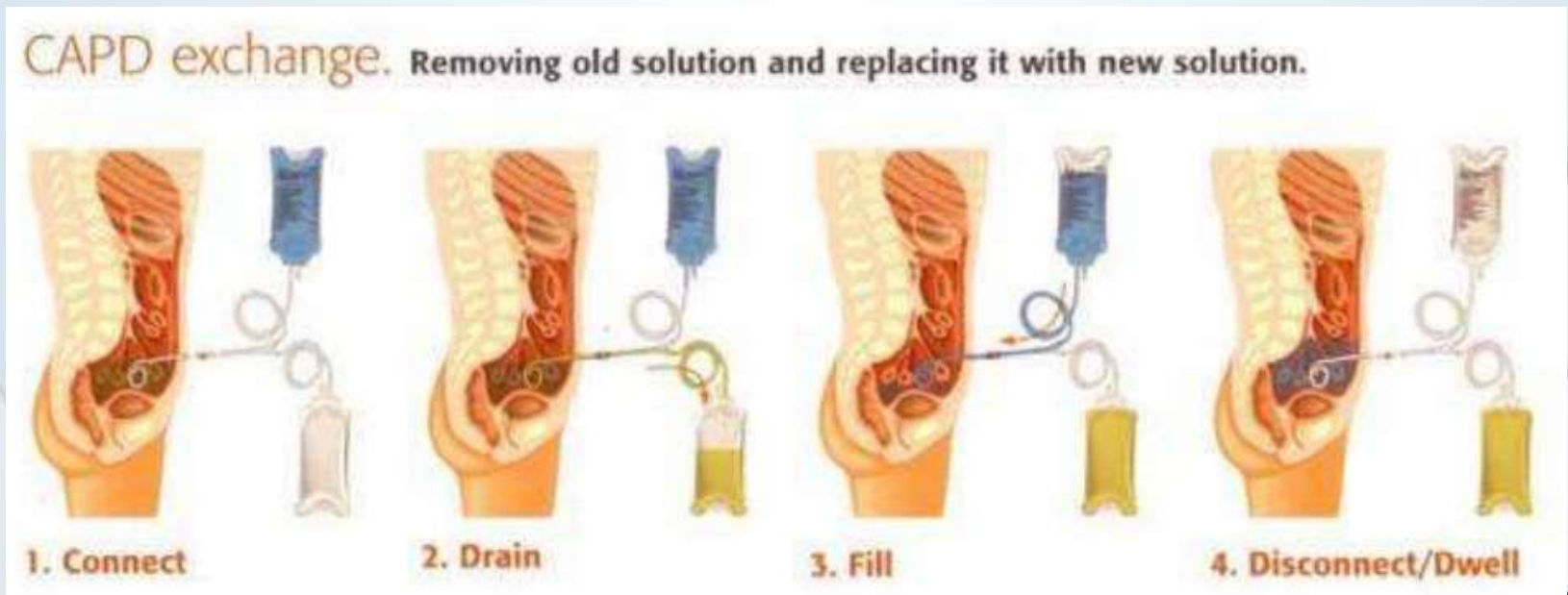
Peritoneal Dialysis

- Dialysis occurs in the peritoneal cavity



Peritoneal Dialysis

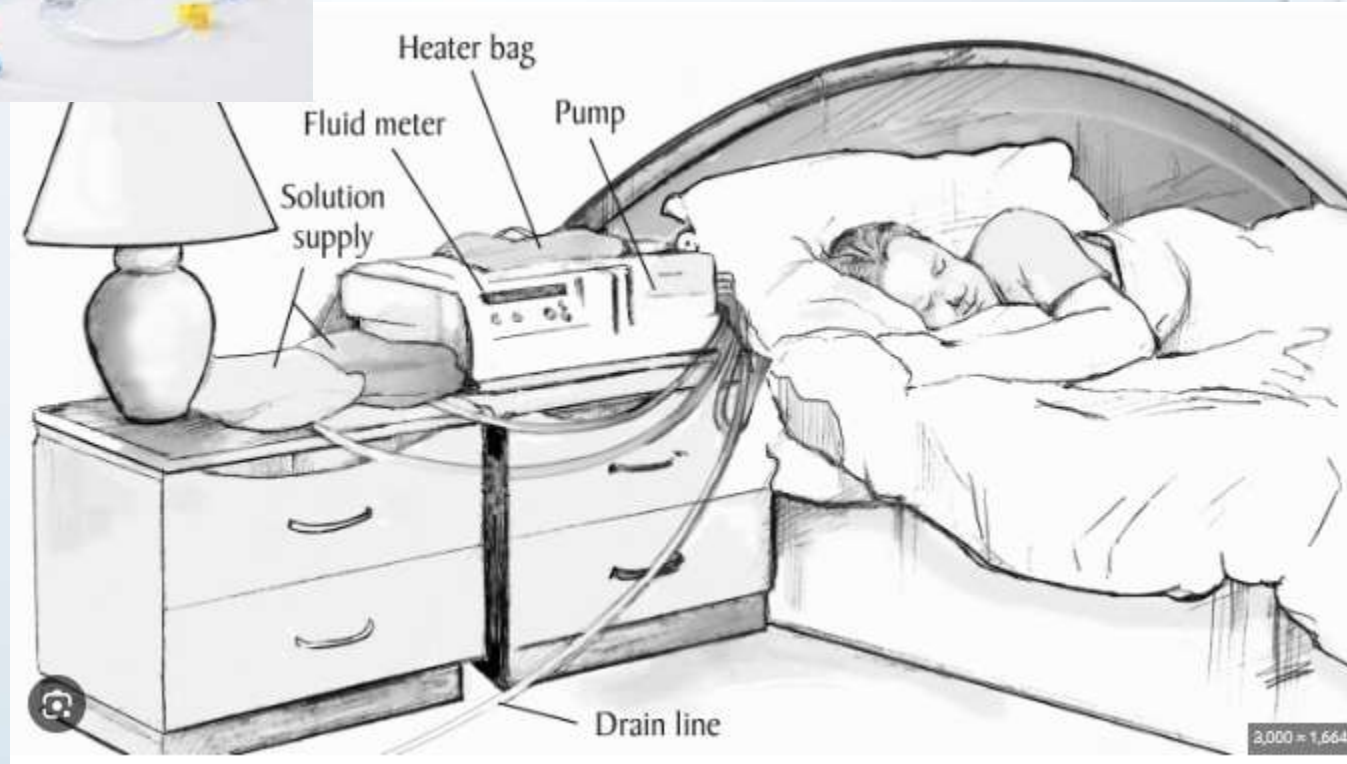
- CAPD
 - Chronic ambulatory peritoneal dialysis
 - Usually 4 times per day



Cycler

- Used by most patients at home
- Does multiple (usually 4 or 5) exchanges overnight
- Long dwell during the day
- Improved patient convenience
- Better fluid and toxin removal
- Not used while in hospital

Cycler



Acute Kidney Injury

- Definition: abrupt decrease in kidney function, resulting in retention of urea and other waste products, and in the dysregulation of extracellular volume and electrolytes²
 - Can occur rapidly (ie. Within hours) or slower (ie. Over 7 days)
 - May recover without renal replacement therapy

Acute Kidney Injury

- Mortality rates of 25 to 80%
- Increases risk of progression to CKD
- Can be classified as:
 - Pre-renal
 - Intra-renal
 - Post-renal
- May require short-term hemodialysis and recover
- May become CKD

Our Team









Kidney Care Patients in British Columbia as of December 31, 2023

Health Authority	Registered Pre-dialysis	Hemodialysis				Home Hemodialysis			Peritoneal Dialysis			Health Authority Total
		Total	In-Centre	Community	Facility-based dependent NC	Total	Training/ Conventional / Short Daily / NC	Facility-based Independent HD or NC	Total	CAPD	APD	
IHA	4007	343	192	151	0	24	24	0	154	59	95	4528
FHA	5481	987	533	405	49	40	40	0	363	94	269	6871
VCH/PHC	4825	674	434	223	17	37	37	*	187	58	129	5723
VIHA	3961	385	212	163	10	21	21	0	106	30	76	4473
NHA	824	92	57	35	0	23	18	5	66	32	34	1005
PHSA	126	5	5	0	0	0	0	0	8	0	8	139
BC Total	19224	2486	1433	977	76	145	140	5	884	273	611	22739

Legend:

IHA = Interior Health Authority

FHA = Fraser Health Authority

VCH/PHC = Vancouver Coastal Health/Providence Health Care

VIHA = Vancouver Island Health Authority

NHA = Northern Health Authority

NC = Nocturnal Dialysis

CAPD = Continuous Ambulatory Peritoneal Dialysis

APD = Automated Peritoneal Dialysis, also known as Continuous Cycling Peritoneal Dialysis (CCPD)

* fewer than 5

Data Source: PROMIS Database of BC Renal

Kidney Care Patients in British Columbia as of December 31, 2023

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Abbotsford Renal Program

- 1 Pharmacist in ARH for HD and PD
- 1 Pharmacist for Kidney Care and Community Dialysis Unit
- 2 Clinical Pharmacy Technicians

- ~ 140 patients at ARH HD
- ~ 90 patients at ARH PD
- ~ 110 patients at ACDU
- ~ 950 patients at AKCC

PROMIS

- Record keeping system used in Renal program
- **Patient Records and Outcome Management Interface System**
- Updated when:
 - Nephrologists prescribe medications in dialysis unit or Kidney Care clinics
 - Renal pharmacy team performs medication reviews

Med Reviews – Why?

- Goal: to reduce drug related adverse events
- Adverse drug events occur in ~ 6.5% of hospitalized patients and account for almost 20% of adverse patient events
- ~ 50% of complex medical patients have at least one medication error at the time of admission⁴
- ~33% of medication errors are clinically relevant and may carry on through to discharge⁴

Med Reviews – Why?

- Patients at highest risk for adverse drug events
 - > 3 concurrent disease states
 - Medication changes > 3 times in the last year
 - > 4 medications in regimen
 - > 11 doses of medications per day
 - History of non-adherence
- The average renal patient meets at least 4 of these risk factors!

Med Reviews – Why?

- Without medication reconciliation on discharge, patients aged 65 or older are more than twice as likely to be readmitted to hospital within 30 days⁵
- Medication reconciliation after discharge reduces the risk of preventable adverse drug reactions within 30 days after discharge⁶

Med Reviews - When/Who?

	Percentage of Patients	Time Frame (Hemodialysis)	Time Frame (Peritoneal Dialysis)
New starts	100	Within 2 weeks of start date	Within 2 weeks of start date
Discharges from Acute Care ¹	100	Within 72 hours of discharge	Within 72 hours of discharge
Transitions ²	100	Within 1 week of transfer	Within 1 week of transfer
6-month reviews ³	60	Every 6 months	N/A
Annual reviews ⁴	90	Yearly (+/- 1 month)	N/A

Med Reviews – How?

1. Inform patient of upcoming med review and ask them to bring all medications (including OTCs) to dialysis unit.
2. Review Pharmanet, PROMIS list, Discharge prescription to identify possible discrepancies
3. Review patient's chart
4. Interview patient
5. Prepare medication review for Pharmacist

Patient Interview

- Ask re: allergies or side effects
- Confirm patients primary care provider and preferred community pharmacy
- Reconcile medications and ask about discrepancies
- Ask about new medications or changes
- Review non-prescription and herbal products
- Review for physician samples and non-oral medications
 - ie. Patches, creams, eye drops, inhalers, nasal sprays
- Complete medication review addendum

Medication Review Addendum

Medication Review – Addendum

Patient:

Date:

New Start	<input type="checkbox"/> Yes – attach order sheet for Emergency Kit of Kayexalate		<input type="checkbox"/> No - Ask patient if they know where their ER kit is - Ask patient to check expiry date (update PROMIS)		
Herbal	OTC	Sample	<input type="checkbox"/> No	<input type="checkbox"/> See Med Rec form	
Bowel Movement	Rating	<input type="checkbox"/> regular	<input type="checkbox"/> constipation - # days ____		<input type="checkbox"/> diarrhea - # days ____
	Frequency	<input type="checkbox"/> daily	<input type="checkbox"/> q2 days	<input type="checkbox"/> q3 days	<input type="checkbox"/> q4 or more days
	Currently using	<input type="checkbox"/> Docusate	<input type="checkbox"/> Sennosides	<input type="checkbox"/> Lactulose	
		<input type="checkbox"/> PEG 3350	<input type="checkbox"/> Loperamide		
Urinary Output	Rating	<input type="checkbox"/> good	<input type="checkbox"/> poor	<input type="checkbox"/> none	
	Frequency	<input type="checkbox"/> 1-2x daily	<input type="checkbox"/> 3-4x daily	<input type="checkbox"/> 5x or more daily	
	Quantity (per day)	<input type="checkbox"/> 1 cup or more	<input type="checkbox"/> ½ cup	<input type="checkbox"/> ¼ cup	<input type="checkbox"/> few drops or trickle
	Currently using	<input type="checkbox"/> Furosemide	<input type="checkbox"/> Tamsulosin		

Medication Review Addendum

RLS or Cramping	Managed	<input type="checkbox"/> Yes				<input type="checkbox"/> No	
	Currently using	<input type="checkbox"/> Ropinirole	<input type="checkbox"/> Carbidopa/Levodopa		<input type="checkbox"/> Vitamin E		
	Location						
	Description						
	Rating	without medication ____ / 10				with medication ____ / 10	
Blood Pressure (PD patients)	Checked	<input type="checkbox"/> AM	<input type="checkbox"/> 12	<input type="checkbox"/> PM	<input type="checkbox"/> HS	Notes	
	Today: Sitting						
	Standing						
	Pulse						
	Yesterday: Sitting						
	Standing						
	Pulse						

Medication Review Addendum

Blood Glucose	Checked	<input type="checkbox"/> AM	<input type="checkbox"/> 12	<input type="checkbox"/> PM	<input type="checkbox"/> HS	Notes
	Today					
	Yesterday					

Note: This list may not include the following type of drugs: investigational, antiretroviral, oncology, physician sample, herbal, or self selected over the counter medications. Always review the list with the patient or reliable alternative caregiver

Dr Cooper

Last MR: 6 Jan 2023

Routine Review

PATIENT:

PHN: Last Med Rec on: 06-JAN-2023
DOB: Report Printed on: 11-JAN-2024 14:09

Status: All-on-One

This report was generated from the PROMIS database- the clinical information system of BC Renal and BC Transplant.

DRUG ALLERGIES: IRON DEXTRAN -NAUSEA, (Interface-iron dextran)

Prescription	Hazard	Directions	Reconciled	Discrepancy (see below)	Suggest Change
ACETAMINOPHEN		PO Take 325-650 mg as directed during hemodialysis. AS PER CHRONIC ORDERS DURING DIALYSIS (wardstock)	✓		
ACETAMINOPHEN (TYLENOL)		PO Take 650 mg 4 times daily as needed. no longer taking		✓	
ALFACALCIDOL (ONE ALPHA)		PO Take 0.5 microgram 3 times a week.	✓		
ALUMINUM HYDROXIDE Liquid		PO Take 15-30 ml(s) as directed during hemodialysis. AS PER CHRONIC ORDERS DURING DIALYSIS (wardstock)	✓		
AMLODIPINE		PO Take 5 mg once daily.	✓		
BUPRENORPHINE 2.MG/NALOXONE 0.5MG (SUBOXONE)		Sublingual Take 2 tablet(s) every morning. Along with 1 tab of Buprenorphine/Naloxone 8 mg/2 mg to equal 12 mg/3 mg (Dr Dowey)	✓		
CALCIUM ACETATE		PO Take 1 tablet(s) every lunch. + 1 tablet(s) every supper. TAKE WITH FIRST BITE OF MEAL	✓		
CARBIDOPA 25MG/LEVODOPA 100MG (SINEMET 100/25)		PO Take 3 tablet(s) at bedtime as needed. she takes QHD not QHS (For RLS)		✓	
CEFAZOLIN SODIUM (ANCEF)		IV Take 2 gram every hemodialysis run. X 2 weeks 8 doses total (Dec 30, Jan 1, 3, 5, 6, 8, 10, 12)	✓		
DARBEPOETIN ALFA (ARANESP)		IV Take 10 microgram every Wednesday during hemodialysis. *AS PER AMP*	✓		
DIMENHYDRINATE		PO or IV Take 25-50 mg as directed during hemodialysis. AS PER CHRONIC ORDERS DURING DIALYSIS (wardstock) update to standard entry		✓	
DIPHENHYDRAMINE HCL		PO or IV Take 25-50 mg as directed during hemodialysis. AS PER CHRONIC ORDERS DURING DIALYSIS (wardstock)	✓		
DOCUSATE SODIUM		PO Take 100 mg 3 times daily as needed. Stool softener	✓		
GABAPENTIN		PO Take 300 mg twice daily as needed. (Dr Manampurem) Dr Smith	✓		
GLAXAL BASE		Topical Take 1 application once daily. APPLY TO AFFECTED AREA ONCE A DAY no longer using		✓	
HYDROXYZINE HCL (ATARAX)		PO Take 10 mg every 8 hrs as needed. no longer using - itch resolved		✓	
IRON SUCROSE (VENOFER)		IV Take 100 mg as directed during hemodialysis. ** HOLD **	✓		
LACTULOSE		PO Take 15-30 ml(s) twice daily as needed. doesn't use, prefers PEG & Sennosides		✓	
LOBAZEPAM (ATIVAN)		PO Take 2 mg every hemodialysis run. LE by Dr Weiss	✓		

[*] MEDICATIONS STARRED IN THIS COLUMN ARE ACKNOWLEDGED BY THE NEPHROLOGIST BUT ARE NOT R/O BY THIS PRESCRIPTION. THESE MEDICATIONS ARE TO BE REFILLED OR REORDERED BY THE FAMILY PHYSICIAN (OR OTHER HEALTH CARE PROVIDER)

* Prescription	Hazard	Directions	Continue	Discontinue	Change
ACETAMINOPHEN		PO Take 325-650 mg as directed during hemodialysis. AS PER CHRONIC ORDERS DURING DIALYSIS (wardstock)			
ACETAMINOPHEN (TYLENOL)		PO Take 650 mg 4 times daily as needed.			
ALFACALCIDOL (ONE ALPHA)		PO Take 0.5 microgram 3 times a week.			
ALUMINUM HYDROXIDE Liquid		PO Take 15-30 ml(s) as directed during hemodialysis. AS PER CHRONIC ORDERS DURING DIALYSIS (wardstock)			
AMLODIPINE		PO Take 5 mg once daily.			
BUPRENORPHINE 2.MG/NALOXONE 0.5MG (SUBOXONE)		Sublingual Take 2 tablet(s) every morning. Along with 1 tab of Buprenorphine/Naloxone 8 mg/2 mg to equal 12 mg/3 mg (Dr Dowey)			
CALCIUM ACETATE		PO Take 1 tablet(s) every lunch. + 1 tablet(s) every supper. TAKE WITH FIRST BITE OF MEAL			
CARBIDOPA 25MG/LEVODOPA 100MG (SINEMET 100/25)		PO Take 3 tablet(s) at bedtime as needed.			
CEFAZOLIN SODIUM (ANCEF)		IV Take 2 gram every hemodialysis run. X 2 weeks 8 doses total (Dec 30, Jan 1, 3, 5, 6, 8, 10, 12)			
DARBEPOETIN ALFA (ARANESP)		IV Take 10 microgram every Wednesday during hemodialysis. *AS PER AMP*			
DIMENHYDRINATE		PO or IV Take 25-50 mg as directed during hemodialysis. AS PER CHRONIC ORDERS DURING DIALYSIS (wardstock)			
DIPHENHYDRAMINE HCL		PO or IV Take 25-50 mg as directed during hemodialysis. AS PER CHRONIC ORDERS DURING DIALYSIS (wardstock)			
DOCUSATE SODIUM		PO Take 100 mg 3 times daily as needed. Stool softener			
GABAPENTIN		PO Take 300 mg twice daily as needed. (Dr Manampuram)			
GLAXAL BASE		Topical Take 1 application once daily. APPLY TO AFFECTED AREA ONCE A DAY			
HYDROXYZINE HCL (ATARAX)		PO Take 10 mg every 8 hrs as needed.			
IRON SUCROSE (VENOFER)		IV Take 100 mg as directed during hemodialysis. ** HOLD **			
LACTULOSE		PO Take 15-30 ml(s) twice daily as needed.			
LORAZEPAM (ATIVAN)		PO Take 2 mg every hemodialysis run.			

Pharmacist: please blister pack this patient's medications YES ☒ NO

Unless otherwise specified, initial and refill quantities are as per BCPRA policy :

- For all medication NEW to this patient, 30 day initial fill and, if tolerated, refill in quantities of 100 days times TWO except for cinacalcet, lanthanum and sevelamer where the refill is in quantities of 60 days times TWO, and
- For all other medications, 90 day fill with three 90 day refills allowed except for cinacalcet, lanthanum and sevelamer where they shall be filled for 60 days with three refills of 60 days allowed

http://www.bcrenalagency.ca/resource-gallery/Documents/Rx-quantities_April-2008_2012.pdf

Fax all pages to pharmacies, usual dialysis unit, nephrologist and family physician

Summary

- Clinical RPhT reconciles medications
- Clinical Pharmacist reviews discrepancies and fills out medication orders
- Nephrologist signs medication orders
 - Acts as a prescription
 - * in left hand column designates medications prescribed by other health care provider and not by nephrologist

CURRENT MEDICATIONS

Printed on: 16-SEP-2013

Printed by:

Split medications given on dialysis: Yes

Allergies: NKDA

PHN:

NAME:

DOB:

Medications To Be Administered During Dialysis:

Start date	End date	Discont. date	Drug Name	Dose/Directions/Schedule
30-JAN-13			ACETAMINOPHEN	PO Take 325-650 mg as directed during hemodialysis. AS PER CHRONIC ORDERS DURING DIALYSIS (wardstock)
30-JAN-13			ALUMINUM HYDROXIDE	PO Take 15-30 ml(s) as directed during hemodialysis. AS PER CHRONIC ORDERS DURING DIALYSIS (wardstock)
26-AUG-13			DARBEPOETIN ALFA (ARANESP)	IV Take 130 microgram once weekly during hemodialysis. AS PER ANEMIA PROTOCOL - WED
30-JAN-13			DIMENHYDRINATE	PO or IV Take 25-50 mg as directed during hemodialysis. AS PER CHRONIC ORDERS DURING DIALYSIS (wardstock)
17-JUL-13			IRON GLUCONATE (FERRLECIT)	IV Take 125 microgram two times per month during hemodialysis. AS PER ANEMIA PROTOCOL, 4TH + 17TH
30-JAN-13			NITROGLYCERIN SPRY	Sublingual Take 1-2 spray(s) as directed during hemodialysis. AS PER CHRONIC ORDERS DURING DIALYSIS (wardstock)
27-JUN-12			QUININE SULFATE	PO Take 300 mg every hemodialysis as necessary, for cramps

Medications Patient Takes At Home:

Start date	End date	Discont. date	Drug Name	Dose/Directions/Schedule
21-JUL-13			ACETAMINOPHEN 300mg/CAFF 15mg/CODINE PHOSPHATE 30mg (TYLENOL WITH CODEINE NO. 3)	PO Take 1-2 tablet(s) every 4 hrs as needed.
26-DEC-11			ASA (ACETYLSALICYLIC ACID)	PO Take 81 mg once daily.
24-AUG-13			BECLOMETHASONE DIFPROPIONATE (BECONASE)	Inhale Take 1 spray(s) twice daily as needed. 1 SPRAY PER NOSTRIL
17-APR-13			BETAMETHASONE 0.1000%	Topical Take 1 application once daily. TO AFFECTED AREA
17-APR-13			BETAMETHASONE 0.1000%	Topical Take 1 application as needed. TO AFFECTED AREAS
30-JAN-12			BISOPROLOL FUMARATE	PO Take 10 mg once daily.
16-JUN-13			CALCIUM ACETATE	PO Take 1 tablet(s) every breakfast. + 1 tablet(s) every lunch. + 1 tablet(s) every supper. Take with meals.
08-AUG-12			DOCUSATE SODIUM (COLACE)	PO Take 100 mg twice daily.
14-FEB-13			FUROSEMIDE (LASIX)	PO Take 80 mg twice daily.
10-APR-12			GLICLAZIDE (DIAMICRON MR)	PO Take 30 mg once daily.
21-JUL-13			HYDROXYZINE HCL (ATARAX)	PO Take 25 mg every 6 hrs as needed.
20-AUG-13			OXAZEPAM	PO Take 30 mg at bedtime.
14-JUN-13			PANTOPRAZOLE (PANTOLOC)	PO Take 40 mg once daily.
17-MAY-13			PERINDOPRIL ERBUMINE (COVERSYL)	PO Take 4 mg once daily.
26-DEC-11			REPLAVITE	PO Take 1 tablet(s) once daily.
17-JUL-12			SALBUTAMOL SULPHATE (VENTOLIN)	Inhale Take 2 puff(s) 4 times daily.

Summary

- Patient receives “My Medication List”
 - Medications given at dialysis are separate from medications taken at home
- Clinical RPhT faxes copy of new medication list to primary care provider
- Patient may request additional copies to take to specialist appointments

What about Hospital Admissions?!

- Provide up to date PROMIS medication list for admitted patients
 - 1 copy sent to ward for inpatient chart
 - 1 copy sent to pharmacy for clinical pharmacist to review
- On discharge, obtain copy of prescription and fax to community pharmacy if not already done

Emergency Preparedness

- All hemodialysis patients receive an Emergency Kit which contains three 15 gram vials of Sodium Polystyrene Sulfonate
 - Potassium binding agent

Date & Time	Dr. Orders	Progre
	Sodium Polystyrene Sulfonate powder (Kayexalate or generic equivalent)	
	Sig : TAKE ONLY IF YOU ARE UNABLE TO HAVE DIALYSIS FOR MORE	
	THAN THREE DAYS AND YOU HAVE ACCESS TO FOOD AND	
	WATER. Starting on the fourth day after your last dialysis day, take	
	15 grams of Kayexalate by mouth once a day until you can have dialysis.	
	Mix in about ½ a cup of water or clear fluid (not fruit juice) or with some food.	
	Mitte: 45 grams (3 x 15 grams)	
	Note : Fax to New Gen Pharmachoice ***	
	New Gen to counsel patient and deliver medication ***	

Kayexalate Emergency Supply



Sodium Polystyrene Sulfonate (Kayexalate®) Emergency Supply

Emergency Instructions for Dialysis Patients

Name and strength of the medication:

Sodium Polystyrene Sulfonate (Kayexalate®) powder

Purpose of the medication:

To control potassium that may build up in your body from the food you eat when you are unable to have dialysis. Too much potassium can be a serious health concern. This medication is only to be used in the event of a disaster (e.g. flood or earthquake) when you are unable to dialyze.

Directions:

TAKE ONLY IF YOU ARE UNABLE TO HAVE DIALYSIS FOR MORE THAN THREE DAYS AND HAVE ACCESS TO FOOD AND WATER. Starting the fourth day after your last dialysis day, take 15 grams of kayexalate by mouth in about ½ a cup water or clear fluid (not fruit juice) or mix with some food, once a day until you can have dialysis.

Note: after mixing sodium polystyrene sulfonate (Kayexalate®) powder with water, it should be used that day.

Common side effects:

Sodium polystyrene sulfonate (Kayexalate®) is not absorbed into the body. For some patients it may cause nausea, loss of appetite, vomiting and constipation. Others may experience diarrhea.

Drug and food interactions:

Your pharmacist will have checked whether sodium polystyrene sulfonate (Kayexalate®) is appropriate for you prior to dispensing this medication.

Contraindications:

Since potassium comes from the food you eat, try to follow a potassium restricted diet. DO NOT TAKE THIS MEDICATION IF YOU ARE NOT ABLE TO EAT as this may lead to potassium levels that are too low.

Storage requirements:

Store this medication with your disaster kit at room temperature (between 15 to 30°C) in a dry and readily accessible location.

Refill information:

It is your responsibility to request a refill of sodium polystyrene sulfonate (Kayexalate®) from your pharmacy if your emergency supply has been used or has expired.

How to monitor the response to therapy and expected outcomes:

Follow up with your dialysis unit. This medication is not a replacement for dialysis but it will help control your potassium level until you can have dialysis.

Action to be taken in the event of a missed dose:

This medication is used on an as needed basis when you are unable to have dialysis for more than three days. If you forget to take a dose, take it as soon as you remember.

Emergency Preparedness

- With each med review, CPhT to confirm with patient the following:
 - They have a Kayexalate kit
 - They know where the kit is
 - They know how to use the kit
 - The kit is not expired!
- Goal: to reduce the risk of life-threatening complications of hyperkalemia secondary to missed dialysis

Flood Response

- November 2021
 - Torrential rainfall caused by 'atmospheric river'
 - Large areas of Abbotsford submerged in water
 - Highway 1, east of Abbotsford, closed



Flood Response

- 54 hemodialysis patients resided between Chilliwack and Boston Bar
- 5 Home Hemodialysis patients without power to dialyze at home
- Over 20 Peritoneal Dialysis patients with limited dialysis supplies

Flood Response

"Our priority is to ensure patients with chronic kidney disease who require access to hospital or community-based dialysis services are taken care of and their needs met during this time," a health authority spokesperson wrote in an email.



Andrew Lee/CBC

CBC | CBC

'If I don't get dialysis, I drop dead': Chilliwack dialysis patients cut off by flooding flown to care

erhealth

Flood Response



- CNE flies to Chilliwack to assess patients

- Outpatient renal and transplant pharmacy team delivers medications



Flood Response

- Every hemodialysis patient east of Abbotsford was flown into Abbotsford to ensure they did not miss dialysis
 - Stayed with a family member or in hotels
 - Some were admitted to ARHCC
 - Meals provided
- Highway 1 opened December 2nd, 2024
 - Over 2 weeks from initial closure!!

Role of the Pharmacy Team

- Called patients to confirm they had their Emergency Kayexalate kit
 - advised them to take it if they had not received dialysis in over 3 days
 - Arranged for a new kit from the Chilliwack renal pharmacy Save on Foods in Vedder
 - Stock issues!!

Role of the Pharmacy Team

- Advised patients to bring at least 2 weeks of medications with them!
- Barriers:
 - Some were already “stranded” in Abbotsford
 - Some forgot or did not have time to arrange
 - Highway was closed for over 2 weeks!!
 - Even patients who brought 2 week supply needed help getting more

Role of the Pharmacy Team

- Liaised with many different community pharmacies to transfer prescriptions from Chilliwack/Hope pharmacies
 - Mostly Newgen Pharmachoice, however some patients were staying in Surrey
- Arranged for new prescriptions if transfer of medications was challenging due to complicated regimens
- Ensured transfer back to usual pharmacy

But wait... there's More!

- Peritoneal dialysis patients receive Fluconazole or Nystatin to prevent fungal peritonitis while on Antibiotics
 - Fluconazole is not covered by Pharmacare
 - Paid for by BCPRA via Renal Pharmacies
- Patients who lived east of Chilliwack (ie. Hope, Boston Bar) were identified, and received an “Emergency Fluconazole kit” to prevent delays

..even More!

- Involvement in bloodwork review to ensure Anemia protocol is followed
- Ensure adequate supply of ESAs and Iron from MacDonald's prescriptions
- Identify barriers resulting in patient non-compliance to medications

Patient Case

- DL is a 79 year old female admitted to ARH Dec 4, 2019 with respiratory failure
- VQ scan positive for bilateral pulmonary emboli
- Past medical history:
 - Hypertension DM2 GERD
 - **B-Cell Lymphoma** ESRD Gout
 - Pulmonary hypertension
 - **Calciophylaxis**

Patient Case

- Dec 4th - initiated on IV Heparin, tolerating with no concerns
- Dec 12th – Ceftriaxone started for ? Left leg cellulitis
- Dec 13th – new maculopapular rash to chest, back, and abdomen - ? Allergy to Ceftriaxone → changed to Piperacillin/Tazobactam
- Dec 13th - Heparin was also discontinued and patient was started on Fondaparinux
 - All notes indicate suspected rash to Ceftriaxone

Treatment Options

Low Molecular Weight Heparin (ie. Dalteparin, Enoxaparin)	1 st line therapy for cancer-related VTE Pt developed rash on IV Heparin
Warfarin	2 nd line therapy for cancer-related VTE Contra-indicated in patients with calciophylaxis
DOACs (ie. Apixaban)	Limited data for use in ESRD <i>at the time</i> Not studied or approved for cancer-related VTE <i>at the time</i>
Fondaparinux	2 nd line therapy for cancer-related VTE Not a pharmacare benefit. Very expensive!

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Patient Case

- Dec 14th - Renal pharmacist consulted by ARH clinical pharmacist regarding Fondaparinux dosing
 - Recommended renally dosed LMWH
 - Monitor for worsening of rash
- Patient remained on Fondaparinux for remainder of hospital stay
- Dec 19th – patient discharged home

Patient Case

- Dec 20th – medication review started by Clinical Pharmacy Technician
 - Fondaparinux discontinued on discharge Rx
 - No other anticoagulant initiated
 - Patient unaware of need for anticoagulant

Medication review escalated by CPhT to
High Priority

Patient Case

- Treatment options discussed with patient
- Treatment options discussed with nephrologist
 - Agreed with RPh to start LMWH and monitor for rash
 - RPh obtained special authority and urgent prescription
 - CPhT assisted with getting urgent patient supply to avoid delays in therapy
 - Patient counselled re: Monitoring parameters

Patient Case Summary

- Complicated patient with safety concerns for all treatment options
- High risk for hospital readmission, or even mortality, due to lack of anticoagulation
- Urgent intervention needed to avoid treatment delays

Quick resolution of drug therapy problem would not have been possible without the diligent work by our Clinical Pharmacy Technician!

Summary

- Clinical Pharmacy Technician is an extremely valuable member of the Renal Unit team, identifying potential and actual drug therapy problems to improve symptoms, reduce the risk of medication related harm, and prevent hospital admission

Expanding the Role...

- Best Possible Medication History on admission
- Assist with hospital discharges to ensure medication discrepancies are properly documented on discharge Rx
- Other patient populations
 - Transplant
 - Cardiac
 - Cancer

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Questions?

