Tips for Primary care Providers co-managing patients with late-stage CKD and ESRD

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Faculty/Presenter Disclosure

- **Faculty:** Andrea Mazurat

- **Relationships with commercial interests:**

  None

Objectives

Review the structure/delivery of renal care in Manitoba

Discuss common medical issues in patients with ESRD

Identify which conditions are addressed in the dialysis unit and which conditions are best managed by primary care

Medications in CKD/ESRD

Tips for co-managing ESRD patients

Definitions/Abbreviations

Chronic Kidney Disease (CKD)

For today's talk CKD is referring to CKD stage 5 (eGFR <15)

End Stage Renal Disease (ESRD)

Chronic requirement (>3 months) for renal replacement therapy

Renal replacement therapy:

Hemodialysis (HD)

Peritoneal dialysis (PD)

Home hemodialysis (HHD)

Transplant

Conservative Therapy

No renal replacement therapy

Goal is to decrease the complications and symptoms associated with chronic kidney disease

I present conservative therapy as an option to all my CKD patients with the emphasis and discussion tailored to the patient

Structure of CKD/ESRD care in Manitoba

Nephrologists in Winnipeg and Brandon

CKD care at HSC/St. Boniface/SOGH/Brandon

- Team consists of Nephrologist, renal nurse, dietician, pharmacist
- Social work, OT available as needed

Frequency of appointments depends on eGFR/risk of progression and symptoms

- Q3-6 months for stable stage 5 CKD
- Q1 month for patients approaching dialysis start

Initiation of Dialysis

Multiple factors taken into consideration rather than a specific creatinine/eGFR cut-off:

- Rate of progression
- Modality/vascular access
- Patient location/logistics
- Uremic symptoms: fatigue, anorexia, pruritus
- Volume overload
- Worsening acidosis
- Electrolyte abnormalities
- Patient preference

Initiation of Dialysis

Typically, patients start dialysis when eGFR 5-10 mL/min

Risk of adverse events increases with eGFR <5 mL/min

Absolute indications to initiate chronic dialysis

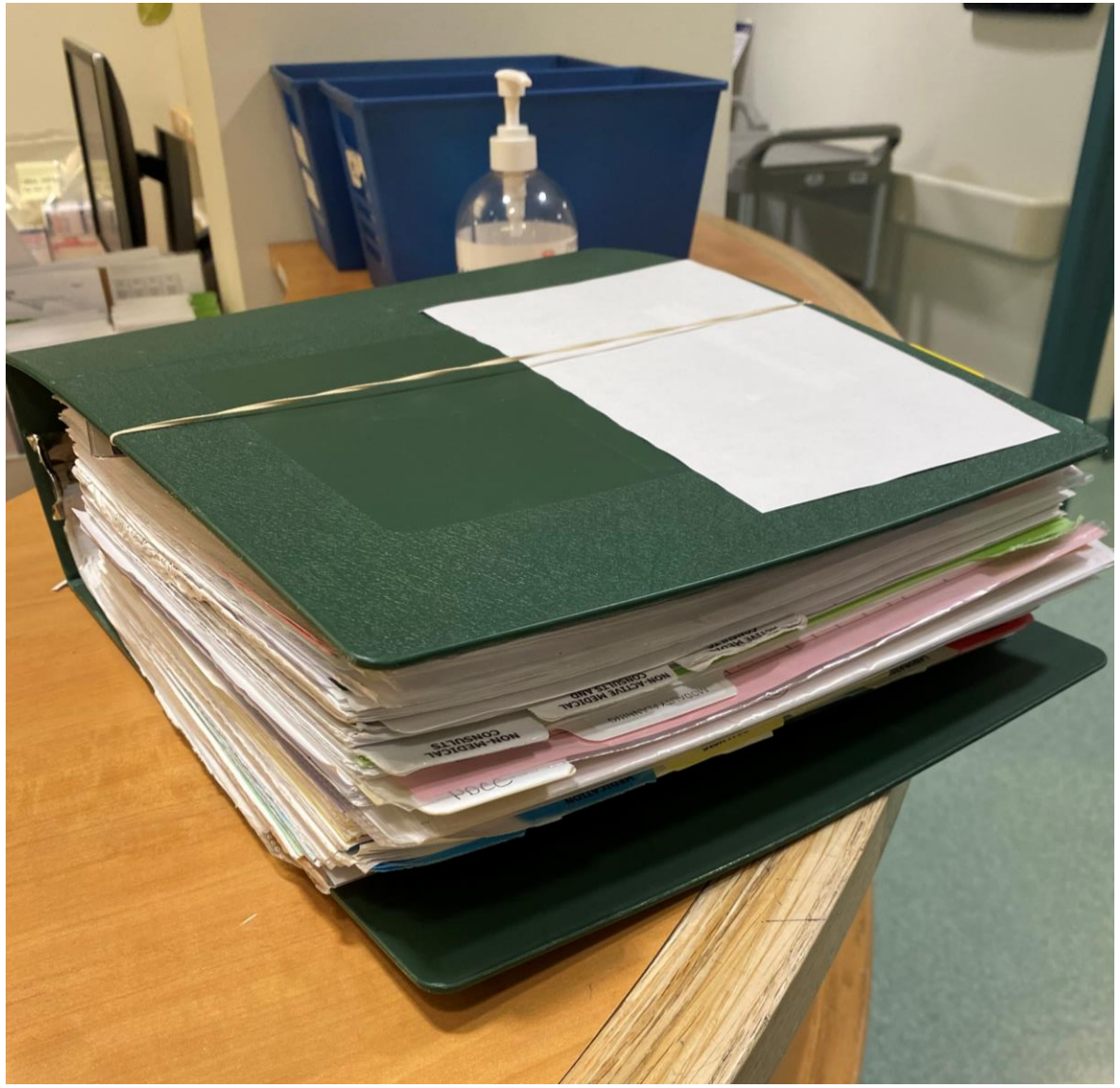
- Severe uremic symptoms
- Volume overload refractory to diuretics
- Pericarditis

We try and avoid an unplanned or “crash” dialysis start

- Higher morbidity/mortality than elective dialysis start

CKD to Dialysis transition

Our Charts are still paper charts…



ESRD administration in Manitoba

Hemodialysis units located in:

- Winnipeg (HSC/SCDU, St. Boniface, Seven Oaks)
- Brandon
- Local Centre locations:
  - *Ashern, Hodgson, Berens River, Gimli, Pine Falls, Selkirk, Flin Flon, The Pas, Garden Hill, Norway House, Thompson, Boundary Trails, Portage, Dauphin, Russell, Swan River*

Peritoneal dialysis units at St. Boniface and SOGH

Home hemodialysis units at HSC and SOGH

Transplant clinic located at HSC

Dialysis team members

- Nephrologist +/- physician assistant
- CRN and renal nurses for that unit
- Pharmacist
- Dietician
- Social worker
- Vascular access nurse
- Occupational therapy
- Spiritual care
- Transition coordinator
- Wound care nurse
- Exercise physiologist
- Dialysis technicians

Hemodialysis

https://www.kidneyhealth.ca/living-with-kidney-disease/dialysis/in-centre-unit-hemodialysis/

Vascular access - Fistula

Vascular Access – Tunneled Central Venous Catheter

Hemodialysis

There are 3 HD shifts per day: morning, afternoon and evening

In Winnipeg the dialysis units run Monday-Saturday

- Brandon also has Sunday dialysis as part of their rotation

Standard HD prescription is 3 times a week, 4 hours per treatment

- Adequacy is measured by something called Kt/V – calculated and reported by the hemodialysis machine
- “Adequate” dialysis is a Kt/V >1.2-1.4 per treatment
- If patient can’t achieve adequate dialysis on the standard regimen, we will increase the frequency or session length of their dialysis

Hemodialysis

Weight and assessment done by dialysis nurse each treatment

- Vital signs are done throughout treatment
- Any issues for Nephrologist identified and triaged
- Patients are seen by the Nephrologist/appropriate team member if the issue is urgent, if non-urgent the issue is saved for the next weekly rounds

Patients are “rounded on” by the Nephrologist weekly to review medical issues, dialysis adequacy, blood pressure

Notes are written in our charts

- Case summaries completed yearly

Hemodialysis

As a result of IV access, we can give:

- IV antibiotics (if they are compatible with the dialysis schedule)
- IV iron
- Blood transfusions
- Rarely other IV medications

Other medications administered at dialysis:

- Eprex
- Levodopa/Carbidopa
- [Anti-hypertensives, anti-tuberculosis medications, calcium or calcitriol]

Peritoneal dialysis

Peritoneal dialysis

Continuous Ambulatory Peritoneal Dialysis **“CAPD”/Twin bags**

- Patients fill and empty their peritoneal space with 1.5-2.5L of fluid 4 times a day
- Usually, 3 exchanges during the day and a longer dwell overnight

Continuous Cycling Peritoneal Dialysis **“CCPD”/Cycler**

- Patients hook up to a machine at night that is programmed and inserts/drains the PD fluid into the peritoneal space while the patient sleeps
- Therapy is 8-10 hours
- Fluid remains in peritoneal space for a long dwell during the day

Peritoneal dialysis

Fluid removal is adjusted by selecting PD bags with different glucose concentrations

0.5%, 1.5%, 2.5%, 4.25% glucose solutions available

- The higher the solution the more fluid removed
- 0.5% solution usually “gives” fluid and is useful when patient is hypovolemic

7.5% Icodextrin solution used for the long dwell

- Non-glucose solution only approved for one bag to be used daily

Peritoneal dialysis

PD unit is open on weekdays with on-call PD nurse available over the weekend

Patients have 2-3 days of training to learn the PD technique

Ongoing support through the PD unit

Patients evaluated Q 2-4 months in clinic

"Assisted PD" available within Winnipeg

- A nurse goes to the patient's house 1-2 times a day to assist with PD
- PD is available in specific long term care homes in Winnipeg

Peritoneal dialysis

Adequacy is calculated from a 24 hour collection of the patient's PD effluent and urine

- pKt/v and rKt/v
- Done Q6 months or PRN if concern patient is receiving adequate dialysis

Adjustments made to patient's PD regimen based on results and adequacy

Peritoneal dialysis - drawbacks

Not a “forever” dialysis modality

- On average 2-5 years
- We have patients who have been on PD for >10 years

Catheter malfunction and infectious complications are common causes of technique failure

Patients must be on a bowel regimen

Weight gain and hyperglycemia common due to glucose load

- 4.25% bag equivalent to a can of coca-cola

Patients with diabetes need careful monitoring of their blood sugars and usually require changes to their regimen

Peritoneal dialysis

PD unit is available to answer questions and troubleshoot issues

- We can see patients “same day” if they have an urgent PD issue and can get to the PD unit: peritonitis, exit site infection, catheter malfunction
- If unable to get to the PD unit and we are concerned they may have peritonitis, patients are advised to seek medical attention locally

PD peritonitis can be life- and modality-threatening

Have a high index for suspicion in anyone on PD with new onset malaise, fever, abdominal pain

- If cloudy effluent present, peritonitis is the diagnosis of exclusion

PD peritonitis

Diagnostic criteria (from the PD effluent):

- >100 cells
- >50% PMNs
- Positive culture

Requires prompt fluid sampling and treatment with intra-peritoneal (IP) antibiotics

Home Hemodialysis

Home Hemodialysis

Patients trained M-F in HHD unit for 6-10 weeks

- Taught how to use the dialysis machine
- Manage fluid status
- Administer medications
- Safely use their vascular access

HHD unit open M-F for any issues

- After hours patients can call the in-centre HD unit, dialysis technicians, Nephrologist on-call

Patients seen Q3 months in clinic or as needed in the HHD unit

Home Hemodialysis

Adequacy typically measured in hours or dialysis per week

Patient regimen determined by the patient's needs, lifestyle and preference

- Some patients dialyze nocturnally for up to 40 hours a week

Dosing and timing of medication needs to take patient dialysis schedule into consideration

Common Medical issues in ESRD that we regularly address

Hypertension

CV risk factor modification

Mineral metabolism

Anemia

Vaccinations

Restless legs

Vascular access issues

Infections

Medication dosing

Generally feeling unwell

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Generally feeling unwell

Common Medical issues in ESRD that (*in my opinion) Nephrology doesn't manage so well

Gynecologic issues and exams

Depression and anxiety

Anything of a sensitive nature

Skin rashes

Anything eye related that can't be treated with antibiotics

COPD

MSK issues

Blood pressure targets

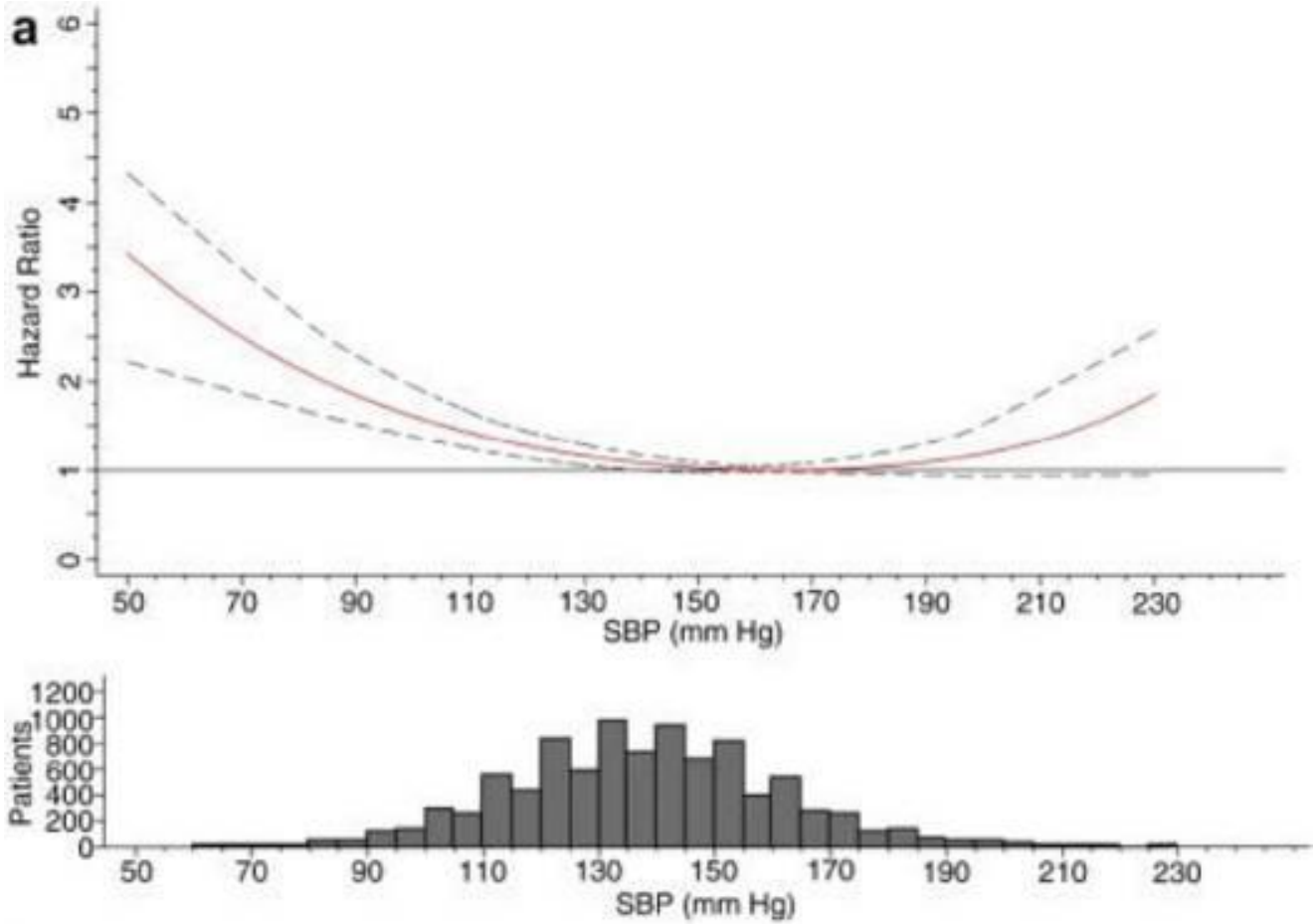
No good trials to guide goal blood pressure targets in patients on hemodialysis

- Most society guidelines suggest a pre-dialysis blood pressure of <140/90 mmHg

Blood pressure readings complicated by timing of measurement (pre-dialysis vs home measurement)

U- or J-shaped curve noted in the literature between pre-dialysis blood pressures and mortality

Relationship between blood pressure and mortality in patients on hemodialysis



McCallum et al. *Semin Dial*. 2019 January ; 32(1): 35–40. doi:10.1111/sdi.12754.

Hypertension management

Fluid management complicates blood pressure management in patients on dialysis

- A significant component of their blood pressure is related to sodium and fluid shifts

The goal for fluid management is to achieve “dry weight”

- **Theoretic** weight at which blood pressure is in target and the patient doesn’t experience severe symptoms related to fluid removal

Hypertension management

Blood pressure management in patients on hemodialysis:

- Remind patients of fluid restriction (1-1.5L per day)
- Home blood pressure readings on non-dialysis days
- Sequential decrease in post-dialysis weight, generally 0.5 kg/treatment until blood pressure normalizes
- Extra treatments
- Medication intensification: ARB and beta-blockers preferred in patients with ESRD

Hypertension management

Blood pressure management in patients on peritoneal dialysis:

- Remind patients of fluid restriction (1-1.5L per day) and need to do daily weights
- Home blood pressure readings several times a day
- Increase the strength of solutions being used to remove excess fluid
- PD nurses call the patient daily or every couple days to go over vital signs, symptoms and to reassess solution strength
- Medication intensification: ARB and beta-blockers preferred in patients with ESRD

Hypertension management

If you see someone in your office and they are symptomatically hypotensive or hypertensive, do whatever needs to be done at that moment

- Otherwise, can leave blood pressure management to Nephrology (ask patient to contact their unit) or contact the clinic/unit yourself if you are concerned

Infections

Patients on dialysis are immunocompromised

They usually require more aggressive therapy and for longer periods of time compared to patients not on dialysis

If possible, obtain cultures due to hospital acquired infections and resistance patterns

Vascular access infections

Patients with an infection near or involving their vascular access (fistula, central line, PD catheter) must be managed by Nephrology

Please call Nephrology

Antibiotics

Almost every antibiotic requires dose-adjustment and attention to timing around dialysis

- We can give IV antibiotics in the dialysis unit
- PD requires significant dose adjustment
- We can teach HHD patients to self-administer some IV antibiotics

Call the Nephrologist/dialysis unit/pharmacist for help in choosing and dosing antibiotics if needed

MEDICATIONS

Assume any medication you prescribe will require dose adjustment

Need to consider timing of doses around dialysis timing (some medications are removed by the dialysis treatment)

If in doubt and the medication is non-urgent, feel free to contact our pharmacists, the dialysis unit or have the patient ask us

Medications requiring adjustment

Antibiotics – as discussed

Gabapentin – maximum 300 mg per day

- *At risk for significant adverse effects if higher doses started*

Valacyclovir/Acyclovir – significant dose adjustment required and even with the adjusted dose confusion requiring hospitalization common. Not cleared by PD and we have seen several cases of toxicity/overdose

Medications

Medications that are preferred over others:

- Hydromorphone preferred over morphine
- Renal multivitamin (Replavite, Jamplavite) rather than standard multivitamin
- Please don’t prescribe calcium or vitamin D for bone health

Medication list

- *We have a medication record for outpatient and **in-dialysis medications***

Medications not to use in ESRD

Baclofen

Bisphosphonates/Denosumab

Generally feeling unwell

Can’t predict how patients will tolerate dialysis before they start

Common symptoms:

- Headache
- Weakness/fatigue
- Cramping
- Insomnia
- Pruritus
- Restless legs

Headaches

More common with in-center hemodialysis, typically occurs towards the middle/end of dialysis and results in shortened dialysis treatments

Can be debilitating and patients are often very frustrated because it is difficult to treat

What we try:

- Optimizing blood pressure (avoiding hypotension or big swings in blood pressure during dialysis)
- Caffeine during dialysis
- Tylenol pre-dialysis
- Metoclopramide pre-dialysis
- Oxygen during dialysis
- Propranolol
- Daily dialysis
- Another modality

Weakness/fatigue

Almost always multifactorial

Things we consider and try to optimize:

- Dry weight adjustment
- Blood pressure and heart rate
- Dialysis adequacy
- Anemia
- Other medical conditions: cardiac, respiratory, thyroid, infections
- Medication induced
- Deconditioning – OT consult
- Mood disorders

Cramping

Can be very painful and prevent patients from receiving adequate dialysis

Things we can try:

- Reinforcing fluid restriction targets
- Changing rate of fluid removal
- Sodium ramping
- Changing dry weight
- Gabapentin
- Cycling during dialysis
- Short daily dialysis
- Other modality

Insomnia

Common due to changes in sleep associated with ESRD

Encourage general sleep hygiene

Reinforce expectations regarding sleep

Melatonin 3-6 mg QHS

Maximum Zopiclone dose is **5 mg daily in ESRD**

Try and avoid benzodiazepines

Can use gabapentin if they have other comorbidities

Pruritus

Can be difficult to treat, tends to be cyclical

Encourage OTC moisturizer multiple times a day

Uremol 10% BID

We will change dialyzers in the HD unit in case there is an “allergy”

Intensify dialysis if not reaching adequacy targets

Ensure calcium/phosphate are in target

Trial gabapentin, non-sedating antihistamines

Referral to dermatology for UV light therapy

Restless legs

Common, contributes to poor sleep

If it is infrequent, we use Carbidopa/Levodopa 25 mg/100mg 1 tab PRN

- Some patients receive pre-dialysis in the HD unit

If it occurs regularly, we will try:

- Ropinirole
- Pramipexole
- Gabapentin
- Titrate dose to effect. This can be deferred to the dialysis unit

Tips to help you navigate the system

Know which hospital and modality your patient is on so that you can contact the correct unit

- Our charts are paper and physically located in the patient's unit

Once on dialysis/transplant patients are taken care of via a "shared care model" and you can contact the Nephrologist on for that service

All our patients have a yearly "case summary" completed which is a comprehensive summary of history and issues

- If you aren't receiving the case summaries please contact the unit to request one and ask to be cc'd on future case summaries

Questions?