We would like to acknowledge that we are gathered today on the traditional territories of the Musqueam, Squamish and Tsleil-Waututh peoples.

Source: www.johomaps.net/na/canada/bc/vancouver/firstnations/firstnations.html
Recognizing Frailty in Chronic Kidney Disease

Wayne Hung, UBC Nephrology PGY-5
Dr. Peter Neufeld, VGH Nephrology
VCH Family & Community Practice Rounds
June 15, 2021
Incident ESRD Patients, Age-Specific Rate per Million Population, Canada, 1997 to 2016
### Prevalence of ESRD by Age, CORR data 1997 to 2016

<table>
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<th>Year</th>
<th>Age 0–19 (N)</th>
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Frailty

- Generalized decline in **multiple physiologic systems**, with exhaustion of **functional reserves** and **vulnerability** to a range of adverse outcomes
  - Independently associated with **poor survival** and **increased comorbidity**
  - Identification in ESRD patients may lead to earlier interventions
  - Comprehensive Geriatric Assessment (CGA) best systematic approach
  - Multiple modified assessment and screening tools available
    - **Clinical Frailty Scale** (Canadian Study of Health and Aging)
Clinical Frailty Scale*

1. Very Fit – People who are robust, active, energetic and motivated. These people commonly exercise regularly. They are among the fittest for their age.

2. Well – People who have no active disease symptoms but are less fit than category 1. Often, they exercise or are very active occasionally, e.g. seasonally.

3. Managing Well – People whose medical problems are well controlled, but are not regularly active beyond routine walking.

4. Vulnerable – While not dependent on others for daily help, often symptoms limit activities. A common complaint is being “slowed up”, and/or being tired during the day.

5. Mildly Frail – These people often have more evident slowing, and need help in high order IADLs (finances, transportation, heavy housework, medications). Typically, mild frailty progressively impairs shopping and walking outside alone, meal preparation and housework.

6. Moderately Frail – People need help with all outside activities and with keeping house. Inside, they often have problems with stairs and need help with bathing and might need minimal assistance (cuing, standby) with dressing.

7. Severely Frail – Completely dependent for personal care, from whatever cause (physical or cognitive). Even so, they seem stable and not at high risk of dying (within ~ 6 months).

8. Very Severely Frail – Completely dependent, approaching the end of life. Typically, they could not recover even from a minor illness.

9. Terminally Ill - Approaching the end of life. This category applies to people with a life expectancy < 6 months, who are not otherwise evidently frail.

Scoring frailty in people with dementia

The degree of frailty corresponds to the degree of dementia. Common symptoms in mild dementia include forgetting the details of a recent event, though still remembering the event itself, repeating the same question/story and social withdrawal.

In moderate dementia, recent memory is very impaired, even though they seemingly can remember their past life events well. They can do personal care with prompting.

In severe dementia, they cannot do personal care without help.

Geriatric Giants

• Depression
• Dementia
• Falls
• Polypharmacy
• Incontinence
• Immobility
• Malnutrition
• Sensory impairment
Frailty

- Elderly ESRD patients represent a classically frail population
  - Multiple comorbidities, polypharmacy, falls, symptoms limiting quality of life and disability
- Two thirds of all dialysis patients meet criteria for frailty
  - Low physical function and vitality scores
  - Inactivity (90% among > 80 years)
  - Malnutrition
- Up to 50% of < 60 year olds on dialysis are frail!!

Woods et al, 2005
Keypoints for today’s discussion

How does recognition of frailty and aging change:

• Diagnosis of CKD?
• Management of CKD?
• Discussions in preparing for ESRD?
• Discussions in advanced care planning?
Definition of CKD
Definition of CKD

1.1: DEFINITION OF CKD

1.1.1: CKD is defined as abnormalities of kidney structure or function, present for > 3 months, with implications for health. (Not Graded)

Criteria for CKD (either of the following present for > 3 months)

<table>
<thead>
<tr>
<th>Markers of kidney damage (one or more)</th>
<th>Criteria for CKD (either of the following present for &gt; 3 months)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Albuminuria (AER ≥ 30 mg/24 hours; ACR ≥ 30 mg/g [≥ 3 mg/mmol])</td>
<td>GFR &lt; 60 ml/min/1.73 m² (GFR categories G3a-G5)</td>
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<tr>
<td>Urine sediment abnormalities</td>
<td></td>
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<tr>
<td>Electrolyte and other abnormalities due to tubular disorders</td>
<td></td>
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<tr>
<td>Abnormalities detected by histology</td>
<td></td>
</tr>
<tr>
<td>Structural abnormalities detected by imaging</td>
<td></td>
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<tr>
<td>History of kidney transplantation</td>
<td></td>
</tr>
</tbody>
</table>

Decreased GFR

Abbreviations: CKD, chronic kidney disease; GFR, glomerular filtration rate.
CKD: staging

Prognosis of CKD by GFR and Albuminuria Categories: KDIGO 2012

| GFR Categories (mL/min/1.73 m²) | Description and range | G1 | Normal or high | G2 | Mildly decreased | G3a | Mildly to moderately decreased | G3b | Moderately to severely decreased | G4 | Severe decreased | G5 | Kidney failure |
|----------------------------------|------------------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|
| Persistent albuminuria categories | Description and range | A1 | Normal to mildly increased | A2 | Moderately increased | A3 | Severely increased |
| Albuminuria categories | mg/g | mg/mmol |
| <30 | 30-300 | >30 |
| <3 | 3-30 | >30 |

Green: low risk (if no other markers of kidney disease, no CKD); Yellow: moderately increased risk; Orange: high risk; Red, very high risk.
How is GFR measured?

• Serum creatinine-based equations
  • Cockcroft-Gault
  • MDRD
  • CKD-Epi

• Creatinine clearance
• Other endogenous markers
• Exogenous markers
Determination of CKD

Bottom line:
• Serum creatinine-based assays are prone to many factors (e.g. age, gender, muscle mass, diet, and medications)

• Underdiagnosed if rely solely on serum creatinine
  • Low muscle mass falsely lowers SCr

• No formula or method consistently performs better than another or is validated in elderly population

Giannelli et al, 2007
Management of CKD
Goal of CKD management

• Identification and management of reversible causes of CKD
• Slowing the progression of renal disease
• Treatment of the complications of kidney disease
• Adjusting medication doses for the level of estimated glomerular filtration rate (eGFR)
• Preparation for renal replacement therapy, if appropriate
Risk Factor Modification

• For the majority of patients with CKD:
  • “Kidneys are innocent bystanders”
• Treatment often directed at modifying risk factors:
  • Blood pressure
  • Glycemic control
  • Lipid management
  • Cardiac function optimization
  • Anti-proteinuric therapy
Blood Pressure Targets?

- KDIGO recommendations:
  - 130/80 in diabetic or proteinuric patients, otherwise 140/90
- HYVET:
  - 150/80 in those aged >80
- SPRINT:
  - 120/80 in those age >50 with high CV risk

- Bottom line: Individualized approach in deciding on the intensity of hypertension therapy
- Tip: Use bedtime dosing of antihypertensive medications to restore nocturnal dips in BP
Glycemic Targets?

- Note that A1C artificially lower in advanced CKD
  - Due to shorter RBC lifespan
  - Diabetic control may be worse than numbers suggest

- Usual approach to individualizing A1C targets

---

### A1C% Targets for Glycemic Control

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<th>A1C%</th>
<th>Targets for Glycemic Control</th>
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<tr>
<td>≤ 6.5</td>
<td>Adults with type 2 diabetes to reduce the risk of CKD and retinopathy if at low risk of hypoglycemia*</td>
</tr>
<tr>
<td>≤ 7.0</td>
<td>MOST ADULTS WITH TYPE 1 OR TYPE 2 DIABETES</td>
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</tbody>
</table>
| 7.1   | Functionally dependent*: 7.1-8.0%  
      | Recurrent severe hypoglycemia and/or hypoglycemia unawareness: 7.1-8.5%  
      | Limited life expectancy: 7.1-8.5%  
| 8.5   | Frail elderly and/or with dementia†: 7.1-8.5%  

Avoid higher A1C to minimize risk of symptomatic hyperglycemia and acute and chronic complications

End of life: A1C measurement not recommended. Avoid symptomatic hyperglycemia and any hypoglycemia.
* based on class of antihyperglycemic medication(s) utilized and the person’s characteristics
† see Diabetes in Older People chapter, p. 5283
Sick day education – meds to hold

• In times of illness with decreased PO intake, may precipitate AKI and increase risk of medication accumulation

• Especially important in those who are frail and on many medications!

• S – Sulfonylureas
• A – ACE inhibitors
• D – Diuretics
• M – Metformin
• A – ARBs
• N – NSAIDs
• S – SGLT2 inhibitors
Complications of CKD
CKD-related Mineral Bone Disease

• AKA: renal or uremic osteodystrophy

• Main defects:
  • Inability to excrete phosphate
  • Vitamin D not activated

• Clinically we see:
  • Low calcium (low vitamin D activity)
  • High phosphate (reduced excretion, dietary intake)
  • High PTH (low calcium, high phosphate, vitamin D deficiency)
CKD-related Mineral Bone Disease

Net effects:

• Deranged bone metabolism
  • High turnover disease
  • Osteomalacia and adynamic bone disease

• High phosphate and PTH associated with CV mortality
  • Theorized intra & extravascular calcification
  • But we don’t really know if treating them improves these outcomes

• Restrictive diet with high pill burden
  • Phosphate binders, Vitamin D analogues - easily can add 5-10 pills each day!

• Often co-exists with osteoporosis
  → high fracture risk → high risk of morbidity and mortality
CKD-MBD and Osteoporosis

• DEXA scan not always reliable in later stage CKD
  • KDOQI still recommends use of DEXA in patients with fractures known risk factors for osteoporosis

• Bone biopsy is gold standard, but rarely performed

• Paucity of safety data in use of anti-resorptives in CKD
  • Use of bisphosphonates in eGFR <30 not well established
  • Theorized risks of accumulation, hypocalcemia, renal injury, and worsening of osteomalacia or adynamic bone disease
  • Denosumab not renally cleared, but risk of hypocalcemia
Management of CKD-MBD

1. Smoking cessation and avoidance of excessive EtOH consumption
2. Moderate weight-bearing physical activity
3. Calcium & Vitamin D supplementation
   • Total elemental calcium (including binders) max 2000 mg/day
   • Vitamin D to maintain 25-OH Vitamin D levels and ‘control’ PTH
     • Convert to activated Vitamin D in advanced CKD
4. Phosphate management through diet and binders*
Anemia

• Anemia of chronic disease
  • Decreased EPO and background inflammation
• Anemia associated with increased mortality
• Investigations: CBC, reticulocytes, ferritin, transferrin saturation, B12
• Treatment begins with ensuring iron replete, then addition of ESA

Johansen et al, 2010
Anemia in Elderly with CKD

- Prudent to investigate for particular causes of anemia:
  - Nutritional deficiencies
  - Occult GI bleeding
  - Hematologic malignancy, e.g. MDS and multiple myeloma

- Oral iron absorption may be poorer in elderly
  - Consider IV iron

- Hemoglobin target 95-115 on ESA
  - Normalization no demonstrable improvement in QoL but increases mortality and CV outcomes
  - General avoidance in those with active malignancy
Nutrition in CKD

• Challenging yet important aspect of care in elderly frail patients
• Multiple layers of dietary restrictions in CKD...
  • Potassium restriction
  • Phosphate restriction
  • Sodium restriction
  • Fluid restriction
• Unclear evidence about optimal protein intake
  • Theorized that high protein intake may lead to hyperfiltration
  • Studies in older CKD patients suggest low protein diet may in fact hasten time to dialysis
Malnutrition in CKD

• Malnutrition common among elderly on dialysis
  • Restrictive diets
  • Frequent & prolonged hospitalizations
  • GI motility disorders
  • Chronic constipation
  • Anorexia
  • Metabolic defects
  • Drug effects

• Albumin < 40g/L marker of mortality
  • No evidence that nutrition therapy decrease mortality

Hakim, 1993
Following a renal diet isn’t easy. This is where renal dietitians help!

The Renal Diet Cheat Sheet

Potassium & Phosphate-Rich Foods To Limit and Substitute
Preparing for ESRD
Many questions...

• How do you prognosticate risk of progression to ESRD?
• What options are available to patients in ESRD?
  • What are the benefits?
  • What are the drawbacks?
  • How does frailty factor into ESRD decision-making?
• How are patients on non-dialysis pathways managed?
Many questions...

• How do you prognosticate risk of progression to ESRD?
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ESRD progression & prognostication

• Predictors:
  • Cause
  • GFR
  • Albuminuria
  • Age
  • Sex
  • Race/ethnicity
  • HTN

• Other risk factors:
  • Hyperglycemia
  • Dyslipidemia
  • Cardiovascular disease
  • Ongoing nephrotoxic exposure
  • Recurrent AKI
  • Smoking
  • Other (comorbidities, socioeconomic status...)

• Kidney Failure Risk Equation (KFRE)
  • 2-year and 5-year risk of ESRD in people with eGFR less than 60
  • 4 and 8 variable calculators
  • Developed initially in Canada and validated in over 30 countries
Kidney Failure Risk Equation

www.kidneyfailurerisk.com
STAGE 4
SEVERE DECREASE IN FUNCTION

Patient risk of progression to kidney failure requiring dialysis or transplant:

<table>
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<tr>
<th>CKD STAGES</th>
<th>GLOMERULAR FILTRATION RATE</th>
<th>Patient risk of progression at 2 years</th>
<th>Patient risk of progression at 5 years</th>
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<tr>
<td>5</td>
<td>&lt; 15</td>
<td>200.41 %</td>
<td>200.7 %</td>
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Risk thresholds used in health systems include:

- 3-5 % over 5 years for referral to a kidney doctor
- 10 % over 2 years for team based care (Kidney Doctor, Nurse, Dietician, Pharmacist)
- 20-40 % over 2 years for planning a transplant or fistula
How can I reduce my risk of kidney failure?

There are things you can do to reduce your risk of kidney failure over the next five years. Click below to see how the following will decrease your risk.

- Your current 5 year risk based on the answers you provided is **40.7%**
- Achieving good blood pressure control can reduce your 5 year risk from **40.7% to 32.15%**.
- An ACE inhibitor (pril) or ARB (sartan) can reduce your 5 year risk from **40.7% to 28.49%**.

The benefits of these changes can add up over time.
When do you start thinking about dialysis?

• No absolute GFR limit, although typically <10ml/min

WITH

• Symptoms or complications of CKD that can no longer be medically managed:
  • Uremic symptoms, volume overload, electrolyte abnormalities, acidosis...
Many questions...

• How do you prognosticate risk of progression to ESRD?

• What options are available to patients in ESRD?
  • What are the benefits?
  • What are the drawbacks?
  • How does frailty factor into ESRD decision-making?

• How are patients on non-dialysis pathways managed?
Available options

Renal Replacement Therapy

• Home therapies
  • Peritoneal Dialysis
  • Home hemodialysis

• In-centre therapy
  • Hemodialysis

• Transplantation
  • Living donor
  • Deceased donor

• Conservative care
  • Non-dialysis, symptom-guided
Dialysis in the Elderly

- Adults ≥ 65 years largest segment of CKD population
- Increasing average age of patients on dialysis
  - In 2000, average age 62 years in US
- Number of elderly initiating dialysis increasing
  - 57% growth in dialysis starts patients ≥ 80 years, 1996 - 2003
- Dialysis modalities in patients ≥ 75 years
  - 96% hemodialysis, 3.5% peritoneal dialysis, 0.3% home hemodialysis

USRDS, 2005
Hansberry et al, 2005
Perceived Benefits of Dialysis

• Most elderly patients would chose dialysis
  • 84% would choose dialysis
  • 83.3% of nursing home elderly would want dialysis
  • 74% of all elderly preferred home dialysis treatment
  • Being independent and free from major symptoms was regarded as important for a good quality of life

Ahmed et al, 1999
Quality of Life on Dialysis

• 1980s studies indicate acceptable quality of life for elderly on dialysis
  • Purported reason: regular social outings!
  • Likely not representative of today’s elderly on dialysis

• Recent studies indicate significant decline in QOL on dialysis
  • 40% patients impaired QOL at initiation, 80% impaired QOL at 3 years on dialysis
  • Impaired sleep, symptoms of disease and physical function most troublesome

Unruh et al, 2008
Functional status of elderly patients on HD

- Study of nursing home residents initiating dialysis looked at functional status of patients before and after dialysis initiation.

Tamura et al, 2009
Function on Dialysis

• High rates of dependency in elderly on HD

BADLs: 52% dependence

IADLs: 90% dependence

Cook et al, 2008
Podsiadlo et al, 1991
Survival on Dialysis

• Life expectancy on dialysis is greatly reduced compared to age matched controls
  • Patients > 65 years - 4 year survival
  • Patients > 75 years survival at 1, 2, and 5 years is 69, 37, and 20%
• Marginal increase in survival in last 20 years
• No clear survival benefit to PD

USRDS, 2009
Letourneau et al, 2003
Jassal et al, 2007
3-Month and One-, Three- and Five-Year Survival Rates* in Dialysis Patients, by Age Group, Canada, CORR 2007 to 2016 (%)

<table>
<thead>
<tr>
<th>Age Group</th>
<th>At start</th>
<th>3 months</th>
<th>1 year</th>
<th>3 years</th>
<th>5 years</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age 0–17</td>
<td>100</td>
<td>99.7</td>
<td>97.7</td>
<td>94.3</td>
<td>86.6</td>
</tr>
<tr>
<td>Age 18–44</td>
<td>100</td>
<td>98.4</td>
<td>95.1</td>
<td>87.0</td>
<td>75.2</td>
</tr>
<tr>
<td>Age 45–54</td>
<td>100</td>
<td>96.7</td>
<td>91.0</td>
<td>78.5</td>
<td>64.5</td>
</tr>
<tr>
<td>Age 55–64</td>
<td>100</td>
<td>94.7</td>
<td>86.8</td>
<td>69.1</td>
<td>50.4</td>
</tr>
<tr>
<td>Age 65–74</td>
<td>100</td>
<td>92.2</td>
<td>81.7</td>
<td>58.8</td>
<td>39.0</td>
</tr>
<tr>
<td>Age 75+</td>
<td>99.9</td>
<td>88.1</td>
<td>73.4</td>
<td>45.3</td>
<td>25.7</td>
</tr>
</tbody>
</table>
Survival of elderly on RRT

- Many trials have demonstrated the small survival benefit of dialysis in elderly patients with high comorbidity or frailty
- Previous studies showed survival advantage from dialysis was \(~4\) months in patients >75 y.o. with high comorbidity
- Much of additional time spent in dialysis or hospital

Figure 1. Quartiles of life expectancy after dialysis initiation by age group.

Tamura et al, 2012
Many questions...

• How do you prognosticate risk of progression to ESRD?
• What options are available to patients in ESRD?
  • What are the benefits?
  • What are the drawbacks?
  • How does frailty factor into ESRD decision-making?
• How are patients on non-dialysis pathways managed?
Kidney Care Clinic

• Provide specific therapy based on diagnosis to slow CKD progression
• Prevent, evaluate and manage CVD, endocrine/metabolic complications, other co-morbid conditions
• Maximize confidence and abilities of patient and families to adjust to their disease, participate in their care
• Support planning and preparation for ESRD
  • Vascular access planning for hemodialysis
  • Peritoneal dialysis catheter insertion
  • Transplant referral and workup
  • Identification of patients for conservative pathway and advanced care planning
Markers of Poor Prognosis

- Poor prognostic factors (“frail” phenotype)
  - Older age (> 80 years, >> 90 years)
  - Poor nutrition
  - Non-ambulatory status
  - Functional dependence and nursing home placement
  - Dementia

- Survival advantage to HD nearly lost in patients with high comorbidity scores
  - Ischemic heart disease
  - PVD

Kurella et al, 2007
Murtagh et al, 2007
Joly et al, 2003
### 3-Month Mortality in Incident Elderly ESRD patients

#### 6-Month Mortality on HD

<table>
<thead>
<tr>
<th>Question</th>
<th>Answer</th>
</tr>
</thead>
<tbody>
<tr>
<td>Would I be surprised if this patient died in the next year?</td>
<td>Unanswered</td>
</tr>
<tr>
<td>Albumin?</td>
<td>Unanswered</td>
</tr>
<tr>
<td>Age?</td>
<td>Unanswered</td>
</tr>
<tr>
<td>Dementia?</td>
<td>Unanswered</td>
</tr>
<tr>
<td>Peripheral Vascular Disease?</td>
<td>Unanswered</td>
</tr>
<tr>
<td>Congestive Heart Failure?</td>
<td>Unanswered</td>
</tr>
<tr>
<td>Peripheral Vascular Disease?</td>
<td>Unanswered</td>
</tr>
<tr>
<td>Dysrhythmia?</td>
<td>Unanswered</td>
</tr>
<tr>
<td>Active Cancer?</td>
<td>Unanswered</td>
</tr>
<tr>
<td>Severe Behavioral Disorder?</td>
<td>Unanswered</td>
</tr>
<tr>
<td>Mobility?</td>
<td>Unanswered</td>
</tr>
<tr>
<td>Serum Albumin?</td>
<td>Unanswered</td>
</tr>
</tbody>
</table>

Cohen et al, 2009
Couchard et al, 2012
European Renal Best Practice Group

Farrington et al, 2017
Withholding Dialysis

• Few universal contraindications to dialysis
  • Metastatic cancer with very poor prognosis
  • Other end organ failure without curative therapy, e.g. liver failure
  • Severe dementia

• Withholding dialysis for comorbidities or poor prognosis can be acceptable (Canada)
  • ¼ patients denied based on poor overall prognosis or severe comorbidity incl. dementia
  • No increase in second opinions or law suits

Hirsch et al, 1994
Many questions...

• How do you prognosticate risk of progression to ESRD?
• What options are available to patients in ESRD?
  • What are the benefits?
  • What are the drawbacks?
  • How does frailty factor into ESRD decision-making?
• How are patients on non-dialysis pathways managed?
Conservative care

• The KCC remains involved but focus of care changes
• Management of symptoms
• Provision of appropriate palliative care
• Advanced care planning
Conservative Approach

• Can survive several years in ESRD off dialysis
  • Median survival 14 months
• Conservatively managed (CM) patients achieve similar rates of hospital free days to patients on HD
• CM patients more likely to die at home or in a hospice (OR 4.15)

Wuerth et al, 2005
Carson et al, 2009
Working together for better kidney health

BC Renal plans and coordinates health-care services for patients with kidney disease in BC

Popular topics

- COVID-19 information for patients
- COVID-19 information for health professionals
- Kidney self assessment
- Chronic kidney disease health info
- Pharmacy & formulary
- Print materials order form
Working together for better kidney health

BC Renal plans and coordinates health-care services for patients with kidney disease in BC

Common Symptom Guides

- Constipation
- Depression and Anxiety
- Fatigue
- Nausea/Poor Appetite
- Muscle Cramps
- Pain Management Resources
- Pruritus
- Restless Leg Syndrome
Conservative Care Pathway

Created November 2016; Updated November 2017
Approved by the BCPRA Kidney Care Committee
CONSERVATIVE MANAGEMENT PATHWAY FOR ADVANCED CHRONIC KIDNEY DISEASE IN BC

All CKD patients
- eGFR > 25: KCC Phase 1a
  - active KCC care
  - CKD stage 3-4
- eGFR 25-15: KCC Phase 1b
  - modality selection
  - CKD stage 3-4
- eGFR < 15: KCC Phase 1c
  - supportive ongoing care
  - CKD stage 5

CKD patients on a conservative pathway
- eGFR < 15 and declining:
  - KCC Phase 2
    - decompensation prognosis < 8 mos
  - KCC Phase 3
    - ↑ symptoms prognosis < 1 mo
  - KCC Phase 4
    - decline/last days
  - KCC Phase 5
    - death & bereavement

Primary Care
- PCP EOL Module: Transition 1
  - disease advancement
- PCP EOL Module: Transition 2
  - decompensation Palliative Performance Scale 50% prognosis < 8 mos
- PCP EOL Module: Transition 3
  - EOL care planning
- PCP EOL Module: Transition 4
  - decline/last days
- PCP EOL Module: Transition 5
  - death & bereavement

GPAC Guideline Part 1*: Approach to Care
GPAC Guideline Part 2*: Pain + Symptom Management
GPAC Guideline Part 3*: Grief & Bereavement

*GPAC Guideline on Palliative Care for the Patient with Incurable Cancer or Advanced Disease

CKD = Chronic Kidney Disease
KCC = Kidney Care Clinic
GPSC = General Practice Services Committee
PCP = Practice Support Program
EOL = End-of-life
Advanced Care Planning
CPR in Dialysis Patients

- Very poor outcomes for inpatient CPR
  - 40% resuscitated into ICU → ¾ of these died within 4 days
  - 8% survive to D/C home vs. 12% of controls
  - 3% still alive at 6 months vs. 9% of controls

- Most dialysis patients want CPR
  - 87% desiring CPR, especially if had seen CPR on TV

Moss et al, 1992
Moss et al, 2001
End of Life Care in ESRD

- Numerous registry studies have characterized **high utilization of health care** by ESRD patients at the end of life
- High rates of hospitalization, ICU admissions, use of intensive procedures during the final month of life
- Significant proportion have **EOL in acute care setting**
- Higher than other life-limiting illnesses

---

**Table. Intensity of Care During the Final Month of Life**

<table>
<thead>
<tr>
<th>Intensity of Care</th>
<th>Medicare Beneficiaries</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Dialysis (Present Study)</td>
</tr>
<tr>
<td>Hospitalization, %</td>
<td>76.0</td>
</tr>
<tr>
<td>Days hospitalized, mean</td>
<td>9.8</td>
</tr>
<tr>
<td>Intensive care unit admission, %</td>
<td>48.9</td>
</tr>
<tr>
<td>Days in an intensive care unit, mean</td>
<td>3.5</td>
</tr>
<tr>
<td>Any intensive procedure, %</td>
<td>29.0</td>
</tr>
<tr>
<td>Hospice use, %</td>
<td>20.0</td>
</tr>
<tr>
<td>Death in a hospital, %</td>
<td>44.8</td>
</tr>
</tbody>
</table>
Dialysis regret

- Review of survey data from HD patients in Canada and the US demonstrate significant rates (21 to 60%) of dialysis regret

- Biggest predictor of dialysis regret: *Choosing dialysis to please doctors or family members*

- Less likely to express regret if:
  - Patient had prognostic discussions about life expectancy with physicians
  - Document for advanced care planning or living will was completed

Davison et al, 2010
## Serious Illness Conversation

### Conversation flow

<table>
<thead>
<tr>
<th>1. Set up the conversation</th>
<th>Patient-tested language</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Introduce purpose</td>
<td>&quot;I'd like to talk about what is ahead with your illness and do some thinking in advance about what is important to you so that I can make sure we provide you with the care you want — is this okay?&quot;</td>
</tr>
<tr>
<td>• Ask permission</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>2. Assess illness understanding &amp; information preferences</th>
<th>Patient-tested language</th>
</tr>
</thead>
<tbody>
<tr>
<td>• What is your understanding now of where you are with your illness?&quot;</td>
<td></td>
</tr>
<tr>
<td>• How much information about what is likely to be ahead with your illness would you like from me?&quot;</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>3. Share prognosis</th>
<th>Patient-tested language</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Frame with a ‘wish...worry’, ‘hope...worry’ statement</td>
<td>Prognosis: &quot;I want to share with you my understanding of where things are with your illness...&quot;</td>
</tr>
<tr>
<td>• Allow silence, explore emotion</td>
<td>Uncertain: &quot;It can be difficult to predict what will happen with your illness. I hope you will continue to live well for a long time but I’m worried that you could get sick quickly, and I think it is important to prepare for that possibility.&quot; Time: &quot;I wish we were not in this situation, but I’m worried that time may be short as... (express as a range e.g. weeks to months, months to a year).&quot; OR Function: &quot;I hope that this is not the case, but I’m worried that this may be as strong as you will feel.”</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>4. Explore key topics</th>
<th>Patient-tested language</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Goals</td>
<td>&quot;What are your most important goals if your health situation worsens?&quot;</td>
</tr>
<tr>
<td>• Fears &amp; worries</td>
<td>&quot;What are your biggest fears and worries about the future with your health?&quot;</td>
</tr>
<tr>
<td>• Sources of strength</td>
<td>&quot;What gives you strength as you think about the future with your illness?&quot;</td>
</tr>
<tr>
<td>• Critical abilities</td>
<td>&quot;What abilities are so critical to your life that you can’t imagine living without them?&quot;</td>
</tr>
<tr>
<td>• Trade-offs</td>
<td>&quot;If you become sicker, how much are you willing to go through for the possibility of gaining more time?&quot;</td>
</tr>
<tr>
<td>• Family</td>
<td>&quot;How much does your family know about your priorities and wishes?&quot;</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>5. Close the conversation</th>
<th>Patient-tested language</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Summarize what you’ve heard</td>
<td>&quot;I’ve heard you say that _____ is really important to you. Keeping that in mind, and what we know about your illness, I recommend that we _____________. This will help us make sure that your treatment plan reflect what’s important to you.&quot;</td>
</tr>
<tr>
<td>• Make a recommendation, check in with patient</td>
<td>&quot;How does this plan seem to you?&quot;</td>
</tr>
<tr>
<td>• Affirm your commitment to the patient</td>
<td>&quot;I will do everything I can to help you through this.&quot;</td>
</tr>
</tbody>
</table>

| 6. Document your conversation & 7. Communicate with key clinicians | |

---
Talking about your illness with loved ones and caregivers

This booklet can help you talk with your loved ones about your illness and the future. It is based on what you have already talked about with your clinician.

Talking about your illness with friends and family may not be easy, but it will help them understand what is important to you. It will also help them support you and your decisions.

Before you talk to your loved ones, think about when and where you want to talk. Choose a time and place when you feel relaxed. Be sure you have time to talk for a while. You can use the words in this guide, or use your own words — whatever is easier for you.

At your scheduled visit, your clinician would like to talk with you about your illness, your goals and wishes, and planning for the future. You may already have an Advance Care Plan which we will need to review as an important part of the care we provide for all of our patients.

Our team likes to start talking about this when patients are doing okay. Your illness is serious but stable, so now is a good time to talk about what is ahead, and to do some planning for the future. Patients who think through what is important to them and what their wishes are often feel less anxious, more at peace, and more in control of their situation.

Before your next meeting

Please prepare for your conversation by thinking about these things:

- What would you like to know about your illness and what is likely to be ahead?
- What kind of information would help you make decisions about your future?
- What is most important to you to have a good quality of life?
- What are you afraid of about your illness?
- What kinds of medical care do you not want?
- What do you think it would be like to share these thoughts with your family?
- If you haven’t already identified a Substitute Decision Maker, who would be able to fill that role?

Please bring to your visit:

- If you have a Representation Agreement or a Temporary Substitute Decision Maker list that is not on file at the hospital, please bring a copy.
- If you have an Advance Directive, please bring a copy.

If you don’t have these documents or have questions about them, talk to your clinician or check out the Speak Up BC website at: http://www.advancecareplanning.ca/resource/british-columbia

Why is this important?

Thinking about and sharing your wishes will give you more control over the care you get. It will also help prepare your loved ones to make decisions for you if you can’t make them at some point in the future. Knowing what you want will ease the burden on your family of making hard decisions for you if you can’t speak for yourself.

Talking about the future won’t change your ongoing care

Talking about the future won’t change the plans we have made so far about your treatment, unless, of course, you want to. We will keep providing the best possible care to control your disease.

You may find it helpful to bring other people to your next appointment

You can choose to bring the person who is your Substitute Decision Maker or other family members to your next visit so they can be a part of the conversation. You can also bring your nurse practitioner, social worker, or chaplain if you like. Please let your clinician’s office know if you would like to bring others to the appointment.

We understand that your wishes may change over time

This is the beginning of an ongoing conversation. We know that you may have other questions or concerns in the future. We will keep being here to support you and answer your questions so that you can make informed decisions.
Dialysis Withdrawal

• ¼ patients ultimately withdraw from dialysis (US data)
  • The rate of withdrawal may increase as older and sicker patients are dialyzed

• Common reasons for withdrawal
  • 40% FTT
  • 30% Medical complications
  • 30% Severe comorbidities, lifestyle burden

• Death occurs within 1-2 weeks

Murtagh et al, 2007
Stopping Dialysis Treatment
What you need to know before deciding

Frequently Asked Questions about Stopping Dialysis Treatment
A guide for patients and families
Recommendations to Support End-Stage Kidney Disease Patients in Their Last Days to Hours of Life

Conservative Care Pathway

Created 2018
Approved by the BCPRA Palliative Care Committee

Created November 2016; Updated November 2017
Approved by the BCPRA Kidney Care Committee
Future Renal Planning

• **Conservative management is a viable option**, especially in frail patients with poor prognosis

• **Realistic and honest disclosure of prognosis** may help patients and families focus on quality of life measures

• **Shared decision making** between family and team can help to allay guilt

• **Provision of palliative/ conservative care** should be emphasized so patients do not feel abandoned

Cohen et al, 2003
Keypoints for today’s discussion

How does recognition of frailty and aging change:

• Diagnosis of CKD?
• Management of CKD?
• Discussions in preparing for ESRD?
• Discussions in advanced care planning?
Elderly CKD patients represent a classically frail population with many geriatric syndromes.

Most of our diagnostic markers and treatment targets are extrapolated for use in elderly patients.

An individualized approach weighing long-term benefits vs. adverse outcomes in frail comorbid patients.

Dialysis often does not meet expectations of patients, families, and clinicians.

Conservative care is a feasible and well-established option.

Importance of advanced care planning in framing patient’s disease and priorities.
Recognizing Frailty in Chronic Kidney Disease

Wayne Hung, UBC Nephrology PGY-5
Dr. Peter Neufeld, VGH Nephrology
VCH Family & Community Practice Rounds
June 15, 2021

Thank you!
Questions and/or comments?
Falls in CKD

• Falls common in CKD prior to ESRD
  • GFR < 60 mL/min predicts falls among community-dwelling older women 65 to 77 years

• Elderly with ESRD fall more than patients in nursing homes
  • 1.2-1.6 falls/person-year vs. 1.0-1.4 falls/resident-year
  • Falls independently associated with increased mortality in dialysis population ≥ 65 years (HR 1.8)

• Falls may be due in part to vitamin D deficiency
  • Decreased falls risk among women with CKD taking vitamin D supplementation

Cook et al, 2006
Desmet et al, 2005
Gallagher et al, 2007
Functional Preservation

- Benefits of exercise in the older population well documented
  - Prevent/slow decline in physical functioning
  - Specific exercises help reduce frailty, e.g. Tai Chi
  - Lower inflammatory markers

- Rehabilitation in dialysis population improves:
  - Aerobic capacity
  - Muscle strength
  - Geriatric renal rehabilitation with tailored dialysis regimen
Cognitive Impairment in CKD

- Decline in cognition begins before progression to ESRD
- Cognitive decline directly related to decline in GFR
  - 10-25% increase in cognitive impairment per 10 mL/min drop < 60
  - Effect persists when metabolics, medications and comorbidities are controlled

Executive Dysfunction

• In CKD first deficit is decline in executive function and verbal memory
  • MMSE scores not different from age matched controls (trend towards drops in MMSE as GFR declines)
  • Trails B and California Verbal Learning Trial most sensitive markers in early CKD

Mechanism – Vascular Disease Plus

1) Pre-existing vascular risk factors
   • HTN (80%), DM (60%), dyslipidemia

2) Related to HD itself
   • Hypoxia and hypoperfusion

3) Accelerated by chronic HD/ ESRD
   • Uremia and abnormal metabolics
   • Pro-inflammatory state
Stroke in Renal Patients

• Increased prevalence of stroke (USRDS)
  • Prevalence 17% in HD, 10% in CKD, 4% in the general Medicare population
  • Incidence 15% in HD, 9.5% in CKD, 2.4% in the general Medicare population

• Silent strokes up to 5x as common in HD as general population
  • 49% prevalence on MRI screening

United States Renal Data System: USRDS 2005
White Matter Disease

• Sign of chronic hypoperfusion
  • Correlates with ischemic neuropath findings

• Increased white matter disease in ESRD
  • 68% in PD vs. 17.5% in non CKD controls

• Association of white matter disease with subcortical dementia phenotype
  • Greater decline in executive function and processing speed than memory or other cortical domains

Longstreth et al. Clinical correlates of white matter findings on cranial magnetic resonance imaging of 3301 elderly people. The Cardiovascular Health Study. Stroke 1996
CNS Hypoperfusion on HD

- PET and dopplers document CNS hypoperfusion while on HD

- Strokes directly related to HD
  - 34% of infarcts occur during or < 30 mins after a HD session
  - Number of hypotensive episodes correlates with frontal atrophy

- Effect worsened by HD vintage
  - Frontal lobes and white matter perfusion inversely related to dialysis vintage

HD Hemodynamics in the Elderly

• Elderly likely more susceptible to hemodynamic effects of HD

• Autonomic dysfunction and low cardiac reserve (esp. DM)
  • Impairment in baroreceptor reflexes impairs vasoconstriction
  • Inability to increase cardiac output
  • Lower average predialysis blood pressure
  • Increased postprandial hypotension (blood drawn to splanchnic circulation)

Direct Effects of HD on Cognition

• Acute variation in cognition during HD cycles
  • Worst cognition while on HD
  • Recovers almost to baseline at 1 hour after dialysis
  • Best on the day after dialysis

• Worst impairment with more aggressive dialysis
  • Fluid, electrolyte and osmotic shifts

Vascular Dementia in ESRD

- Multiple risk factors and exacerbants for vascular disease
  - Vascular risk factors
  - Strokes and white matter disease
  - Hypoperfusion on dialysis

- Vascular dementia and mixed dementia appears more common than pure Alzheimer’s in ESRD
  - Not quantified

Wardlaw et al. Is breakdown of the blood-brain barrier responsible for lacunar stroke, leukoaraisis, and dementia? Stroke 2003
Cognition: Additional Factors

- Decreased medication clearance
  - Opioids (hydromorphone opioid of choice)
- Metabolic abnormalities
  - Uremia
    - Cognition worsens > 1 day out from last HD run
  - Anemia
    - Mild anemia associated with cognitive dysfunction the elderly (Hgb 100-120 g/L)
    - Executive function and selective attention

United States Renal Data System: USRDS 2005
Cholinesterase Inhibitors in Renal Failure

• No studies with CIs in dementia in the ESRD/dialysis population

• Rivastigmine felt to be CI of choice
  • Shortest half life (1.5 hours)
  • Inactive metabolites (renally excreted)
  • Patch form decreases GI side effects and pill burden

Dementia and Mortality

• Dementia a predictor of mortality
  • 2-yr survival with dementia 24% vs 66% for patients without dementia
  • Average time to death for patients with dementia 1.09 vs 2.7 years

• Also true in PD
  • 2 fold increase in mortality

Summary

• Cognitive impairment occurs early in CKD in association with decline in GFR
• Cognitive impairment is common and progressive despite dialysis
• Dementia appears to be largely related to vascular disease
• Executive dysfunction is most common
• Dementia is a marker of poor prognosis
Lipids

• CKD is a risk factor for cardiac disease, so statins may be considered for CV protection based on usual guidelines

• Data conflicts on whether statins improve albuminuria or reduce progression of CKD

• Statin should not be prescribed for the sole purpose of preventing CKD progression because evidence is limited