# Chronic Kidney Disease
# in Indigenous Communities in Canada

MSERS
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# I ACKNOWLEDGE

The land I'm standing on today is the traditional territories of the Wendat, The Haudenosaunee and the Anishinaabe peoples, and is now home to many diverse First Nations, Inuit and Metis people.

I also acknowledge that Toronto is covered by Treaty 13 signed with the Mississaugas of the Credit, and the Williams Treaty signed with multiple Mississaugas and Chippewa bands.

Canada is occupied land, whose existence is dependent on the sacrifices made by our Indigenous peoples. I thank Indigenous people for protecting these lands and recommend that all settlers commit to make meaningful improvements in the lives of our Indigenous people.

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# Faculty/Presenter Disclosure

- Dr. Benjamin Thomson, Associate Professor, Queen's University

- Relationships with commercial interests:
  Grants/Research Support:
  → Old: CIP, POEM (Western University), Innovation Research Grant, CTAQ (Queen's University), CIHR (CONNECT, ACHIEVE), PDOPPS trial funding

  → Current: None

- Committees: Ontario Renal Network Peritoneal Dialysis Focus Group

- Speaking fees: Baxter Canada

# Mitigating Potential Bias

- No mitigation has been required. Content in this talk does not relate to either research grant topics, funding guidelines or funding organization objectives.

# Learning Objectives

***WHAT is the problem?***

- Review the epidemiology of chronic kidney disease in Indigenous Communities in Canada

***WHY is the problem present?***

- Explain why the rates of CKD/ESKD/transplant differ in Indigenous Communities in Canada
- Understand Indigenous perspectives of CKD in Indigenous communities in Canada

***SOLUTIONS to the problem?***

- Describe interventions to enhance kidney related outcomes in Indigenous Communities in Canada
- Expand on the critical role of primary Care in enhancing outcomes for Indigenous communities in Canada

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# Epidemiology of CKD

- Kidney disease: (i) reduced function (decreased eGFR) (ii) altered function (hematuria, proteinuria) (iii) other (hypertension, chronic electrolyte disorders)
- For today, we will consider CKD to mean (KDIGO, similar to KDOQI)

*"abnormalities of kidney structure or function, present for more than 3 months, with implications for health"*

**Prognosis of CKD by GFR and Albuminuria Categories**

| GFR categories (ml/min/1.73 m²) Description and range | | | | Albuminuria categories Description and range | | |
|---|---|---|---|---|---|---|
| | | | | **A1** | **A2** | **A3** |
| | | | | Normal to mildly increased | Moderately increased | Severely increased |
| | | | | <30 mg/g <3 mg/mmol | 30-299 mg/g 3-29 mg/mmol | ≥300 mg/g ≥30 mg/mmol |
| | **G1** | Normal or high | ≥90 | | | |
| | **G2** | Mildly decreased | 60-90 | | | |
| | **G3a** | Mildly to moderately decreased | 45-59 | | | |
| | **G3b** | Moderately to severely decreased | 30-44 | | | |
| | **G4** | Severely decreased | 15-29 | | | |
| | **G5** | Kidney failure | <15 | | | |

Green: low risk (if no other markers of kidney disease, no CKD); Yellow: moderately increased risk; Orange: high risk; Red, very high risk.
KDIGO 2012

- Prognosis worsens with:
  - (i) Decreased GFR (based on serum creatinine)
  - (ii) Increased proteinuria (based on Urine ACR)

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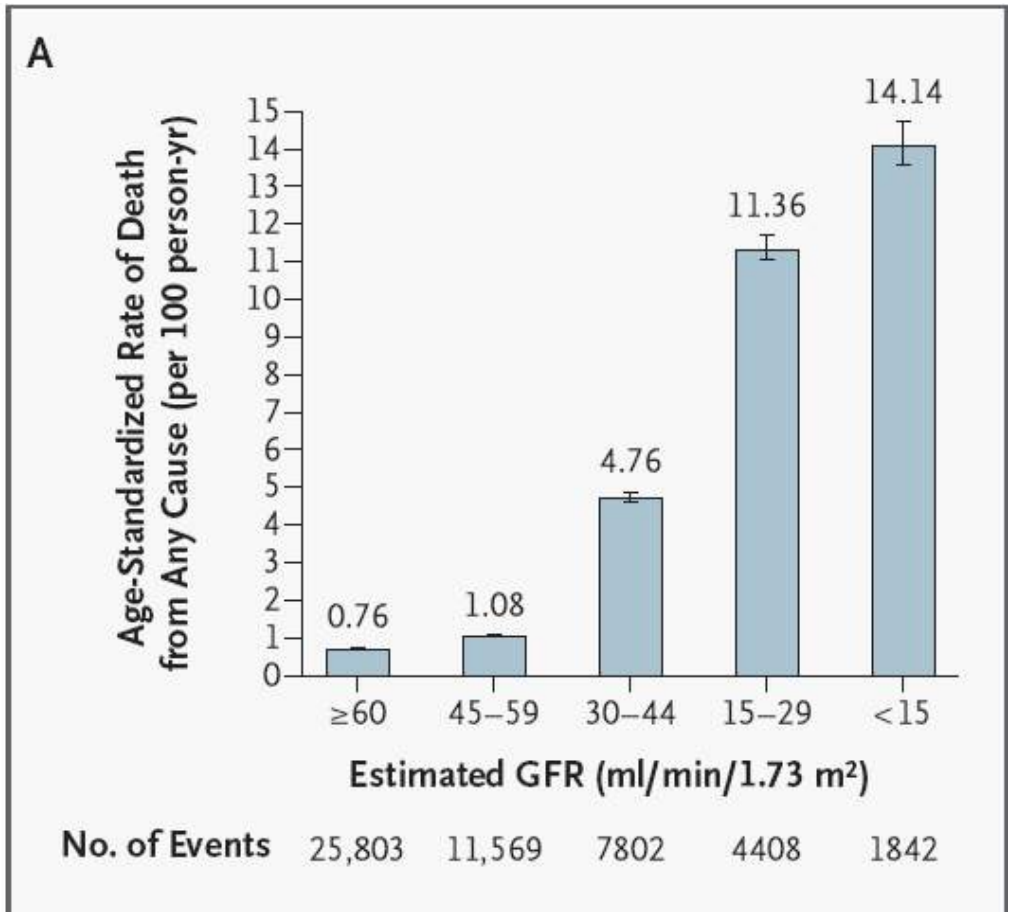
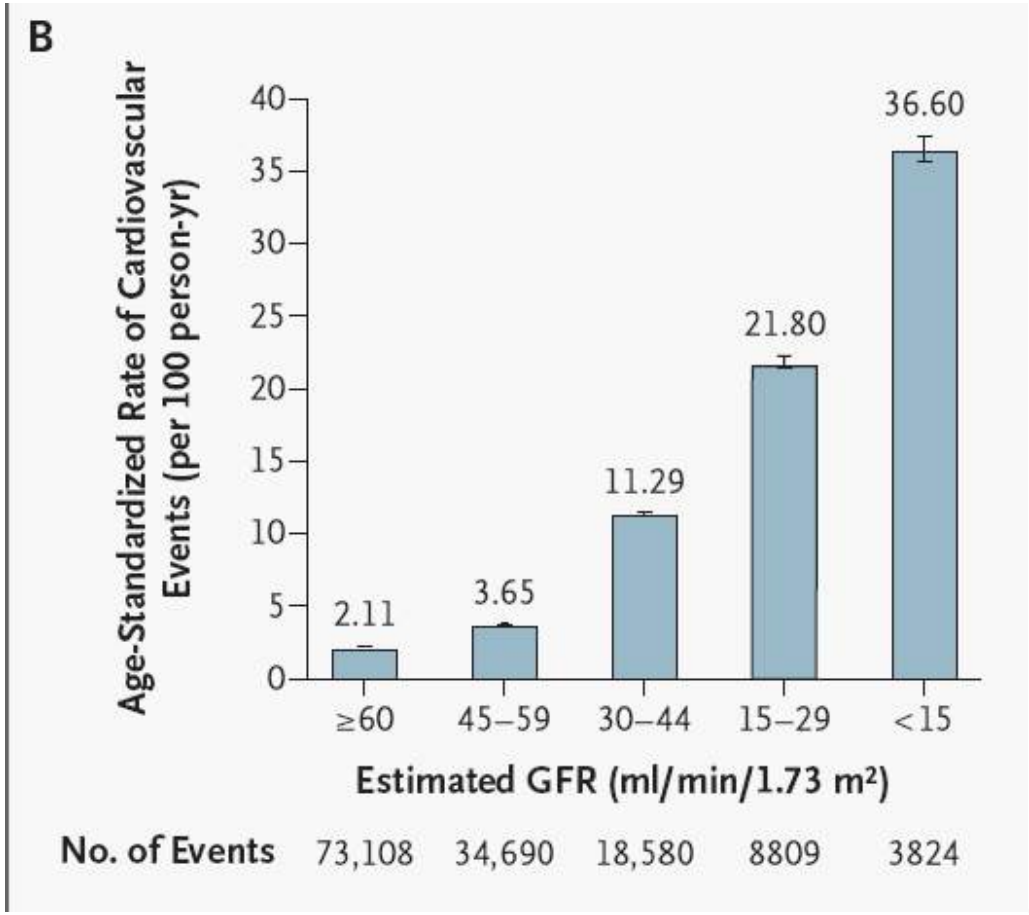
# Epidemiology of CKD

- Renal prognosis (decreased GFR or increased albuminuria) associates with:

1. Increased death



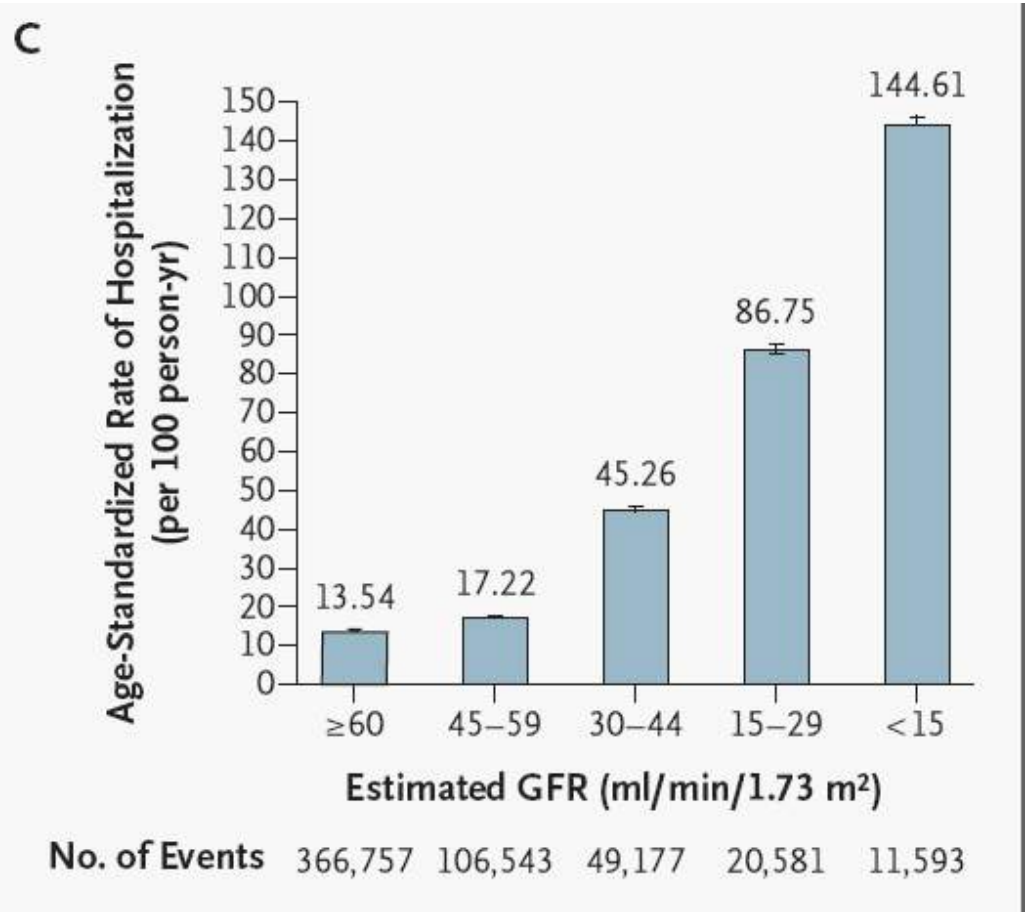

2. Increased cardiovascular events



# Epidemiology of CKD

- Renal prognosis (decreased GFR or increased albuminuria) associates with:

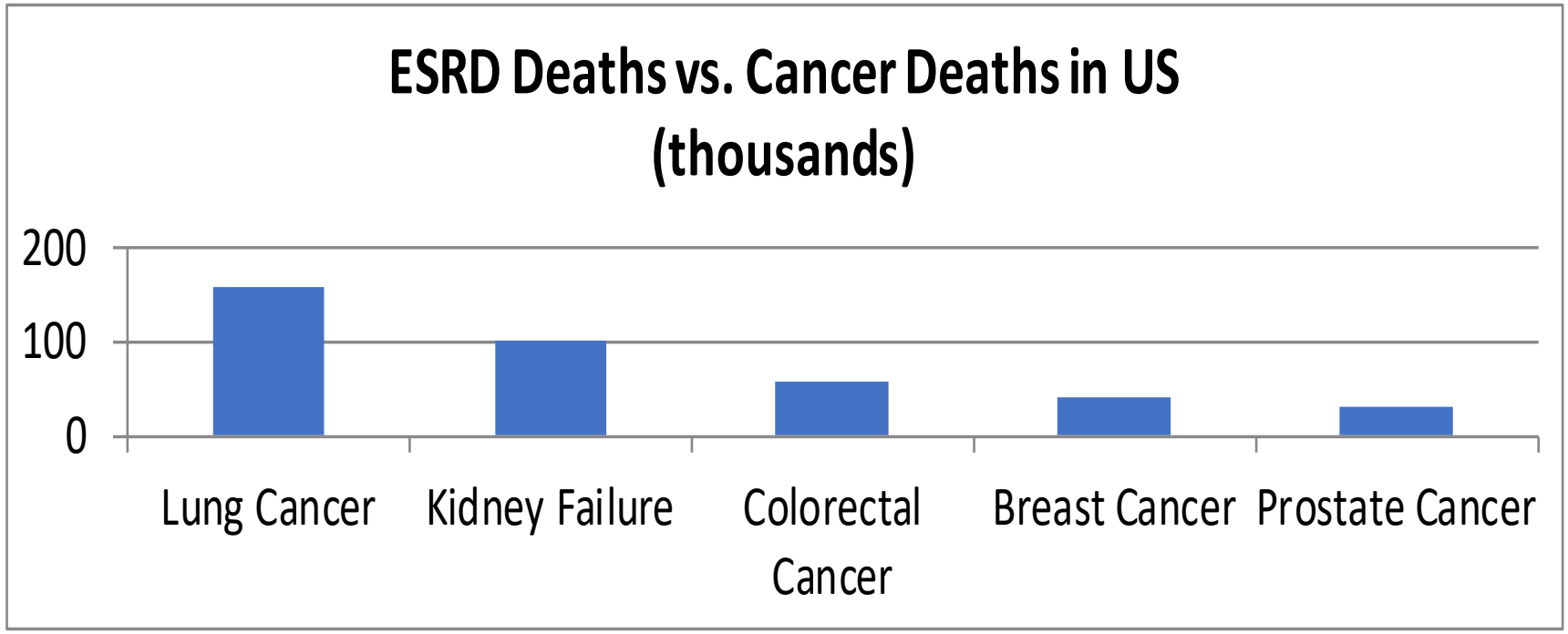
3. Increased Hospitalization




4. Proteinuria (like decreased GFR) associates with:

- Cardiovascular disease
- Congestive heart failure
- Peripheral vascular disease
- Stroke
- Death

# Epidemiology of CKD



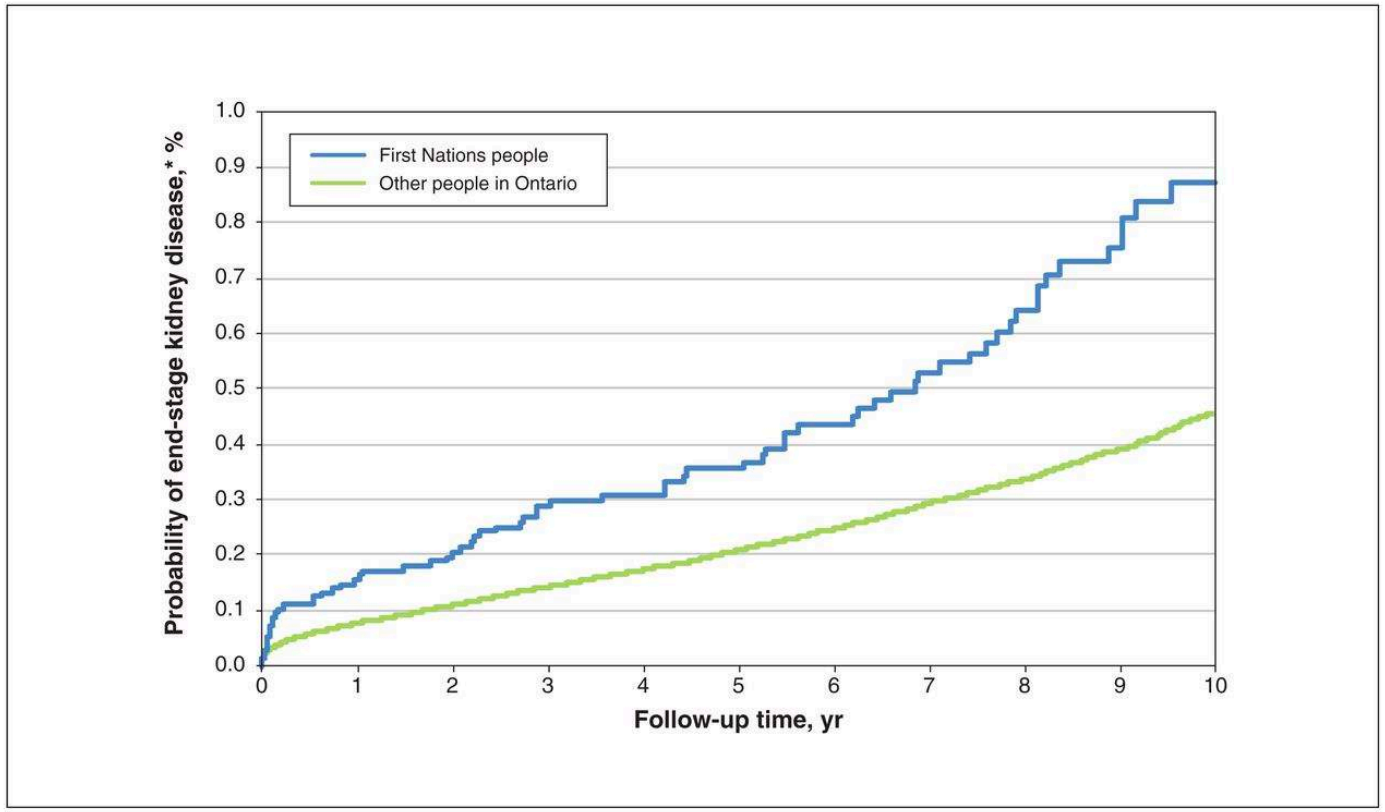
# Epidemiology of CKD

**All of Canada**

- 1 in 10 people in Canada have kidney disease

**Indigenous People in Canada**

- 1 in 3 people in Canada have kidney disease




- Median age at CKD onset 71 (versus 60 for Indigenous)

# Epidemiology of CKD- Transplant

**Table 3 | Unadjusted and adjusted hazard ratios for indigenous patients relative to white patients in Australia, Canada, New Zealand, and the United States**

| | All transplants | | Deceased donor | | Living donor | |
|---|---|---|---|---|---|---|
| Country | Unadjusted HR (95% CI) | Adjusted[a] HR (95% CI) | Unadjusted HR (95% CI) | Adjusted[a] HR (95% CI) | Unadjusted HR (95% CI) | Adjusted[a] HR (95% CI) |
| Australia | 0.23 (0.20–0.26) | 0.23 (0.19–0.27) | 0.29 (0.24–0.33) | 0.32 (0.27–0.37) | 0.15 (0.10–0.19) | 0.18 (0.13–025) |
| Canada | 0.33 (0.28–0.37) | 0.34 (0.29–0.40) | 0.31 (0.26–0.37) | 0.31 (0.26–0.37) | 0.35 (0.28–0.43) | 0.39 (0.30–0.49) |
| New Zealand | 0.15 (0.12–0.18) | 0.23 (0.19–0.28) | 0.15 (0.13–0.18) | 0.22 (0.17–0.28) | 0.14 (0.10–0.18) | 0.26 (0.18–0.37) |
| United States | 0.42 (0.40–0.45) | 0.44 (0.42–0.47) | 0.46 (0.43–0.49) | 0.49 (0.45–0.53) | 0.37 (0.33–0.41) | 0.40 (0.36–0.44) |

CI, confidence interval; HR, hazard ratio.
[a]Adjusted for age, sex, primary cause of end-stage kidney disease, year of diagnosis, comorbidities (diabetes, cerebrovascular disease, ischemic heart disease, peripheral vascular disease, chronic lung disease, and current smoking), and region.

- Indigenous people in Canada:
  - → More likely to have Chronic kidney disease
  - → More likely to have End-stage kidney disease
  - → More likely to be younger when CKD is diagnosed
  - → Less likely to receive a kidney transplant
  - → Communities have rates of End stage kidney disease that are increasing faster than non-indigenous communities

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# Why are rates of CKD, ESKD and transplant so different in Indigenous Communities?

- A few reasons are well studied and published:
  - → A larger proportion with poorly controlled predictors of progression of kidney disease (eg. Diabetes, hypertension)
  - → Access to subspecialty care is reduced in indigenous communities
  - → Primary care outcomes (HbA1C and LDL targets) less likely to be achieved in rural indigenous communities.
  - → Higher rates of risk factors that lead to CKD or CKD progression (eg. Obesity, diabetes, dietary factors, smoking)
  - → There may be genetic factors in Indigenous communities as well.
- Unfortunately, much of the above research barely "scratches the surface" and is in my opinion uninformative and unhelpful

*"The power of data to misinform understandings of Indigenous Health outcomes, especially the acceptance of deficit framing and reinforcement of racial profiling as causal factors for inequities, truncates opportunities to reduce disparities through policy and healthcare reform."*

- Must understand relationship between power, colonisation and loss of resources and how this impacts Indigenous health- only then can practice and policy be informed.

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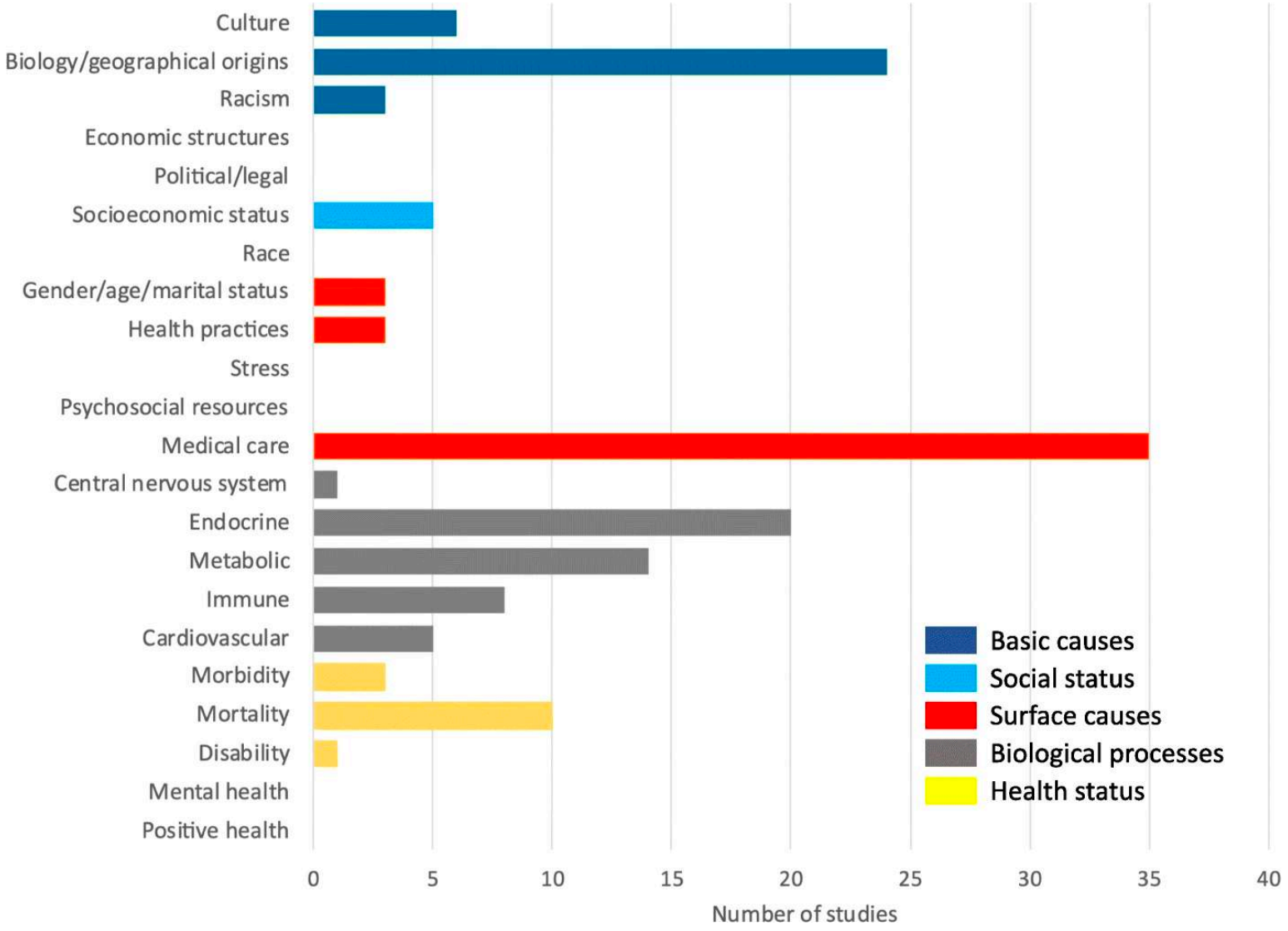
# Why are rates of CKD, ESKD and transplant so different in Indigenous Communities?

- Systematic review with the question "What are the causes of inequities in CKD among Indigenous peoples?"
  → All published causes summarized:



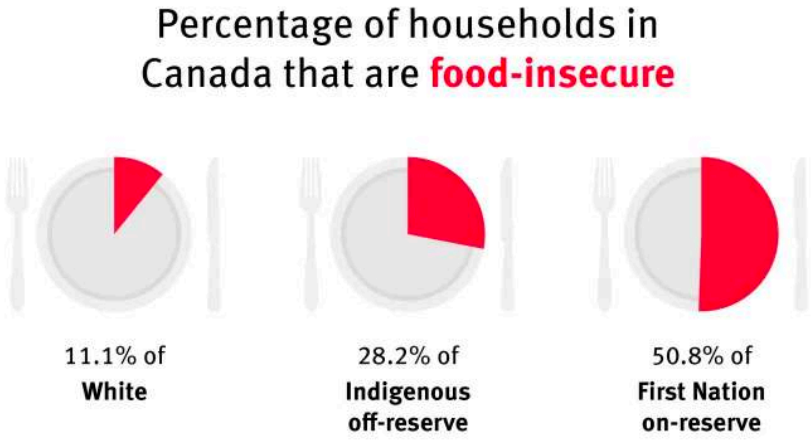
# Why are rates of CKD, ESKD and transplant so different in Indigenous Communities?

- 7 of 180 studies used Indigenous research principles and methodologies.

*"these investigators identified racism, colonisation, and social and economic disparities as causative factors of inequities related to CKD."*

| | Non-Indigenous | Indigenous |
|---|---|---|
| **Rural** | 18.0 | 49.0 |
| **Income Quintile (lowest)** | 17.1 | 43.0 |

→Reduced access to specialist care
→More than 50% of people living in Indigenous communities are food insecure

# Understanding the Indigenous Experience on CKD

- *"Don't use then big jawbreakers"*
  - → Essential to use culturally safe language
  - → Best to explain in the Indigenous context, by including Indigenous experience, and the journal/story of CKD
  - → Indigenous specific educational materials

- *"Staff need to have some Aboriginal cultural values about em"*
- *"Half the time their attitude towards us is what keeps us away"*
  - → Patients feel forced to yield themselves to the care of the staff (reinforcing the colonial model of medicine)
  - → Better to frame dialysis as a patient choice (focusing on family and community rather than "you'll die without it.")
  - → Patients felt disrespected, ignored or discriminated against because of their race
  - → Patients with access to an aboriginal support person "I feel understood"

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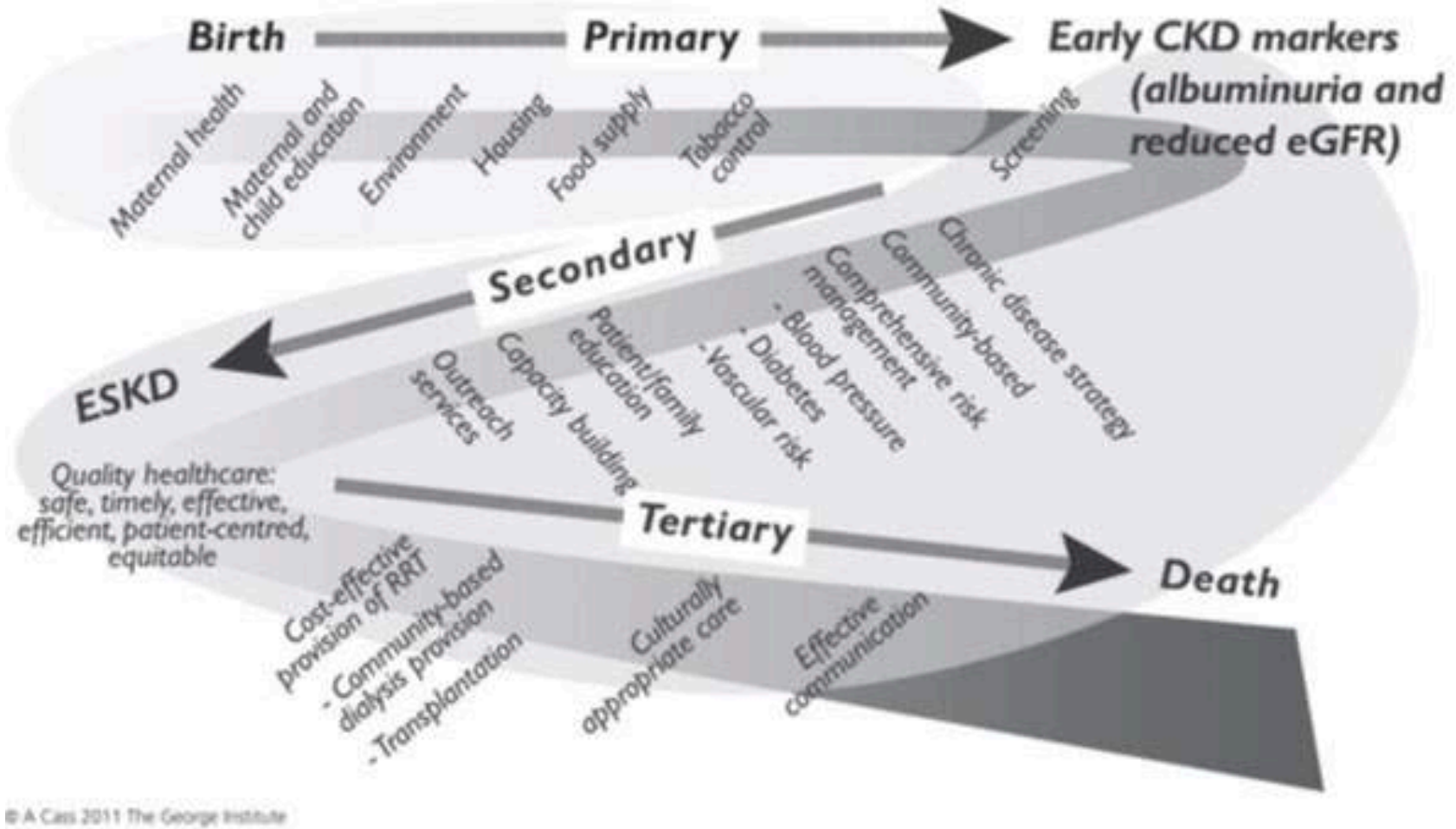
# Understanding the Indigenous Experience on CKD

- *”Stop em following us onto the machine.” (concern about young people being at risk of CKD)*
  - → Express urgent need for prevention programs specific for Indigenous people, with indigenous input
  - → Most Indigenous people who expressed the need for this were willing to be involved in creating and running this

- *“We gotta get em in the schools”  “They don’t care what they eat”*
  - → Prioritizing the importance of elders with CKD teaching younger people about the CKD journey
  - → Education material not relevant to their community

# Putting it all together



# Interventions to enhance renal outcomes in Indigenous patients- At the patient-health care provider level

Journey of Kidney disease

**Birth**

- Prematurity and Intrauterine growth restriction → Decreased nephron mass
  → early development of Chronic kidney disease, hypertension, proteinuria

- Programs to enhance perinatal care likely enhance maternal and fetal kidney-related outcomes

**Primary prevention**

**Early CKD markers**

**Secondary prevention**

**End stage Kidney Disease**

**Tertiary prevention**

**Death**

# Interventions to enhance renal outcomes in Indigenous patients- At the patient-health care provider level

Journey of Kidney disease

- **Birth**
- **Primary prevention**
- **Early CKD markers**
- **Secondary prevention**
- **End stage Kidney Disease**
- **Tertiary prevention**
- **Death**

- **CDC "Primary Prevention of kidney disease":**
  1. Lose weight if you're overweight
  2. Increase physical activity
  3. Reduce or quit smoking
  4. Eat foods lower in salt, eat more fruits and vegetables
  5. Check your blood pressure and take medication to keep under 140/90*
     * (or less based on other factors)
  6. If you have diabetes, stay in target blood sugar range
  7. Stay in your target cholesterol range


# Interventions to enhance renal outcomes in Indigenous patients- At the patient-health care provider level

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**Early CKD markers**

For adults over 18: *"We recommend blood pressure measurement at all appropriate primary care visits"*

**Secondary prevention**

Who and when to screen?

*"Adults aged ≥ 40 years and persons at increased risk for high blood pressure should be screened annually. Adults aged 18 to 39 years with normal blood pressure (< 130/85 mm Hg) who do not have other risk factors should be rescreened every 3 to 5 years."*

- Indigenous Canadians are considered "high risk" for hypertension

**End stage Kidney Disease**

**Tertiary prevention**

**Death**

PECH CHEP Hypertension CANADA

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  7. Stay in your target cholesterol range

When to screen?
"Screening for diabetes in asymptomatic Indigenous adults (>age 18 years) should be considered every 6 to 12 months in those with additional risk factors, especially those with overweight or obesity, those with strong family histories, or women of childbearing age"

DIABETES CANADA
CLINICAL PRACTICE GUIDELINES

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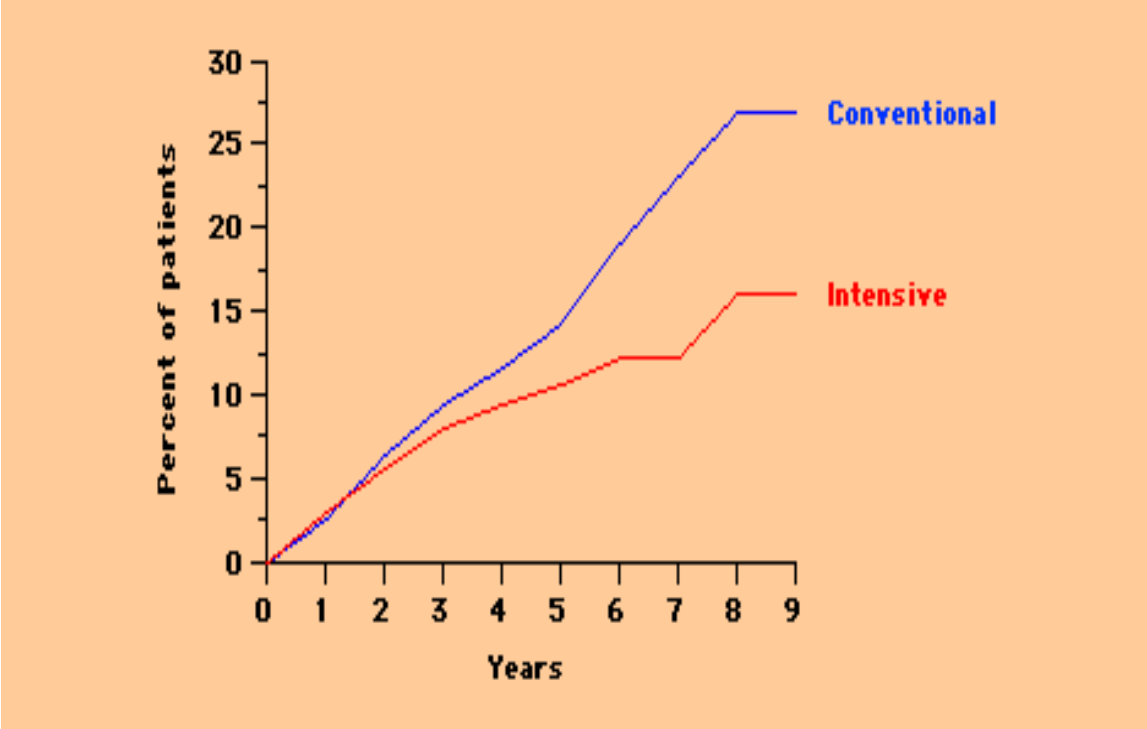
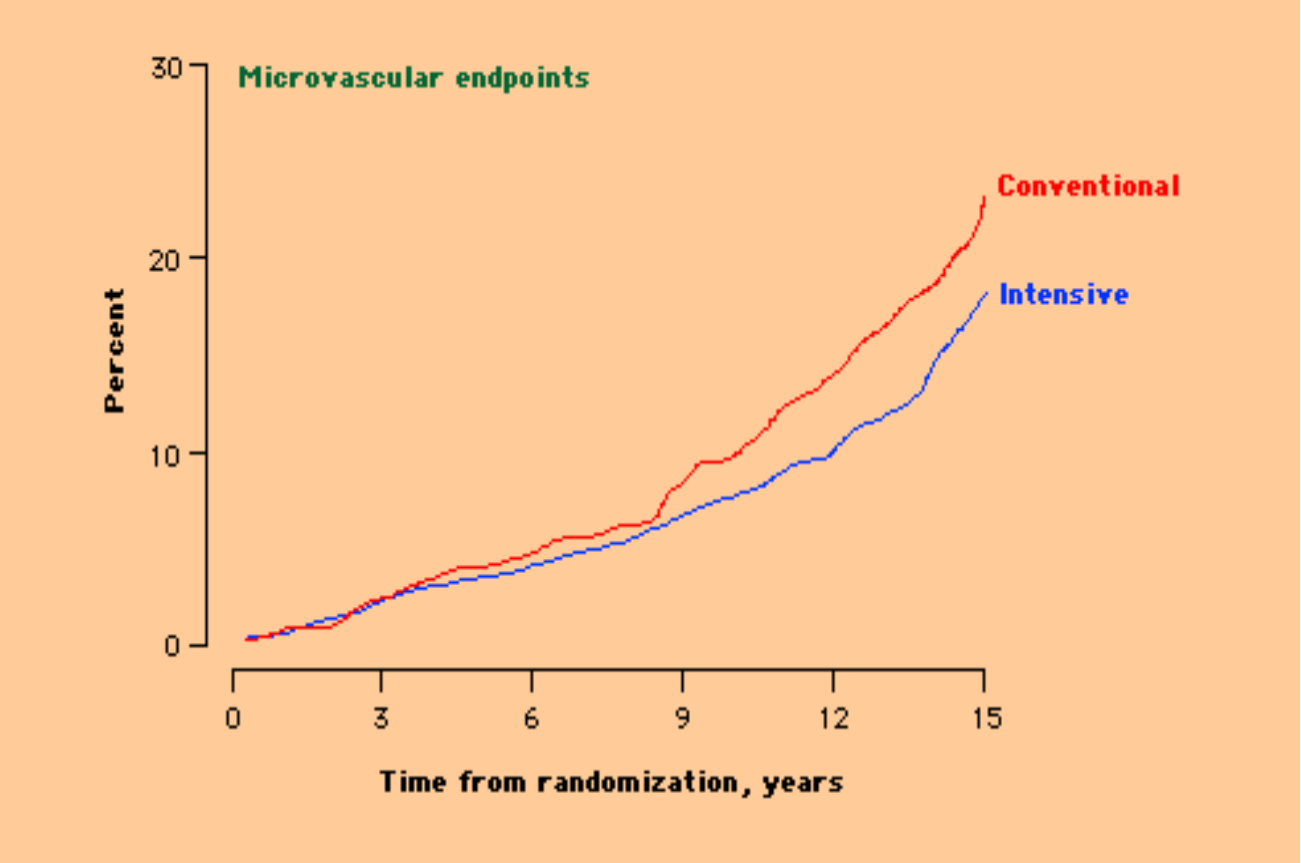
# Interventions to enhance renal outcomes in Indigenous patients- At the patient-health care provider level




DCCT Trial




UKPDS Trial

# Interventions to enhance renal outcomes in Indigenous patients- At the patient-health care provider level

Journey of Kidney disease

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- **Primary prevention**
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- **Death**

- **CDC "Primary Prevention of kidney disease":**
  7. Stay in your target cholesterol range

Who and when to screen?
*"Men 40 years or older, women 40 or older (or postmenopausal)"…*
*"consider earlier in ethnic groups at increased risk…such as indigenous"*
Also all people with:
→ Diabetes, hypertension, current smoker
→ Known atherosclerosis, Abdominal aneurysm
→Family history of premature coronary artery disease or dyslipidemia
→Chronic kidney disease (eGFR < 60 mL/min or Urine ACR > 3 mg/mmol)
→Obesity, HIV infection
→Erectile dysfunction, COPD
→Rheumatological disease (SLE, Psoriasis, Rheumatoid arthritis)

Canadian Cardiovascular Society
Leadership. Knowledge. Community.

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# Interventions to enhance renal outcomes in Indigenous patients- At the patient-health care provider level

Journey of Kidney disease

- **Birth**
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- **Death**

*Who and when to screen for chronic kidney disease?*

→Diabetes mellitus type 2 (at time of diagnosis) and type 1 (5 years after Dx)
→Hypertension
→Family history of kidney disease
→Age 60 or older
→High risk racial groups (African Americans, Hispanics, Indigenous)
→Frequent NSAID use
→History of Acute kidney injury

*What tests to screen?*

→Urine ACR to detect albuminuria
→ Serum Creatinine to estimate GFR

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# Interventions to enhance renal outcomes in Indigenous patients- At the patient-health care provider level

Journey of Kidney disease

- **Birth**
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- **Death**

*How to prevent progression?*

→Diabetes control (HbA1C target < 7.0%, or 7.5% in some populations

→Hypertension control*

* RAAS blockade ideal if albuminuria or diabetes

→Cholesterol control (~15% risk reduction)

→Reduce/quit smoking (~15% risk reduction)

→Treat metabolic acidosis if present

→Prevent AKI (avoid NSAIDs, prevent obstruction)

→Hyperuricemia may be an independent risk factor

* Low protein diet is NOT helpful to prevent progression

- *In patients with albuminuria or diabetes, use ACE inhibitor, ARB*
- *In diabetes, SGLT2 inhibition reduces CKD progression, albuminuria, BP*
- *GLP-1 agonists (eg. Ozempic, Trulicity) leads to weight loss and decreased onset of proteinuria*



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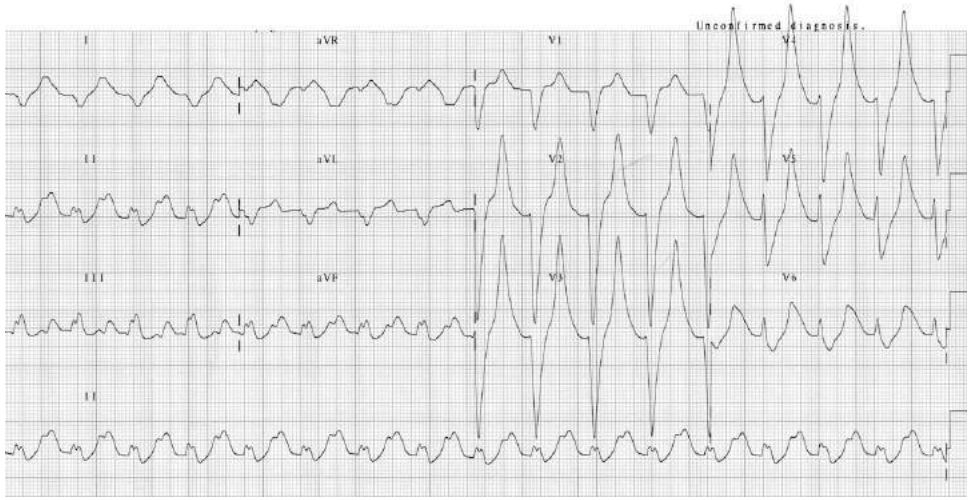
# Complications of Chronic kidney disease
# Electrolytes

| PROBLEM | TREATMENT |
| --- | --- |
| →Water handling (hyponatremia) | → Restriction of water intake |
| →Sodium handling (edema, volume overload, CHF exacerbation) | → Restriction of salt intake, diuretics |
| →Potassium handling (hyperkalemia) | → Restriction of potassium intake |
| →Acid handling (metabolic acidosis) | → Sodium bicarbonate tablets |
| →Phosphate excretion (hyperphosphatemia) | → Restriction of phosphate intake, phosphate binders |
| →Calcium balance (hypocalcemia) | → Vitamin D compounds (eg. calcitriol) |

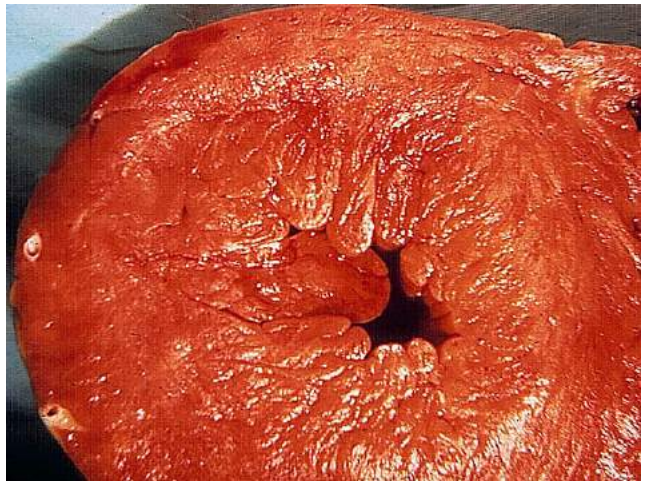


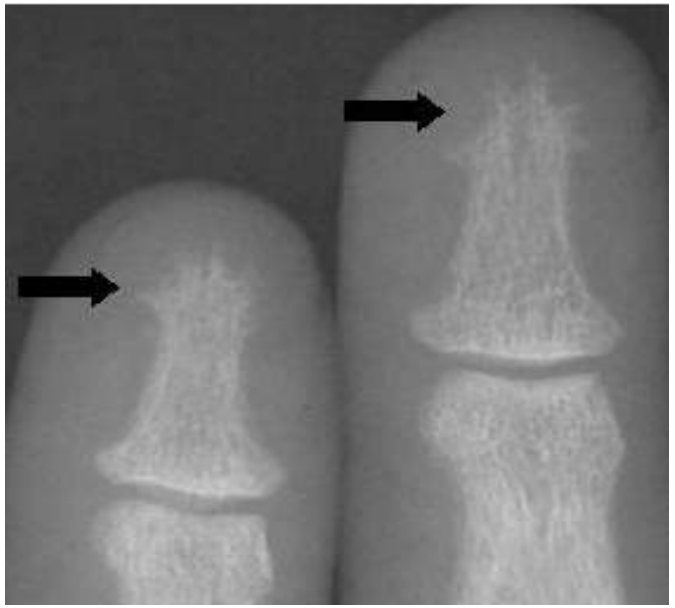

# Complications of Chronic kidney disease Systems

| PROBLEM | TREATMENT |
| --- | --- |
| **HEMATOLOGY:** Anemia | → Erythropoeitin stimulating agents (SC EPO/Darbepoetin) |
| →Iron deficiency (quantitative and qualitative) | → Oral iron |
| →Bleeding tendency (worsens as CKD progresses) | → No remedy |
| **IMMUNOLOGIC:** Weaker as CKD progresses) | → No remedy (assure vaccinated) |
| **NEURO:** | → Neuropathy, weakness, depression |
| **ENDO:** Amenorrhea, Impotence, Hypertriglyceridemia | → No specific remedy |
| →Hypoglycemia | → Monitor diabetes more closely as CKD progresses |
| **DERMATOLOGIC:** Uremic pruritus | → Keep skin moist (moisturizer, some specific to CKD) |
| → Ecchymosis | |

# Complications of Chronic kidney disease
# Systems

| PROBLEM | TREATMENT |
| --- | --- |
| **CARDIAC:** Left Ventricular hypertrophy | → Manage Hypertension, Volume overload |
| →More likely to suffer from sudden cardiac death | → Control electrolytes, optimize cardiac function |
| **BONE METABOLISM** | |
| → Secondary and tertiary hyperparathyroidism | → Optimize calcium, phosphate and Vitamin D balance. |





# Benefits of Multidisciplinary Kidney Disease Clinic

- Eligible anyone with 2 year risk of kidney failure of 10% or higher
- Dialysis modality discussion
- Vascular access preparation
- Discussion regarding renal transplantation
- Code status, substitute decision maker
- Access to social worker, dietician, renal pharmacist.

# Interventions to enhance renal outcomes in Indigenous patients- At the patient-health care provider level

Journey of Kidney disease

**End stage Kidney Disease**

**Tertiary prevention**

**Death**

*"Dialysis was the biggest shock of my life"*

*"I didn't even know I had kidney disease"*

*"Nobody told me what to expect"*

→ Significant distress of the diagnosis and starting dialysis
→ Early diagnosis is essential to prevent a crisis and shock initiation
→ Many participants lacked pre-dialysis education

# Interventions to enhance renal outcomes in Indigenous patients- At the patient-health care provider level

*"dialysis beats the alternative but it messes up your life"*

*"dialysis? You dig yourself a very lonely hole."*

*"your life commitments? You're stuck to that machine!"*

*"I finally came to terms with it but it was hard."*

→ Rural indigenous patients leave their community and family to start dialysis
→ There is loneliness and isolation from family and community when they start
→ Severe limitations on ability to fulfill family and community obligations
→ Takes a longer time to accept dialysis as part of daily life

Journey of Kidney disease

**End stage Kidney Disease**

**Tertiary prevention**

**Death**

# Interventions to enhance renal outcomes in Indigenous patients- At the patient-health care provider level

Journey of Kidney disease

**End stage Kidney Disease**

**Tertiary prevention**

**Death**

*"I thought I'd come to the morgue"* (on describing coming to large urban dialysis unit)

*"It's my second home now"* (describing coming to a smaller dialysis unit close to home)

*"I wish I had one of those nurses to help me at home"*

→ Anguish and discomfort in large dialysis units
→ Preference for home or community-based dialysis
→ Smaller satellite dialysis units are more comfortable places to be

See MSERS talk on Peritoneal Dialysis and on Hypertension

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# Interventions to enhance renal outcomes in Indigenous patients- At the patient-health care provider level

Journey of Kidney disease

**Birth**

Optimize Perinatal care

Public health programs (Indigenous specific) to increase physical activity, reduce smoking

Enhance access to quality food

**Primary prevention**

Screen (and treat) dyslipidemia, diabetes, hypertension

**Early CKD markers**

Screen (and treat) kidney disease, consider risk factors for progression

Ideally use ACE inhibitors if diabetes or albuminuria present

**Secondary prevention**

Ideally use SGLT2 inhibitor if diabetes present

**End stage Kidney Disease**

Culturally safe, Indigenous specific materials for education

Consider Indigenous CKD mentors or elders for education

**Tertiary prevention**

The focus is on the journey, family and community

Transplant must be prioritized

**Death**

Home dialysis (or close to community) should be prioritized

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**There is so much more!**