



## Bringing diabetes case management into the hemodialysis unit

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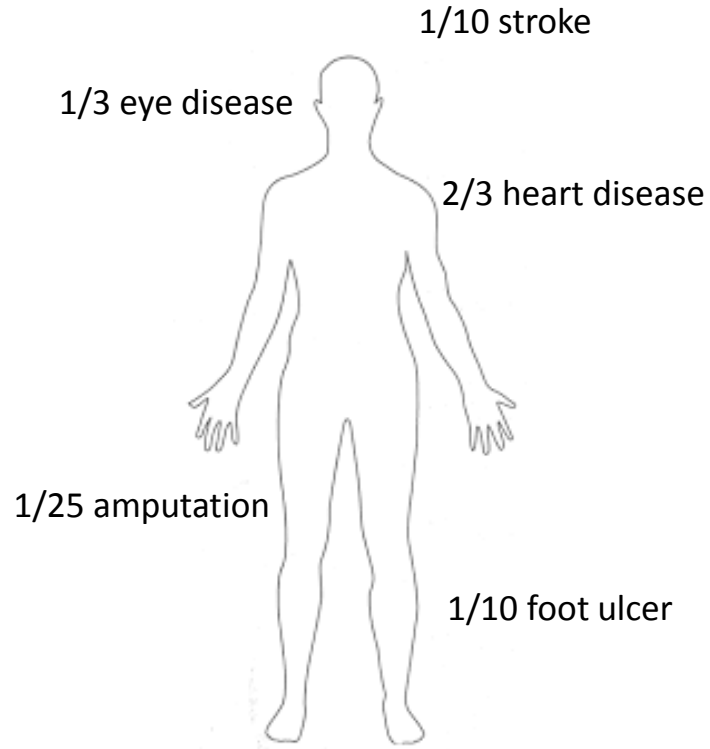
## Over the next 10 minutes

- We need to provide diabetes care in the HD unit
- With the right groundwork we can grow this idea into a feasible, pragmatic registry-based trial
- Our program will benefit patients, care providers, health system





# More often live with diabetes-related complications



# Diabetes care can be helpful

- Blood sugar management
- Monitoring for diabetes-related complications
- Education, self-management support
- **Means more outpatient medical appointments**



# Patients have enough medical visits

Over 2 years, patients in Ontario HD units had:



8 primary care visits



19 specialist visits



9 unique physicians








## Even if able to fit in another medical appointment...

- Once every 3-6 months
- Busy clinics
- We may be too rushed to ensure that management is fully addressed



# Current care models not working well

## In Ontario HD units:

- 1/3  no diabetes lab tests
- 1/5  excessive diabetes lab tests
- 2/5  may have diabetes that is too well-controlled
- 1/10  have diabetes that is not well-controlled
- 1/2  do not have annual eye exams



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*We need to do more to provide patients receiving HD with coordinated, patient-centered diabetes care*





“Diabetes care should be organized around the patient with diabetes...”



“Ontario recognizes the need for greater coordination of care for people with multiple complex conditions”



“Diabetes care in the dialysis unit would be *extremely* welcomed...”

Foot screening and monitoring, individual diabetes education, in-person glycemic support ranked *very useful* by the majority of survey responders



Strategy for Patient-Oriented Research

**SPOR**

Putting Patients First 



**CIHR IRSC**

Canadian Institutes of Health Research  
Instituts de recherche en santé du Canada

# Patients

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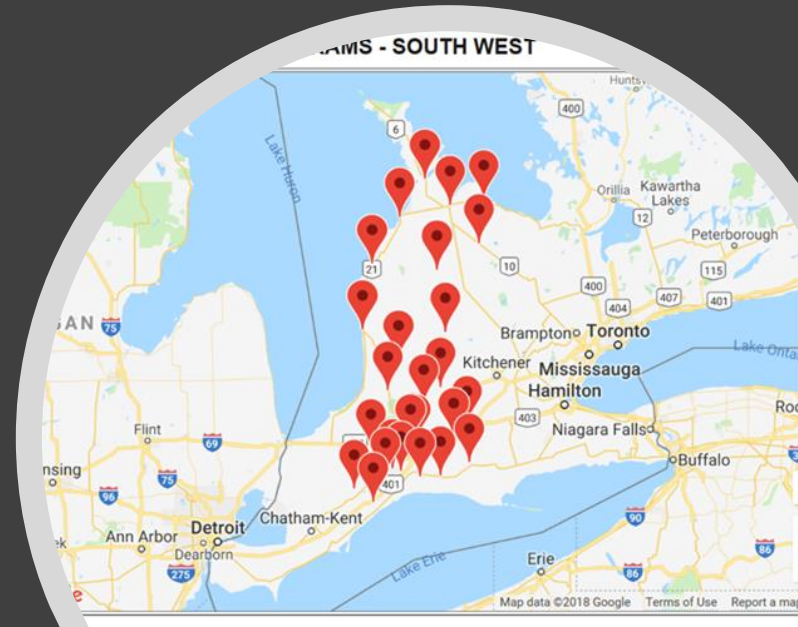
- Patients *want* coordinated diabetes care
- More opportunities for diabetes-related screening
- More self-management, education
- Open to diabetes care in dialysis unit



Let's make this happen!

# Certified diabetes educators (CDE's)

- Live across the province of Ontario
  - Hospitals, DECs, clinics, dialysis units
- Trained to help people:
  - Make healthy food choices
  - Keep blood sugar in check
  - Incorporate exercise into their lives
  - Care for personal needs
  - Make smart decisions about medication
  - Reduce risk of complications





CDE  
2 days/week



# Diabetes case management program

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Self management support

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Education

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Treatment adjustment

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Foot screening and monitoring

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Screening reminders

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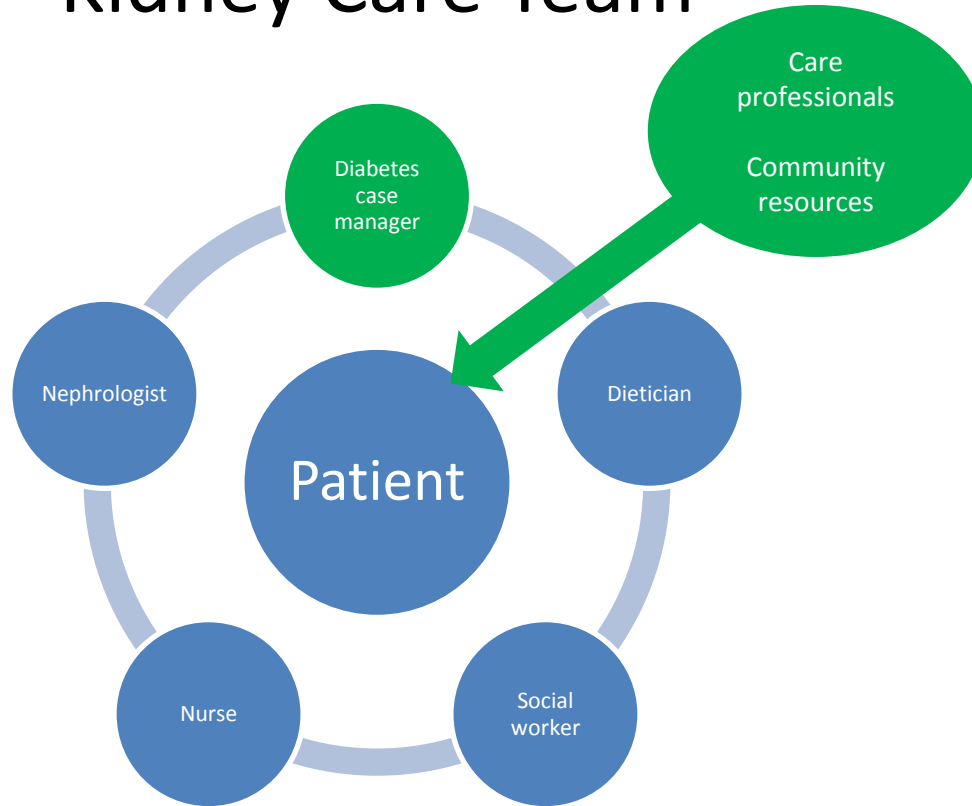
Care coordination

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Resource navigation



# Kidney Care Team





## Pragmatic trial

- **Research question:** Do HD units that adopt a diabetes case management program have a different rate of diabetes-related complications than units that continue with routine diabetes care?
- **Patients:** All patients with diabetes in hemodialysis units across Ontario
- **Intervention:** Diabetes case management program delivered by CDE
- **Control:** Usual care

Medical Director consent



Randomization

Diabetes case management

Usual care

Assign case manager

Training boot camp

Meet with patients to understand needs and resources, treatment plan

Routine and as needed care

2 year outcomes

2 year outcomes





# The Chronic Care Model (CCM)

Improves:

1. A1C
2. Cholesterol
3. Blood pressure
4. Diabetes-related screening
5. Medication adherence
6. Knowledge, behaviors
7. Quality of life
8. Hospital expenditures
9. Mortality

# Outcomes

- **Primary outcome**

Hospital encounters:

- Hyperglycemia
- **Hypoglycemia**
- **Ulcers**
- **Amputations**
- **Heart attack**
- Strokes
- **Retinopathy treatment**



- **Secondary outcomes**

- A1c
- Annual vision screen
- Quality of life
- Appointments
- Individual components of primary outcome



Feasibility |

# Feasible intervention

- CDE's located across the province
- Trained in diabetes management
- Time to deliver program to patients during dialysis sessions
- Program can be supported in the HD unit
  - Diabetes and kidney care are concordant, focused on same management



# Efficient process of informed consent

## Medical director

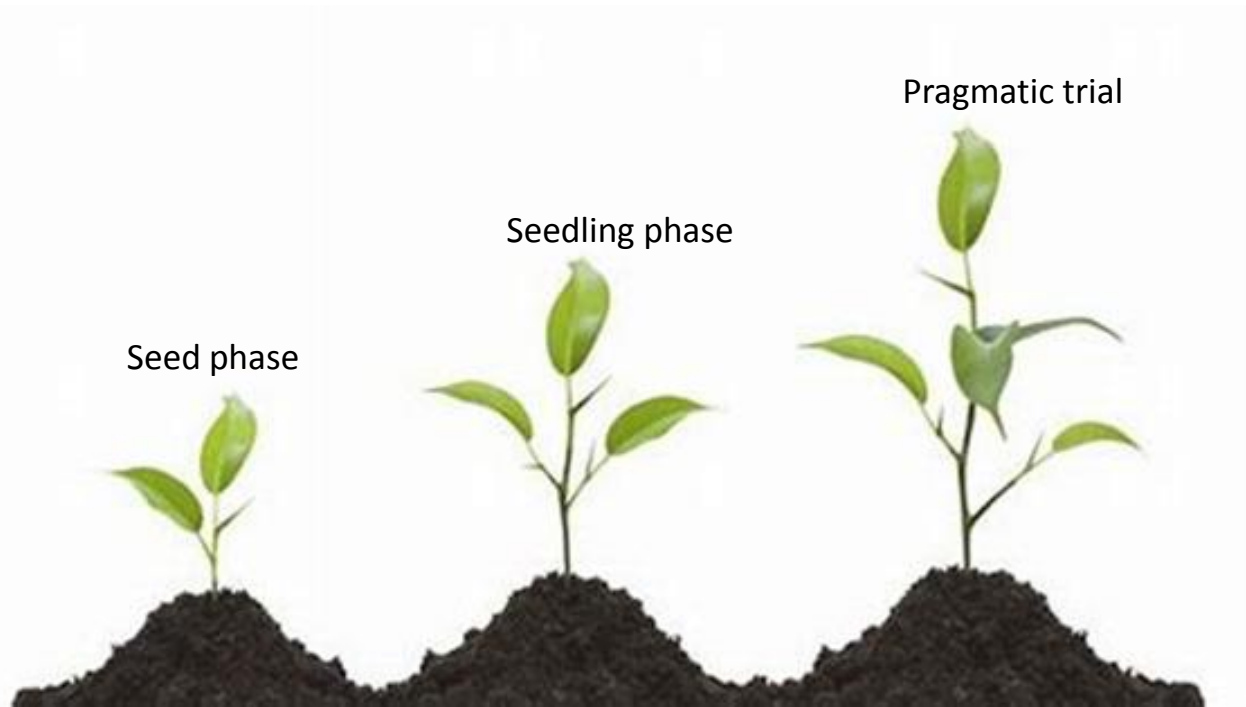
- Low risk intervention
- Delivered into routine care
- Patients will be notified of trial



## Data collection

- All *needed* baseline and follow-up study data will be available from existing ICES data sources
  - OLIS
  - CIHI-DAD
  - OHIP
  - ORN



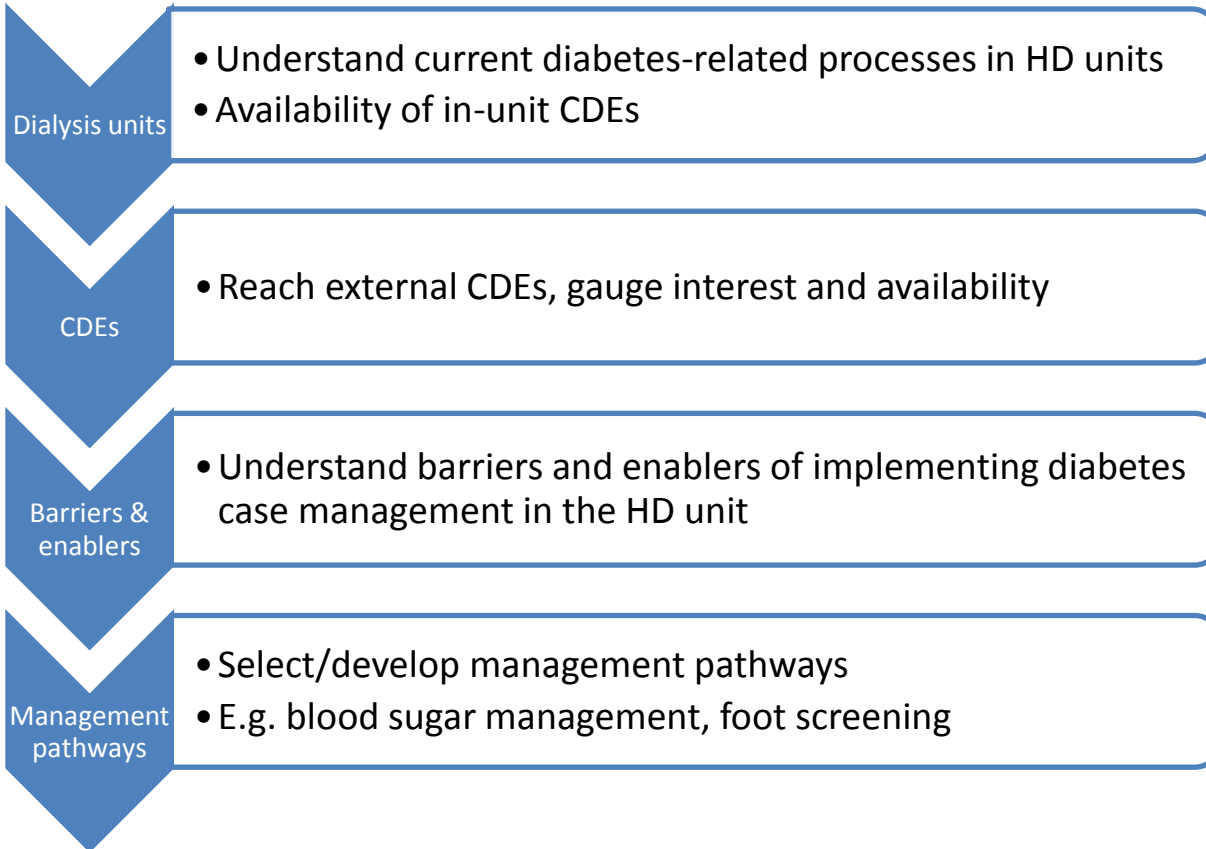


Seed phase

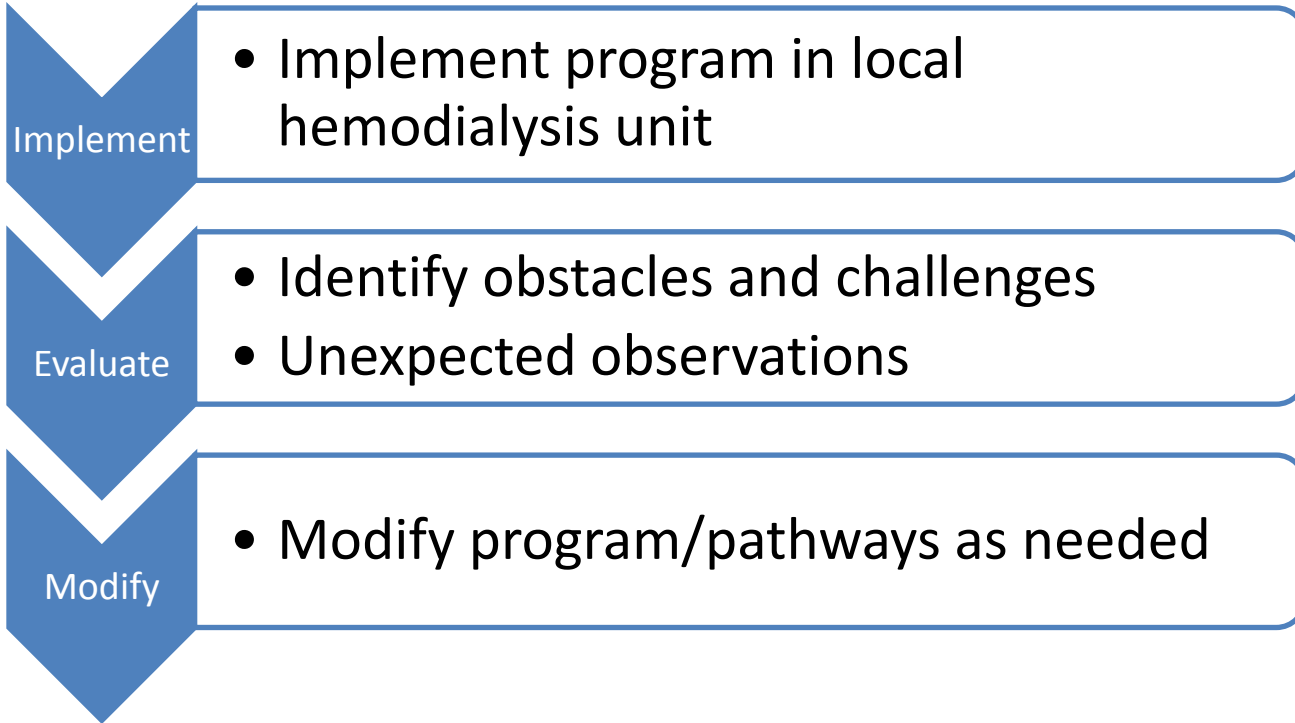
Seedling phase

Pragmatic trial

# Seed phase



# Seedling phase





Barriers

# Bringing CDEs into HD units

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- Willingness and readiness to work in HD unit
- Ensure time available
- Effective operation in units (e.g. insulin titration, part of kidney team, clinical documentation)
- Change of staff



# Cost

Case manager  
\$25,000/yr



Total event cost/person/yr

AMI \$18,635

Stroke \$33,256

TIA \$3,262

LEA \$26,077

DFU \$7,802

DR \$400

Hypo \$4,184

# Benefits

## **Patients**

- Improve outcomes, satisfaction and quality of life
- Reduce out-of-pocket expenses, care burden

## **Care providers**

- Make life easier on dialysis staff who treat complex patients
- Provide learning opportunities
- Reduce patient volumes in DEC's, clinics

## **Health system**

- Create needed program in health system organized around patients with single diseases
- Promote communications, break down "siloes"



# Summary

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Guidelines, governments, and *patients* have called us to better coordinate care

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Let's start by bringing patient-centered diabetes care to patients who need it

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With some groundwork, diabetes case management can be a feasible and implementable program

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Benefit patients, care providers, health care system



Thank you



**ADDITIONAL SLIDES**


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# Implementation of a diabetic foot management best practice guideline (BPG) in hemodialysis units

By Dawn Prentice, RN, PhD, Linda Ritchie, RN, MHS, PhD, Jackie Crandall, RN(EC), MScN, CHPCN(C), Lori Harwood, RN, MSc, CNeph(C), Debra McAuslan, RN, MScN, Julie Ann Lawrence-Murphy, RN(EC), MScN, CNeph(C), Jane Ridley, RN(EC), MScN, CNeph(C), Judy Tigert, RN(EC), MScN, CNeph(C), Barbara Wilson, RN, MScN, CNeph(C)

**Figure One. Renal program: Foot assessment and plan**

- Does the patient have diabetes?  Yes (high risk)  No
- Has the patient had any previous foot or leg ulcers or ischemic digits?  Yes (high risk)  No
- Assessment of sensation—monofilament testing. Indicate level of sensation:
  - Cannot feel the filament (high risk)  Can feel the filament



Right foot                      Left foot

- Structural/biomechanical abnormality. Check (✓) if present (high risk).
  - Callus  Hammer toes  Bunion(s)
  - Charcot foot  Abnormal shape to foot  Other: \_\_\_\_\_
- Circulation. Check (✓) if present (high risk)
  - Skin Temperature:  Cool  Right  Left
  - Rubor  Blanching  Cyanosis
- Other. Check (✓) if present (high risk).
  - Dryness  Corns  Edema  Cracking
  - Toe nails (thickened, ingrown)  Ulcer(s) present—Describe: \_\_\_\_\_
- Self care. Is patient able to see bottom of feet and/or able to reach bottom of feet and has someone been taught to perform appropriate foot care inspection?
  - Yes  No (high risk)
- Plan:
  - High risk (q monthly foot checks)  Low risk (q yearly foot checks)
  - Note on Hemodialysis Treatment Plan  CCAC referral
  - Refer to MD or NP/CNS  Pamphlet
  - Patient Education—Describe: \_\_\_\_\_  DVD—Diabetic Foot Care
  - Foot Kit  Other: \_\_\_\_\_

Signature: \_\_\_\_\_ Date: \_\_\_\_\_

Delivered in  
Conjunction with  
Optimal Diabetes  
Control

Preventive

Integrated at  
the system  
level

Leverage  
Existing  
Investments

Evidence  
Informed

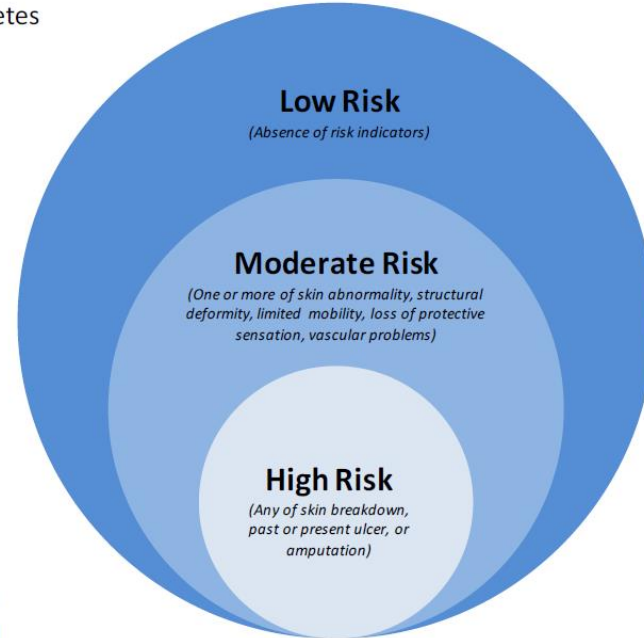
Self-  
Managed  
Approach

Cost  
Efficient

Utilize Service  
Providers' Full  
Scope of  
Practice

Person-  
Centred/  
Patient -  
Focused

Guided by the  
Social  
Determinants of  
Health



Interdisciplinary

# 2 year event rates

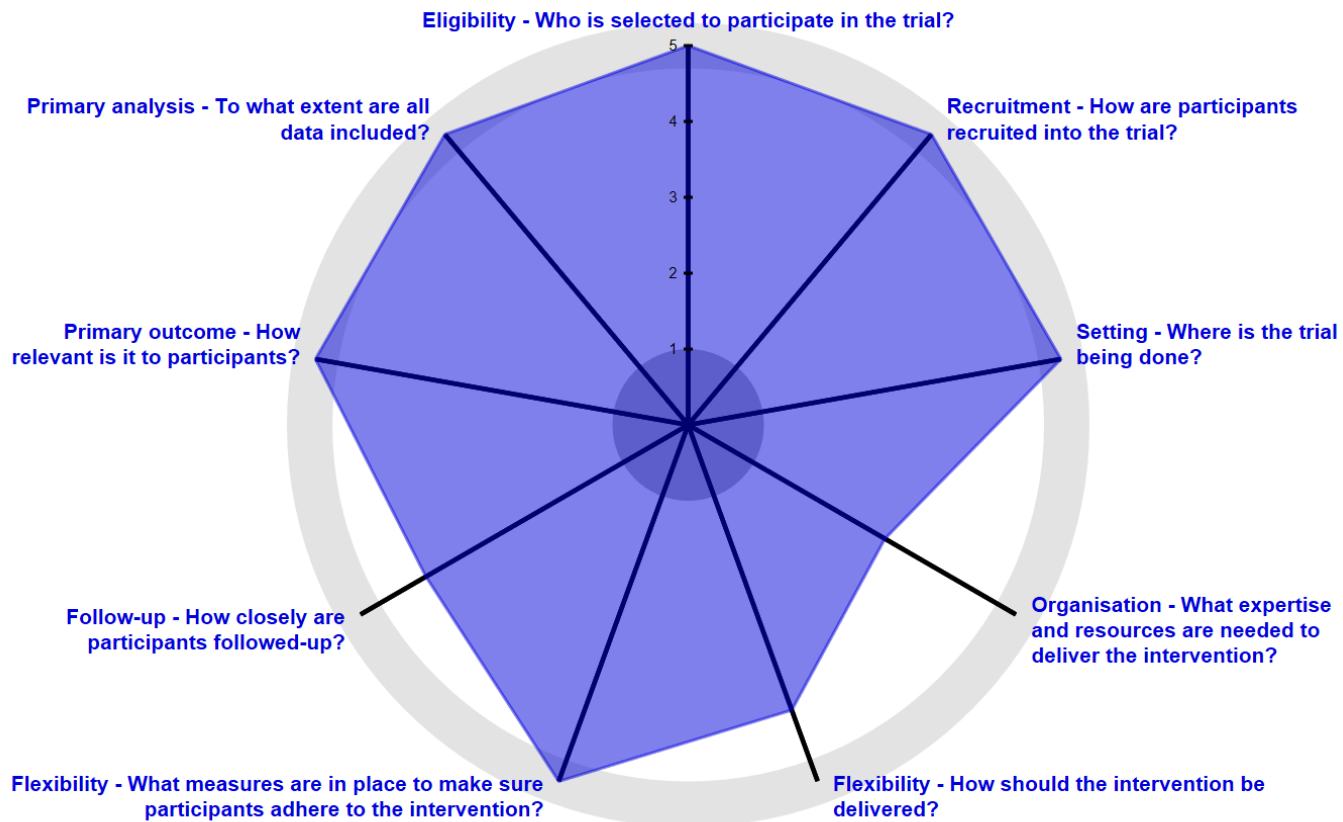
	N=3412 patients
Outcome	
Acute myocardial infarction	9%
Stroke or TIA	6.5%
Foot ulcer	7.9%
Amputation	4.2%
Hypoglycemia	6.8%
Hyperglycemia	0.5%
<b>At least one complication</b>	<b>26%</b>

\*Percentage of patients with diabetes using HD Jan 2014-Jan 2016 (n=3412) who had a diabetes-related hospital encounter over the 2 year follow-up

## **Diabetes Education and Care Management Significantly Improve Patient Outcomes in the Dialysis Unit**

Stephen D. McMurray, MD, Greg Johnson, DO, Stephen Davis, MD, and  
Kathryn McDougall, RN, MS

- 91 patients, 2 HD units
- Randomized by dialysis days
- Diabetes case management program vs. usual care
- Improvement in self-management, knowledge scores
- ARR 10% amputations



# First visit (intake)



Introduction/interest

Disease and complications

Screening needs

Current care team

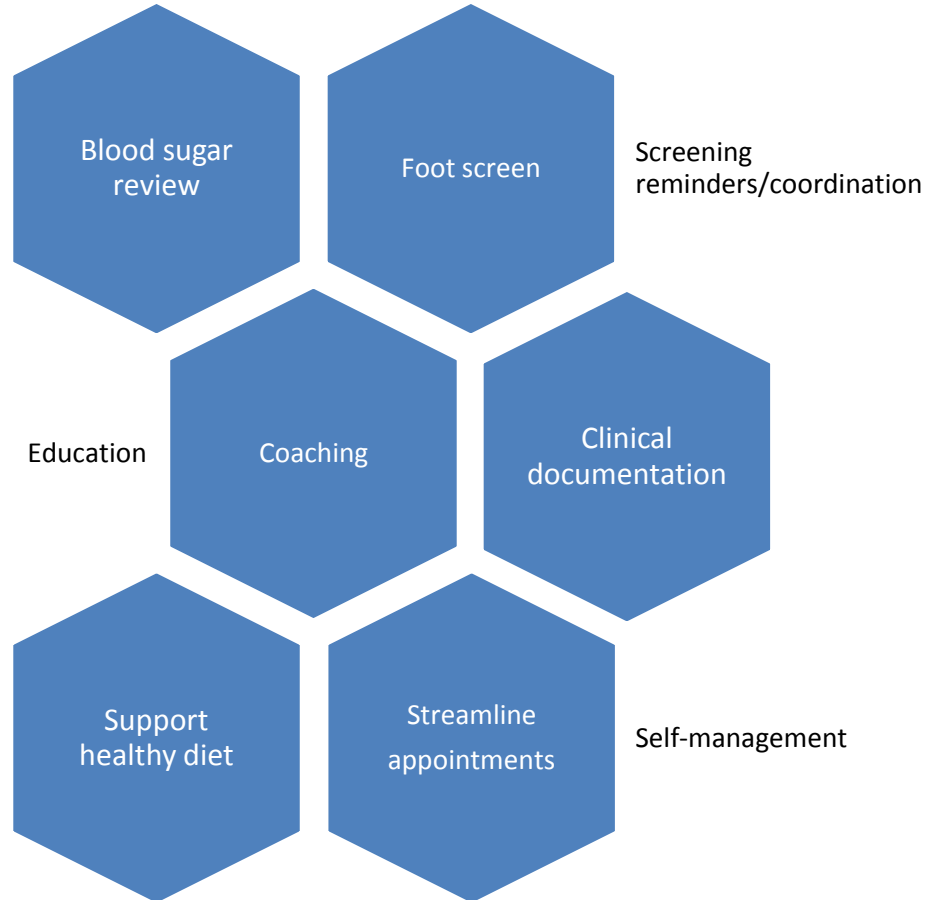
Coping and support

Foot exam

Planned treatment/  
follow-up

Clinical  
documentation

# Routine (proactive) visits



# As needed (reactive visits) e.g. foot ulcer

Blood sugar  
management

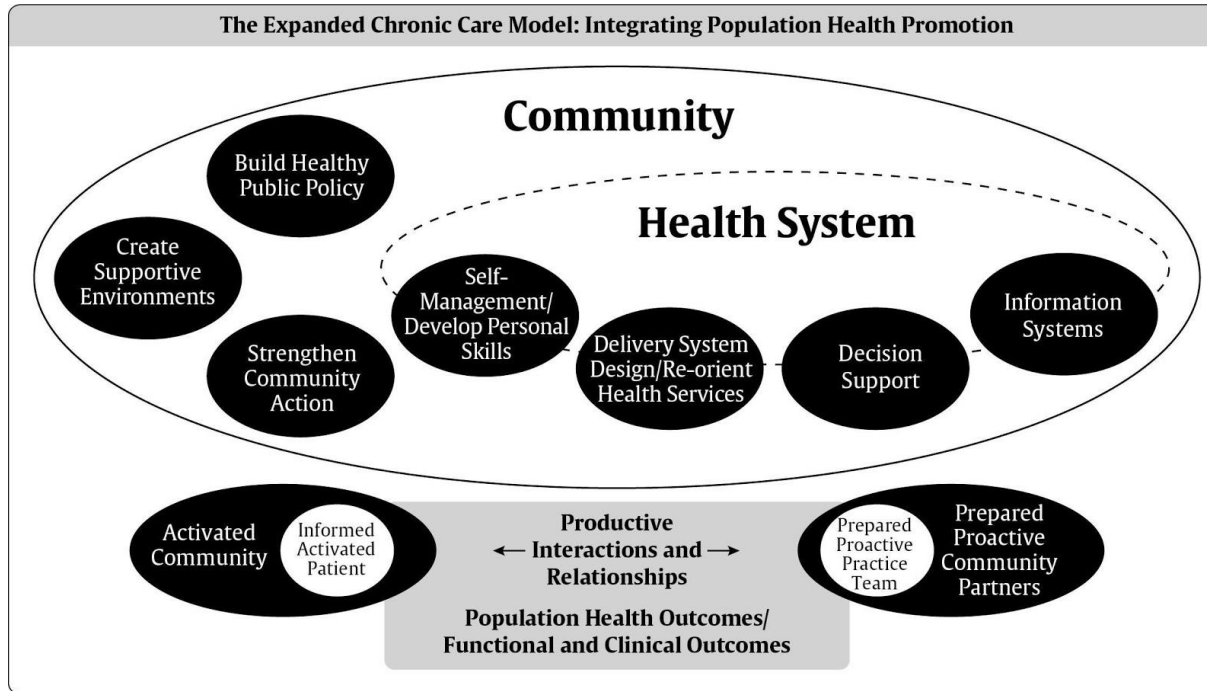
Mobilize and  
coordinate  
specialist visits

Identify available  
community  
supports

Clinical  
documentation

Education





# Chronic care model

*“Integrates important elements into a plausible package designed to foster productive interactions between prepared proactive teams and well-informed motivated patients”*

- **Self-management**
- Promotes active involvement of patients in care
- Goal setting
- **Delivery System Design**
- Systematic changes to practices to improve care quality
- e.g. nurse-based care in new settings

# Chronic care model

- **Decision Support**
- Use of flow sheets, point of care help to make decision making
- **Information Systems**
- Patient reminders for scheduling and attendance
- Facilitated relay of information
- Use of telehealth

## Appendix 2

### Sample Diabetes Patient Care Flow Sheet for Adults

<b>Name:</b>		<b>Type of diabetes:</b> Type 1 <input type="checkbox"/> Type 2 <input type="checkbox"/> Other <input type="checkbox"/>		<b>Date of birth:</b>		<b>Date of diagnosis:</b>	
<b>Risk factors, co-morbidities</b>				<b>Self-Management</b> (discuss with patient; add date and location in chart)			
<input type="checkbox"/> Hypertension <input type="checkbox"/> Dyslipidemia <input type="checkbox"/> Coronary Artery Disease <input type="checkbox"/> Peripheral Artery Disease <input type="checkbox"/> Chronic Kidney Disease <input type="checkbox"/> Mental health diagnosis <input type="checkbox"/> Polycystic Ovary Syndrome <input type="checkbox"/> Foot disease <input type="checkbox"/> Erectile Dysfunction <input type="checkbox"/> Smoking _____ (Date stopped) <input type="checkbox"/> Alcohol: _____ (Assess/discussed)				Patient Goals: _____ Possible Barriers to Self-Management: _____ Diabetes Self-Management Education: _____ <input type="checkbox"/> Weight Management: Ht: _____ Target Wt: _____ Target BMI: _____ <input type="checkbox"/> Physical Activity (aerobic 150 min/week; resistance 2-3 times/week) _____ <input type="checkbox"/> Glucose Meter/lab comparison <input type="checkbox"/> Patient Care Plan (Pregnancy Planning/Driving License): _____ Date discussed			
<b>Vaccinations</b>							
Flu (annual)    Date: _____    Date: _____		Pneumococcus    Date: _____					
<b>Visits</b> (Every 3 to 6 months)							
<b>Date</b>	<b>BP</b>	<b>Weight</b>	<b>A1C</b> Target $\leq 7\%$	<b>Notes</b> (Goals, clinical status)	<b>Hypo-glycemia</b>	<b>Antihyperglycemic Agents / CV protection agents</b>	

Panelist

David Berry

Ron Wald

Channing Liberty

Rey Acedillo

Craig Lindsay

Role Perspective

Nephrologist

Nephrologist

Nurse Educator

Nephrologist

Patient