

Welcome to Diabetes Complications!

- Welcome to the third session in the Diabetes 101 education series!
- Please fill out the attendance form for your site.
- Please send by FAX to 780-495-7338 or scan and email to kathleen.gibson@canada.ca
- The session will start at 1:30 pm and will last about an hour



Diabetes Complications

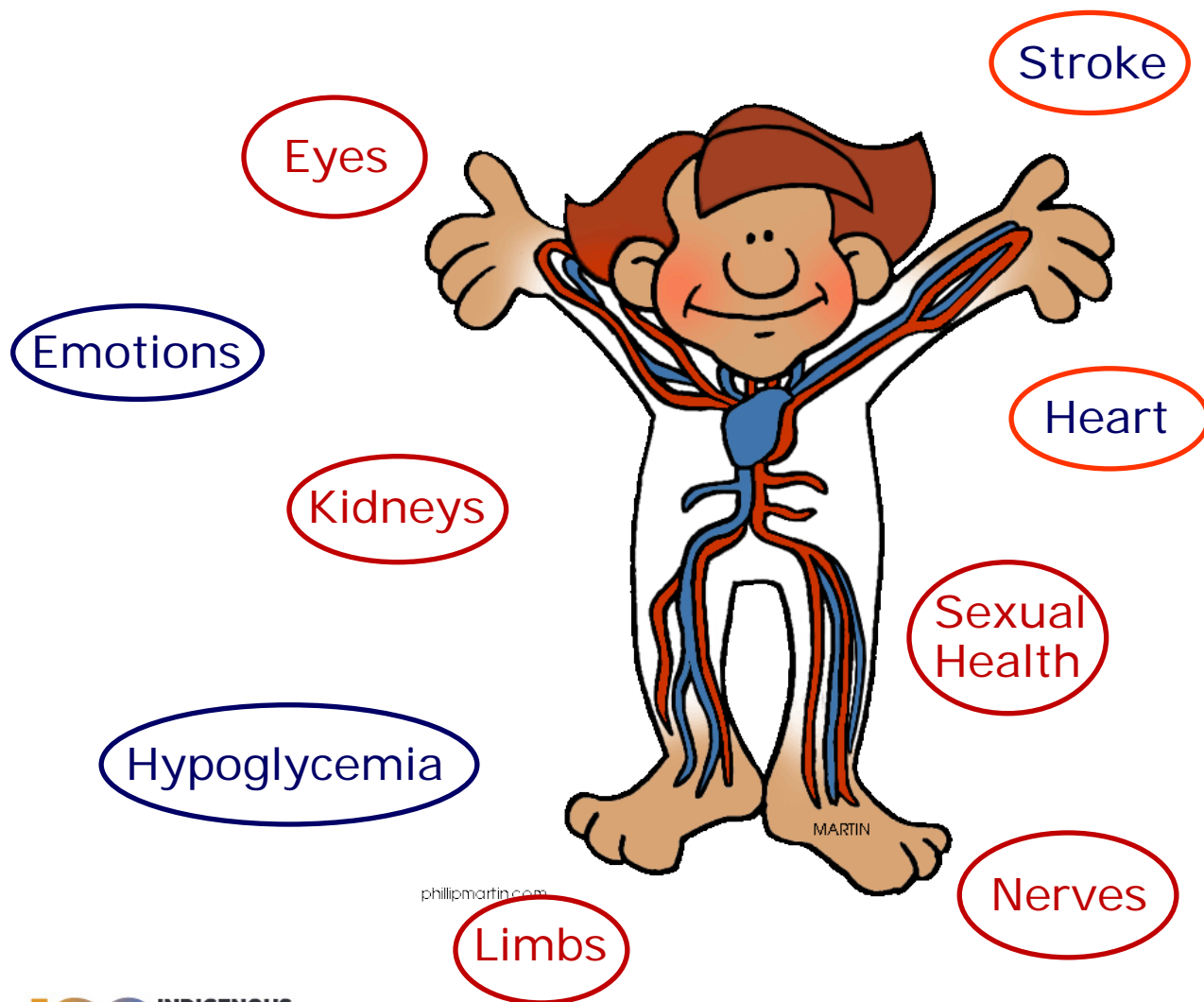
Session Three
Diabetes 101 Education Series

**Kathleen Gibson, Registered Dietitian
and Certified Diabetes Educator**



PANCREAS
CELLS RESISTANCE **INSULIN**
METABOLISM
GLUCOSE STAGES ISLETS **MONITOR**
WEIGHT CONGENITAL
SENSITIVITY NERVE
DIABETES TYPE HEALTHCARE
ACUTE WELL SYMPTOMS
COMPLICATIONS
HYPERGLYCEMIA SUGAR
KETOACIDOSIS **RESPOND**
ADULTS INJECT **INSULIN** PANCREAS
MELLITUS

Overview of Complications



The Gift of Diabetes (2005); The National Film Board of Canada



This movie follows Brion Whitford's struggle to regain his health while living with advanced complications of diabetes. A copy was sent to all communities in 2006. You can also borrow it from the FNIHB resource room or watch it on-line.

https://www.nfb.ca/film/gift_of_diabetes/

Physical Diabetes Complications

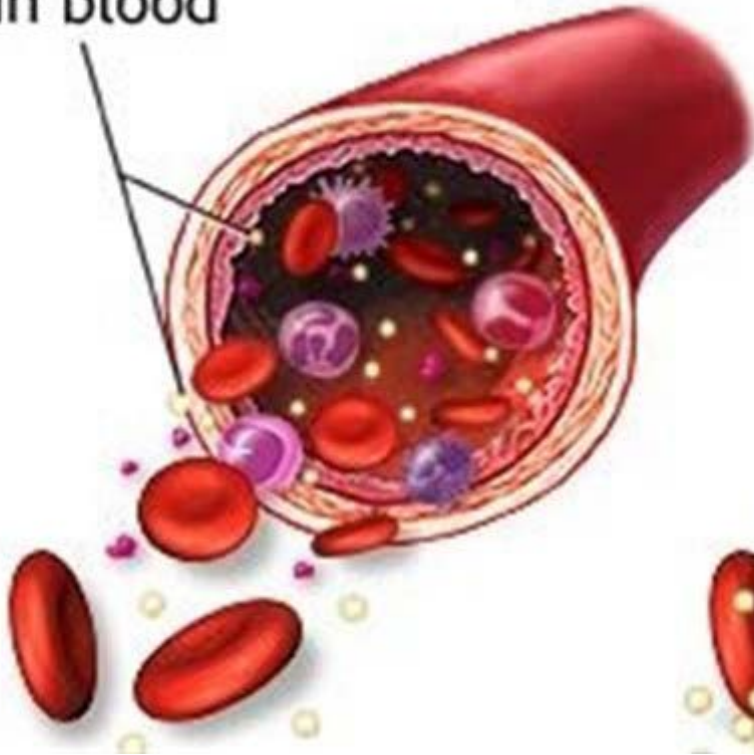
Physical complications of diabetes are related to the body's blood vessels. The complications fall into two categories:

- **Macrovascular**: issues with the large blood vessels
 - Heart disease and Stroke
- **Microvascular**: issues with the very small blood vessels
 - Eyes, Nerves, Kidneys, Sex Organs

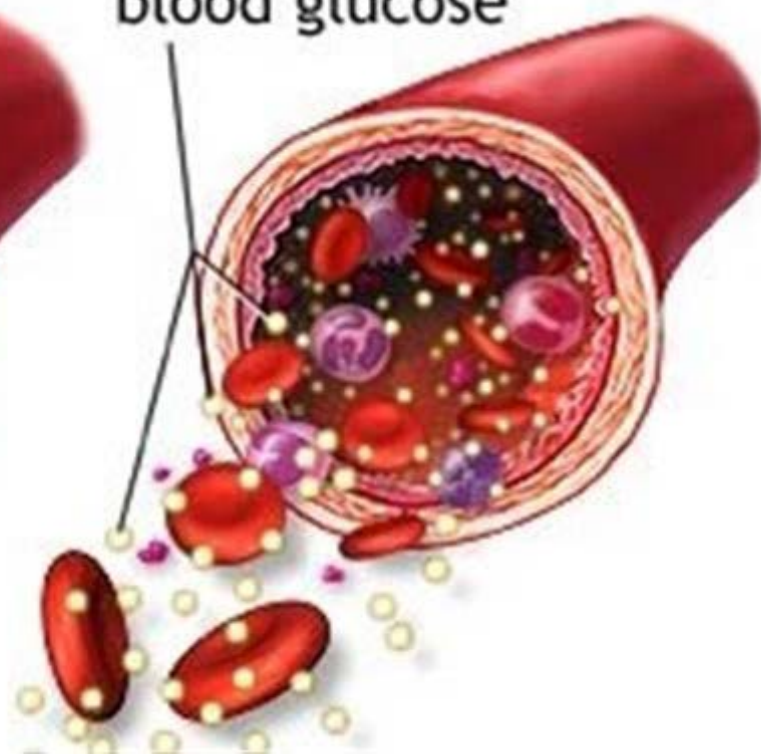
These complications can happen with both type 1 and type 2 diabetes. Both type 1 and type 2 diabetes are serious!

Glucose in blood vessels

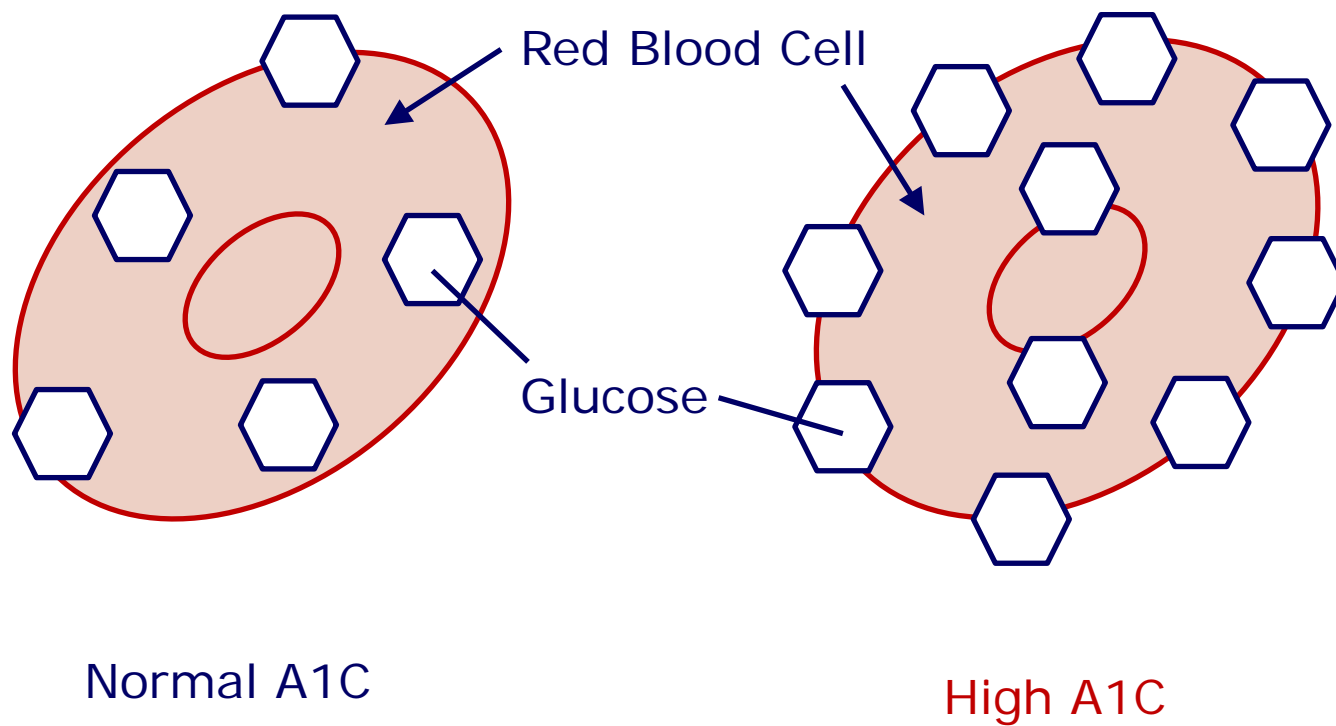
Glucose
in blood



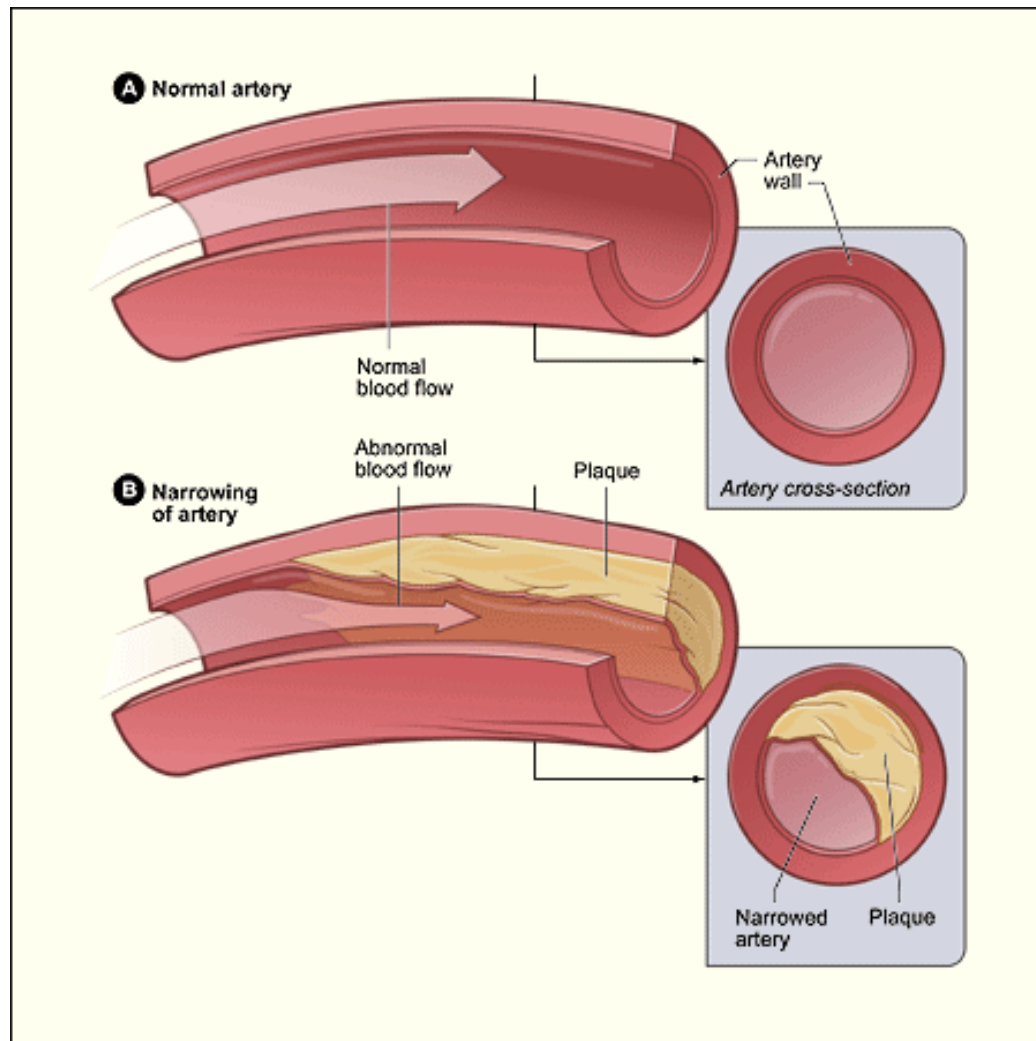
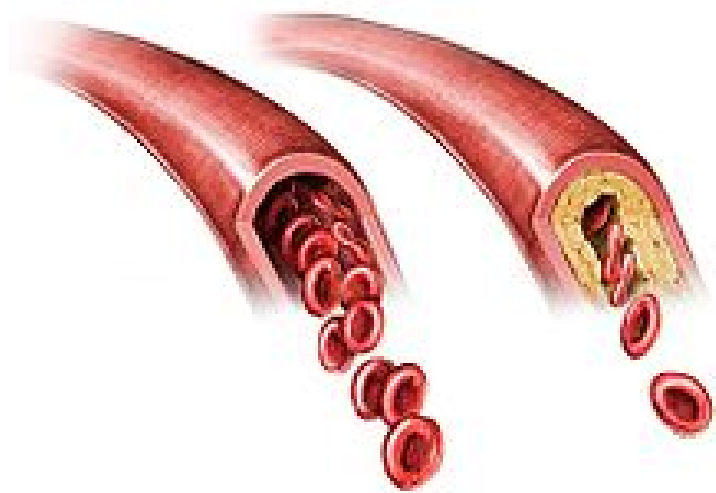
Excessive
blood glucose



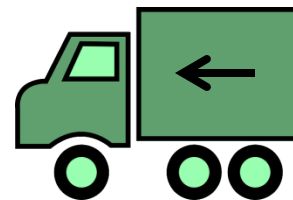
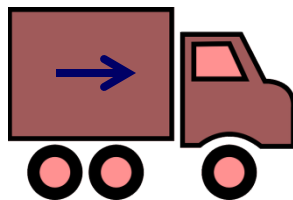
Glucose stuck to Red Blood Cells



Macrovascular: Heart Disease and Stroke



A word about cholesterol



When your cholesterol is measured in your blood, what is really measured is the lipoprotein transport system. Think of them like dump trucks.

Low Density Lipoprotein (aka LDL or lousy)

- This “truck” moves the cholesterol from the liver to the body’s cells. The more fat you have, the more “trucks” your body needs to make. Extra trucks may break down and start the plaque growing.

High Density Lipoprotein (aka HDL or helper)

- This “truck” moves cholesterol from the body back to the liver. The more of these “trucks” you have, the more extra cholesterol can be returned to the liver to make hormones or be thrown away.

Triglycerides

- Triglycerides are a type of fat that stores extra calories. It can store extra fat or extra sugar. If your blood sugars are high, your body tries to store the extra sugar.

Screening for Cardiovascular Disease (CVD)



Resting echocardiogram (ECG), repeated every 3 to 5 years, in people living with diabetes with any of the following:

1. Older than **40 years**
2. Duration of **diabetes more than 15 years** and older than 30 years
3. End organ damage (Microvascular)
4. One or more CVD risk factor: current **smoker**, high blood pressure, family member with premature CVD, chronic kidney disease, obesity or erectile dysfunction
5. Older than 40 years and planning to start **very vigorous** or prolonged exercise (like competitive or long-distance running, high intensity interval training)

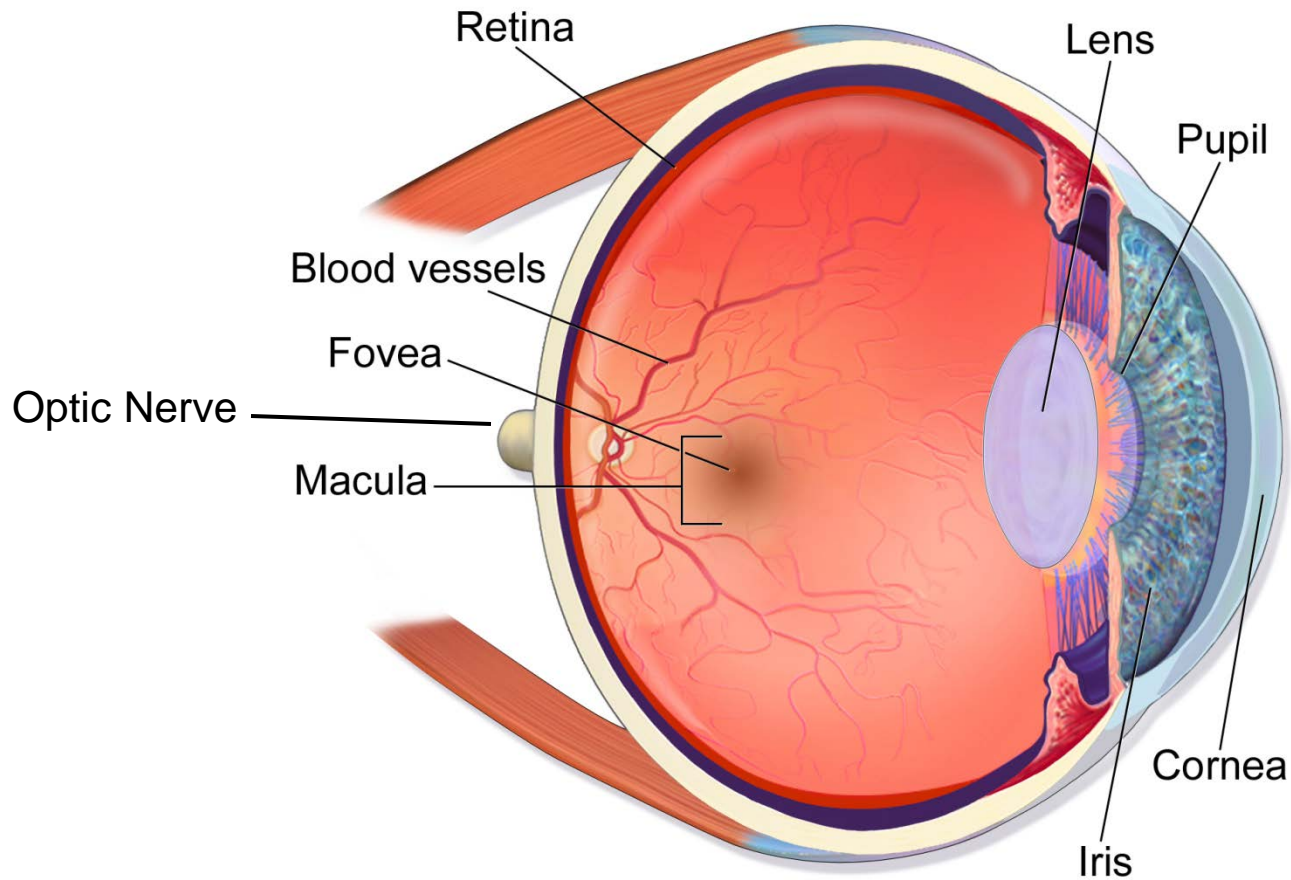
An exercise ECG stress test will be used if the person presents with cardiac symptoms, has other associated diseases, has had a stroke or has abnormalities on a resting ECG.

Microvascular

- High blood sugar results in damage to the small blood vessels:
 - In the back of the **eyes**
 - That feed the **nerves in the hands and feet**
 - In the **kidneys**
 - In the **sex organs**



Diabetic Retinopathy or Diabetes Eye Disease



Eye Anatomy

Dilated View of Retina



The eye on the left has many bleeds, “cotton-wool” and hard exudates. All of these are related to damage of the very small blood vessels in the eye. This person has likely lost some or all of their vision.

You can easily see the small blood vessels in the eye on the right.

Screening for Diabetic Eye Disease

When to Start Screening

- Type 1 diabetes: **5 years after diagnosis** in everyone older than 15 years
- Type 2 diabetes: **At diagnosis** for children, adolescents and adults

How to Screen

- 7-standard field, stereoscopic-colour fundus photography with interpretations by a trained reader (gold standard)
- Direct ophthalmoscopy or indirect slit-lamp fundoscopy through dilated pupil
- Digital fundus photography

Who can Screen

- An experienced vision care professional (optometrist or ophthalmologist)
- Diabetes Eye Program in collaboration with ophthalmologist

Screening for Diabetic Eye Disease - continues

If retinopathy is not found

- Type 1 diabetes: rescreen every year
- Type 2 diabetes: rescreen every 1-2 years*
- Review blood glucose, blood pressure and lipid control
- Screen for other complications

If retinopathy is found

- Diagnose retinopathy severity and set up monitoring schedule
- Treat with appropriate therapy (laser, medications, and/or surgery)
- Review blood glucose, blood pressure and lipid control
- Screen for other complications

Foot Care

- Diabetes can cause both nerve damage and poor blood flow to the legs and feet.
- Issues with the lower limbs are a major cause of morbidity and mortality in people living with diabetes.
- An intraprofessional health care team is needed to treat and manage foot ulcers.
- People living with diabetes can help protect their feet by having a good daily foot care routine.



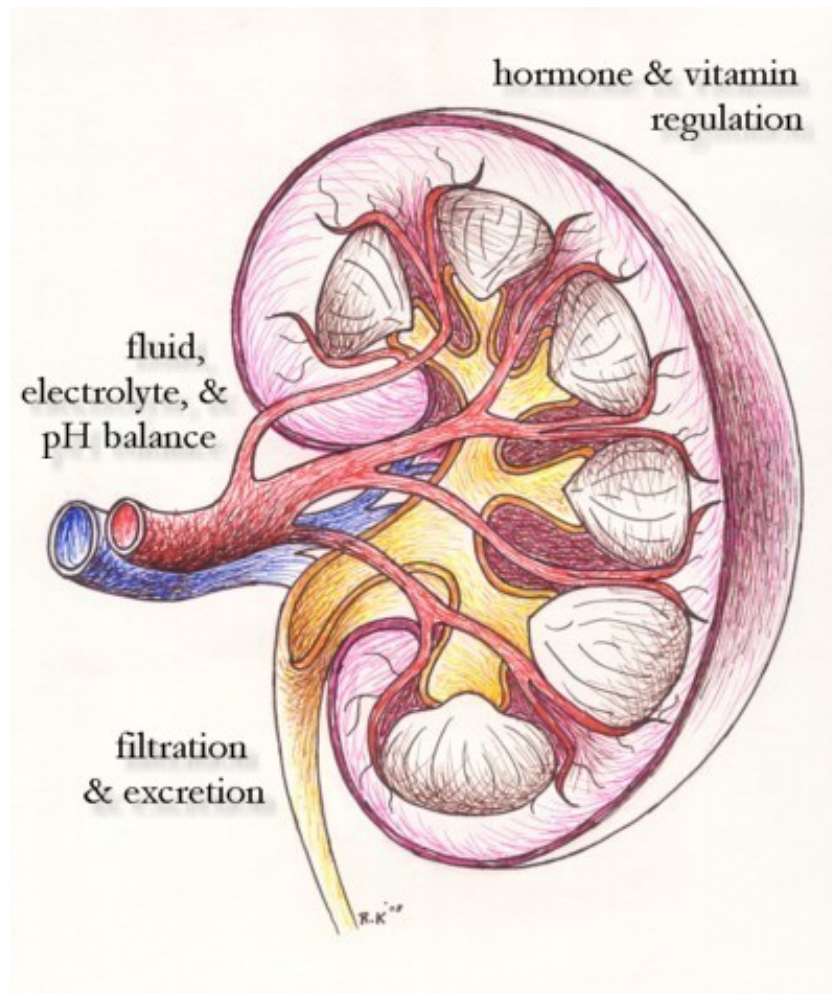
Foot Care Screening

- Annual foot exams to identify people with diabetes at risk for foot ulcers and lower-leg amputations including:
 - Neuropathy – using a 10 g monofilament
 - Peripheral arterial disease (pedal pulses, skin temperature)
 - Skin changes (e.g. calluses, ulcers, infections)
 - Changes in foot structure (e.g. range of motion in ankles and toes, bony deformities – Charcot’s foot)
- Appendices 11A, 11B and 12 in the 2018 Diabetes Canada CPGs show in detail the ways to test for neuropathy.
- Patient education is key to preventing foot trauma.
- Refer clients who need more support.



Chronic Kidney Disease in Diabetes

- Diabetes is the leading cause of kidney disease in Canada.
- Kidney disease is serious.
- Key risk factors for kidney disease:
 - Poor blood sugar control
 - Poor blood pressure control
 - Poor control of blood fats
 - Obesity
 - Cigarette smoking
- Kidney disease is progressive; early detection is important.
- People with kidney disease are at high risk for CVD.



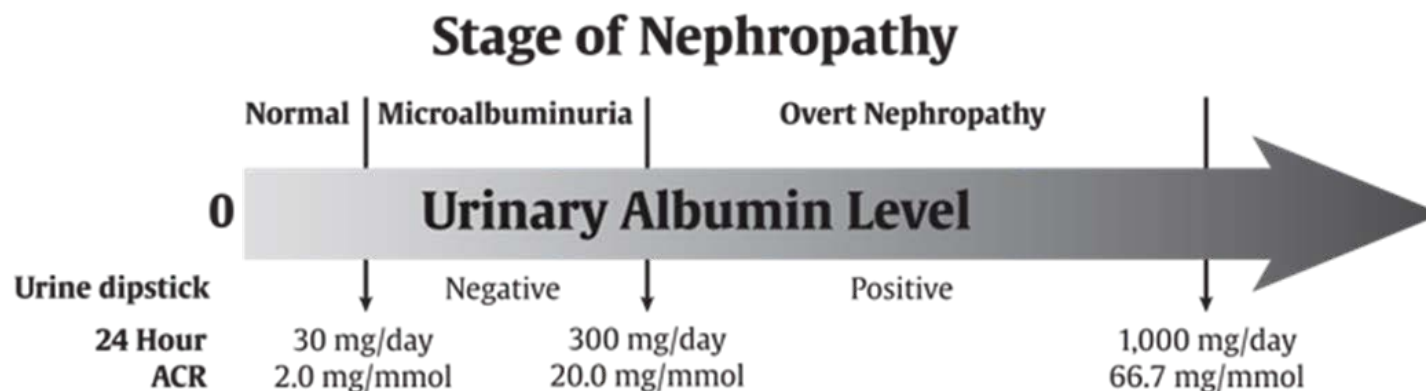
Screening for Kidney Disease

- Type 1: Screen **5 years after** diagnosis and then annually
- Type 2: Screen **at diagnosis** and then annually

Screening for kidney disease looks at two things:

- The Albumin to Creatinine Ratio (ACR) test is done on a random urine sample. ACR is a measure of protein excretion. If you have protein in your urine, it means the filters are damaged.
- Creatinine measured in the blood is an estimate of the Glomerular Filtration Rate (GFR). The eGFR can be used to assess chronic changes in kidney function.

Categories of Kidney disease



Stages of Chronic Kidney Disease

Stage	1	2	3	4	5
Description	Normal	Mild decrease	Moderate decrease	Severe decrease	End-stage renal disease
eGFR	More than 90	60-89	A: 45-59 B: 30-44	15-29	Less than 15

Diabetes and sexual health



- Diabetes can lead to problems with sexual health for both men and women
- Often not discussed by health care provider or client
- Poor sexual health can cause psychological distress and reduce quality of life
- More is known about men's sexual health; women's sexual health is complex and less is known.

Issue	Men	Women
Blood flow	Erectile dysfunction	Dryness, Low arousal
Nerves	Erectile dysfunction	Decreased sensation
Hormones	Decreased testosterone	Decreased estrogen
Other	Psychological	More yeast infections and UTIs

- Being open to talking about sexual health with clients and partners can help reduce distress. There are treatments available.

Diabetes and Mental Health

Diabetes has a clear relationship with mental health. Diabetes can be a large burden and can take a psychological toll on people.



Diabetes-related mental health issues fall into two categories:

1. Diabetes-related psychological distress (e.g. “diabetes distress”, psychological insulin resistance, fear of hypoglycemia)
2. Psychiatric disorders (e.g. depression, anxiety disorders)

Having mental health issues can make it harder for people to cope with and care for their diabetes.

People diagnosed with severe mental health issues like major depressive disorder, schizophrenia and bipolar disorder are at higher risk of developing diabetes.

Diabetes and Mental Health

Starting conversations about mental health is within our scope as health care providers.

- *Session on May 9, 2019: Meaningful Conversations*



All people living with diabetes benefit from regular screening for the presence of diabetes distress and the symptoms of common psychiatric disorders.

- Diabetes-specific measures: Problem Areas in Diabetes scale or Diabetes Distress Scale
- Quality of Life Measures: WHO-5 Well-Being Index
- Screening for depressive/anxiety symptoms: Patient Health Questionnaire (depression), Generalized Anxiety Disorders

There are many resources available to help health care providers and people living with diabetes address and manage mental health concerns.

Cultural and traditional healing is fully supported by non-insured health benefits

Hypoglycemia or Low Blood Sugar

- Certain treatments make people at risk of hypoglycemia (insulin and medication that makes your pancreas produce more insulin)
 - *More discussion during Medications 101 on April 25, 2019*
- Definition of Hypoglycemia:
 - Development of Symptoms
 - Blood glucose less than **4.0 mmol/l**
 - Symptoms go away once the person receives carbohydrates

- Signs and Symptoms

Anxiety	Mood Changes	Confusion	Nausea
Not focused	Trouble speaking	Dizziness	Drowsy
Headache	Hungry	Sweating	Palpitations
Tingling	Trembling	Vision changes	Weakness

Treatment of Hypoglycemia

For mild-to-moderate hypoglycemia, take 15 g of carbohydrate:

- 15 g of glucose in the form of glucose tablets
- 15 mL (3 teaspoons) or 3 packets of table sugar dissolved in water
- 5 cubes of sugar
- 150 mL of juice or regular soft drink
- 6 Life Savers™ (1 = 2.5 g of carbohydrate)
- 15 mL (1 tablespoon) of honey

Test blood sugars again in 15 minutes. If they are higher than 4.0 mmol/l, follow up with a snack if you are more than an hour away from a meal.

If they are still less than 4.0 mmol/l, retreat with another 15 g of carbohydrate, wait 15 minutes and retest.

Summary: Screening for Complications

Complication	What?	How Often?
All complications	A1C	Every 3 months
All complications	Blood Pressure	Every visit
All complications	Cholesterol	Once a year
Heart disease	Resting ECG	Every 3 to 5 years
Eye Disease	7-field, stereoscopic colour fundus photography	Every year for most people
Feet	Foot exam that looks a nerves, skin, bones	Every year
Kidney	ACR, eGFR	Every year
Sexual Health	Conversation	Every visit
Mental Health	Conversation and follow up	Every visit

ABCDE³ of Diabetes Care

		Target
A	A1C targets	Less than or equal to 7.0%
B	BP targets	Less than or equal to 130/80
C	Cholesterol targets	LDL-C less than 2.0 mmol/l
D	Drugs to protect the heart	BP meds, statin, ASA, SGLT2
E	Exercise goals and healthy Eating	150 minutes moderate aerobic activity plus resistance 2-3 times weekly; follow healthy diet pattern
S	Screening for Complications	Heart, Foot, Kidney, Eyes
S	Smoking Cessation	Ask permission to give advice
S	Self-management	Set personalized goals

How do I check my blood sugar?

- Self-monitoring of Blood Glucose (SMBG)
 - Fasting or pre-meal targets: 4 – 7 mmol/l
 - Two hr after eating: 5-10 mmol/l
 - Patterns for checking should be individual
- Check A1C every three months
 - For most people, less than or equal to 7%
- If A1C target is not met, then the SMBG targets can be tightened. BUT it is important to consider risk of hypoglycemia or low blood sugar.



Reminder!



Diabetes complications are **preventable** and **manageable**.

Screening is how you know how things are going.

Good relationships between the health care team and the person living with diabetes can go a long way to living well.

Don't be afraid or worried to **talk about complications** – all of them.

Where can I get more help?

1. Continue attending ISC-FNIHB Diabetes 101 Education series with TSAG
<https://fntn.ca/Home.aspx>
2. ISC-FNIHB:
 - a. Diabetes Eye Program: Francine Steinhauer, 780-495-8429
 - b. General Diabetes Information: Kathleen Gibson RD CDE, 780-495-8641
 - c. Resource Library: <https://www.onehealth.ca/ab/ResourceLibrary/WhatWeOffer.aspx>
3. Diabetes Canada – www.diabetes.ca
 - a. 2018 Clinical Practice Guidelines: <http://guidelines.diabetes.ca/>
4. Alberta Health Services:
 - a. AHS Indigenous Wellness Program – 780-735-4512, learn more at <https://www.albertahealthservices.ca/findhealth/service.aspx?id=1009563>
 - b. Diabetes Foot Care Clinical Pathway Toolkit, learn more at: <https://www.albertahealthservices.ca/scns/Page13331.aspx>

Where can I get more help?

4. Alberta Health Services (continued):

- a. Glenrose Rehabilitation Hospital, Sexual Health Service – 780-735-6290
<https://www.albertahealthservices.ca/findhealth/Service.aspx?id=5798&serviceAtFacilityID=1006101#contentStart>
- b. Renal (Kidney) Services: <https://www.albertahealthservices.ca/info/Page15379.aspx>
- c. Health Link: Call 811 or visit www.MyHealth.Alberta.ca

5. Mental Health resources

- a. 24/7, toll free **First Nations and Inuit Hope for Wellness Help Line: 1-855-242-3310**
- b. WHO-5 Well-Being Index: https://www.psykiatri-regionh.dk/who-5/Documents/WHO5_English.pdf
- c. PHQ-9 and GAD-7: <https://www.phqscreeners.com/>
- d. Critical Psychosocial Issues in Diabetes: <https://cme.ucsd.edu/psychosocialdiabetes/>
 - Web-based training on diabetes and mental health

Overview of Diabetes 101 Series

- [What is Diabetes?](#) – January 23, 2019 – recording available
- [Diabetes Complications](#) – February 28, 2019 – Today!
- [History Plays a Part in our Health Today](#) – March 7 , 2019
- [Diabetes Prevention and Management: Nutrition 101](#) – March 21, 2019
- [Diabetes Prevention and Management: Physical Activity 101](#) – April 11, 2019
- [Diabetes Prevention and Management: Medications 101](#) – April 25, 2019
- [Meaningful Conversations](#) – May 9, 2019
- [Diabetes in Special Populations: Diabetes in Pregnancy](#) – May 23, 2019
- [Diabetes in Special Populations: Diabetes and Youth](#) – June 6, 2019

Questions?

Thank You for Attending Diabetes Complications!

- Please complete the evaluation form. Your feedback helps us create presentations that meet your needs.
- Please send by FAX to 780-495-7338 or scan and email to kathleen.gibson@canada.ca
- Join us on March 7 for History Plays a Part in Health Today

