CANADIAN HEALTH CARE AGENCY
EXPERIENCE THE NORTH

Chronic Disease Case Management and Exacerbation Emergencies

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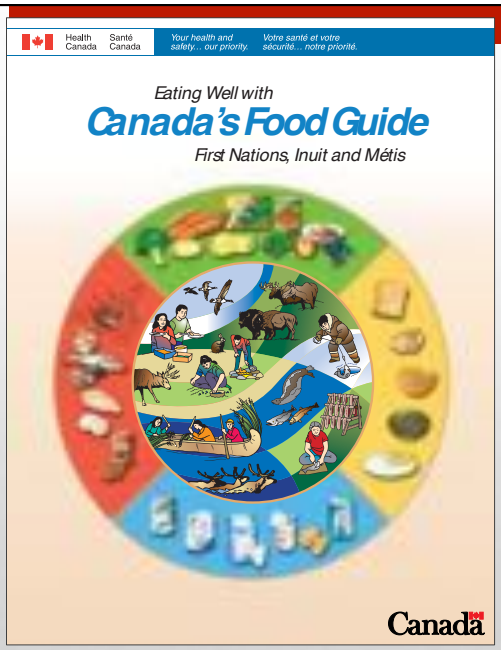
Module 13

Chronic Disease Screening, Management and Exacerbation Emergencies

- Chronic Obstructive Pulmonary Disease (COPD)
- Hypertension
- Chronic Kidney Disease (CKD)
- Diabetes
- Anemia

Chronic Disease Topics

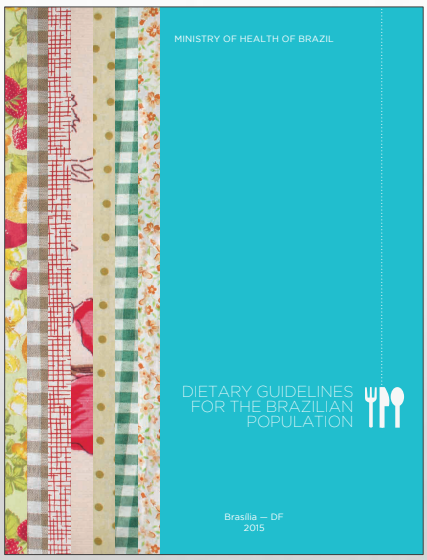


- A food guide tailored to reflect traditions and food choices of First Nations, Inuit and Métis.
- This tailored food guide has recommendations for healthy eating based on science. It recognizes the importance of traditional and store-bought foods for First Nations, Inuit and Métis today.

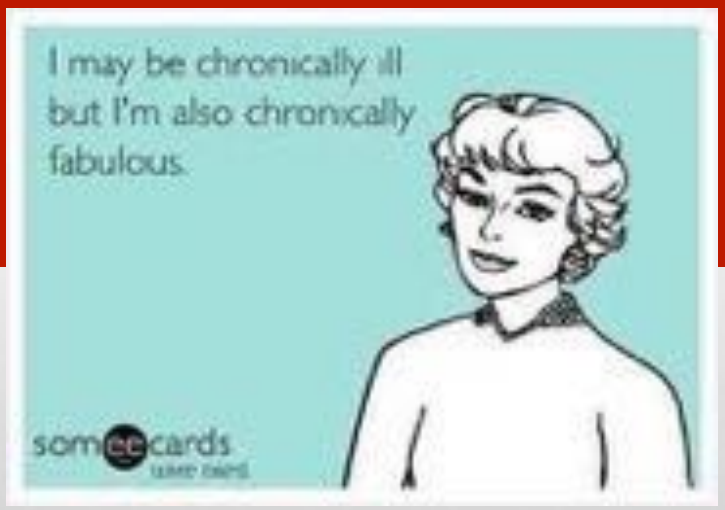
Canada's Food Guide for First Nations, Inuit and Métis © CHCA 2018

Ten Steps to Healthy Diets:

1. Make natural or minimally processed foods the basis of your diet.
2. Use oils, fats, salt, and sugar in small amounts when seasoning and cooking natural or minimally processed foods and to create culinary preparations
3. Limit consumption of processed foods
4. Avoid consumption of ultra-processed foods
5. Eat regularly and carefully in appropriate environments and, whenever possible, in company
6. Shop in places that offer a variety of natural or minimally processed foods
7. Develop, exercise and share cooking skills
8. Plan your time to make food and eating important in your life
9. Out of home, prefer places that serve freshly made meals
10. Be wary of food advertising and marketing



Brazilian Food Guide – FAO (United Nations) © CHCA 2018



CHRONIC DISEASE MANAGEMENT

Definition: A functional disorder of the lung characterized by progressive and persistent airflow obstruction and actual destruction of lung tissue.

Risk Factors:

- Smoking
- Second-hand smoke
- Severe viral pneumonia early in life
- Aging
- Genetic predisposition
- Air pollution
- Occupational exposure to respiratory irritants

- Most clients with COPD have a combination of chronic bronchitis and emphysema.
- However, one pattern is predominant:
  - people with COPD either tend to have more cough and sputum production and less shortness of breath (chronic bronchitis) or
  - tend to have more shortness of breath and less cough and sputum production (emphysema).

Chronic Obstructive Pulmonary Disease

Physical Exam Findings:

- Temperature may be elevated with acute infection
- Heart rate may be elevated, Respiratory rate elevated, depth of respiration may be decreased, Oxygen saturation may be reduced
- Expiratory phase may be prolonged
- Client may appear thin or wasted
- Degree of respiratory distress varies, may be using accessory muscles of respiration
- Cyanosis may occur, Clubbing of fingers may be present
- Chest diameter may increase ("barrel chest")
- Breathing may be pursed-lipped
- If hypoxia is significant, confusion, irritability and diminished level of consciousness may result
- Tactile fremitus decreased, Chest excursion decreased, Hyper resonance
- Decreased diaphragmatic excursion (chronically hyperinflated lungs)
- Air entry reduced, Breath sounds distant (if barrel chest is present)
- Scattered wheezes and crackles may be present
- Decreased FEV1 on peak flow testing

COPD

Complications

- Acute bronchitis
- Pneumonia
- Pulmonary hypertension
- Cor pulmonale (right heart failure)
- Respiratory failure
- Polycythemia (abnormally high haemoglobin)

Diagnostics

- Baseline chest x-ray, non-urgent consult with physician to arrange for baseline pulmonary function testing.

Goals of Treatment

- Reduce or eliminate dyspnea
- Reduce sputum production
- Improve exercise tolerance
- Prevent progression of disease
- Reduce frequency and severity of exacerbations
- Keep oxygen saturation > 90%

Appropriate Consultation

Consult a physician for previously undiagnosed clients, those whose symptoms are not controlled with their current therapy and those with an acute exacerbation.

COPD

Client Education

- Early public education about the hazards of smoking can prevent COPD; Counsel client about smoking cessation (if applicable)
- Recommend adequate hydration
- Recommend increasing room humidity (client should keep a pot of water on the stove, especially in the winter)
- Recommend a weight-loss program (if applicable)
- Discuss natural history, expected course and prognosis of disease
- Counsel client about appropriate use of medications (purpose, dose, frequency, side effects); Counsel client about proper use of inhaler
- Teach client symptoms and signs of exacerbation and acute infection to encourage self-monitoring and early presentation when condition deteriorates
- Monitor q 6 months if stable, monthly if symptomatic
- *Recommend Pneumococcal vaccine, and annual Influenza vaccine.*

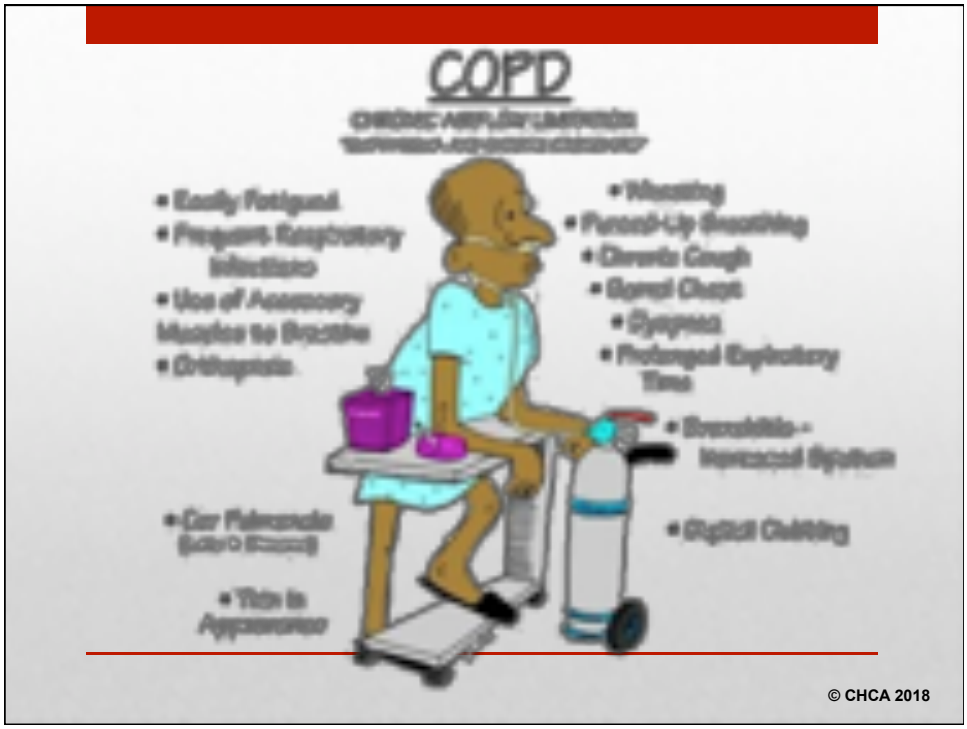
Annual Follow up with the physician

COPD

Maintenance Medications:
WITH CONSULTATION WITH PHYSICIAN

- **SABD** (short-acting bronchodilator)
  - ipratropium bromide (Atrovent) PRN
- **LAAC** (long-acting anticholinergic)
  - tiotropium (Spiriva)
- **SABA** (short-acting ß$_2$-agonist)
  - salbutamol (Ventolin) PR
- **LABA** (long-acting ß$_2$-agonist),
  - salmeterol (Serevent)

COPD

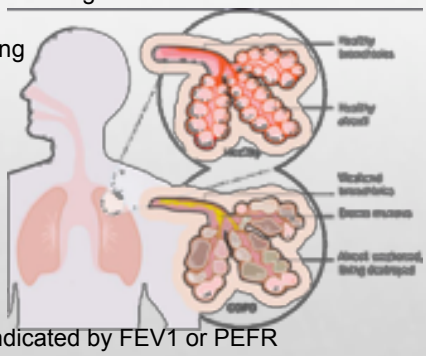


Acute COPD Exacerbation

Recent deterioration of the patient's clinical and functional state due to a worsening of his or her COPD

History

- Worsening dyspnea, sometimes at rest
- Increased cough
- Increased sputum production, often with change in character from mucoid to purulent
- Development of or increase in wheezing
- Loss of energy
- Anorexia
- Fever
- Increase in respiratory rate
- Tachycardia
- Increase in cyanosis
- Use of accessory muscles
- Peripheral edema
- Loss of alertness
- Worsening of airflow obstruction, as indicated by FEV1 or PEFR
- Worsening of oxygen saturation, as indicated by pulse oximetry



COPD Exacerbation

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Acute COPD Exacerbation
Recent deterioration of the patient's clinical and functional state due to a worsening of his or her COPD

Consult a physician as soon as possible.

Adjuvant Therapy

- Oxygen (low flow) via Venturi mask; use a 24% mask initially; titrate concentration and litres of flow to keep oxygen saturation at 90% to 92%
- Watch for signs of respiratory depression
- Start IV therapy with normal saline; adjust IV rate according to state of hydration

COPD Exacerbation

Hypertension

Definition: Persistently elevated blood pressure from increased peripheral arterial resistance related to salt or water retention or endogenous pressure activity.

Risk Factors:

- Heredity
- Obesity
- High salt intake
- Smoking
- High alcohol consumption
- Chronic stress
- Age
- Hyperlipidemia

Diagnosis

- Systolic BP is ≥ 140 mm Hg and/or the diastolic BP is ≥ 90 mm Hg take 2 more readings during the same visit. Discard the first reading and average the last two.
- Hypertension can be diagnosed immediately if there is evidence of urgency or emergency: - Asymptomatic diastolic BP ≥ 130 mm Hg
- Hypertension can be diagnosed in 2 visits within 1 month if the BP is ≥ 180/110 mm Hg *or* BP is 140-179/90-109 mm Hg with target organ damage, diabetes or chronic kidney disease.

Hypertension

Target BP levels are:
< 140/90 mm Hg in the general population
< 130/80 mm Hg in clients with diabetes or renal dysfunction

Non-Pharmacological Treatments:

- Lifestyle Modifications are the first line of treatment.
- Encourage client to lose weight if appropriate (aim for 10%)
- Recommend dietary modifications:
  - Avoid high-salt foods,
  - Avoid adding salt in cooking or at table;
  - Adhere to diet high in fresh fruits and vegetables, high in soluble fibre and low fat dairy products, low in saturated fats
- Recommend smoking cessation
- Recommend restriction of alcohol consumption
- Recommend regular exercise

Pharmacological Treatments:

- **All pharmacotherapy must be initiated only after consultation with a physician.**
- Consider Pharmacotherapy:
  - Diastolic BP ≥ 100 mm Hg or systolic BP ≥ 160 mm Hg in the client who does not have cardiovascular disease, cardiovascular risk factors or target organ damage
- The following classes of drugs are used in the treatment of hypertension:
  - Beta-blockers
  - Angiotensin-converting enzyme (ACE) inhibitors
  - Angiotensin receptor blockers (ARBs)
  - Diuretics
  - Calcium channel blockers (CCBs)

Hypertension

Monitoring and Follow-Up

- For clients on non-pharmacologic therapy, follow up every 3-4 months.
- For clients on antihypertensive drug therapy, follow up every month until 2 successive blood pressure readings are at target level.
  - Once blood pressure has reached target level, follow up every 3-6 months.
- **Annual Follow up with the physician**
- More frequent follow-up is recommended for clients with symptomatic hypertension, severe hypertension, antihypertensive drug intolerance or target organ damage.

Hypertension

Government of Canada / Gouvernement du Canada

HYPERTENSION FLOW SHEET FOR ADULTS

Name:	**Medical history:**
Date of birth: □ Male □ Female	
Band #:	
Healthcare Card #:	**Allergies:**

***RISK FACTORS & CO-MORBIDITIES** (check off all applicable)*

□ Chronic kidney disease □ Heart failure □ Coronary artery disease
□ Dyslipidemia □ Stroke or TIA ** If client has diabetes, use diabetes care flowsheet
□ Tobacco use (current-amount:_____or quit–date:_____)

ROUTINE ASSESSMENT

DATE						
BP <140/90						
Wt (kg) / BMI BMI: 18.5-24.9						
Waist Circumference Men: <102cm; Women: <88cm						
Self-management goal set by client						
Nutrition						
Physical Activity Aerobic: ≥150min/week Resistance: 3 sessions/week						
Smoking Cessation (if applicable)						
Psychosocial Assess for depression, coping and stress						
Medications – review Assess adherence Note any change(s) Inquire about traditional medicine(s)	□ No change	□ No change	□ No change	□ No change	□ No change	□ No change
See progress notes (*: if applicable)						
Signature						

***LABWORK RESULTS** (Note: Labwork, including frequency, must be ordered by an NP or MD)*

DATE	Urine ACR	Creatinine	eGFR	Glucose Status FPG and/or A1C		Electrolytes Na*	Electrolytes K*	Other	
									Baseline ECG □ Date done:

Global cardiovascular risk:

□ Assess global CV risk using model or tool

Model/tool used:_____
Risk Score or "heart age":_____

For NP/MD:
□ Statin for those with ≥3 CV risk factors
□ Consider low-dose ASA in those ≥50 years of age (caution if BP not controlled)

Lipids *(frequency as clinically indicated and if pharmacotherapy initiated)*

Date	TC	LDL	HDL	TG	Non-HDL	ApoB (optional)

Vaccinations ***(in accordance with publicly funded schedule)***

Flu (annual):
Date:_____
Date:_____

Pneumococcal (≥65 years and/or eligible condition):
Date:_____

Jan 2018

See reverse for care objectives and targets

Hypertension

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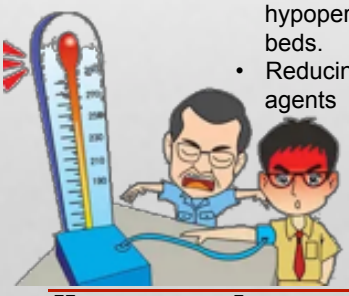
- Hypertensive emergencies – target organ damage present needs urgent consult to specialists depending on type of target organ damage:
  - Cardiology if ACS
  - Cardiac or Vascular Surgery if dissection
  - Neurology if acute stroke or seizure
  - Nephrology if renal failure

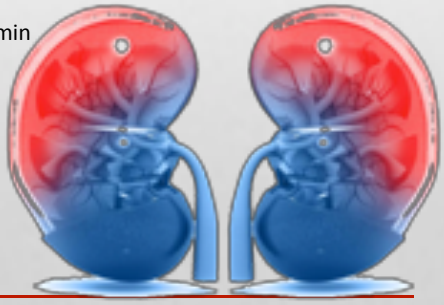
- Goal of Treatment for hypertension in ER:
  - Initial goal for BP reduction to achieve a progressive, controlled reduction in BP to minimize risk of hypoperfusion in cerebral, coronary and renovascular beds.
  - Reducing BP by 20-25% over minutes to hours using IV agents



Hypertension

Normal Kidney Function:
- There are approximately 1 million nephrons in each kidney

Function:
- Removal of wastes from the blood including drugs and toxins d
- Regulation of Fluids, Electrolytes, Acid/ Base Balance
- Controls blood pressure
- Makes 3 important hormones:
  - Erythropoietin (simulates Bone marrow to make RBC's)
  - Renin – Regulation of BP
  - Calcitrol – active form of Vitamin D to main calcium for bones.



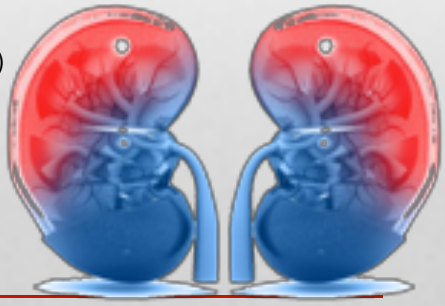
Chronic Kidney Disease

What is Chronic Kidney Disease?

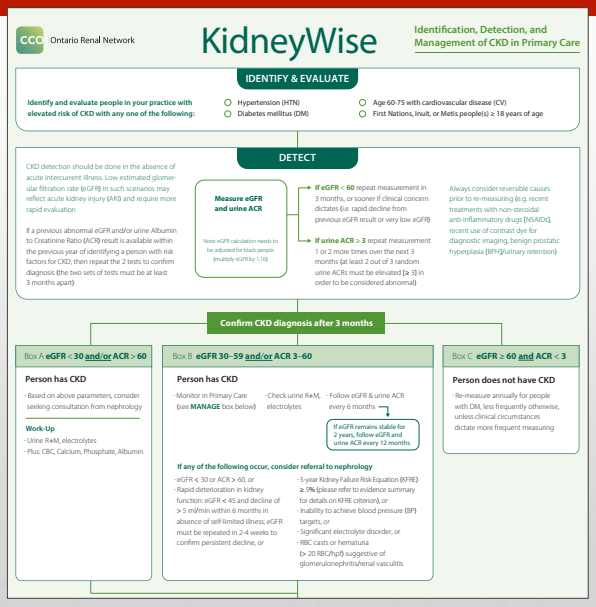
- Presence of kidney damage for a period of 3 months or more
  - eGFR <60mL/ min and/or
  - ACR ≥ 3mg/mmol
- Progressive condition
- Requires a continuum of care
- CKD is common
- Various causes

Causes of CKD:

- Diabetic nephropathy (most common)
- Hypertension
- Glomerulonephritis
- Hereditary or cystic disease
- *Unknown causess*



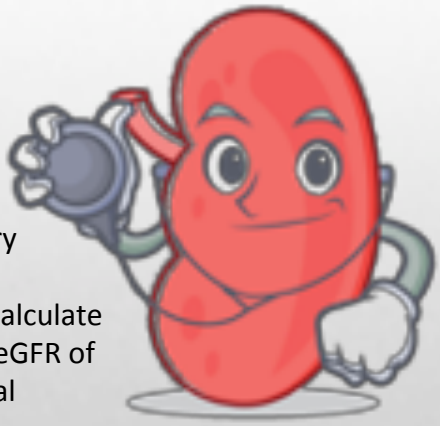
Chronic Kidney Disease



Kidney Wise Toolkit – Ontario Renal Network

Who should be screened?

- Those at increased risk:
  - Hypertension
  - Diabetes
  - Age 60-75 with CVD
  - ? Younger/ earlier for FN



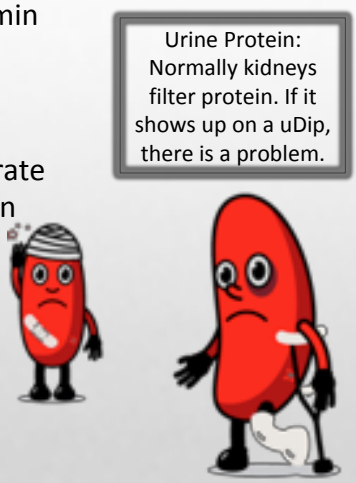
Detection of CKD

- Assess kidney function/ injury
- GFR – used as an indicator
- eGFR – various methods to calculate
- For most healthy people an eGFR of 90mL/min or higher is normal (declines with age)

Chronic Kidney Disease

Assessment of Kidney Injury:

- Random urine test for micro albumin (ACR)
- Healthy kidneys filter out wastes from blood, but leave protein
- Impaired kidneys may fail to separate albumin from waste, an earlier sign of deteriorating kidney function



Factors that May affect results

- Medications
  - NSAIDs
- Volume depletion
- Obstruction (calculi)

Assessing Kidney Injury

Repeat Testing

- IF eGFR <60, repeat the test in 3 months (or sooner if concerned clinically)
- If ACR is ≥3, repeat 1 or 2 more times within 3 mos.

Once isn't enough. Decreased kidney function could be temporary.

Assessing Kidney Injury

Management of CKD

- CV risk very high for those with CKD.
- Most people with CKD die from a CV related event

What to do?

- Lipid Management
- BG Management (target A1C)
- Health Behaviour Modification
  - Smoking cessation

Nutrition

- Important components:
  - Sodium, Protein, Phosphorus, Potassium.

Assessing Kidney Injury

Type 1 Diabetes

Type 2 Diabetes

Gestational Diabetes

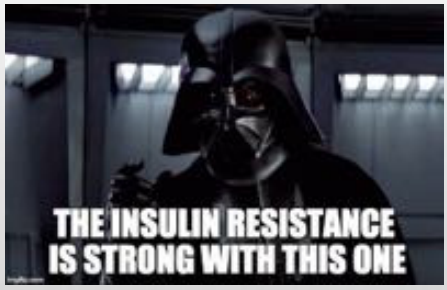
Pre-Diabetes (Insulin resistance)

Diabetes

Definition: A metabolic disorder characterized by hyperglycemia, which is due to defective insulin secretion, defective insulin action or both.

Type 1

- Caused by autoimmune or idiopathic destruction of pancreatic b-cells, which leads to absolute insulin deficiency and tendency to ketoacidosis.
- Onset is usually at younger age (< 30 years).
- Type 1 diabetes is rare among Aboriginal people.



Type 2

- Results from defective insulin secretion and/or an insulin resistance.
- Age at onset is more commonly middle age or older people, but it has been diagnosed in Aboriginal children younger than age 10.
- People with type 2 diabetes are much less prone to ketoacidosis.

Diabetes

Definition: A metabolic disorder characterized by hyperglycemia, which is due to defective insulin secretion, defective insulin action or both.

Gestational Diabetes

- GDM is hyperglycemia with onset or first recognition during pregnancy.
- The prevalence of gestational diabetes in non-Aboriginal women is 3.7% compared to its prevalence in Aboriginal women of 11.5%.
- Offspring of mothers with GDM are at increased risk of obesity and type 2 diabetes mellitus.

Prediabetes

- Refers to impaired fasting glucose (IFG) and impaired glucose tolerance (IGT), both of which predispose individuals to diabetes and its complications.
- IFG is diagnosed based on an elevated fasting blood glucose levels. IGT is diagnosed based on an elevated 2-hour-post 75 gram oral glucose tolerance test (GTT).

Diabetes

Risk Factors for Type 2 Diabetes

- Age ≥ 40 years
- Family history (1st degree relative with type 2 diabetes)
- Member of high-risk population (for example, Aboriginal)
- History of IFG or IGT*
- Metabolic syndrome
- History of gestational diabetes
- History of delivery of a macrosomic infant (large babies [> 4.5 kg at delivery])
- Hypertension*
- Dyslipidemia*
- Abdominal obesity*
- Overweight*
- Vascular disease (coronary, cerebrovascular or peripheral)*
- Presence of complications of diabetes
- Polycystic ovarian syndrome*
- Schizophrenia†
- Acanthosis nigricans (darkened patches on the skin)*

* Associated with insulin resistance
† The incidence of type 2 diabetes is at least 3 times higher in people with schizophrenia

Diabetes

History

- Gradual onset and slow progression of symptoms. Often people are asymptomatic for several years and present with complications of diabetes when they are diagnosed.
- Polyuria, polydipsia, polyphagia
- Nocturia
- Weight loss
- Fatigue, irritability, lack of energy
- Blurred vision, changes in vision, frequent changes in optical prescription
- Nausea and vomiting
- Cuts, wounds or bruises that are slow to heal
- Frequent or recurring infections (for example, vaginal [yeast] infections, urinary tract infections, skin infections of feet)
- Paresthesia of hands/fingers or feet/toes
- Erectile dysfunction

Diabetes

For all patients, review/discuss the following:

- Risk factors for diabetes (see above)
- Eating habits (food choices, meal patterns, cultural influences concerning food)
- Physical activity level (frequency and intensity of activity), factors limiting physical activity
- Medications
- Allergies
- Smoking habits
- Alcohol use (quantity, frequency)
- Contraceptive, reproductive and sexual history
- Weight history
- Social factors (family dynamics, education, employment, lifestyle, coping skills, economic factors)

Diabetes

When considering a diagnosis of diabetes, include the following in your history:

- Symptoms (as above) and complications associated with diabetes
- For adult females: gestational history (including weight of baby and delivery details)

For patients already diagnosed with diabetes, include the following in your history:

- Frequency, severity and cause of episodes of hypoglycemia or episodes of ketoacidosis
- Symptoms and management of complications: eye, kidney, genitourinary (including sexual), bladder, gastrointestinal, heart, cerebrovascular, peripheral vascular and foot
- Previous and current diabetes management (for example, medications)
- Patterns and results of glycemic control (for example, home blood glucose monitoring, laboratory tests, eye exams)

Diabetes

A complete review and examination of all body systems must be done at diagnosis of diabetes then at least annually to detect the presence of complications secondary to the diabetes. Follow-up visits may not include a thorough respiratory, thyroid or musculoskeletal assessment.

General appearance

- Measure Ht, wt, waist circ, calculate (BMI)
- Vital signs: pulse, respiration rate, BP (incl orthostatic BP)
- Integumentary: inspect skin for infection (esp. feet & nails), colour, temperature, bruising, wounds, hyperpigmented patches of acanthosis nigricans, sites of insulin injection

Head and Neck:

Eyes: assess for funduscopic signs of retinopathy
Oral cavity: perform a thorough oral health exam (poor dental health = risk for infection)
Neck: perform a thyroid assessment

Respiratory: perform a routine respiratory exam

Cardiovascular: complete cardiac exam (including signs of heart failure, bruits), palpate and auscultate peripheral pulses

Gastrointestinal: abdominal exam; check for organomegaly (for example, liver)

Musculoskeletal: assess for signs of limited joint mobility, arthropathy, periph edema

Neurologic: complete neurologic exam; assess feet for changes in vibrational sense, proprioception, response to light touch (with 10 g monofilament), reflexes

Diabetes

Complications

- Diabetic ketoacidosis (DKA) (common in type 1 diabetes)
- Hyperosmolar hyperglycemic state (HHS)
- Macrovascular complications
  - Coronary artery disease
  - Stroke
  - Peripheral vascular disease
- Microvascular complications:
  - Nephropathy, end-stage renal disease
  - Retinopathy, cataracts (early onset), blindness
- Peripheral neuropathy
- Recurrent infections (for example, urinary, vaginal [yeast], skin)
- Premature death from complications

"Diabetes has increased dramatically over the past 20 years. That proves that diabetes is caused by global warming!"

Diabetes

Table 3: Diagnostic Plasma Glucose Levels for Diabetes and Prediabetes

	Fasting plasma glucose		2-hour plasma glucose after oral GTT (with 75 g load)		Random plasma glucose
IFG	6.1-6.9		not applicable		not applicable
IFG (isolated)	6.1-6.9	and	< 7.8		not applicable
IGT (isolated)	< 6.1	and	7.8-11		not applicable
IFG and IGT	6.1-6.9	and	7.8-11		not applicable
Diabetes	≥ 7	or	≥ 11.1	or	≥ 11.1 mmol/L in the presence of symptoms of diabetes (for example, polydipsia, polyuria)

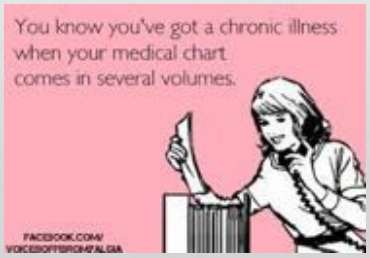
Diabetes should be diagnosed by any of the following criteria:

- FPG ≥7.0 mmol/L
- A1C ≥6.5% (for use in adults in the absence of factors that affect the accuracy of A1C and not for use in those with suspected type 1 diabetes)
- 2hPG in a 75 g OGTT ≥11.1 mmol/L
- Random PG ≥11.1 mmol/L

Diabetes

Other Tests at Diagnosis

- Hemoglobin A1C (Hb_{A1C})
- Fasting lipid levels (total cholesterol [TC], high-density lipoprotein cholesterol [HDL-C], triglycerides [TG] and calculated low-density lipoprotein cholesterol [LDL-C])
- Serum creatinine for estimating glomerular filtration rate (EGFR)
- Thyroid stimulating hormone (TSH)
- Obtain random urine sample for:
  - Albumin to creatinine ratio (micro albumin)
  - Dipstick test for glucose, ketones, protein, blood
  - Microscopy if dipstick abnormal for blood
  - Electrocardiogram (ECG) (for a baseline measurement)



Diabetes

Indigenous Services Canada / Services aux Autochtones Canada

DIABETES CLIENT CARE FLOW SHEET FOR ADULTS

Name:				□ Type 2 □ Type 1	**Age at diagnosis:**	
Date of birth:		□ Male	□ Female	**Medical history:**		
Band #:						
Healthcare Card #:				**Allergies:**		
Risk Factors & Co-morbidities *(check off all applicable)*						
□ Hypertension □ Dyslipidemia □ Retinopathy	□ Chronic kidney disease □ Polycystic ovarian syndrome □ Substance misuse			□ Coronary artery disease □ Erectile dysfunction □ Tobacco use (current-amount:_____or quit–date:_____)	□ Peripheral artery disease □ Mental illness - dx: _____)	
Routine Diabetes Assessment (every 3 to 6 months)						
DATE						
BP <130/80 for most						
Wt (kg) / BMI / WC (cm) BMI 18.5-24.9 WC <102cm ♂; <88cm ♀						
A1C ≤7.0% for most, or _____						
Blood Glucose (self-monitoring) *Inquire about hypoglycemia* for most, premeal 4.0-7.0mmol/L; 2-hour postmeal 5.0-10.0mmol/L						
Foot check (frequency based on screening) Any redness, open area, blister, sign of infection, etc						
Self-management goal(s) set by client						
Nutrition (note referrals) Portion control/CHO consistency Healthy dietary patterns						
Physical Activity Aerobic ≥150min/week Resistance 3 sessions/week						
Smoking Cessation (if applicable)						
Psychosocial Assess for diabetes-related distress, depression, anxiety, substance use, etc.						
Medications - review Note any change(s) Inquire about traditional medicine(s)	□ No change	□ No change	□ No change	□ No change	□ No change	□ No change
See progress notes (↓ if applicable)						
Signature						

Screening for Diabetes Complications (annually or as indicated, but labwork must be ordered by NP or MD)

Nephropathy

Date	ACR	eGFR

Neuropathy
Foot assessment (according to BPGs)
Date: _____
□ See diabetes foot assessment form
Screening frequency: □ **Yearly** □ **Every 6 months** □ **Every 3 months** □ **Every 1 to 3 months**
Inquire about neuropathic pain, erectile dysfunction, gastrointestinal symptoms
Date: _____ Findings: _____

Retinopathy
Annual eye exam
Date:_____
Date:_____

Vaccinations
Flu (annual):
Date:_____
Date:_____
Pneumococcal:
Date:_____

For vascular protection:
□ Statins if CVD, or ≥40 years, or >30 years and >15 years duration, or microvascular disease
□ ACEI/ARB if CVD, or ≥55 years with end organ damage, or microvascular disease
CVD Assessment
ECG:_____
Stress ECG:_____
Other:_____

Lipid Targets: If indicated to treat LDL-C <2.0 mmol/L
Or >50% reduction *(Repeat in 3-6 months if to initiated to confirm)*

Date	Medication	LDL	HDL	TG	(non-HDL-C)	(Apo B)

Self-monitoring of Blood Glucose
Annual meter-to-lab comparison
Date:_____
Review client technique (have client demonstrate with own meter)
Date: _____

Updated May 2018

See reverse for care objectives and targets

Diabetes

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Monitoring and Follow-Up

Note that follow-up testing may be required more frequently than the guidelines stated below, depending on the client, their medications, their diagnostic test results and their other medical conditions. Consult with a physician for guidance about a specific client.

Initial follow-up after diagnosis:

- There are many self-management education topics to be covered following diagnosis (diet, physical activity, HBGM, foot care, medications).
- Therefore, follow-up should focus on enabling the client to be able to self-manage their diabetes and may occur every 4-6 weeks initially or more often as needed.
- Be careful not to overload the client with too much information
- All clients (and their families) should be screened for symptoms of psychological distress
- All clients should be considered for a pneumococcal immunization and annual influenza vaccine

Diabetes

HOW TO USE

Inlow's 60-second Diabetic Foot Screen

FOR THE ASSESSMENT AND MANAGEMENT OF THE DIABETIC FOOT

WoundsCANADA

Patient Name:	Clinician Signature:
ID number:	Date:

In order to use this tool efficiently and for best patient outcomes, complete the following three steps:

▶ **Step 1: Complete an Assessment of the Left and Right Feet**

Instructions: Assess both feet using the four parameters identified within Inlow's 60-second Diabetic Foot Screen[1] to identify clinical indicators and/or care deficits. Once each parameter has been assessed move on to Steps 2 and 3.

Inlow's 60-second Diabetic Foot Screen

LEFT FOOT		RIGHT FOOT
1. Assess for Skin and Nail Changes	**Recommendations and Referrals***	**1. Assess for Skin and Nail Changes**
Skin ☐ Intact and healthy ☐ Dry with fungus or light callus ☐ Heavy callus build up ☐ Prior ulceration or amputation ☐ Existing ulceration (± warmth and erythema) **Nails** ☐ Well-groomed and appropriate length ☐ Unkempt and ragged ☐ Thick, damaged, or infected		**Skin** ☐ Intact and healthy ☐ Dry with fungus or light callus ☐ Heavy callus build up ☐ Prior ulceration or amputation ☐ Existing ulceration (± warmth and erythema) **Nails** ☐ Well-groomed and appropriate length ☐ Unkempt and ragged ☐ Thick, damaged, or infected
2. Assess for Peripheral Neuropathy/ Loss of Protective Sensation (LOPS)	**Recommendations and Referrals***	**2. Assess for Peripheral Neuropathy/ Loss of Protective Sensation (LOPS)**
Sensation – monofilament testing: ☐ No: peripheral neuropathy was not detected (sensation was present at all sites) ☐ Yes: peripheral neuropathy detected (sensation was missing at one or more sites) **Sensation – ask 4 questions:** • Are your feet ever numb? • Do they ever tingle? • Do they ever burn? • Do they ever feel like insects are crawling on them? ☐ No to all 4 questions ☐ Yes to any of the questions		**Sensation – monofilament testing:** ☐ No: peripheral neuropathy was not detected (sensation was present at all sites) ☐ Yes: peripheral neuropathy detected (sensation was missing at one or more sites) **Sensation – ask 4 questions:** • Are your feet ever numb? • Do they ever tingle? • Do they ever burn? • Do they ever feel like insects are crawling on them? ☐ No to all 4 questions ☐ Yes to any of the questions
3. Assess for Peripheral Arterial Disease (PAD)	**Recommendations and Referrals***	**3. Assess for Peripheral Arterial Disease (PAD)**
Pedal Pulses: ☐ Present ☐ Absent **Dependent rubor:** ☐ No ☐ Yes **Cool foot:** ☐ No ☐ Yes		**Pedal Pulses:** ☐ Present ☐ Absent **Dependent rubor:** ☐ No ☐ Yes **Cool foot:** ☐ No ☐ Yes
4. Assess for Bony Deformity (and Footwear)	**Recommendations and Referrals***	**4. Assess for Bony Deformity (and Footwear)**
Deformity: ☐ No deformity ☐ Deformity (i.e. dropped MTH or bunion, chronic Charcot changes) ☐ Amputation ☐ Acute Charcot (+ warmth and erythema) **Range of Motion:** ☐ Full range in hallux ☐ Limited range of motion in hallux ☐ Rigid hallux **Footwear:** ☐ Appropriate ☐ Inappropriate ☐ Causing trauma		**Deformity:** ☐ No deformity ☐ Deformity (i.e. dropped MTH or bunion, chronic Charcot changes) ☐ Amputation ☐ Acute Charcot (+ warmth and erythema) **Range of Motion:** ☐ Full range in hallux ☐ Limited range of motion in hallux ☐ Rigid hallux **Footwear:** ☐ Appropriate ☐ Inappropriate ☐ Causing trauma

* Refer to Steps 2 and 3 before completing this area.

Diabetic Foot Care

1. Assess for Skin and Nail Changes
- Callus, corns, athlete's foot, ingrown toenails, involuted toenails, fungal nails, ram's horn

2. Assess for Peripheral Neuropathy, Loss of Protective Sensation
- Test with a 10-gram monofilament in 4 sites (1st 3rd, 5th toes, same metatarsal heads, also heel and midfoot)
- Do not use a bent monofilament (inaccurate)

3. Assess for Peripheral Arterial Disease (PAD)
- Check posterior tibial and dorsalis pedis pulses on both feet
- Dependant rubor (intermittent claudication − lay down, raise leg 60º, look for pallor, lower leg, look for redness.

4. Assess for Bone deformity and footwear
- Bunion; mallet, hammer and claw toes, charcot foot (collapse of inner foot, pressure point at arch)

5. Client Education
- Can the client see and reach the bottom of their feet, or have someone to help?
- Know risk factors, good footwear, and no barefeet. Proper footcare. Wash feet daily.

Diabetic Foot Assessment

Every 3 months:
- Measure BP, weight (calculate BMI), waist circumference
- Measure Hb_{A1C}
- Review compliance with drug therapy
- Review HBGM diary
- Review compliance with non-pharmacologic interventions (for example, diet and nutrition, physical activity, weight reduction) (may be done every 6 months or every year when patient is stable)
- Discuss incidents of hypoglycemia and hyperglycemia
- Review smoking status and encourage smoking cessation
- Perform foot examination

Every 6 months:
- If chronic kidney disease present (EGFR < 60 mL/min) at diagnosis in person with type 2 diabetes, perform random urine for albumin: creatinine ratio (ACR) and serum creatinine for estimated glomerular filtration rate (EGFR)

Diabetes

Every 1 year:
- Perform quality control of HBGM device; compare venous fasting blood glucose with HBGM device reading (should both be done < 15 minutes apart)
- Measure fasting lipid levels (TC, HDL-C,TG and LDL-C)
- If the type 2 diabetic does not have chronic kidney disease, perform random urine for albumin: creatinine ratio (ACR) and serum creatinine for estimated glomerular filtration rate (EGFR);
- Provide influenza vaccine annually
- Perform screening for peripheral neuropathy using 10 g monofilament testing
- Screen men for erectile dysfunction with a sexual function history
- Schedule client to see a physician and an optometrist or ophthalmologist for screening and evaluation for diabetic retinopathy

Every 2 years:
- Perform an electrocardiogram (ECG)

As needed:
- Measure fasting blood glucose
- Perform urine dipstick

Referral
- Refer all newly diagnosed clients to a physician as soon as possible for complete evaluation
- Refer client to a dietitian for initial assessment and dietary counselling if possible
- Arrange follow-up with a physician or nurse practitioner every 6-12 months if stable or more frequently as necessary

Diabetes

- The management and prevention of diabetes mellitus and associated complications should be a high priority in health planning and healthcare delivery in Aboriginal communities.
- Many studies have noted that culturally appropriate care for diabetes is essential and requires a focus on the geographical, linguistic, educational and social differences among Aboriginal peoples.
- There is no evidence at present that therapeutic strategies should differ from those used in the general population.

Goals of Treatment
- Attain optimum glycemic control for type 1 or type 2.
  - Target FPG 4-7 mmol/L;
  - 2-hour postprandial 5-10 mmol/L;
  - $Hb_{A1C} \leq 7\%$
- Educate the client for self-care
- Prevent complications
- Attain optimum control of concomitant hypertension, dyslipidemia and other cardiovascular risk factors
- Stop smoking

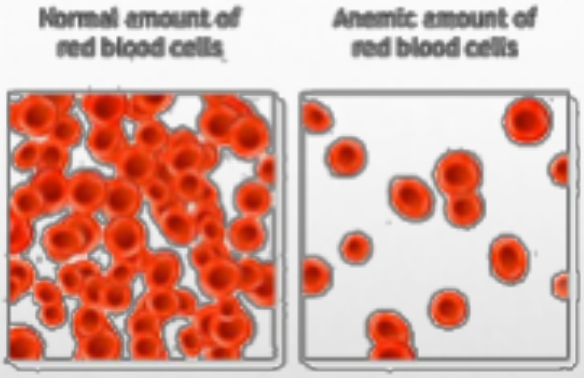
Diabetes

- Can be precipitated by the 6 i's:
  - infection, ischemia/ infarction, iatrogenic (glucocorticoids), intoxication, intra-abdominal process (eg. Pancreatitis, cholecystitis)
- Clinical Features:
  - Polyuria, polydipsia, polyphagia with marked fatigue, nausea and vomiting
  - LOC may be decreased with acidosis
  - Abdominal pain
  - Fruity smelling breath (acetone)
- Urine +ve for glucose and ketones

Management:
- Immediate resuscitation and emergency measures if comatose
- MD Consult and Initiate Medevac
- IV rehydration
- Insulin infusion
- Potassium replacement

Diabetic Emergencies

Anemia

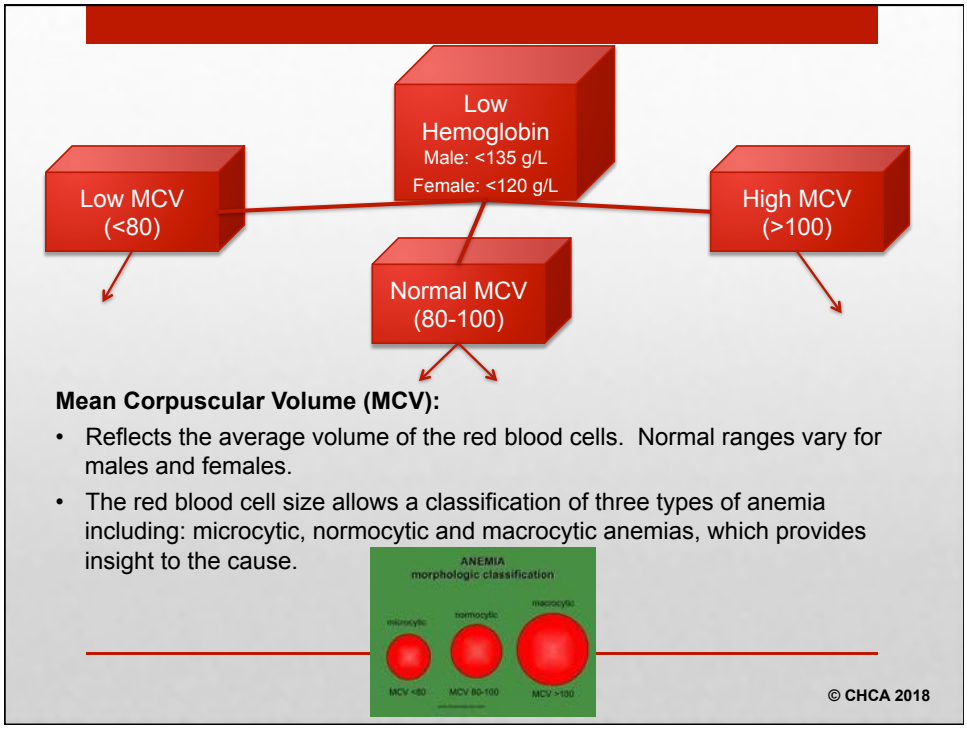


Normal Hemoglobin (Hgb) Levels:

Male: 130-180 g/L
Female: 120-160 g/L

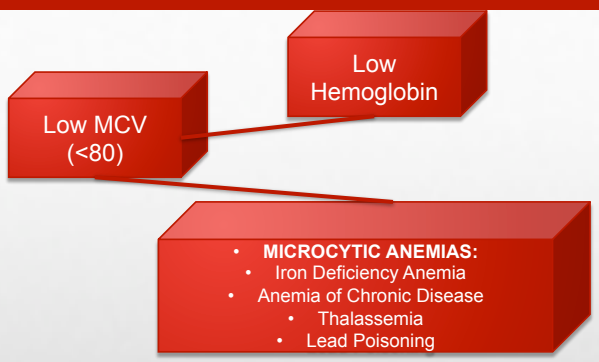
- A decrease in the total amount of red blood cells (RBCs) or hemoglobin in the blood, or a lowered ability of the blood to carry oxygen.
- When anemia comes on slowly, the symptoms are often vague and may include feeling tired, weakness, shortness of breath or a poor ability to exercise.
- Anemia that comes on quickly often has greater symptoms, which may include confusion, feeling like one is going to pass out, loss of consciousness, or increased thirst.

What is Anemia?

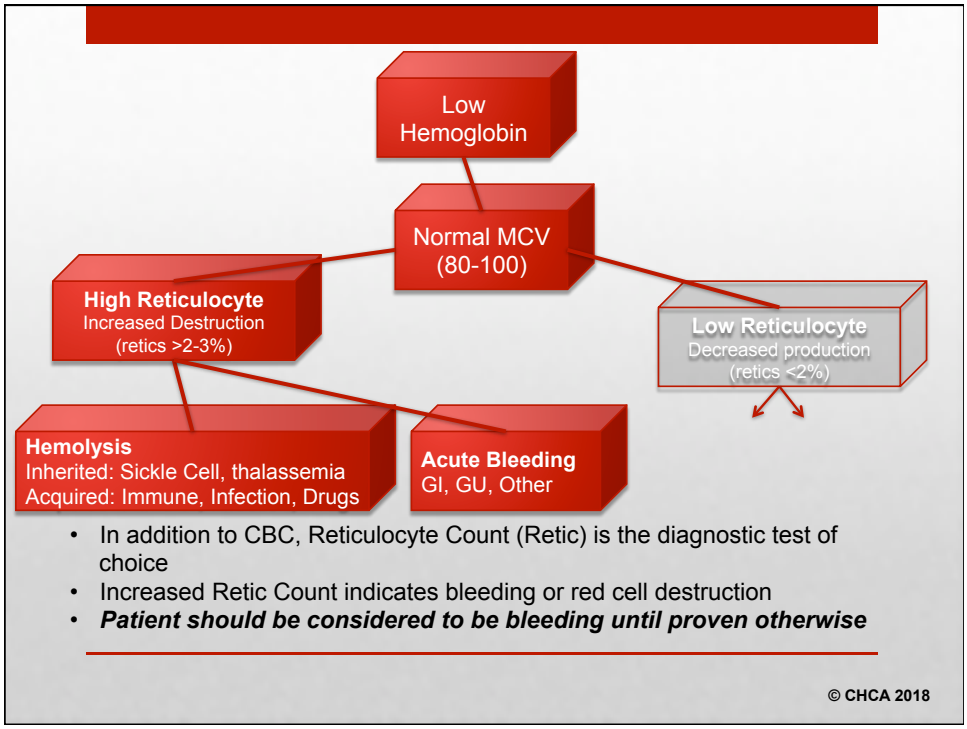


Mean Corpuscular Volume (MCV):

- Reflects the average volume of the red blood cells. Normal ranges vary for males and females.
- The red blood cell size allows a classification of three types of anemia including: microcytic, normocytic and macrocytic anemias, which provides insight to the cause.



- Iron Deficiency Anemia (IDA) is the most common type of microcytic anemia
- In addition to CBC, Serum Ferritin (Fe) is the diagnostic test of choice
- All patients should receive Iron supplementation to restore Hgb levels and MCV to normal, and replenish iron stores.


Low
Hemoglobin
Normal MCV
(80-100)
High Reticulocyte
Increased Destruction
(retics >2-3%)
Low Reticulocyte
Decreased production
(retics <2%)
Hemolysis
Inherited: Sickle Cell, thalassemia
Acquired: Immune, Infection, Drugs
Acute Bleeding
GI, GU, Other
• In addition to CBC, Reticulocyte Count (Retic) is the diagnostic test of choice
• Increased Retic Count indicates bleeding or red cell destruction
• Patient should be considered to be bleeding until proven otherwise
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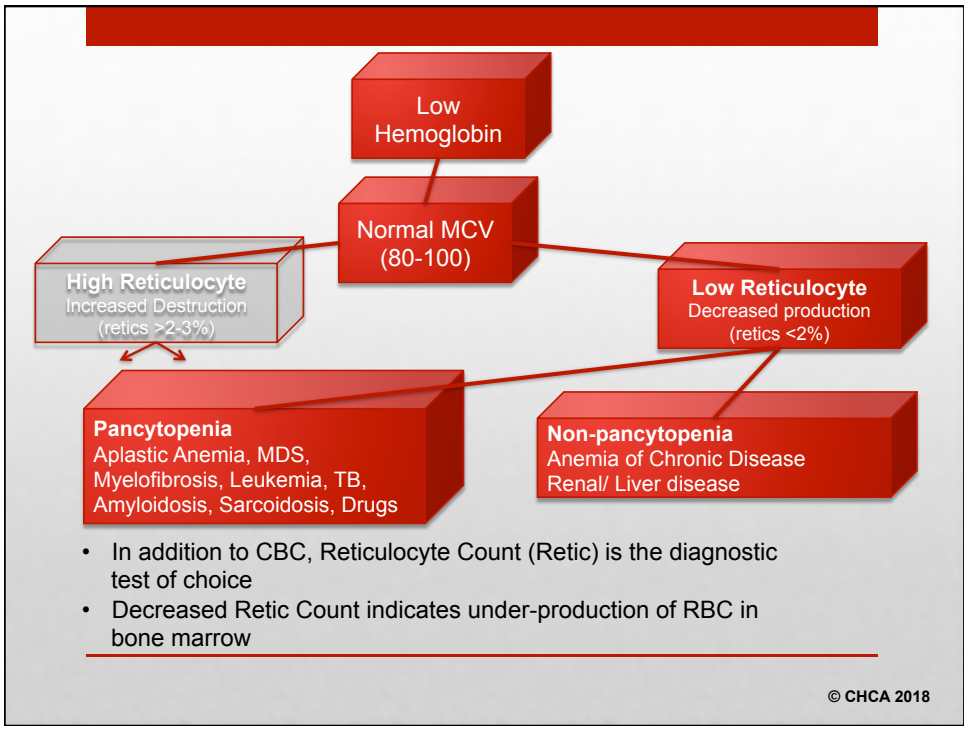
Low
Hemoglobin
Normal MCV
(80-100)
High Reticulocyte
Increased Destruction
(retics >2-3%)
Low Reticulocyte
Decreased production
(retics <2%)
Pancytopenia
Aplastic Anemia, MDS,
Myelofibrosis, Leukemia, TB,
Amyloidosis, Sarcoidosis, Drugs
Non-pancytopenia
Anemia of Chronic Disease
Renal/ Liver disease
• In addition to CBC, Reticulocyte Count (Retic) is the diagnostic test of choice
• Decreased Retic Count indicates under-production of RBC in bone marrow
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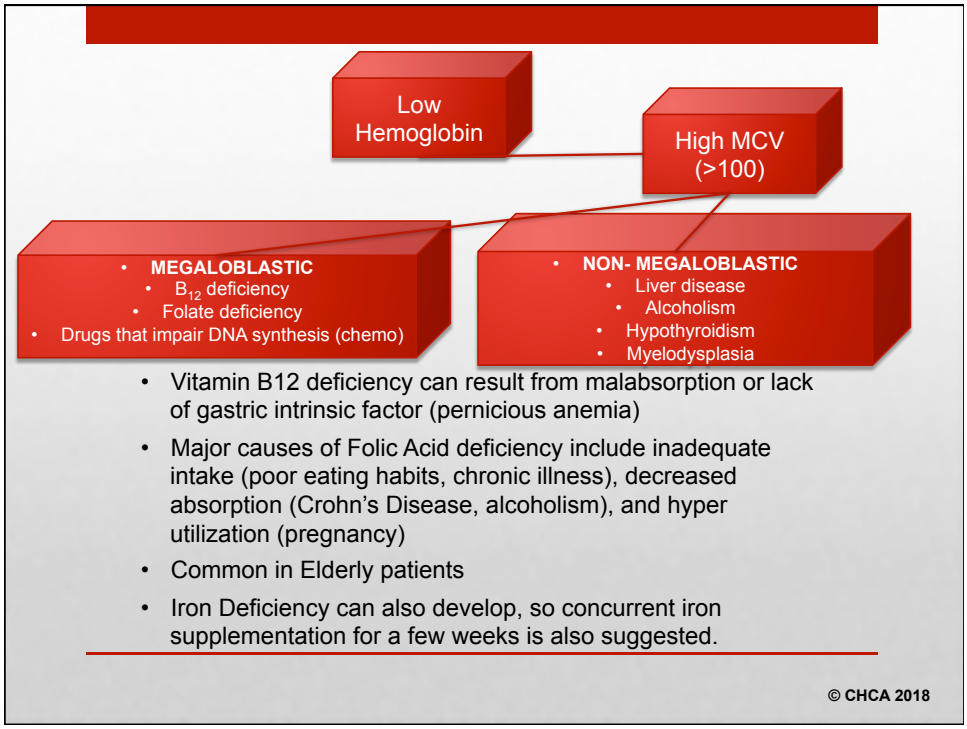
Low Hemoglobin
High MCV (>100)
MEGALOBLASTIC
B12 deficiency
Folate deficiency
Drugs that impair DNA synthesis (chemo)
NON- MEGALOBLASTIC
Liver disease
Alcoholism
Hypothyroidism
Myelodysplasia
Vitamin B12 deficiency can result from malabsorption or lack of gastric intrinsic factor (pernicious anemia)
Major causes of Folic Acid deficiency include inadequate intake (poor eating habits, chronic illness), decreased absorption (Crohn's Disease, alcoholism), and hyper utilization (pregnancy)
Common in Elderly patients
Iron Deficiency can also develop, so concurrent iron supplementation for a few weeks is also suggested.
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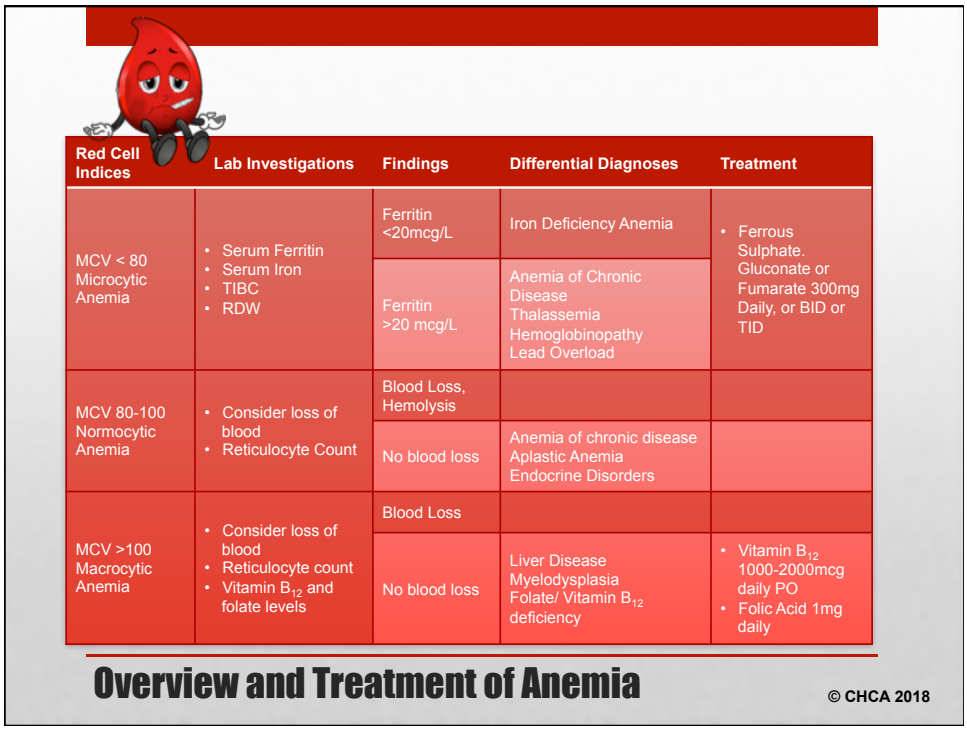
Red Cell Indices
Lab Investigations
Findings
Differential Diagnoses
Treatment
MCV < 80 Microcytic Anemia
Serum Ferritin
Serum Iron
TIBC
RDW
Ferritin <20mcg/L
Iron Deficiency Anemia
Ferritin >20 mcg/L
Anemia of Chronic Disease
Thalassemia
Hemoglobinopathy
Lead Overload
Ferrous Sulphate. Gluconate or Fumarate 300mg Daily, or BID or TID
MCV 80-100 Normocytic Anemia
Consider loss of blood
Reticulocyte Count
Blood Loss, Hemolysis
No blood loss
Anemia of chronic disease
Aplastic Anemia
Endocrine Disorders
MCV >100 Macrocytic Anemia
Consider loss of blood
Reticulocyte count
Vitamin B12 and folate levels
Blood Loss
No blood loss
Liver Disease
Myelodysplasia
Folate/ Vitamin B12 deficiency
Vitamin B12 1000-2000mcg daily PO
Folic Acid 1mg daily
Overview and Treatment of Anemia
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Anemia