# CCHCS Care Guide: Diabetes

**SUMMARY** | **DECISION SUPPORT** | **PATIENT EDUCATION/SELF MANAGEMENT**

## GOALS

- **A1C GOAL: < 7% - personalize based on patient risk factors/benefits***
- **Blood Sugar: Fix the fasting first (glucose 80-130 mg/dl)**
  **then fix preprandial (glucose 80-130 mg/dl)**
  **then fix postprandial (glucose ≤ 180 mg/dl)**
- **Blood Pressure < 140/90****
- **Statin treatment based on cardiac risk status rather than LDL level**

## ALERTS

- **BLOOD SUGAR < 70 mg/dl**
- **BLOOD SUGAR > 400 mg/dl**
- **ALTERED LEVEL OF CONSCIOUSNESS**

**2014 Institute for Clinical Systems Improvement (ICSI).*
*A reasonable A1C goal for many nonpregnant, healthy adults with no concurrent illnesses and at low hypoglycemic risk is ≤ 7.0%.
Higher A1C goals (such as <8%) may be appropriate for patients with a history of severe hypoglycemia, limited life expectancy, advanced microvascular or macrovascular complications, and extensive comorbid conditions. In addition, less stringent goals may be appropriate in those with long-standing diabetes in whom the general goal is difficult to attain despite diabetes self-management education (DSME), appropriate glucose monitoring, and effective doses of multiple glucose-lowering agents including insulin.
**2015 American Diabetes Association (ADA): Lower systolic target (<130) may be appropriate in certain individuals (e.g., younger patients) if it does not cause undue treatment burden.*

## DIAGNOSTIC CRITERIA

| | |
|---|---|
| Pre-Diabetes | Impaired Fasting Glucose (IFG)<br>♦ Fasting Plasma Glucose (FPG) = 100-125 mg/dl (measured after fasting at least 8 hours) |
| Diabetes<br>Type 1 - Impaired insulin production<br>Type 2 - Insulin resistance | ♦ Single measurement of A1C > 6.5%<br>♦ FPG ≥ 126 mg/dl<br>♦ 2-hr plasma glucose (PG) ≥ 200 mg/dl during 75 gm Oral Glucose Tolerance Test (OGTT)<br>♦ Random PG ≥ 200 mg/dl in patient with symptoms of hyperglycemia |
| Gestational Diabetes<br>Pregnancy related insulin resistance | Fasting 75 gm OGTT (after ≥ 8 hrs fast), diagnostic if:<br>♦ Fasting ≥ 92 mg/dl<br>♦ 1 hr ≥ 180 mg/dl<br>♦ 2 hr ≥ 153 mg/dl (based on Intl' Assoc. of Diabetes and Pregnancy Study Groups, see page 10) |

## INITIAL EVALUATION

**HISTORY:** Complete clinical history
- ♦ medications
- ♦ fingerstick blood sugar logs
- ♦ prior A1C
- ♦ symptoms of hypoglycemia
- ♦ complication history:
  - ophthalmologic - renal
  - neuropathic - vascular
  - ASCVD

**PHYSICAL EXAM:**
Funduscopic and/or referral for retinal evaluation (see Microvascular Complications: Eye, on page 6), cardiovascular (including BP and peripheral pulses), skin, thyroid, motor and sensory including reflexes, foot exam including monofilament testing if indicated.

**DIAGNOSTICS:**
A1C, fasting lipid panel, electrolytes, LFTs, creatinine, TSH, EKG, urine albumin (abnormal result repeated at least 2-3 times over 3-6 months to confirm diagnosis, see renal function and urine albumin discussion on page 7).

## TREATMENT OPTIONS

**EDUCATION:**
- Diabetes- general diabetes education (See PE-1, 2 and 3)
- Therapeutic Lifestyle Changes (TLC) (See page 2)

**MEDICATIONS** (See page 2):

Start medications promptly when lifestyle efforts are not sufficient in achieving or maintaining glycemic goals.
- Metformin
- Glipizide
- Insulin (basal insulin preferred)

**RISK MANAGEMENT:**
- ► Cardiovascular Disease (See page 6)
- ► Microvascular complications and foot care (See pages 6-9)

**MONITORING** (See page 5):
- ► DM not at goal: A1C every 90 days or as indicated
- ► BP not at goal: BP checks between visits if BP not at goal
- ► Lipids: As indicated

- At goal: Monitor patient every 180 days (If treatment goals achieved and clinically stable on at least two consecutive clinical encounters, unless the PCP orders more frequent monitoring).

## TABLE OF CONTENTS

## THERAPEUTIC LIFESTYLE CHANGES

### Nutrition

- Consider diet counseling (on site or via telemedicine) to provide patients with practical tools for day-to-day meal planning, making good food choices at meals, and better food choices at canteen.

### Weight loss

- If BMI ≥ 25 in patients with prediabetes or diabetes, establish a realistic weight loss goal at the time of diagnosis.
- Weight loss of 2-8 kg may provide clinical benefits to those with type 2 diabetes, especially early in the disease process.
- Weight loss will modify other CV risk factors.

### Exercise

- Increased physical activity and aerobic exercise can result in significant weight loss and improved cardiovascular capacity.
- Increase aerobic recreational activities (unless contraindicated).
  - Brisk walking/jogging 30 min 5 days week or 50 min 3 days a week.
  - Running 25 min 3 days a week.
- Increase physical activity during daily routine.
  - Reduce sedentary time, particularly by breaking up extended amount of time (>90 min) spent sitting with physical activity.
  - Resistance training involving all major muscle groups 2 or more times a week recommended for all diabetics. Examples of resistance training include: burpees and planks, squats and pull-ups, push-ups and sit-ups.
- Ensure that patients on insulin or insulin secretagogues understand possibility of hypoglycemia with increased activity.

## MEDICATIONS

**INITIAL THERAPY RECOMMENDATIONS**
(See page 3 for CCHCS Recommendations for Antihyperglycemic Therapy in Type 2 diabetes)

| | |
|---|---|
| **A1C < 9%** | Start metformin therapy (500 mg daily or twice daily) in addition to lifestyle changes, titrate to A1C goal (see page 12). |
| **A1C 9 - 10%** | Start dual therapy with metformin and glipizide (starting dose 2.5 mg [elderly] or 5 mg once daily), titrate to A1C goal. |
| **A1C ≥ 10 % or with severe hyperglycemia** | Start with basal insulin or combination insulin (premixed) instead of, or in addition to, metformin (see pages 3 and 12-13). |
| **Any of the above with catabolism or ketonuria** | Start with combination basal and prandial insulin, consider inpatient treatment.* |
| *After establishing control with insulin, may add oral agents and decrease/discontinue insulin in some patients. | |

### ADDING A SECOND AGENT

- Sulfonylurea (glipizide) usual 2nd agent if goal not reached with full dose of metformin within 3 months.
- Insulin is preferred second agent for A1C > 8.5 or for those with hyperglycemia symptoms. Use Thiazolidinediones (TZDs) or Dipeptidyl Peptidase-4 (DPP-4) inhibitors (nonformulary) only if glipizide is not well tolerated or contraindicated.

### DUAL AGENT FAILURE

- Start or intensify insulin therapy.
- Taper and stop sulfonylurea when adding insulin other than basal insulin.
- Triple therapy may be considered by combining two oral agents with basal insulin for those refractory to dual oral therapy.
- May consider addition of a third oral agent for patients with A1C ≥ 8.5. This combination is less likely to be effective and more expensive. (Patients on 3 oral agents [sulfonylurea, metformin, TZD] compared to patients switched to insulin with metformin had similar control with more side effects and more atherogenic profiles).

Note: Evaluate patient's entire medication regimen to identify drugs which may cause diabetes or impair diabetes management.

## MEDICATIONS

### ANTIHYPERGLYCEMIC THERAPY IN TYPE 2 DIABETES: CCHCS RECOMMENDATIONS

**Monotherapy**

**Metformin**

**If A1C target not achieved after approximately 3 months of monotherapy, proceed to 2-drug combination (formulary therapies preferred in CCHCS [Sulfonylurea and Insulin [basal])**

**Dual Therapy**

| Metformin + | Metformin + | Metformin + | Metformin + | Metformin + | Metformin + |
|---|---|---|---|---|---|
| **Sulfonylurea** | **Insulin (basal)** | Thiazolidinedione (TZD)* | DPP-4 inhibitor (DPP-4-i)* | SGLT2 inhibitor (SGLT2-i)* | GLP-1 receptor agonist (GLP-1-RA)* |

**If A1C target not achieved after approximately 3 months of dual therapy, proceed to 3-drug combination**

**Triple Therapy**

| Metformin + Sulfonylurea + | Metformin + Insulin (basal) + | Metformin + TZD* + | Metformin + DPP-4-i* + | Metformin + SGLT2-i* + | Metformin + GLP-1-RA* + |
|---|---|---|---|---|---|
| **Insulin**** or TZD* or DDP-4-i* or SGLT2-i* or GLP-1-RA* | Prandial insulin (may d/c basal insulin and use 70/30 insulin instead) | or DDP-4-i* or SGLT2-i* or GLP-1-RA* or Insulin (basal) | or TZD* or SGLT2-i* or GLP-1-RA* or Insulin (basal) | or DDP-4-i* or TZD* or GLP-1-RA* or Insulin (basal) | or DDP-4-i* or SGLT2-i* or TZD* or Insulin (basal) |

**If A1C target not achieved after approximately 3 months of triple therapy and patient**

- **on oral combination, move to injectables;**
- **on GLP-1-RA, add basal insulin; or**
- **on optimally titrated basal insulin, add GLP-1-RA or mealtime insulin.**

**In refractory patients consider adding TZD or SGLT2-i.**

**Combination Injectable Therapy**

**Metformin +**

**Basal insulin + Mealtime insulin *or* GLP-1-RA**

Source: Adapted from Standards of Medical Care in Diabetes 2015 American Diabetes Association: Position Statement. http://care.diabetesjournals.org (S43). Adapted from Inzucchi et al.

**ANTIHYPERGLYCEMIC AGENT EFFICACY, ADVERSE EFFECTS, COST COMPARISON**

| DRUG/CLASS | EFFICACY | HYPOGLYCEMIA RISK | WEIGHT | SIDE EFFECTS | COST |
|---|---|---|---|---|---|
| **Metformin (biguanide)** | High | Low | Neutral/loss | GI, lactic acidosis | Low |
| **Glipizide**/(sulfonylurea) | High | Low | Gain | Hypoglycemia | Low |
| **Insulin** | Highest | High | Gain | Hypoglycemia | Variable |
| Thiazolidinedione (TZD)* | High | Low | Gain | Edema, CHF, fractures | Low |
| DPP-4 inhibitor (DPP-4-i)* | Intermediate | Low | Neutral | Rare | High |
| SGLT2 inhibitor (SGLT2-i)* | High | Low | Loss | GU, dehydration | High |
| GLP-1 receptor agonist (GLP-1-RA)* | High | Low | Loss | GI | High |

Correlation between A1C and mean plasma glucose on multiple testing

| A1C | mg/dl |
|---|---|
| 6 | 126 |
| 7 | 154 |
| 8 | 183 |
| 9 | 212 |
| 10 | 240 |
| 11 | 269 |
| 12 | 298 |

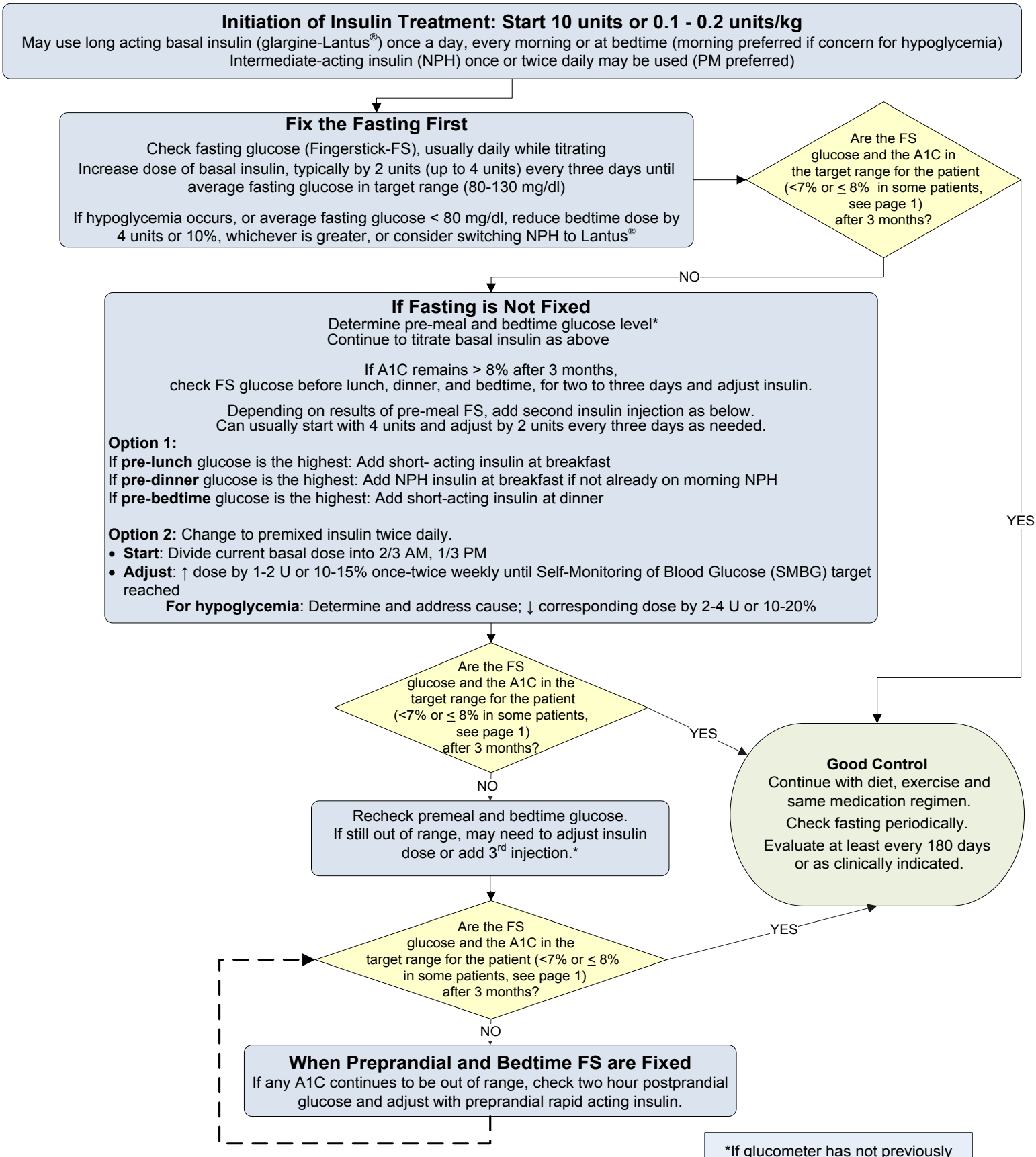
**BOLD** = formulary medications

*TZD, DDP4-i, SGLT2-I GLP-1-RA are nonformulary and require prior authorization, consultation as indicated; not recommended for use in CCHCS/CDCR

**Basal insulin is recommended. Taper and stop sulfonylurea when starting insulin other than basal insulin.

## MEDICATIONS

## INSULIN DOSING ALGORITHM




*If glucometer has not previously been issued consider issuing now.

Source: Adapted from Standards of Medical Care in Diabetes 2015 American Diabetes Association

## MONITORING

### FINGERSTICK (FS) GLUCOSE

- FS testing is very burdensome to patients and staff. You should only order a fingerstick glucose if you are ACTING on the results.
- For patients with Type 2 DM daily FS testing is generally only needed while titrating insulin dose. Once insulin dose stabilizes, may monitor FS much less frequently, especially if A1C is at goal.
- Note: A fasting or premeal FS test is of little value if patient has eaten, defer test in these circumstances.
- Consider KOP glucometer if fasting or premeal tests are needed but difficult to obtain.

| | | |
|---|---|---|
| **LABS** | A1C | Not at goal — Check every 90 days<br>At goal — Can be every 180 days |
| | Lipid panel | Annually, or checked as needed to monitor adherence |
| | Urine microalbumin | Annually — All patients<br>(Type 1 DM patients start annual screening 5 years after diagnosis of diabetes) |
| | Creatinine | Annually — All patients |
| | Glomerular Filtration Rate (GFR) estimate | Annually in all patients with albuminuria |
| | Potassium | Annually in all patients with albuminuria |
| **EXAMS** | Blood pressure | Not at goal — Test between visits as clinically indicated while titrating medication<br>At goal — Check each visit |
| | PCP Foot exam | Annually — All patients |
| | EKG | Annually — Consider in all patients |
| | Dilated retinal exam | Initial eye exam:<br>► Type 1 DM - Perform initial dilated eye exam within 5 years of diabetes onset<br>► Type 2 DM - Perform initial dilated eye exam shortly after diagnosis<br><br>Follow-Up:<br>► Annually— Patients with retinopathy<br>► May consider every 2 years if previous exam normal in well controlled patient |
| | Dental exam | Annually — Upon patient request |
| **VACCINES** | Influenza vaccine | Annually — All patients |
| | Pneumococcal vaccine | Patients with diabetes should receive pneumococcal polysaccharide vaccine (PPSV23) |
| | Hep B vaccine | Recommended — Offer to patients age 19-59 years<br>Consider Hep B vaccine in patients age > 59 years |

## RISK MANAGEMENT

### CARDIOVASCULAR DISEASE

- Consider aspirin (ASA) 81mg in patients with increased CV risk.
  - If 10-yr CV risk >10% (calculate using Pooled Cohort Equation[+]), including men > 50 years of age or women > 60 who have at least one additional major risk factor for CVD other than DM (e.g., dyslipidemia, HTN, smoking, albuminuria, family history of premature CVD).
- Clopidogrel 75mg/day should be used for those with ASA allergy.
- Statin treatment initiation and monitoring is based on risk status rather than LDL level (see below and CCHCS Dyslipidemia Care Guide).

[+] http://clincalc.com/Cardiology/ASCVD/PooledCohort.aspx

**RECOMMENDATIONS FOR STATIN TREATMENT IN DIABETICS[1]**

| AGE | RISK FACTORS | RECOMMENDED STATIN DOSE* | MONITORING WITH LIPID PANEL |
|---|---|---|---|
| < 40 years | None<br>CVD risk factors**<br>Overt CVD*** | None<br>Moderate or high<br>High | Annually or as needed to monitor adherence |
| 40–75 years | None<br>CVD risk factors<br>Overt CVD | Moderate<br>High<br>High | As needed to monitor adherence |
| > 75 years | None<br>CVD risk factors<br>Overt CVD | Moderate<br>Moderate or high<br>High | As needed to monitor adherence |

| | |
|---|---|
| High-intensity statin | Atorvastatin 40 - 80 mg/d |
| Moderate-intensity statin | Atorvastatin 10 - 20 mg/d or Simvastatin 20-40 mg/d |

*In addition to lifestyle therapy.
**CVD risk factors include LDL cholesterol >100 mg/dL, high blood pressure, smoking, and overweight and obesity.
***Overt CVD includes those with previous cardiovascular events or acute coronary syndromes.

[1]Stone NJ, Robinson J, Lichtenstein AH, Bairey Merz CN, Lloyd-Jones DM, Blum CB, McBride P, Eckel RH, Schwartz JS, Goldberg AC, Shero ST, Gordon D, Smith Jr SC, Levy D, Watson K, Wilson PWF, 2013 ACC/AHA Guideline on the Treatment of Blood Cholesterol to Reduce Atherosclerotic Cardiovascular Risk in Adults, *Journal of the American College of Cardiology* (2013), doi: 10.1016/j.jacc.2013.11.002.

### MICROVASCULAR COMPLICATIONS: EYE

Diabetic Retinopathy:

- Optimize glycemic and blood pressure control to reduce risk or slow progression of retinopathy.
- Eye Exams:
  - Type 1 DM - perform initial dilated eye exam within 5 years of diabetes onset.
  - Type 2 DM - perform initial dilated eye exam shortly after diagnosis.
  - Repeat eye exam:
    - If no evidence of retinopathy, repeat every 2 years may be considered.
    - If diabetic retinopathy is present, repeat exams annually, or more frequently as indicated.

## MICROVASCULAR COMPLICATIONS: RENAL FUNCTION

- Annual measurement of urine albumin excretion is recommended for all Type 2 diabetics starting at diagnosis. (For Type 1 diabetes, testing recommended annually starting five years after diagnosis).
- Optimal glucose and blood pressure control reduces the risk or slows progression of diabetic kidney disease.
- Increased urinary protein excretion may be an early finding of diabetic nephropathy.

### DETECTION OF ALBUMINURIA/DIABETIC NEPHROPATHY

**Quantitative measure of urine albumin-to-creatinine ratio (UACR) in an untimed urine sample**

- The recommended screening test for microalbuminuria in all diabetics. (Measurement of spot urine for albumin only is not recommended).
- A value of 30-300 mg albumin/g of creatinine suggests microalbuminuria.
  - This test correlates with 24 hour urine values over a wide range of protein excretion, it is simple and inexpensive, repeat values are easy to obtain.
  - Repeat testing for confirmation is important because fever, exercise, heart failure, and poor glycemic control may cause transient microalbuminuria.
  - Avoidance of vigorous exercise for 24 hours before the test is recommended.
  - Albumin excretion will be underestimated in a muscular man with a high rate of creatinine excretion and overestimated in a cachectic patient with reduced muscle mass / creatinine excretion.

**Normal**
- Urinary albumin excretion < 30 mg/day

**Microalbuminuria**
- Albumin excretion equal to or above 30 and < 300 mg/day (The diagnosis of microalbuminuria requires an elevation of albumin excretion [30-299 mg/day] that persists over 3-6 months)

**Macroalbuminuria**
- Urinary albumin excretion above 300 mg/day

### MANAGEMENT OF ALBUMINURIA

- Reduction of albuminuria may slow the progression of Diabetic Kidney Disease (DKD)/Chronic Kidney Disease (CKD) even in the absence of hypertension.
- Reduction of A1C to levels < 7% does not prevent macrovascular complications of CKD.

| | |
|---|---|
| DM with normal albumin and normal BP | No treatment indicated |
| DM with hypertension and normal albumin | ACE-I or ARB* (d/c if serum Cr increases > 30% over baseline) |
| DM with albuminuria (≥ 30 mg/day) and normal BP | ACE-I or ARB* (d/c if serum Cr increases > 30% over baseline) |

- Treatments to reduce albuminuria should not reduce GFR. ACE-I or ARB should be discontinued when serum creatinine concentration increases > 30% above the baseline value.**

*Angiotension-Converting Enzyme (ACE) inhibitors. Angiotension Receptor Blocker (ARB). Data from: Kidney Disease Outcome Quality Initiative (KDOQI) Clinical Practice Guideline for Diabetes and CKD: 2012 Update

### GLOMERULAR FILTRATION RATE (GFR) ESTIMATION

- Estimate GFR at least annually using creatinine clearance estimated by Cockcroft-Gault Equation (based on serum creatinine, age, and weight), to stage the level of CKD, if present.
- Complications of kidney disease correlate well with level of kidney function (see table on Stages of CKD below).
- Referral to nephrologist is recommended for all CKD stage 3 or higher (see table on Management of CKD in diabetes below).

**STAGES OF CKD[1]**

| Stage | Description | GFR (ml/min/1.73 $m^3$) |
|---|---|---|
| 1 | Kidney damage* with normal or increased GFR | ≥90 |
| 2 | Kidney damage* with mildly decreased GFR | 60-89 |
| 3 | Moderately decreased GFR | 30-59 |
| 4 | Severely decreased GFR | 15-29 |
| 5 | Kidney failure | <15 or dialysis |

*Kidney damage is defined as abnormalities on pathological, urine, blood, or imaging tests.
[1]Adapted from Levey et al. National Kidney Foundation practice guidelines for chronic kidney disease: evaluation, classification, and stratification. Ann Internal Medicine 2003; 139:137-147.

**MANAGEMENT OF CKD IN DIABETES[2]**

| GFR (ml/min/1.73 $m^2$) | Recommended management |
|---|---|
| All diabetic patients | Yearly measurement of creatinine, urinary albumin excretion, potassium |
| 45-60 | Referral to a nephrologist if possibility for nondiabetic kidney disease exists (duration of type 1 diabetes <10 years, persistent albuminuria, abnormal findings on renal ultrasound, resistant hypertension, rapid fall in GFR, or active urinary sediment on urinalysis) |
| 30-44 | Monitor estimated GFR (eGFR) every 3 months<br>Monitor electrolytes, bicarbonate, calcium, phosphorus, parathyroid hormone, hemoglobin, albumin, weight every 3-6 months<br>Consider the need for adjustment of medication doses due to reduction in renal function |
| <30 | Referral to a nephrologist |

[2]National Kidney Foundation. KDOQI Clinical Practice guideline for diabetes and CKD: 2012 update.

## DIABETIC FOOT CARE

| SUGGESTED FOOT EXAM ELEMENTS | |
|---|---|
| **History** | • History of previous foot ulceration or amputation<br>• Neuropathic symptoms: pain, numbness, tingling, prickling, pins and needles sensation<br>• Vascular symptoms: claudication<br>• Impaired vision<br>• Tobacco use<br>• Foot care practices |
| **Inspection** | • Skin: focal lesions: calluses, maceration, ulcers, dry skin, tinea pedis<br>• Nails: onychomycotic or dystrophic nails<br>• Deformities: hammer toe, bunion, pes planus or pes cavus |
| **Vascular Exam** | • Peripheral arterial disease (PAD) suggested by absence of dorsalis pedis and posterior tibial pulses, dependent rubor, and capillary filling time of > 3 seconds<br>• Consider Ankle Brachial Index (ABI) in any patient with signs and symptoms of PAD, especially in diabetics > 50 years |
| **Neurologic Sensory Exam** | Test for loss of protective sensation (LOPS) using:<br>• **10 g monofilament test (see page 9)**<br>• **And at least one of the following:**<br>▸ Vibration using 128 Hz tuning fork tested at tip of great toe bilaterally<br>▸ Pinprick sensation, using a disposable pin applied just proximal to the toenail on dorsal surface of hallux using just enough pressure to deform skin. Inability to perceive pinprick over either hallux is an abnormal test result<br>▸ Ankle reflexes<br>One or more abnormal results suggests LOPS<br>At least two normal tests (and no abnormal) rules out LOPS |
| **HIGH RISK FEET** | |
| | Risk for ulcers or amputations increased in the following diabetic patients with any of the following:<br>• Previous amputation<br>• Past foot ulcer<br>• Peripheral neuropathy<br>• Foot deformity<br>• Peripheral vascular disease<br>**Provide diabetic foot care education at least annually for all patients with High Risk Feet** |

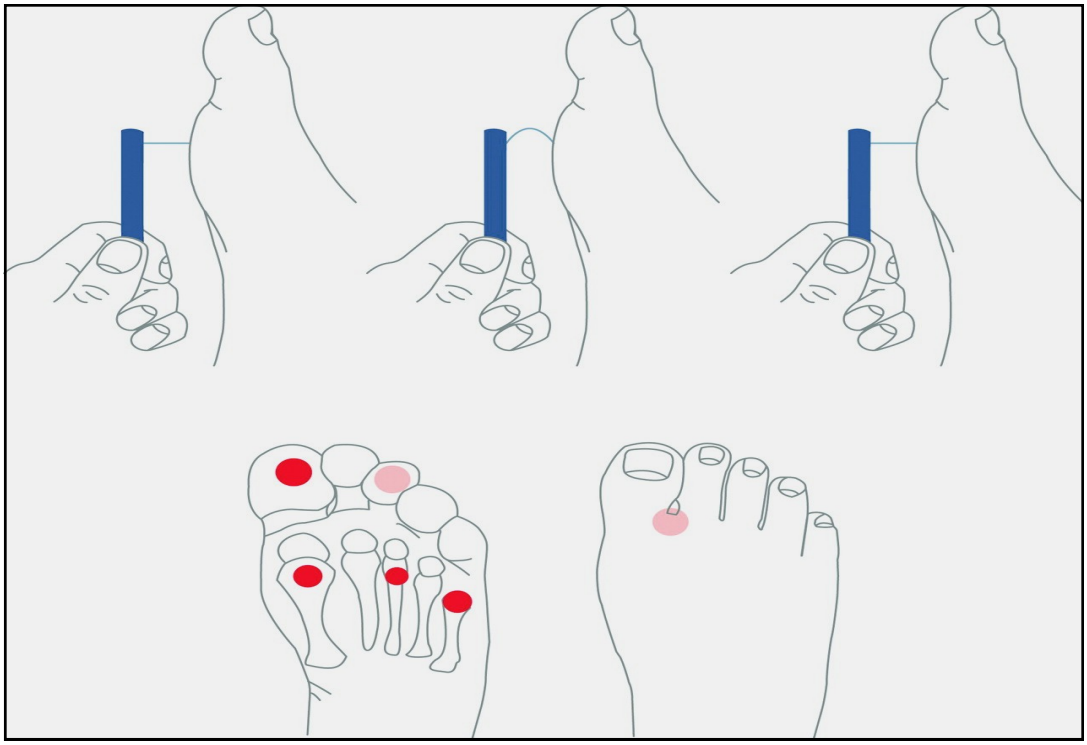
### CONSULTATION, DIABETIC SHOES, AND ORTHOTICS

- Consider consultation and/or authorization of diabetic shoes and/or orthotics for diabetic patients with the following:
  - High risk foot deformity
  - History of pre-ulcerative calluses
  - History of previous ulceration or open ulcers
  - Significant neuropathy/LOPS with evidence of callus formation
  - Poor circulation/PAD
  - Previous amputation of the foot or part of the foot

## DIABETIC FOOT CARE CONTINUED

### MONOFILAMENT TESTING
**(SINGLE USE DISPOSABLE MONOFILAMENTS ARE RECOMMENDED)**

1. Place patient in supine or sitting position with shoe and socks removed.
2. Touch the monofilament wire to patient's skin on his/her arm or hand to demonstrate what the touch feels like.
3. Instruct patient to respond "yes" each time he/she feel the pressure of the monofilament on his/her foot during the exam.
4. Instruct patient to close his/her eyes with toes pointing straight up during the exam.
5. Hold the monofilament perpendicular to the patient's foot (see top panel of diagram below).
6. Press it against the foot, increasing the pressure until the monofilament bends into a C-shape. Do not apply over ulcer, callus, scar, or necrotic tissue. Do not slide monofilament over the skin.
7. Inform the patient you will test each location twice, one touch will be real and one will not. Press the filament to the skin such that it buckles (and hold in place for about 1 second) at one of two times you test each site as you say "time one" or "time two." Have patients identify at which time they were touched.
8. It is recommended to test at least 4 sites on each foot (see lower panel of diagram below: 1st, 3rd, and 5th metatarsal heads and plantar surface of distal hallux, other spots are optional).
9. Randomize the sequence of applying the filament or not throughout the examination.
10. Record response on foot screening form with "+" for yes it was felt and "-" for no. The patient should recognize the perception of pressure and identify the correct site.
11. When the monofilament is not felt, protective sensation is absent, placing the person at high risk for development of a neuropathic ulcer.



Record a "**+**" if the patient can feel the monofilament

Record a "**-**" if the patient is unable to feel the monofilament

## DETECTION AND DIAGNOSIS OF GESTATIONAL DIABETES MELLITUS (GDM)

**ONE-STEP STRATEGY**

- Perform a 75-g OGTT at 24-28 weeks of gestation in women not previously diagnosed with overt diabetes; on the morning after an overnight fast of at least 8 hours, measure plasma glucose fasting and at 1 and 2 hours.
- The diagnosis of GDM is made when any of the following plasma glucose values are met or exceeded:
  - ◊ Fasting: 92 mg/dl
  - ◊ 1 h: 180 mg/dl
  - ◊ 2 h: 153 mg/dl

**TWO-STEP STRATEGY**

Step 1: Perform a 50-g nonfasting Glucose Load Testing (GLT), with plasma glucose measurement at 1 hour, at 24-28 weeks of gestation in women not previously diagnosed with overt diabetes.

- If the plasma glucose level measured 1 hour after the load is ≥140 mg/dl, proceed to a 100-g OGTT.

Step 2: The 100-g OGTT should be performed when the patient is fasting.

- The diagnosis of GDM is made if at least two of the following four plasma glucose levels (measured fasting and 1, 2, and 3 hours after the OGTT) are met or exceeded:

| | Carpenter/Coustan* | or | NDDG** |
|---|---|---|---|
| Fasting | 95 mg/dl | | 105 mg/dl |
| 1 hour | 180 mg/dl | | 190 mg/dl |
| 2 hour | 155 mg/dl | | 165 mg/dl |
| 3 hour | 140 mg/dl | | 145 mg/dl |

NOTE: The threshold for a positive one-step or two-step Glucose Loading Test/Tolerance Test varies depending on the organization/ authors. The most commonly cited ( per Up to Date ) are listed here ( see below ).

§ Criteria from International Association of Diabetes and Pregnancy Study Groups (Up to Date Diabetes Mellitus in Pregnancy: Screening and diagnosis.) Sept 2016.

*Carpenter MW, Coustan DR. Criteria for screening tests for gestational diabetes. Am J Obstet Gynecol 1982;144:768–773.
**NDDG: National Diabetes Data Group. Classification and diagnosis of diabetes mellitus and other categories of glucose intolerance. Diabetes 1979;28:1039–1057.

## PREGNANCY AND DIABETES

According to the American Diabetes Association, pregnancy in a woman with diabetes is by definition a high-risk pregnancy. These patients should be followed as high-risk pregnancies with appropriate obstetrical and medical management.

This Care Guide does not address the specific needs of pregnant patients with diabetes.

Glycemic standards are more stringent, the details of dietary management are more complex, insulin is the only antidiabetic agent approved for use in pregnancy, and a number of medications used in the management of diabetes comorbidities (e.g., ACE inhibitors) are teratogenic and must be discontinued in pregnancy.

## MANAGEMENT OF HYPOGLYCEMIA IN CCHCS

### IDENTIFICATION

- Hypoglycemia- blood glucose < 70 mg/dl.
  - Symptoms may include diaphoresis, agitation, nausea, confusion, altered mental status.
- Severe hypoglycemia- hypoglycemia requiring assistance of a third party.
  - High incidence of morbidity and mortality.
  - Mental status changes may include: confusion, incoherence, combativeness, somnolence, lethargy, seizures, or coma, can be confused with intoxication or withdrawal.
  - Associated with a higher risk of dementia. Conversely, cognitive decline is associated with development of severe hypoglycemia. Elderly and institutionalized patients are particularly vulnerable.
- Diabetics exhibiting signs and symptoms of hypoglycemia, particularly altered mental status, agitation, and diaphoresis, should have fingerstick (FS) glucose checked immediately. Every attempt should be made to document FS glucose before treatment.

### PREVENTION

- Patients receiving insulin or oral antihyperglycemic agents may develop hypoglycemia during illness, with greatly increased activity (exercise) level, or decreased food intake. Profound hypoglycemia may develop when meals are delayed or missed.
- Patients must be counseled:
  - regarding the importance of a consistent diet and activity level
  - to report for insulin injection prior to eating (fasting) to ensure meaningful FS glucose results
  - to report for meals promptly after receiving insulin injections
  - to discuss with his/her provider possible insulin or oral hypoglycemic dosage adjustments during illness
- Custody staff shall ensure that patients receiving insulin have access to their next scheduled meal within 30 minutes of insulin injections.

### TREATMENT

Hypoglycemia:

- Patients who are prone to hypoglycemia should have access to glucose tablets, glucose gel, or a diabetic snack.
- Hypoglycemia can generally be treated by the patient with oral carbohydrates.
- Staff members should also have ready access to glucose tablets or equivalent.
- In general, 15 - 20 g oral glucose is adequate to treat hypoglycemic event. (Glucose is preferred, but any form of carbohydrate that contains glucose can be used).
- FS measurements and treatment should be repeated at 15 minute intervals until blood glucose levels return to normal (> 80 mg/dl). Patient should then consume a snack or meal to prevent recurrent hypoglycemia.

Severe hypoglycemia:

- **Any episode of severe hypoglycemia or recurrent episodes of mild to moderate hypoglycemia require reevaluation of the diabetes management plan by the medical staff.**
- Glucagon is indicated when the patient cannot be treated with oral carbohydrate due to confusion or unconsciousness. (1 mg given IM, IV, or SubQ. Repeat in 15 minutes as needed. Administer IV dextrose as soon as it is available; IV dextrose must be given if the patient fails to respond to glucagon).
- Prolonged monitoring may be required for patients on long-acting insulin or insulin secretagogues.
- Staff should have glucagon for intramuscular injection or glucose for intravenous infusion available to treat severe hypoglycemia.
- In certain cases of unexplained or recurrent severe hypoglycemia, or for patients on long-acting oral hypoglycemic agents or insulin who have poor oral intake, admission to a medical unit for observation and stabilization may be indicated.

## ORAL HYPOGLYCEMIC MEDICATIONS

NOTE: Insulin generally recommended after failure to respond to trial of metformin with or without sulfonylurea. Consider consultation if a trial of a third oral agent is contemplated.

| DRUG CLASS / MEDICATION | DOSING | ADVERSE EFFECTS / INTERACTIONS* | COMMENTS |
|---|---|---|---|
| *BIGUANIDES*<br><br>**metformin (Glucophage®)**<br><br>**Tablet (IR): 500 mg, 850 mg, 1000 mg tabs**<br><br>$ | Initial dose: 500 mg twice daily or 850 mg once daily with meals<br>Titration: After 5-7 days if no GI side effects, increase dose by 500 mg weekly or 850 mg twice daily every other week. (Titrate dose slowly to minimize GI effects). Clinically significant responses rare below 1500 mg/day<br>Max dose: Max effective dose may be 1000 mg twice daily, often max effect seen at 850 mg twice daily. Modestly greater efficacy seen with doses up to 2500 mg/day<br>Max dose: 2550 mg/day (Doses >2000 mg/day better tolerated if given three times daily with meals)<br>Hepatic impairment: Avoid<br>Renal impairment: Avoid Cr ≥ 1.4 mg/dl (females) or ≥ 1.5 mg/dl (males) | • **Black Box Warning:** Lactic acidosis, rare but potentially serious. Risk increases with degree of renal impairment, CHF or impaired liver function. Discontinue during acute illness or during hunger strikes where dehydration may occur<br>• Adverse events: Nausea, diarrhea, cramping, flatulence<br>• May cause vitamin B12 deficiency with anemia and neuropathy which may be confused with diabetic neuropathy<br>• Modest weight loss may occur<br>• Drug interactions: Iodinated contrast agents | • Expected A1C reduction: 1 - 1.5%<br>• Contraindications: Renal insufficiency (Cr is ≥ 1.4 mg/dl in women or ≥ 1.5 mg/dl in men); acute or chronic metabolic acidosis<br>• Do not initiate in patients age ≥ 80 unless normal renal function has been confirmed<br>• Temporarily discontinue metformin prior to or at time of IV iodinated contrast administration and withhold for 48 hours thereafter. Restart upon confirmation of normal renal function<br>• Suspend therapy for surgical procedures and resume with confirmation of normal renal function<br>• Pregnancy: Category B<br>• Lactation: Enters breast milk, not recommended |
| *SULFONYLUREAS*<br><br>**glipizide (Glucotrol®)**<br><br>**Tablet (IR): 5 mg, 10 mg**<br><br>$ | Initial dose: 5 mg once daily; 2.5 mg once daily in elderly<br>Titration: Increase dose by 2.5 mg or 5 mg every 1-2 weeks<br>Max dose: 40 mg/day (Doses >15 mg/day should be divided into 2 doses)<br>Hepatic impairment: Initial dose 2.5 mg/day | • Adverse events: Hypoglycemia, weight gain, dizziness, nausea, asthenia<br>• Increased risk of hypoglycemia when sulfonylurea used with nonbasal insulin | • Expected A1C reduction: 1 - 1.5%<br>• Glyburide is no longer recommended due to hypoglycemic risk<br>• Best given before a meal, preferably breakfast (if once daily dosing)<br>• Possible cross reaction in those allergic to sulfonamides<br>• Pregnancy: Category C<br>• Lactation: Unknown effect, not recommended |
| *THIAZOLIDINE-DIONES (TZDS)*<br><br>pioglitazone (Actos®)<br><br>Tablet: 15 mg, 30 mg, 45 mg<br><br>$ | Initial dose: 15-30 mg once daily<br>Titration: Increase dose by 15 mg increments<br>Max dose: 45 mg/day<br>Concomitant CYP2C8 inhibitors (e.g., gemfibrozil) or CHF (NYHA class I or II): Max 15 mg/day<br>Hepatic impairment:<br>Moderate or severe: Avoid | • **Black Box Warning:** May cause or exacerbate heart failure. Closely monitor for signs and symptoms of heart failure, especially after initiation or dose increase. If heart failure occurs treat accordingly and consider dose reduction or discontinuation of pioglitazone<br>• Adverse effects: Weight gain, edema, CHF, possible hepatic injury; possible increased risk bladder cancer<br>• Drug interactions: Strong CYP2C8 inhibitors (e.g., gemfibrozil); CYP2C8 inducers (e.g., rifampin) | • Expected A1C reduction: 1 - 1.5%<br>• Contraindications: Symptomatic CHF; CHF NYHA Class III or IV<br>• Caution: Combination use with insulin and CHF NYHA Class I and II<br>• Monitor LFTs, avoid if ALT > 2.5 times normal before starting therapy, discontinue if ALT > 3 times normal during therapy<br>• If used with insulin, reduce insulin dose by 10-25% once FBG <120 mg/dl<br>• Reduce dose of sulfonylurea when used with TZDs to minimize hypoglycemia risk<br>• Pregnancy: Category C<br>• Lactation: Unknown effect, not recommended |
| *DIPEPTIDYL PEPTIDASE-4 (DPP-4) INHIBITORS*<br><br>sitagliptin (Januvia®)<br>Tablets: 25 mg, 50mg, 100 mg<br>$$$$$ | Initial and maintenance dose: 100 mg once daily<br>Max dose: 100 mg/day<br>Renal impairment:<br>CrCl 30-49 ml/min: 50 mg daily<br>CrCl <30 ml/min: 25 mg daily | • Adverse effects: Nasopharyngitis, diarrhea, nausea, abdominal pain<br>• Rare severe hypersensitivity reactions including anaphylaxis, angioedema, exfoliative dermatitis, especially within first three months of therapy<br>• Acute pancreatitis<br>• Severe and disabling arthralgias | • Expected A1C reduction: 0.5 - 1%<br>• Assess renal function prior to initiation and periodically thereafter<br>• Reduce dose of sulfonylurea or insulin when used with sitagliptin to minimize hypoglycemia risk<br>• Pregnancy: Category B<br>• Lactation: Unknown effect, use caution |

The cost scale $-$$$$$ represents the relative cost of acquisition of medication only. Frequency and complexity of medication administration (institution workload, effect on adherence) should be considered when determining overall cost-effectiveness of treatment.

**Bold = Formulary**

*See prescribing information for complete description of adverse effects and drug interactions.

## ORAL HYPOGLYCEMIC MEDICATIONS CONTINUED

NOTE: Insulin generally recommended after failure to respond to trial of metformin with or without sulfonylurea. Consider consultation if a trial of a third oral agent is contemplated.

| MEDICATION | DOSING | ADVERSE EFFECTS / INTERACTIONS* | COMMENTS |
|---|---|---|---|
| *SODIUM-GLUCOSE CO-TRANSPORTER 2 (SGLT2) INHIBITORS*<br><br>canagliflozin (Invokana®)<br><br>Tablet: 100 mg, 300 mg<br><br>$$$$$ | Initial dose: 100 mg once daily before the first meal of the day<br>Titration: May be increased to 300 mg once daily<br>Max dose: 300 mg/day<br>Hepatic impairment:<br>Severe: Not recommended<br>Renal impairment:<br>CrCl 45-59 ml/min: max 100 mg/day<br>Avoid with CrCl <45 ml/min | • Adverse effects: Genital mycotic infections, UTIs, increased urination, hypotension, hyperkalemia, impairment in renal function, dose-related increases in LDL<br>• Hypersensitivity reactions (e.g., urticaria) have been reported; usually occur within hours to days after initiation<br>• Drug interactions: Levels may be reduced by rifampin, phenytoin, phenobarbital, ritonavir, digoxin | • Expected A1C reduction: 0.5 - 1%<br>• Contraindications: Severe renal impairment (CrCl <30 ml/min), end stage renal failure, dialysis<br>• Assess renal function prior to initiation of canagliflozin and periodically thereafter<br>• Volume depletion must be corrected prior to initiation of canagliflozin<br>• Reduce dose of sulfonylurea or insulin when used with canagliflozin to minimize hypoglycemia risk<br>• Pregnancy Category C<br>• Lactation: Unknown effect, not recommended |
| *α-GLUCOSIDASE INHIBITORS*<br><br>acarbose (Precose®)<br><br>Tablets: 25 mg, 50mg, 100 mg<br><br>$$ | Initial dose: 25 mg three times daily with first bite of each main meal<br>Titration: Increase by 25 mg/meal every 4-8 weeks<br>Max dose:<br>≤ 60 kg: 50 mg three times daily<br>> 60 kg: 100 mg three times daily<br>Hepatic impairment:<br>Contraindicated in cirrhosis<br>Renal impairment:<br>Avoid with CrCl < 25 ml/min | • Adverse effects: Flatulence, abdominal pain, diarrhea. All tend to abate with time<br>• May cause significant transaminase elevations | • Expected A1C reduction: 0.5 - 1%<br>• Contraindications: Cirrhosis, inflammatory bowel disease, colonic ulceration, partial intestinal obstruction, patients predisposed to intestinal obstruction, GI disease involving disorders of absorption or digestion<br>• Titrate doses slowly to avoid GI effects<br>• Pregnancy: Category B<br>• Lactation: Unknown effect, not recommended |

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## ORAL HYPOGLYCEMIC MEDICATION RECOMMENDATIONS WHEN STARTING INSULIN

- **Continue** metformin (biguanide) to help prevent weight gain in patients on insulin or insulin secretagogues (e.g., sulfonylureas).
- **Stop** sulfonylureas when patient is on basal and prandial insulin simultaneously.
- **Continue** glipizide (sulfonylurea) when using basal insulin only, discontinue sulfonylurea when using nonbasal insulin.
- **Caution** with pioglitazone (TZD) – increased risk of CHF and dose-related fluid retention from TZD in patients on insulin.

## INJECTABLE HYPOGLYCEMIC MEDICATIONS - INSULINS

| INSULIN CLASS *Please see treatment algorithm on page 4* | SPECIFIC INSULIN | ONSET | PEAK | DURATION | COST |
|---|---|---|---|---|---|
| Short-acting | **regular—Humulin R®** | 30-60 minutes | 2 to 4 hours | 8 to 10 hours | $$ |
| Every effort should be made to administer rapid acting insulin before meals. However in rare circumstances when patient movement may be disrupted and risk of hypoglycemia is high, rapid acting insulin may be administered shortly after meals. | | | | | |
| Intermediate-acting | **NPH—Humulin N®** | 1 to 2 hours | 4 to 8 hours | 10 to 20 hours | $$ |
| Premixed | **NPH/regular—Humulin 70/30®** | 30 minutes | Dual peak | Up to 24 hours | $$ |
| Long-acting (basal) | **glargine—Lantus®** (Not to be mixed with other insulins) | 1 to 2 hours | Relatively flat | 20 to 24 hours | $$$$ |

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**Bold = Formulary**

## SWITCHING BETWEEN NPH AND INSULIN GLARGINE

**NPH to insulin glargine**

- NPH once daily: Convert unit-for-unit (1:1) and give once daily.
- NPH twice daily: Glargine dose should be 80% of total NPH dose and given once daily.

**Insulin glargine to NPH**

- Convert unit-for-unit from glargine.
- Give NPH twice daily (e.g., 50:50 or 2/3 AM and 1/3 PM).

## ROLE OF SLIDING SCALE INSULIN

- Sliding scale insulin alone is not appropriate to treat sustained hyperglycemia (>140 mg/dl).
- Scheduled basal insulin is designed to prevent hyperglycemia, whereas sliding scale insulin is useful only to reduce blood sugar after hyperglycemia has occurred.
- Sliding scale insulin dosing has limited indications outside of an inpatient setting.
- Temporary sliding scale insulin may be indicated:
  - When patient-inmate is ill or NPO for any reason.
  - During insulin dose adjustments.

### CCHCS STANDARD SLIDING SCALE INSULIN DOSE PROTOCOLS

| If glucose level is (mg/dl) | LOW dose regimen | MEDIUM dose regimen | HIGH dose regimen |
|---|---|---|---|
| Serum FBS <70 | Hypoglycemia treatment call MD | Hypoglycemia treatment call MD | Hypoglycemia treatment call MD |
| 150-200 | 2 units | 4 units | 6 units |
| 201-250 | 4 units | 6 units | 8 units |
| 251-300 | 6 units | 8 units | 10 units |
| 301-350 | 8 units | 10 units | 12 units |
| 351-400 | 10 units | 12 units | 14 units |
| >400 | 12 units and notify provider | 14 units and notify provider | 16 units and notify provider |

## INJECTABLE HYPOGLYCEMIC MEDICATIONS - NONINSULINS

| MEDICATION | DOSING | ADVERSE EFFECTS / INTERACTIONS* | COMMENTS |
|---|---|---|---|
| *AMYLIN ANALOGUES*<br><br>pramlintide (SymlinPen®)<br><br>Injection: 1000 mcg/ml<br><br>$$$$$ | Initial dose:<br>Type I DM: 15 mcg subQ immediately before each major meal<br>Type II DM: 60 mcg subQ immediately before each major meal<br>Titration:<br>Type I DM: Increase 15 mcg increments after minimum of 3 days with no significant nausea<br>Type II DM: Increase to 120 mcg after 3-7 days with no significant nausea<br>Max dose:<br>Type I DM: 60 mcg/dose<br>Type II DM: 120 mcg/dose | • **Black Box Warning:** Coadministration with insulin may induce severe hypoglycemia, usually within three hours<br>• Adverse effects: Nausea, vomiting, anorexia, headache<br>• Causes weight loss | • Expected A1C reduction: 0.5 - 1%<br>• Contraindications: Confirmed gastroparesis, hypoglycemia unawareness<br>• Administer subQ to abdomen or thigh<br>• Avoid use in poorly adherent patients<br>• Do not use if A1C > 9%<br>• Do not mix with insulin- administer separately<br>• Pregnancy: Category C<br>• Lactation: Unknown effect, use caution |
| *GLUCAGON-LIKE PEPTIDE-1 (GLP-1) AGONIST*<br><br>exenatide<br><br>(Byetta®)<br>Injection (IR): 5 mcg, 10 mcg<br><br>(Bydureon®)<br>Injection (ER): 2 mg<br><br>$$$$$ | Initial dose<br>IR: 5 mcg subQ twice daily within 60 minutes prior to morning and evening meal (≥ 6 hours apart)<br>ER: 2 mg subQ once weekly<br>Titration (IR): May increase to 10 mcg subQ twice daily after 1 month<br>Max dose:<br>IR: 20 mcg/day<br>ER: 2mg/wk<br>Renal impairment:<br>CrCl <30 ml/min: Not recommended | • **Black Box Warning (exenatide ER):** Dose and duration dependent thyroid C cell tumors have developed in animal studies. Human relevance unknown<br>• Adverse effects: Nausea, diarrhea, vomiting, dyspepsia, dizziness. (Nausea usually decreases over time)<br>• Cases of acute pancreatitis reported<br>• Drug interactions: Warfarin, digoxin, oral contraceptives<br>• May impact absorption of orally administered medications | • Expected A1C reduction: 1 - 1.5%<br>• Contraindications (exenatide ER): Patients with personal or family history of medullary thyroid carcinoma or Multiple Endocrine Neoplasia syndrome type 2<br>• Caution: Renal impairment, history of pancreatitis, severe GI disease (e.g., gastroparesis)<br>• Administered subQ to thigh, abdomen, or upper arm<br>• Exenatide IR not recommended with prandial insulin<br>• Exenatide ER not recommended with any insulin<br>• Pregnancy: Category C<br>• Lactation: Unknown effect, use caution |

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**Bold = Formulary**

*See prescribing information for complete description of adverse effects and drug interactions.

# PATIENT EDUCATION/SELF MANAGEMENT

# DIABETES: WHAT YOU SHOULD KNOW

## WHAT IS DIABETES?

**Diabetes is a disease that causes high amounts of glucose (sugar) in the blood.**
**It is caused by the body not making enough insulin or not being able to use the insulin it has.**

**Diabetes can lead to serious health problems including:**

- High blood pressure
- Eye/vision problems
- Kidney disease
- Digestive problems
- Amputation of toes or feet
- Heart attacks
- Strokes
- Nerve damage throughout your body
- Skin problems

## SYMPTOMS TO WATCH FOR IF YOU HAVE DIABETES

**High blood sugar (hyperglycemia) symptoms**

- Thirst
- Frequent urination
- Blurred vision

**What are the causes of high blood sugar?**

- Too much food
- Too little diabetes medicine
- Illness
- Stress

**Low blood sugar (hypoglycemia) symptoms**

- Shakiness
- Nausea
- Drowsiness
- Hunger
- Headache
- Confusion


**What are the causes of low blood sugar?**

- Too little food
- Extra exercise
- Too much diabetes medicine or insulin

## What to do if you have symptoms of high blood sugar

- Be sure to drink plenty of water
- Contact your health care team

## What to do if you have symptoms of low blood sugar

- Eat or drink something with sugar in it
- Contact your health care team if you don't feel better in 15 minutes

# PATIENT EDUCATION/SELF MANAGEMENT

# DIABETES: WHAT YOU SHOULD DO

## KNOW THE ABCS OF DIABETES:


**A**

### A1C

- The A1C is a blood test that measures your blood sugar level over the past three months.
- It is different from the blood sugar checks you do from your finger.
- A1C is usually less than 6.5% in people without diabetes. In people with diabetes the goal is an A1C less than 7-8% (your health care team will tell you what your personal A1C goal should be as the goal is different for different people).

**B**

### Blood pressure

- Blood pressure is the force of your blood against the walls of your blood vessels.
- If your blood pressure gets too high, it makes your heart work too hard.
- High blood pressure can cause a heart attack, kidney disease, or a stroke.
- Your blood pressure should be below 140/80 unless your health care provider tells you a different goal.
- Blood pressure control is important in diabetes. Be sure to have your blood pressure checked at every health care visit.

**C**

### Cholesterol (ko-LESS-tuh-ruhl)

- Cholesterol is a chemical in your blood. LDL is the "bad" cholesterol that can build up and clog your blood vessels, which can cause a heart attack or stroke.
- Most people with diabetes are prescribed medication called "statins" to lower their "bad" cholesterol.
- Your health care provider will check your blood LDL-cholesterol level, often once a year, but sometimes less often if you are taking statin medication.

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## WHAT ELSE SHOULD YOU DO IF YOU HAVE DIABETES?

- Do not smoke.
- Take your medications as directed.
- Control your weight. The best way to maintain a good weight is to eat a healthy diet and exercise more.
  - ► Be active at least 30 minutes on most days. You can walk, jog, or do exercises in your cell, even during lockdowns.
  - ► Eat a healthy diet: limit breads and pastas, canteen-junk foods, candy, and ice cream.
- Try to lower stress levels.
- Check your feet every day for cuts, blisters, red spots, and swelling.
- Report any changes in your vision to your health care provider.
- Be sure to get regular check-ups.
- Talk to health care staff about when you should get lab tests including A1C, and when you should get foot, eye, dental, and EKG exams to monitor your condition.

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## BENEFITS OF EXERCISE IF YOU HAVE DIABETES

- Weight loss and maintenance of normal weight.
- A stronger, healthier heart.
- Improved sleep.
- Improved mood.
- Improved blood pressure, cholesterol, and blood glucose levels.
- May help lower the amount of medication needed to control your blood sugar.

# PATIENT EDUCATION/SELF MANAGEMENT

# DIABETES: FOOT CARE

## WHY IS FOOT CARE IMPORTANT?

Diabetes can cause you to lose feeling in your feet (feet are numb).

When you have numbness or can't feel your feet, they can get injured, often without you knowing it, from:

- something that breaks your skin (such as a cut)
- a deep wound (such as stepping on something sharp)
- walking barefoot on a hot surface
- constant pressure in one spot (from a tight shoe)

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## HOW DO I KEEP MY FEET HEALTHY?


- Check your feet every day.
  - Look for red spots, sores, infected toenails, swelling, cuts, and blisters.
- Wear shoes and socks at all times.
- Wear comfortable shoes that protect your feet and fit well.
- Protect your feet from hot and cold.
- Keep blood flowing to your feet.
  - Put your feet up when sitting.
  - Move your ankles and wiggle your toes throughout the day.
  - Do not cross your legs for long periods of time.


- Wash your feet every day.
  - Dry your feet carefully, especially between the toes.
- Keep the skin of your feet soft and smooth.
  - If you have lotion you can use a thin coat over the tops and bottoms of your feet, but not between your toes.
- Carefully trim your toenails regularly. Ask your health care team for assistance if needed.

- Take care of your diabetes.
  - Work with your health care provider to keep your blood sugar levels in your target range.
- Don't smoke.
- Be more active.

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## HOW DO I TREAT FOOT PROBLEMS?

- Talk to your health care provider if you have any foot problems.

# EDUCACIÓN PARA EL PACIENTE/CONTROL PERSONAL DEL CASO

# DIABETES: LO QUE DEBE SABER

## ¿QUÉ ES LA DIABETES?

**La diabetes es una enfermedad que genera altas cantidades de glucosa (azúcar) en la sangre. Es causada cuando el organismo no produce suficiente insulina o no es capaz de usar la que tiene.**

**La diabetes puede llevar a problemas severos de salud como:**

- Presión arterial alta
- Problemas en ojos/visión
- Enfermedades renales
- Problemas digestivos
- Amputación del pie o de sus dedos
- Ataques cardíacos
- Derrames cerebrales
- Daños a los nervios en todo el cuerpo
- Problemas de la piel

## SÍNTOMAS QUE DEBE CONTROLAR SI TIENE DIABETES

**Síntomas de altos niveles de azúcar en la sangre (hiperglicemia)**

- Sed
- Micción frecuente
- Visión borrosa

**¿Cuáles son las causas de los altos niveles de azúcar en la sangre?**

- Demasiada comida
- Poco medicamento para la diabetes
- Enfermedad
- Estrés

**Síntomas de bajos niveles de azúcar en la sangre (hipoglicemia)**

- Temblores
- Náuseas
- Somnolencia
- Hambre
- Dolor de cabeza
- Confusión


**¿Cuáles son las causas de los altos niveles de azúcar en la sangre ?**

- Muy poca comida
- Ejercicio extra
- Demasiado medicamento para la diabetes o insulina

### Lo que debe hacer cuando hay síntomas de altos niveles de azúcar en la sangre

- Asegúrese de tomar mucha agua
- Comuníquese con su elenco tratante

### Lo que debe hacer cuando hay síntomas de bajos niveles de azúcar en la sangre

- Coma o beba algo que contenga azúcar
- Comuníquese con su elenco tratante si no se siente mejor en los siguientes 15 minutos

# EDUCACIÓN PARA EL PACIENTE/CONTROL PERSONAL DEL CASO

# DIABETES: LO QUE DEBE HACER

## CONOZCA LOS PUNTOS IMPORTANTES DE LA DIABETES:

**1**

### A1C


- La A1C es una prueba sanguínea que mide su nivel de azúcar en la sangre en los tres meses anteriores.
- Es diferente de las pruebas de azúcar en la sangre de su dedo.
- La A1C es, normalmente, inferior a 6.5% en las personas sin diabetes. En las personas con diabetes, la meta es un A1C inferior al 7-8% (su elenco tratante le dirá cual debería ser su meta A1C personal, ya que esta meta es diferente para cada persona).

**2**

### Presión arterial

- La presión arterial es la fuerza de su sangre contra las paredes de sus vasos sanguíneos.
- Si su presión arterial se eleva mucho, hace trabajar demasiado a su corazón.
- La presión arterial alta puede causar un ataque cardíaco, enfermedad renal o un derrame cerebral.
- Su presión arterial debería ser menor de 140/80 a menos que su médico le indique otra meta a alcanzar.
- El control de la presión arterial es importante en la diabetes. Asegúrese de hacerse revisar su presión arterial en cada consulta médica.

**3**

### Colesterol

- El colesterol es una sustancia química en su sangre. LDL es el colesterol "malo" que puede acumularse y obstruir sus vasos sanguíneos, lo que puede causar un ataque cardíaco o un derrame cerebral.
- A la mayoría de las personas con diabetes se les prescribe medicamentos llamados "estatinas" para reducir su colesterol "malo."
- Su médico controlará su nivel de colesterol LDL en la sangre, frecuentemente una vez al año, pero a veces con menos frecuencia si está tomando estatinas.

## ¿QUÉ MÁS DEBERÍA HACER SI TIENE DIABETES?

- No fume.
- Tome sus medicamentos tal como le sean prescritos.
- Controle su peso. La mejor manera de mantener un buen peso es llevar una dieta sana y ejercitarse más.
  - ► Haga alguna actividad al menos 30 minutos la mayoría de los días. Puede caminar, trotar o hacer ejercicio en su celda, aún durante un encierro institucional.
  - ► Lleve una dieta sana: limite los panes y pastas, las comidas chatarra compradas en la cantina, golosinas y helados.

- Intente reducir sus niveles de estrés.
- Revise sus pies diariamente; busque cortadas, ampollas, puntos rojos e inflamación.
- Informe a su médico cualquier cambio en su visión.
- Asegúrese de tener chequeos médicos regulares.
- Hable con el personal médico para saber cuándo debe hacerse pruebas de laboratorio, incluyendo la A1C, y cuándo debe recibir exámenes de los pies, los ojos, los dientes, y un electrocardiograma para controlar su condición.

## BENEFICIOS DEL EJERCICIO SI TIENE DIABETES

- Pérdida de peso y mantenimiento de un peso normal.
- Un corazón más fuerte y sano.
- Un sueño mejorado.
- Un estado de ánimo mejorado.
- Una presión arterial mejorada, además de niveles de colesterol y glucosa en la sangre mejorados.
- Podría ayudar a reducir la cantidad de medicamentos necesarios para controlar el azúcar en la sangre.

# EDUCACIÓN PARA EL PACIENTE/CONTROL PERSONAL DEL CASO

# DIABETES: CUIDADO DE LOS PIES

## ¿POR QUÉ ES IMPORTANTE EL CUIDADO DE LOS PIES?

La diabetes puede hacer que pierda sensación en sus pies (los pies se entumecen).

Cuando tiene entumecimiento o no puede sentir sus pies, estos se pueden herir y frecuentemente sin que usted se dé cuenta, por:

- algo que le rompa la piel (como una cortada)
- una herida profunda (como cuando pisa algo puntiagudo)
- caminar descalzo sobre una superficie caliente
- presión constante en algún punto determinado (por un calzado apretado)

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## ¿CÓMO MANTENGO MIS PIES SANOS?


- Revise sus pies diariamente.
  - Busque puntos rojos, llagas, uñas infectadas, inflamación, cortadas y ampollas.
- Siempre use zapatos y calcetines.
- Use zapatos cómodos que protejan sus pies y calcen bien.
- Proteja sus pies del calor y del frío.
- Mantenga la sangre circulando a sus pies.
  - Levante los pies mientras esté sentado.
  - Mueva sus tobillos y los dedos de los pies durante el curso del día.
  - No mantenga sus piernas cruzadas durante largos periodos de tiempo.
- Lave sus pies todos los días.
  - Seque sus pies con cuidado, especialmente entre los dedos.
- Mantenga la piel de sus pies suave y terso.
  - Si tiene loción puede usar una capa delgada sobre las partes superiores e inferiores de sus pies, pero no entre los dedos.

- Con cuidado, córtese las uñas de los dedos de los pies regularmente. Pida ayuda a su elenco tratante de ser necesario.
- Atienda su diabetes.
  - Trabaje con su médico para mantener sus niveles de azúcar en la sangre dentro del rango establecido como meta.

- No fume.
- Realice más actividades.

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## ¿CÓMO TRATO LOS PROBLEMAS DE LOS PIES?

- Hable con su médico si tiene algún problema con los pies.