Type 2 Diabetes Care Guide

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CALIFORNIA CORRECTIONAL HEALTH CARE SERVICES

Information contained in the Care Guide is not a substitute for a health care professional's clinical judgment. Evaluation and treatment should be tailored to the individual patient and the clinical circumstances. Furthermore, using this information will not guarantee a specific outcome for each patient. Refer to "Disclaimer Regarding Care Guides" for further clarification.

https://cchcs.ca.gov/clinical-resources/

Summary

GOALS

A1C: Target goal of less than7% if it can be achieved without significant hypoglycemia (6 to 7% recommended for patients with a life expectancy greater than 10 to15 years and no to mild microvascular complications) Target range of 7.0% to 8.5% is appropriate (if can be safely achieved) for most persons with micro or macrovascular complications, comorbid conditions, or life expectancy of 5 to10 years GLP-1 or SGLT-2 is indicated in ASCVD or high risk, independent of A1C and other medical treatment.

Blood pressure:
BP targets should be individualized through a shared decision making process that addresses Cardiovascular risk, potential adverse medication effects, and patient preferences
Target BP of less than130 over 80 mmHg while on treatment if it can be safely attained

Lipid management: **Primary Prevention**

1. **Moderate-intensity** statin therapy if age 40 to 75 years without ASCVD
2. **High intensity** statin therapy if age 40 to 75 years at higher risk, including those with multiple ASCVD risk factors, to reduce LDL by less than 50% of baseline and to target an LDL of less than 70mg/dL

ALERTS

1. Review and investigate hypoglycemia events at every encounter
2. Glucose 15 to 20 g is preferred treatment for hypoglycemia (blood glucose less than 70 mg/dL) for the conscious individuals.

Symptomatic patients with new diagnosis of T2D, blood glucose of greater than 300 mg/dL, A1C greater than 10% treatment with Insulin and GLP-1 should be considered.

DIAGNOSTIC CRITERIA

Screening: US Preventative Services Task Force recommends screening all adults age 35 to 70 with overweight or obesity (BMI greater than 25 kg/m2 Or greater than 23 kg/m2 in Asian Americans) and in those who have one or more of the following risk factors including: First-degree relative with DM, High-risk race or ethnicity (e.g., African American, Latino, Native American, Asian American, Pacific Islander), history of CVD or HTN and others.

INITIAL EVALUATION

History	• Complete clinical history including Cardiovascular Risk (CV) factors and 10 year CV risk calculation • End organ sequelae: Retinopathy, nephropathy, neuropathy, ASCVD, Peripheral Vascular Disease (PVD), Coronary artery disease (CAD), Cerebrovascular Disease/Accident (CVA)	• Cerebrovascular Disease/Accident (CVA)Table Bullet • Symptoms of hypoglycemia • Patient self-management capacity • Medications • Patient concerns/compliance with medications
Physical Exam	• Vitals: BP and Body Mass Index (BMI) kg/m2 • Fundoscopic examination (Refer to Optometrist) • Cardiovascular exam, Peripheral pulses (PVD)	• Thyroid palpation • Skin examination/acanthosis nigricans, insulin injection/lipodystrophy • Comprehensive Foot Exam annually

INITIAL EVALUATION

Diagnostics	• Baseline A1C • Lipid panel • Urine Albumin to Creatinine Ratio (UACR)	• Serum creatinine (Cr) and estimated glomerular filtration rate eGFR; • TSH; Liver function tests; Vitamin B12 if on Metformin for more than 1 year • Serum potassium levels in patients on ACE inhibitors, ARBs, or diuretics.

TREATMENT OPTIONS

Lifestyle intervention consists of weight loss when indicated, a Dietary Approaches to Stop **Hypertension (DASH)**-style (medical nutrition therapy) eating pattern, and increased physical activity
Medications: New American Diabetes Association guidelines (2023) anchor on assessment of ASCVD risk

- Use of insulin is de-emphasized. If insulin is used, it should be used with a GLP-1
- Patients with ASCVD conditions (CAD/PVD/CVA, CKD, Heart Failure) or at high risk for ASCVD; use GLP-1 and/or SGLT-2 with known CV effect
- Patients without the above ASCVD factors, glycemic medication choice is based on comorbidities, goals to minimize hypoglycemia and minimize weight gain (promote loss)

MONITORING

- PCP/Care Team visits as clinically appropriate
- Assess glycemic status A1C at least every 180 days in patients who are meeting treatment goals (and who have stable glycemic control)
- Assess glycemic status A1C at least every 90 days and as needed in patients whose therapy has recently changed and/or who are not meeting glycemic goals
- Utilize Dietician and available diabetes education classes for patient education

EVALUATION OF DIABETES AND CLINICAL PRESENTATION

Type 2 diabetes (**T2D**) – T2D is the most common type of diabetes in adults (greater than 90 percent) and is characterized by hyperglycemia due torelative insulin deficiency from progressive loss of insulin secretion from the beta cell with superimposed insulin resistance.

- The majority of patients are asymptomatic at presentation, with hyperglycemia noted on routine laboratory evaluation, prompting further testing. The classic symptoms of hyperglycemia (including polyuria, polydipsia, nocturia, blurred vision, and weight loss) areoften noted only in retrospect after a blood glucose value has been shown to be elevated.
- Rarely adults with T2D can present with a hyperosmolar hyperglycemic state, characterized by marked hyperglycemia, severedehydration, and obtundation, but without ketoacidosis. Diabetic ketoacidosis (DKA) as the presenting symptom of T2D is alsouncommon in adults but may occur under certain circumstances (usually severe infection or other acute illness)

Type 1 diabetes (T1D) – T1D is characterized by autoimmune destruction of the pancreatic beta cells, leading to absolute insulindeficiency. T1D accounts for approximately 5 to 10 percent of diabetes in adults.

- DKA may be the initial presentation in approximately 25 percent of adults with newly diagnosed T1D. Adults with T1D typically have alonger estimated period prior to diagnosis and are likely to have more protracted symptoms of hyperglycemia (polyuria, polydipsia, fatigue) than children

Latent autoimmune diabetes of adults (LADA) – In 2 to 12 percent of adults, the clinical presentation is similar to that of T2D (older-age onset and not initially insulin dependent), with autoimmune-mediated insulin deficiency developing later in the course of disease.

- Patients with LADA are a heterogeneous group of patients with variable titers of antibodies, body mass index (BMI), and frequency ofprogression to insulin dependence. Patients with high titers of GAD65 antibodies usually

have a lower BMI, less endogenous insulin secretion (as measured by stimulated serum C-peptide concentrations), and progress more quickly to insulin dependence. Thus, the presence and titers of anti-GAD antibodies (or ICA) can help to identify patients thought to have T2D, who are likely to respond poorly to oral hypoglycemic drug therapy, require insulin, and to be at increased risk for developing ketoacidosis

SCREENING FOR T2D AND PREDIABETES

Overview: Screening for T2D and earlier intervention improve long-term outcomes. Well-established treatments for T2D/ hyperglycemia reduces the progression of microvascular disease, including retinopathy, nephropathy, and neuropathy. Early interventions to lower lipids with statins and lower blood pressure with angiotensin-converting enzyme inhibitors or angiotensin receptor blockers and use of GLP-1 and SGLT-2 inhibitors can prevent or limit cardiovascular and chronic kidney disease.

Prediabetes —There is often a long pre-symptomatic phase before the diagnosis of T2D. The duration of glycemic burden is a strong predictor of heightened cardiovascular risk. Interventions for prediabetes can prevent or delay the onset of diabetes. Lifestyle interventions aimed at weight loss, increased activity level, treatment with metformin, treatment with GLP-1 and treatment of CVD modifiable risk factors is ended.

CRITERIA FOR TESTING FOR T2D OR PREDIABETES IN ASYMPTOMATIC ADULTS

1. Consider testing all overweight or obese (BMI greater than 25 kg/m2 or greater than 23 kg/m2 in Asian Americans) adults who have greater than 1 of the following risk factors:
   - First-degree relative with diabetes
   - High-risk race/ethnicity (e.g., African American, Latino, Native American, Asian American, Pacific Islander)
   - History of established ASCVD (CAD, CVA and PVD)
   - Hypertension (blood pressure greater than 140/90 mmHg or on therapy for hypertension)
   - HDL cholesterol level less than 35 mg/dL (0.90 mmol/L) and/or a triglyceride level greater than 250 mg/dL
   - History of polycystic ovary syndrome
   - Physical inactivity
   - Other clinical conditions associated with insulin resistance (eg, severe obesity, acanthosis nigerians)
2. Patients with prediabetes (A1C greater than 5.7% [39 mmol/mol], IGT, or IFG) should be tested yearly
3. Patients with a history of Gestational Diabetes Mellitus (GDM) should have lifelong testing at least every 3 years
4. For all other patients, testing should begin at age 35 years
5. If results are normal, testing should be repeated at a minimum of 3-year intervals, with consideration of more frequent testing dependingon initial results and risk status

EVALUATION OF T2D AT INITIAL AND FOLLOW UP VISITS.[ADAPTED FROM 2023, ADA COMPREHENSIVE MEDICAL EVALUATION

INTERVENTION	FREQUENCY	ADDITIONAL NOTES
Diabetes History: Characteristics at onset (e.g., age, symptoms) • Review of previous treatment response • Assess frequency, cause, severity of past hospitalizations, complications, and comorbidities	Initial visit	**Assess patient characteristics:** • Clinical characteristics, (age, A1C, BMI, OSA) • Comorbidities (ASCVD, CKD, HF) • Psychosocial (motivation and history of depression)
Family history	Initial visit	• Family history of diabetes in a first-degree relative

EVALUATION OF T2D AT INITIAL AND FOLLOW UP VISITS.[ADAPTED FROM 2023, ADA COMPREHENSIVE MEDICAL EVALUATION		
INTERVENTION	**FREQUENCY**	**ADDITIONAL NOTES**
		• Family history of autoimmune disorder
Interval History/Monitoring • Patients not meeting goals should be seen every 3 months	Every visit	• Assess comorbidities: obesity, OSA, NAFLD, established ASCVD/or high risk for ASCVD, HF and CKD • Monitor blood pressure and lipids • Review hypoglycemia: awareness/frequency/causes/timing • Check tolerability and side effects to medications • Monitor glycemic status, finger stick glucose (FSG)/A1C
Physical examination	Every visit	• Height, weight, and BMI • Blood pressure • Fundoscopic examination (refer to eye specialist) • Thyroid palpation • Skin examination (e.g., acanthosis nigricans, insulin injection or insertion sites, lipodystrophy) • Foot examination: visual inspection (e.g., skin integrity, callous formation, foot deformity or ulcer, toenails)
Refer patient to Registered dietitian	Initial Diagnosis	• Diabetic education at initial diagnosis and prn if poor control
Smoking cessation counseling	Every visit	• For smokers only
Blood pressure	Every visit	• Targets should be individualized • Target BP on treatment less than 130/80 mmHg if can be safely obtained
Dilated eye examination	Annually	• Begin at onset of T2D • 3 to 5 years after onset of T1D • More frequent if recommended or retinopathy present as indicated • Every 2 to 3 years if there is no evidence of retinopathy
Comprehensive foot examination	Annually	• Every visit if peripheral vascular disease or neuropathy
Dental examination	Annually	• Periodontal disease is more severe and may be more prevalent in patients with diabetes

EVALUATION OF T2D AT INITIAL AND FOLLOW UP VISITS.[ADAPTED FROM 2023, ADA COMPREHENSIVE MEDICAL EVALUATION		
INTERVENTION	**FREQUENCY**	**ADDITIONAL NOTES**
LABORTORY STUDIES		
Lipid profile	Initially, as indicated	• In people less than 40 years without dyslipidemia and not on cholesterol lowering therapy, testing may be infrequent (e.g., every 5 years) • Patients with known ASCVD, monitor as indicated, for goal of LDL less than 70 mg/dL is recommended (as indicated, ADA)
A1C	Annually	• Goal less than 7% (may be lower or higher in selected patients)
Urinary albumin-to-creatinine ratio	Annually	• Begin 3 to 5 years after onset of T1D • At diagnosis in patients with T2D, more frequent as indicated
B12 level	Annually	• Only in patients on Metformin
Serum Creatinine and eGFR	Annually	• Table Text All patients with albuminuria.
Potassium	Annually	• If on ACE inhibitors**/**Angiotension II receptor blockers**/**diuretics

T2D TREATMENT

Overview: Patients with T2D are 2- 4 times more likely to develop cardiovascular (CV) diseases due to increased risk factors, such as hypertension, obesity, and hyperlipidemia. There has been a notable change in the 2023 Standards of Medical Care in Diabetes recommendations on pharmacological therapy for T2D. The American Diabetes Association (ADA) now recommends a patient-centeredapproach following T2D diagnosis.

- Metformin has been the drug of choice for initial treatment of T2D and remains first line therapy
- After initiation of Metformin, the recommendations diverge based on whether the patient has or does not have ASCVD conditions or highASCVD risk (greater than 15% 10 years.)
- For those with established ASCVD,CKD and HF or Indicators for high risk ASCVD: ADA recommends use of newer and more specific medications (glucagon-like peptide-1 receptor agonists (GLP-1) and sodium-glucose co-transporter 2 inhibitors (SGLT-2) inhibitors) which have been shown to limit or decrease ASCVD complications. These medications should be initiated independent of A1C and metformin therapy, particularly for the individuals with existing, or at high risk for heart failure, CKD, and or ASCVD as they offer cardiovascular benefitand lower all-cause mortality

  For patients without ASCVD condition or risk the choice of a second agent (after Metformin) is based on efficacy to achieve and maintain glycemic goals and, avoidance of adverse effects (particularly hypoglycemia and weight gain), as well as cost, and patient preferences

2023, ADA TREATMENT GUIDANCE FOR T2D

- **First line Therapy:** choice depends on comorbidities, patient centered treatment factors**,** including cost and access, and generally includes metformin (unless contraindicated) and comprehensive lifestyle modification.

- **Next steps** should be based on whether or not the patient has established atherosclerotic cardiovascular disease (ASCVD) , heart failure (HF), chronic kidney disease (CKD), ASCVD risk factors or none of these
  - **T2D patients with established ASCVD** or indicators of high ASCVD risk (patients older than 55 years of age with CAD, PVD, carotid stenosis or left ventricular hypertrophy, or 10 year ASCVD risk greater than15%) or CKD should be treated with SGLT-2 inhibitor or GLP-1 with demonstrated CVD benefitand for HF (SGLT-2 inhibitor is recommended)
  - **T2D patients without established ASCVD** (or indicators of high ASCVD risk) the choice of a second agent is based on efficacy to achieve and maintain glycemic goals and, avoidance of adverse effects (particularly hypoglycemia and weight gain), as well as cost, and patient preferences
- **Injectable Therapy :** A GLP-1 is preferred to insulin when possible due to weight gain in most patients who start insulin therapy, and which leads to even more insulin resistance. If insulin is used, combination therapy with a GLP-1 is recommended for greater efficacy and durability of treatment effect. In patients who require a third agent to achieve glycemic goals the greatest reductions in A1C level occurs with insulin regimens and specific GLP-1 added to metformin-based background therapy.
  - **Indications for Injectable Therapy:** Treatment with GLP-1 with or without insulin is indicated if A1C is greater than 10%, blood glucose and greater than 300 mg/dL with or without hyperglycemia symptoms (polyuria, polydipsia and weight loss).**Overbasalization:** This is the clinical situation in which basal insulin doses are increased even further after fasting plasma glucose (FPG)targets have been achieved in an attempt to achieve glycemic targets.
    - This practice often results in hypoglycemia, usually overnight.
    - Thus, titration of basal insulin when A1C is close to 7% has minimal effect on postprandial hyperglycemia or attainment of A1C goal.
    - Basal insulin is not designed to address postprandial hyperglycemia; its role is mainly to suppress hepatic glucose production, address insulin resistance, and correct fasting hyperglycemia.
    - Overbasalization can be identified by a basal insulin dose greater than 0.5 units/kg/day, post meal blood glucose levels greater than180 mg/dL, A1C not at goal despite attainment of the fasting blood glucose target, or a bedtime-to-morning glucose differential greater than 50 mg/dL

SGLT-2 AND GLP-1 MEDICATIONS

These two medications are emphasized in the new DM ADA 2023 (and other) guidelines.

- GLP-1 Glucagon-like peptide 1 receptor agonists (GLP-1): affect glucose control through several mechanisms, including enhancement of glucose-dependent insulin secretion, slowed gastric emptying, and reduction of postprandial glucagon and food intake. These medications typically do not usually cause hypoglycemia. Some of these medications cannot be used with patients with reduced eGFR.
- SGLT-2: Sodium-glucose co-transporter 2 (SGLT-2) inhibitors promote the renal excretion of glucose and thereby modestly lower elevated blood glucose levels in patients with T2D. In patients with cardiorenal comorbidities, many SGLT-2 inhibitors demonstrated cardiorenal outcome benefit. These medications typically do not usually cause hypoglycemia on their own. SGLT-2 inhibitors have established efficacy and safety in patients with eGFR greater than 20 mL amin 1.73 m^2 and provide persistent nephroprotection, thus can be continued until renal replacement therapy with dialysis is initiated.

T2D THERAPEUTIC LIFESTYLE CHANGES

Patient Self-Management

- All patients with DM should be encouraged to participate in DM self-management education/support to assist with implementing and sustaining skills and behaviors needed for ongoing self-management

Nutrition

- Consider Dietitian Referral (onsite or via telemedicine) to provide patients with practical tools for day-to-day meal choice selection and better food choices at canteen. Patients with DM out of control or overweight/obese should get RD consult
- Provide DM dietary patient handouts

Weight loss

- If BMI is greater than 25 in patients with pre-diabetes or DM, establish a realistic weight loss goal at the time of diagnosis
- Weight loss of 2 to 8 kg may provide clinical benefits to those with T2D, especially early in the disease process

Exercise

- Ensure patients on insulin or insulin secretagogues (sulfonylureas) understand the possibility of hypoglycemia with upped activity
- The ADA recommends: at least 150 minutes of moderate to vigorous intensity exercise, spread out over more than 3 days a week with no more than 2 consecutive days without activity. If younger and more physically fit: at least 75 minutes a week of vigorous intensity or interval training may be sufficient.

Psychosocial/Mental Health

- Ensure depression or other mental health issues are addressed, especially if the patient is non-adherent
- Involve and engage the patient, promote self-management skills, explore fears, and consider case coordination

Smoking Cessation: Tobacco and e-Cigarettes

- Advise not to use cigarettes and other tobacco products or e-cigarettes
- Patients who smoke should be offered smoking cessation counseling and treatment

T2D RACIAL/ETHNIC DISPARITIES

- Racial and ethnic minorities with T2D mellitus have worse glycemic control and higher rates of diabetes complications and mortality
- Many minority racial and ethnic groups have a higher burden of cardiovascular disease and chronic kidney disease with higher morbidityand mortality
- Clinical practice guidelines recommend treatment intensification and the preferential use of newer classes of diabetes medications inpatients with, or at high risk for cardiovascular and renal complications
- Studies show that, independent of socioeconomic status and clinical factors (glycemic control and intensity of diabetes therapy), all minority race/ethnicities had lower initiation of newer diabetes medications (SGLT–2 and GLP-1) and was significantly lower for black and American Indian or Alaskan Native individuals
- Racial and ethnic disparities in the initiation of newer diabetes medications have important clinical consequences. These groups mayespecially benefit from the use of newer diabetes medications given their reno- and cardio-protective effects.

CLINICAL INERTIA IN T2D

Treatment Intensification/Clinical Inertia in T2D: Because T2D is a progressive disease involving a decline in β-cell function and increase in insulin resistance most patients ultimately require intensification of treatment to maintain adequate glycemic control. Patients whose glycemia is not well controlled, according to guideline targets, may be at increased risk of the long-term micro- and macrovascular complications of diabetes.

- Many patients with poor glycemic control despite treatment do not receive timely and appropriate intensification of therapy
- Clinical inertia is failure of physicians to initiate or intensify therapy in a timely manner, despite recognition of the problem which leads to poor control of the risks for secondary complications from T2D
- Patients not meeting treatment goals should be reevaluated at regular and frequent intervals to intensify treatment, reinforce lifestyle changes, and monitor for complications

T2D MONITORING

Glycemic Goals (Nonpregnant adults with T2D)

- A1C Targets: Individualized glycemic goals should be based on duration of diabetes, age and life expectancy, comorbid conditions, known CVD or advanced microvascular complications, hypoglycemia unawareness, and patient considerations
- An A1C goal of less than 7% without significant hypoglycemia is appropriate but can be less than 6.5% or 8% based on patient factors
- Older adults who are otherwise healthy with few comorbidities and intact cognitive function and functional status should have lowerglycemic goals (A1C less than 7.0 to 7.5 %)
- Glycemic goals for older adults might reasonably be relaxed as part of individualized care, but hyperglycemia leading to symptomsor risk of acute hyperglycemia complications should be avoided
- Patients with multiple comorbidities, cognitive impairment, or functional dependence should have less stringent glycemic goals (A1C less than 8.0%)Episodes of hypoglycemia should be ascertained and addressed at regular visits
- Pre-prandial capillary plasma glucose or Finger stick blood glucose (FSBG): 80 to 130 mg/dL
- Peak postprandial capillary plasma glucose or Finger stick blood glucose (FSBG): less than 180 mg/dL

Finger Stick Blood Glucose (FSBG)

- If ordered, check and document results at each visit – In Cerner under "Results Review/Vitals"
- Act on results, assess need for continued Finger stick (FS)
- Do not order if not short acting on results. (FS testing is very burdensome to patients & staff)
- May not be necessary for patients with T2D who are diet treated or on only oral medications that are not associated with hypoglycemia
- Oral medication and basal insulin regimens: Once insulin dose stabilizes, may discontinue, or monitor FS much less frequently especially if A1C is at goal
- Note: A fasting, or pre-meal FS test is of little value if patient has eaten, defer test
- Consider a Keep-on-Person (KOP) glucometer if fasting or pre-meal tests are needed but difficult to obtain

Blood Glucose Monitoring (BGM)

- Patients on insulin using a KOP glucometer should be encouraged to check blood glucose levels as appropriate based on insulin regimen, e.g., (fasting, prior to meals and snacks, at bedtime, prior to exercise)
- If patient has unstable blood sugars while incarcerated and requires frequent finger stick blood glucose tests ensure they aretrained on glucometer use prior to release

Continuous Glucose Monitoring (CGM)

- In the community real-time CGM (rtCGM) or intermittently scanned CGM (is CGM) may be considered for diabetes management inadults with diabetes on multiple daily injections (MDI) or CSII (continuous subcutaneous insulin infusion) who are capable of using devices safely
- If Endocrinologist recommends CGM or patient admitted to CDCR with one, contact your institution leadership to help reviewrequirements and technology needed
- Time in Range (TIR) targets are now typically used when using continuous glucose monitoring (CGM)

CVD RISK FACTOR REDUCTION IN PATENT WITH T2D

Overview: Diabetes is a complex, chronic illness requiring multifactorial risk-reduction strategies beyond glycemic control. Atherosclerotic cardiovascular disease (ASCVD) is the leading cause of morbidity and mortality for individuals with diabetes.

- Common conditions coexisting with T2D (e.g., hypertension and dyslipidemia) are clear risk factors for ASCVD, and diabetes itself confers independent risk.
- A comprehensive concurrent evidence-based approach to care will provide reduction in risks of microvascular, kidney, neurologic, and cardiovascular complications. Management of glycemia, blood pressure, and lipids and the incorporation of specific therapies with cardiovascular and kidney outcomes benefit (as individually appropriate) are considered fundamental elements of global risk reduction in diabetes
- For prevention and management of ASCVD conditions/complications cardiovascular risk factors should be systematically assessed at least annually in all patients with diabetes. These risk factors include duration of diabetes, obesity or overweight, hypertension, dyslipidemia, smoking, a family history of premature coronary disease, chronic kidney disease, and the presence of albuminuria

- 10 year risk of ASCVD event should be assessed via EMB calc in EHRS to better stratify **ASCVD risk and help guide therapy**
- The following pages will review BP, ASA, and lipid management in patients with T2D

TREATMENT OF OTHER LIPOPROTEIN FRACTIONS HYPERTRIGLYCERIDEMIA ON STATIN: COMBINATION THERAPY

- For patients with fasting triglyceride levels greater than 500 mg/dL, evaluate for secondary causes of hypertriglyceridemia and consider medical therapy to reduce the risk of pancreatitis
- Moderate hypertriglyceridemia (fasting or nonfasting triglycerides 175 to 499 mg/dL), treatment includes, lifestyle factors (obesity and metabolic syndrome), secondary factors (diabetes, chronic liver, or kidney disease and or nephrotic syndrome, hypothyroidism), and medications that raise triglycerides
- In patients with ASCVD or other CV risk factors on a statin with controlled LDL cholesterol but elevated triglycerides
- (135 to 499 mg/dL), the addition of **icosapent ethyl** can be considered to reduce CV risk
- Statin or fibrate combination has not been shown to improve atherosclerotic cardiovascular disease outcomes and is generally not recommended
- Statin plus niacin combination therapy has not been shown to provide additional CV benefit above statin therapy alone,
- may increase the risk of stroke with additional side effects and is generally not recommended.

DIABETIC NEPHROPATHY/CKD MONITORING

Overview:
CKD is diagnosed by the persistent elevation of urinary albumin excretion (albuminuria), low eGFR, or other manifestations of kidney damage. CKD attributable to diabetes (DKD) typically develops after diabetes duration of 10 years in T1D but may be present at diagnosis of T2D. Diabetes related-CKD can progress to end-stage renal disease (ESRD) requiring dialysis or kidney transplantation and CKD markedly increases CV risk.

Screening: Urinary albumin creatinine ratio (UACR) – False Positives occur, ensure 2 tests (over 3 to 6 months)

- Measure urinary albumin (order includes spot UACR) and eGFR at initial diagnosis and then annually
- Measure UACR every 6 months (twice annually) if urinary albumin is greater than 30 mg/g creatinine and or an eGFR 30 to60 mL/min/1.73 m2 to guide therapy
- Normal UACR: is less than 30 mg/day

T2D RETINOPATHY, NEUROPATHY, AND FOOT CARE

Retinopathy screening for Diabetic Retinopathy:

- Optimize glycemic, BP, and lipid control to reduce risk or slow progression of retinopathy
- Eye Exams:
    - Can be performed by an optometrist or ophthalmologist, preferably onsite
    - Initial eye exam: indicated shortly after diagnosis in patients with T2D
    - Follow-up eye exam:
        - Annually in patients with normal eye exam and well controlled DM – may consider every 2 years
        - Patient with retinopathy – may need more frequent exams

Diabetic Retinopathy:

- Optimize glycemic, BP, and lipid control to reduce risk or slow progression of retinopathy
- Eye Exams:
    - Can be performed by an optometrist or ophthalmologist, preferably onsite
    - Follow-up eye exam: with normal eye exam and well controlled DM – may consider every 2 years

HIGH RISK FEET

Risk for ulcers or amputations increased in patients with diabetes with any of the following:

- Past foot ulcer/open ulcers
- Smoking
- Peripheral neuropathy/loss of protective sensation (LOPS)

- Poor glycemic control
- Foot deformity
- Visual impairment
- Peripheral vascular disease
- Diabetic kidney disease, especially if on dialysis
- Pre-ulcerative callouses or corns

Provide diabetic foot care education at least annually for all patients with High Risk Feet.

COMPREHENSIVE FOOT EXAM ELEMENTS

History

- High risk feet conditions from above
- Neuropathic symptoms: pain, numbness, tingling, prickling, pins and needles sensation
- Vascular symptoms: claudication
- Impaired vision
- Tobacco use
- Foot care practices, shoe wear

Inspection

- Skin: focal lesions e.g., calluses, maceration, ulcers, dry skin, tinea pedis
- Nails: onychomycotic or dystrophic nails
- 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 greater than 3 seconds
- Consider Ankle Brachial Index (ABI) in any patient with signs and symptoms of PAD, especially in diabetics over 50 years

Neurologic Sensory Exam

Test for Loss of Protective Sensation (LOPS) using:

- 10-g monofilament test
- And at least one of the following:
    - Vibration using 128 Hz tuning fork tested at tip of great toe bilaterally
    - 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
    - Ankle reflexes

One or more abnormal results suggests LOPS

At least two normal tests (and no abnormal) rules out LOPS

MANAGEMENT OF HYPOGLYCEMIA IN CCHCS

PREVENTION

- Patients who are prone to hypoglycemia should have access to glucose tablets, glucose gel, or a diabetic snack
- Staff members should also have ready access to glucose tablets or the equivalent
- 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
- Ask about hypoglycemic episodes at each visit
- Custody staff shall ensure that patients receiving insulin have access to their next scheduled meal within 30 minutes of insulin injections
- Elderly patients should be monitored for signs of hypoglycemia

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 their provider possible insulin or oral hypoglycemic dosage adjustments during illness

- To tell the RN if the FS is in fact, post prandial so it can be documented with the FSBS

TREATMENT

Classification of Hypoglycemia	Description	Treatment
Alert Value Less than 70 mg/dL	Conscious with or without symptoms Requires treatment and adjustment of therapy	Acute phase: 15 to 20 grams of glucose preferred But any form of carbohydrate that contains glucose can be used: • Austin Peanut butter or cheese and crackers pack = 16 carbs and 3g of sugar • Keebler Graham cracker pack = 11 g carbs and 3g sugars • Clinic and KOP sugar tablets are 4 g of sugar each • There is also a 40% dextrose gel which have 22 grams of sugar each Recheck in 15 minutes, if still greater than 70 mg/dL, repeat above Follow with high sugar content snack with low protein and fat Once normoglycemic (BS less than 80 mg/dl) – eat meal or snack Consider bedtime snack if at continued risk
Clinically Significant Less than 54 mg/dL	Serious and clinically important	Same as above with vigilance for progression to severe.
Severe cognitive impairment or Unconscious Requires third party assistance	Associated with immediate mortality and 5 year mortality and increases risk for development of dementia	Glucagon 1 mg IM, IV or subQ (Crash carts carry a 1 mg syringe kit). If fails, use IV Dextrose. Repeat every 15 minutes as needed. Administer IV Dextrose as soon as it is available (Crash carts carry bags of Dextrose 50% solution) Prolonged monitoring may be required if on long-acting insulin or insulin secretagogues. If unexplained or recurrent severe, on long acting insulin or on insulin with poor oral intake: Admission to a medical unit for observation and stabilization may be indicated.

ADA advises to increase glycemic targets for at least several weeks as it has been demonstrated to improve counter-regulation and hypoglycemic awareness.

DETECTION AND DIAGNOSIS OF GESTATIONAL DIABETES MELLITUS (GDM)

Patients should be screened in the first trimester who have a BMI less than 25 kg/m2 and any of the following risk factors:

- Physical inactivity
- First degree relative with DM
- High-risk race or ethnicity (African American, Latino, Native American, Asian American, Pacific Islander)
- Hypertension (BP greater than 140/90 mmHg or on treatment for Hypertension)
- Hypercholesterolemia
- A1C greater than 5.5% (36.6 mmol/mol, IGT, IFG on previous testing)
- Delivered a baby weighing greater than 9 pounds (4.1 kg) or previously diagnosed with GDM
- Clinical conditions associated with insulin resistance (e.g., Acanthosis nigricans, Polycystic Ovarian Syndrome)
- History of CVD
- Smoking

All pregnant patients who were not screened in the first trimester, should be tested for GDM at 24 to 28 weeks of gestation.

Screening and Diagnosis:

1. Perform an 8 hour fasting 75-g OGTT at 24 to 28 weeks of gestation in women not previously diagnosed with overt DM.

Diagnostic for GDM if:

- Fasting: 92 mg/dl (a fasting glucose of greater than 126 is diagnostic of overt DM [Pre-gestational diabetes])
- h: 180 mg/dl
- h: 153 mg/dl

2. Two-Step non-fasting 50 g Glucose Load Testing

- h: if it is greater than 140 mg/dl, proceed to a fasting 100-g OGTT
- Diagnostic for GDM if (at least two of the following four):

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

DIAGNOSED WITH GDM– WHAT TO DO

REFER to OBSTETRICS. These patients should be followed as high-risk pregnancies.
CHECK MEDICATIONS (e.g., ACEIs, statins are teratogenic.) Discharge medications not compatible with pregnancy.
REFER TO DIETITIAN.
REFER TO OPHTHALMOLOGY/OPTOMETRY—GDM high risk for retinopathy or progression.
Retinal eye exams should occur before pregnancy or in the 1st trimester
Monitor every trimester and for up to 1 year post-partum as indicated by the degree of retinopathy and recommendations of eye care provider.

USE INSULIN for hyperglycemia not controlled with lifestyle. Glycemic control as close to normal as is safely possible, ideally A1C less than 6.5%, to reduce the risk of congenital anomalies.

TIME-IN-RANGE (TIR) RECOMMENDATIONS FOR CONTINUOUS GLUCOSE MONITORING (CGM)

Overview:
HbA1C alone does not provide the whole picture about an individual with diabetes day to day diabetes management, nor is it a value that individuals with diabetes try to access without a clinician-initiated blood test.
For patients with access to Continuous Glucose Monitoring using "Time in Range" (TIR) as a metric by which to evaluate diabetes management provides a more realistic picture of what is going on day to day, and also empowers individuals with diabetes to take controlof their own diabetes in between follow-up visits because they can easily access this information.

- TIR is a more accurate measure than HbA1C for assessing glycemic control in certain people who have conditions that may confound HbA1C values, such as iron deficiency or other anemias, hemoglobinopathies, and pregnancy.
- A recent analysis of data from the Diabetes Control and Complications Trial (DCCT) showed that TIR by itself is strongly associatedwith the risk of microvascular diabetes complications. Therefore, using the more tangible TIR along with HbA1C can help decrease an individual's risk of developing microvascular complications.

In June 2019, the American Diabetes Association published its first recommendations for TIR targets when using continuous glucose monitoring (CGM) in practice in order to provide guidance for clinicians, researchers, and individuals with diabetes toutilize, interpret and report CGM data in routine clinical care.

How this Affects Diabetes Educators:
Diabetes educators like using TIR to help their patients because it provides targets which are "understandable and actionable. It is also a much more positive goal to strive for." It has also been called a "better 'quality' measure of glucose management" because it captures both hypoglycemia and hyperglycemia and provides a platform for discussing glycemic variability.
TIR informs HbA1C and is an easier metric to use to make adjustments to diabetes medications and lifestyle interventions. It provides valuable information that a HbA1C does not, enabling the diabetes educator to make important treatment adjustments even for those with a HbA1C that is in the target range.
TIR should be individualized based on the individual and their current life circumstances, it may change over time, and that time spent in hypoglycemia (recommended for most as greater than 4% of time or more than 1 hour per day) should not be overlooked.