DENVER HEALTH MEDICAL PLAN INC.™ DENVER HEALTH MEDICAID CHOICE

CLINICAL PRACTICE GUIDELINE

Guideline Number: DHMP_CHOICE_CG1005	**Effective Date: 11/1/2021**
Guideline Subject: Diabetes Management Guideline	**Revision Date: 11/1/2022**
Pages: 1 of 13	

Gregg Kamas 10/13/2021

Quality Management Committee Chair **Date**

I. PURPOSE:

To define standards of care for Diabetes Management for eligible members of the Denver Health Medical Plan, Inc. (DHMP)

II. POPULATION:

All enrolled adult members with diagnosis of Diabetes Mellitus from a licensed healthcare provider. Members will be identified through administrative databases such as pharmacy (all members on oral hypoglycemic agents or insulin), claims, and case management databases as well as the Denver Health Diabetes Registry.

A. Criteria for Diagnosis of Diabetes (ADA, 2020):

- Fasting (no caloric intake for at least 8 hours) Plasma Glucose ≥126 mg/dL* *OR*
- 2-hour plasma glucose ≥200 mg/dL during 75-g oral glucose tolerance test* *OR*
- A1C ≥6.5% (performed in a laboratory with NGSP certified method)* *OR*
- Random plasma glucose ≥200 mg/dL in patients with classic symptoms of hyperglycemia or hyperglycemic crisis

*In absence of unequivocal hyperglycemia, results should be confirmed by repeat testing

For further discussion or clarification please refer to "Classification and Diagnosis of Diabetes: *Standards of Medical Care in Diabetes*-2020 https://care.diabetesjournals.org/content/43/Supplement_1/S14

B. Exclusions:

1. Pregnancy.
2. Acute process not resulting in need for long term management of diabetes such as steroid-induced or polycystic ovarian syndrome requiring glucose control but not having chronic diabetes diagnosis.

III. RESPONSIBILTY:

The diabetes management team should be multidisciplinary and include the patient as well as providers, nurses, dietitians, pharmacists, diabetes educators, mental health professionals, health coaches, patient navigators, social workers, etc. The goal is to enable individuals to self-manage their diabetes.

IV. IMPROVING CARE AND PROMOTING HEALTH IN POPULATIONS:

Utilizing the chronic care model, the goal is to deliver patient centered collaborative care to enable individuals to self-manage their diabetes. Patient-centered communication should incorporate patient preference, assess literacy and numeracy, assess financial barriers, and address cultural barriers. Care should also include a comprehensive plan to reduce cardiovascular disease risk.

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CLINICAL PRACTICE GUIDELINE

Guideline Number: DHMP_CHOICE_CG1005	**Effective Date: 11/1/2021**
Guideline Subject: Diabetes Management Guideline	**Revision Date: 11/1/2022**
Pages: 2 of 13	

_____

Quality Management Committee Chair Date

V. GUIDELINE:

The following guidelines are consistent with the 2020 Standards of Medical Care in Diabetes from the American Diabetes Association (ADA). Some specifications for HEDIS measures of diabetes care are incorporated. Denver Health recommends a check-up for diabetes management every 6 months if at goal on measures, and every 3 months if not at goal.

A. Initial/Comprehensive Medical Evaluation:
Confirm and classify diabetes diagnosis; evaluate for complications and potential comorbid conditions; review previous treatment and risk factor control; engage patient in formulation of care management plan; develop plan for continuing care

B. Additional tasks as appropriate for Follow-up Visits or Annual Evaluation:
   1. Interval medical history
   2. Assess medication compliance and behavior. Review any intolerance of side effects.
   3. Physical examination (height, weight, BMI, blood pressure, thyroid palpation Thyroid palpation is recommended at the initial visit and yearly. The other measures should be done every visit.
   4. Comprehensive foot exam: Inspection; palpation of pulses; determination of monofilament sensation and 1 additional sensation (proprioception, vibration, pinprick, or ankle reflex.) This should be performed initially and annually.
   5. Laboratory evaluation:
      - A1C, if results not available within the past 6 months or last 3 months if previous value not at goal.
      - Lipid profile, spot urinary albumin to creatinine ratio, serum creatinine and eGFR should be done yearly. For those with Type I Diabetes, a TSH should be performed every 3-5 years.
      - Serum potassium yearly in patients on ACE inhibitors, ARBs, or diuretics.
      - B12 when indicated if on metformin.
   6. Assess risk for complications, including cardiovascular and micro/macrovascular complications (see additional tab below for further discussion), and hypoglycemia risk.
   7. Diabetes self-management behaviors: nutrition, psychosocial health, need for referrals, immunizations; or other routine health maintenance screening

8. Evaluate for complications and potential comorbid. Comorbidities: common comorbidities with diabetes may complicate management. The physician and multidisciplinary team will assess and monitor for comorbidities and provide screening/plan interventions as necessary
    - Autoimmune Diseases: Screening should be done upon diagnosis and periodically in type 1 diabetes patients for autoimmune thyroid disease and celiac disease
    - Cancer: patients with diabetes are at increased risk of cancers of the liver, pancreas, endometrium, colon/rectum, breast, and bladder. This may result from shared risk factors between diabetes and age, or with diabetes related factors. Patients are encouraged to undergo recommended age and sex-appropriate cancer screenings as well as reduce the modifiable risk factors (obesity, inactivity, and smoking).
    - Cognitive Impairment/Dementia: Treatment should be simplified as much as possible to prevent hypoglycemia
    - Nonalcoholic Fatty Liver Disease: Interventions that improve metabolic abnormalities (weight loss, glycemic control, treatment for dyslipidemia, etc.) are also beneficial for fatty liver disease.
    - Hepatitis C Infection
    - Pancreatitis
    - Fractures: Age-specific hip fracture risk is increased in diabetes (both male and female). Type 1 diabetes is associated with an increased risk for osteoporosis. Type 2 diabetes shows an increased risk of fracture despite higher bone mineral density.
    - Hearing Impairment
    - Low Testosterone in Men
    - Obstructive Sleep Apnea
    - Periodontal Disease
    - Psychosocial Disorders: Regular and consistent screening for anxiety, depression, disordered eating, and serious mental illness. These can impact the patient's ability to self-manage their diabetes. If screening demonstrates psychosocial impact, initiation of a referral for additional services may be indicated.
9. Review previous treatment plans and evaluate effectiveness.
10. Provide routine recommended vaccines as indicated by age.

C. Facilitating Behavior Change and Well-Being to Improve Health Outcomes with the patient regarding:
1. Diabetes self-management education (DSME) and diabetes self-management support (DSMS):

CLINICAL PRACTICE GUIDELINE

Guideline Number: DHMP_CHOICE_CG1005	**Effective Date: 11/1/2021**
Guideline Subject: Diabetes Management Guideline	**Revision Date: 11/1/2022**
Pages: 4 of 13	

Quality Management Committee Chair **Date**

All people with diabetes should participate in self-management education and support to assist with obtaining the knowledge, skills, and ability for self-care as well as the behaviors needed for ongoing self-management. These patient-centered tools consider the needs of the individual to improve outcomes and reduce costs. Content may be tailored to prevention as well.

a. Overall objectives: support informed decision-making, self-care behaviors, problem-solving, and active collaboration with health-care team.
b. Critical times for evaluation of need for self-management education:
    i. At diagnosis
    ii. Annually and when not meeting targets
    iii. When there are complicating factors such as medical, physical or psychosocial
    iv. Transition in life and care occur

2. Nutrition Therapy: Patient specific-goals include assisting the patient in determining what to eat and following a food plan. Specific dietary recommendations can be accessed at the ADA website. Referral to a registered dietitian nutritionist (RD/RDN) is recommended.
    a. For patients who have type 2 Diabetes and overweight or obesity, modest weight loss can improve glycemic control. Sustaining weight loss is challenging. Referral to other resources may be necessary to help the patient maintain or achieve nutritional goals. For additional information, please refer to http://care.diabetesjournals.org/content/41/Supplement_1/S65
    b. Goals of Nutrition Therapy
        i. Promote and support healthy eating patterns with emphasis on nutrient-dense foods in appropriate portion sizes to help achieve/maintain weight goals, individual glycemic, blood pressure and lipid goals and to delay/prevent complications of diabetes.
        ii. Address individual nutrition needs based on personal/cultural preferences, health literacy, access to healthy foods, willingness/ability to make behavioral changes and existing barriers to change
        iii. Maintain the pleasure of eating by providing nonjudgmental, scientific based feedback.
        iv. Providing individuals with practical tools for developing healthy eating patterns
3. Physical Activity:
    a. Children and Adolescents: 60min/day or more of moderate or vigorous aerobic activity at least 3 days/week.
    b. Adults: 150 minutes or more of moderate to vigorous activity per week, spread over at least 3 days/week unless contraindicated. Flexibility and balance training 2-3/week for older adults with diabetes. 2-3 sessions/week of resistance exercise on nonconsecutive days for adults with type 1 or type 2 diabetes. All adults with diabetes should decrease sedentary behavior.

4. Smoking Cessation: advise all patients not to use tobacco, including ecigarettes. Include screening and cessation counseling as a routine component of care.
5. Psychosocial Issues: screening and follow up regarding attitudes about illness, expectations for management and outcomes, quality of life, financial burden, access to care, and available resources (financial, social, and emotional), depression, anxiety, cognitive capacities, etc. It is important to routinely monitor psychosocial issues particularly when treatment targets aren't met or onset of complications.

CLINICAL PRACTICE GUIDELINE

Guideline Number: DHMP_CHOICE_CG1005 **Effective Date: 11/1/2021**

Guideline Subject: Diabetes Management Guideline **Revision Date: 11/1/2022**

Pages: 6 of 13

Quality Management Committee Chair **Date**

D. Glycemic Targets:

The 2021 ADA update recommends continuous glucose monitoring in all adults with type 1 diabetes who are not meeting glycemic targets, regardless of age and may be helpful in some type 2 diabetes patients, such as those with an intensive insulin regimen and those on regimens associated with hypoglycemia

A1C target	HEDIS classification	Frequency of Testing
<8% *	Good Control	Twice a year if meeting treatment goals with stable glycemic control
≥9%	Poor Control	Quarterly if not meeting treatment goals or with recent changes in therapy

The 2020 ADA position statement considers <7% a reasonable A1C goal for many non-pregnant adults. This goal may need to be adjusted lower or higher based on the individuals needs. However, HEDIS classifies good control as A1c <8% for most populations, <7% for selected population. Clinical judgement is warranted to determine the appropriate glycemic target based on the needs of the patient.

- For more details and information, please refer to Glycemic Targets: Standards of Medical Care in Diabetes- 2021 https://care.diabetesjournals.org/content/44/Supplement_1/S73
- For patients meeting their A1C goals perform A1C testing at least twice a year. For patients not meeting their goals perform the A1C test quarterly.

E. Diabetes Technology

1. The term used to describe the hardware, devices, and software people use to manage their diabetes. Diabetes technology is expanding beyond syringes, pens, or pumps and glucose meters to include hybrid devices that both monitor glucose and deliver insulin.
2. The type of technology used should be based on the patient's needs, desires, skill level and availability of the devices.

F. Pharmacologic approaches to Glycemic Treatment (From ADA, 2021):

1. Insulin Therapy for Type 1 diabetes: Most patients should be treated with multiple daily injections of prandial insulin and basal insulin or continuous subcutaneous insulin infusion and use rapid-acting insulin analogs to reduce hypoglycemia risk. Patients should receive education on matching prandial insulin doses to carbohydrate intake, premeal glucose and anticipated physical activie.

2. Type 2 Diabetes:
    a. Metformin, if not contraindicated and if tolerated is the preferred initial agent for treatment. Consider periodic measurement of vitamin B12 levels, especially in those with anemia or peripheral neuropathy
    b. A patient-centered approach should be used to guide the choice of pharmacologic agents and medication adherence should be a consideration when selecting pharmacologic therapy. Providers should also consider efficacy, hypoglycemia risk, history of atherosclerotic cardiovascular disease, impact on weight, potential side effects, renal effects, delivery method (oral versus subcutaneous), cost, and patient preferences
    c. If A1C is above target, selection of pharmacologic treatment is based on several factors such as: the presence or absence of established atherosclerotic cardiovascular disease (ASCVD) or chronic kidney disease (CKD); whether or not there is a compelling need to minimize hypoglycemia; and cost. DHMP adheres to the clinical care guidelines specified by Denver Health (DH) Ambulatory Care Services (ACS) in their clinical care guideline, *Diabetes Management for Non-Pregnant Adults in the Outpatient Setting.* Further details can be accessed via https://doi.org/10.2337/dci19-0066 titled, *2019 Update to Management of Hyperglycemia in Type 2 Diabetes, 2018* consensus report by the American Diabetes Association (ADA) and the European Association for the Study of Diabetes (EASD).
    d. Reevaluation of the medication regimen and adjustment as needed to incorporate patient factors and regimen complexity is recommended.

G. CVD and Risk Management: Leading cause of morbidity and mortality for those with diabetes; and largest contributor to the costs of diabetes.
    1. Risk factors (hypertension, dyslipidemia, smoking, family history of premature coronary disease, and albuminuria) should be assessed annually.
    2. Blood Pressure Control: ALL patients with hypertension and diabetes should monitor their blood pressure at home to help identify masked hypertension, as well as to improve medication-taking behavior.

Goal	Screening	Diagnosis
<140/90mmHg	Measured at each routine visit	If elevated, confirmed on separate visit/day

*lower BP targets may be appropriate for younger patients, those with albuminuria, and/or those with hypertension and one or more additional ASCVD risk factors if they can be achieved without undue treatment or burden (ADA, 2017).

    a. Patients with BP >120/80 should be advised on lifestyle changes (weight loss, diet changes, increased physical activity, etc.) to reduce blood pressure. If weight loss is indicated a DASH-

style dietary pattern (low sodium and increased potassium), moderation of alcohol intake, and increased physical activity are recommended.

c. Patients with confirmed BP >140/90 on 2 occasions: lifestyle therapy + initiation and titration of pharmacological therapy to achieve blood pressure goal unless contraindicated.
d. Patients with confirmed BP >160/100: lifestyle therapy + initiation of titration of 2 drugs or single-pill combination to reduce CVD events in patients with diabetes.
e. ACE inhibitor or ARB at the maximum tolerated dose indicated for blood pressure treatment is the recommended first line treatment for hypertension in patients with diabetes and urine albumin-to-creatinine ratio ≥300 mg/g creatinine or UACR 30-299 mg/g creatinine. If one class is not tolerated the other should be substituted.
f. For patients treated with ACE, ARB, or diuretic, serum creatinine/estimated glomerular filtration rate (eGFR) and serum potassium levels should be monitored.

3. Lipid Management: Lipid management is driven by risk status, not LDL level.
    a. Lifestyle modification education and recommendations: focus on weight loss (if indicated) diet modification, and increasing physical activity. Intensify lifestyle therapy and optimize glycemic control for patients with elevated triglyceride levels. With triglyceride levels ≥500mg/dL (5.7mmol/L), evaluate for secondary causes and consider medical therapy to reduce the risk of pancreatitis.
    b. Obtain a lipid profile at initiation of medication regimen and 4-12 weeks after initiation or change in dose, and annually. Adjust intensity of statin therapy based on individual response to medication.
    c. Patients with diabetes, 40-75 years of age, should be counseled on their risk for a cardiovascular event through a recognized shared decision making tool.
    d. Primary Prevention
        - Patients 40-75 y.o. with diabetes and without atherosclerotic cardiovascular disease (ASCVD) should use a moderate-intensity statin therapy along with lifestyle therapy
        - Patients 20-39 y.o. with diabetes and multiple ASCVD risk factors, initiation of statin therapy is reasonable along with lifestyle therapy
        - Patients with diabetes who are considered at higher risk with multiple ASCVD risk factors or 50-70 y.o., a high intensity statin therapy should be considered
        - For patients with diabetes and a 10-year ASCVD risk of 20% or higher, consider adding ezetimibe to maximally-tolerated statin therapy to reduce LDL cholesterol levels by 50% or more.

    e. Secondary Prevention

- Patients of all ages with diabetes and ASCVD a high-intensity therapy should be used in addition to lifestyle therapy
- Patients with diabetes and ASCVD that are considered very high risk according to the following criteria, if LDL cholesterol is ≥70 mg/dL on maximally tolerated statin dose, consider adding additional LDL-lowering therapy, such as ezetimibe or PCSK9 inhibitor.
- If patients are unable to tolerate the recommended intensity of statin therapy the maximally tolerated statin dose should be used
- Patients who are 75 or older it is reasonable to continue statin therapy or initiate statin therapy after discussing risks and benefits with the patient

High-Intesity and Moderate-Intensity Statin Therapy (from ADA, 2020)

High-Intensity Statin Therapy: lowers LDL cholesterol by ≥50%	**Moderate Intensity Statin Therapy: lowers LDL cholesterol by 30-50%**
Atorvastatin 40-80mg Rosuvastatin 20-40mg	Atorvastatin 10-20mg Rosuvastatin 5-10mg Simvastatin 20-40mg Pravastatin 40-80mg Lovastatin 40mg Fluvastatin XL 80mg Pitavastatin 2-4mg

4. Antiplatelet Agents:
   a. Use aspirin therapy (75-162 mg/day) as a secondary prevention for those with diabetes and a history of ASCVD.
   b. If the patient has a documented aspirin allergy and ASCVD, clopidogrel (75mg/day) may be used.
   c. Dual antiplatelet therapy is reasonable for up to 1 year after an acute coronary syndrome. Long term dual antiplatelet therapy should be considered for for patients with prior coronary intervention, high ischemic risk and low bleeding risk. Combination therapy with aspirin plus low-dose rivaroxaban should be considered for patients with stable coronary and/or peripheral artery disease and low bleeding risk.
   d. Consider aspirin therapy as a primary prevention strategy for those with diabetes at increased cardiovascular risk (family history of premature ASCVD, hypertension, smoking, dyslipidemia, or albuminuria) and not at increased risk of bleeding.

F. Coronary Heart Disease:

CLINICAL PRACTICE GUIDELINE

Guideline Number: DHMP_CHOICE_CG1005	**Effective Date: 11/1/2021**
Guideline Subject: Diabetes Management Guideline	**Revision Date: 11/1/2022**
Pages: 10 of 13	

Quality Management Committee Chair **Date**

1. Patients with prior myocardial infarction should be continued on beta blockers for at least 3 years after the event. For treatment of patients with heart failure with a reduced ejection fraction a beta blocker with proven cardiovascular benefit should be used unless otherwise contraindicated.
2. For those with known ASCVD, use aspirin and statin therapy if not contraindicated, and consider ACE inhibitor therapy as necessary.
3. For those with symptomatic heart failure, do not use thiazolidinedione.
4. For patients with type 2 diabetes and ASCVD or kidney disease use of a SGLT2 inhibitor or GLP-1 receptor agonist with demonstrated CVD benefits is recommended as part of the patient's diabetic regimen.

G. Microvascular Complications and Foot Care:

1. Diabetic Kidney Disease (DKD): Screening for nephropathy is also a component of HEDIS

a. Assess urinary albumin and eGFR annually (this applies to patients with type 2 diabetes, patients with comorbid hypertension, and type 1 diabetes with a duration of ≥5 years). Patients with urinary albumin >30 mg/g Cr and/or eGFR <60 mL/min/1.73 m2 should have urinary albumin and eGFR monitored twice a year.

b. Optimize glucose control and blood pressure control to reduce risk or slow the progression.

c. For patients (non-pregnant) with diabetes and HTN, either and ACE inhibitor or and ARB is recommended for those with modestly elevated UACR (30-299 mg/g creatinine) and is strongly recommended for those with UACR >300mg/g creatinine.

d. Blood pressure levels <140/90 are recommended to reduce CVD mortality and slow chronic kidney disease progression.

e. For patients with with eGFR < 60 CKD dietary protein intake should be approximately 0.8 g/kg per day and for patients on dialysis, higher levels of protein should be considered.

f. For patients with diabetic kidney disease and an eGFR ≥30 mL/min/1.73 m^2 and urinary albumin >30 mg/gCR, use of a SGLT2 inhibitor to reduce risk of CKD progression along with reducing CV events. For patients with CKD use a GLP-1 receptor agonist to possibly reduce the progression of albuminuria and/or CV events.

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Pages: 11 of 13

_____

Quality Management Committee Chair **Date**

Management of Chronic Kidney Disease:

GFR (mL/min/1.73m^2)	Recommended Management
All Patients	Yearly measurement of creatinine, UACR, potassium
45-60	Referral to a nephrologist if possibility for nondiabetic kidney disease exists; consider need for dose adjustment of medication; monitor eGFR every 6 months; monitor electrolytes, bicarbonate, hemoglobin, calcium, phosphorus, and parathyroid hormone at least yearly; assure vitamin D sufficiency; consider bone density testing; referral for dietary counseling
30-44	Monitor eGFR every 3 months; monitor electrolytes, bicarbonate, calcium, phosphorus, parathyroid hormone, hemoglobin, albumin, and weight every 3-6 months; consider dose adjustment of medications
<30	Referral to a nephrologist

2. Diabetic Retinopathy: Optimize glycemic control, blood pressure, and serum lipid control can reduce risk/slow progression. Retinal Eye Exam is a component of the HEDIS measurement. Fundus photographs are a screening tool, not a substitute for a comprehensive exam. If utilizing eye camera- interpretation of images is to be completed by a trained eye care provider.

Screening for Diabetic Retinopathy:

Population	Exam/Finding	Timeframe
Adults with Type 1 Diabetes	Initial dilated and comprehensive eye exam by an ophthalmologist or optometrist	Within 5 years after onset of diabetes
Patients with Type 2 Diabetes	Initial dilated and comprehensive eye examination by an ophthalmologist or optometrist	At the time of the diabetes diagnosis
All patients with diabetes after initial exam	No evidence of retinopathy for one or more annual exams	Exams every 2 years may be considered
All patients with diabetes after initial exam or with abnormal findings	Any evidence of diabetic retinopathy present =>dilated retinal exam	Dilated retinal exam repeated annually by an ophthalmologist or optometrist
	Retinopathy that is progressing or sight-threatening	Requires more frequent examinations/monitoring
	*Consider a referral to ophthalmologist specializing in retinopathy with signs of any macular edema, or retinopathy	

NOTE:

This guideline is designed to assist providers by providing an analytical framework for the evaluation and treatment of patients, and is not intended either to replace a clinicians judgment or to establish a protocol for all patients with a particular condition.

3. Neuropathy:
   a. Tight glycemic control is the only method shown to prevent/delay diabetic neuropathy in patients with Type 1 diabetes, and to slow progression of diabetic neuropathy in Type 2 patients.
   b. Assessment and Screening: All patients should be assessed for diabetic peripheral neuropathy (DPN) starting at diagnosis of type 2 diabetes and 5 years after the diagnosis of type 1diabetes. Annual assessment thereafter.
   Assessment for distal symmetric polyneuropathy should include history and assessment of either temperature or pinprick sensation and vibration sensation using a 128-Hz tuning fork. All patients should have annual 10-g monofilament testing to identify feet at risk of ulceration and amputation. Treatment can include pregabalin, or duloxetine.
4. Foot Care:
   a. An annual comprehensive foot exam will identify risk factors for ulcers and amputations. For patients with sensory lost, prior ulcerations or amputations a foot exam should occur at each visit.
   b. The annual exam should include: inspection of the skin, assessment of foot deformities, neurological assessment (10-g monofilament testing), and vascular assessment, including pulses in legs and feet.
   c. Obtain a history of ulceration, amputation, Charcot foot, angioplasty or vascular surgery, cigarette smoking, retinopathy, and renal disease. Also assess current symptoms of neuropathy and vascular disease.
   d. Provide general preventive foot self-care education including, footwear selection/behaviors, and home care.

H. Older Adults: Generally, older adults (≥65 years) who are functional, cognitively intact, and with a long life expectancy have the same treatment goals as younger adults. Older adults have a higher risk of premature death, coexisting illnesses, depression and geriatric syndromes, including neurocognitive impairment. The ADA consensus report "Diabetes in Older Adults" contains further details.

1. Consider the assessment of medical, functional, mental, and social geriatric domains for diabetes management in older adults to provide a framework to determine targets and therapeutic approaches. Also, consider the cost of the treatment plan and risk of non-compliance due to cost.
2. Screening for geriatric syndromes may be appropriate in older adults experiencing limitations in their basic and instrumental activities of daily living as they may affect diabetes self-management and be related to health-related quality of life.
3. Screening for diabetes complications should be individualized in older adults. Pay close attention to complications that lead to functional impairment.
4. Glycemic levels may be relaxed in older adults based on individual criteria.
5. Annual screening for early detection of mild cognitive impairment or dementia for those 65 years and older.

CLINICAL PRACTICE GUIDELINE

Guideline Number: DHMP_CHOICE_CG1005	**Effective Date: 11/1/2021**
Guideline Subject: Diabetes Management Guideline	**Revision Date: 11/1/2022**
Pages: 13 of 13	

Quality Management Committee Chair **Date**

6. High priority population for depression screening and treatment.
7. Hypoglycemia should be avoided. Assess and manage by adjusting targets as necessary.
8. Persons who use continuous glucose monitoring and insulin pumps should continue with access as applicable after age 65.

RELEVANT LINKS:

1. Standards of Medical Care in Diabetes-2020 Abridged for Primary Care Providers: https://care.diabetesjournals.org/content/diacare/suppl/2019/12/20/43.Supplement_1.DC1/Standards_of_Care_2020.pdf
2. 2019 Update to: Management of Hyperglycemia in Type 2 Diabetes, 2018 consensus report by the American Diabetes Association (ADA) and the European Association for the Study of Diabetes (EASD): https://doi.org/10.2337/dci19-0066
3. DH ACS Clinical Care Guideline: Diabetes Management for Non-Pregnant Adults in the Outpatient Setting: https://denverhealth.policystat.com/policy/5032184/latest/

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Diabetes Management for Non-Pregnant Adults in the Outpatient Setting

Clinical Care Guideline

PURPOSE

To inform decision-making about Diabetes Self-Management Education and medication choices to optimize glycemic control in patients with diabetes mellitus (DM) in the outpatient setting.

SCOPE

This applies to Denver Health (DH) Ambulatory Care Services (ACS) Adult Patients (>18 years old) that are not pregnant and at least 12 weeks postpartum.

GUIDELINE

Care providers are expected to follow the most current evidence-based recommendations for diabetes care detailed in the American Diabetes Association's *Standards of Medical Care in Diabetes.* The 2019 Standards are attached and can be viewed at: (http://care.diabetesjournals.org/content/42/Supplement_1).

The following is a summary of the *2019 ADA Standards of Care* and the *Management of Hyperglycemia in Type 2 Diabetes, 2018* (https://doi.org/10.2337/dci18-0033) consensus report by the American Diabetes Association (ADA) and the European Association for the Study of Diabetes (EASD), with additional specific guidance for Denver Health providers.

A. CLASSIFICATION AND DIAGNOSIS OF DIABETES

1. Use Hemoglobin **A1c** as the preferred screening test for prediabetes and diabetes. Risk of future diabetes is continuous and becomes disproportionately greater at the higher end of the range. In absence of unequivocal hyperglycemia, confirm results by repeat testing.

2. A1c ranges:
   Normal = <5.7%
   Prediabetes = 5.7-6.4%
   Diabetes = >6.5%

3. Distinguishing Type 1 from Type 2 diabetes- Measure glutamic acid decarboxylase (GAD) antibodies and c-peptide secretion to distinguish type 1 from type 2 diabetes. The presence of two or more of the following should raise suspicion for type 1 diabetes: age of onset <50 years, acute symptoms, body mass index (BMI) <25 kg/m^2, and personal or family history of autoimmune disease. Individuals in whom the diagnosis of type 2 diabetes is uncertain can be referred to the Endocrinology Clinic for evaluation.

4. Screening- Screen all adults beginning **at age 45 years** (regardless of BMI or risk factors), and younger adults who are overweight or obese (BMI ≥25 kg/m^2 (or ≥23 kg/m^2 in Asian) **and** have one or more of the following additional **risk factors** for diabetes:
   - First-degree relative with diabetes
   - High-risk race/ethnicity (e.g. African American, Latino, Native American, Asian American, Pacific Islander)
   - History of CVD
   - Other clinical conditions associated with insulin resistance (e.g., severe obesity, acanthosis nigricans)
   - Physical inactivity
   - Women with polycystic ovary syndrome
   - HLD cholesterol level <35 mg/dL and/or a triglyceride level >250 mg/dL
   - Hypertension (≥140/90 mmHg or on therapy for hypertension

5. Test individuals with **prediabetes** and anyone on **atypical antipsychotic** medication **every year**, and individuals with **normal** screening every **1-3** years (depending on risk status).

6. Evaluate individuals with **prediabetes** for other cardiovascular disease risk factors.

B. PREVENTION OR DELAY OF TYPE 2 DIABETES

1. Refer individuals with prediabetes to an intensive behavioral lifestyle intervention program modeled on the Diabetes Prevention Program to achieve and maintain 7% weight loss and increase moderate-intensity physical activity to at least 150 min/week.

2. Consider metformin therapy for prevention of diabetes, particularly for individuals with BMI ≥35 kg/m^2, those less than 60 years of age, and women with history of gestational diabetes.

C. COMPREHENSIVE MEDICAL EVALUATION AND ASSESSMENT OF COMORBIDITIES

1. Complete a comprehensive diabetes medical evaluation at the initial, follow-up, and annual visits for all individuals with diabetes (See ADA Standards, Table 4.1)

D. LIFESTYLE MANAGEMENT

1. DSMES- All individuals with diabetes should receive DSMES. Evaluate the need for DSMES at diagnosis, annually, when complications arise, and after transitions of care. Referrals for Denver Health DSME classes can be made through Epic.

2. Nutrition therapy- An individualized medical nutrition therapy program is recommended for all individuals with type 1 or type 2 diabetes, prediabetes, and gestational diabetes. Encourage individuals with diabetes to eat a healthy balanced diet, with reduced intake of refined carbohydrates and added sugars, and a focus on nutrient-dense carbohydrates that are high in fiber, including vegetables, legumes, fruits, dairy (milk and yogurt), and whole grains. Discourage consumption of sugar-sweetened beverages and processed “low-fat” or “nonfat” food products with high amounts of

refined grains and added sugars in all individuals.

3. Weight management - Refer individuals who are overweight or obese and have type 2 diabetes or prediabetes to weight-loss intervention programs. Goal weight loss should be >5% and should be achieved by the combination of reduced caloric intake and lifestyle modification.
4. Physical activity- Most adults with diabetes should engage in 150 minutes or more of moderate-to-vigorous intensity aerobic activity per week, spread over at least 3 days/week, with no more than 2 consecutive days without activity. Shorter durations (minimum 75 min/week) of vigorous-intensity or interval training may be sufficient for younger and more physically fit individuals. Adults with diabetes should engage in 2-3 sessions/week of resistance exercise on nonconsecutive days. All adults, particularly those with type 2 diabetes, should minimize prolonged sitting/sedentary behavior.
5. Smoking Cessation- Advise all individuals to not use cigarettes or other tobacco products, or e-cigarettes.
6. Psychosocial Issues- All individuals with diabetes should be evaluated for psychosocial factors that may affect diabetes control, including: attitudes about diabetes, expectations for medical management and outcomes, affect or mood, general and diabetes-related quality of life, available resources (financial, social, and emotional), and psychiatric history.Consider screening for symptoms of diabetes distress, depression, anxiety, disordered eating, and cognitive impairment.

E. GLYCEMIC MONITORING AND TARGETS

1. Monitoring
    a. Establish and review A1c/blood glucose target and monitoring frequency at every visit
    b. Most individuals using intensive insulin regimens (multiple-dose insulin or insulin pump therapy) should perform self-monitoring of blood glucose (SMBG) prior to meals and snacks, at bedtime, occasionally postprandially, prior to exercise, when they suspect low blood glucose, after treating low blood glucose until blood sugar normalizes, and prior to critical tasks such as driving.
    c. SMBG can help guide treatment decisions and/or self-management for individuals on less frequent insulin injections. Bluetooth-enabled glucometers can be downloaded for data review at the time of the clinic visit.
    d. Continuous glucose monitoring (CGM) along with intensive insulin regimens, is a useful tool to lower A1c in adults with type 1 diabetes who are not meeting glycemic targets.
    e. Intermittently scanned continuous glucose monitoring may be considered as a substitute for self-monitoring in adults with diabetes requiring frequent glucose testing, but is not recommended for most DH patients at this time due to high cost and no proven benefit over SMBG with finger-sticks.
    f. DH patients for whom CGM is deemed appropriate should be referred to Endocrine Clinic for assessment, ordering, and CGM education.
2. Check A1c **every 3 months** in individuals who are not at goal or whose therapy has changed, and **every 6 months** in individuals at goal and with no change in therapy.
3. A1c target

a. The **A1c target for most non-pregnant adults with diabetes should be <7%.**

b. A more stringent A1c target of <6.5% may be appropriate for certain individuals (those with diabetes for less than 5 years, type 2 diabetes treated with lifestyle +/- metformin only, long life expectancy, or no significant cardiovascular disease) as long as it can be achieved without hypoglycemia.

c. A less stringent A1c target of <8% or <8.5% may be appropriate for individuals with a history of severe hypoglycemia, limited life expectancy, advanced microvascular or macrovascular complications, extensive comorbid conditions, or long-standing diabetes in whom the goal is difficult to achieve despite diabetes self-management education, appropriate glucose monitoring, and effective doses of multiple glucose-lowering agents including insulin.

d. A1c < 8% within the last 3 months is generally adequate for elective surgery. Individuals who are not eligible for surgery due to high A1c but are motivated to improve their glycemic control can be referred to Clinical Pharmacist or Endocrinology for intensive management.

e. There is no benefit to A1c target or A1c monitoring for patients at end of life.

4. SMBG (self-monitored blood glucose) goal- A1c levels correlate to the following SMBG goals:

a. **A1c < 7%:**
- Fasting 80-130 mg/dL
- Pre-prandial 80-130 mg/dL
- 2 hour post-prandial < 180 mg/dL
- Bedtime 100-150 mg/dL

b. A1c < 8%
- Fasting 100-150 mg/dL
- Pre-prandial 100-150 mg/dL
- 2 hour post-prandial < 200 mg/dL
- Bedtime 150-200 mg/dL

5. Hypoglycemia

a. Hypoglycemia classifications

i. Hypoglycemia alert value (level 1) - blood glucose **≤70 mg/dL**. Should prompt treatment with fast-acting carbohydrate and dose adjustment of glucose lowering therapy.

ii. Clinically significant hypoglycemia (level 2) – blood glucose **<54 mg/dL**. Sufficiently low to indicate serious, clinically important hypoglycemia.

iii. Severe hypoglycemia (level 3) - No specific glucose threshold. Hypoglycemia **associated with severe cognitive impairment requiring external assistance** for recovery.

b. Hypoglycemia treatment

i. Treat conscious individuals with blood glucose ≤70 mg/dL with 15-20 grams oral glucose, or any form of carbohydrate that contains glucose. Repeat treatment after 15 minutes if SMBG shows continued hypoglycemia. Once SMBG returns to normal, individual should eat a meal or snack to prevent recurrence of hypoglycemia.

ii. Prescribed glucagon for all individuals at increased risk of clinically-significant

hypoglycemia. Family members/friends/caregivers should know where glucagon is kept and when and how to administer it.

iii. Re-evaluate treatment regimen in all patients with hypoglycemia

F. PHARMACOLOGIC APPROACHES TO GLYCEMIC TREATMENT

1. Type 1 diabetes- Refer individuals with type 1 diabetes to Endocrinology for ongoing management.
2. Type 2 diabetes- general recommendations
    a. Individualized glycemic management can be achieved by following the steps outlined in the Decision Cycle for Patient-centered Glycemic Management in Type 2 Diabetes figure from the ADA Standards 2019 document (See ADA Standards, Figure 4.1)
3. Type 2 diabetes management- (See ADA Standards, Figure 9.1)
    a. **First-line** therapy for **ALL** individuals with type 2 diabetes- **metformin** and comprehensive lifestyle interventions including weight management and physical activity. Consider early combination therapy if A1c is > 9.5% or > 1.5% above goal
    b. **Intensification** of therapy for individuals **WITH established ASCVD or CKD** (See ADA/EASD Consensus Report, Figure 3) - SGLT2i or GLP-1 RA with proven ASCVD/CKD benefit are preferred.
        i. If **A1c is AT GOAL**, individual is already **on two or more** glucose lowering medications, and is **NOT on an SGLT2i or GLP-1 RA**,
            a. Consider **switching** to agent with proven CVD benefit as detailed below, **OR**
            b. Reconsider/**lower A1c goal** and **add** SGLT2i or GLP-1 RA, **OR**
            c. **Reassess A1c every 3 months** and add SGLT2i or GLP-1RA if A1c increases above goal
        ii. **If ASCVD predominates**,
            a. **Second-line** agent- **GLP-1 RA** and **SGLT2i** are preferred
                i. **GLP-1 RA with proven CVD benefit** (strongest evidence for liraglutide > semaglutide > exenatide extended release), **OR**
                ii. **SGLT2i with proven CVD benefit** if eGFR adequate (evidence modestly stronger for empagliflozin > canagliflozin; see ADA Standards, Table 9.1 for renal dosing recommendations)
            b. **Fourth- or fifith-line- DPP-4i** if not on GLP1 RA**, Basal insulin** (degludec or U100 glargine have demonstrated CVD safety), **TZD, Sulfonylurea** (choose later generation SU with lower risk of hypoglycemia)
        iii. **If HF or CKD predominates**,
            a. **Second-line- SGLT2i with evidence of reducing HF and/or CKD progression** if eGFR is adequate (empagliflozin or canagliflozin; see ADA Standards, Table 9.1 for renal dosing recommendations)
            b. **Third-line-** if SGLT2i not tolerated or contraindicated or if eGFR less than adequate

add **GLP-1 RA with proven CVD benefit** (strongest evidence for liraglutide > semaglutide > exenatide extended release; caution in ESRD)

c. **Fourth- or fifith-line-** (**Avoid** TZD in the setting of HF)

i. **DPP-4i (not** saxagliptin**)** in the setting of HF (if not on GLP-1 RA)

ii. **Basal insulin** (degludec or U100 glargine have demonstrated CVD safety)

iii. **Sulfonylurea** (choose later generation SU with lower risk of hypoglycemia)

c. **Intensification** of therapy for individual **WITHOUT established ASCVD or CKD**

i. If compelling **need to minimize hypoglycemia** (See ADA/EASD Consensus Report, Figure 5)

a. **Second-line**

i. **DPP4i** or **GLP-1 RA**, OR

ii. **SGLT2i** if eGFR adequate (see ADA Standards, Table 9.1 for renal dosing recommendations), OR **TZD**

b. **Fifth and sixth-line** agents:

i. **Later generation sulfonylurea (SU)**

ii. **Basal insulin** with lower risk of hypoglycemia (Degludec/glargine U300 < glargine U100 < NPH insulin)

ii. If compelling **need to minimize weight gain or promote weight loss** (See ADA/EASD Consensus Report, Figure 4)

a. **Second- and third-line**

i. **GLP-1 RA** with good efficacy for weight loss (semaglutide > liraglutide > dulaglutide > exenatide > lixisenatide), OR

ii. **SGLT2i** if eGFR adequate (see ADA Standards, Table 9.1 for renal dosing recommendations),

b. **Fourth-line**

i. **Add DPP-4i** if not on GLP-1 RA, **OR**

ii. **If DPP-4i not tolerated on contraindicated or patient on GLP-1 RA, cautious addition** of: **later generation SU**, **low dose TZD**, or **basal insulin**

iii. **If Cost** is a major issue for patient, and **no specific comorbidities** (no established CVD or CKD, lower risk of hypoglycemia, and lower priority to avoid weight gain or no weight-related comorbidities); (See ADA/EASD Consensus Report, Figure 6). NOTE- Standards of care recommendations should be followed for all patients regardless of payer source or insurance. Low-cost algorithm should only be followed if patient is unable to otherwise afford recommended medication regimen. Discount programs and Patient Assistance Programs are available for most Denver Health patients who do not have health insurance.

a. **Second-line**- (Add **based on lowest cost for patient)**:

i. **later generation SU**, OR

ii. **TZD** (low-dose TZDs are better tolerated), OR

iii. **DPP-4i**, OR

iv. **SGLT2i**

b. **consider addition** of **basal insulin with lowest acquisition cost**

d. **Intensification** to **injectable therapies** (See ADA Standards, Figure 9.2)

i. Consider initial injectable combination (i.e. GLP-1 RA + basal insulin or prandial/basal insulin) if A1c >10% or >2% above goal

ii. If A1c above target despite dual/triple therapy

a. Consider GLP-1 RA prior to insulin in most patients. If CVD, consider GLP-1 RA with proven CVD benefit

b. Consider insulin as first injectable if A1c >11%, symptoms or evidence of catabolism suggestive of insulin deficiency (weight loss, polyuria, polydipsia), or if type 1 diabetes is a possibility (refer to Endocrinology for evaluation and management).

c. If already on GLP-1 RA or if GLP-1 RA not appropriate OR insulin preferred, proceed with addition of insulin (see below)

iii. If A1c continues above goal after 3 months of maximum-tolerated dose of GLP-1 RA, add basal insulin.

a. Initiation for basal insulin- start 10 units/day OR 0.1-0.2 units/kg/day.

b. Titration for basal insulin- Instruct patient on self-titration or refer to Nurse-run insulin titration program. Set fasting plasma glucose target that correlates to A1c goal (See section 5) GLYCEMIC MONITORING AND TARGETS, d) SMBG goal). Choose evidence-based titration algorithm, i.e. increase 2 units every 3 days to reach fasting glucose target without hypoglycemia. Determine cause for hypoglycemia if it occurs. If no clear reason, lower dose by 10-20%

c. For patients on GLP-1 RA and basal insulin, consider referral to Endocrinology for consideration of fixed dose GLP-1 RA/insulin combination pens (iDegLira or iGlarLixi)

iv. If A1c continues above goal after 3 months despite adequately titrated basal insulin, OR once basal dose >0.7-1.0 units/kg OR fasting glucose at target, add prandial insulin

a. Initiation- Dose prandial insulin with largest meal or meal with greatest postprandial glucose excursion. Rapid-acting analog insulin (lispro/Humalog or aspart/Novolog) is preferred over regular insulin due to its shorter duration of action. Start with 4 units per day or 10% of basal dose. If A1c <8%, consider lowering the total insulin dose by 4 units per day or 10% of basal dose.

b. Titration of prandial insulin- Increase dose by 1-2 units or 10-15% twice weekly. Determine cause for hypoglycemia if it occurs. If no clear reason, lower corresponding dose by 10-20%. If A1c continues above goal after 3 months, despite 1 injection of prandial insulin daily, add additional injections of prandial insulin. Add 1 injection of

prandial insulin with second-largest meal or meal with second-largest glucose excursion. NOTE- stepwise addition of prandial insulin every 3 months is associated with lower risk of hypoglycemia and increased patient satisfaction compared with immediate introduction of full basal-bolus regimen

v. Consider twice or three times daily premixed insulin regimen instead of basal-bolus injections

a. Regular/NPH premixed insulin is more affordable than analog premixed insulin (Humalog 70/30 but has higher risk of hypoglycemia due to its physiologic action profile

b. Initiation of premixed insulin twice daily- In insulin-naïve patients, start 10-12 units or 0.3 units/kg. If already on insulin, divide current basal dose into ⅔ AM and ⅓ PM, OR ½ AM and ½ PM

c. Titration of premixed insulin twice daily- Increase dose by 1-2 units or 10-15% once or twice weekly until SMBG target is reached. Determine and address cause for hypoglycemia. If no clear cause, decrease corresponding dose by 2-4 units or 10-20%.

d. Titration to premixed insulin three times daily- Add additional injection before lunch. Increase dose by 1-2 units or 10-15% once or twice weekly until SMBG target is reached. Determine and address cause for hypoglycemia. If no clear cause, decrease corresponding dose by 2-4 units or 10-20%.

vi. Considerations for oral therapy in combination with injectable therapies

a. Metformin- continue treatment with metformin

b. TZD- consider reducing dose or stopping when adding insulin to avoid fluid retention and/or weight gain

c. Sulfonylurea- Stop, or reduce dose by 50% when basal insulin started to avoid hypoglycemia. Stop if prandial insulin or premixed insulin is started.

d. SGLT2i- Continue SGLT2i when adding injectable therapy. Consider adding SGLT2i when on injectable therapy if patient has established ASCVD, if A1c above target, or as weight reduction aid. Beware euglycemic DKA in type 1 DM.

e. DPP-4i- stop if GLP1 RA started

4. REFERRALS

a. Patients who require titration of basal insulin can be referred to RN for Insulin Titration Protocol

b. Referral to Clinical Pharmacist is recommended for patients who have inadequate glycemic control and are on complex medical regimens and/or have diabetes comorbidities requiring medical management.

c. Management by Endocrinology is recommended for the following patients with diabetes:

i. Patients with type 1 diabetes

ii. Patients on an insulin pump

iii. Patients receiving concentrated insulin

iv. Patients with history of severe or clinically significant hypoglycemia (severe cognitive impairment requiring external assistance for recovery, history of confirmed BG <54 mg/dL, or BG <70 mg/dL despite medication adjustment after initial occurrence)

v. Patients with hypoglycemia unawareness

vi. Patients with ESRD, on dialysis

vii. Patients with steroid-induced hyperglycemia

G. CARDIOVASCULAR DISEASE AND RISK MANAGEMENT

1. Hypertension/Blood pressure control

a. Diagnosis – hypertension is defined as a sustained blood pressure >=140/90 mmHg.

b. Treatment Goals

i. ASCVD risk score <15% - treat to blood pressure goal of <140/90 mmHg

ii. ASCVD risk score >15% - treat to blood pressure goal of <130/80 mmHg

c. Treatment Strategies for Hypertension in Patients with Diabetes (See ADA Standards, Figure 10.1)

i. Choice of agent

a. - If albuminuria- start ACEi or ARB agent

b. - If no albuminuria- start ACEi, ARB, CCB, or Diuretic (chlorthalidone and indapamide preferred)

ii. For patients with blood pressure >=160/100 mmHg- start lifestyle intervention and two blood pressure agents

iii. For patients with blood pressure not at target after maximum-tolerated titration of above agents- consider addition of Mineralocorticoid Receptor Antagonist

2. Lipid Management

a. Screening and monitoring

i. Patients not on statins or other lipid-lowering therapy should have fasting lipids checked at time of diabetes diagnosis, at initial medical evaluation, and **every 1-5 years** thereafter depending on risk for ASCVD

ii. Patients with dyslipidemia and/or on lipid therapy should have fasting lipids **every year** to monitor response to therapy and adherence

b. Risk evaluation and Management

i. **Familial Hypercholesterolemia**- Patients with LDL>=190 mg/dL, regardless of age, should be treated with high dose statin therapy and referred to Endocrinology for evaluation of Familial Hypercholesterolemia and further management

ii. **Secondary Prevention** - Patients with diabetes and **ASCVD**, regardless of age, should be

treated with **high** dose statins +/- ezetimibe or PCSK9 inhibitor to **LDL goal <70 mg/dL**

iii. **Primary Prevention**-

a. Patients with baseline LDL<190 mg/dL, no ASCVD, and **age >=40 years** should be started on **moderate** dose statin therapy

b. Consider moderate dose statin therapy in patients **younger** than 40 years with **high risk for ASCVD**

c. Moderate- and High-Intensity Statin Therapy

i. **Moderate-Intensity**- lowers LDL cholesterol by 30-50%:
- Atorvastatin/Lipitor 10-20 mg
- Rosuvastatin/Crestor 5-10 mg
- Simvastatin/Zocor 20-40 mg
- Pravastatin/Pravachol 40-80 mg
- Fluvastatin/Lescol XL 80 mg
- Pitavastatin/Livalo 2-4 mg

ii. **High-Intensity**- lowers LDL cholesterol by >=50%
- Atorvastatin/Lipitor 40-80 mg
- Rosuvastatin/Crestor 20-40 mg

3. Antiplatelet Agents

a. Secondary Prevention- Patients with diabetes and ASCVD

i. aspirin therapy (75-162 mg/day)

ii. clopidogrel (75 mg/day) if allergic to aspirin

b. Primary Prevention- Patients with diabetes and NO ASCVD

i. Determine cardiovascular risk and safety profile. Consider aspirin (75-162 mg/day) for patients with:

a. Type 1 or 2 diabetes, AND

b. >=50 years of age, AND

c. At least 1 additional major risk factor:
- Family history of premature ASCVD
- Hypertension
- Dyslipidemia
- Smoking
- Albuminuria

d. AND, not at increased risk of bleeding

4. Coronary Heart Disease

a. Screening- consider screening in the presence of any of the following:

i. Atypical cardiac symptoms (e.g., unexplained dyspnea, chest discomfort)

ii. Signs or symptoms of associated vascular disease including carotid bruits, transient

ischemic attack, stroke, claudication, or peripheral arterial disease, OR

iii. Electrocardiogram abnormalities (e.g., Q waves)

b. Treatment

i. In patients with known ASCVD, consider ACEi or ARB to reduce the risk of cardiovascular events

ii. In patients with prior MI, continue beta-blockers for at least 2 years after the event

iii. In patients with CHF, metformin can be used if eGFR remains >30 mL/min/1.73 m^2 but should be avoided in unstable or hospitalized patients

c. In patients with ASCVD, antihyperglycemic therapy should begin with lifestyle management and metformin and subsequently incorporate an agent proven to reduce major adverse cardiovascular events and cardiovascular mortality (see Section 6, PHARMACOLOGIC APPROACHES TO GLYCEMIC TREATMENT)

H. MICROVASCULAR COMPLICATIONS AND FOOT CARE

1. Diabetic Kidney Disease

a. Screening- assess urinary albumin and assess glomerular filtration rate at least once per year in patients with:
- Type 1 diabetes with duration of >=5 years
- Type 1 diabetes and comorbid hypertension
- Type 2 diabetes

b. Treatment

i. Optimize glucose control

ii. Optimize blood pressure control

iii. For patients with nondialysis-depended diabetic kidney disease, limit dietary protein intake to no more than 0.8g/kg body weight/day.

iv. Use ACEi or ARB as first-line treatment for hypertension in patient with proteinuria and/or decreased eGFR.

v. Consider use of SGLT2i or GLP-1 RA as second-line treatment (after metformin) for glycemic control in patients with chronic kidney disease (See Section 6, PHARMACOLOGIC APPROACHES TO GLYCEMIC TREATMENT)

vi. Monitoring of urinary albumin-to-creatinine ratio in patients with albuminuria treated with ACEi or ARB is reasonable to assess response to treatment and progression of diabetic kidney disease.

vii. Patients with eGRF <30 mL/min/1.73 m^2, uncertain etiology of kidney disease, rapidly progressing kidney disease, or difficult management issues should be referred to Nephrology for evaluation and treatment.

2. Diabetic Retinopathy

a. Screening

i. Adults with type 1 diabetes- initial dilated and comprehensive eye examination within 5 years of onset of diabetes

ii. Type 2 diabetes- initial dilated and comprehensive eye examination at time of diagnosis

iii. Continue screening every 1-2 years if no evidence of retinopathy and glycemia is well controlled; every year or more frequently if diabetic retinopathy is present.

b. Management

i. Patients with any level of macular edema, severe non-proliferative retinopathy, or any proliferative diabetic retinopathy, should be managed by Ophthalmology.

3. Neuropathy

a. Screening

i. Screen patients with type 1 diabetes starting 5 years after diagnosis, and then annually

ii. Screen patients with type 2 diabetes at diagnosis and then annually

iii. Assess for distal symmetric polyneuropathy with:
- Temperature or pinprick sensation (small fiber function)
- Vibration sensation using 128-Hz tuning fork (large-fiber function)
- 10-g monofilament test- protective sensation (risk for ulceration and amputation)

b. Differential diagnosis- diabetic neuropathy is a diagnosis of exclusion. Consider other causes of neuropathy including:
- Vasculitis
- Inherited neuropathies
- Chronic inflammatory demyelinating neuropathy
- Infections (HIV)
- Malignancies (multiple myeloma, bronchogenic carcinoma)
- Renal disease
- Hypothyroidism
- Vitamin B12 deficiency (increased risk with metformin therapy)
- Neurotoxic medications (chemotherapy)
- Toxins (alcohol)

c. Treatment

i. Optimize glucose control to prevent or delay the development of neuropathy in patients with type 1 diabetes and too slow the progression of neuropathy in patients with type 2 diabetes

ii. Assess and treat to reduce pain related to diabetic peripheral neuropathy and symptoms of autonomic neuropathy and to improve quality of life

iii. Pregabalin/Lyrica or duloxetine/Cymbalta are recommended as initial treatments for neuropathic pain

iv. Medications not approved for the treatment of painful diabetic peripheral neuropathy (tricyclic antidepressants, gabapentin, venlafaxine, tramadol, and topical capsaicin) may also be effective and can be considered for use.

4. Foot Care

    a. Evaluation

        i. A comprehensive foot evaluation is recommended at least annually to identify risk factors for ulcers and amputations.

        ii. Foot examination should include:
        - Inspection of the skin
        - Assessment of foot deformities
        - Neurological assessment (10-g monofilament testing with at least one other assessment: pinprick, temperature, vibration), and
        - vascular assessment including pulses in the legs and feet

        iii. Patients with symptoms of claudication or decreased or absent pedal pulses should be referred for ankle-brachial index and for further vascular assessment as appropriate

    b. Prevention and Treatment

        i. Provide general preventive foot self-care education to all patients with diabetes

        ii. Specialized therapeutic footwear is recommended for patients with high risk for diabetic ulcers including those with severe neuropathy, foot deformities, or history of amputation

        iii. Refer patients with foot ulcers to the DH Wound Care clinic

PROCEDURES

Follow treatment recommendations detailed in the most current American Diabetes Association Standards of Medical Care in Diabetes document and additional specific Denver Health recommendations detailed in this Guideline.

EXTERNAL REFERENCES

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ATTACHMENTS

None

Attachments

No Attachments

Approval Signatures

Step Description	Approver	Date
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Nursing Services Advisory Council	Adrianne Bauer: RN Nursing Program Mgr.	01/2019
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Applicability

Denver Health