GLIN IPA

2023

Clinical Care Pathway: Diabetes

Clinical Care Pathway: Diabetes

Purpose & Objective

This protocol provides evidence-based care recommendations in the screening and treatment of type 2 diabetes in the primary care setting for adults. The protocol seeks to assist in early diagnosis and effective treatment of type 2 diabetes. The diabetes protocol should provide primary care physicians, family nurse practitioners, and physician's assistants with a guide that is evidence-based and cost effective. This pathway was derived from the American Diabetes Association and the American Association of Clinical Endocrinology clinical guidelines for individuals diagnosed with type 2 diabetes as well as primary literature referenced.

Goals of Care

- Optimize quality of life
- Prevent complications
- Treatment goals and plans should be created with patients based on their individual preferences, values, and goals

Prevention or Delay of Type 2 Diabetes

- Monitor for the development of type 2 diabetes in those with prediabetes at least annually, modified based on individual risk/benefit assessment.
- More intensive preventive approaches should be considered in individuals who are at particularly high risk of progression to diabetes, including individuals with BMI ≥ 35 kg/m2, those at higher glucose levels (e.g. fasting plasma glucose 110-125 mg/dL, 2-h post-challenge glucose 173-199 mg/dL, A1C ≥ 6.0%), and individuals with a history of gestational diabetes Mellitus

Criteria for Screening for Diabetes

Criteria for screening for diabetes or prediabetes in asymptomatic adults
Testing should be considered annually in adults with overweight or obesity (BMI ≥ 25 kg/m2 or ≥ 23 kg/m2 in Asian Americans) who have one or more of the following risk factors:First degree relative with diabetes • First-degree relative with diabetes • High-risk race/ethnicity (ex. African American, Latino, Native American, Asian American, Pacific Islander) • History of cardiovascular disease • Hypertension (≥ 140/90 mmHg or on therapy for hypertension) • HDL cholesterol level < 35 mg/dL (0.90 mmol/L) and/or a triglyceride level > 250 mg/dL (2.82 mmol/L) • Women with polycystic ovary syndrome • Physical inactivity • Prescribed medications which could raise blood sugar levels (ie: chronic glucocorticoids, statins, antipsychotics) • Other clinical conditions associated with insulin resistance (ex. severe obesity, acanthosis nigricans)
Patients with prediabetes (A1C ≥ 5.7% [39 mmol/mol], impaired glucose tolerance, or impaired fasting glucose) should be tested yearly
All pregnant women at 24 to 28 weeks gestation
Women who were diagnosed with gestational diabetes mellitus should have lifelong testing at least every 3 years
For all other patients, testing should begin at age 35 years
People with HIV at the start of therapy, and annually thereafter
If results are within normal limits, testing should be repeated at a minimum of 3-year intervals, with consideration of more frequent testing depending on initial results and risk status

Defining Prediabetes

Criteria defining prediabetes*
Fasting plasma glucose 100 mg/dL (5.6 mmol/L) to 125 mg/dL (6.9 mmol/L) (impaired fasting glucose)
OR
2-h plasma glucose during oral glucose tolerance test 140 mg/dL (7.8 mmol/L) to 199 mg/dL (11.0 mmol/L) (impaired glucose tolerance)
OR
A1C 5.7-6.4% (39-47 mmol/mol)

*For all three tests, risk is continuous, extending below the lower limit of the range and becoming disproportionately greater at the higher end of the range)

Early Intervention

Diabetes Prevention Program (DPP)

- Adults with overweight/obesity and risk factors for type 2 diabetes should be referred to DPPs, or other intensive lifesyle change program to help achieve and maintain 7% loss of initial body weight and increase moderate-intensity physical activity (such as brisk walking) to at least 150 min/week

Treatment of modifiable cardiovascular disease risk factors (pre-diabetes)

- Evaluation of tobacco use should occur and if indicated, referral for tobacco cessation should be part of routine care for those at risk for diabetes
- Statin therapy may increase the risk of type 2 diabetes in people at high risk of developing type 2 diabetes. In individuals, glucose status should be monitored regularly and diabetes prevention approaches reinforced. It is NOT recommended that statins be discontinued
- A1c and serum lipids measured annually
- Weight loss encouraged at every visit to reduce insulin resistance and impaired insulin secretion
- At every visit -blood pressure and weight should be monitored

Early Intervention
(CONTINUED)

Metformin therapy for prevention of type 2 diabetes

- Considered in adults with prediabetes, especially those
  - aged 25–59 years with BMI ≥35 kg/m2 ,
  - higher fasting plasma glucose (e.g., ≥110 mg/dL),
  - higher A1C (e.g., ≥6.0%),
  - women with prior gestational diabetes mellitus
- Consider for patients in whom lifestyle interventions fail to improve glycemic indices
- A1c and lipids monitored annually
- Avoid in patients with an eGFR ≤ 30ml/min/m2

Pioglitazone therapy for lowering risk of stroke or myocardial infarction

- In people with a history of stroke and evidence of insulin resistance and prediabetes, pioglitazone may be considered to lower risk of stroke or mycardial infarction
- This benefit should be balanced with the risks of pioglitazone therapy, including weight gain, edema and fracture
- Consider for patients in whom lifestyle interventions fail to improve glycemic indices
- Monitor A1c, lipids, LFTs and serum bilirubin annually
- Consider using pioglitazone at lower doses 15 or 30 mg per day to reduce risk of adverse effects

Diagnosis of type 2 diabetes

Criteria for the diagnosis of type 2 diabetes
Fasting plasma glucose ≥ 126 mg/dL (7.0 mmol/L). Fasting defined as no caloric intake for at least 8 hours
OR
2-h plasma glucose ≥ 200 mg/dL (11.1 mmol/L) during oral glucose tolerance test. The test should be performed as described by World Health Organization, using a glucose load containing the equivalent of 75 grams of anhydrous glucose dissolved in water
OR
A1C ≥ 6.5% (48 mmol/mol). The test should be performed in a laboratory using a method that is NGSP certified and standardized to the Diabetes Control and Complications Trial assay*
OR
In a patient with classic symptoms of hyperglycemia or hyperglycemic crisis, a random plasma glucose ≥ 200 mg/dL (11.1 mmol/L)

***in the absence of unequivocal hyperglycemia, diagnosis requires two abnormal test results from the same sample or in two separate test samples**

***in patients with CKD or anemia, A1c POC testing may not be accurately reflective of glycemic control. Consider alternative forms of glucose testing, ie: fructosamine when self monitored blood glucose readings and A1c results are disconcordant**

Comprehensive Medical Evaluation and Assessment of Comorbidities

*Every Follow up Visit defined as annually for patients who are at their A1C goal and as every 3-6 months for patients who are NOT at their A1C goal

Table 4.1 - Components of the comprehensive diabetes medical evaluation at initial, follow-up, and annual visits

		INITIAL VISIT	EVERY FOLLOW-UP VISIT	ANNUAL VISIT
PAST MEDICAL AND FAMILY HISTORY	**Diabetes history**			
	▪ Characteristics at onset (e.g., age, symptoms)	✓		
	▪ Review of previous treatment regimens and response	✓		
	▪ Assess frequency/cause/severity of past hospitalizations	✓		
	Family history			
	▪ Family history of diabetes in a first-degree relative	✓		
	▪ Family history of autoimmune disorder	✓		
	Personal history of complications and common comorbidities			
	▪ Common comorbidities (e.g., obesity, OSA, NAFLD)	✓		✓
	▪ High blood pressure or abnormal lipids	✓		✓
	▪ Macrovascular and microvascular complications	✓		✓
	▪ Hypoglycemia: awareness/frequency/causes/timing of episodes	✓	✓	✓
	▪ Presence of hemoglobinopathies or anemias	✓		✓
	▪ Last dental visit	✓		✓
	▪ Last dilated eye exam	✓		✓
	▪ Visits to specialists	✓	✓	✓
	Interval history			
	▪ Changes in medical/family history since last visit		✓	✓
BEHAVIORAL FACTORS	▪ Eating patterns and weight history	✓	✓	✓
	▪ Assess familiarity with carbohydrate counting (e.g., type 1 diabetes, type 2 diabetes treated with MDI)	✓		✓
	▪ Physical activity and sleep behaviors	✓	✓	✓
	▪ Tobacco, alcohol, and substance use	✓		✓
MEDICATIONS AND VACCINATIONS	▪ Current medication regimen	✓	✓	✓
	▪ Medication-taking behavior	✓	✓	✓
	▪ Medication intolerance or side effects	✓	✓	✓
	▪ Complementary and alternative medicine use	✓	✓	✓
	▪ Vaccination history and needs	✓		✓
TECHNOLOGY USE	▪ Assess use of health apps, online education, patient portals, etc.	✓		✓
	▪ Glucose monitoring (meter/CGM): results and data use	✓	✓	✓
	▪ Review insulin pump settings and use, connected pen and glucose data	✓	✓	✓
SOCIAL LIFE ASSESSMENT	**Social network**			
	▪ Identify existing social supports	✓		✓
	▪ Identify surrogate decision maker, advanced care plan	✓		✓
	▪ Identify social determinants of health (e.g.., food security, housing stability & homelessness, transportation access, financial security, community safety)	✓		✓

Comprehensive Medical Evaluation and Assessment of Comorbidities

(CONTINUED)

PHYSICAL EXAMINATION	▪ Height, weight, and BMI; growth/pubertal development in children and adolescents	✓	✓	✓
	▪ Blood pressure determination	✓	✓	✓
	▪ Orthostatic blood pressure measures (when indicated)	✓		
	▪ Fundoscopic examination (refer to eye specialist)	✓		✓
	▪ Thyroid palpation	✓		✓
	▪ Skin examination (e.g., acanthosis nigricans, insulin injection or insertion sites, lipodystrophy)	✓	✓	✓
	▪ Comprehensive foot examination			
	• Visual inspection (e.g., skin integrity, callous formation, foot deformity or ulcer, toenails)**	✓		✓
	• Screen for PAD (pedal pulses—refer for ABI if diminished)	✓		✓
	• Determination of temperature, vibration or pinprick sensation, and 10-g monofilament exam	✓		✓
	▪ Screen for depression, anxiety, and disordered eating	✓		✓
	▪ Consider assessment for functional performance*	✓		✓
	▪ Consider assessment for functional performance*	✓		✓
LABORATORY EVALUATION	▪ A1C, if the results are not available within the past 3 months	✓	✓	✓
	▪ If not performed/available within the past year	✓		✓
	• Lipid profile, including total, LDL, and HDL cholesterol and triglycerides#	✓		✓^
	• Liver function tests#	✓		✓
	• Spot urinary albumin-to-creatinine ratio	✓		✓
	• Serum creatinine and estimated glomerular filtration rate*	✓		✓
	• Thyroid-stimulating hormone in patients with type 1 diabetes#	✓		✓
	• Vitamin B12 if on metformin	✓		✓
	• Serum potassium levels in patients on ACE inhibitors, ARBs, or diuretics+	✓		✓

ABI, ankle-brachial pressure index; ARBs, angiotensin receptor blockers; CGM, continuous glucose monitors; MDI, multiple daily injections; NAFLD, nonalcoholic fatty liver disease; OSA obstructive sleep apnea;PAD, peripheral arterial disease

*At 65 years of age or older

+May be needed more frequently in patients with known chronic kidney disease or with changes in medications that affect kidney function and serum potassium (see Table 11.1)

#May also need to be checked after initiation or dose changes of medications that affect these laboratory values (i.e., diabetes medications, blood pressure medications, cholesterol medications, or thyroid medications)

^In people without dyslipidemia and not on cholesterol-lowering therapy, testing may be less frequent

**Should be performed at every visit in patients with sensory loss, previous foot ulcers, or amputations

Vaccinations as part of comprehensive care

For details regarding vaccination recommendations – please see Appendix 1

Lifestyle modifications

For details regarding recommendations – please see Appendix 2

Recommendations for multidisciplinary approach

Consider referral to GLIN Pharmacy Team if patient has one or more of the following:	• A1C > 8% • Utilizes continuous glucose monitoring devices • Utilizes insulin pump technology
Consider referral to nutrition services/ Diabetes Self Management Education (DSME) classes if patient has one or more of the following:	• A1C > 5.7% • Body mass index of ≥ 35 kg/m2
Consider referral to endocrinology if:	• Goals not met within 6mo using internal resources • Patient has other conditions that would require specialist care • Pediatric (< 18 years old) population • Patient and/or provider preference

Glycemic Targets

A1c goal	Fasting glucose target	Prandial glucose targets	Recommended population
<6.5%	70-110 mg/dl	< 140 mg/dl	• Low risk of hypoglycemia (minimal to no drug-drug interactions that would worsen hypoglycemia) • Long life expectancy • Extensive resources and support system in place • No existing comorbidities of significance** • Intact cognitive and functional status
<7%	80-130 mg/dl	< 180 mg/dl	• Access to resources and a support system • Few/mild important comorbidities** • Intact cognitive and functional status
<8%	90-150 mg/dL	< 200 mg/dl	• High risk of hypoglycemia • Inability to assess and treat hypoglycemia events • Limited resources and support system • Multiple comorbidities of significance** • May have some cognitive impairment affecting activities of daily living
<8.5%	100-175 mg/dL	< 225 mg/dl	• Limited life expectancy • Severe comorbidities of significance** • End stage chronic illness§ • Severe cognitive impairment affecting activities of daily living

**Comorbidities of significance include (but are not limited to) obesity, dyslipidemia, hypertension, coronary heart disease, peripheral vascular disease, myocardial infarction, stroke, congestive heart failure, chronic obstructive pulmonary disease, depression, obstructive sleep apnea

§ Presence of a single end-stage chronic illness, such as stage 3 or 4 heart failure or oxygen-dependent lung disease,

Hypoglycemia

Classification of hypoglycemia	
Level 1	Glucose < 70 mg/dL and ≥ 54 mg/dL
Level 2	Glucose < 54 mg/dL
Level 3	A severe event character

- Occurrence and risk for hypoglycemia should be reviewed at every encounter and investigated as indicated
- Glucose (approximately 15-20g) is the preferred treatment for the conscious individual with blood glucose < 70 ml/dL, although any form of carbohydrate that contains glucose may be used. Fifteen minutes after treatment, if blood glucose monitoring shows continued hypoglycemia, the treatment should be repeated. Once the blood glucose monitoring pattern is trending up, the individual should consume a meal or snack to prevent recurrence of hypoglycemia
- Glucagon should be prescribed for all individuals at increased risk of level 2 or 3 hypoglycemia, so that it is available should it be needed. Caregivers, school personnel or family members providing support to these individuals should know where it is and when and how to administer it. Glucagon administration is not limited to health care professionals.

Diabetes Technology

- Continuous glucose monitoring
  - Real-time continuous glucose monitoring and other glucose monitoring systems are recommended for persons with type 2 diabetes who are treated with insulin therapy or who have high risk for hypoglycemia and/or with hypoglycemia unawareness
  - AACE recommends 2 metrics, percent TIR (>70%) and percent time below range (<70 mg/dl [<4%] and < 54 mg/dl [<1%] to be used as a starting point for the assessment of quality of glycemic control and as the basis for therapy adjustment
  - There is emerging evidence that CGM is efficacious in reducing hyperglycemia and A1C levels in insulin-treated persons with T2D, including those taking 1 or 2 doses of basal insulin
  - Health care providers should be aware of medications and other factors, such as high dose vitamin C (> 500 mg per day), high dose acetaminophen (> 1 g every 6 hours), hydroxyurea (dose not specified) and hypoxemia, that can interfere with glucose meter accuracy and provide clinical management as indicated
  - In patients on multiple daily injections and continuous subcutaneous insulin infusion, real time continuous glucose monitoring devices should be used as close to daily as possible for maximal benefit.
  - Intermittently scanned continuous glucose monitoring (CGM) devices should be scanned frequently, at a minimum once every 8 hours

Recommended candidates for continuous glucose monitors

- Uncontrolled type 2 diabetics that have not shown ability to accurately perform finger stick testing or ability to consistently finger stick test
- Type 2 diabetics with lack of hypoglycemia awareness
- Type 2 diabetics using insulin therapy (whether basal or bolus insulin therapy, however especially for patients utilizing bolus insulin therapy)
- Patients on insulin pumps

Insurance coverage of continuous glucose monitors varies greatly. Most insurance companies require stipulations such as:

- Type 1 diabetes diagnosis
- 3+ administrations on insulin per day or utilizing an insulin pump
- Documentation that patient requires frequent adjustment to insulin based on glucose results
- Testing at least 4 times per day

THESE ARE NOT UBIQUITOUS ACROSS ALL PAYERS, IF THERE ARE SPECIFIC QUESTIONS RELATED TO PRODUCT AND PAYER, THE GLIN PHARMACY TEAM CAN ASSIST IN REVIEWING

- Insulin pumps
  - Automated insulin delivery systems should be offered for diabetes management to adults with types of insulin-deficient diabetes who are capable of using the device safely (either by themselves or with caregivers). The choice of device should be made based on patient circumstances, desires, and needs

Recommended candidates for insulin pumps

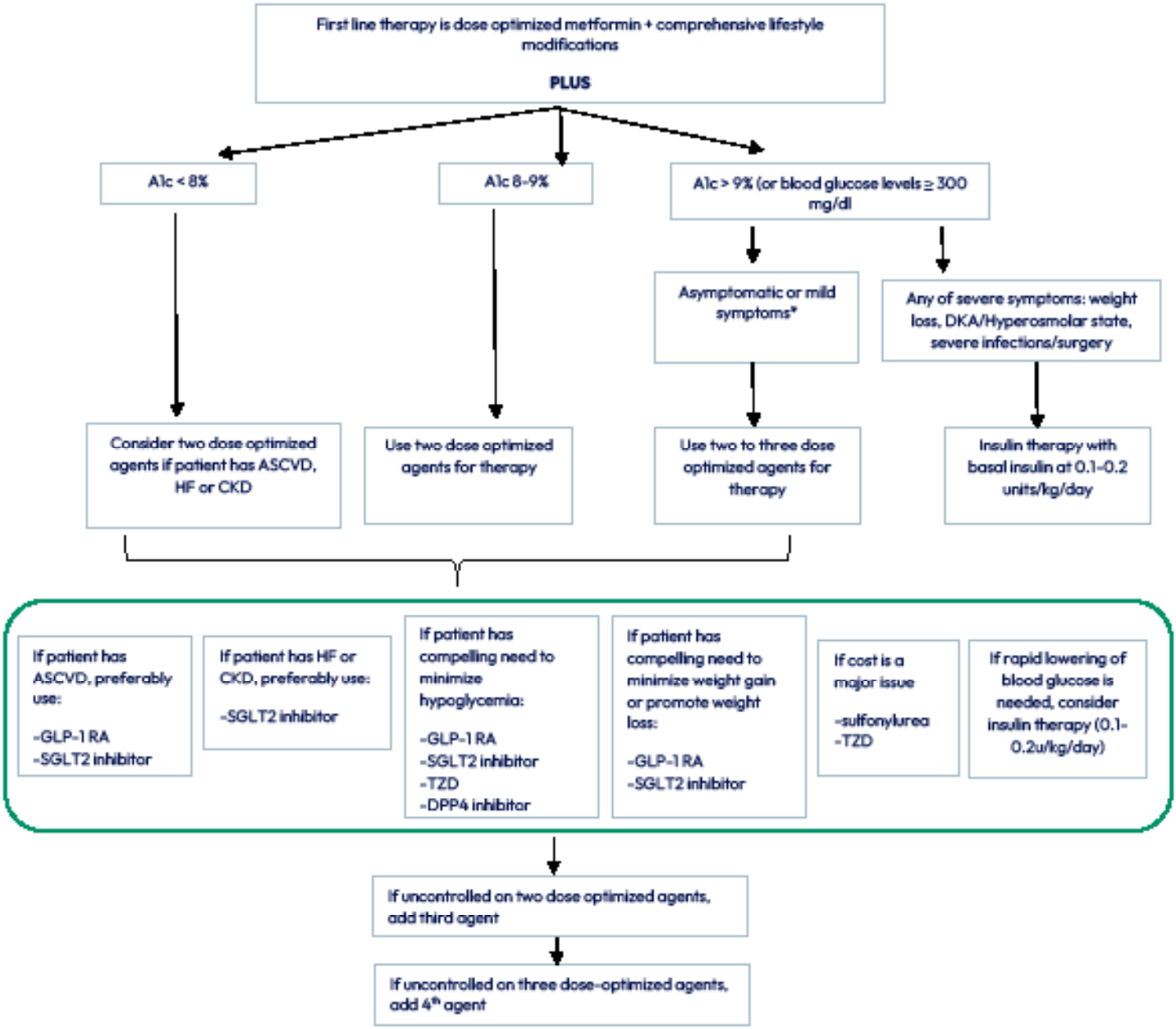
- Requiring frequent multiple daily insulin injections
- Labile blood glucose that requires different insulin dosing profiles
- Willingness to check blood sugar multiple times per day, or those patients already using a continuous glucose monitor
- Ability to communicate well with providers and pump manufacturer surrounding any problem solving for pump technology should issues arise
- Ability to count carbohydrates accurately

Insurance coverage of insulin pumps varies greatly and may require prior authorizations with extra documentation of the patient's diabetes management.

IF THERE ARE SPECIFIC QUESTIONS RELATED TO PRODUCT AND PAYER, THE GLIN PHARMACY TEAM CAN ASSIST IN REVIEWING

Pharmacologic Therapy for Type 2 Diabetes

- First line therapy depends on comorbidities, patient-centered treatment factors and management needs and generally includes metformin and comprehensive lifestyle modification
  - Other medications (GLP1 RAs, SGLT2 inhibitors) with or without metformin based on glycemic needs, are appropriate initial therapy for individuals with type 2 diabetes with or at high risk for atherosclerotic cardiovascular disease (ASCVD), heart failure (HF) and/or chronic kidney disease (CKD)
- In adults with type 2 diabetes and established/high risk of atherosclerotic cardiovascular disease (ASCVD), heart failure, and/or chronic kidney disease, the treatment regimen should include agents that reduce cardio-renal risk
- Early introduction of insulin should be considered if there is evidence of ongoing weight loss, if symptoms of hyperglycemia are present, or when levels (A1C > 10% or blood glucose levels ≥ 300 mg/dL) are very high
- GLP1 RAs are preferred to insulin when possible
  - If insulin is used, combination therapy with a GLP 1 RA is recommended for greater efficacy and durability of treatment effect
- Clinicians should be aware of the potential for overbasalization with insulin therapy
  - Clinical signals that may prompt evaluation of overbasalization include basal dose more than 0.5 units/kg/day, high bedtime-morning or pre-prandial glucose differential, hypoglycemia (aware or unaware), and high glycemic variability
  - Indication of overbasalization should prompt reevaluation to further individualize therapy
- If A1C not at goal in 3 months, move to next step
  - A patient centered approach should be used to guide the choice of glucose lowering medication. Considerations include efficacy, cost, benefit, risk, contraindications, patient's preference and patient's characteristics such as prescence of ASCVD/HF/CKD (see table below of profiles of anti diabetic medications)
- Consider individualizing based on patient's A1C goal AND blood sugar readings



*mild symptoms include but not limited to: frequent urination, increased thirst, dry mouth, dry skin, blurry vision

ASCVD (Atherosclerotic cardiovascular disease) defined as all included individuals with established cardiovacular disease (myocardial infarction, stroke, any revascularization procedure), also transient ischemic attack, unstable angina, symptomatic or asymptomatic coronary artery disease

HF (heart failure), CKD (chronic kidney disease)

Profiles of Anti-Diabetic Medications

Medication class	Drug name	A1C reduction	FBG and/ or PPG coverage	Hypoglycemia	Weight change	CV effects		Renal effects		Oral/SQ	Clinical considerations
						ASCVD	HF	Progression of CKD	Dosing/use considerations		
Biguanides	Metformin	~1-2%	FBG	No	Neutral (potential for modest loss)	Potential benefit	Neutral	Neutral	• Contraindicated with eGFR < 30 ml/min/m^2	Oral	• GI side effects common; to mitigate GI side effects consider low dose titration, extended release formulations and administration with food • Potential for vitamin B12 deficiency; monitor semi-annually
SGLT2 inhibitors	Bexagliflozin (Brenzavvy™) Canagliflozin (Invokana™) Dapagliflozin (Farxiga™) Empaglifozin (Jardiance™) Ertugliflozin (Steglatro™)	~0.5-1%	FBG and PPG	No	Loss (intermediate)	Benefit: canagliflozin, empagliflozin	Benefit: canagliflozin, dapagliflozin, empagliflozin, ertugliflozin	Benefit: canagliflozin, dapagliflozin, empagliflozin	• See labels for renal dose considerations of individual agents • Glucose lowering effect is lower for SGLT2 inhibitors at lower eGFR	Oral	• Should be discontinued before any scheduled surgery to avoid potential risk for DKA • DKA risk (all agents, rare in T2DM) • Risk of bone fracture (canagliflozin) • Genitourinary infections • Risk of volume depletion, hypotension • Increase LDL cholesterol • Risk of Fournier's gangrene
GLP1-RAs	Dulaglutide (Trulicity™) Exenatide (Bydureon™, Byetta™) Liraglutide (Victoza™, Saxenda™) Lixisenatide (Adlyxin™) Semaglutide (Ozempic™, Rybelsus™)	~1-2%	FBG and PPG	No	Loss (intermediate to very high)	Benefit: dulaglutide, liraglutide, semaglutide (SQ) Neutral: exenatide once weekly, lixisenatide	Neutral	Benefit for renal endpoints in cardiovascular outcome trials, driven by albuminuria outcomes: dulaglutide, liraglutide, semaglutide (SQ)	• See labels for renal dose considerations of individual agents • No dose adjustment for dulaglutide, liraglutide, semaglutide • Monitor renal function when initiating or escalating doses in patients with renal impairment reporting severe adverse GI reactions	SQ; oral (semaglutide)	• FDA black box: risk of thyroid C-cell tumors in rodents; human relevance not determined (liraglutide, dulaglutide, exenatide extended release, semaglutide) • GI side effects common (nausea, vomiting, diarrhea) • Injection site reactions • Pancreatitis has been reported in clinical trials but causality has not been established, discontinue if pancreatitis is suspected
GIP and GLP 1-RA	Tirzepatide (Mounjaro™)	~1.5-2.4%	FBG and PPG	No	Loss (very high)	Under investigation	Under investigation	Under investigation	• No dose adjustment • Monitor renal function when initiating or escalating doses in patients with renal impairment reporting severe adverse GI reactions	SQ	• FDA black box: risk of thyroid C-cell tumors in rodents; human relevance not determined • GI side effects common (nausea, vomiting, diarrhea) • Injection site reactions • Pancreatitis has been reported in clinical trials but causality has not been established, discontinue if pancreatitis is suspected

Medication class		Drug name	A1C reduction	FBG and/ or PPG coverage	Hypoglycemia	Weight change	CV effects		Renal effects		Oral/SQ	Clinical considerations
							ASCVD	HF	Progression of CKD	Dosing/use considerations		
DPP4 inhibitors		Alogliptin Linagliptin (Tradjenta™) Saxagliptin (Onglyza™) Sitagliptin (Januvia™)	~0.4 to 0.8%	PPG	No	Neutral	Neutral	Neutral (potential risk, saxagliptin)	Neutral	• Renal dose adjustment required for sitagliptin, saxagliptin, alogliptin • No dose adjustment required for linagliptin	Oral	• Pancreatitis has been reported in clinical trials but causality has not been established, discontinue if pancreatitis is suspected • Joint pain • Bullous pemphigoid (post marketing); discontinue if suspected
Thiazolidinediones		Rosiglitazone (Avandia™) Pioglitazone	~1%	FBG and PPG	No	Gain	Potential benefit: pioglitazone	Increased risk	Neutral	• No dose adjustment required • Generally not recommended in renal impairment due to potential for fluid retention	Oral	• FDA black box: congestive heart failure (pioglitazone, rosiglitazone) • Fluid retention (edema, heart failure) • Benefit in NASH • Risk of bone fractures • Bladder cancer (pioglitazone) • Increase LDL cholesterol (rosiglitazone)
Sulfonylureas (2nd generation)		Glimepiride, Glipizide, Glyburide	~1-2%	FBG and PPG	Yes	Gain	Neutral	Neutral	Neutral	• Glyburide generally not recommended in chronic kidney disease • Glipizide and glimepiride: initiate conservatively to avoid hypoglycemia	Oral	• FDA special warning on increased risk of cardiovascular mortality based on studies of an older sulfonylurea (tolbutamide)
Insulin	**Human insulin**	See chart below	Varies	See chart below	Yes	Gain	Neutral	Neutral	Neutral	• Lower insulin doses required with a decreased in eGFR; titrate per clinical response	SQ; inhaled	• Injection site reactions • Higher risk of hypoglycemia with human insulin (NPH or premixed formulations) vs analogs
	Analogs										SQ	

Medication Class	Drug Name	FBG and/or PPG Coverage
Ultra Long-Acting Insulin	Insulin degludec (Tresiba™), Insulin glargine (Toujeo™)	FBG
Long Acting Insulin	Insulin glargine (Lantus™, Basaglar®, Semglee®), Insulin detemir (Levemir™)	FBG
Intermediate-Acting Insulin	Humulin N, Novolin N	FBG
Short Acting Insulin	Humulin R, Novolin R	PPG
Rapid Acting Insulin	Insulin lispro (Humalog™, Admelog®, Lyumjev™), Insulin aspart (Novolog™, Fiasp™), Insulin glusine (Apidra™), Afrezza®	PPG
Premixed Insulin	Humalog™ Mix 75/25, Humalog™ Mix 50/50, Novolog™ Mix 70/30, Humulin™ 70/30, Novolin™ 70/30	FBG and PPG

Management of Comorbidities:

Management of Hypertension

- Blood pressure < 130/80 mmHg is the recommended goal for persons with diabetes
- Select antihypertensive medications based on ability to reduce blood pressure to goal and preventing or slowing progression of micro- and macrovascular disease, use either ACE inhibitor or ARB for blood pressure control and to delay progression of kidney disease in diabetes mellitus
- Recommendations for treatment of confirmed hypertension in people with diabetes
  - Initial BP > 130/80 and < 160/100 mmHg
    - Start one agent along with lifestyle management
      - Preferably ACE inhibitor or ARB if albuminuria (>30 mg/g), or CAD present, unless contraindicated
    - Assess blood pressure control and adverse effects at each follow up visit
      - If not meeting target, add agent from alternative drug class (ACE inhibitor or ARB, calcium channel blockers, diuretic)
    - If not meeting target on two agents, then add agent from alternative drug class
    - If not meeting target on a drug from each class (ACE inhibitor or ARB, calcium channel blocker and diuretic) consider addition of mineralocorticoid receptor antagonist
  - Initial BP ≥ 160/100 mmHg
    - Start two agents along with lifestyle management
      - Preferably ACE inhibitor or ARB as one of the agents if albuminuria or CAD is present, unless contraindicated
    - Assess blood pressure control and adverse effect (at each follow up visit)
      - If not meeting target, add another agent from alternative drug class (ACE inhibitor or ARB, calcium channel blockers, diuretic)
    - If not meeting target on a drug from each class (ACE inhibitor or ARB, calcium channel blocker and diuretic) consider addition of mineralocorticoid receptor antagonist
- Please see clinical pathway for Hypertension for additional information

Management of Lipids

- All persons with prediabetes or type 2 diabetes should have a lipid panel checked at diagnosis with any lipid therapy changes (new medication start or dose adjustment) and at LEAST annually thereafter to assess cardiovascular and metabolic disease risks
- LDL goal <70mg/dL for primary prevention
- LDL goal <55mg/dL for secondary prevention

A1c goal	ASCVD Risk	Therapy recommendations
Individuals aged 40-75 years with diabetes without confirmed ASCVD (primary prevention)	High Risk (10-year risk <10%); includes type 2 diabetes with < 2 additional risk factors and no target organ damage	Begin moderate intensity statin, intensify as needed
	Very High Risk (10-year risk 10% to 20%, includes type 2 diabetes with ≥ 2 additional risk factors)	Begin high intensity statin, addition of ezetimibe or bempedoic acid to reach lipid targets
	Extreme Risk (10-year risk >20%; includes established ASCVD or target organ damage	Begin high intensity statin, addition of ezetimibe, bempedoic acid and/or PCSK9 agent to reach lipid targets
Adults with diabetes aged > 75 years	Regardless of risk	May be reasonable to initiate moderate intensity statin after discussion of potential benefits and risks
Individuals of all ages with diabetes as ASCVD (secondary prevention)	Already confirmed ASCVD	Begin high intensity statin, addition of ezetimibe, bempedoic acid and/or PCSK9 agent to reach lipid targets

Target organ damage: left ventricular systolic or diastolic dysfunction, eGFR <45 ml/min/m2, and abnormal ankle-brachial index

Management of triglycerides

Individuals with type 2 diabetes and triglyceride level above goal of ≤ 150 mg/dL	Triglycerides < 500 mg/dL	• Initiate a low carbohydrate and reduced fat diet • Consider insulin as needed for glycemic control • If TG remain > 200 mg/dL and lipids not at goal with maximal statin, measure ApoB and use fibrates as needed to achieve Apo B < 90mg/dL • Add icosapent ethyl if not at lipid goal and ASCVD risk category is very high (type 2 diabetes with ≥ 2 additional ASCVD risk factors
	Triglycerides ≥500 mg/dL	• Initiate a low fat, no-added sugar diet • Use insulin as needed for glycemic control • Ensure statin use as initial lipid lowering therapy aligned with ASCVD risk • Use fibrates and, as needed, generic Lovaza, or icosapent ethyl to lower triglycerides • Add niacin only if triglycerides remain > 1000 mg/dL to decrease risk of pancreatitis

- Efficacy of lipid lowering regimen should be monitored every 6 to 12 weeks and dose increased or intensity of statin increased as needed and tolerated to achieve goal

Antiplatelet Management

- In patients who are 40-59 years old, aspirin therapy (75–162 mg/ day) may be considered as a primary prevention strategy in those with diabetes who are at increased cardiovascular risk (10 years risk > 10%), after a comprehensive discussion with the patient on the benefits versus the comparable increased risk of bleeding
  - Aspirin therapy is NOT recommended for those at low risk of ASCVD, such as men and women aged < 40 years with diabetes and no other major ASCVD risk factors
- Use aspirin therapy (75–162 mg/day) as a secondary prevention strategy in those with diabetes and a history of ASCVD

Chronic Kidney Disease Management

- At least annually, urinary albumin (e.g., spot urinary albumin-to-creatinine ratio) and estimated glomerular filtration rate should be assessed in all patients with type 2 diabetes regardless of treatment
  - In moderate to severe CKD (stages 3 to 5), check UACR and eGFR more frequently (every 3 to 6 months)
- Measure UACR and eGFR after medication additions or adjustments (ACE inhibitors, ARBs, SGLT2 inhibitors, finerenone) or change in clinical status that may affect kidney function (ex. Iodinated contrast administration, acute illness)
- Referral to nephrology is recommended by CKD stage 4 or earlier if there are concerns about kidney disease diagnosis, rapid progression, complications, or management

Therapy considerations for patients with T2DM and diabetic kidney disease	
ACE or ARB	• Indicated for patients with T2DM AND HTN to reduce progression of kidney disease • Moderately increased albuminuria (urinary albumin-to-creatinine ratio 30-299 mg/g creatinine • Severely increased albuminuria (urinary albumin-to-creatinine ratio ≥ 300 mg/g creatinine) and/or estimated glomerular filtration rate < 60 ml/min/1.73m^2
SGLT 2 inhibitor	• Use recommended if eGFR ≥ 20 ml/min/1.73 m^2 • To reduce progression of kidney disease and reduce cardiovascular events
GLP-1 RA with proven benefit (dulaglutide, liraglutide, semaglutide [SQ])	• Use recommended if eGFR ≥ 15 ml/min/1.73 m^2 to reduce risk of ASCVD and progression of albuminuria
Finerenone	• For people with type 2 diabetes and chronic kidney disease with albuminuria, normal potassium and eGFR ≥ 25 ml/min/1.73 m^2 treated with maximum tolerated doses of ACE inhibitor or angiotensin receptor blocker

- Please see chronic kidney disease (CKD) clinical pathway for additional information

Obesity and Weight Management

- Patients with type 2 diabetes and obesity/adiposity-based chronic disease should be treated with weight loss interventions which will both improve glycemic control and prevent adiposity-based chronic disease
  - Target for weight loss should be >5% to ≥10% of baseline body weight
  - Individuals with diabetes and obesity may benefit from modest or larger magnitudes of weight loss. Relatively small weight loss (approximately 3-7% of baseline weight) improves glycaemia and other intermediate cardiovascular risk factors. Larger, more sustained weight losses (> 10%) usually confer greater benefits, including disease-modifying effects and possible remission of type 2 diabetes, and may improve long-term cardiovascular outcomes and mortality
- Measuring height, weight and calculating BMI should be done at every follow up visit (minimum semi annually)
- Metabolic surgery should be a recommended option to treat type 2 diabetes in screened surgical candidates with BMI ≥40 kg/m2 (BMI ≥37.5 kg/m^2 in Asian Americans) and in adults with BMI 35.0–39.9 kg/m^2 (32.5–37.4 kg/m^2 in Asian Americans) who do not achieve durable weight loss and improvement in comorbidities (including hyperglycemia) with nonsurgical methods
- Metabolic surgery may be considered as an option to treat type 2 diabetes in adults with BMI 30.0–34.9 kg/m^2 (27.5–32.4 kg/m^2 in Asian Americans) who do not achieve durable weight loss and improvement in comorbidities (including hyperglycemia) with nonsurgical methods
- Please see appendix 3 for details regarding weight management medications

Retinopathy

- Patients with type 2 diabetes should have an initial dilated and comprehensive eye examination by an ophthalmologist at the time of the diabetes diagnosis, or retinal screening performed by RetniaVue, if available
- If there is no evidence of retinopathy for one or more annual eye exams and glycaemia is well controlled, then screening every 1–2 years may be considered. If any level of diabetic retinopathy is present, subsequent dilated retinal examinations should be repeated at least annually by an ophthalmologist or optometrist. If retinopathy is progressing or sight-threatening, then examinations will be required more frequently
- Promptly refer patients with any level of diabetic macular edema, moderate or worse nonproliferative diabetic retinopathy (a precursor of proliferative diabetic retinopathy), or any proliferative diabetic retinopathy to an ophthalmologist

Neuropathy

- All patients should be assessed for diabetic peripheral neuropathy starting at diagnosis of type 2 diabetes at least annually thereafter
- Diabetic foot exams should be performed at every visit to identify deformities and to identify those at risk for complications such as ulcerations and amputations
- Assess and treat patients to reduce pain related to diabetic peripheral neuropathy and symptoms of autonomic neuropathy and to improve quality of life
- Gabapentinoids, serotonin-norepinephrine reuptake inhibitors, tricyclic antidepressants, and sodium channel blockers are recommended as initial pharmacologic treatments for neuropathic pain in diabetes

Foot Care

- Perform a comprehensive foot evaluation at least every 6 months – 12 months or as clinically indicated to identify risk factors for ulcers and amputations
  - Patients with evidence of sensory loss or prior ulceration or amputation should have their feet inspected at every visit
  - The 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
- 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
- Refer patients who smoke or who have histories of prior lower-extremity complications, loss of protective sensation, structural abnormalities, or peripheral arterial disease to foot care specialists for ongoing preventive care and lifelong surveillance.
- Provide general preventive foot self-care education to all patients with diabetes

Referral for Hospitalization

- Life threatening acute metabolic complications of diabetes
- Diabetic Ketoacidosis
- Hyperglycemic hyperosmolar nonketotic syndrome (HHNKS)
- Hypoglycemia with neuroglycopenia
- Substantial and chronic poor metabolic control that necessitates close monitoring of the patient to determine the etiology of the control problem, with subsequent modification of therapy
- Severe, chronic complications of diabetes that requires intensive treatment or other severe conditions unrelated to diabetes that significantly affect its control or are complicated by diabetes

Appendix

Appendix 1 - Vaccinations

Highly recommended immunizations for adults with diabetes

<table>
<tr><th>Vaccination</th><th>Age-group recommendations</th><th>Frequency</th></tr>
<tr><td>Hepatitis B</td><td>< 60 years of age; ≥60 years of age discuss with health care professionals</td><td>Two- or three- or four-dose series
2-dose series only applies when 2 doses of Heplisav-B* are used at least 4 weeks apart
3-dose series Engerix-B or Recombivax HB at 0, 1, 6 months
3-dose series HepA-HepB (Twinrix) at 0, 1, 6 months
4-dose series HepA-HepB (Twinrix) accelerated schedule of 3 does at 0, 7, and 21-30 days, followed by a booster dose at 12 months</td></tr>
<tr><td>Human papilloma virus (HPV)</td><td>≤ 26 years of age; 27-45 years of age may also be vaccinated against HPV after discussion with health care professionals</td><td>Age 15 or older at initial vaccination: 3-dose series at 0, 1-2 months, 6 months</td></tr>
<tr><td>Influenza</td><td>All people with diabetes advised not to receive live attenuated influenza vaccine</td><td>Annual</td></tr>
<tr><td>Pneumo-coccal</td><td>19-64 years of age with certain underlying medical conditions** (includes Diabetes Mellitus)

≥ 65 years of age</td><td>
<table>
<tr><th colspan="2" rowspan="2">Patient Type</th><th colspan="4">Pneumococcal vaccine administration history</th></tr>
<tr><th>Vaccine naïve or unknown vaccination status</th><th>Previously received PPSV23 ONLY</th><th>Previously received PCV13 ONLY</th><th>Completed PCV13 and PPSV23 vaccination series</th></tr>
<tr><td rowspan="2">19-64 years old**</td><td>PCV20</td><td>1 dose</td><td>1 dose at least 1 year after the most recent PPSV23</td><td>1 dose may be given 8 weeks after PCV13 if PPSV23 is not available</td><td>CSF leak or cochlear implant: 1 dose at ≥ 65 years old at least 5 years after last PPSV23</td></tr>
<tr><td>PCV15</td><td>1 dose followed by PPSV23 at least 1 year later****</td><td>1 dose at least 1 year after the most recent PPV23</td><td>Not indicated</td><td>Not indicated</td></tr>
<tr><td rowspan="2">≥ 65 years old</td><td>PCV20</td><td>1 dose</td><td>1 dose at least 1 year after the most recent PPSV23</td><td>1 dose may be used if PPSV23 is not available OR 1 dose PPSV23 at least 1 year after PCV13 and at least 5 years since last PPSV23 dose (if applicable)</td><td rowspan="2">Vaccination series is complete, no additional doses indicated</td></tr>
<tr><td>PCV15</td><td>1 dose followed by PPSV23 at least 1 year later****</td><td>1 dose at least 1 year after the most recent PPSV23</td><td>Not indicated</td></tr>
</table>
</td></tr>
<tr><td>Tetanus, diphtheria, pertussis (TDAP)</td><td>All adults; pregnant individuals should have an extra dose</td><td>Booster every 10 years</td></tr>
<tr><td>Zoster</td><td>≥ 50 years of age</td><td>Age 50 years and older: 2-dose series Shingrix 2-6 months apart (minimum interval 4 weeks; repeat dose if administered too soon), regardless of previous herpes zoster or history of zoster vaccine live vaccination (administer Shingrix at least 2 months after Zostavax)</td></tr>
</table>

PCV13, 13-Valent pneumococcal conjugate vaccine; PCV15, 15-valent pneumococcal conjugate vaccine; PCV 20, 20-valent pneumococcal conjugate vaccine; PPSV23, 23-valent pneumococcal polysaccharide vaccine

**Note: immunocompromising conditions include chronic renal failure, nephrotic syndrome, immunodeficiency, iatrogenic immunosuppression, generalized malignancy, human immunodeficiency virus, Hodgkin disease, leukemia, lymphoma, multiple myeloma, solid organ transplants, congenital or acquired asplenia, sickle cell disease, or other hemoglobinopathies

****a minimum interval of 8 weeks may be considered in patients with immunocompromising conditions, cochlear implants, or CSF leak

Appendix 2
Lifestyle Modifications

Behavior modification	Dietary Therapy	Physical Activity	Smoking Cessation
• Psychosocial care should be integrated with a collaboractive, patient-centered approach and provided to all people with diabetets • Screening and follow up may include, but not limited to: attitudes about diabetes, expectation for medical management and outcomes, affect or modd, general and diabetes-related quality of life, available resources (financial and social) • Providers should assess for symptoms of diabetes distress, depression, anxiety, disordered eating and cognitive capacities (should be done at initial visit and when there is a change in disease, treatment or life circumstance	• Promote and support healthful eating patterns, emphasizing nutrient-dense foods in approved portion sizes • Providing nonjudgemental messages about food choices • Address individual needs based on personal and cultural preferences, health literacy, access to healthful food and barriers to change • Incorporating nutrition services for a multi-disclinplinary approach is recommended esepcially for prediabetic patients and/or patients with obesity	• Most adults 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 minutes/ week) of vigorous intensity or interval training may be sufficient for younger and more physically fit individuals	• Advise all patients not to use cigarettes and other tobacco products or e-cigarettes • After identification of tobacco or e-cigarette use, include smoking cessation counseling and other forms of treatment as a routine component of diabetes care (at every follow up visit)

Appendix 3
Weight management medications

Drug	Indication	Mechanism of Action	Dose	Adjustments	Efficacy	Adverse Effects, Precautions, and Contraindications
Wegovy™ (Semaglutide)	Adults with a BMI ≥ 30kg/m² OR BMI ≥ 27kg/m² with weight-associated comorbidities (i.e. HTN, T2DM, or dyslipidemia)	Semaglutide is a GLP-1 receptor agonist. Semaglutide binds and activates the GLP-1 receptor causing enhanced insulin secretion, slowed gastric emptying, reduction of food intake, and promotion of beta cell proliferation.	Titrate to target dose over 17 weeks: **Weeks 1-4**: 0.25mg SQ once weekly **Weeks 5-8**: 0.5mg SQ once weekly **Weeks 9-12**: 1mg SQ once weekly **Weeks 13-16**: 1.7mg SQ once weekly **Weeks 17+**: 2.4mg SQ once weekly * 2.4mg is considered the maintenance dose, if patient cannot tolerate 2.4mg, decrease to 1.7mg weekly for 4 weeks, then increase to 2.4mg. If patient cannot tolerate 2.4mg after temporary decrease, discontinue Wegovy™	No hepatic or renal dose adjustments required by the manufacturer of Wegovy™.	After 68 weeks, weight loss of up to 15% of baseline body weight was achieved, 85% of patients achieved greater than 5% weight loss[12]. No guidance has been provided for discontinuation due to lack of results while using Wegovy™	**ADVERSE EFFECTS:** • Acute pancreatitis • Acute gallbladder disease • Hypoglycemia • Acute kidney injury (AKI) • Hypersensitivity • Nausea • Vomiting • Abdominal pain **PRECAUTIONS:** • Breast-feeding • Cholelithiasis • Depression • Pancreatitis • Pregnancy • Renal failure • Suicidal ideation • Thyroid cancer **CONTRAINDICATIONS:** • Medullary thyroid carcinoma • Thyroid C-cell tumors • Multiple endocrine neoplasia syndrome type 2
Saxenda® (Liraglutide)	Adults with a BMI ≥ 30kg/m² OR BMI ≥ 27kg/m² with weight-associated comorbidities (i.e. HTN, T2DM, or dyslipidemia)	Liraglutide is a GLP-1 receptor agonist, causing an increase in insulin secretion, slowed gastric emptying, reduction of food intake, and promotion of beta cell proliferation.	Initial: 0.6mg SQ daily for one week Increase dose by 0.6mg/week to a maximum dose of 3 mg SQ once daily	No hepatic or renal adjustments required by the manufacturer of Saxenda©.	56% of Saxenda users lost ≥5% of their baseline body weight after 1 year of use[2]. Saxenda should be discontinued if patient has not achieved 4% weight loss after 16 weeks of treatment[5].	**ADVERSE EFFECTS:** • Nausea • Vomiting • Diarrhea • Constipation • Headache • Dizziness • Increased lipase **PRECAUTIONS:** • Acute pancreatitis • Acute gallbladder disease • Hypoglycemia • Suicidal ideation **CONTRAINDICATIONS:** • Medullary thyroid cancer • Multiple endocrine neoplasia syndrome type 2 • Pregnancy • Thyroid C-cell tumor

Appendix 3
(CONTINUED)

Drug	Indication	Mechanism of Action	Dose	Adjustments	Efficacy	Adverse Effects, Precautions, and Contraindications
Phentermine	Patients aged 17+ for short term (≤12 week) therapy: BMI ≥ 30kg/m^2 OR BMI ≥ 27kg/m^2 with > 1 weight-associated comorbidity (i.e. HTN, T2DM, or dyslipidemia)	Indirect sympathomimetic, increases release of and inhibits reuptake of norepinephrine and dopamine therefore reducing appetite	15mg to 37.5 mg PO either once or twice daily	**Renal adjustments:** If eGFR 15-29ml/min/1.73m^2: Do not exceed 15mg/day Avoid use if eGFR <15ml/min/1.73m^2 There are no hepatic adjustments required	A 12 week post marketing surveillance study demonstrated a mean weight reduction of 5-5.2% from baseline body weight[11]. No guidance has been provided for discontinuation due to lack of results while using phentermine.	**ADVERSE EFFECTS:** • Dizziness • Secondary hypertension • Tachycardia and palpitations • Insomnia • Headache • Euphoria **PRECAUTIONS:** • Co-administration with other weight loss therapies • Primary • pulmonary hypertension • Valvular heart disease • Development of tolerance • Use with alcohol • Use in patients using insulin or oral hypoglycemic medications **CONTRAINDICATIONS:** • Cardiac arrhythmias • Coronary artery disease (CAD) • Heart failure (HF) • Stroke • Uncontrolled hypertension • Glaucoma • Hyperthyroidism • Pregnancy • Use within 14 days of MAOis
Xenical® (orlistat)	Patients 12 and older with a BMI >30kg/m^2 OR BMI >27kg/m^2 with > 1 weight associated comorbidity (i.e. HTN, T2DM, or dyslipidemia)	Promotes weight loss through nutrient absorption. Binds covalently with gastric and pancreatic lipases within the lumen of the stomach and small intestine, causing less fat to be absorbed by the body	120mg by mouth three times daily with each main meal containing fats, may miss dose if meal is missed or contains no fat	Studies in patients with renal and hepatic insufficiency were not conducted by the manufacturer due to the lack of systemic absorption	Average weight loss was found to be between 2.9-3.4% of baseline body weight[3]. No guidance has been provided for discontinuation due to lack of results while using Xenical®	**ADVERSE EFFECTS:** • Abdominal pain • Oily rectal leakage • Fecal urgency • Flatulence • Steatorrhea **PRECAUTIONS:** • Anorexia nervosa • Bulimia nervosa • Pancreatitis • Renal disease • Seizure disorders **CONTRAINDICATIONS:** • Cholestasis • Chronic malabsorption syndrome • Pregnancy

Appendix 3
(CONTINUED)

Drug	Indication	Mechanism of Action	Dose	Adjustments	Efficacy	Adverse Effects, Precautions, and Contraindications
Contrave® (Bupropion and Naltrexone)	Adults with BMI ≥ 30kg/m² OR BMI ≥ 27kg/m² with > 1 weight associated comorbidity (i.e. HTN, T2DM, or dyslipidemia)	Naltrexone and bupropion impact the hypothalamus and mesolimbic dopamine circuit which controls the appetite and reward systems respectively. Contrave increases the firing rate of POMC neurons, which regulates the appetite.	Titrate to target dose over 4 weeks: **Week 1**: 1 tablet by mouth every morning **Week 2**: 1 tablet by mouth in the morning, 1 tablet by mouth in the evening **Week 3**: 2 tablets by mouth in the morning, 1 tablet in the evening **Week 4+**: 2 tablets by mouth in the morning and evening	**Renal Adjustments:** CrCl 30-49ml/min: Max daily dose of 1 tablet twice daily CrCl <30ml/min: Do not use **Hepatic Adjustments:** A dose of one tablet daily should not be exceeded in patients with hepatic impairment	3.7%-8.1% weight loss after 56 weeks of use, with the mean weight loss being 5.4%[7] from baseline body weight. If a patient has not lost at least 5% of baseline body weight after 12 weeks of maintenance therapy, Contrave should be discontinued[6]	**ADVERSE EFFECTS:** • Constipation • Headache • Nausea • Vomiting • Abdominal pain **PRECAUTIONS:** • Suicidal behavior • Seizures • Opioid use • Increase in blood pressure and heart rate • Angle closure glaucoma **CONTRAINDICATIONS:** • Pregnancy • Uncontrolled hypertension • Seizure disorders • Eating disorders • Chronic opioid use • Use within 14 days of MAOis
Plenity®	Adults with a BMI of 25kg/m² to 40kg/m²	Plenity consists of modified cellulose and citric acid, which are two naturally derived products. The capsule contains hydrogel particles that mix with ingested foods resulting in particle release. The hydrogel particles occupy about 1/4th of the patient's stomach volume, promoting satiety and fullness. Plenity is non-systemic and works directly in the GI tract	Take 2.25g (3 capsules) by mouth with water 30 minutes before lunch and dinner for a total of 6 capsules daily. If pre-meal dose is missed, administer during or immediately after the meal.[10]	Plenity® is not systemically absorbed and does not require adjustments in patients with hepatic and renal impairment	6.4% average weight loss from baseline weight after 24 weeks of treatment[4] Results are typically seen after 4 weeks of use. No guidance has been provided for discontinuation due to lack of results.	**ADVERSE EFFECTS:** • Bloating • Stomach pain • Diarrhea, constipation, and gas **PRECAUTIONS:** • Dysphagia • GERD • Esophageal anatomic abnormalities • Suspected strictures • Complications from prior gastrointestinal surgery **CONTRAINDICATIONS:** • Pregnancy • History of allergic reaction to cellulose, citric acid, sodium stearyl fumarate, gelatin, or titanium oxide
Qsymia® (Phentermine and Topiramate) *REMS program required	Patients age 12+ with a BMI ≥ 30kg/m² OR BMI ≥ 27kg/m² with > 1 weight associated comorbidity (i.e. HTN, T2DM, or dyslipidemia)	Phentermine is a sympathomimetic amine with pharmacologic properties similar to amphetamine. CNS effects reduce appetite including stimulation of the hypothalamus to release norepinephrine Topiramate effects on weight management may be due to its effects on appetite suppression and satiety enhancement and based on the combination of potential mechanisms such as blocking neuronal voltage-depending sodium channels, enhancing GABA activity, antagonizes AMPA/kainite glutamate receptors and weakly inhibits carbonic anhydrase.	Initiate 3.75/23mg by mouth once daily in the morning for 14 days. Increase to 7.5mg/46mg by mouth once daily for 14 days. After 12 weeks, if patient has not lost at least 3% of baseline weight, increase the dose to 11.25mg/69mg by mouth once daily for 14 days, with a final increase to 15mg/92mg once daily. *Discontinue the 15mg/92mg formulation by dosing every other day for one week before stopping treatment to avoid precipitating a seizure[11]	**Renal Adjustments:** In CrCl ≤50ml/min do not exceed 7.5mg/46mg once daily **Hepatic Adjustments:** In patients with Child-Pugh score 7-9, dosing should not exceed 7.5mg/46mg daily	Average weight loss of 9.8% from baseline weight after using the highest dose for 1 year, demonstrated[9] Discontinue or escalate dose if 3% weight loss is not achieved after 12 weeks on 7.5mg/46mg daily[10].	**ADVERSE EFFECTS:** • Tachycardia • Constipation • Headache • Xerostomia • Insomnia **PRECAUTIONS:** • Suicidal behavior and ideation • abrupt discontinuation • COPD • Use with CNS depressants • Coronary artery disease, • Insomnia • Myocardial infarction history **CONTRAINDICATIONS:** • Glaucoma • Hyperthyroidism • Use within 14 days of MAOis • Pregnancy • Substance abuse

References

1. American Association of Clinical Endocrinology Clinical Practice Guideline: Developing a Diabetes Mellitus Comprehensive Care Plan -- 2022 Update. https://www.sciencedirect.com/science/article/pii/S1530891X22005766?via%3Dihub. Published 2022.

2. Centers for Disease control and Prevention, Updated Recommendations for Prevention of Invasive Pneumococcal Disease among Adults Using the 23-Valent Pneumococcal Polysaccharide Vaccine (PPSV23)

3. Centers of Disease Control and Prevention, Use of Hepatitis B Vaccination for Adults with Diabetes Mellitus; Recommendations of the Advisory Committee on Immunization Practices (ACIP) 2014

4. Chamberlain J. ROLE OF CONTINUOUS GLUCOSE MONITORING IN DIABETES TREATMENT.2018.

5. Demicheli et al., Vaccines for Preventing Influenza in the Elderly

6. Doolin et al., Recommendations of the Advisory Committee on Immunization Practices for Use of Herpes Zoster Vaccines

7. Falkenhorst et al., Effectiveness of the 23-Valent Pneumococcal Polysaccharide Vaccine (PPV23) Against Pneumococcal Disease in the Elderly; Systematic Review and Meta-analysis

8. Havers et al,, Use of Tetanus Toxoid, Reduced Diphtheria Toxoid, and Acellular Pertussis Vaccines: Updated Recommendations for the Advisory Committee on Immunization Practices – United States, 2019

9. Kobayashi et al., Use of 15-Valent Pneumococcal Conjugate Vaccine and 20-Valent Pneumococcal Conjugate Vaccine Among U.S. Adults: Updated Recommendations of the Advisory Committee on Immunization Practices – United States, 2022

10. Meites et al., Human Papillomavirus Vaccination for Adults: Updated Recommendations of the Advisory Committee on Immunization Practices

11. Standards in Medical Care of Diabetes 2023. American Diabetes Association. 2023;46.

12. Wexler D. Overview of general medical care in nonpregnant adults with diabetes mellitus. https://www.uptodate.com/contents/overview-of-general-medical-care-in-nonpregnant-adults-with-diabetes-mellitus?search=diabetes%20aspirin%20primary%20prevention§ionRank=1&usage_type=default&anchor=H11&source=machineLearning&selectedTitle=3~150&display_rank=3#. Published December 2022.

13. Wexler D. Management of persistent hyperglycemia in type 2 diabetes mellitus. https://www.uptodate.com/contents/management-of-persistent-hyperglycemia-in-type-2-diabetes-mellitus?search=management%20of%20type%202%20diabetes&source=search_result&selectedTitle=2~150&usage_type=default&display_rank=2. Published January 2023.

For additional questions, please reach out to your assigned Clinical Transformation Consultant.

GLIN.COM