This PowerPoint file is a supplement to the video presentation. Some of the educational content of this program is not available solely through the PowerPoint file. Participants should use all materials to enhance the value of this continuing education program.

American Diabetes Association (ADA) Standards of Care 2023 Guideline Updates

Rachel Basinger, PharmD, BCACP, CTTS
Assistant Professor
Jerry H. Hodge School of Pharmacy
Texas Tech University Health Sciences Center
Dallas, Texas

Goals

Pharmacists

1. Discuss revisions of the 2023 American Diabetes Association (ADA) Guidelines
2. Evaluate data supporting the 2023 revisions
3. Review general approach to glucose management
4. Identify new hyperglycemia agents and/or indications on the horizon

Technicians

1. Discuss revisions of the 2023 American Diabetes Association (ADA) Guidelines
2. Review general approach to glucose management
3. Identify brand/generic names and side effects/precautions of hyperglycemic medications

Disclosures

This speaker does not have any actual or potential conflicts of interest to disclose

ADA Standards of Care

- Annual update since 1989
- Publish online in December
  - Diabetes Care Journal
  - https://diabetesjournals.org/care/issue/46/ Supplement_1
- Free access
  - full version
  - abridged version
  - app

ADA Standards of Care

- Updates include language changes to therapeutic recommendations based on most current literature available – presentation focus on changes that effect pharmacy practice

Index

Structure

- Recommendations
  - control “F”
  - #.# recommendation
  - supportive evidence supporting recommendation

Screening and Diagnosis

Recommendations

10.1 Blood pressure should be measured at every routine clinical visit. When possible, individuals found to have elevated blood pressure (systolic blood pressure 120–129 mmHg and diastolic <80 mmHg) should have blood pressure confirmed using multiple readings, including measurements on a separate day, to diagnose hypertension. **A** Hypertension is defined as a systolic blood pressure ≥130 mmHg or a diastolic blood pressure ≥80 mmHg based on an average of ≥2 measurements obtained on ≥2 occasions. **A** Individuals with blood pressure ≥180/110 mmHg and cardiovascular disease could be diagnosed with hypertension at a single visit. **E**

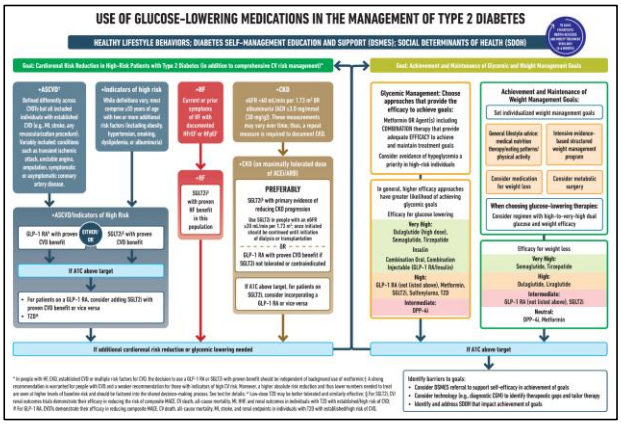
10.2 All people with hypertension and diabetes should monitor their blood pressure at home. **A**

Blood pressure should be measured at every routine clinical visit by a trained individual and should follow the guidelines established for the general population: measurement in the seated position, with feet on the floor and arm supported at heart level, after 5 min of rest. Cuff size should be appropriate for the upper-arm circumference. Elevated values should preferably be confirmed on a separate day; however, in individuals with cardiovascular disease and blood pressure ≥180/110 mmHg, it is reasonable to diagnose hypertension at a single visit (21). Postural changes in blood pressure and pulse may be evidence of autonomic neuropathy and therefore require adjustment of blood pressure targets. Orthostatic blood pressure measurements should be checked on initial visit and as indicated.

Home blood pressure self-monitoring and 24-h ambulatory blood pressure monitoring may provide evidence of white coat hypertension, masked hypertension, or other discrepancies between office and “true” blood pressure (23,24). In addition to confirming or refuting a diagnosis of hypertension, home blood pressure assessment may be useful to monitor antihypertensive treatment. Studies of individuals without diabetes found that home measurements may better correlate with ASCVD risk than office measurements (23,24). Moreover, home blood pressure monitoring may improve patient medication taking and thus help reduce cardiovascular risk (25).

Structure

- Tables and figures



Section 2: Classification and Diagnosis of Diabetes – POC A1c Testing

- Monitoring, but not diagnosis
- Strict criteria for use
  - must follow NGSP and DCCT methods
  - NGSP certified and FDA approved
  - CLIA-regulated or waived setting – review package insert
  - training and competency evaluation – minimum of proficiency testing three times a year

POC: point of care; NGSP: National Glycohemoglobin Standardization Program; DCCT: Diabetes Control and Complication Trial; FDA: US Food and Drug Administration; CLIA: Clinical Laboratory Improvement Amendments

Section 3: Prevention or Delay of Type 2 Diabetes and Associated Comorbidities

- **3.9 Added: Statins and increased risk of progression to T2DM**
  - monitor glucose regularly and implement preventative strategies
  - moderate risk of progression: pooled data HR 1.26 (1.17-1.58)
  - cardiovascular and mortality benefit >>>>> risk of diabetes
  - Do NOT stop statin

T2DM: Type 2 diabetes mellitus

Section 3: Prevention or Delay of Type 2 Diabetes and Associated Comorbidities

- **3.10 Added: Address use of pioglitazone in patients with history of stroke with insulin resistance or pre-diabetes**
  - IRIS study (Insulin Resistance Intervention after Stroke)
  - reduction in risk of CVA and MI but increase in weight gain, edema, and fracture
  - patient-specific balance of risk versus benefit decision

CVA: cerebrovascular accident; MI: myocardial infarction

Section 3: Prevention or Delay of Type 2 Diabetes and Associated Comorbidities

- **3.12 Added: Support use of pharmacotherapy for patient-centered goals to reduce progression to diabetes**
  - **Section 8: Obesity and Weight Management for the Prevention and Treatment of Type 2 Diabetes**
  - **Section 9: Pharmacologic Approaches to Glycemic Treatment**
  - **Section 10: Cardiovascular Disease and Risk Management**

Section 3: Prevention or Delay of Type 2 Diabetes and Associated Comorbidities

- **3.13 Added: Support use of intensive preventative approaches for individuals at high risk of progression to diabetes**

Section 4: Comprehensive Medical Evaluation and Assessment of Comorbidities

- Vaccines
  - updated COVID vaccine recommendations for current recommendation
    - as of February 9, 2023, COVID-19 included in routinely recommended vaccine schedule
    - adults: same as new CDC guidelines (bivalent booster)
    - children: updates since publication – refer to recent CDC guidelines

Section 4: Comprehensive Medical Evaluation and Assessment of Comorbidities

- Vaccines
  - Hepatitis B
    - updated since publication – ALL adults less than 60 years old (not just DM)
  - Pneumococcal pneumonia
    - same as new CDC guidelines (PCV13, PCV15, PCV20, PPSV23)

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 plans 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 plan	✓	✓	✓
	• 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)	✓		✓
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, lipohypertrophy)	✓	✓	✓
	• Comprehensive foot examination			
	◦ Visual inspection (e.g., skin integrity, callous formation, foot deformity or ulcer, toenails)[a]	✓		✓
	◦ 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 cognitive performance[c]	✓		✓
	• Consider assessment for functional performance[c]	✓		✓
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[d]	✓		✓
	◦ Liver function tests[e]	✓		✓
	◦ Spot urinary albumin-to-creatinine ratio	✓		✓
	◦ Serum creatinine and estimated glomerular filtration rate[f]	✓		✓
	◦ Thyroid-stimulating hormone in people with type 1 diabetes[g]	✓		✓
	◦ Vitamin B12 if on metformin	✓		✓
	◦ Serum potassium levels in people with diabetes on ACE inhibitors, ARBs, or diuretics[h]	✓		✓

- **Tablet 4.1 Updated: Components of the comprehensive medical evaluation at initial, follow-up, and annual visits**
  - **Past medical history**
  - **Family history**
  - **Behavioral factors**
  - **Medication and vaccines**
  - **Technology use**
  - **Social life**
  - **Physical exam**
  - **Laboratory evaluation**

Section 4: Comprehensive Medical Evaluation and Assessment of Comorbidities

- **Patients with diabetes have higher risk of NASH with significant fibrosis and risk of NASH progression and mortality but there are limited treatments for cirrhosis**

NASH: Nonalcoholic steatohepatitis

Section 4: Comprehensive Medical Evaluation and Assessment of Comorbidities

- Subsection for NASH updated
  - weight loss: lifestyle, GLP1RA, bariatric surgery
  - pharmacotherapy: TZD and GLP1RA
    - treat steatohepatitis
    - slow fibrosis progression
    - decrease cardiovascular disease

TZD: thiazolidinedione; GLP1RA: glucagon-life peptide-1 receptor agonist

Section 4: Comprehensive Medical Evaluation and Assessment of Comorbidities

- TZD
  - increasing glucose and lipid metabolism
- GLP1RA
  - weight loss
  - decrease liver function tests

TZD: thiazolidinedione; GLP1RA: glucagon-life peptide-1 receptor agonist

Section 5: Facilitating Positive Health Behaviors and Well-being to Improve Health Outcomes

- Lots of updates, but most more directed at other members of a healthcare team

Section 5: Facilitating Positive Health Behaviors and Well-being to Improve Health Outcomes

- Micronutrients and supplements
  - no clear evidence of benefit from herbals and supplements without underlying deficiencies
    - check B12 with metformin or neuropathy
    - no need for routine antioxidants (E and C)
    - added: against beta carotene due to increased lung cancer and cardiovascular mortality risk (ATBC study)

The Alpha-Tocopherol, Beta-Carotene Cancer Prevention (ATBC) Study

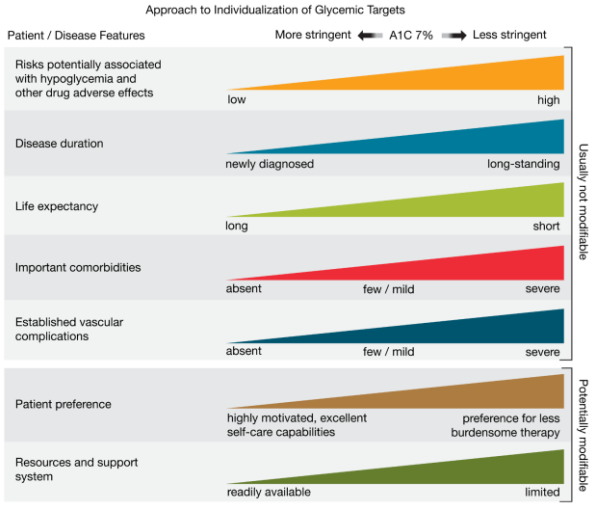
Section 5: Facilitating Positive Health Behaviors and Well-being to Improve Health Outcomes

- Micronutrients and supplements
  - no clear evidence of benefit from herbals and supplements without underlying deficiencies
    - insufficient evidence for cinnamon, curcumin, vitamin D, aloe vera, chromium

Section 6: Glycemic Targets

- 6.5b Added: Fragility or high risk of hypoglycemia target

  CGM: over 50% time in range, less than 1% below range

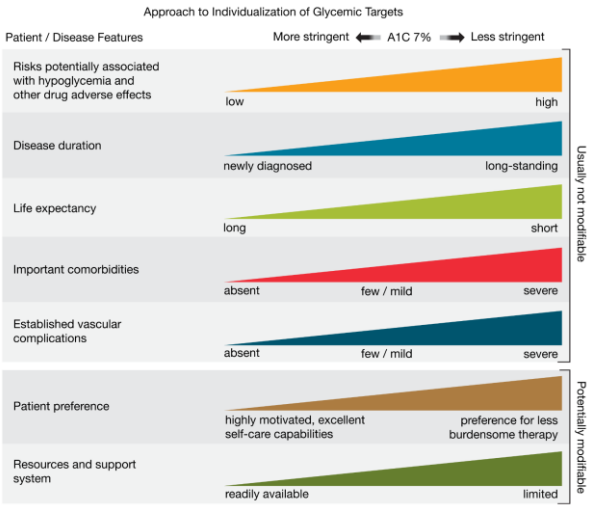


CGM: continuous glucose monitor

Section 6: Glycemic Targets

- 6.5b Added: Fragility or high risk of hypoglycemia target

  others (no change): over 70% time in range, less than 4% below range, less than 1% below 54 mg/dL



Section 8: Obesity and Weight Management for the Prevention and Treatment of Type 2 Diabetes

- Language amended to reinforce obesity as a chronic disease
- Focus on
  - nutrition
  - physical activity
  - behavioral counseling
  - pharmacotherapy
  - medical devices
  - metabolic surgery

Section 8: Obesity and Weight Management for the Prevention and Treatment of Type 2 Diabetes

- 8.5 Added: Even small weight loss (3-7%) should be treatment goal, but larger weight loss (10% or more) has better diabetes and cardiovascular benefits
  - November 2022 Meta-Analysis
    - no change in CV or all cause mortality
    - limitations to studies

CV: cardiovascular

Section 8: Obesity and Weight Management for the Prevention and Treatment of Type 2 Diabetes

- 8.5 Added: Even small weight loss (3-7%) should be treatment goal, but larger weight loss (10% or more) has better diabetes and cardiovascular benefits
  - Look AHEAD trial
    - intensive lifestyle sustainable
    - >10% weight reduction or worse baseline A1c subgroups saw reduction in CVE

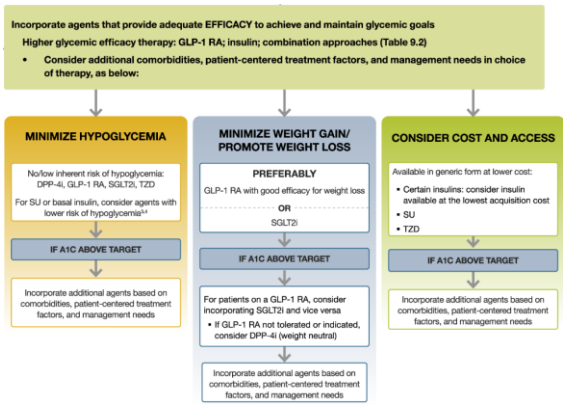
AHEAD: Action for Health in Diabetes; CVE: cardiovascular event

Section 8: Obesity and Weight Management for the Prevention and Treatment of Type 2 Diabetes

- GLP1RA and tirzepatide added as glucose lowering options with potential for weight loss

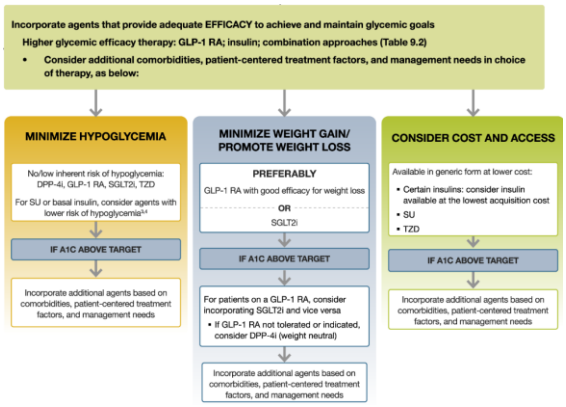
Section 9: Pharmacologic Approaches to Glycemic Treatment

- Aligns with recent consensus statement with European Association for the Study of Diabetes (EASD) September 2022



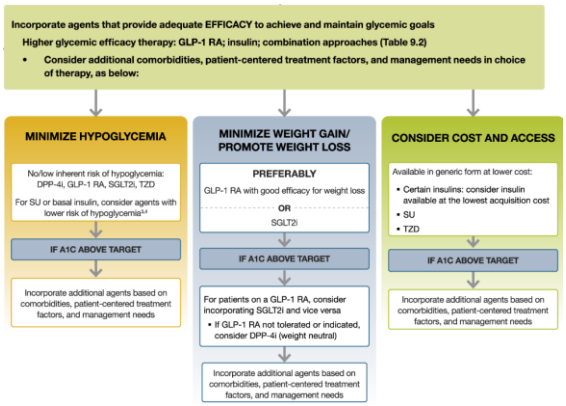
Section 9: Pharmacologic Approaches to Glycemic Treatment

- Change to right side of chart emphasizing efficacy: glucose/weight loss



Section 9: Pharmacologic Approaches to Glycemic Treatment

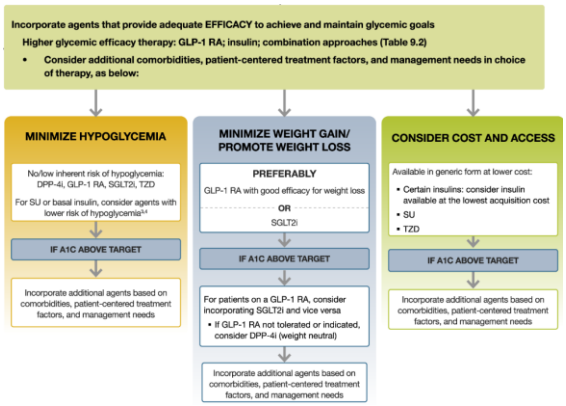
- Tirzepatide (GIP/GLP1RA)
  - SURPASS trials 1-5 (6 pending (basal/bolus insulin))



GIP: glucose-dependent insulinotropic polypeptide

Section 9: Pharmacologic Approaches to Glycemic Treatment

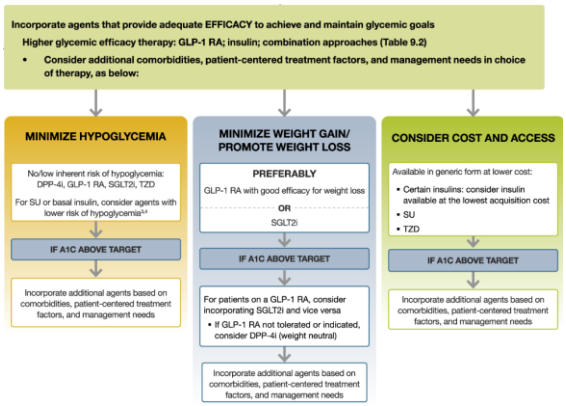
- Tirzepatide (GIP/GLP1RA)
  - 5, 10, 15 mg SQ weekly
  - A1c reduction of 2%+



SQ: subcutaneously

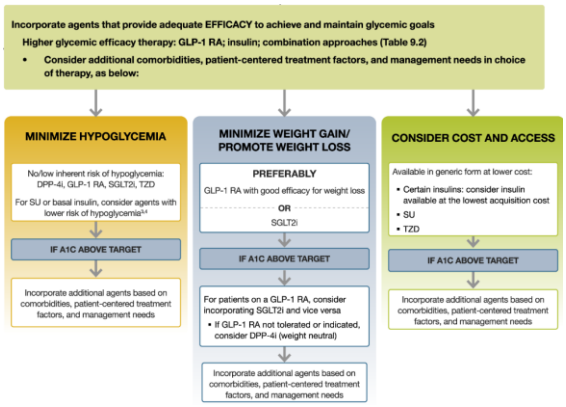
Section 9: Pharmacologic Approaches to Glycemic Treatment

- Emphasized combination therapy earlier based on baseline A1c from goal
  - ≥1.5% from goal, glucose ≥300 mg/dL, or A1c ≥10%



Section 9: Pharmacologic Approaches to Glycemic Treatment

- **Emphasized combination therapy earlier based on baseline A1c from goal**
  - **VERIFY study (biguanide vs. biguanide + DDP4i)**



DDP4i: dipeptidyl peptidase 4 inhibitor

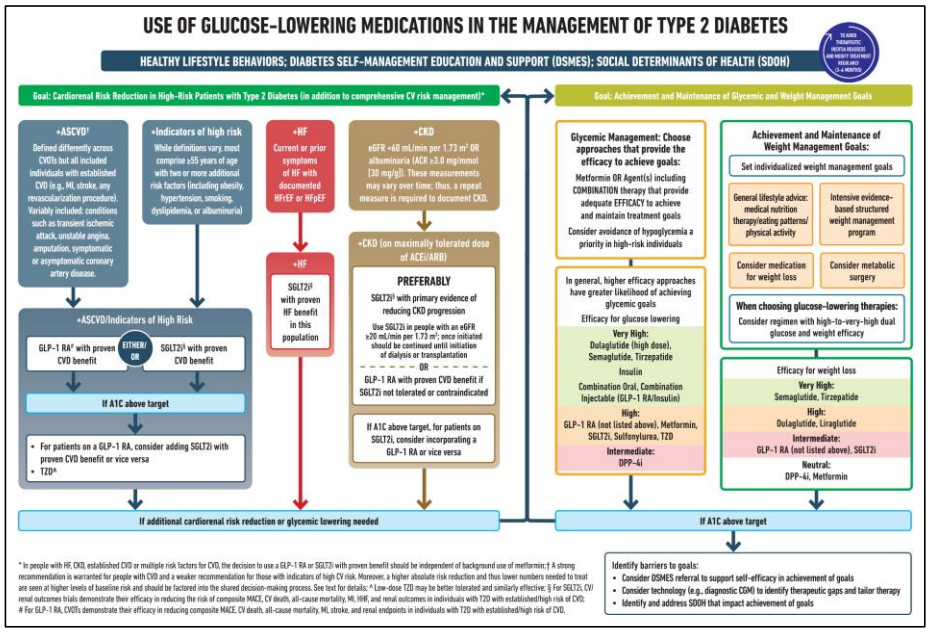


Figure 9.3

Table 9.2

canagliflozin (Invokana®), empagliflozin (Jardiance®), dapagliflozin (Forxiga®), ertugliflozin (Steglatro®)

dulaglutide (Trulicity®), liraglutide (Victoza®), semaglutide (Ozempic®, Rybelsus®), exenatide (Byetta®, Bydureon®), lixisenatide (Adlyxine™)

tirzepatide (Mounjaro™)

alogliptin (Nesina®), saxagliptin (Onglyza®), sitagliptin (Januvia®), linagliptin (Tradjenta®)

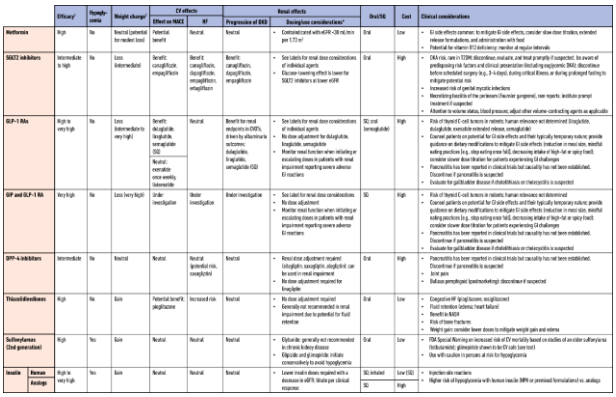
pioglitazone (Actos®)

glyburide (Glynase®), glipizide (Glucotrol®), glimepiride (Amaryl®)

NPH insulin (Humulin® N, Novolin® N); regular insulin (Humulin® N, Novolin® N)

aspart insulin (Fiasp®, NovoLog®), lispro insulin (Admelog®, Humalog®, Lyumjev™), glulisine insulin (Apidra®)

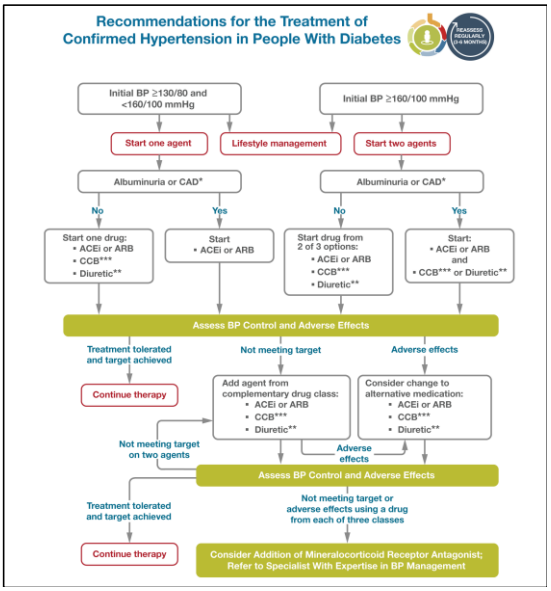
detemir insulin (Levemir®), glargine insulin (Lantus®, Semglee®, Basaglar®, Toujeo®), degludec insulin (Tresiba®)



	Efficacy[1]	Hypoglycemia	Weight change[2]	CV effects		Renal effects		Oral/SC	Cost	Clinical considerations
				Effect on MACE	HF	Progression of DKD	Dosing/use considerations[3]			
Metformin	High	No	Neutral (potential for modest loss)	Potential benefit	Neutral	Neutral	• Contraindicated with eGFR <30 mL/min per 1.73 m²	Oral	Low	• GI side effects common; to mitigate GI side effects, consider slow-dose titration, extended release formulations, and administration with food • Potential for vitamin B12 deficiency; monitor at regular intervals
SGLT2 inhibitors	Intermediate to high	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	High	• DKA risk, rare in T2DM; discontinue, evaluate, and treat promptly if suspected; be aware of predisposing risk factors and clinical presentation (including euglycemic DKA); discontinue before scheduled surgery (e.g., 3–4 days); during critical illness; during prolonged fasting to mitigate potential risk • Increased risk of genital mycotic infections • Necrotizing fasciitis of the perineum (fournier gangrene), case reports: institute prompt treatment if suspected • Attention to volume status, blood pressure; adjust other volume-contracting agents as applicable
GLP-1 RAs	High to very high	Yes	Loss (intermediate to very high)	Benefit: dulaglutide, liraglutide, semaglutide (SQ) Neutral: exenatide once weekly, lixisenatide	Neutral	Benefit for renal endpoints in CVOTs, 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	SC; oral (semaglutide)	High	• Risk of thyroid C-cell tumors in rodents; human relevance not determined: dulaglutide, exenatide extended-release, semaglutide • Counsel patients on potential for GI side effects and their typically temporary nature; provide guidance on dietary modifications to mitigate GI side effects (reduction in meal sizes, mindful eating practices [e.g., stop eating once full], decreasing intake of high-fat or spicy food); consider slower dose titration for patients experiencing GI challenges • Pancreatitis has been reported in clinical trials but causality has not been established. Discontinue if pancreatitis is suspected • Evaluate for gallbladder disease if cholelithiasis or cholecystitis is suspected
GIP and GLP-1 RAs	Very high	No	Loss (very high)	Under investigation	Under investigation	Under investigation	• See label for renal dose considerations • No dose adjustment • Monitor renal function when initiating or escalating doses in patients with renal impairment reporting severe adverse GI reactions	SC	High	• Risk of thyroid C-cell tumors in rodents; human relevance not determined • Counsel patients on potential for GI side effects and their typically temporary nature; provide guidance on dietary modifications to mitigate GI side effects (reduction in meal sizes, mindful eating practices [e.g., stop eating once full], decreasing intake of high-fat or spicy food); consider slower dose titration for patients experiencing GI challenges • Pancreatitis has been reported in clinical trials but causality has not been established. Discontinue if pancreatitis is suspected • Evaluate for gallbladder disease if cholelithiasis or cholecystitis is suspected
DPP-4 inhibitors	Intermediate	No	Neutral	Neutral	Neutral (potential risk, saxagliptin)	Neutral	• Renal dose adjustment required: linagliptin; saxagliptin, alogliptin: can be used in renal impairment • No dose adjustment required for linagliptin	Oral	High	• Pancreatitis has been reported in clinical trials but causality has not been established. Discontinue if pancreatitis is suspected • Joint pain • Bullous pemphigoid (postmarketing): discontinue if suspected
Thiazolidinediones	High	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	Low	• Congestive HF (group), macroglossa • Fluid retention (edema), heart failure • Benefit in NASH • Risk of bone fractures • Weight gain; consider lower doses to mitigate weight gain and edema
Sulfonylureas (2nd generation)	High	Yes	Gain	Neutral	Neutral	Neutral	• Glyburide: generally not recommended in chronic kidney disease • Glipizide and glimepiride: initiate conservatively to avoid hypoglycemia	Oral	Low	• FDA Special Warning on increased risk of CV mortality based on studies of an older sulfonylurea (tolbutamide); glimepiride shown to be CV safe (see text) • Use with caution in persons at risk for hypoglycemia
Insulin: Human Analogs	High to very high	Yes	Gain	Neutral	Neutral	Neutral	• Lower insulin doses required with a decrease in eGFR; titrate per clinical response	SC: inhaled SC	Low (SQ) High	• Injection-site reactions • Higher risk of hypoglycemia with human insulin (NPH or premixed formulations) vs. analogs

Section 10: Cardiovascular Disease and Risk Management

- 10.1 Revised to update definitions of hypertension to align with ACC/AHA: ≥130/80
- 10.4 Blood pressure goals changed: <130/80
- Figure 10.2 Updated



ACC: American College of Cardiology; AHA: American Heart Association

Section 10: Cardiovascular Disease and Risk Management

- Revisions align now with 2019 ESC/EAS guidelines
  - reduction of 39 mg/dL in LDL = 9% reduction in all death and 13% CV death
- No change: 40-70 years old for primary prevention
  - moderate intensity statin

ESC: European Society of Cardiology; EAS: European Atherosclerosis Society

Section 10: Cardiovascular Disease and Risk Management

- 10.20 Revised: Primary prevention HIGHER risk
  - high risk = at least ONE ASCVD risk factor
  - high intensity statin with LDL reduction of ≥50% and target LDL ≤70 mg/dL
- 10.21 Added: Add ezetimibe OR PCSK9 inhibitor to maximum tolerated statin if unable to reach LDL goal

Section 10: Cardiovascular Disease and Risk Management

- 10.22 Added: Keep statin on even after age 75
- 10.23 Added: May be reasonable to initiate moderate statin after age 75

Section 10: Cardiovascular Disease and Risk Management

- 10.26 Revised: Secondary prevention
  - high intensity statin with LDL reduction of ≥50% and target LDL ≤55 mg/dL
  - add ezetimibe OR PCSK9 inhibitor to maximum tolerated statin if unable to reach LDL goal
  - pending cardiovascular outcome data for new siRNA (inclisiran (Leqvio®))

Section 10: Cardiovascular Disease and Risk Management

- 10.42b Revised: SGLT2i for preserved or reduced ejection heart failure
- 10.43 Added: Add nonsteroidal mineralocorticoid receptor antagonist (finerenone) for CKD with albuminuria treated with target doses of ACEi or ARB

Section 11: Chronic Kidney Disease and Risk Management

- 11.5a Revised: eGFR and urinary albumin levels to initiate SGLT2i changed
  - eGFR ≥20 mL/min/1.73m2
  - urinary albumin: ≥200 mg/g creatinine
- 11.5b Added: Limited but emerging evidence for SGLT2i
  - CKD with normal urinary albumin

eGFR: Estimated Glomerular Filtration Rate

Section 11: Chronic Kidney Disease and Risk Management

- No albuminuria
  - added finerenone first-line option with SGLT2i or GLP1RA (not alternative)

Section 12: Retinopathy, Neuropathy, and Food Care

- Information, terminology, and clarification added
- 12.20 Revised: First-line agents for neuropathy
  - gabapentinoids
    - gabapentin, pregabalin
  - SNRI
    - duloxetine, venlafaxine, desvenlafaxine

SNRI: Serotonin and norepinephrine reuptake inhibitors

Section 12: Retinopathy, Neuropathy, and Food Care

- Information, terminology, and clarification added
- 12.20 Revised: First-line agents for neuropathy
  - TCA
    - amitriptyline
  - sodium channel blockers
    - lamotrigine, lacosamide, oxcarbazepine, valproic acid

TCA: tricyclic antidepressant

Special Populations

- Section 13: Older Adults
  - emphasis on deintensification of treatment goals to reduce risk of hypoglycemia and medication burden
  - recommended use of technology
    - insulin pumps for type 1
    - CGM for hypoglycemia risk regardless of medication therapy
- Section 15: Management of Diabetes in Pregnancy
  - diet, CGM, and breastfeeding updates

Section 16: Diabetes Care in the Hospital

- **16.5 Revised: Glucose target range of 100-180 mg/dL for noncritically ill patients with new or known hyperglycemia (in addition to previous alternative target of 110-140 mg/dL)**
- **16.7 Revised: Basal, prandial, and correction components preferred treatment for most noncritically ill patients with adequate nutritional intake**

Discussion

Did any of the updates (or lack of updates) surprise you?

What is New and on the Horizon

- Bexagliflozin (Brenzavvy®)
  - new SGLT2i approved JAN 2023
    - T2DM for glucose lowering with eGFR >30
    - similar A1c reduction, side effects, positive effects
    - pending CV trials

What is New and on the Horizon

- Teplizumab (Tzield®)
  - MOA
    - anti-CD3 monoclonal antibody
  - FDA approved July 2022
    - delay onset to symptomatic T1DM in stage 2 patients for at least two years
    - risk (side effects/$) vs benefit

T1DM: type 1 diabetes mellitus; stage 2: + islet cell antibodies and dysglycemia without over hyperglycemia; MOA: mechanism of action

What is New and on the Horizon

- **Tirzepatide**
  - **pending weight loss indication**
    - **SURMOUNT trials – Fast Track designation OCT 2022**
    - **15-20% weight reduction (dose specific)**
    - **about 50% of patients lost at least 10% of weight**
  - **GLP1RA vs. GIP/GLP1RA??**
  - **Pending CV in T2DM (Mounjaro™)**
    - **SURPASS-CVOT**
    - **finishes OCT 2024**
  - **SGLT2i or GLP1RA vs. GIP/GLP1RA??**

Knowledge Assessment

Pharmacists

1. Discuss revisions of the 2023 American Diabetes Association (ADA) Guidelines
2. Evaluate data supporting the 2023 revisions
3. Review general approach to glucose management
4. Identify new hyperglycemia agents and/or indications on the horizon

Technicians

1. Discuss revisions of the 2023 American Diabetes Association (ADA) Guidelines
2. Review general approach to glucose management
3. Identify brand/generic names and side effects/precautions of hyperglycemic medications

Everyone

- Which statement is correct regarding the treatment of cholesterol for a patient with a history of a myocardial infarction (secondary prevention)?
  A. LDL target of less than 55 mg/dL
  B. LDL reduction of 30-50%
  C. Use of PCSK9 inhibitor
  D. Use of moderate intensity statin

Everyone

- For a patient without ASCVD, heart failure, or CKD, metformin is first-line therapy for glucose lowering. True or false?

Pharmacists

- **Which medication is currently conducting studies to seek cardiovascular outcome lowering indication?**
  - A. **Semaglutide**
  - B. **Liraglutide**
  - C. **Tirzepatide**
  - D. **Dulaglutide**

Pharmacists

- **Though data for CGM is mainly in basal/bolus insulin users, the guidelines support use in special populations such as older adults and pregnant patients. True or false?**

Technicians

- **What is the generic name for Mounjaro™?**
  - **Empagliflozin**
  - **Pioglitazone**
  - **Tirzepatide**
  - **Metformin**

References

- **American Diabetes Association. Standards of care in diabetes – 2023; 46(Suppl. 1) https://doi.org/10.2337**
- **The Alpha-Tocopherol, Beta Carotene Cancer Prevention Study Group. The effect of vitamin E and beta carotene on the incidence of lung cancer and other cancers in male smokers. N Engl J Med. 1994;330(15):1029–1035.**
- **Davies MJ, Aroda VR, Collins BS, et al. Management of hyperglycemia in type 2 diabetes, 2022. A consensus report by the American Diabetes Association (ADA) and the European Association for the Study of Diabetes (EASD). Diabetes Care 2022;45(11):2753-2786.**
- **Zucatti KP, Teixeira PP, Wayerbacher LF, et al. Long-term effect of lifestyle interventions on the cardiovascular and all-cause mortality of subjects with prediabetes and type 2 diabetes: a systematic review and meta-analysis. Diabetes Care 2022;45(11):2787-2795.**
- **Medicine Matters. A quick guide to the SURPASS and SURMOUNT trials. https://diabetes.medicinematters.com/tirzepatide/type-2-diabetes/a-quick-guide-to-the-surpass-and-surmount-trials/18478154. Updated August 2022. Accessed February 10, 2023.**

References

- Mach F, Baigent C, Catapano AL, et al.; ESC Scientific Document Group. 2019 ESC/EAS guidelines for the management of dyslipidaemias: lipid modification to reduce cardiovascular risk. Eur Heart J 2020;41:111–188\
- TheracosBio Announces FDA Approval of Brenzavvy (bexaglifloxin) for the treatment of Adults with Type 2 Diabetes. News release. BusinessWife; January 23, 2023. Accessed January 25, 2023. https://www.businesswire.com/news/home/20230123005126/en/TheracosBio-Announces-FDA-Approval-of-Brenzavvy%E2%84%A2-bexagliflozin-for-the-Treatment-of-Adults-with-Type-2-Diabetes
- Lilly receives U.S. FDA Fast Track designation for tirzepatide for the treatment of adults with obesity, or overweight with weight-related comorbidities. News release. PRNewswife; October 6, 2022. Accessed December 22, 2022. https://www.prnewswire.com/news-releases/lilly-receives-us-fda-fast-track-designation-for-tirzepatide-for-the-treatment-of-adults-with-obesity-or-overweight-with-weight-related-comorbidities-301642476.html
- CDC. COVID-19 Vaccination for Children. https://www.cdc.gov/vaccines/covid-19/planning/children.html. October 5, 2022. Accessed December 22, 2022.

Health.edu
at Texas Tech University Health Sciences Center®

American Diabetes Association (ADA) Standards of Care 2023 Guideline Updates

Rachel Basinger, PharmD, BCACP, CTTS