Diabetes Mellitus Guidelines

- Use patient-centered, nonjudgmental language that fosters collaboration between patients and providers, including people-first language (e.g., “person with obesity” rather than “obese person”)

1. Population screening
    a. Indications
        i. Adults of any age with body mass index greater than or equal to 25 (23 for Asian American), plus one or more additional risk factor for diabetes, including
            1. First degree relative with diabetes,
            2. High risk race/ethnicity, including; African American, Latino, Native American, Asian American, Pacific Islander,
            3. Physical inactivity,
            4. Women who delivered a baby weighing greater than 9 pounds or who were diagnosed with gestational diabetes,
            5. Hypertension,
            6. HDL cholesterol less than 35,
            7. Triglyceride greater than 250,
            8. Women with polycystic ovary syndrome,
            9. Previous test abnormalities including hemoglobin A1c greater than 5.7, impaired glucose tolerance or impaired fasting glucose on previous testing,
            10. Other conditions associated with insulin resistance including severe obesity, acanthosis nigricans,
            11. History of *Atherosclerotic cardiovascular disease*

- In patients with no risk factors, testing should begin at age 35 years
    - Testing for prediabetes and/or type 2 diabetes should be considered in women planning pregnancy with overweight or obesity and/or who have one or more additional risk factor for diabetes
    - Screening with a fasting glucose test for undiagnosed diabetes in all women who are planning to become pregnant, especially if they have risk factors.
    - For unplanned pregnancies, women should be screened at the first prenatal visit
    - Risk-based screening for prediabetes and/or type 2 diabetes should be considered after the onset of puberty or after 10 years of age,

whichever occurs earlier, in children and adolescents with overweight (BMI ≥85th percentile) or obesity (BMI ≥95th percentile) and who have additional risk factors for diabetes.

* At least annual monitoring for the development of type 2 diabetes in those with prediabetes is suggested.

Cystic Fibrosis Related DM

* Annual screening for cystic fibrosis–related diabetes (CFRD) with an oral glucose tolerance test should begin by age 10 years in all patients with cystic fibrosis not previously diagnosed with CFRD
* A1C is not recommended as a screening test for cystic fibrosis–related diabetes
* Patients with cystic fibrosis–related diabetes should be treated with insulin to attain individualized glycemic goals
* Beginning 5 years after the diagnosis of cystic fibrosis–related diabetes, annual monitoring for complications of diabetes is recommended

Screening in Organ Transplant Recipients:

* Patients should be screened after organ transplantation for hyperglycemia, with a formal diagnosis of post-transplantation diabetes mellitus being best made once a patient is stable on an immunosuppressive regimen and in the absence of an acute infection
* The oral glucose tolerance test is the preferred test to make a diagnosis of post-transplantation diabetes mellitus

Screening in Children:

* All children diagnosed with diabetes in the first 6 months of life should have immediate genetic testing for neonatal diabetes
* Children and those diagnosed in early adulthood who have diabetes not characteristic of type 1 or type 2 diabetes that occurs in successive generations (suggestive of an autosomal dominant pattern of inheritance) should have genetic testing for maturity-onset diabetes of the young
* In both instances, consultation with a center specializing in diabetes genetics is recommended to understand the significance of these mutations and how best to approach further evaluation, treatment, and genetic counseling

Screening in Pregnancy:

- Test for undiagnosed prediabetes and diabetes at the first prenatal visit in those with risk factors using standard diagnostic criteria
- Test for gestational diabetes mellitus at 24–28 weeks of gestation in pregnant women not previously found to have diabetes
- Test women with gestational diabetes mellitus for prediabetes or diabetes at 4–12 weeks postpartum, using the 75-g oral glucose tolerance test and clinically appropriate nonpregnancy diagnostic criteria
- Women with a history of gestational diabetes mellitus should have lifelong screening for the development of diabetes or prediabetes at least every 3 years
- Women with a history of gestational diabetes mellitus found to have prediabetes should receive intensive lifestyle interventions and/or metformin to prevent diabetes
- Women with preexisting type 1 or type 2 diabetes who are planning pregnancy or who have become pregnant should be counseled on the risk of development and/or progression of diabetic retinopathy. Dilated eye examinations should occur ideally before pregnancy or in the first trimester, and then patients should be monitored every trimester and for 1 year postpartum as indicated by the degree of retinopathy and as recommended by the eye care provider

Special Considerations:

- Patients with type 1 diabetes should be screened for autoimmune thyroid disease soon after diagnosis and periodically thereafter
- Adult patients with type 1 diabetes should be screened for celiac disease in the presence of gastrointestinal symptoms, signs, or laboratory manifestations suggestive of celiac disease
- Patients with type 2 diabetes or prediabetes and elevated liver enzymes (ALT) or fatty liver on ultrasound should be evaluated for presence of nonalcoholic steatohepatitis and liver fibrosis

b. Frequency
   i. Repeat testing at least at 3 year intervals
c. Screening tests used are the same as listed below under criteria for diagnosis

2. Criteria for diagnosis
   a. Hemoglobin A1c greater than or equal to 6.5, OR

(Marked discordance between measured A1C and plasma glucose levels should raise the possibility of A1C assay interference and consideration of using an assay without interference or plasma blood glucose criteria to diagnose diabetes
In conditions associated with an altered relationship between A1C and glycemia, such as hemoglobinopathies including sickle cell disease, pregnancy (second and third trimesters and the postpartum period), glucose-6-phosphate dehydrogenase deficiency, HIV, hemodialysis, recent blood loss or transfusion, or erythropoietin therapy, only plasma blood glucose criteria should be used to diagnose diabetes)

b. Fasting plasma glucose greater than or equal to 126, OR
c. Two-hour plasma glucose greater than or equal to 200 during an oral glucose tolerance test, OR
d. Classic symptoms of hyperglycemia with random plasma glucose greater than or equal to 200, AND
e. A confirmation study using the same test, or a confirmation using a different test from the above list. If the confirmatory test chosen is a different test than the initial abnormal, and is normal, then a third test utilizing the initial abnormal study should be repeated. (Examples, if the hemoglobin A1c is greater than 6.5 and fasting plasma glucose greater than 126, the diagnosis is confirmed. If hemoglobin A1c is greater than 6.5 and fasting plasma glucose less than 126, then a repeat hemoglobin A1c is needed, which, if greater than 6.5, confirms the diagnosis)

3. Clinical evaluation and disease surveillance
    a. History (including current visit and previously obtained elements) should include
        i. Detailed history regarding diabetes course including age and characteristics of onset,
        ii. Review of previous treatment regimens and response to therapy,
        iii. Current treatment including medications and medication adherence,
        iv. Current meal plan, physical activity pattern and assessment of readiness for behavior change,
        v. Results of glucose monitoring and patient's use of results, hypoglycemic events,
        vi. History of diabetes related complications including

1. Microvascular such as retinopathy, diabetic kidney disease, neuropathy (including peripheral sensory, and autonomic such as sexual dysfunction and gastroparesis),
2. Macrovascular including coronary artery disease, cerebrovascular disease, peripheral arterial disease
    - Patients with type 1 diabetes should be screened for autoimmune thyroid disease soon after diagnosis and periodically thereafter
    - Adult patients with type 1 diabetes should be screened for celiac disease in the presence of gastrointestinal symptoms, signs, or laboratory manifestations suggestive of celiac disease.

vii. Other complications including psychosocial problems and dental disease

1. Psychosocial assessment and care recommendations include
    a. Attitudes about illness, expectations for medical management and outcomes,
    b. Affect and mood,
    c. General and diabetes-related quality of life,
    d. Resources including financial, social and emotional support
    e. Psychiatric history,
    f. Screening for depression, eating disorders and cognitive impairment when self-management is poor, especially children, patients with hypoglycemia, and older patients
    g. Relaxing glucose targets for a few weeks can improve hypoglycemia awareness in many patients.

b. Physical examination should include

i. Height, weight and body mass index,
ii. Blood pressure,
iii. Thyroid examination,
iv. Skin examination,
v. Peripheral vascular examination,
vi. Neurologic examination including

1. Presence/absence of patellar and achilles reflexes,
2. Sensory examination including proprioception, vibration and monofilament sensation.

c. Laboratory evaluation should include

i. When using A1C to diagnose diabetes, it is important to recognize that A1C is an indirect measure of average blood glucose levels and to take other factors into consideration that may impact hemoglobin glycation independently of glycemia including age, race/ethnicity, and anemia/hemoglobinopathiesFasting lipid profile, at least annually, and more frequently if needed to assess changes in treatment regimen

ii. Liver function tests, at least annually

iii. Urine albumin to creatinine ratio or microalbumin, at least annually

* Patients with urinary albumin >30 mg/g Cr and/or an eGFR <60 mL/min/1.73 m^2 should be monitored twice annually to guide therapy

iv. Serum creatinine and calculated GFR, at least annually

v. TSH in type 1 diabetes, dyslipidemia or women over 50, at least annually

d. Referrals to include

i. Eye care professional for dilated annual examination

ii. Registered dietitian for medical nutritional therapy

iii. Dentist for comprehensive periodontal examination

4. Disease management for type 2 diabetes

a. General principles

i. The management plan should emphasize a collaborative approach utilizing a care team and engaging the patient in self-management. The care team should include members responsible for clinical decision making, tracking patient progress toward treatment goals, and diabetes education. Using principles of patient-centered care, primary care practices treating diabetics should develop roles and responsibilities for members of the care team, which may include physicians, mid-level providers, nurses, pharmacists, behavioral health specialists and educators. When involvement of medical-surgical specialists is indicated, the care team is also responsible for tracking the patient's involvement with specialists and the assimilation of specialty evaluation and treatment into the patient's individual care plan.

b. Ongoing assessment of glycemic control

* Use of technology should be individualized based on a patient's needs, desires, skill level, and availability of devices

i. Hemoglobin A1c, at least every 6 months, and when target levels are not achieved, or treatment changes are made, every 3 months is appropriate to guide clinical decision making

Glycemic Goals:

* An A1C goal for many nonpregnant adults of <7% (53 mmol/mol) without significant hypoglycemia is appropriate.
* If using ambulatory glucose profile/glucose management indicator to assess glycemia, a parallel goal is a time in range of >70% with time below range <4%
* On the basis of provider judgment and patient preference, achievement of lower A1C levels than the goal of 7% may be acceptable, and even beneficial, if it can be achieved safely without significant hypoglycemia or other adverse effects of treatment.
* Less stringent A1C goals (such as <8% [64 mmol/mol]) may be appropriate for patients with limited life expectancy, or where the harms of treatment are greater than the benefits.

ii. Self-monitoring of blood glucose (SMBG)

1. Patients on multiple-dose insulin (MDI) should perform SMBG at least prior to meals, occasionally postprandially, at bedtime, prior to exercise, when they suspect hypoglycemia and prior to crucial tasks such as driving.
2. SMBG may be useful to guide treatment decisions and self-management for patients on single dose insulin or non-insulin therapies. Ongoing education which directs patients to proper action steps when SMBG is out of target range is recommended.

* Health care providers should be aware of medications and other factors, such as high-dose vitamin C and hypoxemia, that can interfere with glucose meter accuracy and provide clinical management as indicated

3. Continuous glucose monitoring (CGM) may be a useful supplemental tool in those with frequent hypoglycemia or hypoglycemia unawareness.

4. Use of continuous glucose monitoring (CGM) in adults with type 1 diabetes has been expanded to all adults (18 and above) who are not meeting glycemic targets
    - Standardized, single-page glucose reports with visual cues such as the Ambulatory Glucose Profile (AGP) should be considered as a standard printout for all CGM devices
    - Time in range is associated with the risk of microvascular complications and should be an acceptable end point for clinical trials and can be used for assessment of glycemic control. Additionally, time below target (<70 and <54 mg/dL [3.9 and 3.0 mmol/L]) and time above target (>180 mg/dL [10.0 mmol/L]) are useful parameters for reevaluation of the treatment regimen

c. Medication management
    i. Initiate metformin therapy along with lifestyle interventions, unless metformin is contraindicated,
    ii. GLP-1 receptor agonists or SGLT2 inhibitors can be used in addition to or instead of metformin. These medicines can be prescribed to patients with diabetes who have or are at risk for atherosclerosis, heart failure, or chronic kidney disease (CKD) to help reduce cardiovascular events and disease progression.
    iii. Health care professionals may also use a nonsteroidal mineralocorticoid receptor antagonist (finerenone) when they cannot use SGLT2 inhibitors for chronic kidney disease.
    iv. In newly diagnosed type II diabetic with markedly symptomatic and/or elevated blood glucose levels, consider insulin therapy with or without additional agents from the outset,
    v. If non-insulin monotherapy at maximal tolerated dose does not achieve or maintain A1c target over 3-6 months, add a second oral agent, a GLP-1 receptor agonist, or insulin
    vi. insulin is the preferred agent for the management of type 1 and type 2 diabetes in pregnancy
    vii. A table of medication algorithms indicated for control of type 2 diabetes is found in Attachment A.
    vi. For patients who achieve short-term weight-loss goals, long-term (≥1 year) comprehensive weight-maintenance programs should be prescribed. Such programs should provide at least monthly contact and

encourage ongoing monitoring of body weight (weekly or more frequently) and/or other self-monitoring strategies, such as tracking intake, steps, etc.; continued consumption of a reduced-calorie diet; and participation in high levels of physical activity (200–300 min/week).

To achieve weight loss of >5%, short-term (3-month) interventions that use very low-calorie diets (≤800 kcal/day) and total meal replacements may be prescribed for carefully selected patients by trained practitioners in medical care settings with close medical monitoring. To maintain weight loss, such programs must incorporate long-term comprehensive weight-maintenance counseling.

vii * Metabolic surgery should be a recommended option to treat type 2 diabetes in screened surgical candidates with BMI ≥40 kg/m^2 (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
- Metabolic surgery should be performed in high-volume centers with multidisciplinary teams knowledgeable about and experienced in the management of diabetes and gastrointestinal surgery
- Long-term lifestyle support and routine monitoring of micronutrient and nutritional status must be provided to patients after surgery, according to guidelines for postoperative management of metabolic surgery by national and international professional societies
- People being considered for metabolic surgery should be evaluated for comorbid psychological conditions and social and situational circumstances that have the potential to interfere with surgery outcomes
- People who undergo metabolic surgery should routinely be evaluated to assess the need for ongoing mental health services to help with the adjustment to medical and psychosocial changes after surgery

∗ When choosing glucose-lowering medications for patients with type 2 diabetes and overweight or obesity, consider a medication's effect on weight

- Whenever possible, minimize medications for comorbid conditions that are associated with weight gain
- The early introduction of insulin should be considered if there is evidence of ongoing catabolism (weight loss), if symptoms of hyperglycemia are present, or when A1C levels (>10% [86 mmol/mol]) or blood glucose levels (≥300 mg/dL [16.7 mmol/L]) are very high
- Most people with type 1 diabetes should be treated with multiple daily injections of prandial and basal insulin, or continuous subcutaneous insulin infusion
- Most individuals with type 1 diabetes should use rapid-acting insulin analogs to reduce hypoglycemia risk
- Patients with type 1 diabetes should receive education on how to match prandial insulin doses to carbohydrate intake, premeal blood glucose, and anticipated physical activity
- A patient-centered approach should be used to guide the choice of pharmacologic agents. Considerations include CV comorbidities, hypoglycemia risk, impact on weight, cost, risk for side effects, and patient preference
- Among patients with type 2 diabetes who have established ASCVD or indicators of high-risk, established kidney disease, or HF, a sodium–glucose cotransporter 2 (SGLT2) inhibitor or glucagon-like peptide 1 (GLP-1) receptor agonist with demonstrated CVD benefit is recommended as part of the glucose-lowering regimen independent of A1C and in consideration of patient-specific factors
- In patients with type 2 diabetes and established HF, an SGLT2 inhibitor may be considered to reduce risk of HF hospitalization.
- Numerous large, randomized controlled trials have reported statistically significant reductions in CV events for three of the FDA-approved SGLT2 inhibitors (empagliflozin, canagliflozin, and dapagliflozin) and four FDA-approved GLP-1 receptor agonists (liraglutide, albiglutide [although that agent was removed from the market for business reasons], semaglutide [lower risk of CV events in a moderate-sized clinical trial but one not powered as a CV outcomes trial], and dulaglutide). SGLT2 inhibitors also appear to reduce risk of HF hospitalization and progression of kidney disease in patients with established ASCVD, multiple risk factors for ASCVD, or DKD.
- Long-term use of metformin may be associated with biochemical vitamin B12 deficiency; consider periodic measurement of vitamin B12 levels in metformin-treated patients, especially in those with anemia or peripheral neuropathy

Vii Metformin therapy for prevention of type 2 diabetes should be considered in those with prediabetes, especially for those with BMI ≥35 kg/m^2, those aged <60 years, and women with prior GDM

Viii Diabetes Management in Hospitalized Patients:

- Insulin therapy should be initiated for treatment of persistent hyperglycemia starting at a threshold ≥180 mg/dL (10.0 mmol/L). Once insulin therapy is started, a target glucose range of 140–180 mg/dL (7.8–

10.0 mmol/L) is recommended for the majority of critically ill and noncritically ill patients
More stringent goals, such as 110–140 mg/dL (6.1–7.8 mmol/L), may be appropriate for selected patients if they can be achieved without significant hypoglycemia

- Basal insulin or a basal plus bolus correction insulin regimen is the preferred treatment for noncritically ill hospitalized patients with poor oral intake or those who are taking nothing by mouth
  An insulin regimen with basal, prandial, and correction components is the preferred treatment for noncritically ill hospitalized patients with good nutritional intake
- Use of only a sliding scale insulin regimen in the inpatient hospital setting is strongly discouraged

d. Evaluation for the presence of, and treatment of coexisting cardiovascular risk factors including
   i. Current tobacco use
      1. Current tobacco user should receive counseling regarding the adverse health consequences of smoking and encouraged to quit
   ii. Hypertension
      1. Guidelines from the American Diabetic Association, Standards of Medical Care in Diabetes – 2019, state:
         People with diabetes and hypertension should be treated to a systolic blood pressure (SBP) goal of ,140 mmHg.
         b Lower systolic targets, such as ,130 mmHg, may be appropriate for certain individuals, such as younger patients, if they can be achieved without undue treatment burden.
         c Individuals with diabetes should be treated to a diastolic blood pressure (DBP) ,90 mmHg.
         d Lower diastolic targets, such as ,80 mmHg, may be appropriate for certain individuals, such as younger patients, if they can be achieved without undue treatment burden. (This is new information)
      2. Inhibitors of the renin angiotensin system may have unique advantages for initial or early treatment in patients with coexisting diabetes and hypertension.

3. Consider mineralocorticoid receptor antagonist therapy in patients with resistant hypertension
4. For patients with type 2 diabetes and chronic kidney disease, consider use of a sodium–glucose cotransporter 2 inhibitor or glucagon-like peptide 1 receptor agonist shown to reduce risk of chronic kidney disease progression, cardiovascular events, or both.

iii. Lipid disorder

1. Lifestyle recommendations for lipid-lowering include reduction of total calories consumed, reduction in proportion of calories from saturated fat, trans-fat and cholesterol with increase in omega-3-fatty acids, viscous fiber and plant stanols-sterols.
2. Statin therapy should be added to lifestyle therapy regardless of lipid levels for diabetic patients with overt *Atherosclerotic cardiovascular disease*, and in patients over age 40 with one or more additional cardiovascular risk factor.
3. Consider adding ezetimibe to moderate-intensity statin provides additional cardiovascular benefits for select individuals with diabetes.
4. Consider adding non-statin LDL-lowering therapies for patients with diabetes and ASCVD who have LDL cholesterol 70 mg/dL despite maximally tolerated statin dose..

iv. Anti-thrombotic therapy

1. Consider aspirin (75-162 mg per day) as a primary prevention strategy in diabetics with increased risk of *Atherosclerotic cardiovascular disease*; i.e. those with a 10 year risk calculation exceeding 10%. This includes most men and women over 50 who have at least one additional major risk factor such as family history of *Atherosclerotic cardiovascular disease*, hypertension, smoking, dyslipidemia or albuminuria.
2. Women with type 1 and type 2 diabetes to should take low-dose aspirin starting at the end of the first trimester to lower the risk of preeclampsia.
3. Use aspirin (75-162 mg per day) as a secondary prevention strategy in diabetics with *Atherosclerotic cardiovascular disease*.

e. Assessment of common comorbid conditions. For patients with risk factors, signs or symptoms, consider assessment and treatment for common diabetes associated conditions including:
    i. Hearing impairment,
    ii. Obstructive sleep apnea,
    iii. Fatty liver disease,
    iv. Low testosterone in men,
    v. Periodontal disease,
    vi. Osteoporosis,
    vii. Cognitive impairment,
    viii. Cancers including liver, pancreas, endometrium, colorectal, breast and bladder.

5. Diabetes self-management education (DSME)
    a. People with diabetes should receive DMSE according to national standards and diabetes self-management support at the time of diagnosis and as needed thereafter,
    b. Effective self-management and quality of life are the key outcomes of DMSE and should be measured and monitored as part of care,
    c. DMSE should address psychosocial issues since emotional well-being is associated with positive diabetes outcomes,
    d. Physical activity recommendations include
        i. At least 150 min. per week of moderate intensity aerobic exercise spread over at least 3 days per week and,
        ii. Resistance training at least twice per week, in the absence of contraindications
    e. Medical nutritional therapy
        i. Weight loss is recommended for all overweight or obese diabetics. Either low carbohydrate, low-fat calorie restricted or Mediterranean diet may be effective.
        ii. Physical activity and behavior modification are important components of weight loss programs and are most helpful in maintenance of weight loss.
        iii. The mix of carbohydrate, protein and fat may be adjusted to meet the metabolic goals and individual preferences of the person with diabetes.

iv. Monitoring carbohydrate, whether by carbohydrate counting, choices or experience based estimation, remains a key strategy in achieving glycemic control.
v. Reducing trans-fat intake lowers LDL cholesterol and increases HDL cholesterol.
vi. Adults who choose to use alcohol should do so in moderation, one drink per day for women, 2 drinks or less per day for adult men.

6. Immunizations
   a. Influenza vaccine annually,
   b. COVID-19 vaccination: Iinitial and booster according to CDC guidelines
   c. Pneumococcal polysaccharide vaccine upon diagnosis and one time revaccination at age 65, or 5 years after initial vaccine, which ever comes last
   d. *Hepatitis B vaccine is recommended for all diabetics age 19-59 years, and should be considered in those age > 60 years.*
7. Clinical Quality Measures
   a. HEDIS 2012 Comprehensive Diabetes Care
      i. Hemoglobin A1c > 9.0, < 8.0, <7.0
      ii. Retinal eye exam within the past 2 years
      iii. LDL cholesterol testing within one year and less than 100
      iv. Microalbumin testing within one year
      v. Blood pressure less than 140/90
      vi. Blood pressure less than 130/80
   b. Healthy People 2020 Diabetes Objectives
      i. Reduce the annual number of new cases of diagnosed diabetes in the population
      ii. Reduce the death rate among the population with diabetes
         1. Reduce the all-cause mortality rate among diabetics
         2. Reduce cardiovascular death rates among diabetics
      iii. Reduce the rate of lower extremity amputations among diabetics
      iv. Improve glycemic control among the population with diagnosed diabetes
         1. Reduce the proportion with A1 C value > 9.0
         2. Increase the proportion with A1 C value < 7.0
      v. Improve lipid control among persons with diagnosed diabetes
      vi. Increase the proportion of diabetics whose blood pressure is under control

vii. Increase the proportion of diabetics who have an annual dental examination
viii. Increase the proportion of diabetics who have an annual foot examination
ix. Increase the proportion of diabetics who have an annual dilated eye examination
x. Increase the proportion of diabetics with at least 2 A1c measurements per year
xi. Increase the proportion of diabetics who have an annual urinary microalbumin
xii. Increase the proportion of diabetics who perform self blood glucose monitoring at least daily
xiii. Increase the proportion of diabetics who receive formal diabetes education
xiv. Increase the proportion of persons with diabetes whose condition has been diagnosed
xv. Increase prevention behaviors in persons at high risk for diabetes
    1. Increase the proportion of pre-diabetics who report increasing their activity level
    2. Increase the proportion of pre-diabetics who report reducing the amount of fat or calories in their diet

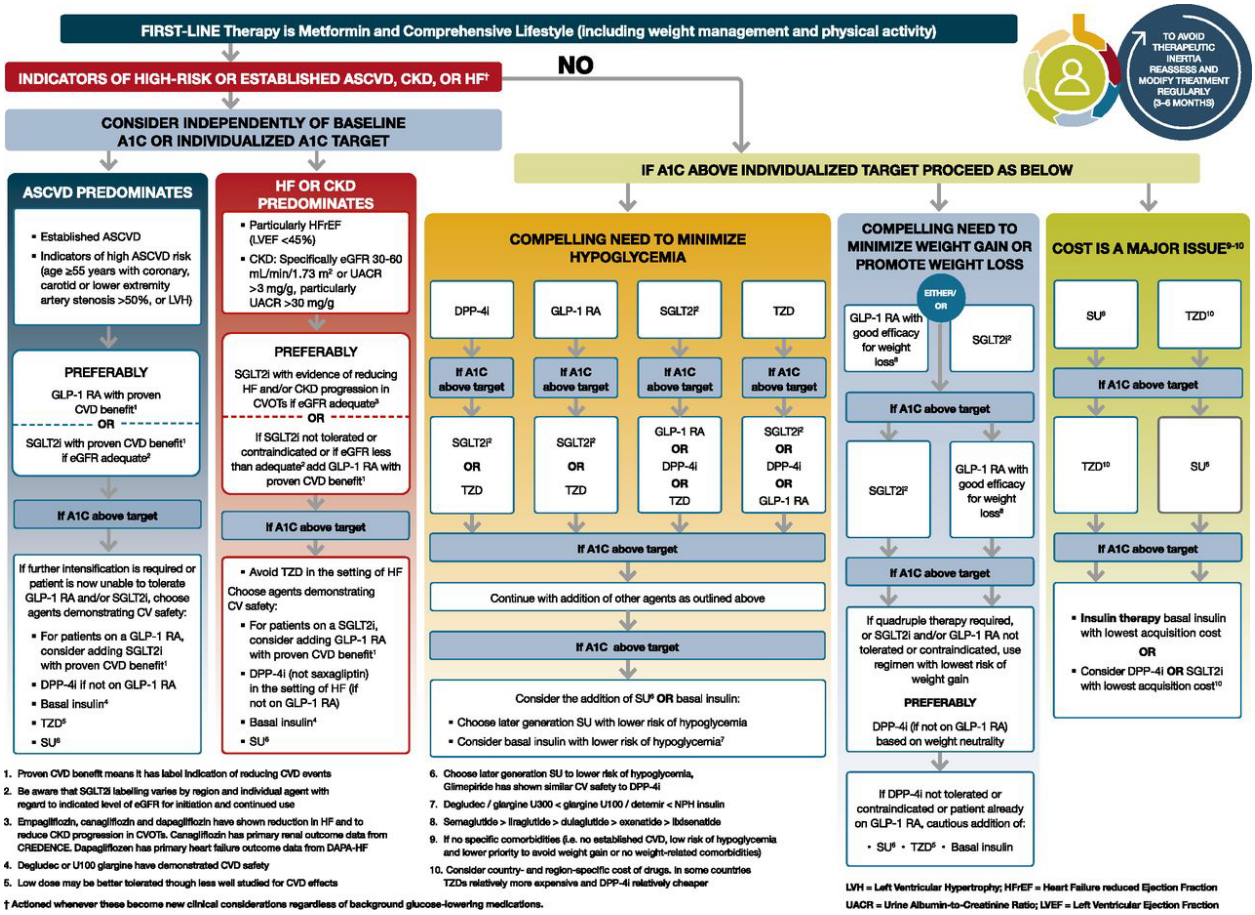
8. References

a. Diabetes Care 2022;45(Supplement_1):S3 https://doi.org/10.2337/dc22-Sppc
b. US Department of Health and Human Services, National Diabetes Education Program, Guiding Principles for Diabetes Care http://ndep.nih.gov/publications/PublicationDetail.aspx?PubId=108
c. American Medical Association, 2014 Evidence-Based Guideline for the Management of High Blood Pressure in Adults - Report From the Panel Members Appointed to the Eighth Joint National Committee (JNC 8) http://jama.jamanetwork.com/article.aspx?articleid=1791497

9. Patient Resources

a. US Department of Health and Human Services, National Diabetes Education Program, 4 Steps to Control Your Diabetes. For Life. http://ndep.nih.gov/publications/PublicationDetail.aspx?PubId=4
b. US Department of Health and Human Services, Physical Activity Guidelines for Americans, Be Active Your Way: A Guide For Adults http://www.health.gov/paguidelines/adultguide/default.aspx
c. US National Library of Medicine, National Institutes of Health, MedlinePlus, Diabetes Diet-Type II, http://www.nlm.nih.gov/medlineplus/ency/article/007429.htm
d. United States Department of Agriculture, USDA, choosemyplate.gov, Let's Eat for the Health of It, http://www.choosemyplate.gov/food-groups/downloads/MyPlate/DG2010Brochure.pdf
e. American Diabetes Association, Learning How to Change Habits, http://professional.diabetes.org/admin/UserFiles/file/Reducing%20Cardiometabolic%20Risk_%20Patient%20Education%20Toolkit/English/ADA%20CMR%20Toolkit_4Habits.pdf

Attachment A



1. Proven CVD benefit means it has label indication of reducing CVD events
2. Be aware that SGLT2i labelling varies by region and individual agent with regard to indicated level of eGFR for initiation and continued use
3. Empagliflozin, canagliflozin and dapagliflozin have shown reduction in HF and to reduce CKD progression in CVOTs. Canagliflozin has primary renal outcome data from CREDENCE. Dapagliflozen has primary heart failure outcome data from DAPA-HF
4. Degludec or U100 glargine have demonstrated CVD safety
5. Low dose may be better tolerated though less well studied for CVD effects
6. Choose later generation SU to lower risk of hypoglycemia, Glimepiride has shown similar CV safety to DPP-4i
7. Degludec / glargine U300 < glargine U100 / detemir < NPH insulin
8. Semaglutide > liraglutide > dulaglutide > exenatide > lixisenatide
9. If no specific comorbidities (i.e. no established CVD, low risk of hypoglycemia and lower priority to avoid weight gain or no weight-related comorbidities)
10. Consider country- and region-specific cost of drugs. In some countries TZDs relatively more expensive and DPP-4i relatively cheaper

† Actioned whenever these become new clinical considerations regardless of background glucose-lowering medications.

LVH = Left Ventricular Hypertrophy; HFrEF = Heart Failure reduced Ejection Fraction
UACR = Urine Albumin-to-Creatinine Ratio; LVEF = Left Ventricular Ejection Fraction