ADA Standards of Medical Care in Diabetes – 2024

January 2024 Volume 47, Supplement 1

This is not an all-inclusive list. Please refer to source document for full recommendations, including level of evidence rating

ADA, American Diabetes Association

2024 ADA: Use of Glucose- lowering medications in the management of T2D *(Figure 9.3; S166)*

Health lifestyle behaviors; Diabetes Self-Management Education and Support (DSMES); Social Determinants of Health (SDOH)

TO AVOID THERAPEUTIC INERTIA REASSESS AND MODIFY TREATMENT REGULARLY (3-6 MONTHS)

Goal: Cardiorenal risk reduction in high-risk patients with Type-2 diabetes (in addition to comprehensive CV risk management)*

+ASCVD†

Defined differently across CVOTs but all included individuals with established CVD (e.g., MI, stroke, any revascularization procedure). Variably included: conditions such as transient ischemic attack, unstable angina, amputation, symptomatic or asymptomatic coronary artery disease.

+Indicators of high risk

While definitions vary, most comprise ≥55 years of age with two or more additional risk factors (including obesity, hypertension, smoking, dyslipidemia, or albuminuria)

+HF

Current or prior symptoms of HF with documented HFrEF or HFpEF

+CKD

eGFR<60 mL/min per 1.73 m^2 OR albuminuria (ACR ≥3.0 mg/mmol [30mg/g]). These measurements may vary over time; thus, a repeat measure is required to document CKD

+ASCVD/Indicators of High Risk

GLP-1 RA# with proven CVD benefit — Either / OR — SGLT2i§ with proven CVD benefit

If A1C above target

- For patients on a GLP-1 RA, consider incorporating SGLT2i with proven CVD benefit and vice versa
- TZD^

+HF

SGLT2i § with proven HF benefit in this population

+CKD (on maximally tolerated dose of ACEi/ARB)

PREFERABLY
SGLT2i§ with primary evidence of reducing CKD progression
Use SGLT2i in people with an eGFR ≥20 mL/min per 1.73m^2; once initiated should be continued until initiation of dialysis or transplantation

OR

GLP-1 RA with proven CVD benefit if SGLT2i not tolerated or contraindicated

If A1C above target, for patients on SGLT2i, consider incorporating a GLP-1RA or vice versa

If additional cardiorenal risk reduction or glycemic lowering needed

Goal: Achievement and maintenance of glycemic and weight management goals

Glycemic management: Choose approaches that provide the efficacy to achieve goals:

Metformin OR Agent(s) including COMBINATION therapy that provide adequate EFFICACY to achieve and maintain treatment goals
Prioritize avoidance of hypoglycemia in high-risk individuals

In general, higher efficacy approaches have greater likelihood of achieving glycemic goals

Efficacy for glucose lowering

Very high: Dulaglutide (high dose), Semaglutide, Tirzepatide
Insulin Combination Oral, Combination injectable (GLP-1 RA/Insulin)

High: GLP-1 RA (not listed above), Metformin, SGLT2i, Sulfonylurea, TZD

Intermediate: DPP-4i

Achievement and maintenance of weight management goals:

Set individualized weight management goals

General lifestyle advice: medical nutrition therapy/eating patterns/physical activity	Intensive evidence-based structured weight management program	Consider medication for weight loss	Consider metabolic surgery

When choosing glucose-lowering therapies:
Consider regimen with high-to-very-high dual glucose and weight efficacy

Efficacy for weight loss

Very high: Semaglutide, Tirzepatide

High: Dulaglutide, Liraglutide

Intermediate: GLP-1 RA (not listed above), SGLT2i

Neutral: DPP-4i, Metformin

If A1c above target

Identify barriers to goals:

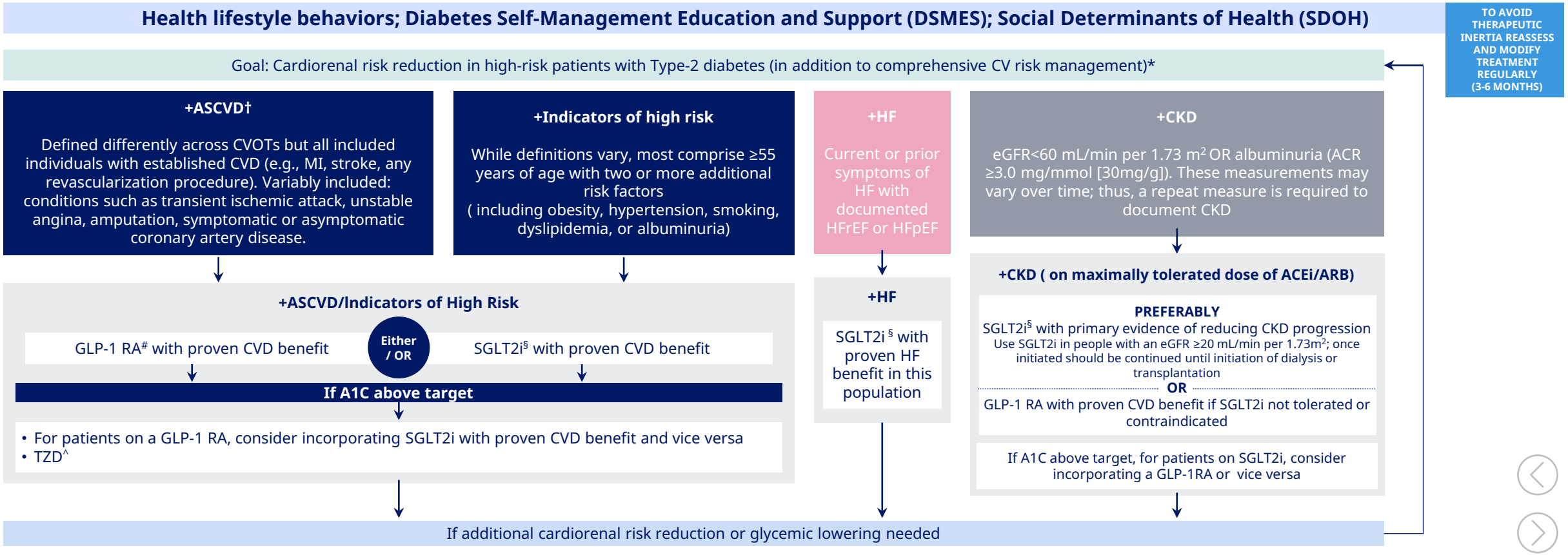
- Consider DSMES referral to support self-efficacy in achievement of goals
- Consider technology (e.g., diagnostic CGM) to identify therapeutic gaps and tailor therapy
- Identify and address SDOH that impact achievement of goals

* In people with HF, CKD, established CVD or multiple risk factors for CVD, the decision to use a GLP-1 RA or SGLT2i with proven benefit should be independent of background use of metformin; † A strong recommendation is warranted for people with CVD and a weaker recommendation for those with indicators of high CV risk. Moreover, a higher absolute risk reduction and thus lower numbers needed to treat are seen at higher levels of baseline risk and should be factored into the shared decision-making process. See text for details; ^ Low-dose TZD may be better tolerated and similarly effective; § For SGLT2i, CV/ renal outcomes trials demonstrate their efficacy in reducing the risk of composite MACE, CV death, all-cause mortality, MI, HHF, and renal outcomes in individuals with T2D with established/high risk of CVD; # For GLP-1 RA, CVOTs demonstrate their efficacy in reducing composite MACE, CV death, all-cause mortality, MI, stroke, and renal endpoints in individuals with T2D with established/high risk of CVD

A1C, glycated hemoglobin; ACEi, angiotensin-converting enzyme inhibitor; ACR, albumin-to-creatinine ratio; ARB, angiotensin receptor blocker; ASCVD, atherosclerotic cardiovascular disease; CGM, continuous glucose monitoring; CKD, chronic kidney disease; CV, cardiovascular; CVD, cardiovascular disease; CVOT, cardiovascular outcomes trial; DPP-4i, dipeptidyl peptidase 4 inhibitor; eGFR, estimated glomerular filtration rate; GLP-1 RA, glucagon-like peptide 1 receptor agonist; HF, heart failure; HFpEF, heart failure with preserved ejection fraction; HFrEF, heart failure with reduced ejection fraction; HHF, hospitalization for heart failure; MACE, major adverse cardiovascular events; MI, myocardial infarction; SDOH, social determinants of health; SGLT2i, sodium-glucose cotransporter 2 inhibitor; T2D, type 2 diabetes; TZD, thiazolidinedione.
Adapted from Davies et al. (84).
American Diabetes Association (ADA). Diabetes Care 2024;47(Supplement_1):S158–S178

ADA STANDARDS OF MEDICAL CARE IN DIABETES – 2024

2024 ADA: Use of Glucose- lowering medications in the management of T2D *(Figure 9.3; S166)*



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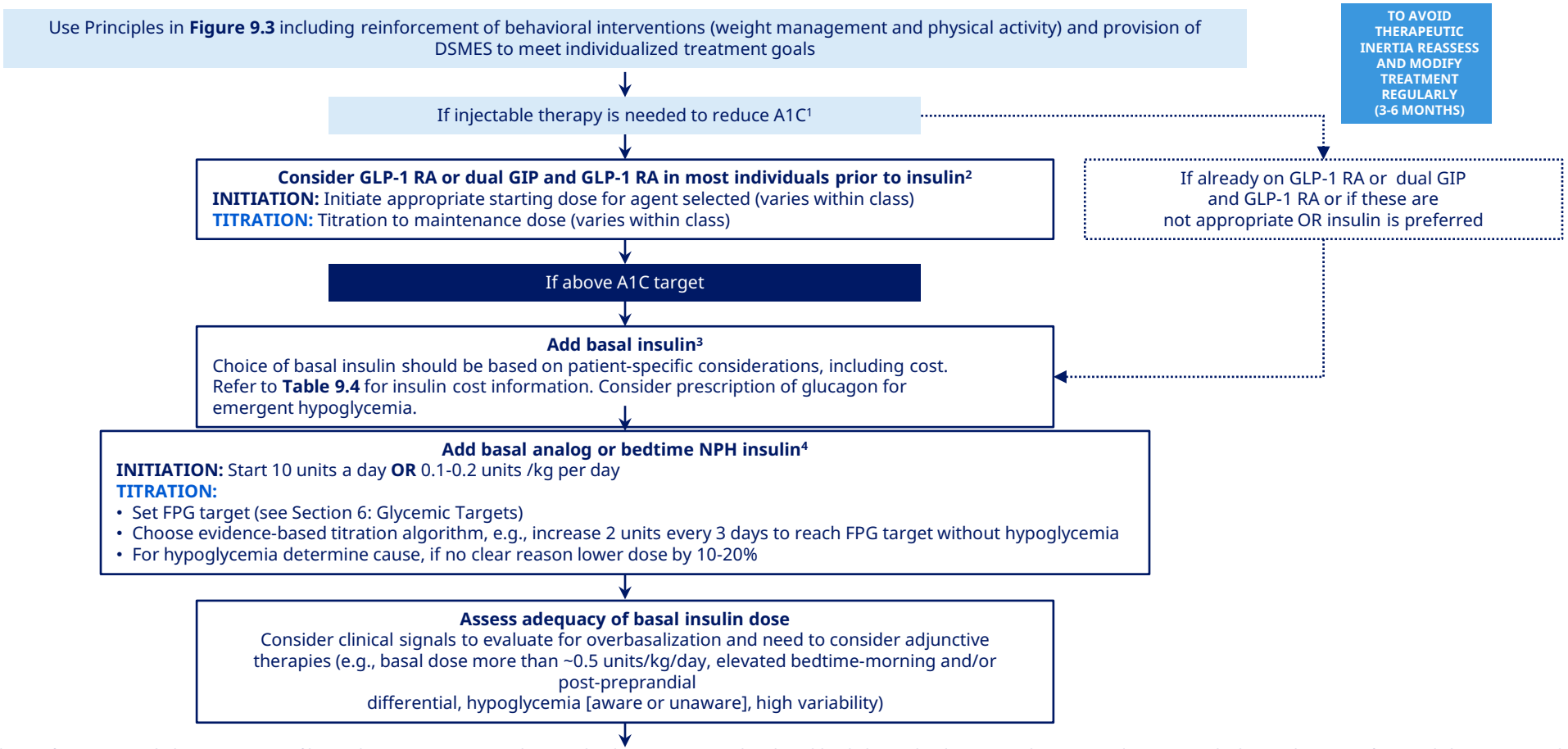
American Diabetes Association (ADA). Diabetes Care 2024;47(Supplement_1):S158–S178

ADA STANDARDS OF MEDICAL CARE IN DIABETES – 2024

2024 ADA: Algorithm for intensifying to injectable therapies *(Figure 9.4; S171) (1/2)*



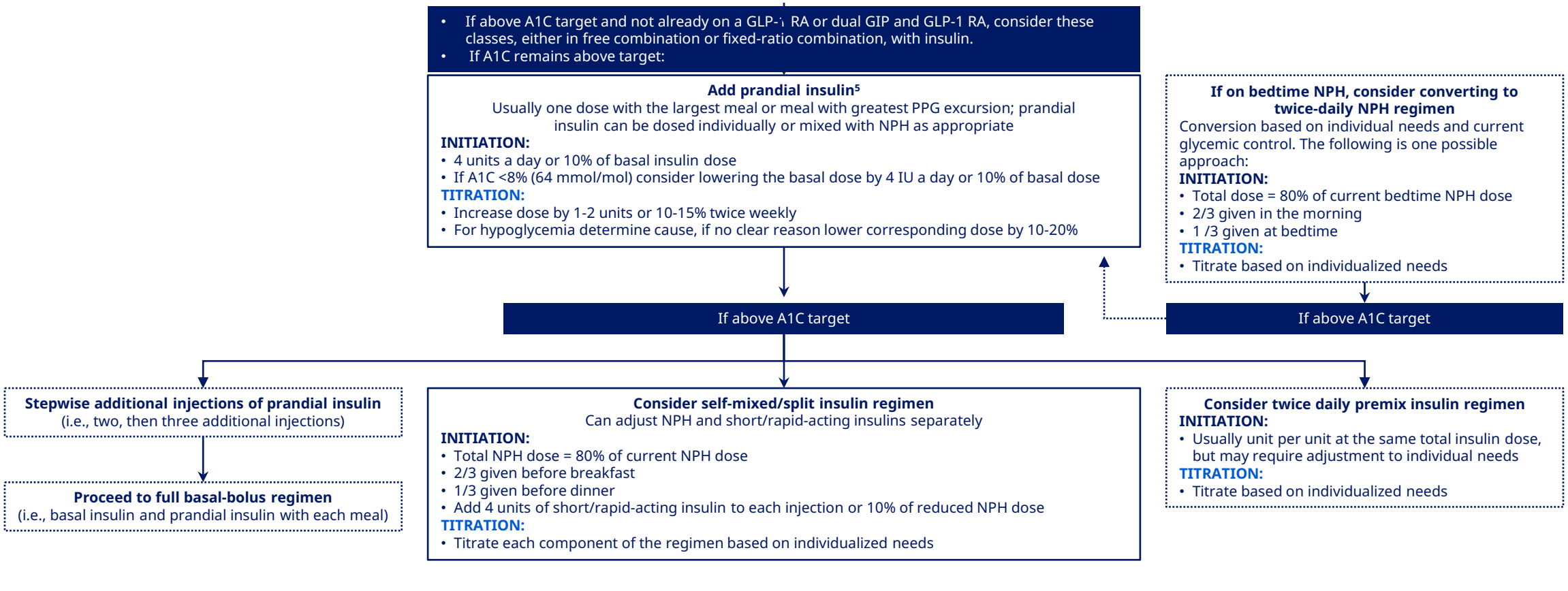
1. Consider insulin as the first injectable if evidence of ongoing catabolism, symptoms of hyperglycemia are present, when A1C levels (>10% [86 mmol/mol]) or blood glucose levels (300 mg/dL [16.7 mmol/L]) are very high, or a diagnosis of type 1 diabetes is a possibility.
2. When selecting GLP-1 RA, consider: patient preference, A1C lowering, weight-lowering effect, or frequency of injection. If CVD, consider GLP-1 RA with proven CVD benefit. Oral or injectable GLP-1 RA are appropriate.
3. For patients on GLP-1 RA and basal insulin combination, consider use of a fixed-ratio combination product (iDegLira or iGlarLixi).
4. Consider switching from evening NPH to a basal analog if the patient develops hypoglycemia and/or frequently forgets to administer NPH in the evening and would be better managed with an A.M. dose of a long-acting basal insulin.

A1C, glycated hemoglobin; CVD, cardiovascular disease; DSMES, diabetes self-management education and support; FPG, fasting plasma glucose; GLP-1 RA, glucagon-like peptide 1 receptor agonist; GIP, glucose-dependent insulinotropic peptide; NPH, Neutral Protamine Hagedorn

American Diabetes Association (ADA). Diabetes Care 2024;47(Supplement_1):S158–S178.

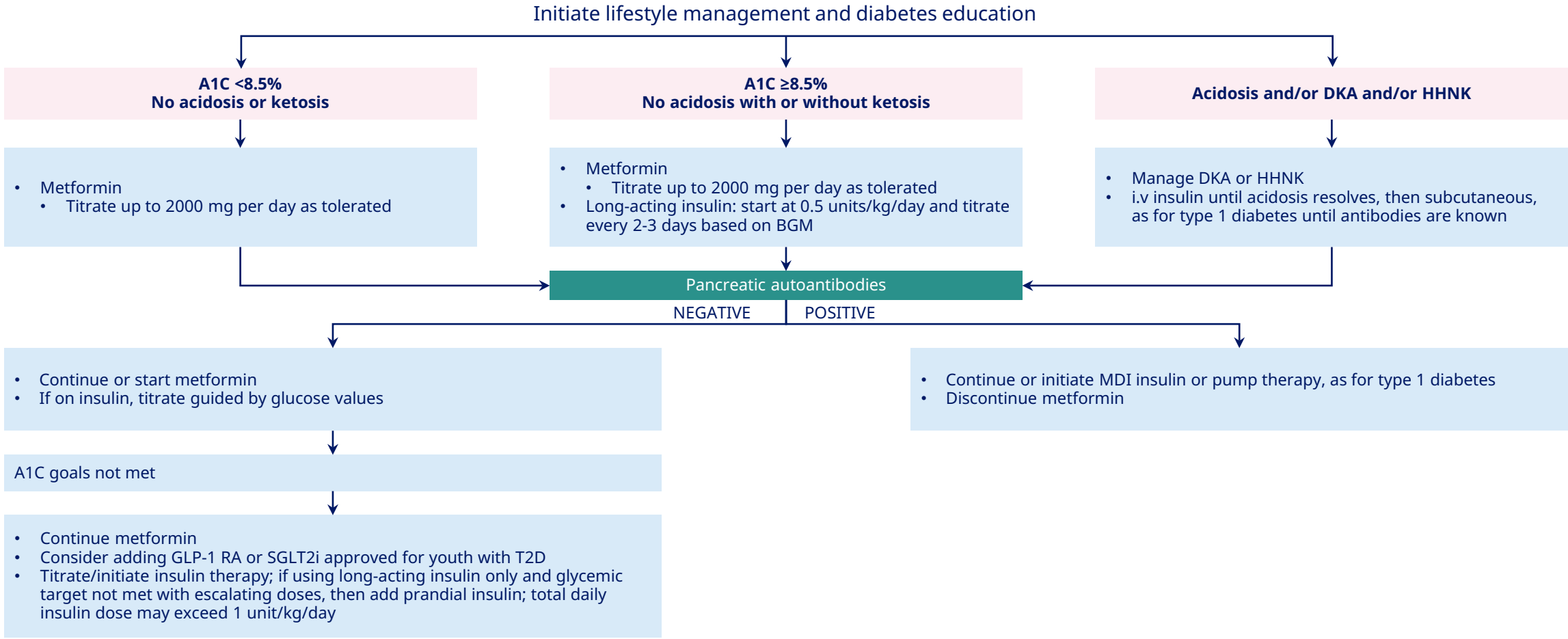
ADA STANDARDS OF MEDICAL CARE IN DIABETES – 2024

2024 ADA: Algorithm for intensifying to injectable therapies *(Figure 9.4; S171)* (2/2)



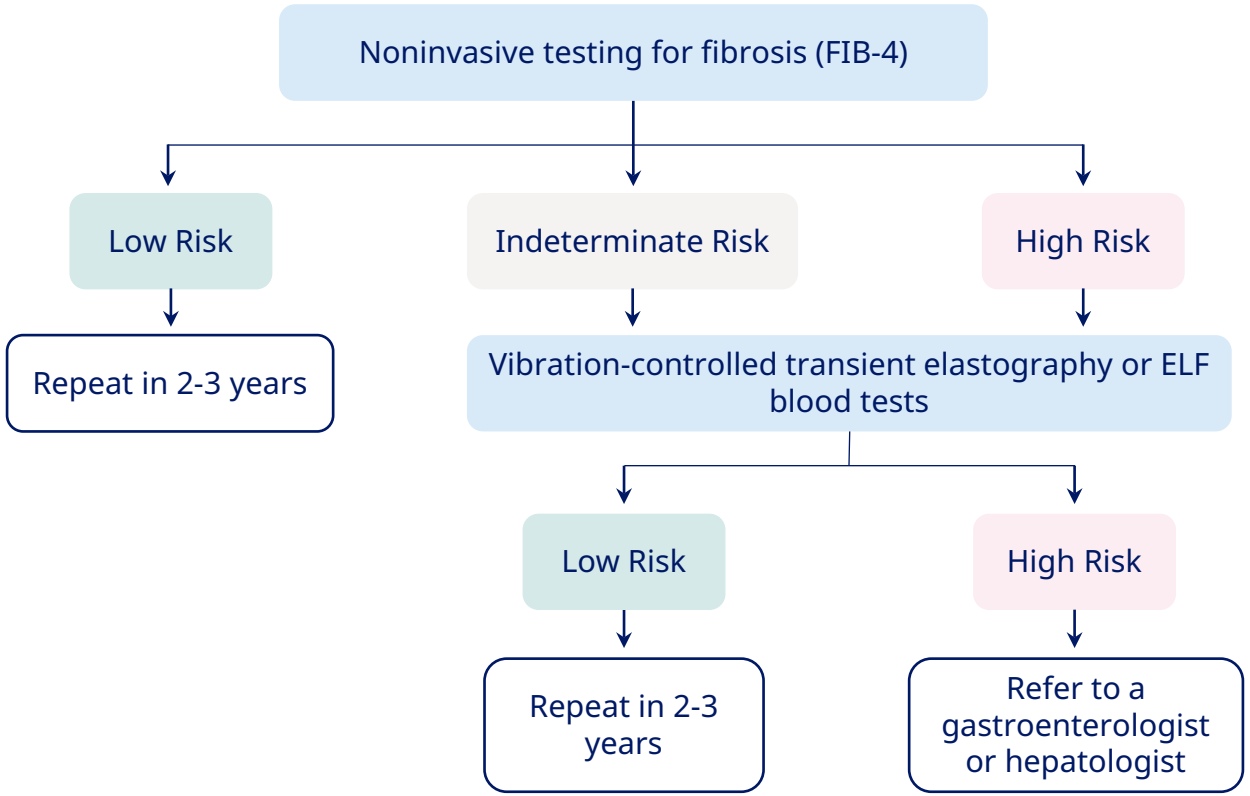
5. If adding prandial insulin to NPH, consider initiation of a self-mixed or premixed insulin regimen to decrease the number of injections required.
A1C, glycated hemoglobin; FPG, fasting plasma glucose; GLP-1 RA, glucagon-like peptide 1 receptor agonist; GIP, glucose-dependent insulinotropic peptide; NPH, Neutral Protamine Hagedorn; PPG, postprandial glucose
American Diabetes Association (ADA). Diabetes Care 2024;47(Supplement_1):S158–S178.

2024 ADA: Management of new onset diabetes in youth with overweight or obesity with clinical suspicion of T2D *(Figure 14.1; S270)*



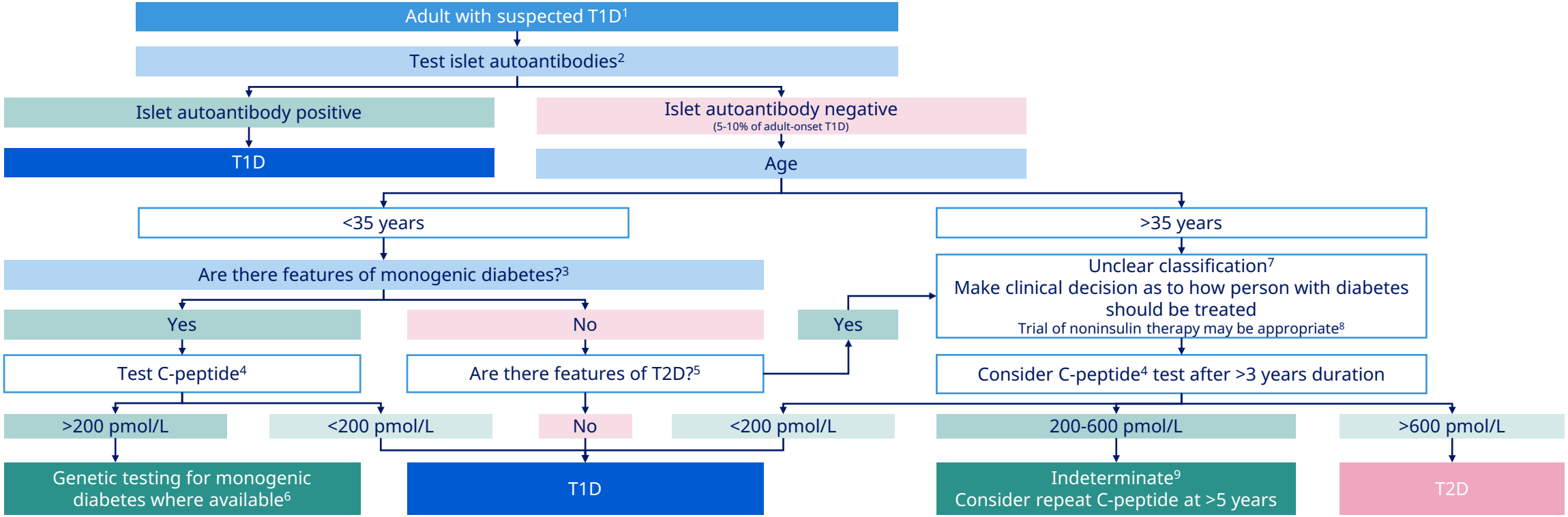
A1C 8.5% = 69 mmol/mol. Adapted from the ADA position statement Evaluation and Management of Youth-Onset Type 2 Diabetes[2]
BGM, blood glucose monitoring; CGM, continuous glucose monitoring; DKA, diabetic ketoacidosis; HHNK, hyperosmolar hyperglycemic nonketotic syndrome; i.v, intravenous; MDI, multiple daily injections; SGLT2i, sodium-glucose co transporter 2 inhibitor
American Diabetes Association (ADA). Diabetes Care 2024;47(Supplement_1):S258–S281

2024 ADA: A proposed algorithm for risk stratification in individuals with nonalcoholic fatty liver disease (NAFLD) or nonalcoholic steatohepatitis (NASH). *(Figure 4.2; S67)*



ELF, enhanced liver fibrosis; FIB-4, fibrosis 4 index Adapted from Kanwal et al (174)
American Diabetes Association (ADA). Diabetes Care 2024;47(Supplement_1):S52–S76

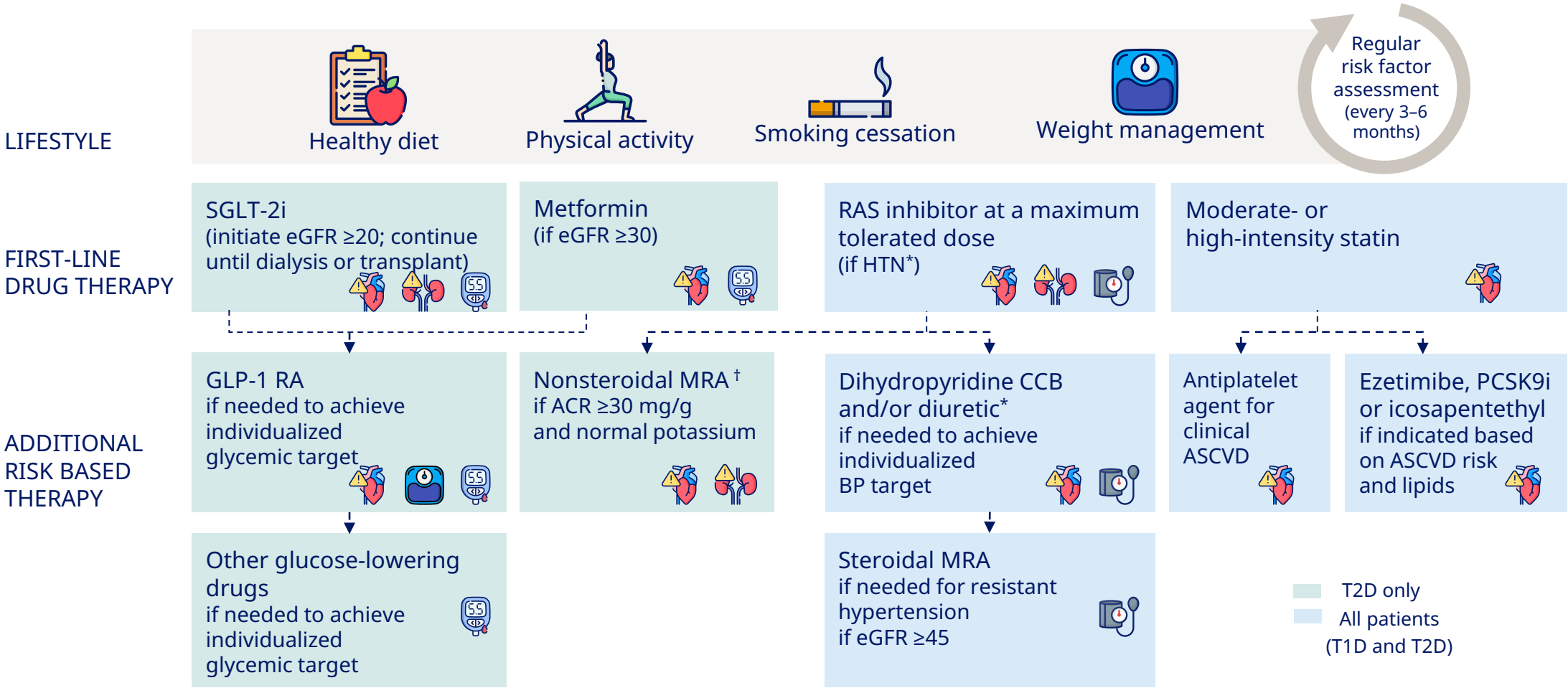
Flowchart for investigation of suspected type 1 diabetes in newly diagnosed adults, based on data from White European populations *(Fig. 2.1; S25)*



[1]No single clinical feature confirms T1D in isolation. [2]Glutamic acid decarboxylase (GAD) should be the primary antibody measured and, if negative, should be followed by islet tyrosine phosphatase 2 (IA-2) and/or zinc transporter 8 (ZnT8) where these tests are available. In individuals who have not been treated with insulin, antibodies against insulin may also be useful. In those diagnosed at <35 years of age who have no clinical features of T2D or monogenic diabetes, a negative result does not change the diagnosis of T1D, since 5–10% of people with T1D do not have antibodies. [3]Monogenic diabetes is suggested by the presence of one or more of the following features: A1C <58 mmol/mol (<7.5%) at diagnosis, one parent with diabetes, features of a specific monogenic cause (e.g., renal cysts, partial lipodystrophy, maternally inherited deafness, and severe insulin resistance in the absence of obesity), and monogenic diabetes prediction model probability >5% (diabetesgenes.org/exeter-diabetes-app/ModyCalculator). [4]A C-peptide test is only indicated in people receiving insulin treatment. A random sample (with concurrent glucose) within 5 h of eating can replace a formal C-peptide stimulation test in the context of classification. If the result is ≥600 pmol/L (≥ 1.8 ng/mL), the circumstances of testing do not matter. If the result is <600 pmol/L (<1.8 ng/mL) and the concurrent glucose is <4 mmol/L (<70 mg/dL) or the person may have been fasting, consider repeating the test. Results showing very low levels (e.g., <80 pmol/L [<0.24 ng/mL]) do not need to be repeated. Where a person is insulin treated, C-peptide must be measured prior to insulin discontinuation to exclude severe insulin deficiency. Do not test C-peptide within 2 weeks of a hyperglycemic emergency. [5]Features of type 2 diabetes include increased BMI (≥ 25 kg/m2), absence of weight loss, absence of ketoacidosis, and less marked hyperglycemia. Less discriminatory features include non-White ethnicity, family history, longer duration and milder severity of symptoms prior to presentation, features of the metabolic syndrome, and absence of a family history of autoimmunity. [6]If genetic testing does not confirm monogenic diabetes, the classification is unclear and a clinical decision should be made about treatment. [7]T2D should be strongly considered in older individuals. In some cases, investigation for pancreatic or other types of diabetes may be appropriate. [8]A person with possible T1D who is not treated with insulin will require careful monitoring and education so that insulin can be rapidly initiated in the event of glycemic deterioration. [9]C-peptide values 200–600 pmol/L (0.6–1.8 ng/mL) are usually consistent with T1D or maturity-onset diabetes of the young but may occur in insulin-treated T2D, particularly in people with normal or low BMI or after long duration. Reprinted and adapted from Holt et al. Diabetes Care. 2021; 44:2589-2625.
T1D, type 1 diabetes; T2D, type 2 diabetes; Standards of Care in Diabetes - 2024: Diabetes Care, December 2023, Vol.47, Supplement 1; Figure 2.1

ADA STANDARDS OF MEDICAL CARE IN DIABETES – 2024

Holistic approach for improving outcomes in patients with diabetes and CKD *(Fig. 11.2; S225)*



**ACEi or ARB (at maximal tolerated doses) should be first-line therapy HTN when albuminuria is present. Otherwise, CCB or diuretic can also be considered; all 3 classes are often needed to attain BP targets. eGFR is presented in units of mL/min/1.73m^2*

†Finerenone is currently the only ns-MRA with proven clinical kidney and cardiovascular benefits.

ACEi, angiotensin-converting enzyme inhibitor; ACR, albumin-to creatinine ratio; ARB, angiotensin receptor blocker; ASCVD, atherosclerotic cardiovascular disease; BP, blood pressure; CCB, calcium channel blocker; CVD, cardiovascular disease; eGFR, estimated glomerular filtration rate; GLP-1 RA, glucagon-like peptide 1 receptor agonist; HTN, hypertension; MRA, mineralocorticoid receptor antagonist; ns-MRA, nonsteroidal mineralocorticoid receptor antagonist; PCSK9i, proprotein convertase subtilisin/kexin type 9 inhibitor; RAS, renin-angiotensin system; SGLT2i, sodium–glucose cotransporter 2 inhibitor; T1D, type 1 diabetes; T2D, type 2 diabetes

Diabetes Care 2024;47(Supplement_1):S219–S230; Reprinted from de Boer et al. (1)

Decision cycle for person-centered glycemic management in T2D *(Fig. 4.1; S53)*

Review and agree on management plan
- Review management plan
- Mutually agree on changes
- Ensure agreed modification of therapy is implemented in a timely fashion to avoid therapeutic inertia
- Decision cycle undertaken regularly (at least once/twice a year)
- Operate in an integrated system of care

Provide ongoing monitoring and support of
- Emotional well-being
- Lifestyle and health behaviors
- Tolerability of medication
- Biofeedback including BGM/CGM, weight, step count, HbA_{1C} blood pressure, lipids

Implement management plan
- Ensure there is regular review: more frequent contact initially is often desirable for DSMES

Agree on management plan
Specify SMART goals:
- **S**pecific
- **M**easurable
- **A**chievable
- **R**ealistic
- **T**ime limited

Assess key patient characteristics
- The individual's priorities
- Current lifestyle and health behaviors
- Comorbidities, i.e., CVD, CKD, HF
- Clinical characteristics, i.e., age, HbA_{1c} weight
- Issues such as motivation, cognition, depression
- Social determinants of health

Consider specific factors that impact choice of treatment
- Individualized glycemic and weight goals
- Impact on weight, hypoglycemia and cardiorenal protection
- Underlying physiological factors
- Side effect profile of medication
- Complexity of regimen, i.e., frequency, mode of administration
- Regimen choice to optimize medication use and reduce treatment discontinuation
- Access, cost, availability of medication and lifestyle choices

Utilize shared decision making to create a management plan
- Ensures access to DSMES
- Involves an educated and informed patient (and the individual's family/caregiver)
- Explore personal preferences
- Language matters (include person-first, strengths based, empowering language
- Includes motivational interviewing, goal setting, and shared decision making

ASCVD, Atherosclerotic Cardiovascular Disease; BGM, blood glucose monitoring; CGM, continuous glucose monitoring; CKD, Chronic Kidney Disease; CVD, cardiovascular disease; DSMES, Diabetes Self-Management Education and Support; HbA1c, glycated hemoglobin; HF, Heart Failure; SMBG, self measured blood glucose; T2D, type 2 diabetes;
Standards of Care in Diabetes - 2024: Diabetes Care, December 2023, Vol.47, Supplement 1; Figure 4.1