Incorporating Health & Wellness into Care for Patients with Diabetes

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Disclosures

Kathleen Wilson PhD, CPNP, PNP-BC, FNP–BC, FAANP, BC-ADM (c), FAANP

--Nothing to disclose

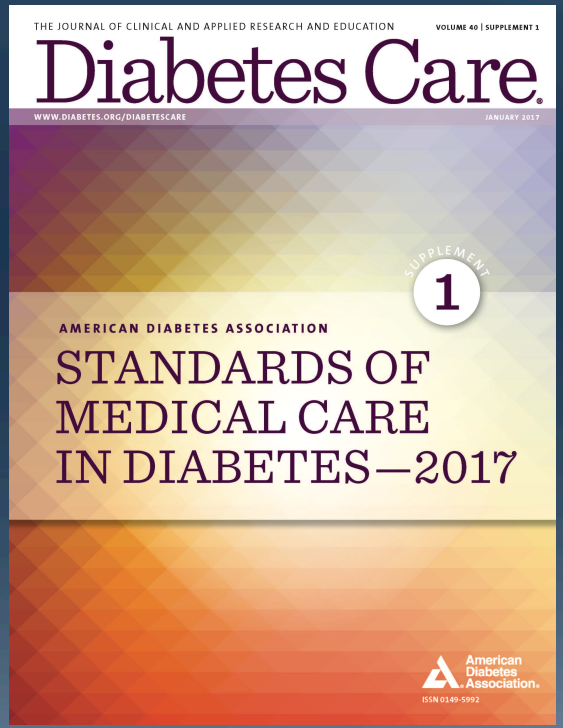
Course Objectives

After completion of this session, the NP should be able to:

- Review American Diabetes Association 2017 Standards of Medical Care for Diabetes with particular attention to lifestyle management (*10 recommendations*)
- Discuss pharmacologic management options for patients with diabetes
- Discuss prevention & management for patients experiencing complications of diabetes

A long winding path with many bumps along the way!

Standards of Medical Care in Diabetes - 2017



- Full version
- Abridged version for PCPs
- Free app
- Pocket cards with key figures
- Free webcast for continuing education credit

Professional.Diabetes.org/SOC

American Diabetes Association®

Evidence Grading System

A	• Clear evidence from well-conducted, generalizable RCTs, that are adequately powered, including • Evidence from a well-conducted multicenter trial or meta-analysis that incorporated quality ratings in the analysis; • Compelling non-experimental evidence; • Supportive evidence from well-conducted RCTs that are adequately powered
B	• Supportive evidence from a well-conducted cohort studies • Supportive evidence from a well-conducted case-control study
C	• Supportive evidence from poorly controlled or uncontrolled studies • Conflicting evidence with the weight of evidence supporting the recommendation
E	• Expert consensus or clinical experience

1.
Promoting Health and Reducing Disparities in Populations

Care Delivery Systems

- 33-49% of patients still do not meet targets for A1C, blood pressure, or lipids.
- 14% meet targets for all A1C, BP, lipids, and nonsmoking status.
- Progress in CVD risk factor control is slowing.
- Substantial system-level improvements are needed.
- Delivery system is fragmented, lacks clinical information capabilities, duplicates services & is poorly designed.

American Diabetes Association Standards of Medical Care in Diabetes.
Promoting Health and Reducing Disparities in Populations. *Diabetes Care* 2017; 40 (Suppl. 1): S6-S10

American Diabetes Association.

Chronic Care Model

Six Core Elements:

1. Delivery system design
2. Self-management support
3. Decision support
4. Clinical information systems
5. Community resources & policies
6. Health systems

* *Team-based care, community involvement, patient registries, and decision support tools to meet patient needs*

Care in Diabetes.
Promoting Health and Reducing Disparities in Populations. *Diabetes Care* 2017; 40 (Suppl. 1): S6-S10

American Diabetes Association.

Strategies for System-Level Improvement

www.BetterDiabetesCare.nih.gov

Three Key Objectives

1. Optimize Provider and Team Behavior
2. Support Patient Self-Management
3. Change the Care System

American Diabetes Association Standards of Medical Care in Diabetes.
Promoting Health and Reducing Disparities in Populations. *Diabetes Care* 2017; 40 (Suppl. 1): S6-S10

American Diabetes Association.

Teamwork

Collaboration

Objective 1: Optimize Provider and Team Behavior

For patients who have not achieved beneficial levels of control in blood pressure, lipids, or glucose, the care team should prioritize timely & appropriate intensification of lifestyle and/or pharmaceutical therapy.

- Strategies include:
  - Explicit goal setting with patients
  - Identifying and addressing language, numeracy, and/or cultural barriers to care
  - Integrating evidence-based guidelines
  - Incorporating care management teams

American Diabetes Association Standards of Medical Care in Diabetes.
Promoting Health and Reducing Disparities in Populations. *Diabetes Care* 2017; 40 (Suppl. 1): S6-S10

Objective 2: Support Patient Self-management

Implement a systematic approach to support patient behavior change efforts, including:

- Healthy lifestyle
- Disease self-management
- Prevention of diabetes complications
- Identification of self-management problems and development of strategies to solve those problems

American Diabetes Association Standards of Medical Care in Diabetes.
Promoting Health and Reducing Disparities in Populations. *Diabetes Care* 2017; 40 (Suppl. 1): S6-S10

Objective 3: Change the Care System

Successful practices prioritize providing a high quality of care. Changes that have been shown to increase quality of care include:

1. Basing care on evidence-based guidelines
2. Expanding the role of teams to implement more intensive disease management strategies
3. Redesigning the care process
4. Activating and educating patients

American Diabetes Association.

Objective 3: Change the Care System (2)

Successful practices prioritize providing a high quality of care. Changes that have been shown to increase quality of care include:

6. Removing financial barriers and reducing patient out-of-pocket costs (Identifying Low Income Subsidy/LIS)
7. Identifying community resources and public policy that supports healthy lifestyles
8. Coordinated primary care, e.g., through Patient-Centered Medical Home
9. Changes to reimbursement structure

American Diabetes Association Standards of Medical Care in Diabetes.
Promoting Health and Reducing Disparities in Populations. *Diabetes Care* 2017; 40 (Suppl. 1): S6-S10

Health Disparities

- Ethnic/Cultural/Sex Differences
- Access to Health Care
  - Lack of Health Insurance
- Food Insecurity
- Language Barriers
- Homelessness

American Diabetes Association Standards of Medical Care in Diabetes.
Promoting Health and Reducing Disparities in Populations. *Diabetes Care* 2017; 40 (Suppl. 1): S6-S10

American Diabetes Association.

2.
Classification and Diagnosis of Diabetes

American Diabetes Association.

Recommendations: Prediabetes

- Testing should begin at age 45 for all people. B
- Consider testing for prediabetes in asymptomatic adults of any age w/ BMI ≥25 kg/m2 or ≥23 kg/m2 (in Asian Americans) who have 1 or more add'l risk factors for diabetes. B
- If tests are normal, repeat at a minimum of 3-year intervals. C

American Diabetes Association Standards of Medical Care in Diabetes.
Classification and diagnosis of diabetes. Diabetes Care 2017; 40 (Suppl. 1): S11-S24

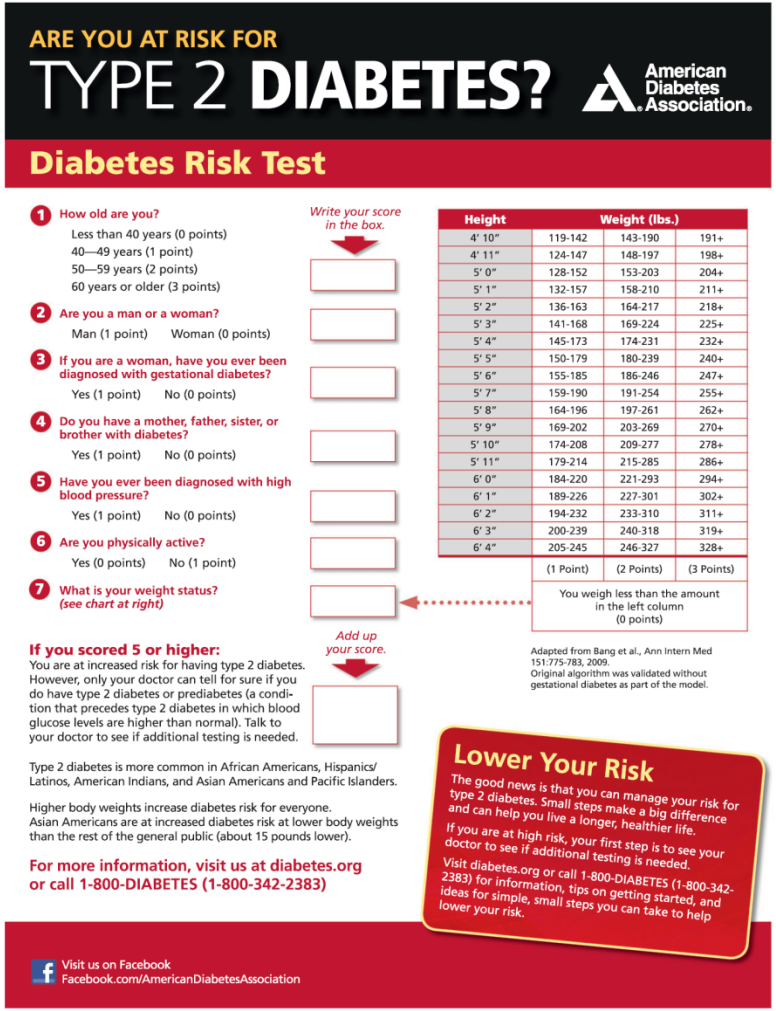


Figure 2.1—ADA risk test.

Risk factors for Prediabetes and T2D

- A1C ≥5.7% (39 mmol/mol), IGT, or IFG on previous testing
- first-degree relative with diabetes
- high-risk race/ethnicity (e.g., African American, Latino, Native American, Asian American, Pacific Islander)
- women who were diagnosed with GDM
- history of CVD
- 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
- other clinical conditions associated with insulin resistance (e.g., severe obesity, acanthosis nigricans).

www.diabetes.org/are-you-at-risk

American Diabetes Association Standards of Medical Care in Diabetes.
Classification and diagnosis of diabetes. Diabetes Care 2017; 40 (Suppl. 1): S11-S24

Prediabetes*

FPG 100–125 mg/dL (5.6–6.9 mmol/L): IFG

OR

2-h plasma glucose 140–199 mg/dL (7.8–11.0 mmol/L): IGT

OR

A1C 5.7–6.4%

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

American Diabetes Association Standards of Medical Care in Diabetes. Classification and diagnosis of diabetes. Diabetes Care 2017; 40 (Suppl. 1): S11-S24

Recommendations: Testing for Type 2 Diabetes

- Consider testing in asymptomatic adults of any age with BMI ≥25 kg/m^2 or ≥23 kg/m^2 in Asian Americans who have 1 or more add'l dm risk factors. B
- For all patients, testing should begin at age 45 years. B
- If tests are normal, repeat testing carried out at a minimum of 3-year intervals is reasonable. C

American Diabetes Association Standards of Medical Care in Diabetes.
Classification and diagnosis of diabetes. Diabetes Care 2017; 40 (Suppl. 1): S11-S24

Criteria for the Diagnosis of Diabetes

Fasting plasma glucose (FPG)
≥126 mg/dL (7.0 mmol/L)

OR

2-h plasma glucose ≥200 mg/dL
(11.1 mmol/L) during an OGTT

OR

A1C ≥6.5%

OR

Classic diabetes symptoms + random plasma glucose
≥200 mg/dL (11.1 mmol/L)

American Diabetes Association Standards of Medical Care in Diabetes.
Classification and diagnosis of diabetes. Diabetes Care 2017; 40 (Suppl. 1): S11-S24

3. Comprehensive Medical Evaluation and Assessment of Comorbidities

American Diabetes Association.

Components of the Comprehensive Diabetes Evaluation (5)

Laboratory Evaluation

- A1C, if results not available within past 3 months
- If not performed/available within past year:
  - Fasting lipid profile
  - Liver function tests
  - Spot urinary albumin-to-creatinine ratio
  - Serum creatinine and eGFR
  - Thyroid-stimulating hormone (TSH)

American Diabetes Association Standards of Medical Care in Diabetes. Comprehensive Medical Evaluation and Assessment of Comorbidities. Diabetes Care 2017; 40 (Suppl. 1): S25-S32

Common Comorbidities

- Autoimmune Diseases
- Cancer
- Cognitive Impairment Dementia
- Fatty Liver Disease
- Fractures
- Hearing Impairment
- HIV
- Low Testosterone (Men)
- Obstructive Sleep Apnea
- Periodontal Disease
- Psychosocial Disorders

American Diabetes Association Standards of Medical Care in Diabetes. Comprehensive Medical Evaluation and Assessment of Comorbidities. Diabetes Care 2017; 40 (Suppl. 1): S25-S32

4. Lifestyle Management

American Diabetes Association.

Recommendations: Diabetes Self-Management

Diabetes Education & Support (DMSE & DSMS):

- All people with diabetes should participate in DSME and DSMS both at diagnosis and as needed thereafter. B

- DSME/S should be patient-centered, respectful, and responsive to individual patient preferences, needs, and values that should guide clinical decisions. A

American Diabetes Association Standards of Medical Care in Diabetes. Lifestyle Management. Diabetes Care 2017; 40 (Suppl. 1): S33-43

Recommendations: Nutrition

Alcohol:

- Drink alcohol in moderation (no more than one drink per day for adult women and no more than two drinks per day for adult men).

Sodium:

- Limit sodium consumption to less than 2,300 mg/day

American Diabetes Association Standards of Medical Care in Diabetes. Lifestyle Management. Diabetes Care 2017; 40 (Suppl. 1): S33-43

Goals of Nutrition Therapy (2)

3. To maintain the pleasure of eating by providing non-judgmental messages about food choices.
4. Provide practical tools for developing healthful eating patterns rather than focusing on individual macronutrients, micro-nutrients, or single foods.

American Diabetes Association Standards of Medical Care in Diabetes. Lifestyle Management. Diabetes Care 2017; 40 (Suppl. 1): S33-43

Recommendations: Nutrition

- An individualized MNT program is recommended
- Carb counting education
- Education on healthy food choices and portion control
- Modest weight loss achievable by the combination of lifestyle modification and the reduction of calorie intake
- Macronutrient distribution should be individualized
- Carbohydrate intake from whole grains, vegetables, fruits, legumes, and dairy products, with an emphasis on foods higher in fiber and lower in glycemic load.

Recommendations: Nutrition

- Avoid sugar-sweetened beverages to control weight and reduce their risk for CVD and fatty liver
- Minimize the consumption of foods with added sugar
- Eating plans could include: Mediterranean, DASH, and plant-based diets.

American Diabetes Association Standards of Medical Care in Diabetes. Lifestyle Management. Diabetes Care 2017; 40 (Suppl. 1): S33-43

Recommendations: Physical Activity (1)

- 150+ min/wk of moderate-to-vigorous activity over at least 3 days/week with no more than 2 consecutive days without exercise.
  - Shorter durations (minimum 75 min/week) of vigorous-intensity or interval training may be sufficient for younger and more physically fit individuals.
- Resistance training in 2-3 sessions/week on nonconsecutive days

American Diabetes Association Standards of Medical Care in Diabetes. Lifestyle Management. Diabetes Care 2017; 40 (Suppl. 1): S33-43

Recommendations: Physical Activity (2)

- Decrease the amount of time spent in daily sedentary behavior. B Prolonged sitting should be interrupted every 30 min for blood glucose benefits. C

- Flexibility training and balance training are recommended 2–3 times/week for older adults with diabetes. Yoga and tai chi may be included based on individual preferences to increase flexibility, muscular strength, and balance. C

American Diabetes Association Standards of Medical Care in Diabetes. Lifestyle Management. Diabetes Care 2017; 40 (Suppl. 1): S33-43

Goals of Nutrition Therapy

1. Promote & support healthful eating patterns, emphasizing a variety of nutrient-dense foods in appropriate portion sizes, to improve health and to:
   - Achieve and maintain body weight goals
   - Attain individualized glycemic, blood pressure, and lipid goals
   - Delay or prevent complications of diabetes
2. Address nutrition needs based on personal & cultural preferences, health literacy & numeracy, access to healthful foods, willingness and ability to make behavioral changes & barriers to change.

American Diabetes Association Standards of Medical Care in Diabetes. Lifestyle Management. Diabetes Care 2017; 40 (Suppl. 1): S33-43

Recommendations: Smoking Cessation

- Advise all patients not to use cigarettes, other tobacco products A or e-cigarettes E.

- Include smoking cessation counseling and other forms of treatment as a routine component of diabetes care. B

American Diabetes Association Standards of Medical Care in Diabetes. Lifestyle Management. Diabetes Care 2017; 40 (Suppl. 1): S33-43

Recommendations: Immunizations

- Provide routine vaccinations for children and adults with diabetes per age-specific CDC recommendations. C

CDC.gov/vaccines

- Administer hepatitis B vaccine to unvaccinated adults with diabetes aged 19-59 years. C

- Consider administering hepatitis B vaccine to unvaccinated adults with diabetes ≥ 60 years old. C

American Diabetes Association Standards of Medical Care in Diabetes. Lifestyle Management. Diabetes Care 2017; 40 (Suppl. 1): S33-43

Recommendations: Psychosocial Care

- Psychosocial care should be provided to all people with diabetes, with the goals of optimizing health outcomes and QOL . A
- Psychosocial screening and follow-up include:
  - **Attitudes**
  - **Expectations for medical mgmt. & outcomes**
  - **Affect/mood**
  - **Quality-of-life (QOL)**
  - **Resources- financial, social & emotional**
  - **Psychiatric history** E

American Diabetes Association Standards of Medical Care in Diabetes. Lifestyle Management. Diabetes Care 2017; 40 (Suppl. 1): S33-43

Recommendations: Psychosocial Care (2)

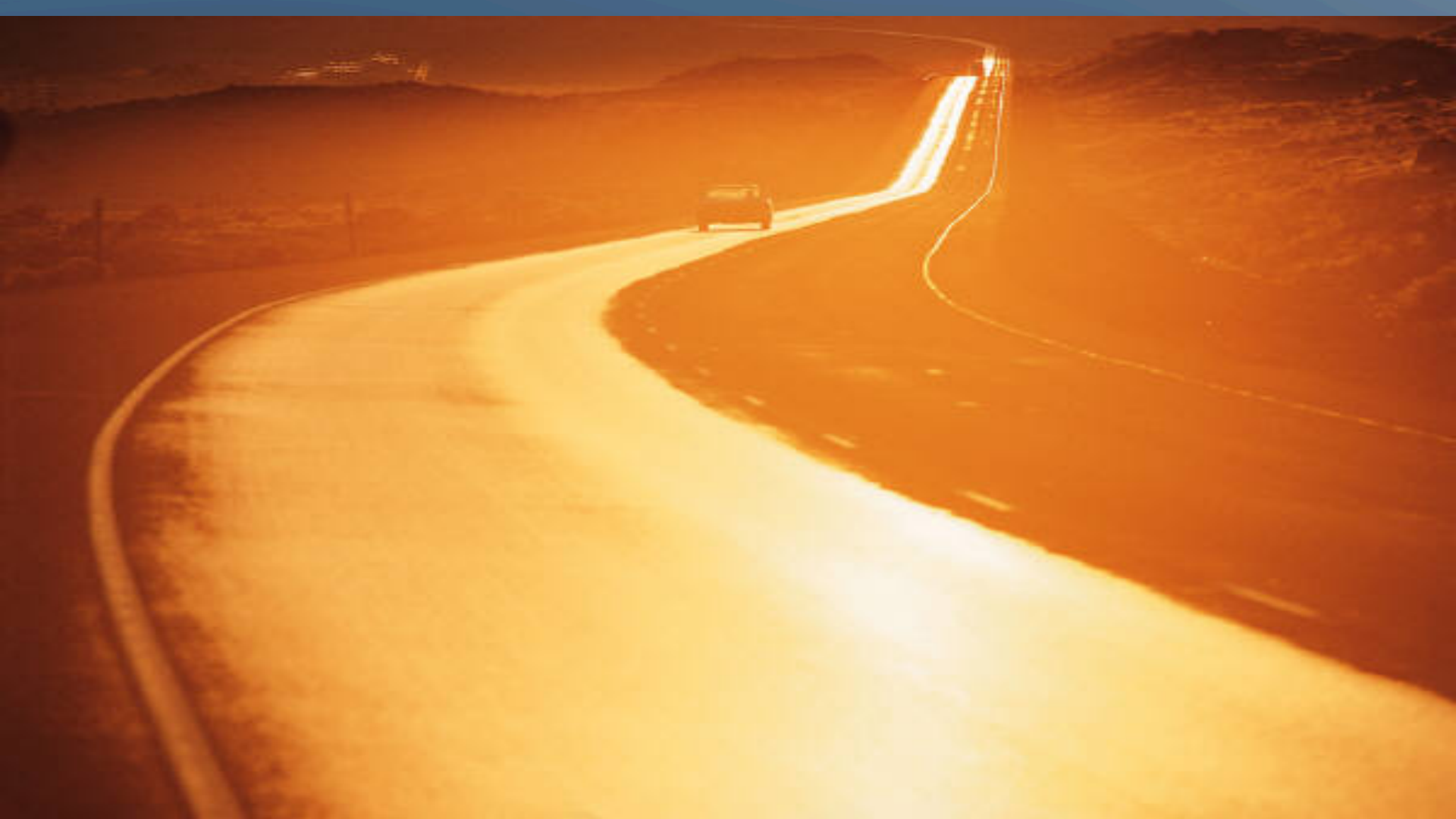
- Providers should consider assessment for symptoms of diabetes distress, depression, anxiety, disordered eating, and cognitive capacities using patient-appropriate standardized and validated tools at the initial visit, at periodic intervals, and when there is a change in disease, treatment, or life circumstance. B
- Consider screening older adults (aged ≥65 years) with diabetes for cognitive impairment and depression. B

American Diabetes Association Standards of Medical Care in Diabetes. Lifestyle Management. Diabetes Care 2017; 40 (Suppl. 1): S33-43

Diabetes Distress

- Diabetes distress
  - Very common and distinct from other psychological disorders
  - Negative psychological reactions related to emotional burdens of managing a demanding chronic disease
- Recommendation: Routinely monitor people with diabetes for diabetes distress, particularly when treatment targets are not met and/or at the onset of diabetes complications. B

American Diabetes Association Standards of Medical Care in Diabetes. Lifestyle Management. Diabetes Care 2017; 40 (Suppl. 1): S33-43



5.
Prevention or Delay of Type 2 Diabetes

American Diabetes Association.

Recommendations: Prevention or Delay of T2DM

Patients with *prediabetes* should :

- Be referred for intensive diet education
- Physical activity behavioral counseling program adhering to the tenets of the DPP targeting a loss of 7% of body weight
- Increase their moderate physical activity to at least 150 min/week.
- Metformin therapy
  - BMI $\geq$35 kg/m^2,
  - aged < 60 years,
  - women with prior gestational diabetes (GDM),
  - those with rising A1C despite lifestyle intervention.

American Diabetes Association Standards of Medical Care in Diabetes.
Prevention or delay of type 2 diabetes. Diabetes Care 2017; 40 (Suppl. 1): S44-S47

Recommendations: Prevention or Delay of T2DM (2)

- Monitor at least annually for the development of diabetes in those with prediabetes. E
- Screening for and treatment of modifiable risk factors for CVD is suggested. B

American Diabetes Association Standards of Medical Care in Diabetes.
Prevention or delay of type 2 diabetes. Diabetes Care 2017; 40 (Suppl. 1): S44-S47

6.
Glycemic Targets

Assessment of Glycemic Control

- Patient self-monitoring of blood glucose (SMBG)
- A1C
- CGM in selected patients.

American Diabetes Association Standards of Medical Care in Diabetes. Glycemic targets. Diabetes Care 2017; 40 (Suppl. 1): S48-S56

American Diabetes Association.

Recommendations: A1C Testing

- If A1c at goal: Perform A1C test at least 2x annually
- If A1c NOT at goal: Perform the A1C test every 3 months
- Use of point-of-care (POC) testing for A1C provides the opportunity for more timely treatment changes. E

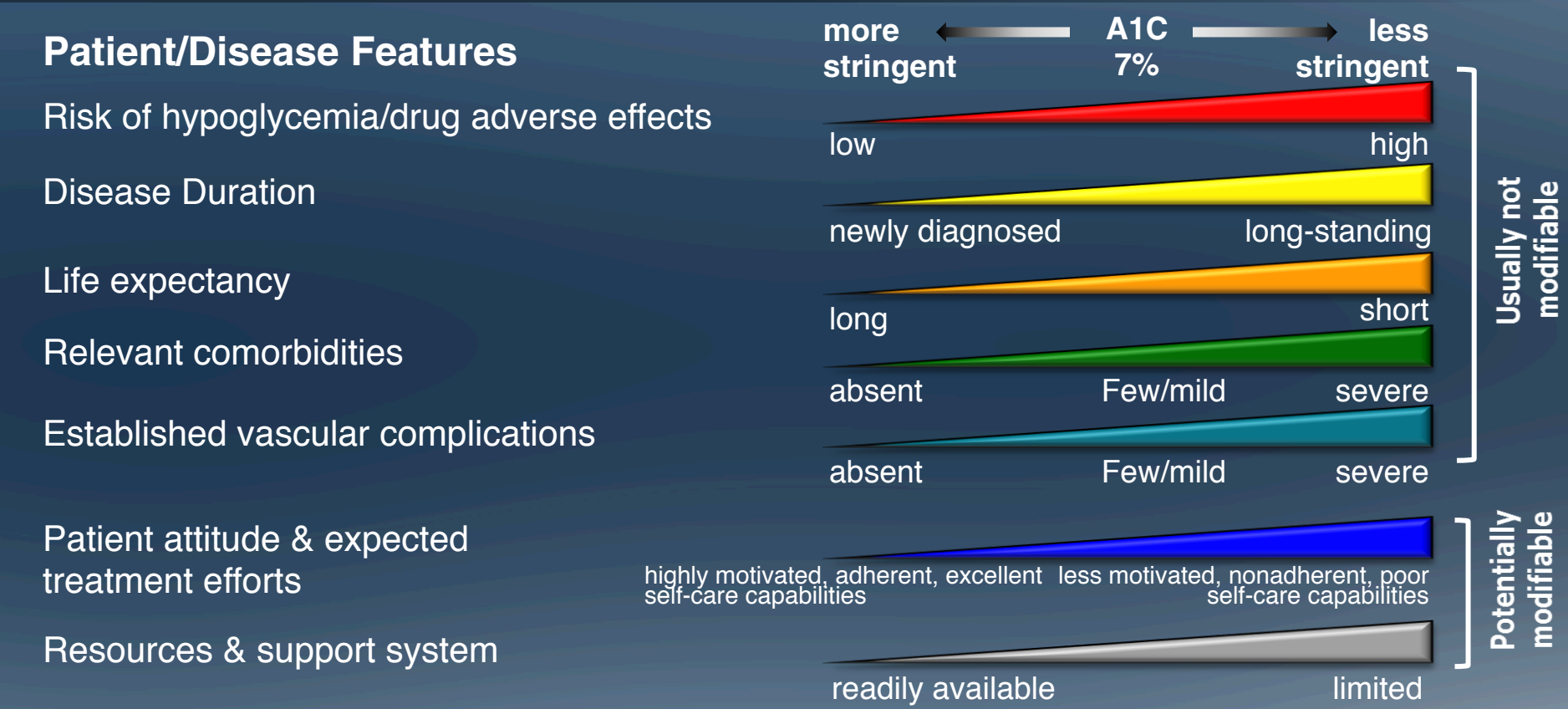
American Diabetes Association Standards of Medical Care in Diabetes.
Glycemic targets. Diabetes Care 2017; 40 (Suppl. 1): S48-S56

Recommendations: Glycemic Goals in Adults

- A reasonable A1C goal for many nonpregnant adults is <7% (53 mmol/mol). A
- Consider more stringent goals (e.g. <6.5%) for select patients if achievable without significant hypos or other adverse effects. C
- Consider less stringent goals (e.g. <8%) for patients with a history of severe hypoglycemia, limited life expectancy, or other conditions that make <7% difficult to attain. B

American Diabetes Association Standards of Medical Care in Diabetes. Glycemic targets. Diabetes Care 2017; 40 (Suppl. 1): S48-S56

Approach to the Management of Hyperglycemia



American Diabetes Association Standards of Medical Care in Diabetes. Glycemic targets. Diabetes Care 2017; 40 (Suppl. 1): S48-S56

American Diabetes Association.

A1C and CVD Outcomes

- DCCT: Trend toward lower risk of CVD events with intensive control (T1D)
- EDIC: 57% reduction in risk of nonfatal MI, stroke, or CVD death (T1D)
- UKPDS: nonsignificant reduction in CVD events (T2D).
- ACCORD, ADVANCE, VADT suggested no significant reduction in CVD outcomes with intensive glycemic control (T2D)

Care.DiabetesJournals.org

American Diabetes Association Standards of Medical Care in Diabetes. Glycemic targets. Diabetes Care 2017; 40 (Suppl. 1): S48-S56

7.
Obesity Management for the Treatment of Type 2 Diabetes

American Diabetes Association.

Overweight/Obesity Treatment

	Body Mass Index Category (kg/m^2)				
Treatment	23.0* or 25.0-26.9	27.0-29.9	27.5* or 30.0-34.9	35.0-39.9	≥40
Diet, physical activity & behavioral therapy	+	+	+	+	+
Pharmacotherapy		+	+	+	+
Metabolic surgery			+	+	+

* Asian-American individuals

\+ Treatment may be indicated for selected, motivated patients.

American Diabetes Association Standards of Medical Care in Diabetes. Obesity management for the treatment of type 2 diabetes. Diabetes Care 2017; 40 (Suppl. 1): S57-S63

American Diabetes Association.

Recommendations: Diet, physical activity & behavioral therapy

- Diet, physical activity & behavioral therapy designed to achieve >5% weight loss
- Interventions should be high-intensity (≥16 sessions in 6 months) and focus on diet, physical activity & behavioral strategies to achieve a 500 - 750 kcal/day energy deficit.
- Diets should be individualized, as those that provide the same caloric restriction but differ in protein, carbohydrate, and fat content are equally effective in achieving weight loss.
- Patients who achieve short-term weight loss goals should be prescribed long-term maintenance programs.

American Diabetes Association Standards of Medical Care in Diabetes. Obesity management for the treatment of type 2 diabetes. Diabetes Care 2017; 40 (Suppl. 1): S57-S63

Recommendations: Pharmacotherapy

- If patient response to weight loss medications <5% after 3 months or there are safety or tolerability issues at any time, discontinue medication and consider alternative medications or treatment approaches. A

American Diabetes Association Standards of Medical Care in Diabetes. Obesity management for the treatment of type 2 diabetes. Diabetes Care 2017; 40 (Suppl. 1): S57-S63

Metabolic Surgery

- Evidence supports gastrointestinal operations as effective treatments for overweight T2DM patients.
- Randomized controlled trials with postoperative follow-up ranging from 1 to 5 years have documented sustained diabetes remission in 30–63% of patients, though erosion of remission occurs in 35-50% or more.
- With or without diabetes relapse, the majority of patients who undergo surgery maintain substantial improvement of glycemic control for at least 5 to 15 years

American Diabetes Association Standards of Medical Care in Diabetes. Obesity management for the treatment of type 2 diabetes. Diabetes Care 2017; 40 (Suppl. 1): S57-S63

Recommendations: Metabolic Surgery

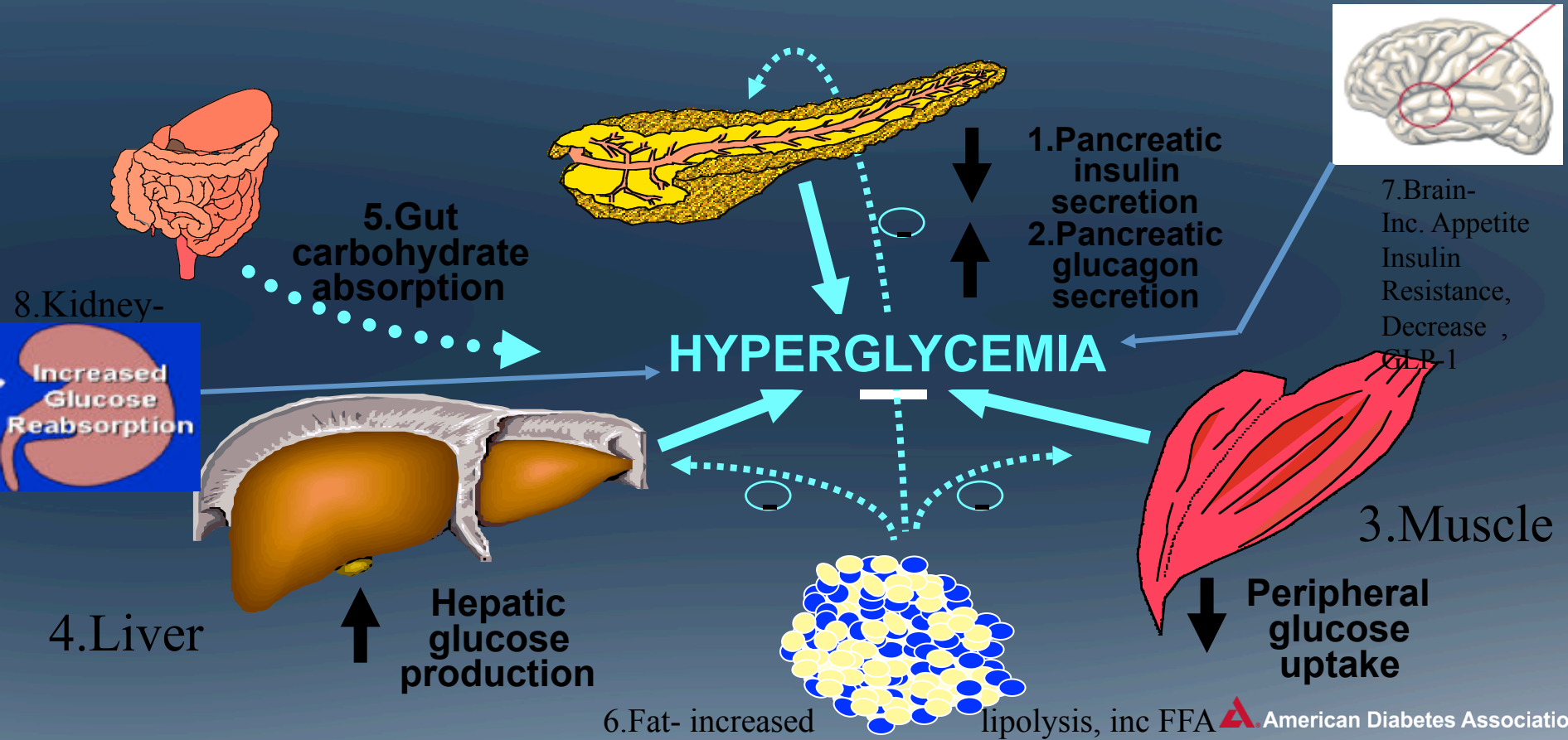
- Metabolic surgery *should be recommended* to treat T2DM for all appropriate surgical candidates with BMIs ≥ 40 (37.5*) and those with BMIs 35.0-39.9 (32.5-37.4*) when hyperglycemia is inadequately controlled despite lifestyle & optimal medical therapy. A
- Metabolic surgery *should be considered* for the treatment of T2DM in adults with BMIs 30-34.9 (27.5-32.4*) when hyperglycemia is inadequately controlled despite optimal medical control by either oral or injectable medications (including insulin). B
- Metabolic surgery should be performed in high-volume centers with multidisciplinary teams that understand and are experienced in the management of diabetes and gastrointestinal surgery. C

American Diabetes Association Standards of Medical Care in Diabetes. Obesity management for the treatment of type 2 diabetes. Diabetes Care 2017; 40 (Suppl. 1): S57-S63

8. Pharmacologic Approaches to Glycemic Treatment

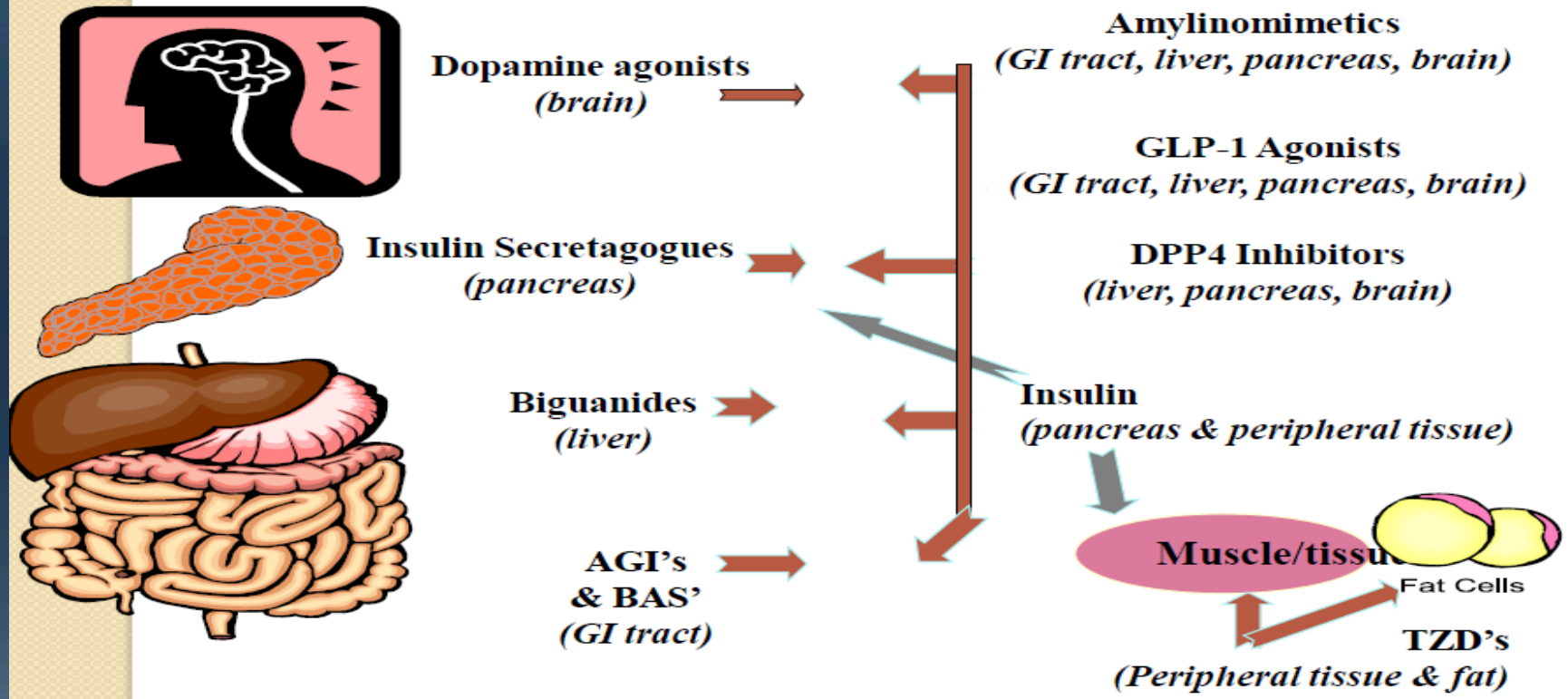
American Diabetes Association.

‘Ominous Octect: Pathophysiological Contributions to Hyperglycemia in Type 2 Diabetes



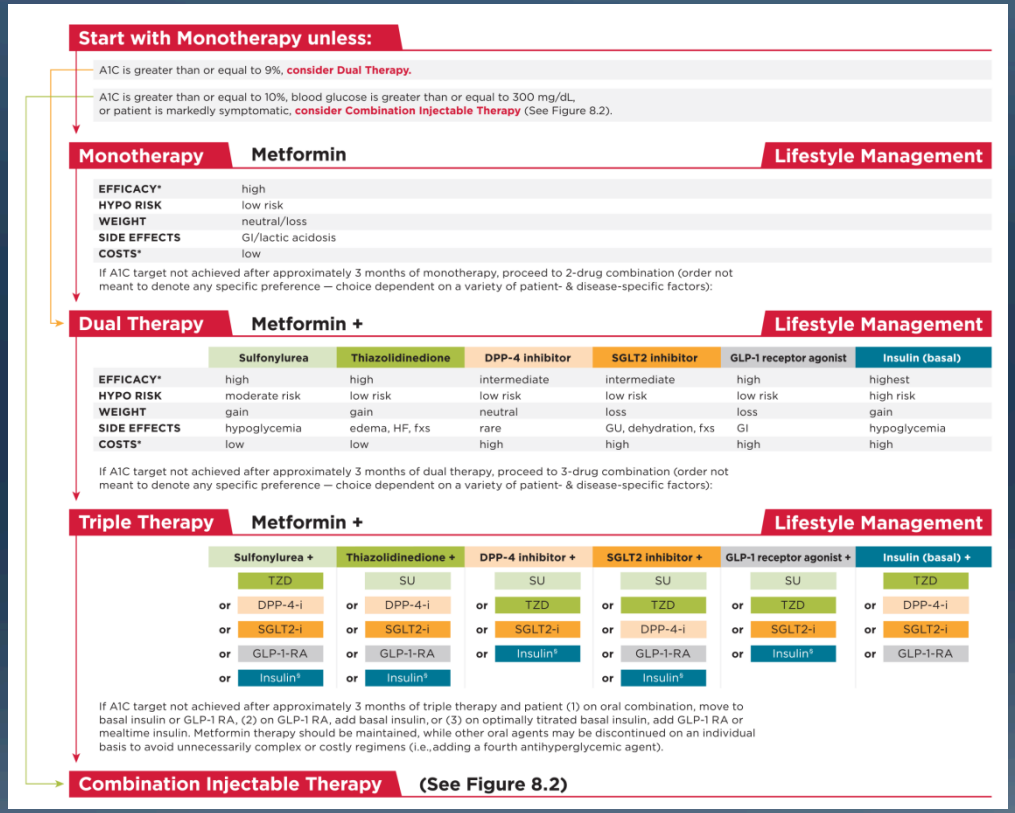
American Diabetes Association.

Pharmacotherapy to "Fix" T2DM Dysfunctional Organs



Martin CL. *The Diabetes Educator*. 2007 ; 33: 6-13.

Antihyperglycemic Therapy in T2DM



Start with Monotherapy unless:

A1C is greater than or equal to 9%, **consider Dual Therapy.**

A1C is greater than or equal to 10%, blood glucose is greater than or equal to 300 mg/dL, or patient is markedly symptomatic, **consider Combination Injectable Therapy** (See Figure 8.2).

Monotherapy — Metformin — Lifestyle Management

EFFICACY*	high
HYPO RISK	low risk
WEIGHT	neutral/loss
SIDE EFFECTS	GI/lactic acidosis
COSTS*	low

If A1C target not achieved after approximately 3 months of monotherapy, proceed to 2-drug combination (order not meant to denote any specific preference — choice dependent on a variety of patient- & disease-specific factors):

Dual Therapy — Metformin + — Lifestyle Management

	Sulfonylurea	Thiazolidinedione	DPP-4 inhibitor	SGLT2 inhibitor	GLP-1 receptor agonist	Insulin (basal)
EFFICACY*	high	high	intermediate	intermediate	high	highest
HYPO RISK	moderate risk	low risk	low risk	low risk	low risk	high risk
WEIGHT	gain	gain	neutral	loss	loss	gain
SIDE EFFECTS	hypoglycemia	edema, HF, fxs	rare	GU, dehydration, fxs	GI	hypoglycemia
COSTS*	low	low	high	high	high	high

If A1C target not achieved after approximately 3 months of dual therapy, proceed to 3-drug combination (order not meant to denote any specific preference — choice dependent on a variety of patient- & disease-specific factors):

Triple Therapy — Metformin + — Lifestyle Management

Sulfonylurea +	Thiazolidinedione +	DPP-4 inhibitor +	SGLT2 inhibitor +	GLP-1 receptor agonist +	Insulin (basal) +
TZD	SU	SU	SU	SU	TZD
or DPP-4-i	or DPP-4-i	or TZD	or TZD	or TZD	or DPP-4-i
or SGLT2-i	or SGLT2-i	or SGLT2-i	or DPP-4-i	or SGLT2-i	or SGLT2-i
or GLP-1-RA	or GLP-1-RA	or Insulin§	or GLP-1-RA	or Insulin§	or GLP-1-RA
or Insulin§	or Insulin§		or Insulin§		

If A1C target not achieved after approximately 3 months of triple therapy and patient (1) on oral combination, move to basal insulin or GLP-1 RA, (2) on GLP-1 RA, add basal insulin, or (3) on optimally titrated basal insulin, add GLP-1 RA or mealtime insulin. Metformin therapy should be maintained, while other oral agents may be discontinued on an individual basis to avoid unnecessarily complex or costly regimens (i.e., adding a fourth antihyperglycemic agent).

Combination Injectable Therapy (See Figure 8.2)

American Diabetes Association Standards of Medical Care in Diabetes.
Approaches to glycemic treatment. Diabetes Care 2017; 40 (Suppl. 1): S64-S74

Start with Monotherapy unless:

A1C is greater than or equal to 9%, **consider Dual Therapy.**

A1C is greater than or equal to 10%, blood glucose is greater than or equal to 300 mg/dL, or patient is markedly symptomatic, **consider Combination Injectable Therapy** (See Figure 8.2).

Monotherapy — Metformin — Lifestyle Management

EFFICACY*	high
HYPO RISK	low risk
WEIGHT	neutral/loss
SIDE EFFECTS	GI/lactic acidosis
COSTS*	low

If A1C target not achieved after approximately 3 months of monotherapy, proceed to 2-drug combination (order not meant to denote any specific preference — choice dependent on a variety of patient- & disease-specific factors):

Dual Therapy — Metformin + — Lifestyle Management

	Sulfonylurea	Thiazolidinedione	DPP-4 inhibitor	SGLT2 inhibitor	GLP-1 receptor agonist	Insulin (basal)
EFFICACY*	high	high	intermediate	intermediate	high	highest
HYPO RISK	moderate risk	low risk	low risk	low risk	low risk	high risk
WEIGHT	gain	gain	neutral	loss	loss	gain
SIDE EFFECTS	hypoglycemia	edema, HF, fxs	rare	GU, dehydration, fxs	GI	hypoglycemia
COSTS*	low	low	high	high	high	high

If A1C target not achieved after approximately 3 months of dual therapy, proceed to 3-drug combination (order not meant to denote any specific preference — choice dependent on a variety of patient- & disease-specific factors):

Triple Therapy — Metformin + — Lifestyle Management

Sulfonylurea +	Thiazolidinedione +	DPP-4 inhibitor +	SGLT2 inhibitor +	GLP-1 receptor agonist +	Insulin (basal) +
TZD	SU	SU	SU	SU	TZD
or DPP-4-i	or DPP-4-i	or TZD	or TZD	or TZD	or DPP-4-i
or SGLT2-i	or SGLT2-i	or SGLT2-i	or DPP-4-i	or SGLT2-i	or SGLT2-i
or GLP-1-RA	or GLP-1-RA	or Insulin[§]	or GLP-1-RA	or Insulin[§]	or GLP-1-RA
or Insulin[§]	or Insulin[§]		or Insulin[§]		

If A1C target not achieved after approximately 3 months of triple therapy and patient (1) on oral combination, move to basal insulin or GLP-1 RA, (2) on GLP-1 RA, add basal insulin, or (3) on optimally titrated basal insulin, add GLP-1 RA or mealtime insulin. Metformin therapy should be maintained, while other oral agents may be discontinued on an individual basis to avoid unnecessarily complex or costly regimens (i.e., adding a fourth antihyperglycemic agent).

Combination Injectable Therapy (See Figure 8.2)

Recommendations: Pharmacologic Therapy For T2DM

- Metformin, if not contraindicated and if tolerated, is the preferred initial pharmacologic agent for T2DM. A
- Consider insulin therapy (with or without additional agents) in patients with newly dx'd T2DM who are markedly symptomatic and/or have elevated blood glucose levels (≥300 mg/dL) or A1C (≥10%). E

American Diabetes Association Standards of Medical Care in Diabetes. Approaches to glycemic treatment. Diabetes Care 2017; 40 (Suppl. 1): S64-S74

New Recommendation: Pharmacologic Therapy For T2DM

Long-term use of metformin may be associated with biochemical vitamin B12 deficiency, and periodic measurement of vitamin B12 levels should be considered in metformin-treated patients, especially in those with anemia or peripheral neuropathy. B

American Diabetes Association Standards of Medical Care in Diabetes.
Approaches to glycemic treatment. Diabetes Care 2017; 40 (Suppl. 1): S64-S74

Recommendations: Pharmacological Therapy For T2DM

- If noninsulin monotherapy at maximal tolerated dose does not achieve or maintain the A1C target over 3 months, add a second oral agent, a GLP-1 receptor agonist, or basal insulin. A
- Use a patient-centered approach to guide choice of pharmacologic agents. E
- Don’t delay insulin initiation in patients not achieving glycemic goals. B

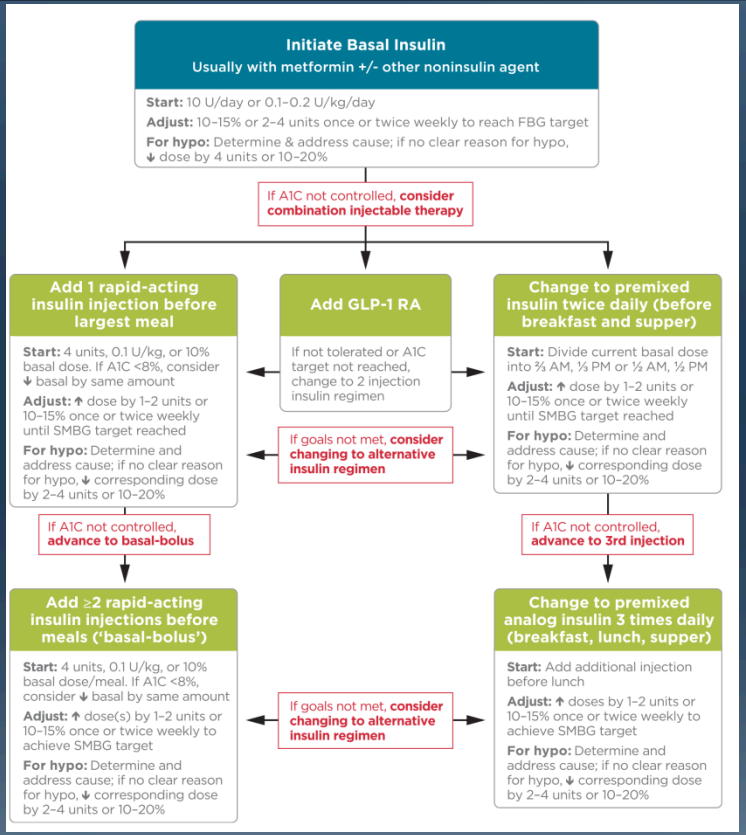
American Diabetes Association Standards of Medical Care in Diabetes. Approaches to glycemic treatment. Diabetes Care 2017; 40 (Suppl. 1): S64-S74

Medicines and their effect on blood glucose

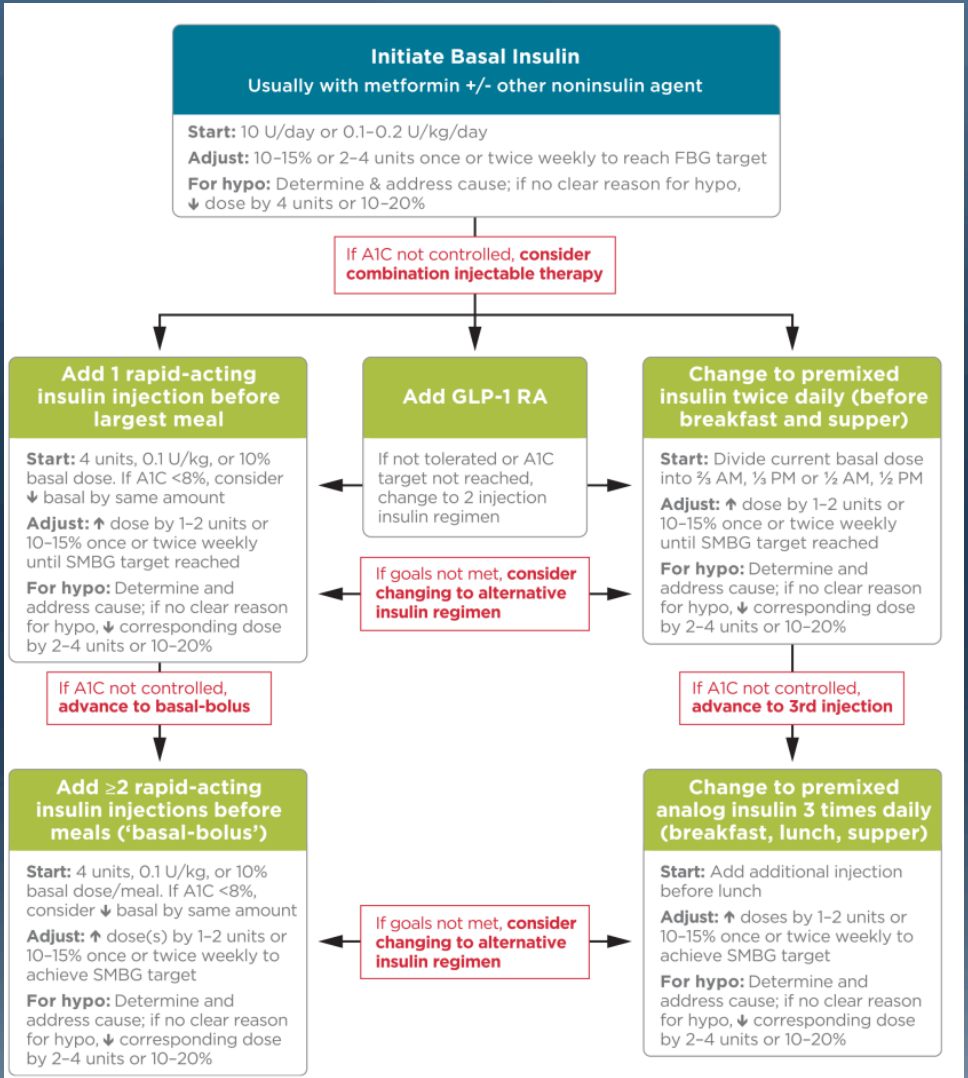
Medication	Effect on blood glucose
Alpha-glucosidase inhibitors	Post-prandial
Bile Acid Sequestrant	Post-prandial
Biguanides (metformin)	Fasting
DPP-4 inhibitors (gliptins)	Post-prandial
Dopamine agonists	Post-prandial
Glinides	Post-prandial
GLP-1 agonists	Short acting – Post-prandial Long acting – Fasting & Postprandial
Pramlintide (amylinomimetic)	Post-prandial
Sulfonylureas	Fasting & Post-prandial
Thiazolidinediones	Fasting & Post-prandial
Insulin (Basal)	Fasting
Insulin (Bolus)	Post-prandial

Amylinomimetics	loss	low risk	possible	yes	injectable
Bile Acid Sequestrant	neutral or loss	low risk	possible	yes	GI adverse effects (constipation), dose frequency- 6 tabs daily
Biguanides	loss	low risk	possible	yes	Inexpensive, GI adverse effects
DPP-4 Inhibitors (gliptins)	neutral	low risk	possible	yes	minimal adverse effects, cost
Dopamine agonist	neutral or loss	Low risk	unknown	yes/no	GI adverse effects , hypotension
GLP-1 agonists	loss	low risk	possible	yes	GI adverse effects (nausea), cost, injectable
Insulin	gain	+ risk – bolus low risk - basal	possible	possible	best A1c lowering, injectable
Secretagogues (Sulfonylureas & Glinides)	gain	+ risk	no	no	immediate short-term response, inexpensive
TZD's (glitazones)	gain	low risk	possible	yes/no	4-8 weeks for response, redistribution of subcutaneous/visceral fat, edema, bone loss- adverse effects

Combination Injectable Therapy in T2DM



American Diabetes Association Standards of Medical Care in Diabetes. Approaches to glycemic treatment. Diabetes Care 2017; 40 (Suppl. 1): S64-S74


Initiate Basal Insulin
Usually with metformin +/- other noninsulin agent
Start: 10 U/day or 0.1–0.2 U/kg/day
Adjust: 10–15% or 2–4 units once or twice weekly to reach FBG target
For hypo: Determine & address cause; if no clear reason for hypo, ↓ dose by 4 units or 10–20%
If A1C not controlled, consider combination injectable therapy
Add 1 rapid-acting insulin injection before largest meal
Start: 4 units, 0.1 U/kg, or 10% basal dose. If A1C <8%, consider ↓ basal by same amount
Adjust: ↑ dose by 1–2 units or 10–15% once or twice weekly until SMBG target reached
For hypo: Determine and address cause; if no clear reason for hypo, ↓ corresponding dose by 2–4 units or 10–20%
If A1C not controlled, advance to basal-bolus
Add ≥2 rapid-acting insulin injections before meals ('basal-bolus')
Start: 4 units, 0.1 U/kg, or 10% basal dose/meal. If A1C <8%, consider ↓ basal by same amount
Adjust: ↑ dose(s) by 1–2 units or 10–15% once or twice weekly to achieve SMBG target
For hypo: Determine and address cause; if no clear reason for hypo, ↓ corresponding dose by 2–4 units or 10–20%
Add GLP-1 RA
If not tolerated or A1C target not reached, change to 2 injection insulin regimen
If goals not met, consider changing to alternative insulin regimen
If goals not met, consider changing to alternative insulin regimen
Change to premixed insulin twice daily (before breakfast and supper)
Start: Divide current basal dose into ⅔ AM, ⅓ PM or ½ AM, ½ PM
Adjust: ↑ dose by 1–2 units or 10–15% once or twice weekly until SMBG target reached
For hypo: Determine and address cause; if no clear reason for hypo, ↓ corresponding dose by 2–4 units or 10–20%
If A1C not controlled, advance to 3rd injection
Change to premixed analog insulin 3 times daily (breakfast, lunch, supper)
Start: Add additional injection before lunch
Adjust: ↑ doses by 1–2 units or 10–15% once or twice weekly to achieve SMBG target
For hypo: Determine and address cause; if no clear reason for hypo, ↓ corresponding dose by 2–4 units or 10–20%

New Recommendation: Pharmacologic Therapy For T2DM

In patients with long-standing suboptimally controlled type 2 diabetes and established atherosclerotic cardiovascular disease, ***empagliflozin*** or ***liraglutide*** should be considered as they have been shown to reduce cardiovascular and all-cause mortality when added to standard care. Ongoing studies are investigating the cardiovascular benefits of other agents in these drug classes. B

American Diabetes Association Standards of Medical Care in Diabetes.
Approaches to glycemic treatment. Diabetes Care 2017; 40 (Suppl. 1): S64-S74

9. Cardiovascular Disease and Risk Management

American Diabetes Association.

Recommendations: Hypertension/ Blood Pressure Control

Screening and Diagnosis:

- Blood pressure should be measured at every routine visit. B
- Patients found to have elevated blood pressure should have blood pressure confirmed on a separate day. B

Systolic Targets:

- People with diabetes and hypertension should be treated to a systolic blood pressure goal of <140 mmHg. A
- Lower systolic targets, such as <130 mmHg, may be appropriate for certain individuals at high risk of CVD, if they can be achieved without undue treatment burden. C

Diastolic Targets:

- Patients with diabetes should be treated to a diastolic blood pressure <90 mmHg. A
- Lower diastolic targets, such as <80 mmHg, may be appropriate for certain individuals at high risk for CVD if they can be achieved without undue treatment burden. C

American Diabetes Association Standards of Medical Care in Diabetes.
Cardiovascular disease and risk management. Diabetes Care 2017; 40 (Suppl. 1): S75-S87

Recommendations: Hypertension/ Blood Pressure Treatment (2)

- Patients with confirmed office-based blood pressure >160/100mmHg should, in addition to lifestyle therapy, have prompt initiation and timely titration of two drugs or a single pill combination of drugs demonstrated to reduce cardiovascular events in patients with diabetes. A

- Lifestyle intervention including:
  - Weight loss if overweight
  - DASH-style diet
  - Moderation of alcohol intake
  - Increased physical activity

American Diabetes Association Standards of Medical Care in Diabetes. Cardiovascular disease and risk management. Diabetes Care 2017; 40 (Suppl. 1): S75-S87

Recommendations: Hypertension/ Blood Pressure Treatment

- Treatment for hypertension should include A
  - ACE inhibitor
  - Angiotensin II receptor blocker (ARB)
    - First-line treatment for hypertension in patients with diabetes and urinary albumin–to–creatinine ratio ≥300 mg/g creatinine (A) or 30–299 mg/g creatinine (B). If one class is not tolerated, the other should be substituted. B
  - Thiazide-like diuretic
    - ACE inhibitors, ARBs, or diuretics, monitor serum creatinine / eGFR & potassium levels. B
  - Dihydropyridine calcium channel blockers
- Multiple drug therapy (two or more agents at maximal doses) generally required to achieve BP targets.

American Diabetes Association Standards of Medical Care in Diabetes.
Cardiovascular disease and risk management. Diabetes Care 2017; 40 (Suppl. 1): S75-S87

Recommendations: Lipid Management

- In adults not taking statins, a screening lipid profile is reasonable (E):
  - At diabetes diagnosis
  - At the initial medical evaluation
  - And every 5 years, or more frequently if indicated

- To improve lipid profile in patients with diabetes, recommend lifestyle modification A, focusing on:
  - Weight loss (if indicated)
  - Reduction of saturated fat, trans fat, cholesterol intake
  - Increase of ω-3 fatty acids, viscous fiber, plant stanols/sterols
  - Increased physical activity

American Diabetes Association Standards of Medical Care in Diabetes.
Cardiovascular disease and risk management. Diabetes Care 2017; 40 (Suppl. 1): S75-S87

Recommendations: Lipid Management

- Intensify lifestyle therapy & optimize glycemic control for patients with:
  - Triglyceride levels ≥150 mg/dL and/or
  - HDL cholesterol <40 mg/dL in men and <50 mg/dL in women
- Goal: (LDL<100, with ASCVD <70)
- For patients with fasting triglyceride levels ≥ 500 mg/dL, evaluate for secondary causes and consider medical therapy to reduce the risk of pancreatitis.

American Diabetes Association Standards of Medical Care in Diabetes.
Cardiovascular disease and risk management. Diabetes Care 2017; 40 (Suppl. 1): S75-S87

Recommendations for Statin Treatment in People with Diabetes

Age	Risk Factors	Statin Intensity*
<40 years	None	None
	ASCVD risk factor(s)	Moderate or high
	ASCVD	High
40–75 years	None	Moderate
	ASCVD risk factors	High
	ACS & LDL ≥50 or in patients with history of ASCVD who can't tolerate high dose statin	Moderate + ezetimibe
>75 years	None	Moderate
	ASCVD risk factors	Moderate or high
	ASCVD	High
	ACS & LDL ≥50 or in patients with history of ASCVD who can't tolerate high dose statin	Moderate + ezetimibe

American Diabetes Association Standards of Medical Care in Diabetes.
Cardiovascular disease and risk management. Diabetes Care 2017; 40 (Suppl. 1): S75-S87

High- and Moderate-Intensity Statin Therapy*

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

* Once-daily dosing. XL, extended release

American Diabetes Association Standards of Medical Care in Diabetes.
Cardiovascular disease and risk management. Diabetes Care 2017; 40 (Suppl. 1): S75-S87

American Diabetes Association.

Recommendations: Lipid Management (5)

- Combination therapy (statin/fibrate) doesn't improve ASCVD outcomes and is generally not recommended A. Consider therapy with statin and fenofibrate for men with *both* trigs ≥204 mg/dL (2.3 mmol/L) and HDL ≤34 mg/dL (0.9 mmol/L). B
- Combination therapy (statin/niacin) hasn't demonstrated additional CV benefit over statins alone, may raise risk of stroke & is not generally recommended. A
- Statin therapy is contraindicated in pregnancy. B

American Diabetes Association Standards of Medical Care in Diabetes.
Cardiovascular disease and risk management. Diabetes Care 2017; 40 (Suppl. 1): S75-S87

Recommendations: Antiplatelet Agents

- Aspirin is not recommended for ASCVD prevention for adults with DM at low ASCVD risk
  - Low risk: such as in men or women with diabetes aged <50 years with no major additional ASCVD risk factors)
  - Use aspirin therapy (75–162 mg/day) as secondary prevention in those with diabetes and history of ASCVD (Family history of premature ASCVD (Hypertension, smoking, dislipidemia, albuminuria)
- For patients w/ ASCVD & aspirin allergy, clopidogrel (75 mg/day) should be used. B
- Dual antiplatelet therapy is reasonable for up to a year after an acute coronary syndrome. B

American Diabetes Association Standards of Medical Care in Diabetes.
Cardiovascular disease and risk management. Diabetes Care 2017; 40 (Suppl. 1): S75-S87

Recommendations: Coronary Heart Disease

Treatment

- In patients with known ASCVD, use aspirin and statin therapy (if not contraindicated) A and consider ACE inhibitor therapy C to reduce risk of cardiovascular events.
- In patients with a prior MI, β-blockers should be continued for at least 2 years after the event. B
- In patients with symptomatic heart failure, TZDs should not be used. A
- In type 2 diabetes, patients with stable CHF,metformin may be used if renal function is normal but should be avoided in unstable or hospitalized patients with CHF. B

American Diabetes Association Standards of Medical Care in Diabetes.
Cardiovascular disease and risk management. Diabetes Care 2017; 40 (Suppl. 1): S75-S87

10. Microvascular Complications and Foot Care

American Diabetes Association.

Stages of Chronic Kidney Disease

Stage	Description	eGFR (mL/min/1.73 m^2)
1	Kidney damage* with normal or increased eGFR	≥ 90
2	Kidney damage* with mildly decreased eGFR	60–89
3	Moderately decreased eGFR	30–59
4	Severely decreased eGFR	15–29
5	Kidney failure	<15 or dialysis

eGFR = estimated glomerular filtration rate

* Kidney damage defined as abnormalities on pathologic, urine, blood, or imaging tests.

American Diabetes Association Standards of Medical Care in Diabetes. Microvascular complications and foot care. Diabetes Care 2017; 40 (Suppl. 1): S88-S98

American Diabetes Association.

Diabetic Kidney Disease

Screening

- Annual check >urinary albumin and estimated glomerular filtration rate (eGFR)

Treatment

- Optimize glucose control to reduce risk or slow progression of diabetic kidney disease. A
- Optimize blood pressure control to reduce risk or slow progression of diabetic kidney disease. A
- ACE inhibitor or ARB is recommended for those with modestly elevated urinary albumin excretion (30–299 mg/g creatinine) B and is strongly recommended for patients w/ urinary albumin excretion ≥300 mg/g creatinine and/or eGFR <60. A
- An ACE inhibitor or ARB isn't recommended for primary prevention of diabetic kidney disease in patients with diabetes with normal BP, normal UACR (<30 mg/g creatinine) & normal eGFR. B

American Diabetes Association Standards of Medical Care in Diabetes.
Microvascular complications and foot care. Diabetes Care 2017; 40 (Suppl. 1): S88-S98

Management of CKD in Diabetes

eGFR	Recommended
All patients	Yearly measurement of creatinine, urinary albumin excretion, potassium
45-60	Referral to a nephrologist if possibility for nondiabetic kidney disease exists
	Consider dose adjustment of medications
	Monitor eGFR every 6 months
	Monitor electrolytes, bicarbonate, hemoglobin, calcium, phosphorus, parathyroid hormone at least yearly
	Assure vitamin D sufficiency
	Consider bone density testing
	Referral for dietary counselling

American Diabetes Association Standards of Medical Care in Diabetes.
Microvascular complications and foot care. Diabetes Care 2017; 40 (Suppl. 1): S88-S98

Management of CKD in Diabetes (2)

eGFR	Recommended
30-44	Monitor eGFR every 3 months
	Monitor electrolytes, bicarbonate, calcium, phosphorus, parathyroid hormone, hemoglobin, albumin weight every 3–6 months
	Consider need for dose adjustment of medications
<30	Referral to a nephrologist

American Diabetes Association Standards of Medical Care in Diabetes.
Microvascular complications and foot care. Diabetes Care 2017; 40 (Suppl. 1): S88-S98

American Diabetes Association.

TX Recommendations: Diabetic Kidney Disease

For non-dialysis dependent diabetic kidney disease, dietary protein intake should be

- ~0.8 g/kg body weight per day. On dialysis, higher levels of dietary protein intake to be considered. B
- ACE inhibitor or ARB if modestly elevated urinary albumin excretion (30–299 mg/g creatinine) B and strongly recommended Ualbumin ≥300 mg/g creatinine and/or eGFR <60. A

American Diabetes Association Standards of Medical Care in Diabetes.
Microvascular complications and foot care. Diabetes Care 2017; 40 (Suppl. 1): S88-S98

Diabetic Retinopathy

GOAL: Reduce the risk or slow the progression of retinopathy by:

- Optimize glycemic control
- Optimize blood pressure control

Screening:

- Initial dilated and comprehensive eye examination by an ophthalmologist or optometrist:
  - Adults with type 1 diabetes, within 5 years of diabetes onset. B
  - Patients with type 2 diabetes at the time of diabetes diagnosis.B

American Diabetes Association Standards of Medical Care in Diabetes.
Microvascular complications and foot care. Diabetes Care 2017; 40 (Suppl. 1): S88-S98

Neuropathy

- Early recognition & management is important because:
  - DN is a diagnosis of exclusion.
  - Numerous treatment options exist.
  - Up to 50% of DPN may be asymptomatic.
- Recognition & treatment may improve symptoms, reduce sequelae, and improve quality-of-life.
- Use of pregabalin or duloxetine are recommended as initial pharmacologic treatments for neuropathic pain in diabetes.

American Diabetes Association Standards of Medical Care in Diabetes.
Microvascular complications and foot care. Diabetes Care 2017; 40 (Suppl. 1): S88-S98

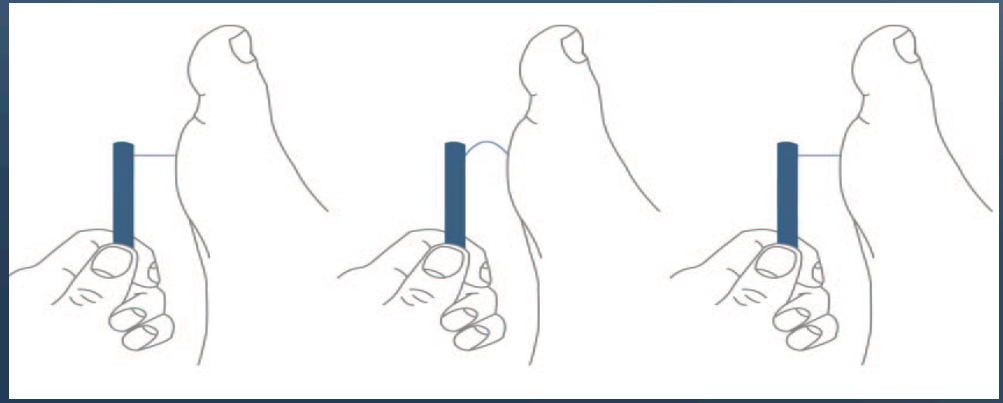
Foot Care in Type 2 DM

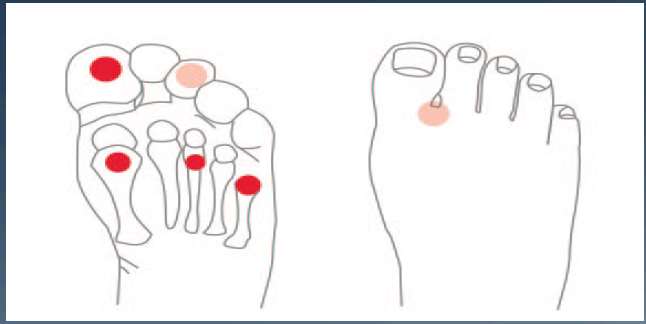
- Annual comprehensive foot evaluation annually
- Inspection of feet at every visit
- Exam should include:
  - inspection of the skin,
  - assessment of foot deformities,
  - neurologic assessment &
  - vascular assessment including pulses in the legs and feet.
- Referral if symptoms of claudication, decreased, or absent pedal pulses
- Multidisciplinary approach is recommended for individuals high-risk
- Specialized therapeutic footwear is recommended for high-risk patient

American Diabetes Association Standards of Medical Care in Diabetes.
Microvascular complications and foot care. Diabetes Care 2017; 40 (Suppl. 1): S88-S98

Recommendations: Foot Care

- To perform the 10-g monofilament test, place the device perpendicular to the skin; Apply pressure until monofilament buckles.
- Hold in place for 1 second & release.
- The monofilament test should be performed at the highlighted sites while the patient's eyes are closed.





Boulton A, Armstrong D, Albert, S et. al. Comprehensive Foot Examination and Risk Assessment. Diabetes Care. 2008; 31: 1679-1685

11.
Older Adults

Older Adults

- 26% of patients aged >65 have diabetes.
- Older adults have higher rates of premature death, functional disability & coexisting illnesses.
- At greater risk for polypharmacy, cognitive impairment, urinary incontinence, injurious falls & persistent pain.
- Screening for complications should be individualized and periodically revisited.
- At higher risk for depression
- Greater risk of hypoglycemia – needing med adjustments.

American Diabetes Association Standards of Medical Care in Diabetes.
Older adults. Diabetes Care 2017; 40 (Suppl. 1): S99-S104

15.
Diabetes Advocacy

Advocacy Position Statements

- ADA publishes evidence-based advocacy statements on issues including:
  - Diabetes and employment
  - Diabetes and driving
  - Diabetes management in schools, child care programs, and correctional institutions.
- These are important tools in educating:
  - Schools
  - Employers
  - Licensing agencies
  - Policy makers
  - Professional.diabetes.org/SOC

American Diabetes Association. Standards of Medical Care in Diabetes. Diabetes advocacy. *Diabetes Care* 2017;40(Suppl. 1):S128–S129


Thank You!