Diabetes Management in Primary Care

SOUTH DAKOTA DIABETES COALITION

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Disclosures

-PRN Employee with Horizon Health
-Current Board Member of the SDDC

Learning Objectives

1. Understand the role of primary care providers in diabetes management.

2. Identify evidence-based approaches to diabetes treatment and monitoring.

3. Address common challenges in diabetes care and patient engagement.

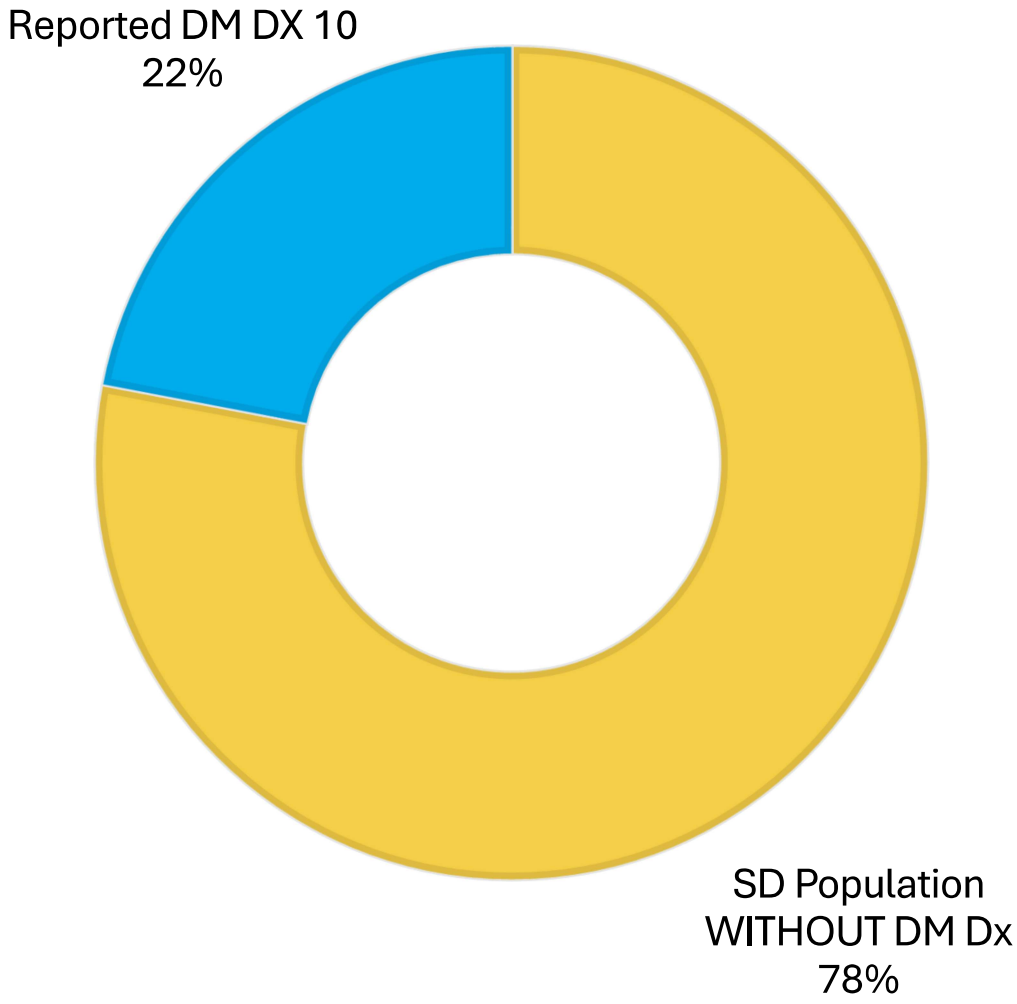
Prevalence of Diabetes in SD

In South Dakota, 10% of adults were living with a diagnosis of diabetes.

This ranged from 7% to 22% of adults across counties in the state.

Every year, an estimated 4,100 adults in South Dakota are diagnosed with diabetes.

Please note: This information is from the **2024 Annual Data Release and uses data from 2021 for this measure.**



So, what is the role of the Primary Care Clinician?

- Likely to be the first and most frequent point of contact for individuals with Type 2 Diabetes.
- Play a pivotal role in early diagnosis, establishment of effective treatment strategies, and coordination of care.
- Aim to prevent but also screen and identify any secondary complications.

Key Components of Diabetes Care in the Primary Care Setting

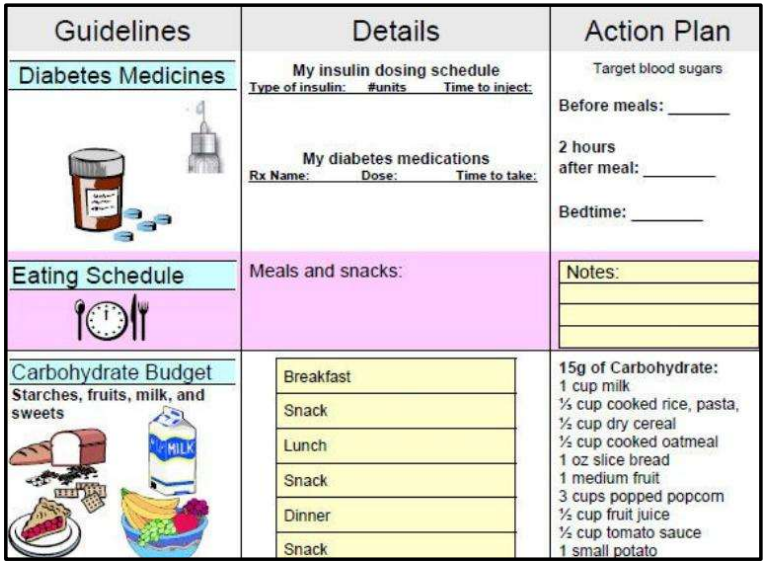
1. Complete comprehensive diabetes medical evaluation at initial, follow-up, and annual visits

2. Screen, prevent, and delay complications

3. Facilitate Positive Health Behaviors and Well-Being to Improve Health Outcomes (education and lifestyle change program, nutrition, any other pertinent referrals)

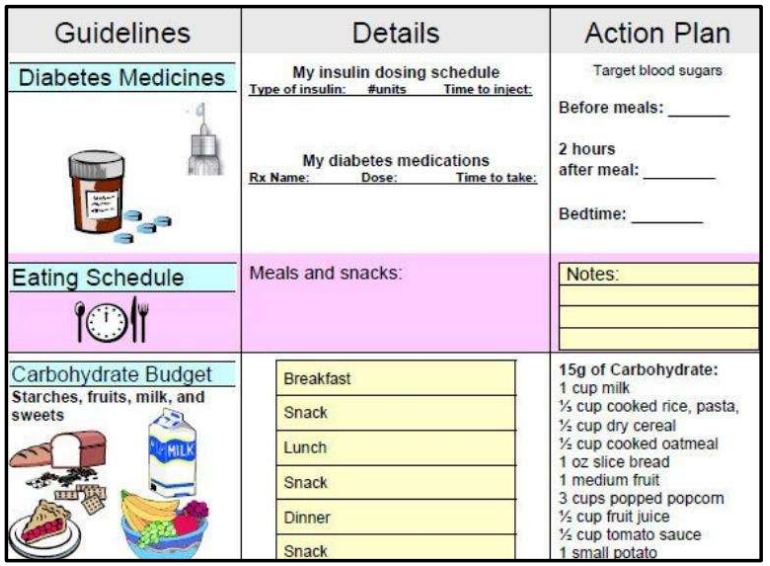
4. Establish glycemic goals, time-in-range goals, and plans for hypo/hyperglycemia

5. Consider what diabetes technology will be used and prescribed



Key Components of Diabetes Care in the Primary Care Setting (cont.)

6. Consider specific goals and plans for patients who are overweight or obese/overall weight management discussions
7. Pharmacologic approach and plan
8. Cardiovascular disease and risk management
9. Chronic kidney disease and risk management
10. Retinopathy, neuropathy, and foot care
11. Considerations for older adults
12. Recognize and address any barriers/challenges to care



Comprehensive Diabetes Medical Evaluation

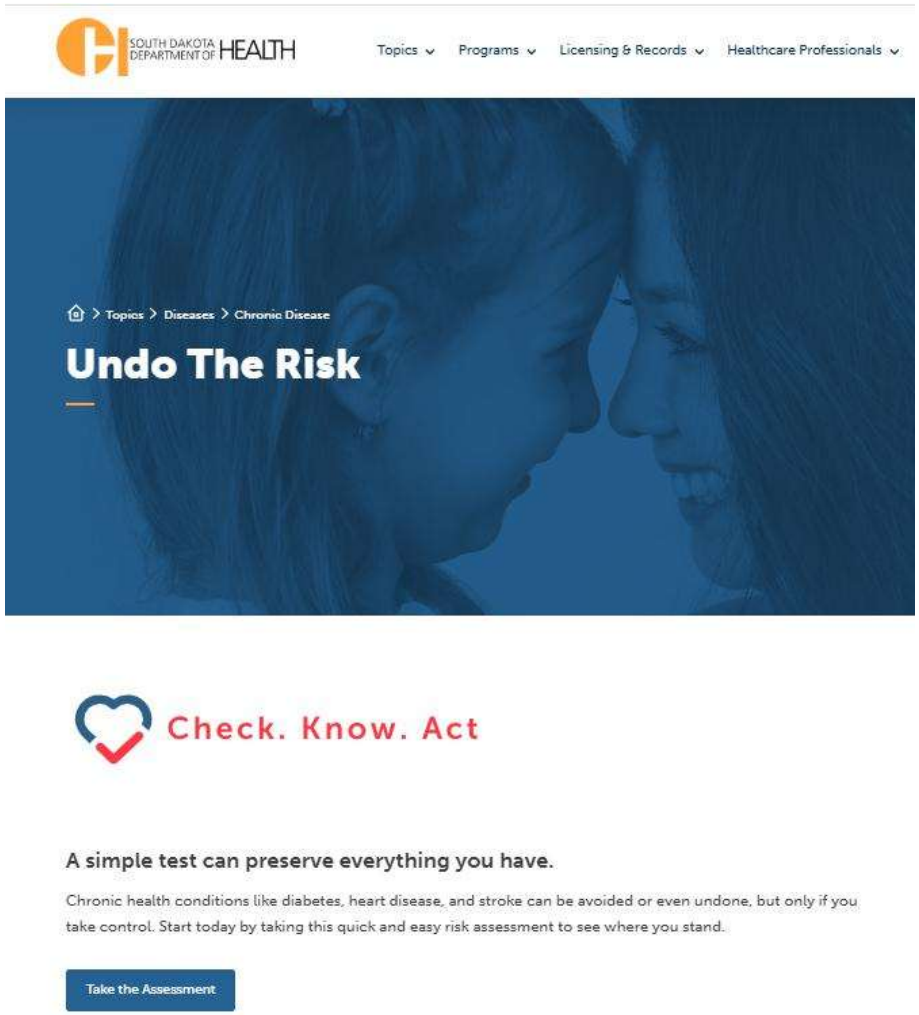
Comprehensive Diabetes Medical Evaluation

- Initial visit: complete H&P, ask about DM hx, co-morbid conditions, inquire about behavioral factors, medications, immunizations, technology use, social life, physical exam, lab evaluation, make follow-up appointments

- Every follow-up: interval changes, any updates to hx, last dental/vision exams, changes in medications, social/behavioral status, review glucose logs or CGM data, physical exam, follow-up labs

Screen, Prevent, and Delay Complications

Consider having patients take the 60-Second Risk Rest for Type 2 Diabetes | UndotheRisk | www.undotherisk.com



ADA Adult Screening Recommendations

Criteria for screening for diabetes or prediabetes in asymptomatic adults:

1. Testing should be considered in adults with overweight or obesity (BMI ≥ 25 kg/m2 or ≥ 23 kg/m2 in individuals of Asian ancestry) who have one or more of the following risk factors:
   - First-degree relative with diabetes
   - High-risk race, ethnicity, and ancestry (e.g., African American, Latino, Native American, Asian American)
   - History of cardiovascular disease
   - Hypertension (≥130/80 mmHg or on therapy for hypertension)
   - HDL cholesterol level <35 mg/dL (<0.9 mmol/L) and/or triglyceride level >250 mg/dL (>2.8 mmol/L)
   - Individuals with polycystic ovary syndrome
   - Physical inactivity
   - Other clinical conditions associated with insulin resistance (e.g., severe obesity, acanthosis nigricans, metabolic dysfunction – associated steatotic liver disease)

ADA Adult Screening Recommendations (cont.)

2. People with prediabetes (AIC ≥ 5.7% [≥39 mmol/mol], IGT or IFG)* should be tested yearly.
3. People who were diagnosed with GDM* should have testing at least every 1-3 years.
4. For all other people, testing should begin at age 35 years.
5. If results are normal, testing should be repeated at a minimum of 3-year intervals, with consideration of more frequent testing depending on initial results and risk status.
6. Individuals in other high-risk groups (e.g., people with HIV, exposure to high-risk medicines, evidence of periodontal disease, history of pancreatitis) should also be closely monitored.

*Impaired glucose tolerance (IGT), impaired fasting glucose (IFG), gestational diabetes mellitus (GDM)

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- ☐ High-risk race, ethnicity, and ancestry (e.g., African American, Latino, Native American, and Asian American)
- ☐ History of cardiovascular disease
- ☐ Hypertension (≥130/80 mmHg or on therapy for hypertension)
- ☐ HDL cholesterol <35 mg/dL (<0.9 mmol/L) and/or triglyceride level >250 mg/dL (>2.8 mmol/L)
- ☐ Polycystic ovary syndrome
- ☐ Physical inactivity
- ☐ Other clinical conditions associated with insulin resistance (e.g., severe obesity, acanthosis nigricans, and metabolic dysfunction–associated steatotic liver disease)

Clinical Notes

- If results are normal, repeat screening at least every 3 years (annually for those with prediabetes), or sooner with symptoms or changes in risk factors for diabetes.

ADA Children/Adolescent Screening Recommendations

- Risk-based screening for Type 2 Diabetes or prediabetes in asymptomatic children and adolescents in a clinical setting.
- Screening should be considered in youth* who have overweight (≥85th percentile) or obesity (≥95th percentile) **and** who have one or more additional risk factors:
    - Maternal history of diabetes or GDM during the child's gestation
    - Family history of Type 2 Diabetes in first- or second-degree relative
    - High-risk race, ethnicity, and ancestry (see Table 2.5)
    - Signs of insulin resistance or conditions associated with insulin resistance (acanthosis nigricans, hypertension, dyslipidemia, polycystic ovary syndrome, large- or small-for-gestational-age birth weight)

* After the onset of puberty or after 10 years of age, whichever occurs earlier. If tests are normal, repeat testing at a minimum of 3-year intervals (or more frequently if BMI is increasing or risk factor profile is deteriorating) is recommended. Reports of Type 2 Diabetes before age 10 years exist, and this can be considered with numerous risk factors.

Key Strategies for Diabetes Prevention

NATIONAL DIABETES PREVENTION PROGRAM

01

Healthy Eating Habits

Focus on balanced, nutritious meals daily. Encourage more plant-based foods, healthy fats, and skip fad diets and encourage lifestyle changes.

02

Regular Physical Activity

Engage in exercise for at least 30 minutes of aerobic activity most days for a total of 150 minutes a week. Encourage strength training, balance training for older adults, and overall less time sitting.

03

Losing Weight if You're Overweight or Obese

The American Diabetes Association recommends that people with prediabetes lose at least 5% to 7% of their body weight to prevent diabetes. More weight loss can turn into even greater benefits.

People in one large study lowered their risk of developing Type 2 Diabetes by almost 60% over three years. In this study, they lost about 7% of their body weight with changes in physical activity and diets.

PROJECT POWER®

1. Why Screen?

- Lab testing is safe and cost-effective.
- Screening presents an opportunity to address cardiovascular risk factors (e.g., hypertension and dyslipidemia).

2. How to Screen

- Conduct an assessment of risk factors.

–or–

- Use an assessment tool such as the American Diabetes Association risk test.
- Consider diagnostic testing based on assessment results.

3. When to Screen

- Monitor people with prediabetes at least annually.
- In those without prediabetes who have normal results, repeat screening at least every 3 years.
- Screen after the onset of puberty or after the age of 10 years in children and adolescents with overweight (BMI ≥85th percentile) or obesity (BMI ≥95th percentile) who have at least one risk factor.
- Screen whenever there are symptoms suggestive of diabetes or changes in risk.

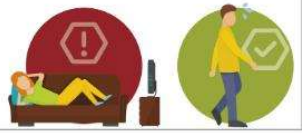
Nutrition and Physical Activity Recommendations for Adults at Risk for Type 2 Diabetes

Follow a Healthy Eating Pattern

- Emphasize whole grains, legumes, nuts, fruits, and vegetables and minimize refined and processed foods
- A variety of healthy eating patterns include:
  - » Mediterranean-style
  - » Low-carbohydrate
  - » Vegetarian or plant-based
  - » DASH (Dietary Approaches to Stop Hypertension)

Get Regular Physical Activity

- ≥150 min/week of moderate-intensity physical activity, such as brisk walking
- May include resistance or strength training
- Break up prolonged sedentary time



Weight Management for Type 2 Diabetes Prevention

Where to Refer

- Refer adults with overweight or obesity who are at high risk for type 2 diabetes to a recognized diabetes prevention lifestyle change program (www.cdc.gov/diabetes-prevention/lifestyle-change-program/find-a-program.html).

What is the Diabetes Prevention Program?

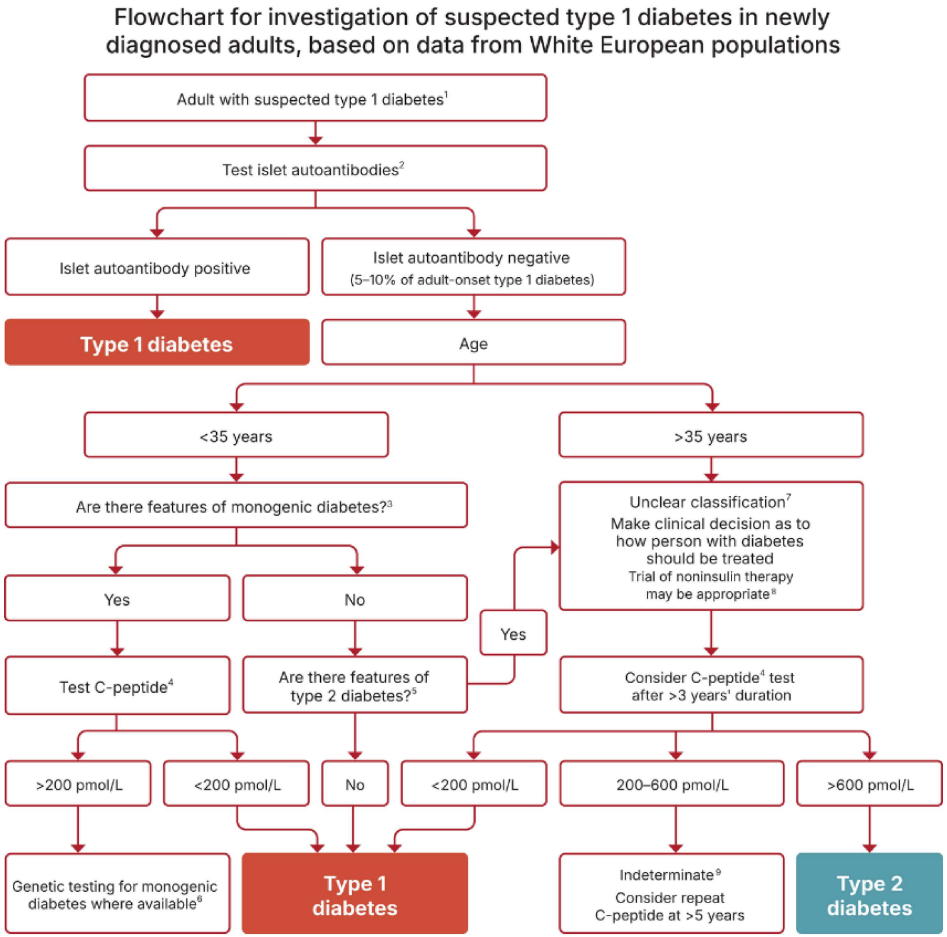
- The Diabetes Prevention Program (DPP) study demonstrated that intensive lifestyle intervention could reduce the risk of type 2 diabetes by 58% over 3 years. The two major goals of the DPP intensive lifestyle intervention were to achieve and maintain ≥7% weight loss and ≥150 min/week of moderate-intensity physical activity, such as brisk walking.
- Technology-assisted programs using smartphones, web apps, and telehealth platforms can effectively deliver the DPP lifestyle change program, overcoming barriers, especially for people with low income and/or in rural locations.
- DPP lifestyle change programs are covered by Medicare, Medicaid in certain states, and some commercial payors.

Prediabetes

- More than 1/3 American adults have prediabetes
- Identify patients with prediabetes
  - Make appropriate referrals, weight loss goals, and decide if medication tx should be offered, make plan for monitoring
    - Consider offering Metformin to:
      - Adults aged 25–59 years with a BMI ≥35 kg/m2
      - Those with higher A1C (e.g., ≥6.0% [≥42 mmol/mol])
      - Individuals with higher FPG (e.g., ≥110 mg/dL [≥6 mmol/L])
      - Individuals with a history of GDM

ADA Recommendations for Suspected Type 1 Adults

- In primary care, our role is generally to recognize Type 2 Diabetes and refer patients to endocrinology when appropriate.
- Be a point of contact/coordination depending on location, but ideally not managing these patients (provider comfort level).
- For this presentation, Type 2 is the focus.



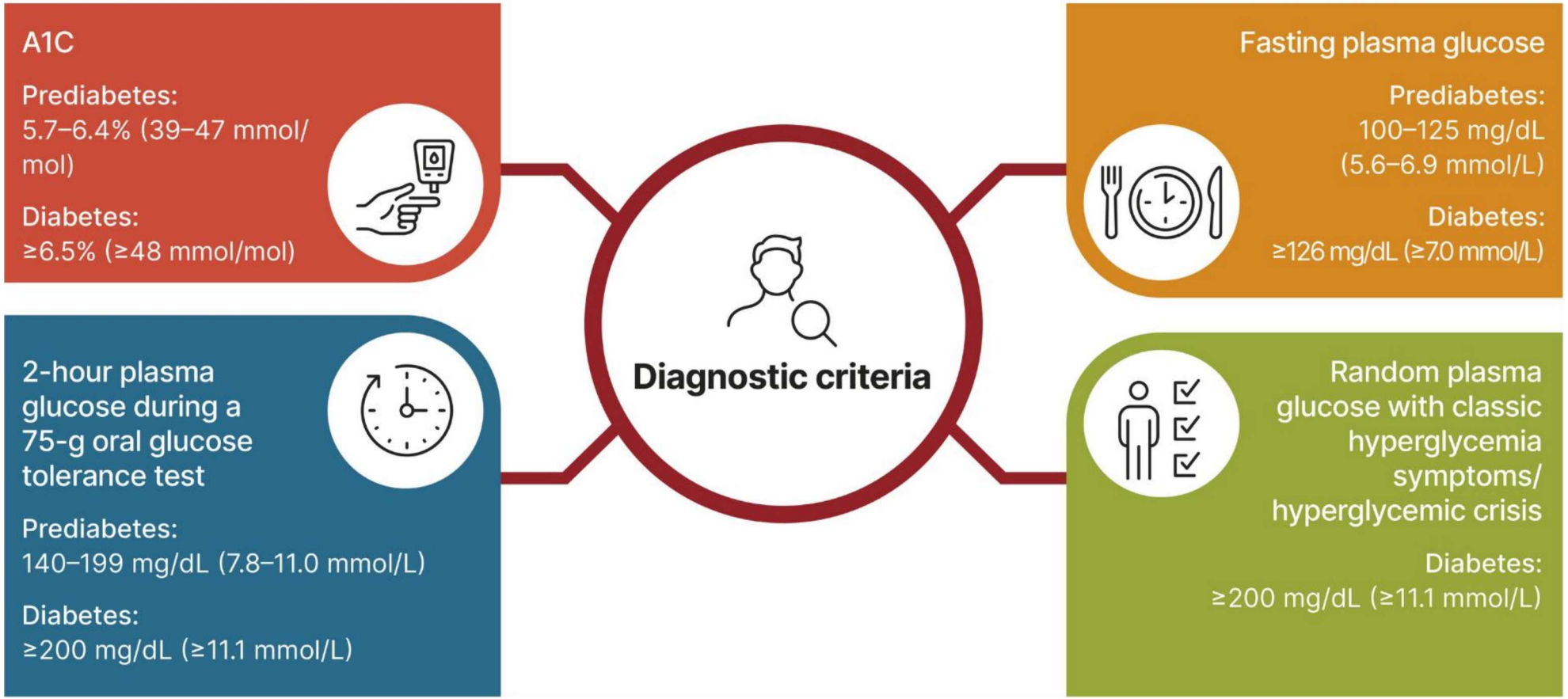
ADA Recommend Screening Modalities for Type 2 Diabetes Management

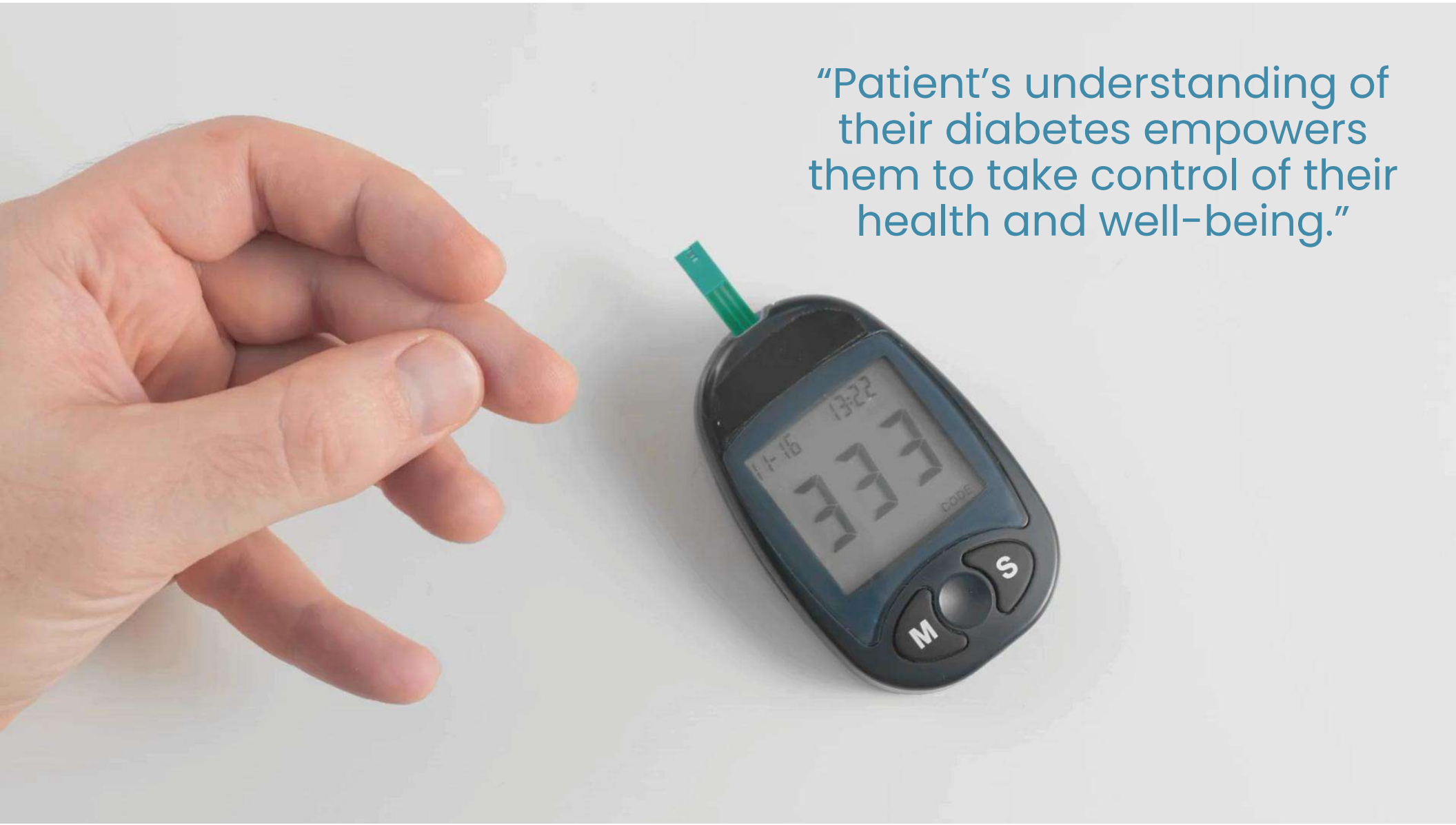
Criteria for the diagnosis of diabetes in nonpregnant individuals

- **A1C ≥6.5% (≥48 mmol/mol).** The test should be performed in a laboratory using a method that is NGSP certified and standardized to the DCCT assay.*
- **FPG ≥126 mg/dL (≥7.0 mmol/L)**. Fasting is defined as no caloric intake for at least 8 h.*
- **2-h PG ≥200 mg/dL (≥11.1 mmol/L) during OGTT.** The test should be performed as described by the WHO, using a glucose load containing the equivalent of 75 g anhydrous glucose dissolved in water.
- In an individual with **classic symptoms of hyperglycemia or hyperglycemic crisis, a random plasma glucose ≥200 mg/dL (≥11.1 mmol/L)**. Random is any time of the day without regard to time since previous meal.

DCCT, Diabetes Control and Complications Trial; FPG, fasting plasma glucose; OGTT, oral glucose tolerance test; NGSP, National Glycohemoglobin Standardization Program; WHO, World Health Organization; 2-h PG, 2-h plasma glucose. *In the absence of unequivocal hyperglycemia, diagnosis requires two abnormal results from different tests which may be obtained at the same time (e.g., A1C and FPG), or the same test at two different time points.

What is the Diagnosis?




“Patient’s understanding of their diabetes empowers them to take control of their health and well-being.”
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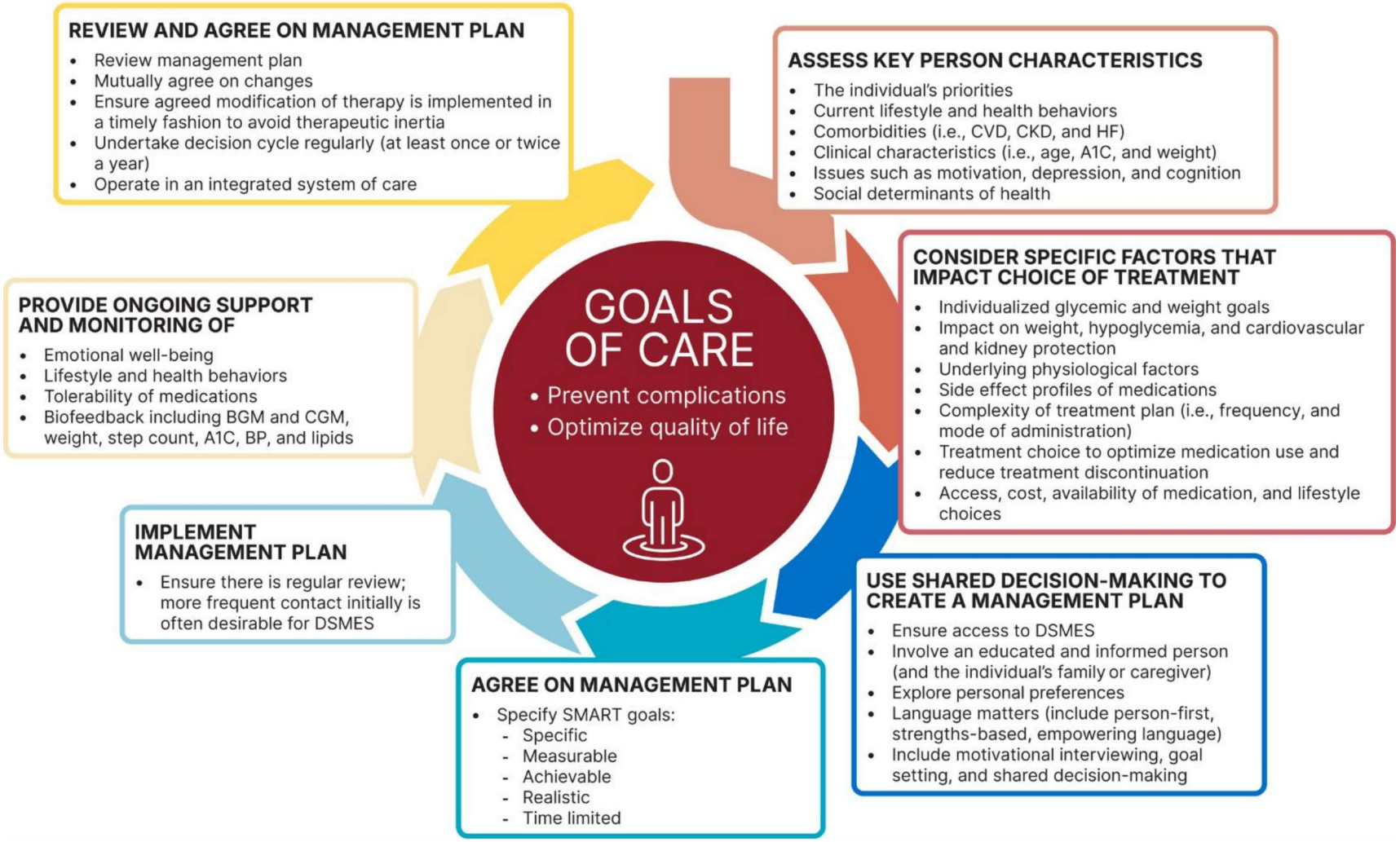
A1C of 6.5%.... Now what?

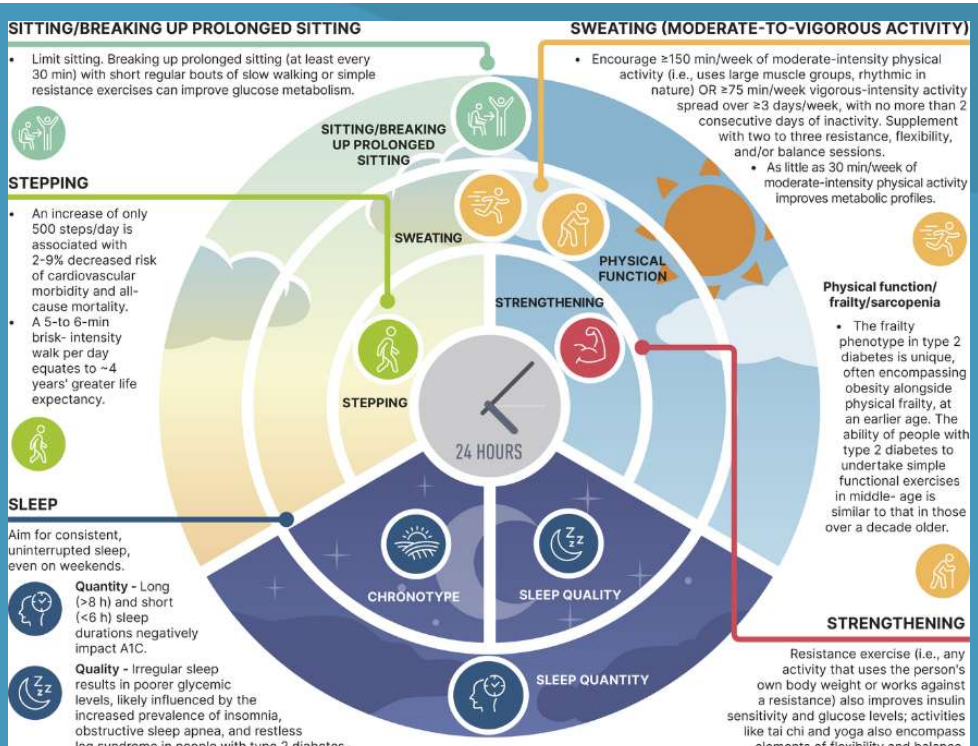
Decision Cycle for Person-Centered Glycemic Management in Type 2 Diabetes



Facilitate Positive Health Behaviors and Well-Being to Improve Health Outcomes

Facilitate Positive Health Behaviors and Well-Being to Improve Health Outcomes

- Building positive health behaviors and maintaining psychological well-being are foundational for achieving diabetes management goals and maximizing quality of life.
- Essential tasks to help people with diabetes achieve their health goals:
  - Refer for diabetes self-management education and support (DSMES)
  - Counsel on and support cessation of tobacco products and vaping
  - Refer for medical nutrition therapy (MNT)
  - Counsel on health behaviors and sleep quality
  - Counsel on routine physical activity
  - Support and refer to behavioral health professionals for psychosocial care



SITTING/BREAKING UP PROLONGED SITTING

- Limit sitting. Breaking up prolonged sitting (at least every 30 min) with short regular bouts of slow walking or simple resistance exercises can improve glucose metabolism.

STEPPING

- An increase of only 500 steps/day is associated with 2-9% decreased risk of cardiovascular morbidity and all-cause mortality.
- A 5-to 6-min brisk- intensity walk per day equates to ~4 years' greater life expectancy.

SLEEP

Aim for consistent, uninterrupted sleep, even on weekends.

Quantity - Long (>8 h) and short (<6 h) sleep durations negatively impact A1C.

Quality - Irregular sleep results in poorer glycemic levels, likely influenced by the increased prevalence of insomnia, obstructive sleep apnea, and restless leg syndrome in people with type 2 diabetes.

Chronotype - Evening chronotypes (i.e., night owl: go to bed late and get up late) may be more susceptible to inactivity and poorer glycemic levels than morning chronotypes (i.e., early bird: go to bed early and get up early).

SWEATING (MODERATE-TO-VIGOROUS ACTIVITY)

- Encourage ≥150 min/week of moderate-intensity physical activity (i.e., uses large muscle groups, rhythmic in nature) OR ≥75 min/week vigorous-intensity activity spread over ≥3 days/week, with no more than 2 consecutive days of inactivity. Supplement with two to three resistance, flexibility, and/or balance sessions.
  - As little as 30 min/week of moderate-intensity physical activity improves metabolic profiles.

Physical function/ frailty/sarcopenia

- The frailty phenotype in type 2 diabetes is unique, often encompassing obesity alongside physical frailty, at an earlier age. The ability of people with type 2 diabetes to undertake simple functional exercises in middle- age is similar to that in those over a decade older.

STRENGTHENING

Resistance exercise (i.e., any activity that uses the person's own body weight or works against a resistance) also improves insulin sensitivity and glucose levels; activities like tai chi and yoga also encompass elements of flexibility and balance.

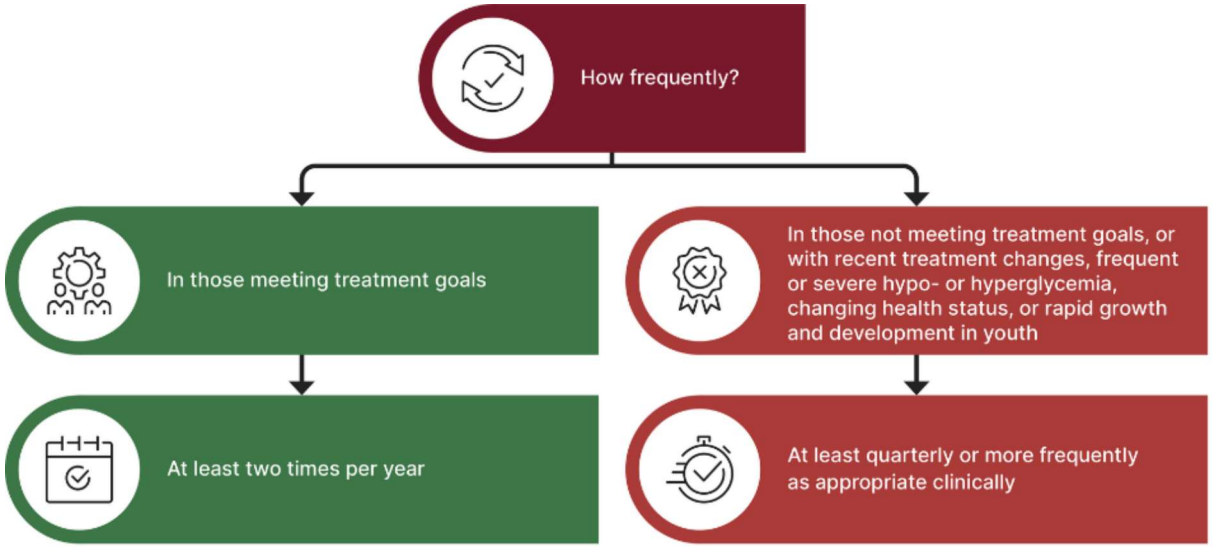
	Glucose/ insulin	Blood pressure	A1C	Lipids	Physical function	Depression	Quality of life
SITTING/BREAKING UP PROLONGED SITTING	◯↓	◯↓	◯↓	◯↓	◯↑	◯↓	◯↑
STEPPING	◯↓	◯↓	◯↓	◯↓	◯↑	◯↓	◯↑
SWEATING (MODERATE-TO-VIGOROUS ACTIVITY)	◯↓	◯↓	◯↓	◯↓	◯↑	◯↓	◯↑
STRENGTHENING	◯↓	◯↓	◯↓	◯↓	◯↑	◯↓	◯↑
ADEQUATE SLEEP DURATION	◯↓	◯↓	◯↓	◯↓	◯?	◯↓	◯↑
GOOD SLEEP QUALITY	◯↓	◯↓	◯↓	◯↓	◯?	◯↓	◯↑
CHRONOTYPE/CONSISTENT TIMING	◯↓	◯?	◯↓	◯?	◯?	◯↓	◯?

IMPACT OF PHYSICAL BEHAVIORS ON CARDIOMETABOLIC HEALTH IN PEOPLE WITH TYPE 2 DIABETES

◯↑ Higher levels of improvement (physical function, quality of life) ◯↓ Lower levels of improvement (glucose/insulin, blood pressure, A1C, lipids, depression)
◯? No data available
◯↑ Green arrows = strong evidence ◯↑ Yellow arrows = medium-strength evidence ◯↑ Red arrows = limited evidence

Assessment of Glycemic Status

- AIC typically every 3, 4, or 6 months
- AM fasting goal <80-130
- 2-hour post prandial goal of <180
- CGM goal-typically TIR around 70% or greater



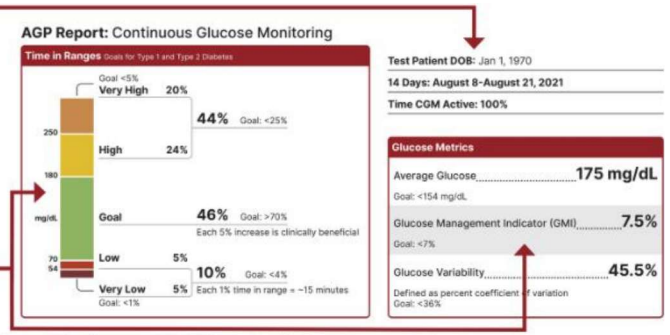
Clinical Notes

- Limitations of A1C testing:
  - Accuracy can be affected by conditions that affect red blood cell turnover (e.g., hemolytic and other anemias, glucose-6-phosphate dehydrogenase deficiency, recent blood transfusion, use of drugs that stimulate erythropoiesis, end-stage kidney disease, and pregnancy).
  - Some hemoglobin variants can interfere with some A1C assays, although this problem has been minimized with newer assays.
  - A1C cannot be used for people with sickle cell disease or other homozygous hemoglobin variants.
  - A1C does not assess glycemic variability or hypoglycemia.
- Consider alternative measures, such as fructosamine and glycated albumin, when necessary.
- Assess glycemic variability using blood glucose monitoring/CGM and A1C values.

Assessment of Glycemic Status

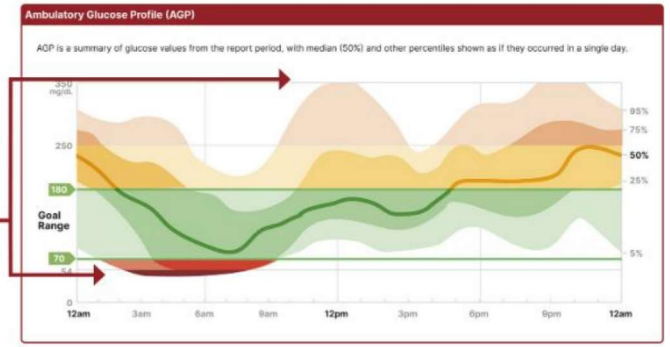
- Glucose Assessment via CGM: The Ambulatory Glucose Profile (AGP) Report

1. Ensure sufficient data for analysis; CGM active at least 70% of the time over 14 days is recommended.
2. Discuss individuals' daily self-management routine.
3. Ask individuals to identify and explain what they observe on the report.
4. Check overall CGM metrics:

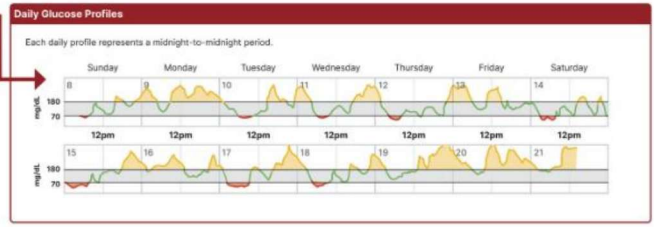


- TBR: percentage of readings and time with glucose <70 mg/dL (<3.9 mmol/L)
- TIR: percentage of readings and time with glucose 70–180 mg/dL (3.9–10.0 mmol/L)
- TAR: percentage of reading and time with glucose >180 mg/dL (>10.0 mmol/L)
- Average glucose
- Glucose management indicator: an estimate of A1C
- Glycemic variability: expressed as percent coefficient of variation; target ≤36%

5. Identify any hypoglycemia first, and then look for hyperglycemia patterns. Review the time spent in these patterns on the overall profile and daily graphs.



6. Discuss identified patterns and ask individuals to reflect on potential causes and possible solutions.
7. If you use CGM metrics to assess glycemia, goals for nonpregnant adults or those with frailty will vary; set glycemic goals based on the general guidelines on the next page.
8. Use shared decision-making to develop an action plan.



Taking Control of Your Diabetes (TCOYD)

- Non-profit for diabetes education by 2 endocrinologists who have had Type 1 since their teen years
- Resources for providers and patients
- Podcast
- Free CME on rapid fire CGM interpretation
- https://tcoyd.org/cme-enduring-cgm-data/

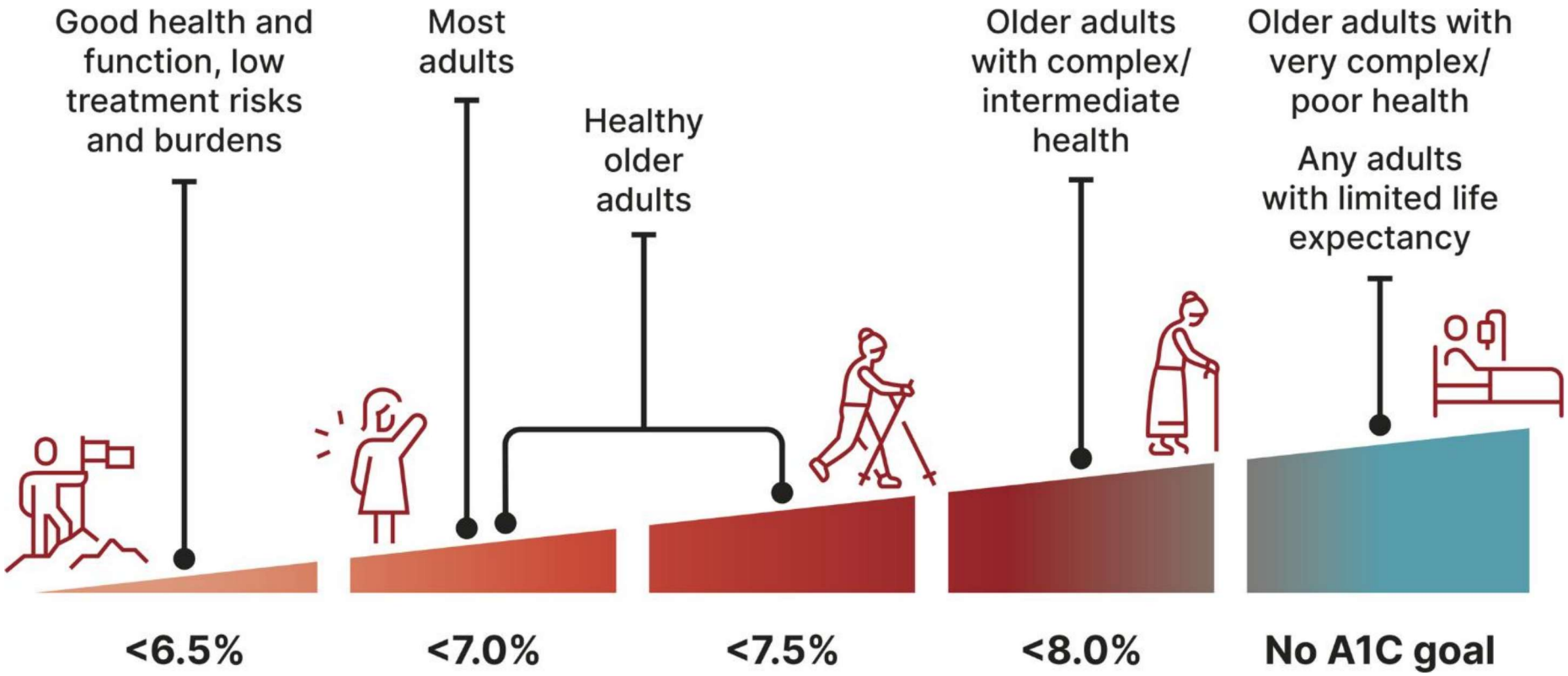
Correlation Between A1C and Estimated Average Glucose (eAG)

A1C (%)	mg/dL	mmol/L
5	97 (76–120)	5.4 (4.2–6.7)
6	126 (100–152)	7.0 (5.5–8.5)
7	154 (123–185)	8.6 (6.8–10.3)
8	183 (147–217)	10.2 (8.1–12.1)
9	212 (170–249)	11.8 (9.4–13.9)
10	240 (193–282)	13.4 (10.7–15.7)
11	269 (217–314)	14.9 (12.0–17.5)
12	298 (240–347)	16.5 (13.3–19.3)

A calculator for converting A1C results into eAG, in either mg/dL or mmol/L, is available at professional.diabetes.org/eAG.

Data in parentheses are a 95% CI. Adapted from Nathan DM, Kuenen J, Borg R, Zheng H, Schoenfeld D; A1c-Derived Average Glucose Study Group. Translating the A1C assay into estimated average glucose values. Diabetes Care 2008;31:1473–1478.

Establishing Personalized A1C/TIR Goals



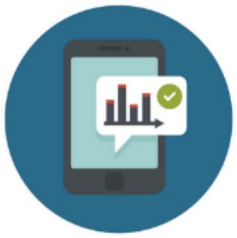
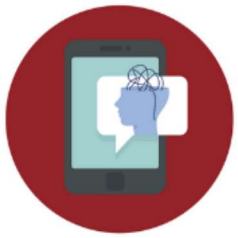
Hypoglycemia and Hyperglycemia

- Educate patients on symptoms of each
- Include an individualized plan as to what to do in each situation
- Review impact of medication/awareness

Consider What Diabetes Technology Will Be Used and Prescribed

Consider What Diabetes Technology Will Be Used and Prescribed

- Mainly use traditional finger sticks and CGMs in primary care
- Consider cost and insurance coverage

				
Insulin pumps (also called continuous subcutaneous insulin infusion [CSII] systems) are insulin delivery devices that are worn on the body.	**Connected insulin pens and pen caps** are insulin delivery pens or related devices that can record and/or send insulin dose data and may also calculate doses.	**Continuous glucose monitoring (CGM) systems** and **glucose meters** are devices to monitoring glucose levels.	**Automated insulin delivery (AID) systems** connect a CGM system and an insulin pump with a control algorithm to deliver insulin automatically.	**Diabetes self-management support software** includes apps or online platforms that are intended to treat a medical or psychological condition or assist with data management or lifestyle modification.

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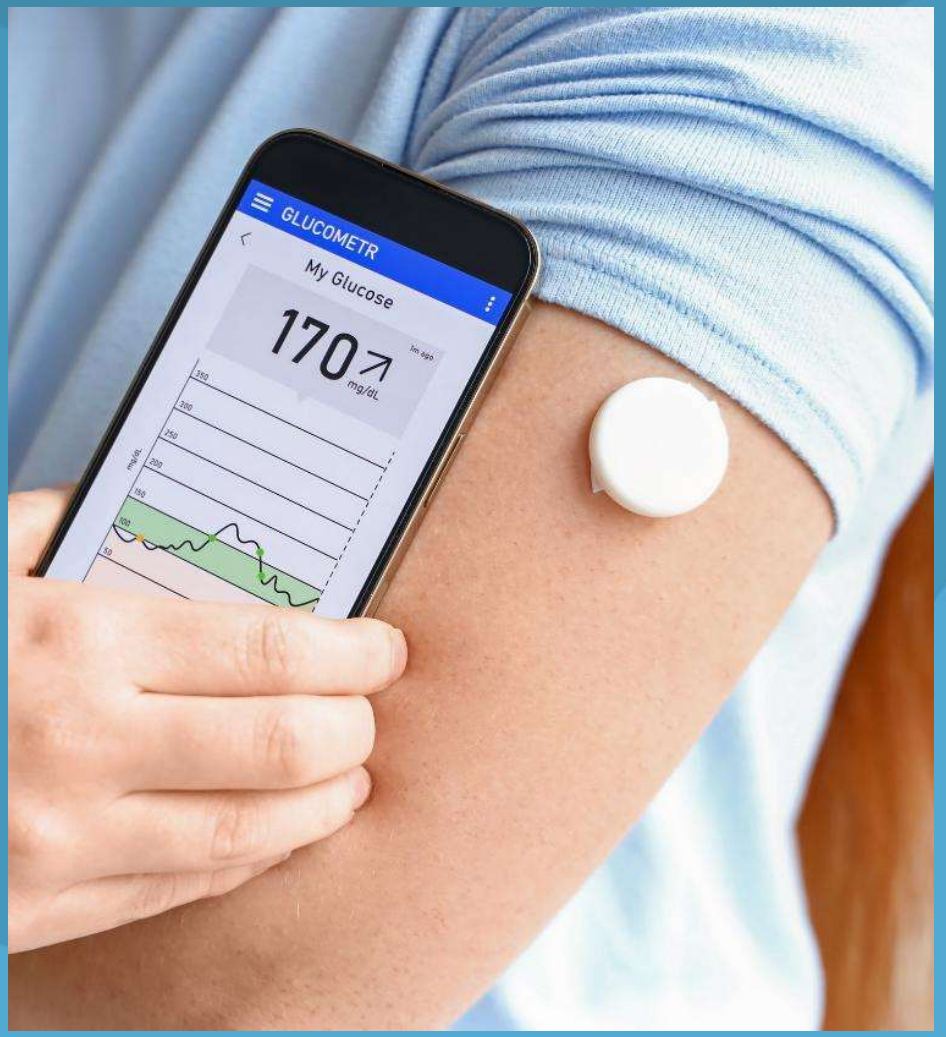
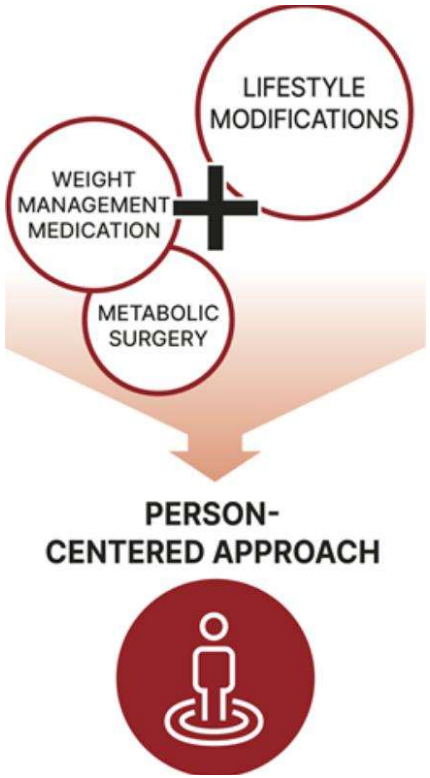

GLUCOMETR
My Glucose
170
mg/dL

Consider Specific Goals and Plans for Patients Who are Overweight or Obese

Overall Weight Management Discussions

Consider Specific Goals and Plans for Patients who are Overweight or Obese Overall Weight Management Discussions



Nutrition, Physical Activity, and Behavioral Therapy for People With Overweight and Obesity

Recommendations:

- Nutrition, physical activity, and behavioral therapy are recommended for people with Type 2 Diabetes and overweight or obesity to achieve both weight and health outcome goals.
- Frequent counseling (≥16 sessions in 6 months) focusing on nutrition, exercise, and behavioral strategies to achieve a 500–750 kcal/day energy deficit, is beneficial for weight loss and recommended if available.
- Long-term (≥1 year) weight maintenance programs are advised for those meeting weight loss goals, offering monthly support, at least weekly body weight monitoring, self-monitoring strategies, and regular physical activity (200–300 min/week).
- Short-term, structured very-low-calorie diets (800–1,000 kcal/day) should be reserved for carefully selected individuals, be prescribed by trained practitioners in medical settings with close monitoring, and include counseling for long-term weight maintenance.

When developing a care plan, consider systemic, structural, cultural, and socioeconomic factors that may affect nutrition patterns and food choices, such as food insecurity and hunger, access to healthful food options, and other social determinants of health.

Medication	Common side effects	Possible safety concerns/considerations
Short-term treatment (12 weeks)		
Sympathomimetic amine anorectic		
Phentermine	Dry mouth, insomnia, dizziness, irritability, increased blood pressure, and elevated heart rate	• Contraindicated for use in combination with monoamine oxidase inhibitors • Caution with cardiovascular disease • Do not use if at high risk for glaucoma due to risk of acute angle-closure glaucoma
Long-term treatment (52–72 weeks)*		
Lipase inhibitor		
Orlistat	Abdominal pain, flatulence, and fecal urgency	• Potential malabsorption of fat-soluble vitamins (A, D, E, and K) and of certain medications (e.g., cyclosporine, thyroid hormone, and anticonvulsants) • Rare cases of severe liver injury reported • Cholelithiasis • Nephrolithiasis
Sympathomimetic amine anorectic/antiepileptic combination		
Phentermine/ topiramate ER	Constipation, paresthesia, insomnia, nasopharyngitis, xerostomia, increased blood pressure, and nephrolithiasis	• Contraindicated for use in combination with monoamine oxidase inhibitors • Birth defects • Cognitive impairment • Caution with cardiovascular disease • Do not use if at high risk for glaucoma due to risk of acute angle-closure glaucoma
Opioid antagonist/antidepressant combination		
Naltrexone/ bupropion ER	Constipation, nausea, headache, xerostomia, insomnia, elevated heart rate and blood pressure	• Contraindicated in people with unmanaged hypertension and/or seizure disorders • Contraindicated for use with chronic opioid therapy • Acute angle-closure glaucoma • **BLACK BOX WARNING:** Risk of suicidal behavior/ideation in people <24 years of age who have depression
Glucagon-like peptide 1 (GLP-1) receptor agonists (RAs)		
Liraglutide	Gastrointestinal side effects (nausea, vomiting, diarrhea, and esophageal reflux)	• Hypoglycemia (with concominant use of insulin or sulfonylurea) • Pancreeatitis has been reported in clinical trials, but causality has not been established. Discontinue if pancreatitis is suspected • Use caution in people with kidney disease when initiating dose due to increased risk of gastrointestinal side effects and potential risk of acute kidney injury from dehydration • May cause cholelithiasis and gallstone-related complications • Gastrointestinal disorders (severe constipation and small-bowel obstruction/ileus progression) • Monitor for potential consequences of delayed absorption of oral medications • May cause injection site reactions • May cause elevated heart rate • **BLACK BOX WARNING:** Risk of thyroid C-cell tumors in rodents; human relevance not determined; do not use in individuals with a personal or family history of medullary thyroid cancer or multiple endocrine neoplasia type 2
Semaglutide		
Dual glucose-dependent insulinotropic polypeptide and GLP-1 RA		
Tirzepatide	Gastrointestinal side effects (nausea, vomiting, diarrhea, and esophageal reflux)	• Same as for GLP-1 RAs • Monitor effects of oral medications with narrow therapeutic index (warfarin) or whose efficacy is dependent on threshold concentration • Advise females using oral contraceptives to switch to a nonoral contraceptive or add a barrier method of contraception for 4 weeks after initiation and for 4 weeks after each dose escalation • **BLACK BOX WARNING:** Risk of thyroid C-cell tumors in rodents; human relevance not determined; do not use in individuals with a personal or family history of medullary thyroid cancer or multiple endocrine neoplasia type 2

Table 8.2—Median monthly (30-day) AWP and NADAC of maximum or maintenance dose of obesity pharmacotherapies

Medication name	Typical adult maintenance dose	AWP (median and range for 30-day supply)	NADAC (median and range for 30-day supply)
Sympathomimetic amine anorectic: approved for short-term use only			
Phentermine	8–37.5 mg daily	$43 ($3–$58)*	$2 ($2–$3)*
Lipase inhibitor			
Orlistat	60 mg t.i.d. (OTC) 120 mg t.i.d. (Rx)	$58 ($41–$90) $675 ($520–$781)	NA $514 ($416–$611)
Sympathomimetic amine anorectic/ antiepileptic combination			
Phentermine/topiramate ER	7.5 mg/46 mg daily	$238 ($238–$251)	NA
Opioid antagonist/antidepressant combination			
Naltrexone/bupropion ER	16 mg/180 mg b.i.d.	$750	NA
GLP-1 receptor agonist			
Liraglutide	3 mg daily	$1,619	$1,303
Semaglutide	2.4 mg once weekly	$1,619	$1,302
Dual GIP and GLP-1 receptor agonist			
Tirzepatide	5, 10, or 15 mg once weekly	$1,304**	$1,022

The costs listed in this table are representative of costs at a national level. These costs may not be representative of an individual's cost and do not account for medication coverage or available discounts. AWP, average wholesale price; b.i.d., twice daily; ER, extended release; GIP, glucose-dependent insulinotropic polypeptide; GLP-1, glucagon-like peptide 1; NA, data not available; NADAC, National Average Drug Acquisition Cost; OTC, over the counter; Rx, prescription; t.i.d., three times daily. AWP and NADAC prices are for a 30-day supply of maximum or maintenance dose as of 15 July 2025 (190,191). *Data are for 37.5 mg q.d. dose. **Pricing listed for tirzepatide is for the pens only, not the cost of vials available from the manufacturer.

Pharmacologic Approach and Plan

Pharmacologic Approach and Plan

- Make sure your patient knows you are their champion and have bought into their treatments as best as possible.
- Identify and address any barriers while in office.
- Look at comorbidities and overall A1C goals to decide.

Intervention	Expected decrease in A1C with monotherapy (%)	Advantages	Disadvantages
Initial therapy			
Lifestyle change to decrease weight and increase activity	1 to 2	Broad benefits	May be insufficient for most within first year due to limited adherence, inadequate weight loss, and/or weight regain
Metformin	1 to 2	Weight loss to weight neutral, low cost, low risk of hypoglycemia, generally well tolerated, well-studied in combination with other agents	GI side effects, contraindicated with impaired kidney function (eGFR <30 mL/min/1.73 m^2)*
Additional therapy¶			
Insulin (usually with a single daily injection of intermediate- or long-acting insulin initially)	1.5 to 3.5	No dose limit, rapidly effective, improved lipid profile	Hypoglycemia, may require more than 1 daily injection, requires home glucose monitoring, weight gain, analogs are expensive
Dual GLP-1 and GIP receptor agonist (once-weekly injections)	2 to 2.5	Weight loss	Requires injection, frequent GI side effects, very expensive
GLP-1 receptor agonist (oral or daily to weekly injections)	0.5 to 2	Weight loss, reduction in major adverse cardiovascular events (liraglutide, subcutaneous semaglutide, dulaglutide) in patients with established CVD and at high risk for CVD	Most agents require injection, frequent GI side effects, very expensive
SGLT2 inhibitor	0.5 to 0.7	Weight loss, reduction in systolic blood pressure, reduced heart failure and cardiovascular mortality, improved kidney outcomes in patients with nephropathy	Mycotic genital infection, DKA; SGLT2 inhibitors have also been associated with urinary tract infections, bone fractures, and lower limb amputations
Sulfonylurea (shorter-acting agents preferred)	1 to 2	Rapidly effective	Hypoglycemia (especially with glyburide/glibenclamide or chlorpropamide), weight gain
Glinide	0.5 to 1.5Δ	Rapidly effective	Hypoglycemia, weight gain, may require 3 times daily dosing
Pioglitazone	0.5 to 1.4	Improved lipid profile, potential decrease in MI and stroke	Fluid retention, HF, weight gain, bone fractures, and bladder cancer; side effects minimized at doses of 15 to 30 mg
DPP-4 inhibitor	0.5 to 0.8	Weight neutral	Possible increased risk of HF with saxagliptin, expensive
Alpha-glucosidase inhibitor	0.5 to 0.8	Weight neutral	Frequent GI side effects limit use, 3 times daily dosing

A1C: glycated hemoglobin; CVD: cardiovascular disease; DKA: diabetic ketoacidosis; DPP-4: dipeptidyl peptidase 4; eGFR: estimated glomerular filtration rate; GI: gastrointestinal; GIP: glucose-dependent insulinotropic polypeptide; GLP-1: glucagon-like peptide 1; HF: heart failure; MI: myocardial infarction; SGLT2: sodium-glucose cotransporter 2.

* Initiation is contraindicated with eGFR <30 mL/min/1.73 m^2 and not recommended with eGFR 30 to 45 mL/min/1.73 m^2.

¶ The order of listing of additional therapies does not indicate a preferred order of selection. The choice of additional therapy should be based on criteria discussed in the UpToDate topics on the management of hyperglycemia in diabetes mellitus.

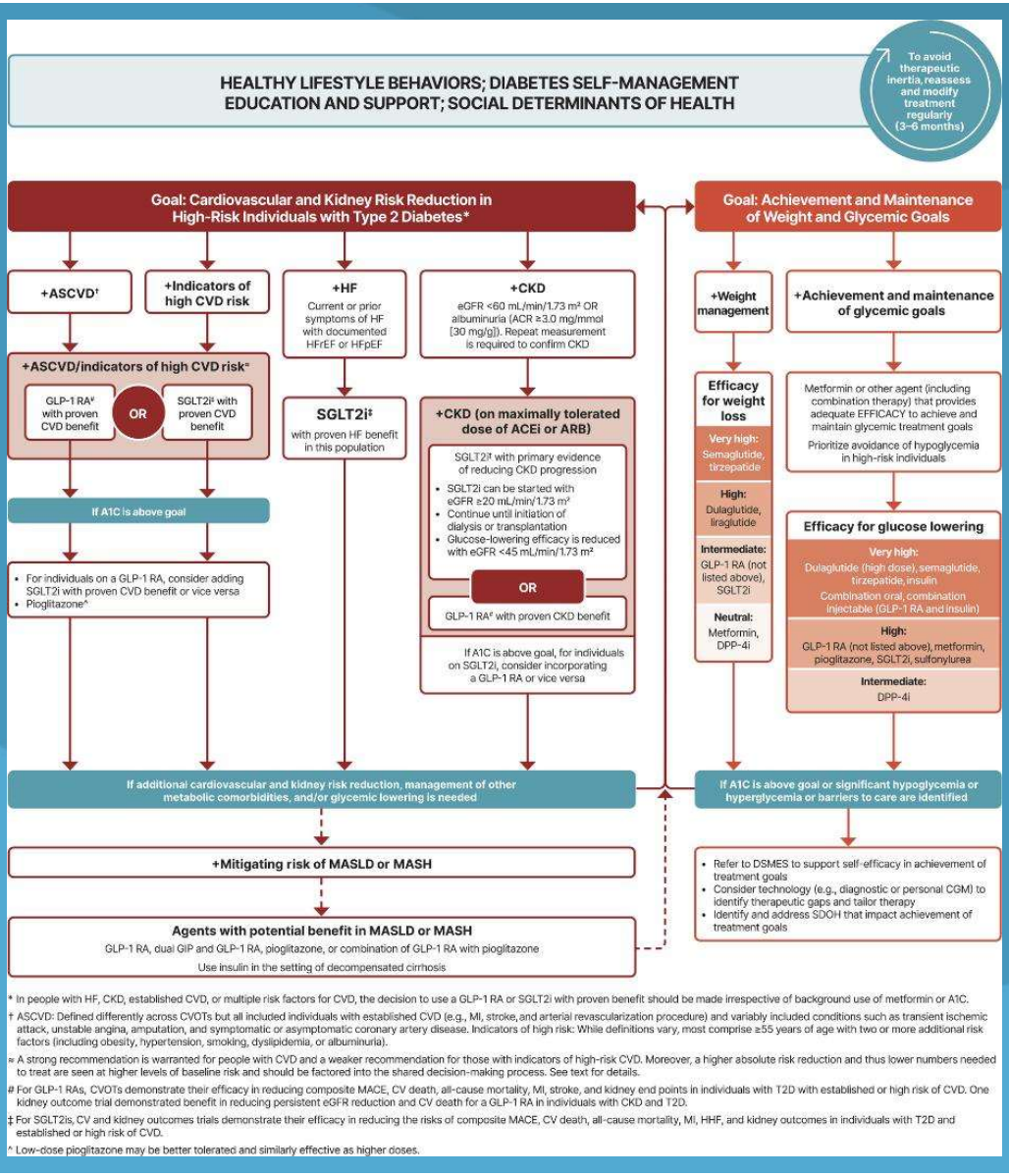
Δ Repaglinide is more effective in lowering A1C than nateglinide.

Adapted from:

1. Nathan DM, Buse JB, Davidson MB, et al. Medical Management of Hyperglycemia in Type 2 Diabetes: A Consensus Algorithm for the Initiation and Adjustment of Therapy: A consensus statement of the American Diabetes Association and the European Association for the Study of Diabetes. Diabetes Care 2009; 32:193.

With additional data from:

Which therapy should I start first?	When should I start insulin first?	Can I use combination insulin and noninsulin injectable therapy?	When would I use combination insulin and noninsulin injectable therapy?	When should I modify a patient's injectable therapy?
Treatment with a glucagon-like peptide 1 (GLP-1) receptor agonist (RA) or a dual glucose-dependent insulinotropic polypeptide (GIP)/ GLP-1 RA is preferred before insulin therapy because of its ability to achieve both glycemic and weight management goals. Some GLP-1 RAs also provide cardiovascular benefit.	If there are symptoms of hyperglycemia (polyuria or polydipsia) or there is evidence of catabolism (unexpected weight loss). When A1C or blood glucose levels are very high (A1C >10% [>86 mmol/mol] or blood glucose ≥300 mg/dL [≥16.7 mmol/L]).	Yes; combination therapy with insulin and a noninsulin injectable is recommended for greater glycemic effectiveness and beneficial effects on weight and hypoglycemia risk. If insulin is already being used, insulin dosing should be reassessed upon addition or dose escalation of a GLP-1 or dual GIP/GLP-1 RA.	Consider combination insulin and GLP-1 or dual GIP/GLP-1 RA therapy when individualized goals are not met using either one separately.	Intensify or deintensify therapy when an individual is not meeting treatment goals, including management of hyperglycemia and weight and avoidance of hypoglycemia.



* 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 made irrespective of background use of metformin or A1C.

† ASCVD: Defined differently across CVOTs but all included individuals with established CVD (e.g., MI, stroke, and arterial revascularization procedure) and variably included conditions such as transient ischemic attack, unstable angina, amputation, and 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).

≈ A strong recommendation is warranted for people with CVD and a weaker recommendation for those with indicators of high-risk CVD. 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.

For GLP-1 RAs, CVOTs demonstrate their efficacy in reducing composite MACE, CV death, all-cause mortality, MI, stroke, and kidney end points in individuals with T2D with established or high risk of CVD. One kidney outcome trial demonstrated benefit in reducing persistent eGFR reduction and CV death for a GLP-1 RA in individuals with CKD and T2D.

‡ For SGLT2is, CV and kidney outcomes trials demonstrate their efficacy in reducing the risks of composite MACE, CV death, all-cause mortality, MI, HHF, and kidney outcomes in individuals with T2D and established or high risk of CVD.

^ Low-dose pioglitazone may be better tolerated and similarly effective as higher doses.

Name That Price… $

Table 9.3—Median monthly (30-day) AWP and NADAC of maximum approved daily dose of noninsulin glucose-lowering agents in the U.S.

Class	Compound	Dosage strength/ product (if applicable)	Maximum approved daily dose†	Median AWP (min, max)*	Median NADAC (min, max)*
Biguanides	• Metformin	500 mg (IR)	2,000 mg	$85 ($3, $216)	$2
		500 mg (ER)	2,000 mg	$89 ($5, $6,719)	$3
		850 mg (IR)	2,550 mg	$108 ($3, $189)	$2
		1,000 mg (IR)	2,000 mg	$87 ($2, $144)	$1
		1,000 mg (ER)	2,000 mg	$1,884 ($242, $7,214)	$26 ($24, $28)
		500 mg (Sol)	2,000 mg	$810 ($810, $1,478)	$417
Sulfonylureas (2nd generation)	• Glimepiride	4 mg	8 mg	$73 ($71, $198)	$2
	• Glipizide	10 mg (IR)	40 mg	$72 ($67, $91)	$6
		10 mg (XL/ER)	20 mg	$48	$9
	• Glyburide	6 mg (micronized)	12 mg	$54 ($48, $71)	$13
		5 mg	20 mg	$88 ($63, $432)	$7
Thiazolidinedione	• Pioglitazone	45 mg	45 mg	$348 ($7, $349)	$4
α-Glucosidase inhibitors	• Acarbose	100 mg	300 mg	$106 ($104, $378)	$22
	• Miglitol	100 mg	300 mg	$294 ($241, $346)	$183
Meglitinides	• Nateglinide	120 mg	360 mg	$104	$16
	• Repaglinide	2 mg	16 mg	$878 ($799, $1,728)	$28
DPP-4 inhibitors	• Alogliptin	25 mg	25 mg	$234	$143
	• Linagliptin	5 mg	5 mg	$630	$504
	• Saxagliptin	5 mg	5 mg	$524 ($523, $524)	$179
	• Sitagliptin	100 mg	100 mg	$341	$303
		25 mg/mL	100 mg	$354	NA
SGLT2 inhibitors	• Bexagliflozin	20 mg	20 mg	$47	NA
	• Canagliflozin	300 mg	300 mg	$718	$575
	• Dapagliflozin	10 mg	10 mg	$664	$345
	• Empagliflozin	25 mg	25 mg	$629	$604
	• Ertugliflozin	15 mg	15 mg	$428	$343
GLP-1 RAs	• Dulaglutide	4.5 mg pen	4.5 mg‡	$1,185	$953
	• Liraglutide	18 mg/3 mL pen	1.8 mg	$929 ($845, $929)	$577
	• Semaglutide	2 mg pen	2 mg‡	$1,197	$966
		14 mg (tablet)	14 mg	$1,197	$965
Dual GIP and GLP-1 RA	• Tirzepatide	15 mg pen	15 mg‡	$1,296	$1,041
Bile acid sequestrant	• Colesevelam	625 mg tabs	3.75 g	$692 ($674, $712)	$56
		3.75 g suspension	3.75 g	$674 ($673, $675)	$93
Dopamine-2 agonist	• Bromocriptine	0.8 mg	4.8 mg	$1,188	$957

AWP, average wholesale price; DPP-4, dipeptidyl peptidase 4; ER and XL, extended release; GIP, glucose-dependent insulinotropic polypeptide; GLP-1 RA, glucagon-like peptide 1 receptor agonist; IR, immediate release; max, maximum; min, minimum; NA, data not available; NADAC, National Average Drug Acquisition Cost; SGLT2, sodium–glucose cotransporter 2; Sol, solution. AWP and NADAC prices as of 15 July 2025. *Calculated for 30-day supply (AWP [222] or NADAC [223] unit price × number of doses required to provide maximum approved daily dose × 30 days); median AWP or NADAC listed alone when only one product and/or price. †Used to calculate median AWP and NADAC (min, max); generic prices used, if available commercially. ‡Administered once weekly.

Name That Price...(cont.) $

Table 9.4—Median cost of insulin products in the U.S. calculated as AWP and NADAC per 1,000 units of specified dosage form/product

Insulins	Compounds	Dosage form/product	Median AWP (min, max)*	Median NADAC (min, max)*
Rapid-acting	• Aspart	U-100 vial	$87†	$70†
		U-100 cartridge	$107†	$86†
		U-100 prefilled pen	$112†	$90†
	• Aspart biosimilars#	U-100 vial	$83	NA
		U-100 prefilled pen	$107	NA
	• Aspart ("faster acting product")	U-100 vial	$347	$278
		U-100 cartridge	$430	$344
		U-100 prefilled pen	$447	$358
	• Glulisine	U-100 vial	$102	$82
		U-100 prefilled pen	$132	$105
	• Inhaled insulin	Inhalation cartridges	$1,578	$1,265
	• Lispro	U-100 vial	$30†	$24†
		U-100 cartridge	$123	$98
		U-100 prefilled pen	$127†	$102†
		U-200 prefilled pen	$424	$339
	• Lispro-aabc	U-100 vial	$330	$263
		U-100 prefilled pen	$424	$339
		U-200 prefilled pen	$424	$339
	• Lispro follow-on product	U-100 vial	$118	$110
		U-100 prefilled pen	$151	$121
Short-acting	• Human regular	U-100 vial	$56 ($54, $58)‡	$44 ($43, $46)‡
		U-100 prefilled pen	$73	$58
Intermediate-acting	• Human NPH	U-100 vial	$58 ($54, $58)‡	$45 ($43, $46)‡
		U-100 prefilled pen	$93 ($73, $113)	$74 ($58, $91)
Concentrated human regular insulin	• U-500 human regular insulin	U-500 vial	$178	$143
		U-500 prefilled pen	$230	$183
Long-acting	• Degludec	U-100 vial	$142†	$114†
		U-100 prefilled pen	$142†	$114†
		U-200 prefilled pen	$142†	$114†
	• Glargine	U-100 vial	$77	$62
		U-100 prefilled pen	$77	$62
		U-300 prefilled pen	$152	$122†
	• Glargine biosimilar/follow-on products	U-100 vial	$76†	$61†
		U-100 prefilled pen	$74 ($74,† $261)	$59 ($59,† $209)
Premixed insulin products	• Aspart 70/30	U-100 vial	$87†‡	$69†‡
		U-100 prefilled pen	$112†‡	$90†‡
	• Lispro 50/50	U-100 vial	$102	NA
		U-100 prefilled pen	$127	$102
	• Lispro 75/25	U-100 vial	$102	$82
		U-100 prefilled pen	$127†	$102†
	• NPH/regular 70/30	U-100 vial	$56 ($54, $58)	$45 ($43, $46)
		U-100 prefilled pen	$93 ($73, $113)‡	$74 ($58, $90)‡
Premixed insulin/GLP-1 RA products	• Degludec/liraglutide	100/3.6 mg prefilled pen	$1,073	$859
	• Glargine/lixisenatide	100/33 mg prefilled pen	$713	$571

AWP, average wholesale price; GLP-1 RA, glucagon-like peptide 1 receptor agonist; NA, data not available; NADAC, National Average Drug Acquisition Cost. AWP (222) and NADAC (223) prices as of 15 July 2025. *AWP or NADAC calculated as in **Table 9.3**. †Unbranded product prices used when available. ‡AWP and NADAC data presented do not include human insulins (approximately $25/vial or $43/box of 5 pens) or select analog insulins (approximately $73/vial or $86/box of 5 pens) available at Walmart; median listed alone when only one product and/or price. #Pricing for aspart-xjhz not available on 15 July 2025.

Insulin Considerations

- Provide or refer people with diabetes and caregivers for education about injection technique and timing and problem-solving for issues related to insulin therapy (e.g., hypoglycemia, missed or incorrect doses, and dose adjustments).
- Ensure that individuals have all supplies necessary for injections (e.g., pen needles for insulin pens or appropriate syringes for insulin dose size or concentration when using insulin in vials) and glucose monitoring.
- Evaluate individuals with Type 2 Diabetes to determine whether they are candidates for GLP-1 or dual GIP/GLP-1 RA therapy.
- Evaluate all people on insulin therapy to determine whether they could benefit from continuous glucose monitoring.
- Ensure that people on insulin therapy have the education and supplies needed to prevent and treat hypoglycemia, including glucagon, glucose monitoring supplies, and appropriate sources of carbohydrates to treat low glucose levels.
- Schedule timely and routine follow-up visits to reassess therapy and adjust care plans to avoid therapeutic inertia.

Cardiovascular Disease and Risk Management

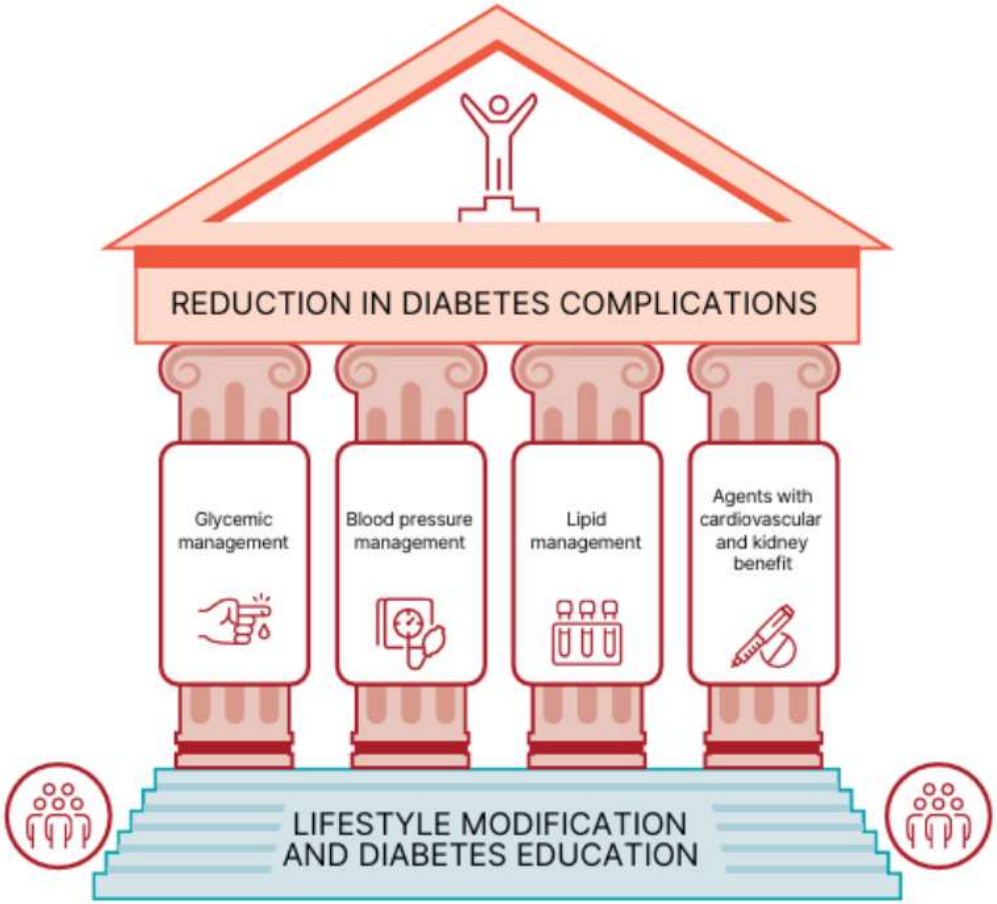
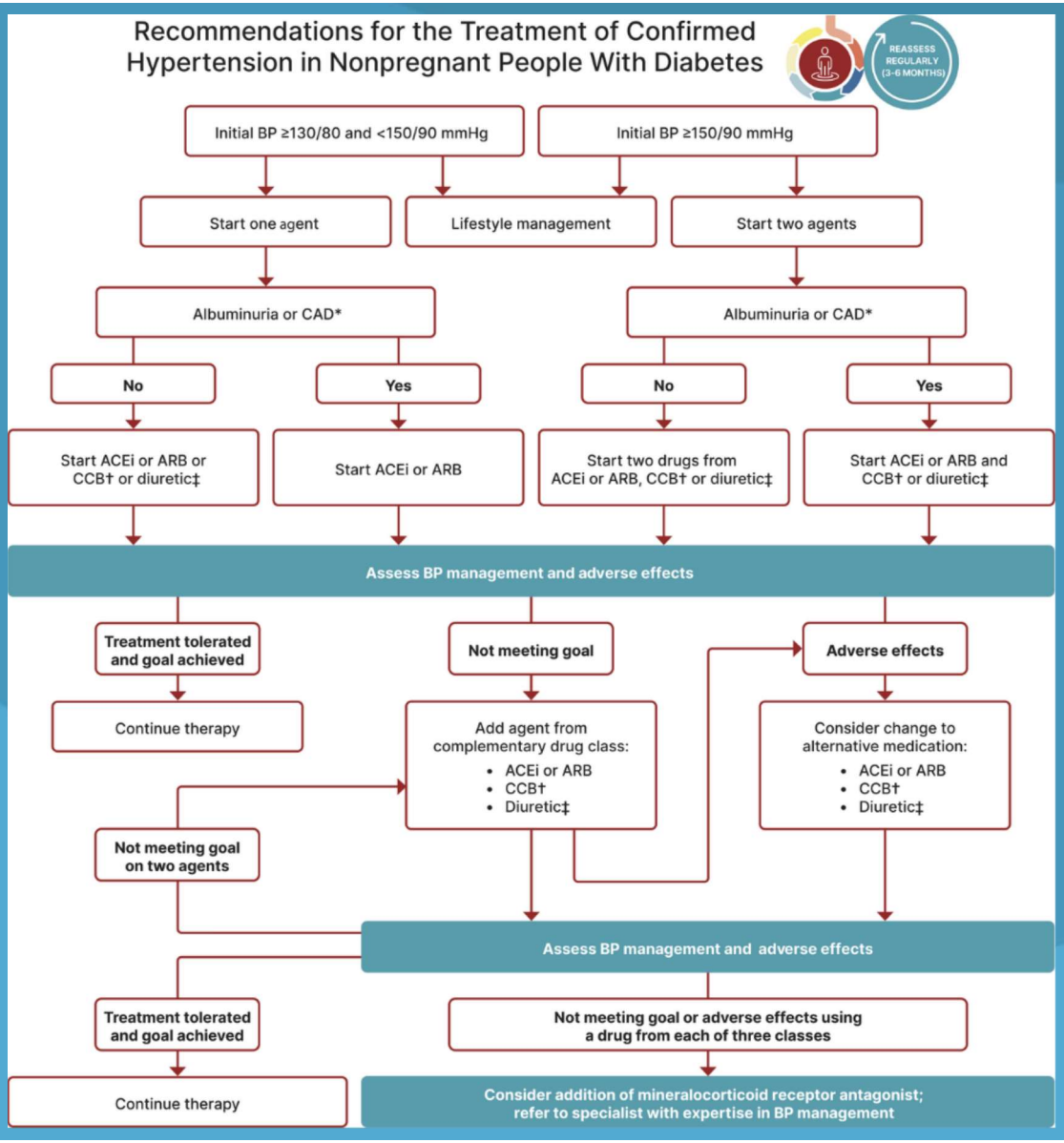
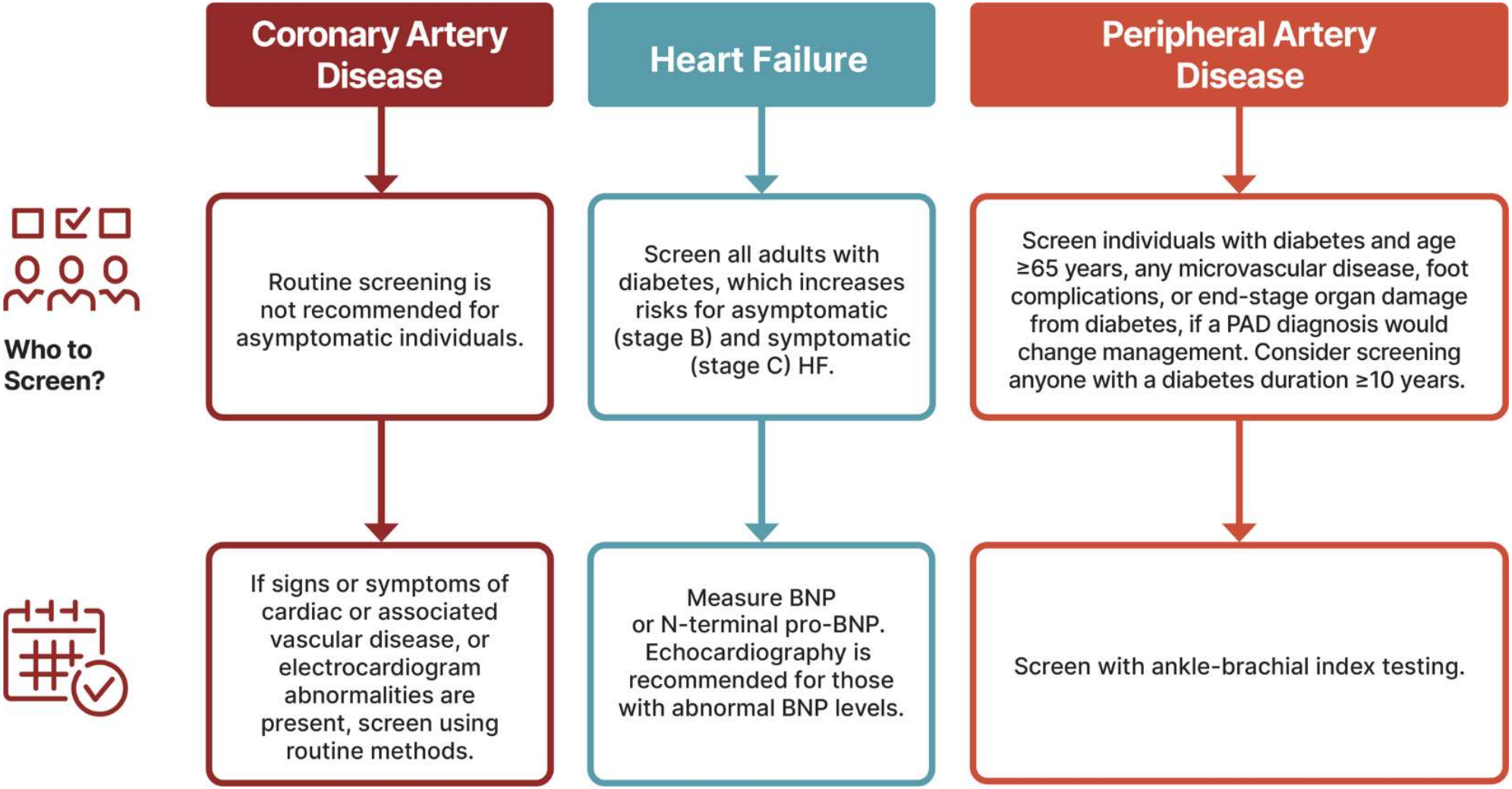
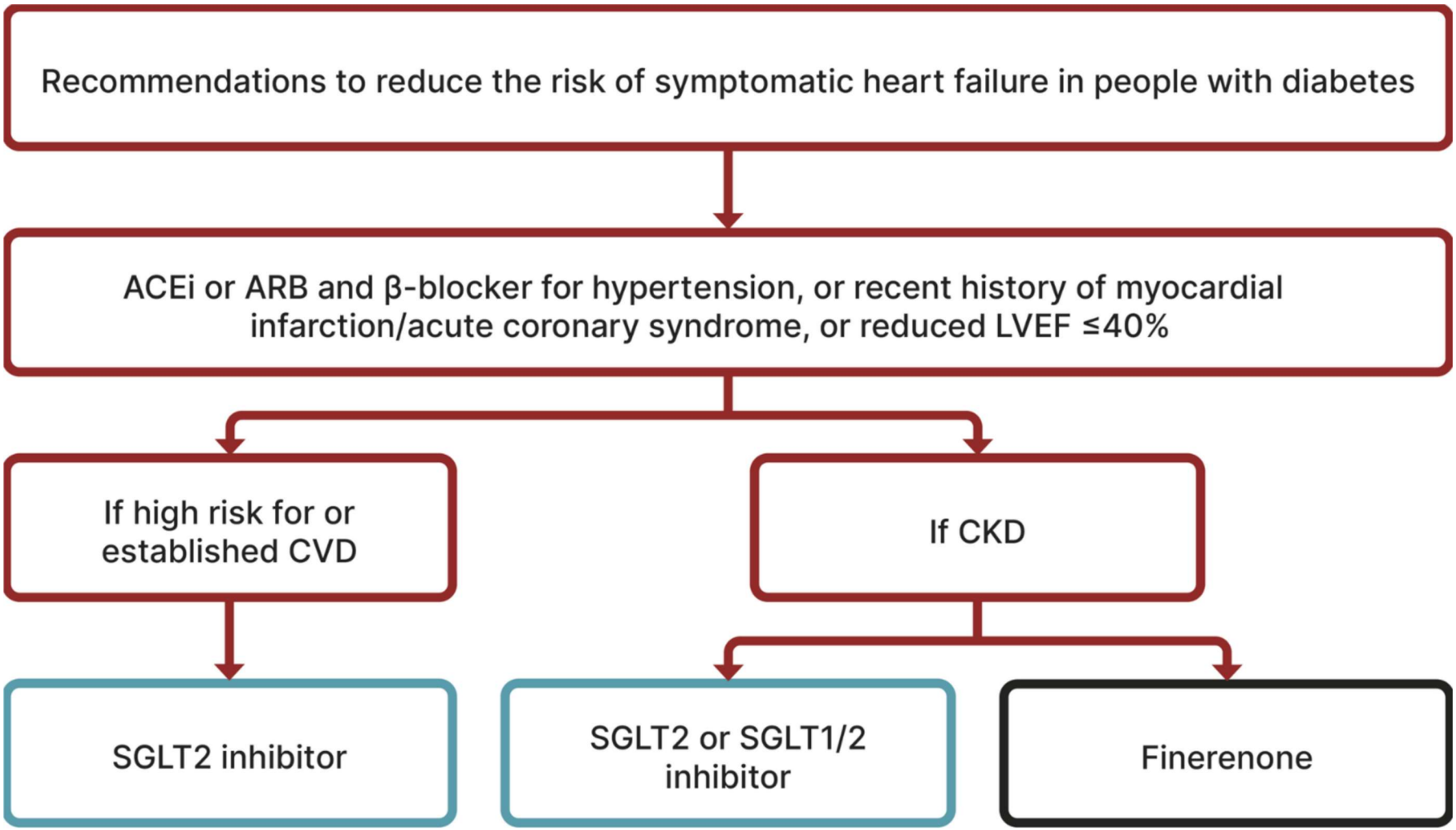


Figure 10.1—Multifactorial approach to reduction in risk of diabetes complications.


Recommendations for the Treatment of Confirmed Hypertension in Nonpregnant People With Diabetes
REASSESS REGULARLY (3-6 MONTHS)
Initial BP ≥130/80 and <150/90 mmHg
Initial BP ≥150/90 mmHg
Start one agent
Lifestyle management
Start two agents
Albuminuria or CAD*
Albuminuria or CAD*
No
Yes
No
Yes
Start ACEi or ARB or CCB† or diuretic‡
Start ACEi or ARB
Start two drugs from ACEi or ARB, CCB† or diuretic‡
Start ACEi or ARB and CCB† or diuretic‡
Assess BP management and adverse effects
Treatment tolerated and goal achieved
Not meeting goal
Adverse effects
Continue therapy
Add agent from complementary drug class:
• ACEi or ARB
• CCB†
• Diuretic‡
Consider change to alternative medication:
• ACEi or ARB
• CCB†
• Diuretic‡
Not meeting goal on two agents
Assess BP management and adverse effects
Treatment tolerated and goal achieved
Not meeting goal or adverse effects using a drug from each of three classes
Continue therapy
Consider addition of mineralocorticoid receptor antagonist; refer to specialist with expertise in BP management


Coronary Artery Disease
Heart Failure
Peripheral Artery Disease
Who to Screen?
Routine screening is not recommended for asymptomatic individuals.
Screen all adults with diabetes, which increases risks for asymptomatic (stage B) and symptomatic (stage C) HF.
Screen individuals with diabetes and age ≥65 years, any microvascular disease, foot complications, or end-stage organ damage from diabetes, if a PAD diagnosis would change management. Consider screening anyone with a diabetes duration ≥10 years.
If signs or symptoms of cardiac or associated vascular disease, or electrocardiogram abnormalities are present, screen using routine methods.
Measure BNP or N-terminal pro-BNP. Echocardiography is recommended for those with abnormal BNP levels.
Screen with ankle-brachial index testing.


Recommendations to reduce the risk of symptomatic heart failure in people with diabetes
ACEi or ARB and β-blocker for hypertension, or recent history of myocardial infarction/acute coronary syndrome, or reduced LVEF ≤40%
If high risk for or established CVD
If CKD
SGLT2 inhibitor
SGLT2 or SGLT1/2 inhibitor
Finerenone

Lipids

- How often should you check lipids?
- For people with prediabetes or diabetes not on lipid-lowering therapy, check at diagnosis and at least annually thereafter.
- Check lipids at initiation of lipid-lowering therapy, 4–12 weeks after initiation or dose changes, and annually thereafter.

ASCVD Primary Prevention

Lipid management for primary prevention of atherosclerotic cardiovascular disease events in people with diabetes in addition to healthy behavior modification

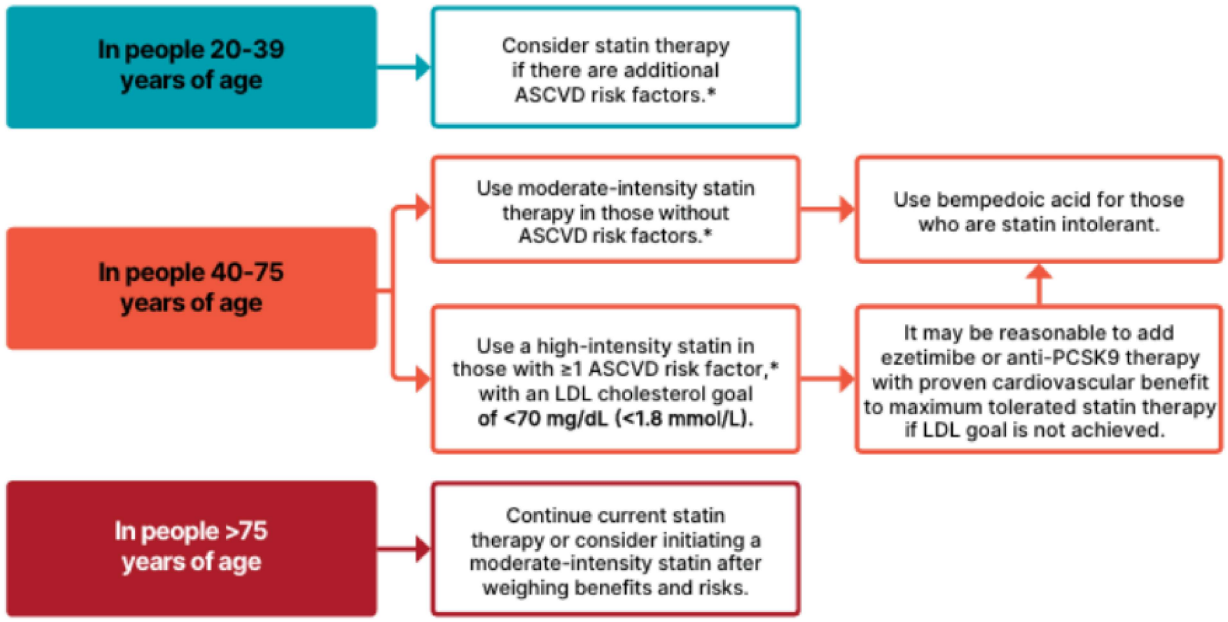


Figure 10.3—Recommendations for primary prevention of atherosclerotic cardiovascular disease (ASCVD) in people with diabetes using cholesterol-lowering therapy. *ASCVD risk factors include older age, hypertension, dyslipidemia, smoking, chronic kidney disease, or obesity. Adapted from "Standards of Care in Diabetes—2024 Abridged for Primary Care Professionals" (315).

Lipids (cont.)

ASCVD Secondary Prevention

Use lifestyle and high-intensity statin therapy to reduce LDL cholesterol by ≥50% from baseline to a goal of <55 mg/dL (<1.4 mmol/L).

→

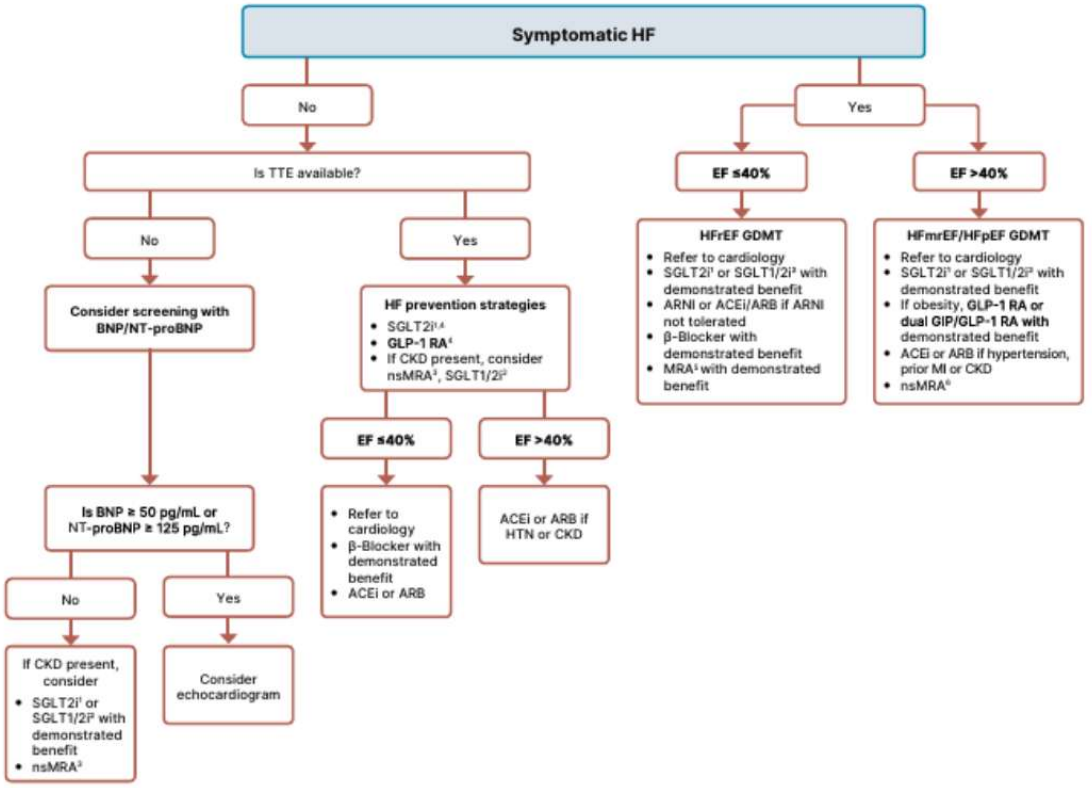
Add ezetimibe or a PCSK9-directed therapy with demonstrated benefit if LDL cholesterol goals are not met on maximum tolerated statin therapy.

→

Use an alternative lipid-lowering treatment for those who are statin intolerant:

- PCSK9 inhibitor with monoclonal antibody treatment
- Bempedoic acid
- PCSK9 inhibitor with siRNA inclisiran

HF and DM



1. **SGLT2i parameters: if eGFR ≥ 20 mL/min/1.73 m²**
2. **SGLT1/2i can be used as an alternative to SGLT2i if eGFR ≥ 30 mL/min/1.73 m²**
3. **If UACR ≥ 30mg/g, K+<5.0 mEq/L (< 5.0 mmol/L)**
4. **The absolute benefit of SGLT2i and GLP-1RA in preventing symptomatic HF will be greatest among those at the highest absolute** risk.
5. **If eGFR ≥30 mL/min/1.73 m², K+<5.0 mEq/L (< 5.0 mmol/L)**
6. **If eGFR ≥25 mL/min/1.73 m², K+<5.0 mEq/L (< 5.0 mmol/L)**

Figure 10.5—Overview of recommendations for the prevention and treatment of symptomatic heart failure in people with diabetes. ACEi, ACE inhibitor; ARB, angiotensin receptor blocker; ARNI, angiotensin receptor neprilysin inhibitor; BNP, B-type natriuretic peptide; NT-proBNP, N-terminal pro-B–type natriuretic peptide; CKD, chronic kidney disease; CVD, cardiovascular disease; EF, ejection fraction; eGFR, estimated glomerular filtration rate; GDMT, guideline-directed medical therapy; GIP/GLP-1 RA, glucose-dependent insulinotropic polypeptide and glucagon-like peptide-1 receptor agonist; GLP-1 RA, glucagon-like peptide-1 receptor agonist; HF, heart failure; HFmrEF, heart failure with mildly reduced ejection fraction; HFpEF, heart failure with preserved ejection fraction; HFrEF, heart failure with reduced ejection fraction; HTN, hypertension; MI, myocardial infarction; MRA, mineralocorticoid receptor antagonist; nsMRA, nonsteroidal mineralocorticoid receptor antagonist; SGLT1/2i, sodium–glucose cotransporter 1 and 2 inhibitor; SGLT2i, sodium–glucose cotransporter 2 inhibitor; TTE, transthoracic echocardiography; UACR, urine albumin-to-creatinine ratio.

Chronic Kidney Disease and Diabetes Management

Chronic Kidney Disease (CKD) and Diabetes Management (DM)

- Reduces cardiovascular risks
- Improves patient outcomes

Who?

- Everyone with type 2 diabetes
- Everyone with type 1 diabetes for ≥5 years

How?

- Urinary albumin-to-creatinine ratio (UACR)
- Estimated glomerular filtration rate (eGFR)

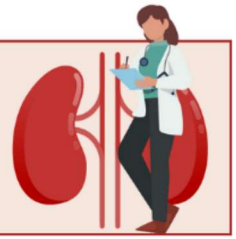
How often?

Annually

Monitoring Established CKD

How? UACR and eGFR. Use the CKD Epidemiology Collaboration's CKD-EPI Refit equation, which eliminates race as a variable, as the eGFR formula for all individuals.

How often? One to four times per year, depending on the stage of the disease.



Classification of CKD

CKD is classified based on: • GFR (G) • Albuminuria (A)				Albuminuria categories Description and range		
				A1	A2	A3
				Normal to mildly increased	Moderately increased	Severely increased
				<30 mg/g <3 mg/mmol	30-299 mg/g 3-29 mg/mmol	≥300 mg/g ≥30 mg/mmol
GFR categories (mL/min/1.73 m²) Description and range	G1	Normal or high	≥90	Screen 1	Treat 1	Treat and refer 2
	G2	Mildly decreased	60-89	Screen 1	Treat 1	Treat and refer 2
	G3a	Mildly to moderately decreased	45-59	Treat 1	Treat 2	Treat and refer 3
	G3b	Moderately to severely decreased	30-44	Treat 2	Treat and refer 3	Treat and refer 3
	G4	Severely decreased	15-29	Treat and refer 3	Treat and refer 3	**Treat and refer 4+**
	G5	Kidney failure	<15	**Treat and refer 4+**	**Treat and refer 4+**	**Treat and refer 4+**

Low risk (if no other markers of kidney disease, no CKD) Moderately increased risk High risk Very high risk

CKD and DM

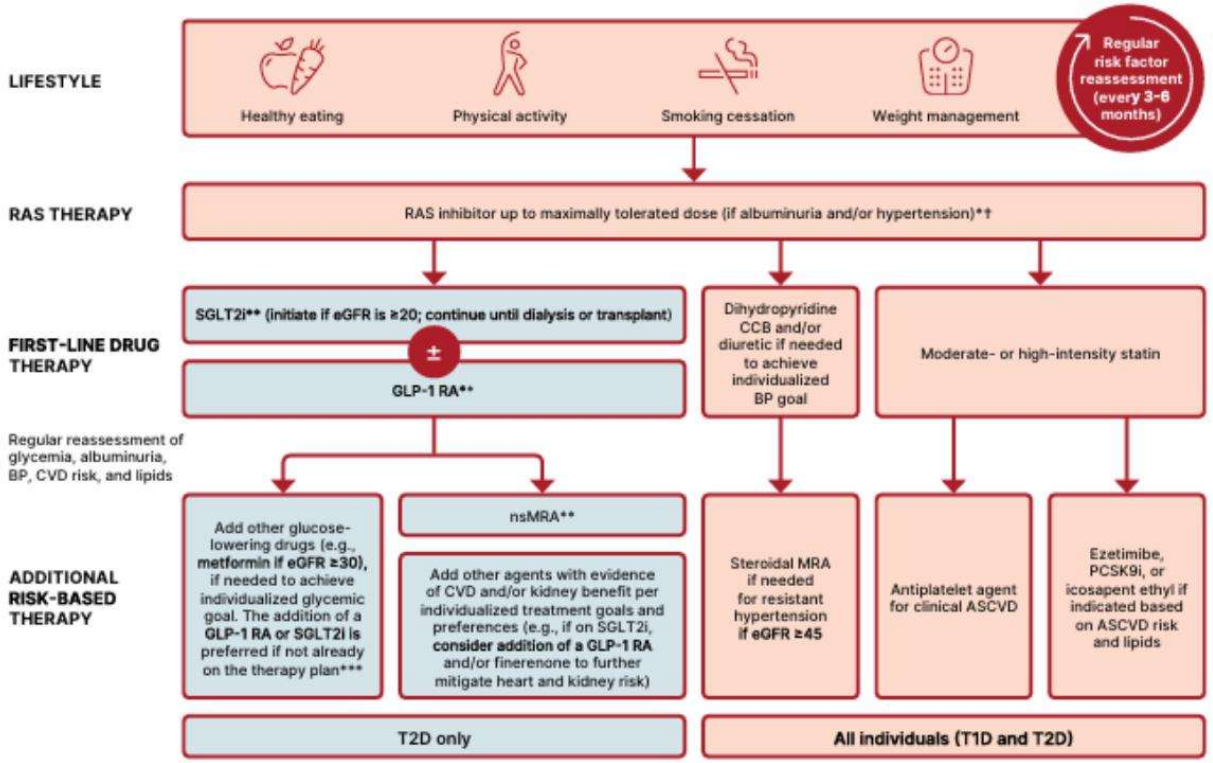


Figure 11.2—Holistic approach for improving outcomes in people with diabetes and CKD. Icons presented indicate the following benefits: BP cuff, BP lowering; glucose meter, glucose lowering; heart, cardioprotection; kidney, kidney protection; scale, weight management. eGFR is presented in units of mL/min/1.73 m^2. †ACEi or ARB (at maximal tolerated doses) should be first-line therapy for hypertension when albuminuria is present. Otherwise, dihydropyridine calcium channel blocker or diuretic can also be considered; all three classes are often needed to attain BP targets. †Finerenone is currently the only nsMRA 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; nsMRA, 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.

CKD and DM (cont.)

- Monitor for ↑ serum creatinine and for ↑ serum K+ levels when ACEi, ARBs, and MRAs are used, or for ↓K+ levels when diuretics are used at routine visits and 7–14 days after initiation or after a dose change.
- Continue ACE inhibitor or ARB therapy for ≤30% increases in serum creatinine in the absence of volume depletion.
- Aim for a urinary albumin reduction ≥30% in people with CKD and urinary albumin ≥300 mg/g to slow CKD progression.
- Optimize blood pressure management (aim for <130/80 mmHg).

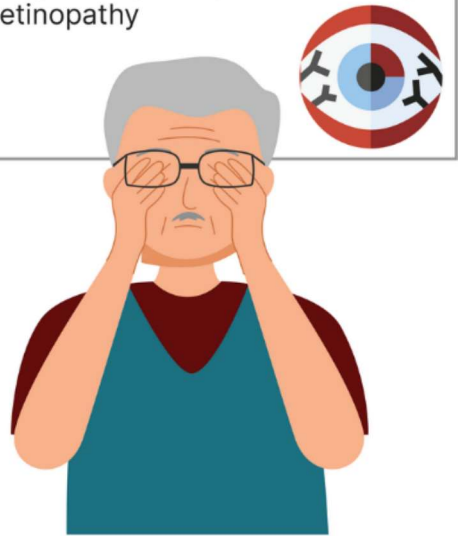
Retinopathy, Neuropathy, and Foot Care

Retinopathy, Neuropathy, and Foot Care

If PCPs can optimize the management of glycemia, blood pressure, and lipids -this can reduce or slow the progression of microvascular complications of diabetes.

How?	When?	Follow-Up Eye Exam Schedule
Dilated and comprehensive eye exam Retinal photography*	For people with type 1 diabetes: within 5 years after the onset of diabetes NOW For people with type 2 diabetes: at the time of diabetes diagnosis	• At least annually for people with any level of retinopathy • Every 1–2 years for those with no retinopathy for one or more annual exams and well-managed glycemia • More frequently for those with progressing or sight-threatening retinopathy

*Retinal photography with remote reading or use of an authorized artificial intelligence tool can expand access to screening where qualified eye care professionals are not available. When abnormalities are detected, in-person exams will be needed.



Treatment

Promptly refer to an ophthalmologist who is knowledgeable and experienced in managing DR any individuals with:

- Any level of diabetic macular edema
- Moderate or worse nonproliferative DR (a precursor of proliferative DR)
- Any proliferative DR

Retinopathy, Neuropathy, and Foot Care

All patients should be evaluated for DPN at dx and at least annually.

Pain Relief: Drug and nondrug strategies can ease symptoms.

Evidence-Based Medications:

- Gabapentinoids
- Serotonin-norepinephrine reuptake inhibitors
- Tricyclic antidepressants
- Sodium channel blockers

Combination therapy may be more effective than monotherapy for pain from DPN.

Consider if any referrals are needed - podiatry, vascular

Check feet at least annually for risk factors for ulcers and amputations; more frequent examinations are needed for those with loss of protective sensation, peripheral artery disease, or other serious complications.

How Often Should Foot Screenings Be Performed?

Table 12.1—International Working Group on Diabetic Foot risk stratification system and corresponding foot screening frequency

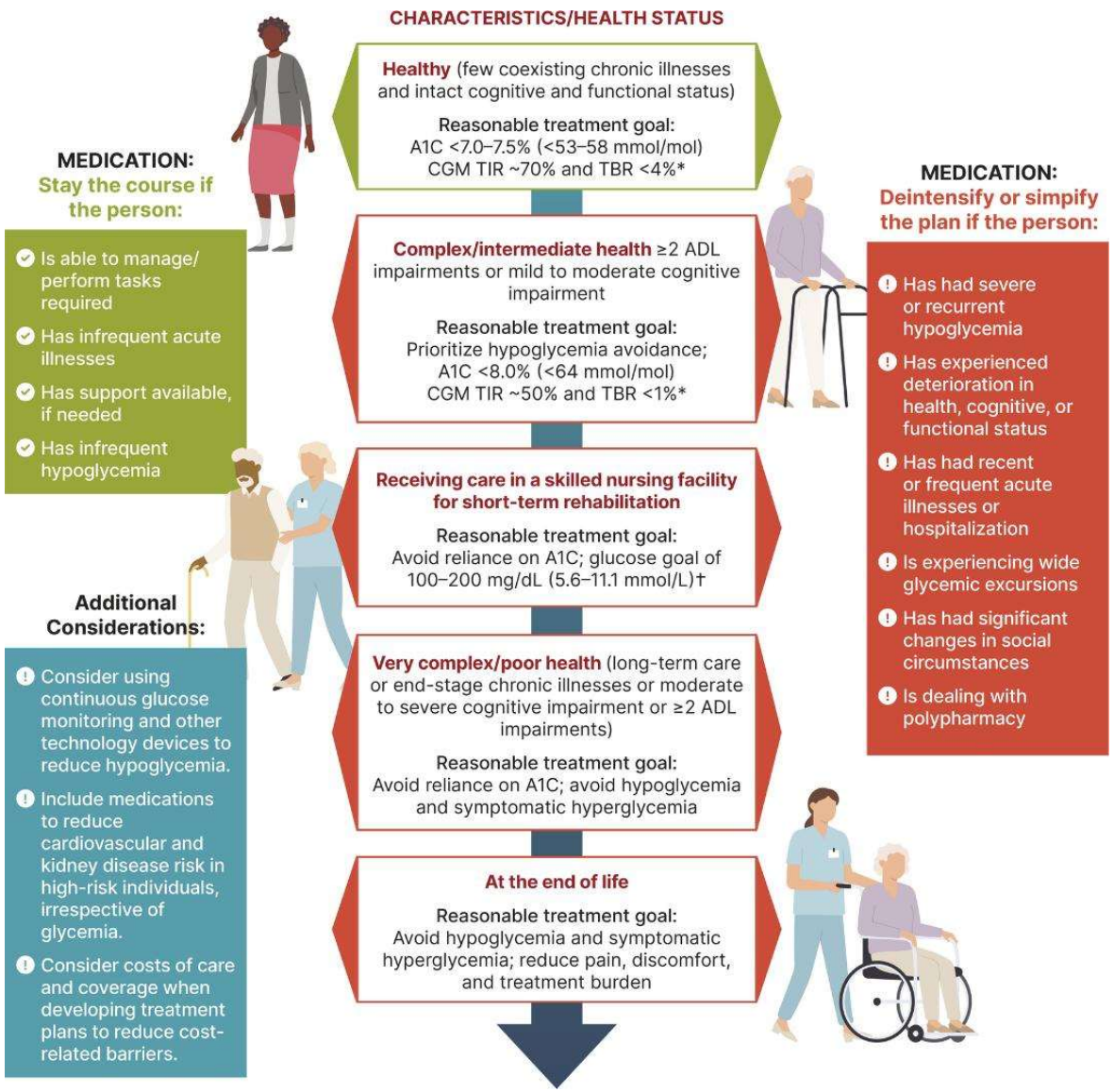
Category	Ulcer risk	Characteristics	Examination frequency*
0	Very low	No LOPS and no PAD	Annually
1	Low	LOPS or PAD	Every 6–12 months
2	Moderate	LOPS + PAD, or LOPS + foot deformity, or PAD + foot deformity	Every 3–6 months
3	High	LOPS or PAD and one or more of the following: • History of foot ulcer • Amputation (minor or major) • Kidney failure	Every 1–3 months

Adapted with permission from Schaper et al. (123). LOPS, loss of protective sensation; PAD, peripheral artery disease. *Examination frequency suggestions are based on expert opinion and person-centered requirements.

Considerations for Older Adults

Considerations for Older Adults

- Where is the patient at functionally?
- Is this goal reasonable?
- Do medication risks outweigh benefits/patient desired wishes?
- How much assistance do they need to give this medication or adhere to this plan?
- Can the plan be simplified?
- Simplify complex insulin regimens.
- Consider recent hospitalizations.
- Respect your patient and be rigorous in reevaluating health status.



Recognize and Address Any Barriers/Challenges to Care

Recognize and Address Any Barriers/Challenges to Care

Most common in my practice area include:

- Cost/Insurance coverage
- Lack of understanding
- Missed follow-ups
- Language or cultural concerns
- Anxieties around healthcare in general

Local Resources for Patients/Providers

KNOW YOUR CARE

Learn more about how diabetes impacts your body and the importance of receiving routine diabetes care. The following information provides recommendations for routine diabetes care, but it is important to follow your provider's orders regarding the suggested frequency of exams, tests, and other care needs. For more information about insurance coverage regarding routine diabetes care, turn to the back page and visit doh.sd.gov/topics/diseases/chronic-disease/diabetes/diabetes-resources/.

High blood sugar can cause people with diabetes to experience blurry vision and eye disease.

It is recommended to have an eye exam, including a retinal check, once a year.

Individuals with diabetes may have additional complications with certain illnesses and should get immunizations, as appropriate.

Talk with your provider about the frequency of important immunizations.

High blood sugar can harm the vessels in the kidneys that filter blood and may lead to the need for dialysis.

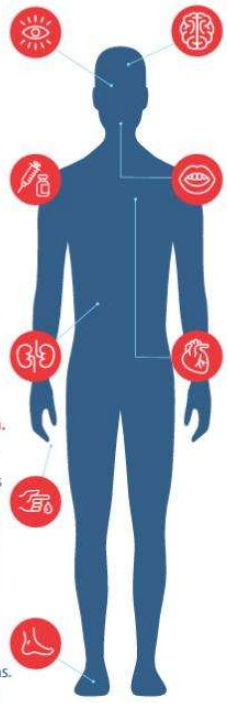
Make sure to have lab work done once a year to check kidney function.

High blood sugar can lead to diabetes complications throughout the body.

You should have your A1C checked* every 3-6 months, and check your blood sugar at regular times as recommended by your provider.

High blood sugar can lead to nerve damage and poor blood flow, which can lead to infections and amputations.

Inspect your feet routinely at home. Get a comprehensive foot exam once a year and a foot check at each visit.



High blood sugar can damage blood vessels and cause an increased risk for stroke.

Be sure to have your blood pressure checked at each visit.

The most common oral health complication of high blood sugar is gum disease. Diabetes can also cause a dry mouth and infections.

Schedule a dental exam and cleaning every 3 to 6 months (depending on a dentist's recommendation and dental plan coverage).

High blood sugar can increase cholesterol making the heart work harder to pump blood, increasing the risk for heart disease and heart attacks.

Be sure to have your cholesterol checked each year.

Understanding diabetes care and management is important to prevent or reduce the risk for complications. Individuals with diabetes should attend diabetes education:

- At time of diagnosis
- If complications appear
- When transitions in care occur

Follow up with your health care provider for questions or concerns regarding your diabetes care and management.

SOUTH DAKOTA Diabetes PROGRAM

*All recommendations above are sources from the American Diabetes Association Standards of Care in Diabetes - 2025. • *Frequency may vary based on provider's care plan for diabetes management.*

KNOW YOUR PLAN

It is important to understand your insurance coverage for your diabetes care – including office visits, screenings, lab tests, and pharmacy coverage.

BEFORE YOU CALL:

- Consider checking your insurance company's website or app — many answers are available there.
- If you need additional assistance, call the phone number listed on your insurance card.
- Check with your insurance company to understand if there are different costs for in-network and out-of-network visits.

Your medical and/or other insurance providers may provide the following benefits:

- Diabetes Self-Management Education Services (DSMES)
- Dietitian services/ Medical Nutrition Therapy (MNT)
- Continuous Glucose Monitor (CGM)
- Blood sugar testing supplies and test strips
- Immunizations
- Specialty care
- Pharmacy benefits
- Mental health screenings and coverage
- Adaptive shoes
- Foot exams/foot care
- Lab work
- Dilated eye exams
- Dental exams/cleanings

Many insurance companies offer additional free services, including, but not limited to:

- Annual wellness visits
- Mental health screenings
- Nutrition counseling
- Fitness & wellness resources
- Fitness/gym membership reimbursement
- Health coaching/case management/community health worker services for diabetes management or prevention (participation may include free testing supplies and resources)

Visit doh.sd.gov/topics/diseases/chronic-disease/diabetes/diabetes-resources/ to learn more and to download a sample script to assist you in calling your insurance company.

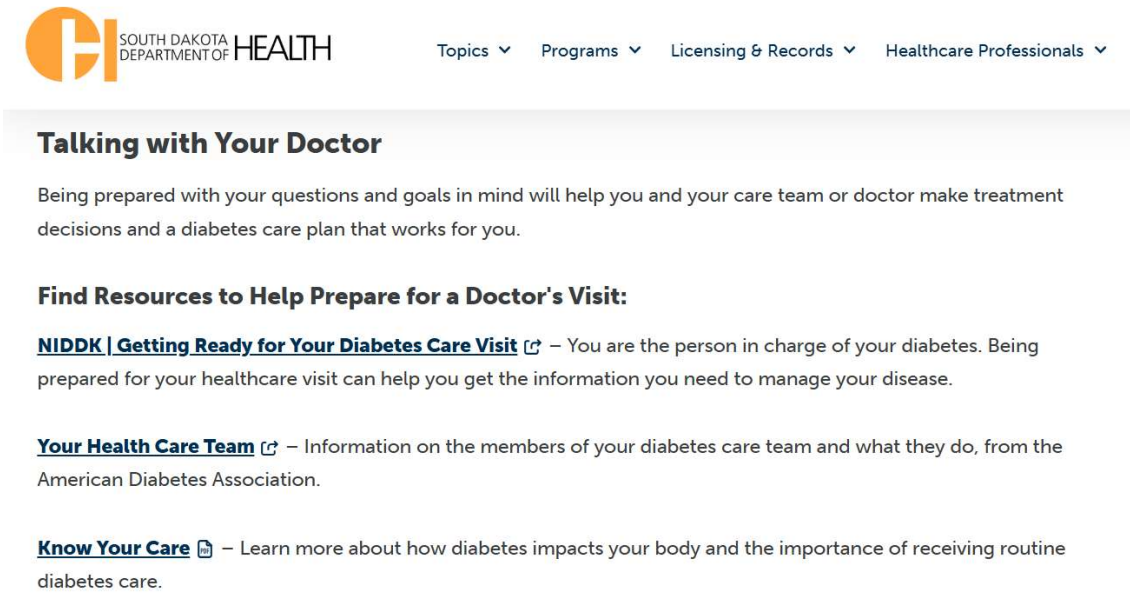
This resource is meant to guide users through contacting their insurance company and is not a guarantee of coverage or benefits.

UndoTHERisk.com

Additional Know Your… Resources

In addition to Know Your Care and Know Your Plan, the SD DOH and SDDC are developing the following resources:

- Know Your Medications
- Know Your Team
- Know Your Numbers
- Know Your Emergency Plan
- Know Your Sick Day
- Know Your Travel
- Know Your Technology
- And complimenting fillable forms!



https://doh.sd.gov/topics/diseases/chronic-disease/diabetes/diabetes-management/

South Dakota Diabetes Coalition

Case Study - Joe

- Joe, a 56-year-old, Hispanic male, presents to your clinic as a new patient with c/o fatigue, blurry vision, a non-healing wound to his LLE, and overall, just not feeling well.
- He has no known medical history as he admits he hasn't seen a provider since he had a laceration in the ER a few years ago. He is a smoker, denies alcohol or drug use, and works in a factory setting. He is wondering what he can do to have more energy and heal his leg.
- His vitals are: BP 150/90; HR 88; Resp 21; BMI 33.0

WHERE DO YOU START?

- Finish getting your history, perform PE, and start lab work-up.
- Be mindful you likely aren't going to fix all of Joe's issues in one visit and he will need education on adherence to treatment plan and importance of follow-up visits.

Your nurse walks in as you are assessing his LLE wound and updates you his A1C is back and is **9% – WHAT NEXT?**

- Time to start in with education, choosing medications, and don't forget you still have to address his wound and BP. Keep in mind your next visit showed up and it's 2 siblings here for well child checks. Welcome to Primary Care :)

SOUTH DAKOTA DIABETES COALITION

Thank You!

Resources

- https://diabetesjournals.org/clinical/article/doi/10.2337/cd25-aint/157719/Standards-of-Care-in-Diabetes-2025-Abridged-for?searchresult=1
- https://diabetesjournals.org/collection/2720/2025-Abridged-Standards-of-Care
- https://www.countyhealthrankings.org/health-data/south-dakota?measure=Diabetes+Prevalence*&year=2024
- https://diabetesjournals.org/clinical/article/40/4/401/144956/Role-of-Primary-Care-Clinicians-in-the-Management
- https://diabetesjournals.org/care/article/48/Supplement_1/S27/157566/2-Diagnosis-and-Classification-of-Diabetes
- https://www.cdc.gov/diabetes/risk-factors/index.html https://diabetes.org/about-diabetes/diabetes-prevention
- https://www.mayoclinic.org/diseases-conditions/type-2-diabetes/in-depth/diabetes-prevention/art-20047639
- https://www.cdc.gov/diabetes-prevention/lifestyle-change-program/lifestyle-change-program-details.html
- https://www.uptodate.com/contents/initial-management-of-hyperglycemia-in-adults-with-type-2-diabetes-mellitus?search=type%202%20dm%20medication&source=search_result&selectedTitle=2%7E150&usage_type=default&display_rank=2
- https://pmc.ncbi.nlm.nih.gov/articles/PMC4346284/