Standards of Care Updates 2024
Sponsored by
ADCES NorCal Chapter

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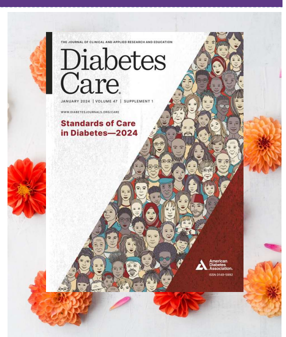
Pronouns: She, her, hers
President, Diabetes Education Services

Coach Bev has no Conflict of Interest

- She's not on any speaker's bureau
- Does not invest or have any financial relationships with diabetes related companies.
- Gathers information from reading package inserts, research and articles
- The ADA Standards of Medical Care is main resource for course content



Outcomes and Objectives

Learning Outcome:

Participants will identify updates and articulate recommendations from the 2024 ADA Standards of Care that can be applied to their practice.

- **Objectives:**

1. State the changes and updates to the annual ADA Standards of Medical Care in Diabetes.
2. Identify key elements of the position statement.
3. Discuss how health care professionals can apply this information in their clinical setting

Type 2 Diabetes in America 2024

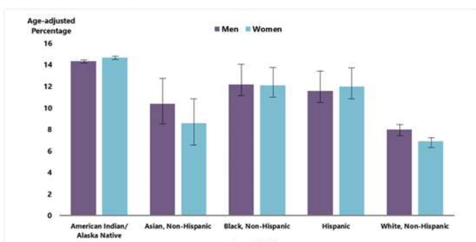
- 11.3% with Diabetes - 37 million adults
  - 23% don't know they have it
- 38% with Prediabetes – 96 million adults

Figure 3. Age-adjusted, county-level prevalence of diagnosed diabetes among adults aged 20 years or older, United States, 2004, 2012, and 2019

Diabetes Prevalence by Ethnic Group

- For adults, diabetes prevalence highest among:
  - American Indians and Alaska Natives (14.5%),
  - Non-Hispanic Blacks (12.1%),
  - People of Hispanic origin (11.8%),
  - Non-Hispanic Asians (9.5%)

Figure 2. Age-adjusted estimated prevalence of diagnosed diabetes by race/ethnicity group and sex for adults aged 18 years or older, United States, 2018–2019



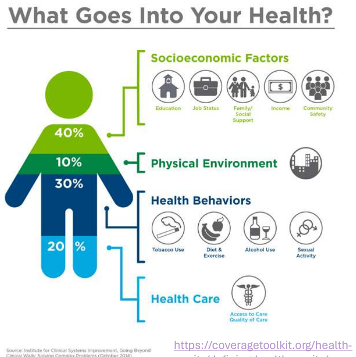
www.cdc.gov/diabetes/data/statistics-report/diagnosed-diabetes.html

Status of Diabetes Care

- In 2015–2018, U.S. community-dwelling adults with diabetes achieved:
  - A1C <7% by 50.5%
    - 75.4% achieved A1C <8%.
  - BP target of <130/80 achieved by 47.7%
    - 70.4% achieved blood pressure <140/90 mmHg.
  - Lipid control (non-HDL cholesterol) <130 mg/dL, achieved by 55.7%
- 22.2% met targets for all three risk factors
- Many not receiving adequate lifestyle or pharmacotherapy.

Address Barriers to Self Management

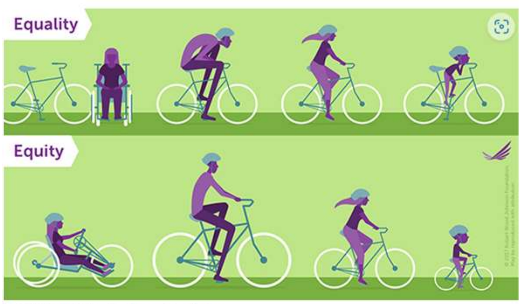
- **Barriers exist** within health system, payer, health care professional & individual.
- **Address barriers** through innovation, including community health workers, telehealth, other digital health solutions.
- **Consider social determinants of health** in the target population when designing care.



5. Facilitating Positive Health Behaviors and Well-being to Improve Health Outcomes: Standards of Care in Diabetes—2024

https://coveragetoolkit.org/health-equity/defining-health-equity/

Equality vs Equity



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Design and deliver diabetes care with goal of **health equity** across all populations.

https://coveragetoolkit.org/health-equity/defining-health-equity/

What is Type 2 Diabetes?

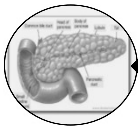
- Complex metabolic disorder ....
  (Insulin resistance and deficiency)

with social, behavioral and environmental risk factors unmasking the effects of genetic susceptibility.

New Diagnosis?
Call 800 – DIABETES to request "Getting Started Kit"
www.Diabetes.org

American Diabetes Association

2. Diagnosis and Classification and of Diabetes Natural History of Diabetes



No diabetes
FBG <100
Random <140
A1c <5.7%

Yes!

Prediabetes
FBG 100-125
Random 140 - 199
A1c ~ 5.7- 6.4%
50% working pancreas

NO

Diabetes
FBG 126 +
Random 200 +
A1c 6.5% or +
20% working pancreas

Development of type 2 diabetes happens over years or decades

Pre Diabetes & Type 2- Screening Guidelines (ADA 2024 Clinical Practice Guidelines)

1. Start screening all people at age 35.
2. Screen at any age if BMI ≥ 25 (Asians BMI ≥ 23) plus one or > additional **risk factor**:

- First-degree relative w/ diabetes
- Member of a high-risk ethnic population
- Habitual physical inactivity
- *PreDiabetes
- History of heart disease
- *Taking high risk meds; antiretrovirals, 2nd generation antipsychotics or steroids
- History of pancreatitis

2. Diagnosis and Classification of Diabetes: *Standards of Care in Diabetes—2024*

Second-Generation Antipsychotic Meds and Diabetes Risk

- People taking these meds require frequent monitoring due to increased risk of hyperglycemia and other metabolic effects.
- There is a range of effects across second-generation antipsychotic medications;
  - Olanzapine, haloperidol, clozapine, quetiapine, and risperidone tend to have *more* metabolic effects.
  - Aripiprazole and ziprasidone tend to have *fewer* metabolic effects.
  - It taking these agents, screen for prediabetes or diabetes at baseline, rescreen at 12–16 weeks after medication initiation, and screen annually thereafter ADA 2024

2. Diagnosis and Classification of Diabetes: *Standards of Care in Diabetes—2024*

Diabetes 2 - Who is at Risk?
(ADA 2024 Clinical Practice Guidelines)

Screen using A1C, Fasting Blood Glucose or OGTT.

Repeat screening at least every 3 years if negative.

*If prediabetes or on high risk meds, recheck yearly

Risk factors cont'd

- HTN - BP > 130/80
- HDL < 35 or triglycerides > 250
- History of Gestational Diabetes Mellitus
- Polycystic ovary syndrome (PCOS)
- Other conditions associated w/ insulin resistance:
  - Elevated BMI, acanthosis nigricans (AN)

2. Diagnosis and Classification of Diabetes: *Standards of Care in Diabetes—2024*

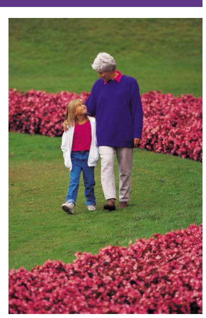
Poll Question

JR's mom has type 1 diabetes and JR's dad has type 2 diabetes. JR is 28 years old and in the emergency room with a glucose of 482 mg/dl. Besides checking glucose, ketones and A1C levels, which of the following lab test can be used to determine if someone has autoimmune diabetes?

1. Endogenous insulin titer
2. Glutamic Acid Decarboxylase
3. Beta cells auto antibodies
4. Langerhan's antibody

How do we know someone has Type 1 vs Type 2?

- Type 1 - Positive antibodies
  - GAD - glutamic acid decarboxylase (primary)
  - IA2 - islet antigen 2, or
  - ZnT8 - zinc transporter 8
- Can also check C-peptide levels to determine endogenous insulin production
- Younger people develop quickly
- Older people take longer to develop
- "misdiagnosis is common and can occur in ~40% of adults with new type 1 diabetes"



2. Diagnosis and Classification of Diabetes: *Standards of Care in Diabetes—2024*

Determine if Type 1 - Use AABBCC Approach

- **A**ge
  - e.g., for individuals <35 years old, consider type 1 diabetes
- **A**utoimmunity
  - e.g., personal or family history of autoimmune disease or polyglandular autoimmune syndromes
- **B**ody habitus
  - e.g., BMI <25 kg/m2
- **B**ackground
  - e.g., family history of type 1 diabetes
- **C**ontrol
  - e.g., level of glucose control on noninsulin therapies
- **C**omorbidities
  - e.g., treatment with immune checkpoint inhibitors for cancer can cause acute autoimmune type 1 diabetes or presence of other autoimmune conditions

2. Diagnosis and Classification of Diabetes: *Standards of Care in Diabetes—2024*

Type 1 Diabetes Features?

- For JR, a 28 admitted to the ICU with a blood glucose of 476 mg/dl, pH of 7.1, anion gap of 15. Recently lost 13 pounds.

Type I Most Discriminative Features

- Younger than 35 years at diagnosis
- Lower BMI (<25 kg/m^2)
- Unintentional weight loss
- Ketoacidosis
- Glucose 360 mg/dl or greater.

CONSENSUS REPORT | OCTOBER 18 2021
The Management of Type 1 Diabetes in Adults. A Consensus Report by the American Diabetes Association (ADA) and the European Association for the Study of Diabetes (EASD)

3. Prevention or Delay of Diabetes and Associated Comorbidities: *Standards of Care in Diabetes—2024*

Type 1 Diabetes Progression

	Stage 1	Stage 2	Stage 3
Characteristics	• Autoimmunity	• Autoimmunity	• Autoimmunity
	• Normoglycemia	• Dysglycemia	• Overt hyperglycemia
	• Presymptomatic	• Presymptomatic	• Symptomatic
Diagnostic criteria	• Multiple islet autoantibodies - GAD, glutamic acid decarboxylase (primary) - islet antigen 2, or - Zinc transporter 8 (ZnT8)	• Islet autoantibodies Dysglycemia: Elevated IFG and/or IGT • FPG 100–125 mg/dL • 2-h PG 140–199 mg/dL • A1C 5.7–6.4% or ≥10% increase in A1C	• Autoantibodies may disappear over time (5-10% may not express antibodies) • Diabetes diagnosed by standard criteria

2. Diagnosis and Classification of Diabetes: *Standards of Care in Diabetes—2024*

www.DiabetesEd.net

3. Prevention or Delay of Diabetes and Associated Comorbidities (for Preclinical Type 1 Diabetes)

- Positive Antibodies with Prediabetes:
  - A1c 5.7 – 6.4% or fasting BG 100 -125mg/dl
- Action:
  - Screen A1C every 6 months
  - 75- OGTT every year
  - Modify screening based on antibodies and glycemic metrics.
  - May benefit from CGM to monitor progression

Trialnet.org

American Diabetes Association. 3. Prevention or Delay of Diabetes and Associated Comorbidities: *Standards of Care in Diabetes—2024*

Type 1 & Lifestyle Prevention

- Observational studies in those with antibodies, shed light on factors that ***increase*** β-cell demand:
  - Less physical activity
  - Consuming higher glycemic index foods
  - Sugar intake.
- Factors that **reduced risk** of progression from TEDDY study:
- Daily minutes spent doing vigorous physical exercise.
- More info needed

3. Prevention or Delay of Diabetes and Associated Comorbidities: *Standards of Care in Diabetes—2024*

Pharmacologic Intervention to Delay Symptomatic Type 1 (in Stage 2)

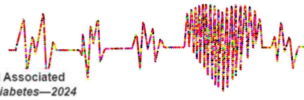
- Teplizumab-Tzield (CD3-monoclonal antibody)
- 14-day infusion can delay the onset of symptomatic type 1 diabetes (stage 3)
- An option in selected individuals aged ≥8 years with stage 2 type 1 diabetes.
- In a single trial, 44 individuals received 14-day course of teplizumab vs 32 placebo.
- The median time to stage 3 diagnosis of type 1
  - 48.4 months in tep group
  - 24.4 months placebo

3. Prevention or Delay of Diabetes and Associated Comorbidities: *Standards of Care in Diabetes—2024*

126. Herold KC, Bundy BN, Long SA, et al.; Type 1 Diabetes TrialNet Study Group. An anti-CD3 antibody, teplizumab, in relatives at risk for type 1 diabetes. *N Engl J Med* 2019;381:603–613

3. Detecting PreDiabetes Matters

- Given the cost-effectiveness of lifestyle behavior modification programs for diabetes prevention:
  - Offer Diabetes Prevention Programs to adults at high risk of type 2 diabetes
  - Should be covered by third-party payers,
  - Address inconsistencies in access
- Screening guidelines for people with Type 1



3. Prevention or Delay of Diabetes and Associated Comorbidities: *Standards of Care in Diabetes—2024*

3. Prediabetes Pharmacologic Intervention

- No FDA approved med for prevention (off label)
- Consider Metformin Therapy for Prediabetes
- Especially for ages 25-59
  - BMI of 35+
  - If A1c is ~6.0 or FPG is 110mg/dL
  - Women with history of GDM
- Monitor B12 level (esp with neuropathy or anemia)
- CV Risk Mitigation important.
- Statin can increase BG, stop if notice elevation
- Consider low dose pioglitazone (Actos) if history of stroke.

3. Prevention or Delay of Diabetes and Associated Comorbidities: *Standards of Care in Diabetes—2024*

DiaBingo

B Frequent skin and yeast infections
B A BMI of ____ or greater indicates increased pre/diabetes risk?
B To reduce complications, control **A**1c, **B**lood pressure, **C**holesterol
B PreDiabetes – fasting glucose level of ___ to ____
B Erectile dysfunction indicates greater risk for ____
B Diabetes – fasting glucose level____ or greater
B Type 1 diabetes is best described as an ______ disease
B People with diabetes are ______ times more likely to die of heart dx
B Elevated triglycerides, < HDL, smaller dense LDL
B Each percentage point of A1C = _____ mg/dl glucose
B At dx of type 2, about __% of the beta cell function is lost
B Diabetes – random glucose ____ or greater

Mr. J - What are Your Recommendations?

Mr. J Profile

67 yr old with newly type 2. History of stroke.

Meds: Metoprolol, metformin, lovastatin 20mg.

Labs:

- A1C 9.3%
- LDL 136 mg/dl
- Triglycerides 260mg/dl
- GFR 58, UACR 32
- B/P 142/79
- Liver enzymes in normal range

Self-Care Skills

- Goes to gym 2-3 times a week
- Plays golf on occasion.
- Eats out 2 times a week.
- Has appt with RD
- Feeling overwhelmed.

What are the Goals?

ABCs of Diabetes – ADA 2024

- A1c less than 7% (individualize)
  - Pre-meal BG 80-130
  - Post meal BG <180
  - Time in Range (70-180) 70% of time
- Blood Pressure < 130/80
- Cholesterol
  - Statin therapy based on age & risk status
  - If 40+ with ASCVD Risk, decrease 50%, LDL <70
  - If 40+ with ASCVD, decrease 50%, LDL <55

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Next Steps?

Immunization Schedule for Diabetes 2024

Vaccine	Who by Age	Series and Frequency
Hepatitis B Vaccine	Less than 60 years*	2-3 dose series
RSV	Adults ≥ 60 years	Single dose
Influenza (avoid live attenuated vaccine)	All	Annually
Tetanus, diphtheria, pertussis (TDAP)	All adults; extra dose during pregnancy	Booster every 10 years.
Zoster	50+	2 dose Shingrix
COVID-19	Starting at age 6 mo's	Initial vaccination and boosters
Pneumonia (PPSV23) Pneumovax	Adults19-64*	See Standards for schedule and details and for those 65 or older.
*Pneumococcal Conjugate Vaccine (PCV15, PCV20)	19-64 with underlying risk factors or no previous vaccination*.	May need PPSV23 follow-up vaccine ≥1 year.* If 65+, discuss with provider.

2024 ADA Standards, Vol.47, S52-S76.

*See ADA Standards, Table 4.4 for detailed info/considerations.
For educational purposes only. www.DiabetesEd.net

NEW Bone Health Recommendations

- Diabetes associated with increased fractures
- Take preventive action:
  - For high-risk older adults (aged >65 years) and younger individuals with multiple risk factors.
    - Monitor bone mineral density using dual-energy X-ray absorptiometry every 2–3 years.
  - Avoid medications that increase fractures in high risk
  - Problem solve to prevent falls
  - Adequate calcium and vita D intake
  - Consider antiresorptive meds, osteoanabolic agents for those with low bone mineral density score.

4. Comprehensive Medical Evaluation and Assessment of Comorbidities: *Standards of Care in Diabetes—2024*

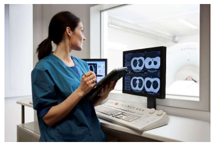
Risk Factors for Fracture

- General risk factors
  - Prior osteoporosis fracture
  - Age > 65 years
  - Low BMI
  - Sex
  - Malabsorption
  - Recurrent falls
  - Glucocorticoid use
  - Family history
  - Alcohol /tobacco abuse
  - Rheumatoid arthritis
- Diabetes Specific Risk Factors
  - Lumbar spine or hip T-score ≤ -2.0
  - Frequent hypoglycemia
  - Diabetes >10 years
  - Diabetes meds: TZDs or sulfonylureas, insulin
  - A1C > 8%
  - Peripheral autonomic neuropathy
  - Retinopathy and nephropathy

4. Comprehensive Medical Evaluation and Assessment of Comorbidities: *Standards of Care in Diabetes—2024*

www. DiabetesEd.net

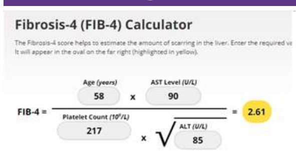
Nonalcoholic Fatty Liver Disease or Metabolic Steatotic Liver Disease



- Recent studies estimate that MASLD is prevalent in >70% of adults with type 2 diabetes.
- Higher risk in those with type 2 diabetes or prediabetes with cardiometabolic risk factors
- Screen for liver fibrosis using FIB 4 Index
  - Uses liver enzymes (ALT & AST), platelet count plus age
  - If positive, follow-up with imaging

4. Comprehensive Medical Evaluation and Assessment of Comorbidities: *Standards of Care in Diabetes—2024*

Screening for NASH – FIB-4



- The American College of Gastroenterology considers Upper limit of normal ALT levels:
- 29–33 units/L for males
- 19–25 units/L for female individuals

(mdcalc.com/calc/2200/fibrosis-4-fib-4-index-liver-fibrosis).

FIB-4 estimates risk of hepatic cirrhosis (age 35+):

- Calculated by imputing:
  - Age
  - plasma aminotransferases (AST and ALT)
  - and platelet count
- FIB-4 Risk Levels
  - Lower risk is <1.3
  - Intermediate 1.3 to 2.67
  - High risk >2.67
    - considered as having a high probability of advanced fibrosis (F3–F4).

4. Comprehensive Medical Evaluation and Assessment of Comorbidities: *Standards of Care in Diabetes—2024*

www.DiabetesEd.net

FIVE critical times to provide and modify DSMES

1) At diagnosis.
2) When not meeting treatment goals.
3) Annually
4) When complicating factors develop (medical, physical, psychosocial).
5) When transitions in life and care occur.

Powers MA, Bardsley JK, et al. DSMES Consensus Report, The Diabetes Educator, 2020
ADCES. AADE7 Self-Care Behaviors, The Diabetes Educator, 2020

5. Facilitating Positive Health Behaviors and Well-being to Improve Health Outcomes: *Standards of Care in Diabetes—2024*
American Diabetes Association Professional Practice Committee

(cdc.gov/diabetes/professional-info/training.html)

DSMES is underutilized

Despite the benefit of DSMES, data from the 2017 and 2018 Behavioral Risk Factor Surveillance System of 61,424 adults with self-reported diabetes indicate that

53% of individuals eligible for DSMES through their health insurance receive it.

Scan for NorCal Resource Directory

DSMES is for Everyone

- All people with diabetes benefit from diabetes self-management education and support to facilitate the knowledge, decision-making, and skills mastery for diabetes self-care.
- Assess clinical outcomes, health status, well being and support.
- Person centered
- Digital coaching
- Identify barriers
- Eval SDOH
- Consider barriers

Psychosocial Assessment – Screen for:

- Integrate psychosocial care using a collaborative, person centered approach for all people with diabetes, to optimize health outcomes and health-related quality of life
- Assess for:
  - Diabetes Distress annually
  - Depression
  - Anxiety
  - Disordered eating
  - Cognitive capacities
- Use validated tools
- Initial visit & periodically
- If over 65, screen for depression & cognitive impairment
- Refer to behavioral health

5. Facilitating Positive Health Behaviors and Well-being to Improve Health Outcomes: *Standards of Care in Diabetes—2024*
American Diabetes Association Professional Practice Committee

Diabetes Distress & Screening Tools

- Screen people with diabetes, caregivers, and family members for diabetes distress at least annually.
  - Consider more frequent monitoring when treatment targets are not met, at transitional times, and/or in the presence of diabetes complications.
- Health care professionals can address diabetes distress
- May consider referral to a qualified behavioral health professional, ideally one with experience in diabetes, for further assessment and treatment if indicated.

professional.diabetes.org/sites/default/files/media/ada_mental_health_toolkit_questionnaires.pdf

- The ADA provides access to tools for screening specific psychosocial topics, such as diabetes distress, fear of hypoglycemia, and other relevant psychological symptoms

5. Facilitating Positive Health Behaviors and Well-being to Improve Health Outcomes: *Standards of Care in Diabetes—2024*

Medical Nutrition Therapy – ADA Macronutrient Distribution

- No ideal percentage of calories from protein, carbohydrate and fat for people with diabetes.
- Consider personal preferences
  - tradition, culture, religion, health beliefs and goals, economics
  - as well as metabolic goals when working with individuals to determine the best eating pattern for them
- Macronutrient distribution based on *individualized assessment*

Healthcare team members complement MNT, providing guidance on healthy food choices for the individual

5. Facilitating Positive Health Behaviors and Well-being to Improve Health Outcomes: *Standards of Care in Diabetes—2024*
American Diabetes Association Professional Practice Committee

Eating Patterns ADA Standards 2024

Until there is more evidence:

- Emphasize non-starchy vegetables
- Choose whole foods, including "power carbs", nuts/seeds
- Minimize meat, added sugars, sugary beverages, refined grains and ultra-processed foods
- Any approach should consider:
  - Individualize based on "health status, personal and cultural preferences, ability to sustain recommendations and ultimately food access and nutrition security"

5. Facilitating Positive Health Behaviors and Well-being to Improve Health Outcomes: *Standards of Care in Diabetes—2024*
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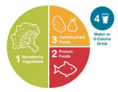
Meeting with a RD can result in a 0.3-2% drop in A1C

5. Facilitating Positive Health Behaviors and Well-being to Improve Health Outcomes: *Standards of Care in Diabetes—2024*
American Diabetes Association Professional Practice Committee

Healthy Eating Patterns/Approaches

Eating Patterns:
- Carb-Restricted
- Mediterranean Diet
- Plant based eating
- DASH (Dietary Approaches to Stop Hypertension)
- Structured low-calorie

Approaches:
- Diabetes Plate Method
- Carbohydrate Counting
- Intermittent fasting/time restricted
- Meal replacements



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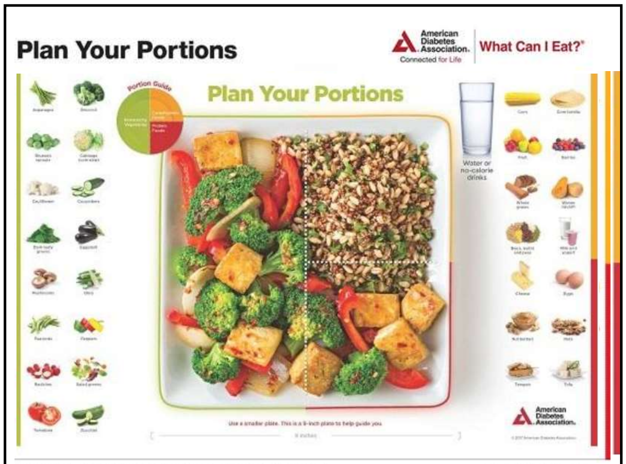

Carbs and Lowering Glucose

- Reducing overall carb intake has demonstrated most evidence for improved glycemia
- **Low carb** = Definition Varies
  - **25% or less,** Cals from carbs
  - Most people consume 44-46% of Cals from carb
- Emphasize non-starchy vegetables, fruits, and whole grains, as well as dairy products, with minimal added sugars

A systematic review found:
- Each 10% decrease in carb intake reduced A1C, fasting plasma glucose levels, weight, lipids, BP at 6 months.

But favorable effects diminished and were not maintained at follow-up or at greater than 12 months.

5. Facilitating Positive Health Behaviors and Well-being to Improve Health Outcomes: *Standards of Care in Diabetes—2024*
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Low Carb Meal Plan Not Recommended for:

- Women who are pregnant or lactating or children
- People with or at risk for disordered eating
- People who have renal disease
- Use with caution if taking SGLT-2 Inhibitor due to potential risk of ketoacidosis

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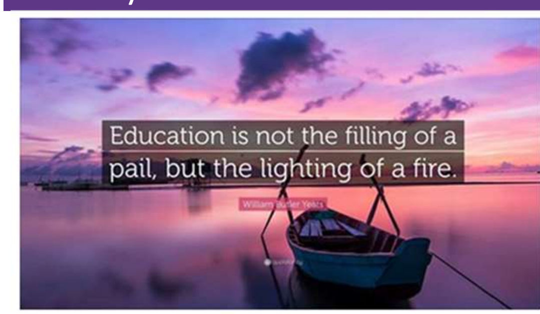
Exercise Standards

- Adults – 150 min/wk moderate intensity
  - over 3 days a week.
  - Don't miss > 2 consecutive days w/out exercise
  - Get up every 30 mins - Reduce sedentary time
  - T1 and T2 – resistance training 2 -3 xs a week
  - Flexibility and balance training 2-3 xs a week (Yoga and Tai Chi)

Half way there



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Self-Care Skills

- Goes to gym 2-3 times a week
- Plays golf on occasion.
- Eats out 2 times a week.

Next Steps

- Nutrition coaching
- Has appt with RD
- Vaccines
- DSME

ABCs of Diabetes – ADA 2024

- A1c less than 7%
  - Pre-meal BG 80-130
  - Post meal BG <180
  - Time in Range (70-180) 70% of time
    - Time below range | Low, less than 70mg/dL <4% of time &
    - Very low, less than 54 mg/dL <1% of time

Glycemic targets need to be woven into the overall person-centered strategy.

- Blood Pressure < 130/80
- Cholesterol
  - Statin therapy based on age & risk status
  - If 40+ with ASCVD Risk, decrease 50%, LDL <70
  - If 40+ with ASCVD, decrease 50%, LDL <55

Ambulatory Glucose Profile

- Standardized report with visual cues for those on CGM devices
- For most with type 1 or type 2 diabetes

  > 70% of readings within BG range of 70-180mg/dL

  < 4% of readings < 70 mg/dL

  < 1% of readings < 54 mg/dL

  < 25% of readings > 180 mg/dL

  < 5% of readings > 250 mg/dL

For those with frailty or at high risk of hypoglycemia recommend:

- Target of 50% time in range
- Less than1% time below range

6. Glycemic Goals and Hypoglycemia: *Standards of Care in Diabetes—2024*

Assess for Hypoglycemia (Glucose)

- **BG <70mg/dl – Level 1**
- Follow 15/15 rule and contact provider to make needed changes. At increased hypo risk.

- **BG < 54mg/dl – Level 2**
- Indicates serious hypo. Reassess BG Goals. Consider med decrease. Predictive of Level 3 Hypo. Needs Glucagon Emergency Kit

- **Severe Hypoglycemia – Level 3**
- Altered mental, physical functioning.
- Requires external assistance – no threshold

6. Glycemic Goals and Hypoglycemia: *Standards of Care in Diabetes—2024*
American Diabetes Association Professional Practice Committee

Tx of Level 2 & 3 Hypoglycemia

- If can swallow w/out risk of aspiration, try gel, honey, etc. inside cheek
- If unable to swallow, D50 IV or Glucagon
- Glucagon injection (need Rx)
  - Inform and instruct caregivers, school personnel, family, coworkers of hypo signs and appropriate action
  - Dosing: Adults 1mg, Children <20kg 0.5mg
  - Glycemic effect 20 - 30mg, short lived
  - Must intake carb as soon as able
- If on Insulin or level 2 or 3 hypo, (<54), get Glucagon ER Kit. Re-evaluate diabetes med treatment plan. Glucose sensor recommended.

Poll Question

- JL is 78 and drinks a "few cocktails" every night. Lives with partner and takes basal insulin at night and bolus insulin as needed. Has had a few low blood glucose levels in past week of 62, 49 and 51. What is the most important recommendation?

- A. Decrease alcohol intake
- B. Check BG at least 4 times a day.
- C. Double check injection sites.
- D. Get glucagon rescue medication.

Glucagon Rescue Medications for Diabetes-Related Hypoglycemia

Name/Delivery	Supplied	Dose Range: Adult	Dose Range: Peds / Age WT Dosing	Age / Route / Storage
Glucagon Emergency Kit Injection requires mixing glucagon powder	1mg / 1mL vial + syringe	1mg	0.03mg/kg or < 6yrs or < 25 kgs | 0.5mg ≥ 6yrs or > 25kgs | 1mg	All ages approved SubQ or IM admin Expires in 2 years at room temp.
Baqsimi Nasal glucagon powder	3 mg intranasal device	3 mg	< 4 yrs: not recommended 4 yrs or older | 3mg dose	Approved Age 4+ Nasal admin Expires ~ 2 years at room temp (keep in shrink-wrapped tube).
Gvoke Injectable liquid stable glucagon solution	0.5mg or 1.0mg in -Prefilled syringe -HypoPen auto-injector -Kit with vial and syringe	1 mg	< 2yrs: not recommended 2- 12 yrs < 45kg | 0.5mg ≥ 45kg | 1mg 12 yrs or older | 1mg	Approved Age 2+ SubQ admin in arm, thigh, abdomen Expires in 2 years at room temp (keep in foil pouch).
Dasiglucagon (Zegalogue) Stable liquid glucagon analog	0.6mg/0.6mL Prefilled syringe Autoinjector	0.6mg	< 6yrs: not recommended 6 yrs or older | 0.6mg	Approved Age 6+ SubQ in abdomen, buttocks, thigh outer upper arm Expires in 1 year at room temp. (store in red protective case).

**All raise BG 20+ points. Can cause nausea, vomiting. After admin, roll person on side. Seek medical help. If no response after 1st dose, give 2nd dose in 15 mins. When awake, give oral carbs ASAP when safe to swallow. Please consult package insert for detailed info.*

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DiabetesEd.net

Hypoglycemia: Identify, Treat, & Prevent

PocketCards are updated twice yearly. Scan QR code to download or order the latest version.

SCAN ME

Step 1

Identify your signs of hypoglycemia or low blood sugar:

- Sweaty
- Shaky
- Hungry
- Can't think straight
- Headache
- Irritated, grouchy
- Other

Step 2

If have signs of hypo, treat with carbs until glucose reaches 70+, then eat usual meal.

- Sugary drink, 4–8oz
- Piece of fruit
- Raisins, handful
- Glucose tabs, 4+
- Honey/glucose gel
- Skittles candy, 15+

Step 3

Have glucagon rescue meds available.

In case of severe hypo, identify someone (ahead of time) who can get medical help & give a glucagon rescue medication.

Notify your provider of low blood sugar events.

Hypoglycemia Levels:

Level 1 – Glucose less than 70
Level 2 – Glucose less than 54
Level 3 - Severe, needs assistance

Identify Causes of Hypo & Problem Solve to Prevent Future Episodes

» Low carb meal
» Extra activity
» Drinking alcohol
» Delayed, missed meal
» Too much insulin/meds
» Insulin timing

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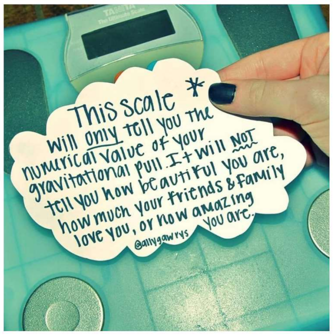
8. Obesity and Weight Management for Prevention & Treatment of Type 2 Diabetes

- *Once a year, calculate BMI and assess weight trajectory to inform approach*
- *Be sensitive and allow for privacy when weighing*
- Use person centered language based on indivdual preference
  - Person with higher weight or person in larger body

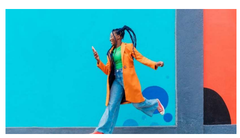
8. Obesity and Weight Management for the Prevention and Treatment of Type 2 Diabetes: *Standards of Care in Diabetes–2024*
American Diabetes Association Professional Practice Committee

Weight is a Heavy Issue



Use of BMI

- BMI poor indicator for "excessive fat" and health risk
- WHO defines Obesity as: *abnormal or excessive fat accumulation that presents a risk to health*
- Dx obesity using :
  - BMI + distribution measures like waist circumference, waist:hip or waist:height ratio and associated health consequences



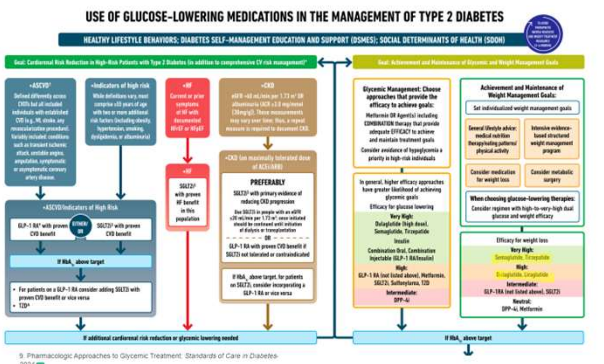
8. Obesity and Weight Management for the Prevention and Treatment of Type 2 Diabetes: *Standards of Care in Diabetes–2024*

American Diabetes Association Professional Practice Committee*

9: Step Wise Approach to Hyperglycemia 2024

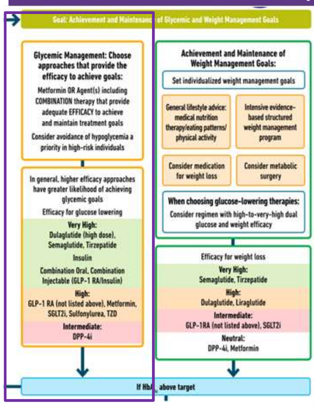
- *Usually, start one medication at a time*
- *However, evidence supports initial combo therapy if A1C 8.5% or more, to quickly reach goals and slow decline of glucose control.*
- Where to start?
  - Individual values
  - CVD, Heart failure or Kidney Disease
  - Minimize Hypoglycemia
  - Minimize wt gain or promote wt loss
  - Consider Cost

ADA Meds Algorithm



9. Pharmacologic Approaches to Glycemic Treatment: *Standards of Care in Diabetes-2024*
American Diabetes Association Professional Practice Committee

Metformin is "Usually" 1st Line



- Why metformin?
  - Longstanding evidence
  - High efficacy and safety
  - Inexpensive - 3 months for $12
  - Weight neutral
- If ASCVD, HF or CKD or high ASCVD risk, use SGLT2i or GLP-1 RA +/- metformin
- If A1C ≥ 8.5%, consider combo therapy.

9. Pharmacologic Approaches to Glycemic Treatment: *Standards of Care in Diabetes-2024*
American Diabetes Association Professional Practice Committee

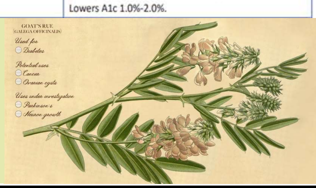
Common Oral Diabetes Meds

Diabetes Education Services

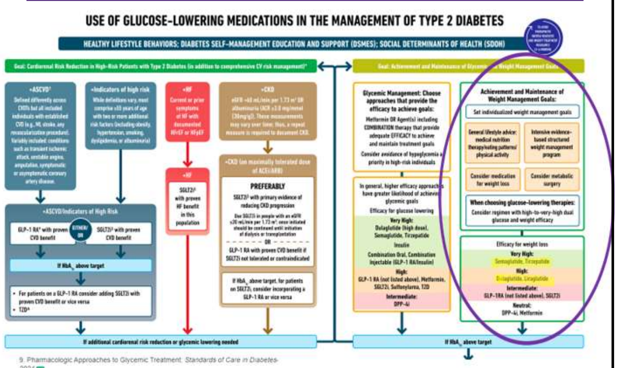
Download Success! Get Our Free CDCES Coach App

Class/Main Action	Name(s)	Daily Dose Range	Considerations
Biguanides • Decreases hepatic glucose output • First line med at diagnosis of type 2	metformin (Glucophage) Riomet (liquid metformin)	500 - 2550 mg (usually BID w/ meal) 500 - 2550 mg 500mg/5mL	**Side effects:** nausea, bloating, diarrhea, B12 deficiency. To minimize GI Side effects, use XR and take w/ meals. **Obtain GFR before starting.** • If GFR <30, do not use. • If GFR <45, don't start Meformin • If pt on Metformin and GFR falls to 30-45, eval risk vs. benefit; consider decreasing dose. **For dye study,** if GFR <60, liver disease, alcoholism or heart failure, restart metformin after 48 hours if renal function stable. **Benefits:** lowers cholesterol, no hypo or weight gain, cheap. Approved for pediatrics, 10 yrs + Lowers A1c 1.0%-2.0%.
	Extended Release-XR (Glucophage XR) (Glumetza) (Fortamet)	(1x daily w/dinner) 500 – 2000 mg 500 – 2000 mg 500 – 2500 mg	

Biguanide derived from:
Goat's Rue *Galega officinalis*,
French Lilac
Does NOT harm kidneys
$10 for 3-month supply from Walmart & other pharmacies



ADA Meds Algorithm



9. Pharmacologic Approaches to Glycemic Treatment: *Standards of Care in Diabetes-2024*

GLP-1 & GIP Receptor Agonists

Class/Main Action	Name	Dose Range	Considerations
GLP-1 RA - Glucagon Like Peptide Receptor Agonist **"Incretin Mimetic"** • Increases insulin release with food • Slows gastric emptying • Promotes satiety • Suppresses glucagon	exenatide (Byetta) exenatide XR†(Bydureon) liraglutide (Victoza)*† dulaglutide* (Trulicity)† semaglutide* (Ozempic) (Rybelsus) Oral tablet	5 and 10 mcg BID 2 mg 1x a week Pen injector - Bydureon BCise 0.6, 1.2 and 1.8 mg daily 0.75, 1.5, 3.0 and 4.5 mg 1x a week pen injector 0.25, 0.5, 1.0 and 2.0 mg 1x a week pen injector 3, 7, and 14 mg daily in a.m. Take on empty stomach with sip of water	**Side effects:** nausea, vomiting, weight loss, injection site reaction. Report signs of acute pancreatitis or intestinal blockage (ileus) and stop med. Increase dose monthly to achieve targets. **Black box warning:** Thyroid C-cell tumor warning (avoid if family history of medullary thyroid tumor). *Significantly reduces risk of CV death, heart attack, and stroke. †Approved for pediatrics 10-17 yrs Lowers A1C 0.5 – 1.6% Weight loss: 4-6% body weight loss.
GLP-1 & GIP Receptor Agonist Activates receptors for GLP-1 (see above) & Glucose-dependent Insulinotropic Polypeptide (GIP).	Tirzepatide (Mounjaro)	2.5, 5.0, 7.5, 10, 12.5 and 15 mg 1x a week prefilled single dose pen Increase dose by 2.5 mg once monthly to reach targets.	**Side effects:** nausea, diarrhea, injection site reaction. Report pancreatitis, signs of intestinal blockage. **Black box warning:** Avoid if family history of medullary thyroid tumor. Lowers A1C ~ 1.8 - 2.4% Weight loss: 7-13% body weight loss at max dose.

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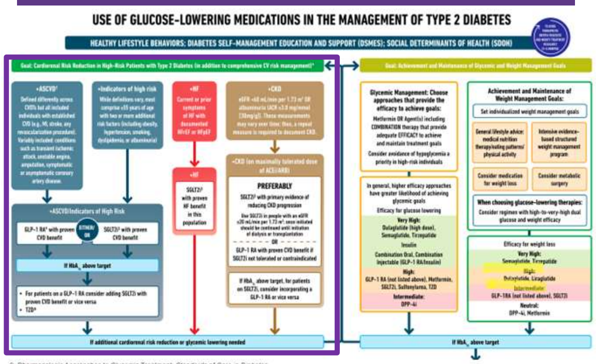
GLP-1/GIP Receptor Agonist Indications

Drug	Lower BG	Reduce CV Risk?	Wt loss approved?
Exenatide IR **(Byetta)** Lixisenatide **(Adlyxin)** Semaglutide **(Rybelsus)**	Yes		
Exenatide ER **(Bydureon)**	Yes for 10 yrs and older		
Dulaglutide **(Trulicity)**	Yes for 10 yrs and older	Yes	
Semaglutide **(Ozempic)**	Yes	Yes	Yes Wegovy 2.4mg
Liraglutide **(Victoza)**	Yes for 10 yrs and older	Yes	Yes Saxenda 3mg
Tirzepatide **(Mounjaro)**	Yes	?	Yes, Zepbound up to 15 mg

ADA Meds Algorithm



9. Pharmacologic Approaches to Glycemic Treatment: *Standards of Care in Diabetes-2024*
American Diabetes Association Professional Practice Committee

SGLT2 Inhibitors- "Glucoretics"

- **Action**: "Glucoretic" decreases renal reabsorption in the proximal tubule of the kidneys (reset renal threshold and increase glucosuria). Risk of ketoacidosis, Fournier's gangrene
- **Indicated as first line therapy** for those with Congestive Heart Failure and diminishing kidney function.

Common Oral Diabetes Meds

Class/Main Action	Name(s)	Daily Dose Range	Considerations
SGLT2 Inhibitors "Glucoretic" • Decreases glucose reabsorption in kidneys	Canagliflozin* (Invokana)	100 - 300 mg 1x daily	**Side effects:** hypotension, UTIs, genital infections, increased urination, weight loss, ketoacidosis. **Heart Failure, CV & Kidney Protection:** 1st line therapy for Heart Failure (HF), Kidney Disease (CKD), Cardiovascular Disease, before or with metformin. **Considerations:** See Package Insert (PI) for GFR cut-offs, dosing. Limited BG lowering effect if GFR < 45, still benefits kidneys & heart at lower GFR. If CKD & GFR ≥20, use SGLT-2 to reduce CVD, HF, preserve renal function. (ADA/EASD) **Benefits:** SGLT-2s* reduce BG, CV death & HF, slow CKD. †Approved for peds, 10 yrs +. Lowers A1C 0.6% to 1.5%.
	Dapagliflozin* (Farxiga)	5 - 10 mg 1x daily	
	Empagliflozin*† (Jardiance)	10 - 25 mg 1x daily	
	Ertugliflozin (Steglatro)	5 – 15 mg 1x daily	
	Bexagliflozin (Brenzavvy)	20 mg 1x daily	

2024 Standard 11 - Chronic Kidney Disease and Risk Management

- Optimize glucose and B/P Control to protect kidneys
- Screen Urine Albumin Create ratio (UACR) & GFR
  - Type 2 at dx then yearly
  - Type 1 with diabetes for 5 years, then yearly
  - If urinary albumin ≥300 and GFR 30–60 monitor 1-4 times a year to guide therapy.
- Treat hypertension with ACE or ARB and for elevated albumin-to-creatinine ratio of 30 -299.
- Monitor serum creat and K+
  - if on ACE, ARB or diuretics

Albuminuria Categories	Urinary Albumin Creatine Ratio (UACR)
Normal to mildly increased – A1	< 30 mg/g
Moderately increased – A2	30 – 299 mg/g
Severely increased – A3	300 mg/g +

Kidney Disease Stage	GFR
Stage 1 – Normal	90+
Stage 2 – Mild loss	89 - 60
Stage 3a – Mild to Mod	59 - 45
Stage 3b – Mod to Severe	44 - 30
Stage 4 – Severe loss	29 -15
Stage 5 – Kidney failure	14 - 0

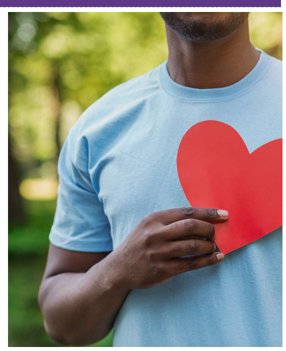
11. Chronic Kidney Disease and Risk Management: *Standards of Care in Diabetes—2024*

SGLT-2i Indications Summary

Drug	Lower BG	Reduce CV Risk?	Use to treat Heart Failure?	Slow renal disease?
Dapagliflozin (Farxiga)	Yes	Yes	Yes +/- Diabetes	Yes
Empagliflozin (Jardiance)	Yes	Yes	Yes +/- Diabetes	Yes
Canagliflozin (Invokana)	Yes	Yes	Yes w/ Diabetes	Yes
Ertugliflozin (Steglatro)	Yes		Yes w/ Diabetes	Yes
Bexagliflozin (Brenzavvy)	Yes		Yes w/Diabetes	Yes

Diabetes Meds Lower CV Risk

- **If diabetes plus ASCVD risk factors**
  - SGLT-2s* and GLP-1s* reduce risk of major adverse CV events
  - Plus ACE or ARB if HTN
  - Post MI, continue beta blockers for 3 years.
- **If type 2 diabetes and heart failure**
  - SGLT-2s reduce risk of heart failure and hospitalization.
  - Also consider beta blocker



10. Cardiovascular Disease and Risk Management: *Standards of Care in Diabetes—2024*

How much do they cost?

TZD's - Actos and Avandia $5 & $348

"Squirters" - Glipizide, Glyburide, Glimepiride $10 for 3 mo's

Metformin and Metformin XR

"Incretin enhancers" or DPP-IV*i*

Januvia, Tradjenta $657 & $630

"Incretin Injection" - (GLP-1 RA's)

Exenatide and Semaglutide $964, $1123

"Glucoretic"- SGLT-2s Empagliflozin $408- $718

"Twincretin" (GLP-1 + GIP) Tirzepatide (Mounjaro) $982

See Table 9.3 in ADA Standards on Median Monthly Average Wholesale Price (AWP) 2024

Mr. J - What are Your Recommendations?

Mr. J Profile

67 yr old with newly type 2. History of stroke.

Meds: Metoprolol, metformin, lovastatin 20mg.

ADD SGLT-2 or GLP-1

Labs:

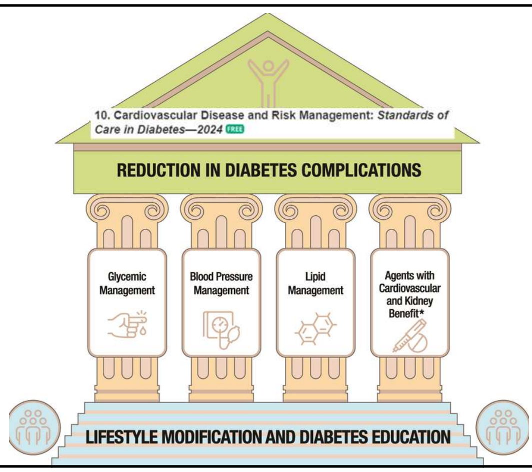
- A1C 9.3% (goal 7%)
- LDL 136 mg/dl (goal <55)
- Triglycerides 260mg/dl (<150)
- GFR 58, UACR 32 (>50, <30)
- B/P 142/79 (130/80)
- Liver enzymes in normal range

Self-Care Skills

- Goes to gym 2-3 times a week
- Plays golf on occasion.
- Eats out 2 times a week.

Next Steps

- Continue healthy eating, activity
- Add SGLT-2 or GLP
- Make sure on max metformin dose

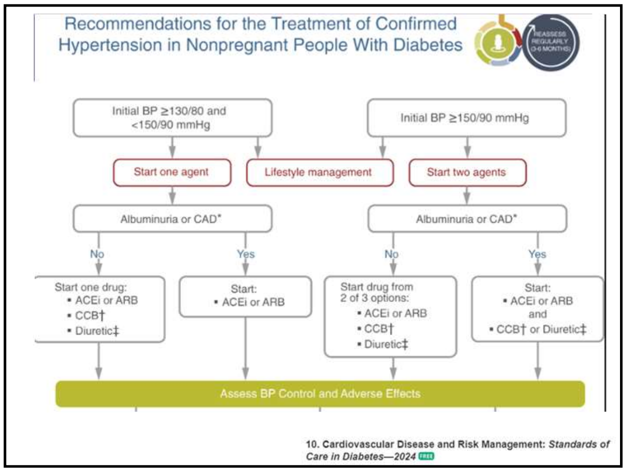


BP Treatment in addition to Lifestyle

- **BP target <130/80**
  (if it can be safely attained)
  - With albuminuria* or ASCVD
    - Start either ACE or ARB
  - No albuminuria - Any of the 4 classes of BP meds can be used:
    - *ACE Inhibitors, *ARBs, *thiazide-like diuretics or calcium channel blockers.
    - *Monitor K+ 7-14 days after start/annually
  - Avoid ACE and ARB at same time
  - Multiple Drug Therapy often required
- **If B/P ≥ 150 /90 start 2 drug combo**

*Albuminuria = Urinary albumin creatinine ratio of 30+

10. Cardiovascular Disease and Risk Management: *Standards of Care in Diabetes—2024*



Poll Question

RZ is 47 years old with type 2 diabetes and hypertension. RZ takes metformin 1000 mg BID, plus lisinopril 20mg daily. RZs LDL is 130 mg/dL. Based on the most recent ADA Standards, what is the LDL Cholesterol target for RZ?

A. LDL less than 100 mg/dL.

B. Lower LDL by 30%.

C. LDL target of 65 mg/dL or less.

D. Determine LDL target based on ASCVD risk.

ADA 2024 Summary

A1c less than 7% (individualize)

- Pre-meal BG 80-130
- Post meal BG <180
- Time in Range (70-180) 70% of time

Blood Pressure <130/80

Cholesterol

- Statin therapy based on age & risk status
- If 40+ with ASCVD Risk, decrease LDL by 50%, LDL <70
- If 40+ with ASCVD, decrease LDL by 50%, LDL <55

Lipid Monitoring and Lifestyle Treatment Strategies

- Lipid Goals
  - LDL < 70 or 55 based on risk
  - HDL >40
  - Triglycerides <150

Monitoring:
If **not** taking statins and underage of 40.
- check at time of diagnosis and every 5 yrs.
On statin
Monitor lipids at diagnosis and yearly.
Monitor lipids 4-12 weeks after statin dose adjustment.

- Weight loss if indicated
- Mediterranean or DASH Diet
- Reduction of saturated fat intake
- Increase of omega-3 fatty acids, viscous fibers and plant stanols/sterols
- Increase activity level
- BG lowering helps lower triglycerides and increase HDL

10. Cardiovascular Disease and Risk Management: *Standards of Care in Diabetes—2024* FREE

Statin Therapy

- Moderate intensity (lowers LDL 30-50%)
  - atorvastatin (Lipitor) 10-20mg
  - rosuvastatin (Crestor) 5-10mg
  - simvastatin (Zocor) 20-40mg
  - pravastatin (Pravachol) 40 – 80mg
  - lovastatin (Mevacor) 40 mg
  - fluvastatin (Lescol) XL 80mg
  - pitavastatin (Livalo) 1-4mg
- High intensity statins (lowers LDL 50%):
  - atorvastatin (Lipitor) 40-80mg
  - rosuvastatin (Crestor) 20-40mg

10. Cardiovascular Disease and Risk Management: *Standards of Care in Diabetes—2024* FREE

New Lipid Lowering Medications

Contributor: Diana Isaacs, PharmD, BCPS, BCACP, BC-ADM, CDCES, FADCES, FCCP 2022

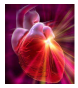
PCSK9 Inhibitors Lipid Medications
Proprotein convertase subtilisin/kexin type 9

	Alirocumab (Praluent)	Evolocumab (Repatha)
FDA-approved indications	• Primary hyperlipidemia (HLD) • Homozygous familial hypercholesterolemia (HoFH) • Secondary prevention of cardiac events	
Dosing	• **HoFH**: 150 mg SC q2 weeks • **HLD or secondary cardiac prevention**: 75 mg SC q2 weeks or 300 mg SC q4 weeks; if adequate LDL response not achieved, may increase to max of 150 mg q2 weeks	• **HoFH**: 420 mg SC q4 weeks; may increase to 420 mg q2 weeks if meaningful response not achieved in 12 weeks • **HLD or secondary cardiac prevention**: 140 mg q2 weeks or 420 mg q4 weeks
Dosage forms	• Auto-injector 75 mg/mL or 150 mg/mL	• Repatha Sure Click (auto-injector) 140 mg/mL • Repatha Pushtronex System (single use infusor with pre-filled cartridge) 420 mg/3.5 mL – administered over 9 minutes
Storage	• Store in refrigerator in outer carton until used • Once used, keep at room temperature, use within 30 days	
Injection clinical pearls	• Do not shake or warm with water • Administer by SC injection into thigh, abdomen, or upper arm • Rotate injection site with each injection	
Drug interactions	• No known significant interactions	
Monitoring parameters	• Lipid panel before initiating therapy, 4-12 weeks after initiating, and q3-12 months thereafter	
Side effects	• Injection site reaction (4-17%) • Hypersensitivity reaction (9%) • Influenza (6%) • Myalgia (4-6%) • Diarrhea (5%)	• Nasopharyngitis (6-11%) • Upper respiratory tract infection (9%) • Diabetes mellitus (9%) • Influenza (8-9%) • Injection site reaction (6%) • Myalgia (4%)

From Meds Cheat Sheet Page

Coronary Vessel Disease Meds

- In those with CVD or at higher risk:
  - Get blood glucose to goal
  - Statin therapy with addition of ezetimibe or a PCSK9 inhibitor recommended if goals not achieved on maximum tolerated statin therapy.
  - B/P Med (ACE or ARB)
  - Beta blocker after MI or CHF
  - Aspirin (or another agent)
  - Diabetes Meds that significantly decrease CV events:
    - *SGLT-2i's
      - Empagliflozin (Jardiance), canagliflozin (Invokana), dapagliflozin (Farxiga)
    - *GLP-1 RA's
      - Semaglutide (Ozempic), liraglutide (Victoza), dulaglutide (Trulicity)



10. Cardiovascular Disease and Risk Management: *Standards of Care in Diabetes—2024*

Mr. J - What are Your Recommendations?

Mr. J Profile

67 yr old with newly type 2. History of stroke.

Meds: Metoprolol, metformin, lovastatin 20mg.

ADD SGLT-2 or GLP-1

Increase lovastatin

Add ACE or ARB

Labs:

- A1C 7.3% (goal 7%)
- LDL 118 mg/dl (goal <55)
- Triglycerides 210mg/dl (<150)
- GFR 58, UACR 32 (>50, <30)
- B/P 138/79 (130/80)
- Liver enzymes in normal range

Self-Care Skills

- Goes to gym 2-3 times a week
- Plays golf on occasion.
- Eats out 2 times a week.

Next Steps

- Continue healthy eating, activity
- Get B/P machine for home
- Make sure has meter
- Check UACR/GFR in next few months

Gets admitted to hospital

16. Diabetes Care in the Hospital - What's the Big Deal?

- Hyperglycemia is associated with increased morbidity and mortality in hospital settings.
  - Acute Myocardial Infarction
  - Stroke
  - Cardiac Surgery
  - Infection
  - Longer lengths of stay

16. Diabetes Care in the Hospital: *Standards of Care in Diabetes—2024*

American Diabetes Association Professional Practice Committee

ADA Goals and Treatments Hospitalized Patients

- Critical Care
  - Individualize based on pt status
  - Once insulin therapy initiated, blood glucose goal is 140-180
  - More stringent goals of 110 -140 may be appropriate in ICU, with careful consideration of preventing hypo.
  - Basal bolus or Insulin drip

16. Diabetes Care in the Hospital: *Standards of Care in Diabetes—2024*
American Diabetes Association Professional Practice Committee

- Med Surg Goals
  - □ 100 -180
  - □ Poor oral intake – use basal insulin + correction
  - □ Healthy intake – basal bolus

SGLT-2's in Hospital Setting?

- Recommended if type 2 diabetes and heart failure.
  - Initiate use of a SGLT-2 or continue during hospitalization and upon discharge, if no contraindications and after recovery from the acute illness.
- Avoid SGLT2 inhibitors in cases of severe illness, in people with ketonemia or ketonuria, and during prolonged fasting and surgical procedures
- Hold SGLT-2's 3 days (4 days for Ertugliflozin) before surgery

16. Diabetes Care in the Hospital: *Standards of Care in Diabetes—2024*
American Diabetes Association Professional Practice Committee

DiaBingo- G

G ADA goal for A1c is less than ____%
G People with DM need to see their provider at least every month
G Blood pressure goal is less than
G People with DM should see eye doctor (ophthalmologist) at least
G The goal for triglyceride level is less than
G Goal for my HDL cholesterol is more than
G The goal for blood sugars 1-2 hours after a meal is less than:
G People with DM should get this shot every year

G People with DM need to get urine tested yearly for ___________

G Periodontal disease indicates increased risk for heart disease
G The goal for blood sugar levels before meals is:
G The activity goal is to do ___ minutes on most days

Survey – Just Click and Complete