Diabetes and Hypertension Project ECHO* Clinic

*ECHO: Extension of Community Healthcare Outcomes

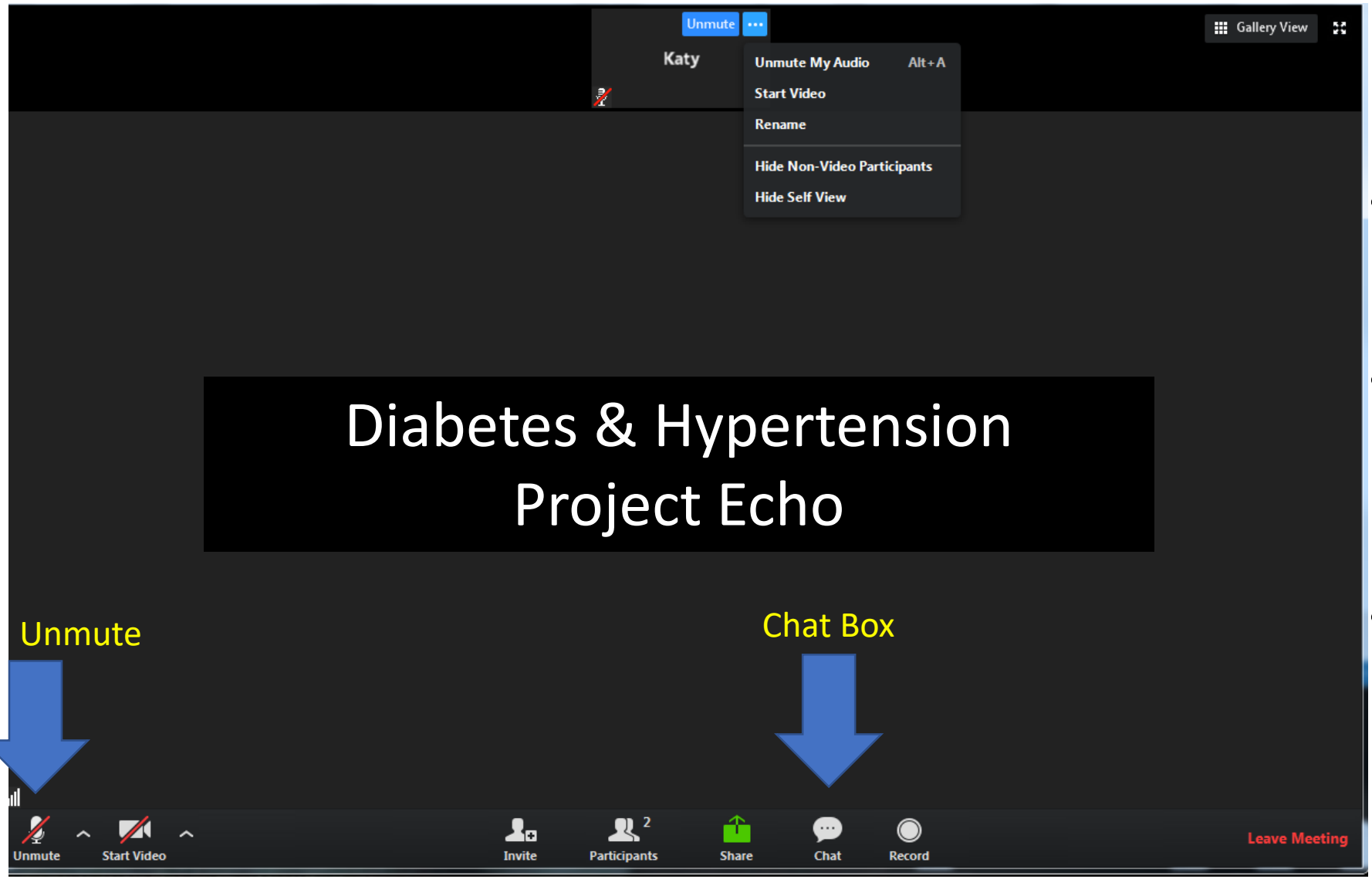
March 8, 2023

Before we begin:

- Rename your Zoom screen with your name and organization
- Claim CE:
- Go to **vcuhealth.org/echodmhtn** for instructions on creatin your account

The Diabetes and Hypertension ECHO is made possible by funding through CDC Cooperative Agreement NU58DP006620-InnoVAte.

Zoom Reminders



- You are all on mute. Please unmute to talk.
- If joining by telephone audio only, press *6 to mute and unmute.
- Use the chat function to speak with our team or ask questions.

Helpful Reminders

- Please feel free to eat your lunch or step away briefly if needed
- We are recording and can share sessions upon request
  - Each session's slides are available on www.vcuhealth.org/echodmhtn
- Please **do not share any protected health information** in your discussion or the chat box
- Project ECHO operates on the "All Teach, All Learn" model
  - Feel free to ask questions in the chat or unmute to ask questions at designated times
  - We're all here to learn from each other and value each person's input and expertise!

VCU Health Diabetes & Hypertension ECHO Clinics

VCU Hub Team	
Principal Investigator	Dave Dixon, PharmD
Clinical Experts	Niraj Kothari, MD Trang Le, MD
Program Coordinator	Sydney Weber

- One-hour ECHO clinics on 2nd Thursdays
- Every ECHO clinic includes a didactic presentation followed by case discussions
- Website: www.vcuhealth.org/echodmhtn
  - Directions for claiming CE :

Disclosures

Trang Le, M.D., has no financial conflicts of interest to disclose.

There is no commercial or in-kind support for this activity.

American Diabetes Association Standards of Care 2023 – Updates

Learning objectives

- Review summary of changes in the 2023 American Diabetes Association Standards of Care
- Discuss updates to the medication algorithims for glucose-lowering agents in the treatment of diabetes
- Summarize changes to screening of diabetes-related comorbidities

- Beginning with the 2018 ADA Standards of Care in Diabetes, the Standards document became a “living” document where notable updates are incorporated into the Standards
- Living Standards Updates Available at: http://care.diabetesjournals.org/living-standards

Notable updates:

- Emphasis on supporting higher weight loss (up to 10-15% or more) based on the efficacy of and access to newer medications when appropriate
- New recommendations related to **sleep health and physical activity** in people with diabetes
- Broad consideration of **social determinants of health** in guiding the design and delivery of care
- New **hypertension diagnosis cut-offs** (hypertension is now defined as a systolic blood pressure ≥130 mmHg or a diastolic blood pressure ≥80 mmHg)
- The **expanded role of SGLT2 inhibitor use** in preserved and reduced heart failure ejection fraction
- The **role of finerenone** in individuals with diabetes and chronic kidney disease with albuminuria
- New **lipid management recommendations** suggesting lower LDL goals for high-risk individuals

Diabetes Care 2023;46(Supplement_1):S5–S9 https://doi.org/10.2337/dc23-Srev

Notable updates:

- Details on **digital health, telehealth**, and **telemedicine** and the benefits of these modalities of care delivery
- The utility of **point-of-care A1C testing** for diabetes screening and diagnosis
- An expanded "**Nonalcoholic Fatty Liver Disease**" (NAFLD) subsection
- Screening for **food insecurity** by any member of the diabetes healthcare team
- The use of **technology in older adults with diabetes**
- The use of **person-first and inclusive language**
- Updates in **vaccination for people with diabetes**
- Updates in **COVID-19 and diabetes**

Diabetes Care 2023;46(Supplement_1):S5–S9 https://doi.org/10.2337/dc23-Srev

Question

For diabetes screening and diagnosis, which of the following is true?

a. Point-of-care A1c test results must be confirmed in a laboratory to meet diagnostic criteria for diabetes

b. Point-of-care A1c testing can be used for diabetes screening and diagnosis

POCT A1c

- To avoid misdiagnosis or missed diagnosis, the A1C test should be performed using a method that is certified by the National Glycohemoglobin Standardization Program (NGSP) and standardized to the Diabetes Control and Complications Trial (DCCT) assay
- Point-of-care A1C testing for diabetes screening and diagnosis should be restricted to U.S. Food and Drug Administration–approved devices at laboratories proficient in performing testing of moderate complexity or higher, by trained personnel

Question: Which of the following is most cost-effective for initial screening of Nonalcoholic Fatty Liver Disease (NAFLD) in diabetes?

a. Fibrosis-4 index (FIB-4)

b. Liver ultrasound

c. Coagulation factors (PT, INR)

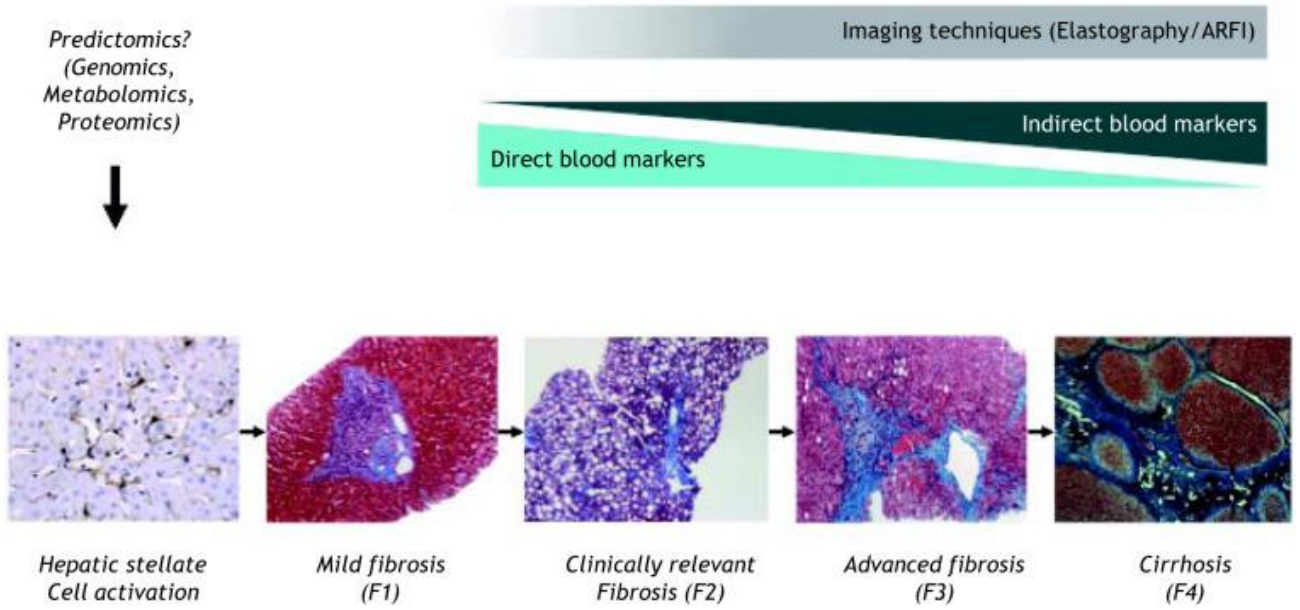
d. AST and ALT

Nonalcoholic fatty liver disease (NAFLD)

- broad spectrum of disease:
  - nonalcoholic fatty liver with macrovesicular hepatic steatosis only (or with mild inflammation) →
  - →steatohepatitis (nonalcoholic steatohepatitis [NASH])→
  - → cirrhosis
- absence of significant alcohol consumption:
  - >21 standard drinks per week in men
  - >14 standard drinks per week in women
  - over a 2-year period preceding evaluation) or the presence of other secondary causes of fatty liver disease

Nonalcoholic fatty liver disease (NAFLD)

- Fibrosis stages are classified histologically as:
- F0, no fibrosis;
- F1, mild;
- F2, moderate (significant);
- F3, severe (advanced);
- F4, cirrhosis.



Andrés Duarte-Rojo, et al, Annals of Hepatology, Volume 11, Issue 4,2012, 426-439,

Nonalcoholic fatty liver disease (NAFLD)

- NAFLD is prevalent in >70% of US adults with type 2 diabetes and 20% of those with T1DM
- NASH is a leading cause of hepatocellular carcinoma (HCC) and liver transplantation in the U.S.
- Transplant waiting lists are overrepresented by people with type 2 diabetes

Nonalcoholic fatty liver disease (NAFLD)

- ***fibrosis-4 index (FIB-4)*** is the most cost-effective strategy for the initial screening of people with prediabetes and cardiometabolic risk factors or type 2 diabetes in the primary care and diabetes clinical setting
- A screening strategy based on elevated plasma aminotransferases >40 units/L would miss most individuals with NASH in these settings, as clinically significant fibrosis (≥F2) is frequently observed with lower AST levels

Nonalcoholic fatty liver disease (NAFLD)

The American College of Gastroenterology considers the upper limit of normal ALT levels to be

29–33 units/L for male individuals and

19–25 units/L for female individuals

- higher levels are associated with increased liver-related mortality, *even in the absence of identifiable risk factors*

MD+CALC

Search “QT interval” or “QT” or “EKG”

Fibrosis-4 (FIB-4) Index for Liver Fibrosis

Noninvasive estimate of liver scarring in HCV and HBV patients, to assess need for biopsy.

When to Use | Pearls/Pitfalls | Why Use

Age Use with caution in patients <35 or >65 years old, as the score has been shown to be less reliable in these patients		years
AST Aspartate aminotransferase	Norm: 15 - 41	U/L
ALT Alanine aminotransferase	Norm: 1 - 35	U/L
Platelet count	Norm: 150 - 350	× 10^3/μL

Result:

Please fill out required fields.

About the Creator

Dr. Richard Sterling

Also from MDCalc...

Related Calcs

- NAFLD Fibrosis Score
- HIV CKD Prediction
- MELD Score (New)

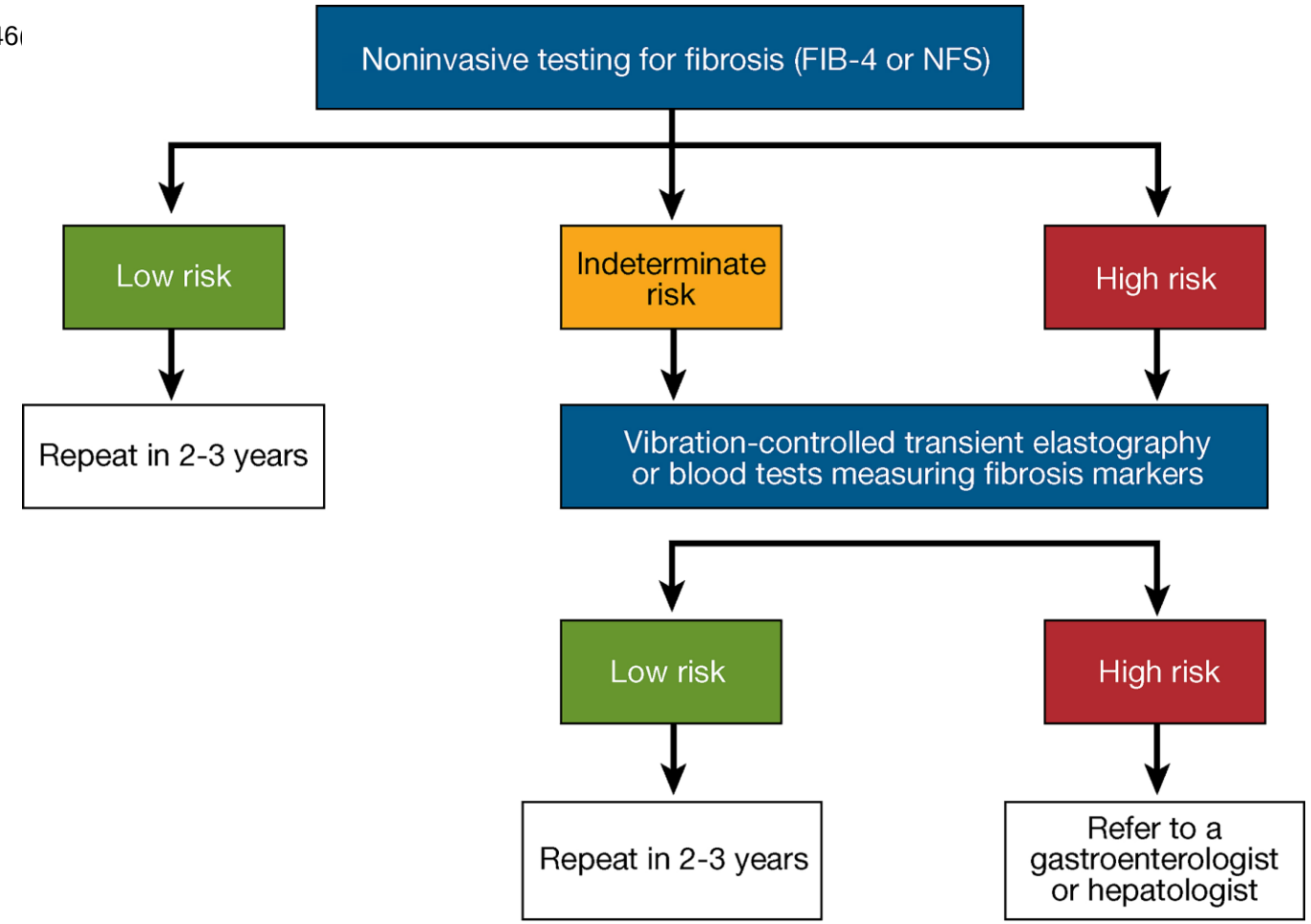
https://www.mdcalc.com/calc/2200/fibrosis-4-fib-4-index-liver-fibrosis

VCU

FIB-4 Index

- A value of <1.3 is considered lower risk,
- >2.67 is considered as having a high probability of advanced fibrosis (F3–F4)
- reasonable specificity and negative predictive value to *rule out* advanced fibrosis
- lacks adequate sensitivity and positive predictive value to establish presence of advanced fibrosis in many cases
- people with diabetes often fall in the “indeterminate risk” group for establishing the advanced fibrosis (or intermediate) group (between 1.3 and 2.67).
- low cost, simplicity, and good specificity make it the initial test of choice
- performance is better in a population with higher prevalence of significant fibrosis (i.e., hepatology clinics) compared with primary care settings.
- FIB-4 has not been well validated in pediatric populations and does not perform as well in those aged <35 years.
- In people with diabetes ≥65 years of age, higher cutoffs for FIB-4 have been recommended (1.9–2.0 rather than >1.3)

Diabetes Care. 2022;46



A proposed algorithm for risk stratification in individuals with nonalcoholic fatty liver disease (NAFLD) or nonalcoholic steatohepatitis (NASH). NFS, NAFLD fibrosis score created by a group of experts that included American Diabetes Association representatives. Reprinted from Kanwal et al. (64).

Glycemic targets and Time in Range (TIR)

- If using ambulatory glucose profile/glucose management indicator to assess glycemia, a parallel goal for many nonpregnant adults is time in range of >70% with time below range <4% and time <54 mg/dL (very low range) <1%.
- Question: What should the TIR goal be for patients at high risk of hypoglycemia?
  a. 80%
  b. 50%
  c. 40%
  d. 30%

Glycemic targets and Time in Range (TIR)

- For those with frailty or at high risk of hypoglycemia, a target of >***50% time in range with <1% time below range*** is recommended

CGM interfering substances

- Sensor interference due to several medications/substances is a known potential source of CGM measurement errors
- Several of these substances have been reported in the various CGM brands' user manuals,
- HOWEVER, additional interferences have been discovered after the market release of these products.
- Hydroxyurea, used for myeloproliferative disorders and hematologic conditions, is one of the most recently identified interfering substances that cause a temporary increase in sensor glucose values discrepant from actual glucose values
- → routinely review the medication list of the person with diabetes to identify possible interfering substances and advise them accordingly on the need to use additional BGM if sensor values are unreliable due to these substances

CGM interfering substances

Table 7.4—Continuous glucose monitoring devices interfering substances

Medication	Systems affected	Effect
Acetaminophen		
>4 g/day	Dexcom G6	Higher sensor readings than actual glucose
Any dose	Medtronic Guardian	Higher sensor readings than actual glucose
Alcohol	Medtronic Guardian	Sensor readings may be higher than actual glucose
Ascorbic acid (vitamin C), >500 mg/day	FreeStyle Libre	Higher sensor readings than actual glucose
Hydroxyurea	Dexcom G6, Medtronic Guardian	Higher sensor readings than actual glucose
Mannitol	Senseonics Eversense	Sensor bias within therapeutic concentration ranges
Tetracycline	Senseonics Eversense	Sensor bias within therapeutic concentration ranges

Obesity and Weight Management

- What % weight loss should be recommended to achieve disease modifying effects, including possible T2DM remission?

    a. >5%

    b. >10%

    c. >20%

Obesity and Weight Management

- As little as 3–7% weight loss reduces the risk for diabetes in people at risk and improves glycemia in those with diabetes
- Larger, sustained weight losses (>10%) usually confer greater benefits, including disease-modifying effects and possible remission of type 2 diabetes, and may improve long-term cardiovascular outcomes and mortality
- Given the challenge of losing weight and maintaining weight loss, aiming for relatively small and attainable weight loss is often an effective clinical strategy, particularly for individuals who feel overwhelmed by larger weight loss targets.

From: **9. Pharmacologic Approaches to Glycemic Treatment: Standards of Care in Diabetes—2023**

USE OF GLUCOSE-LOWERING MEDICATIONS IN THE MANAGEMENT OF TYPE 2 DIABETES

HEALTHY LIFESTYLE BEHAVIORS; DIABETES SELF-MANAGEMENT EDUCATION AND SUPPORT (DSMES); SOCIAL DETERMINANTS OF HEALTH (SDOH)

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

Goal: Cardiorenal Risk Reduction in High-Risk Patients with Type 2 Diabetes (in addition to comprehensive CV risk management)*

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

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

+ASCVD/Indicators of High Risk
GLP-1 RA# with proven CVD benefit — EITHER/OR — SGLT2i§ with proven CVD benefit
→ If A1C above target
- For patients on a GLP-1 RA, consider adding SGLT2i with proven CVD benefit or vice versa
- TZD^

+HF
Current or prior symptoms of HF with documented HFrEF or HFpEF
→ **+HF**
SGLT2i§ with proven HF benefit in this population

+CKD
eGFR <60 mL/min per 1.73 m² OR albuminuria (ACR ≥3.0 mg/mmol [30 mg/g]). These measurements may vary over time; thus, a repeat measure is required to document CKD.
→ **+CKD (on maximally tolerated dose of ACEi/ARB)**
PREFERABLY
SGLT2i§ with primary evidence of reducing CKD progression
Use SGLT2i in people with an eGFR ≥20 mL/min per 1.73 m²; once initiated should be continued until initiation of dialysis or transplantation
OR
GLP-1 RA with proven CVD benefit if SGLT2i not tolerated or contraindicated
→ If A1C above target, for patients on SGLT2i, consider incorporating a GLP-1 RA or vice versa

If additional cardiorenal risk reduction or glycemic lowering needed

Goal: Achievement and Maintenance of Glycemic and Weight Management Goals

Glycemic Management: Choose approaches that provide the efficacy to achieve goals:
Metformin OR Agent(s) including COMBINATION therapy that provide adequate EFFICACY to achieve and maintain treatment goals
Consider avoidance of hypoglycemia a priority in high-risk individuals

In general, higher efficacy approaches have greater likelihood of achieving glycemic goals
Efficacy for glucose lowering
Very High: Dulaglutide (high dose), Semaglutide, Tirzepatide
Insulin
Combination Oral, Combination Injectable (GLP-1 RA/Insulin)
High: GLP-1 RA (not listed above), Metformin, SGLT2i, Sulfonylurea, TZD
Intermediate: DPP-4i

Achievement and Maintenance of Weight Management Goals:
Set individualized weight management goals
- General lifestyle advice: medical nutrition therapy/eating patterns/physical activity
- Intensive evidence-based structured weight management program
- Consider medication for weight loss
- Consider metabolic surgery

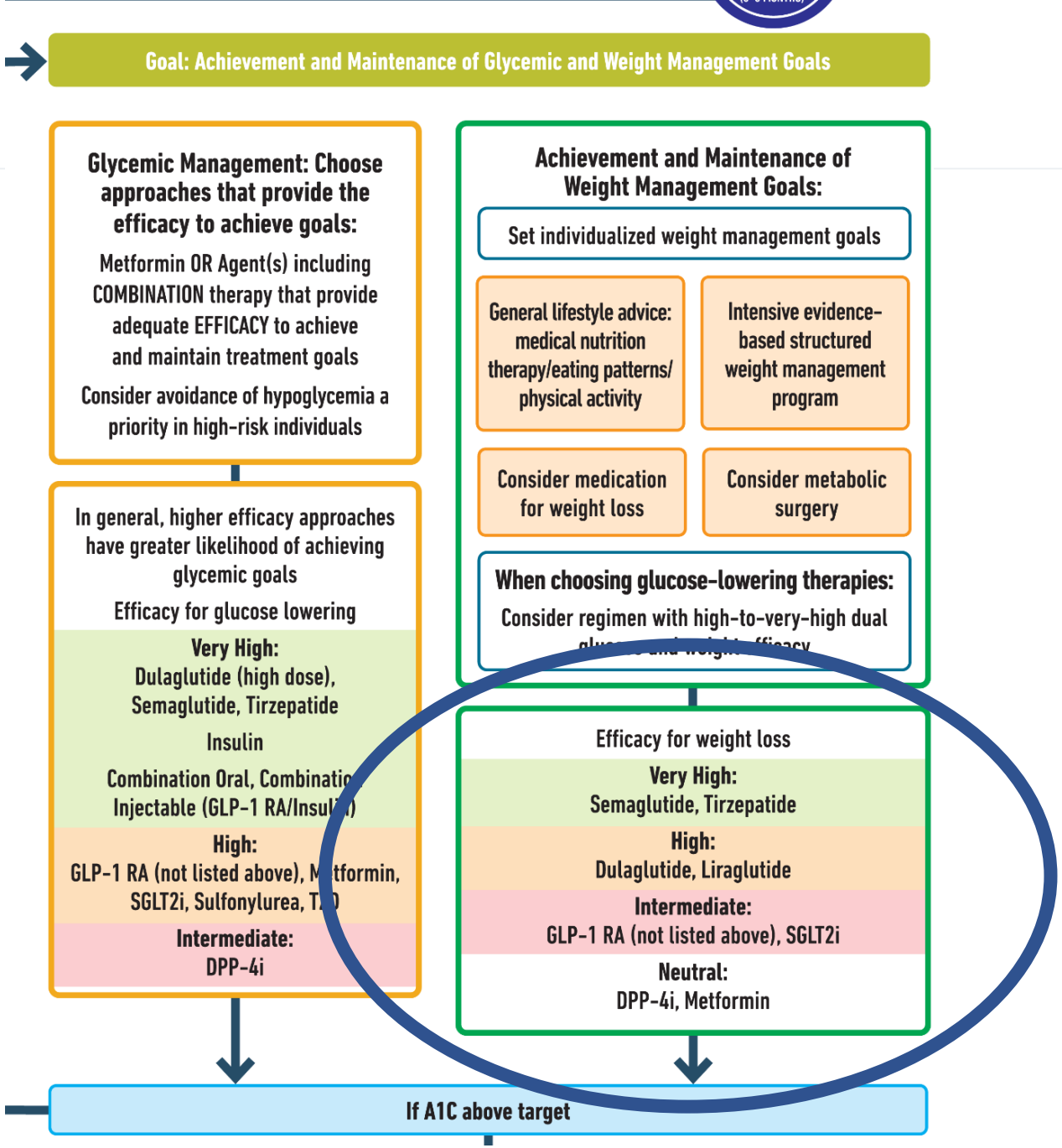
When choosing glucose-lowering therapies:
Consider regimen with high-to-very-high dual glucose and weight efficacy

Efficacy for weight loss
Very High: Semaglutide, Tirzepatide
High: Dulaglutide, Liraglutide
Intermediate: GLP-1 RA (not listed above), SGLT2i
Neutral: DPP-4i, Metformin

If A1C above target

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

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



Diabetes Care. 2022;46(Supplement_1):S140-S157. doi:10.2337/dc23-S009

Case Studies

Case 1: 69 year old Caucasian female, lives with her mother and helps manage her health conditions in addition to her own

- PMH: T2DM, HTN, obesity, depression
- Weight: 123kg
- Labs: A1C 7.2%, UACR 43 mg/g, eGFR 88
- Meds:
  - Lantus 27 units daily,
  - Ozempic 1 mg weekly,
  - Metformin XR 2000 mg daily (started at 500 mg daily with titration schedule to 2000 mg daily at last visit),
  - Humalog with meals- this has been changed from sliding scale insulin→ to general carb-size meal-based dosing→now a combination of carb-size meal-based dosing + SSI

Case 1: 69 year old Caucasian female, lives with her mother and helps manage her health conditions in addition to her own

- Patient has had ongoing GI issues that pre-dated initiation of metformin and Ozempic.
- They have not worsened with addition/titration of these drugs, and did not improve when drugs were temporarily discontinued.
- Referred to GI for this issue.
- Pt states years ago she was managed on an insulin pump and continues to carb count at home.
- Reports eating < 50 g carbs per day
- At last visit noted that her BG rises from AM to pre-lunch if skipping breakfast.
- Following this, we re-started metformin. She has had issues with post-prandial hypoglycemia when using correctional sliding scale and reported that carb-size meal-based dosing (eg 4 units Humalog for "small carb meal") "didn't work", so she returned to correctional scale

Case 1 – challenges

- How to developing carb/correctional scales that address this patient's needs.
- What are reasons to avoid scales ?because many patients aren't able to manage them appropriately,
- How can you best assess how to move forward in a patient who is already varying meal-time doses?
- Other therapies that could be considered? (currently avoiding SGLT2i because of low carb intake)

Case 2: Follow up from prior case. 62yo gentleman with T2DMs since 2013. Weight 100kg

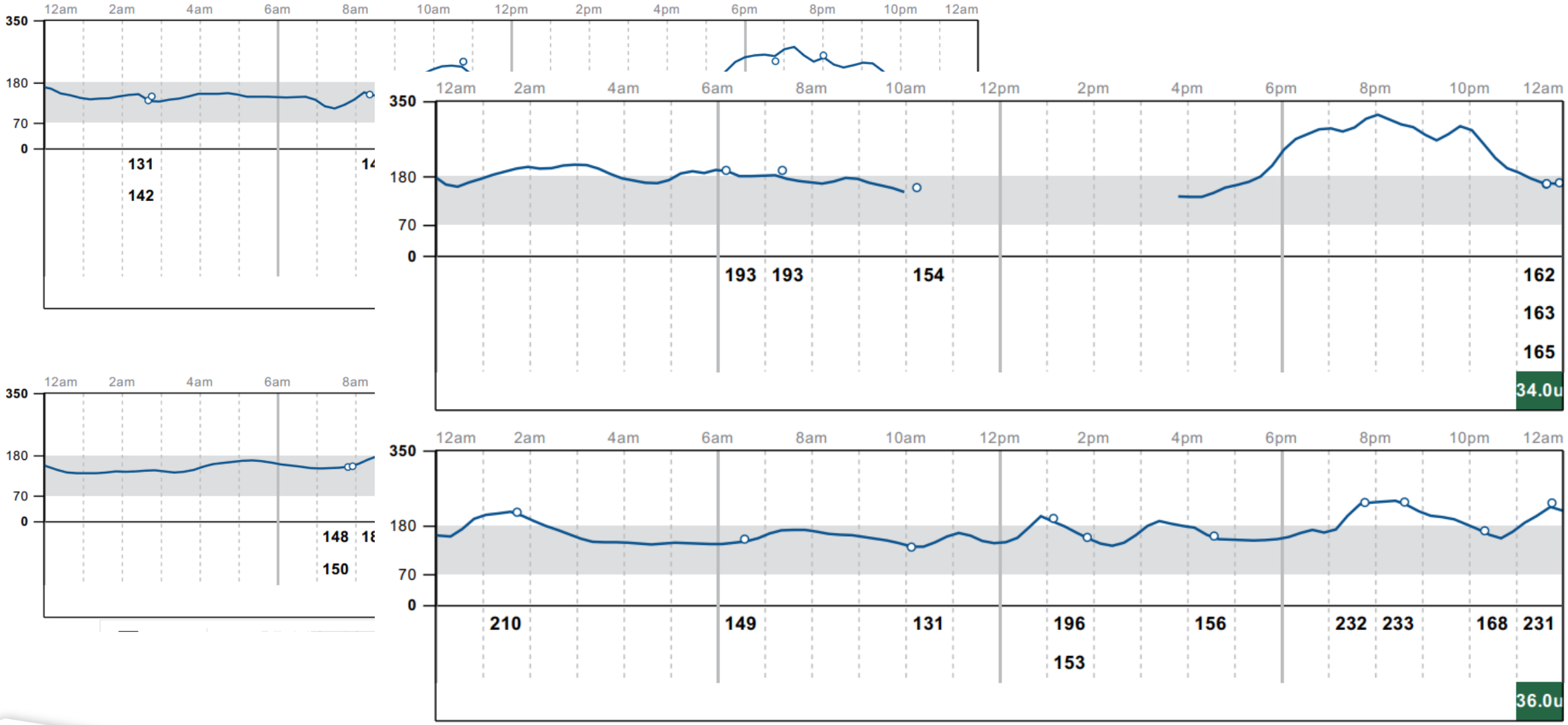
Component	Latest Ref Rng & Units	4/23/2018	7/24/2018	1/21/2019	6/13/2019	11/22/2019	3/16/2020	11/24/2020
Est Average Glucose	mg/dL	117	137	301	186	169	169	180
HEMOGLOBIN A1C	<5.7 %	5.7	**6.4 (H)**	**12.1 (H)**	**8.1 (H)**	**7.5 (H)**	**7.5 (H)**	**7.9 (H)**

Metformin, Jardiance, Trulicity,

4/27/2021	9/10/2021	12/22/2021	4/12/2022	9/28/2022	1/9/2023
189	186		180	**183**	174
8.2 (H)	**8.1 (H)**	**7.8 (H)**	**7.9 (H)**	**8.0 (H)**	**7.7 (H)**

Jardiance, Trulicity, Lantus 36 units daily, CGM
(worsening diarrhea, improved with stopping metformin)

September 2022



Next steps?

- Prandial insulin?
- BMI 36.58
- Ongoing difficulty with weight loss

Questions?

Case Studies

- Anyone can submit cases: www.vcuhealth.org/echodmhtn
- Receive feedback from participants and content experts
- Earn **$150** for submitting and presenting

Provide Feedback

www.vcuhealth.org/echodmhtn

- Feedback
  - Overall feedback related to session content and flow?
  - Ideas for guest speakers?

Send us your feedback

vcuhealth.org/services/telehealth/for-providers/education/diabetes-and-hypertension-project-echo

For Providers

- Education −
  - **Diabetes and Hypertension Project ECHO** −
    - Our Team
    - Curriculum
    - Claiming CE Credit
    - Contact Us
  - VCU Nursing Home ECHO +
  - VCU Health Palliative Care ECHO +
  - Virginia Opioid Addiction ECHO +
  - Virginia Sickle Cell Disease ECHO +

Diabetes and Hypertension Project ECHO

Welcome to the Diabetes and Hypertension Extension for Community Health Outcomes or ECHO, a virtual network of multidisciplinary diabetes and hypertension experts. An ECHO model connects professionals with each other in real-time collaborative virtual sessions on Zoom. Participants present de-identified cases to one another, share resources, connect to each other, and grow in their expertise. This ECHO will address practice level issues and solutions related to managing complex patients with difficult to control diabetes and hypertension. Register now for an ECHO Session!

Network, Participate and Present

- Engage in a collaborative community with your peers.
- Listen, learn and discuss informational and case presentations in real-time.
- Take the opportunity to submit your de-identified case study for feedback from a team of specialists for diabetes and hypertension.
- Provide valuable feedback.
- Claim CE credit by texting in attendance.

Benefits

VCU Diabetes & Hypertension Project ECHO Clinics

2nd Thursdays — 12 p.m. to 1 p.m.

Mark Your Calendars — Upcoming Sessions

April 13, 2023 – Bolus Insulin: When and How

May 11, 2023 – Management of Hypertriglyceridemia

Please register at www.vcuhealth.org/echodmhtn

Project ECHO
Virginia Commonwealth University

Thank you for coming!

Reminder: Mute and Unmute to talk
Press *6 for phone audio
Use chat function for questions

VCU

Diabetes Care. 2022;46(Supplement_1):S49-S67. doi:10.2337/dc23-S004

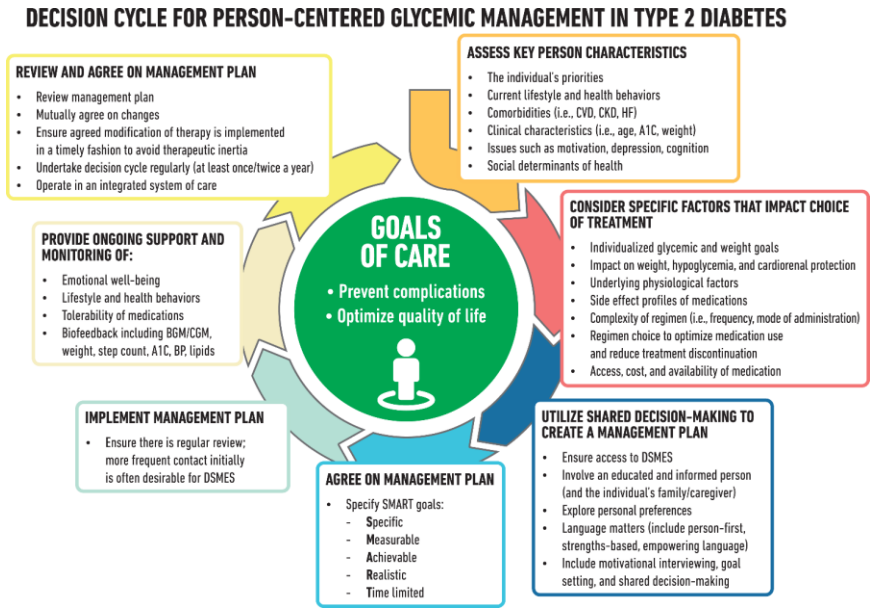


Figure Legend:

Decision cycle for person-centered glycemic management in type 2 diabetes. Adapted from Davies et al. (211). BGM, blood glucose monitoring; BP, blood pressure; CGM, continuous glucose monitoring; CKD, chronic kidney disease; CVD, atherosclerotic cardiovascular disease; DSMES, diabetes self-management education and support; HF, heart failure.