T1DM Screening and Management

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Objectives

1. **Understand the Screening Criteria for T1DM** and
   Identifying Individuals at Risk for Type 1 Diabetes

2. **Review Evidence-Based Management of T1DM** and
   Optimizing Glycemic Control in T1DM

3. **Recognize Complications and Comorbidities** and
   Managing Acute and Long-Term Complications in T1DM

T1D Staging System

Stage 1 (normoglycemia, positive antibodies, asymptomatic)

Stage 2 (dysglycemia, positive antibodies)

Beta cell destruction continues.

Blood sugar levels may become slightly elevated.

Still no obvious symptoms, but may experience subtle changes such as increased thirst or urination.

Stage 3 (clinical diagnosis)

Beta cell function is significantly impaired.

Blood sugar levels become significantly elevated.

Symptoms become apparent

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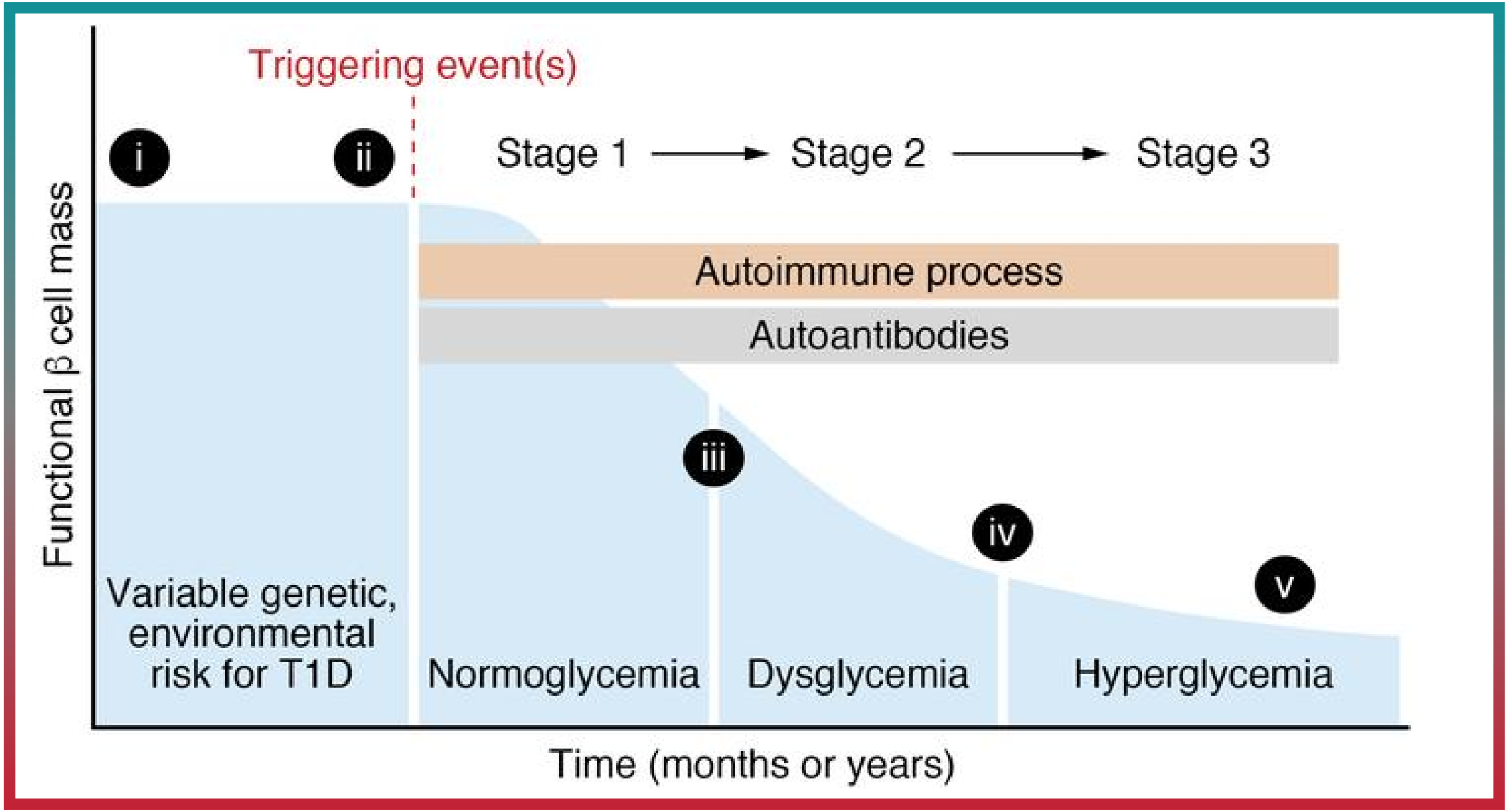


Powers, A., *J Clin Invest.* 2021;131(8):e142242. https://doi.org/10.1172/JCI142242.

Understand the Screening Criteria for T1DM

and

Identifying Individuals at Risk for T1DM

Who to Screen?

- First-degree relatives of individuals with T1DM
- Second-degree relatives of individuals with T1DM
- High-risk individuals based on genetic markers (HLA-DR3/DR4) or those with a personal or family history of autoimmune diseases such as celiac disease and thyroid disorders (e.g., Hashimoto's or Graves' disease).

https://www.cdc.gov/diabetes/basics/quick-facts.html

How to Screen?

- Screening may be done by detection of autoantibodies
- **GAD** – Glutamic Acid Decarboxylase
- **IAA** – Insulin
- **IA-2** – Islet antigen 2
- **ZnT8** – Zinc Transporter 8

https://www.cdc.gov/diabetes/basics/quick-facts.html

Type 1 Diabetes

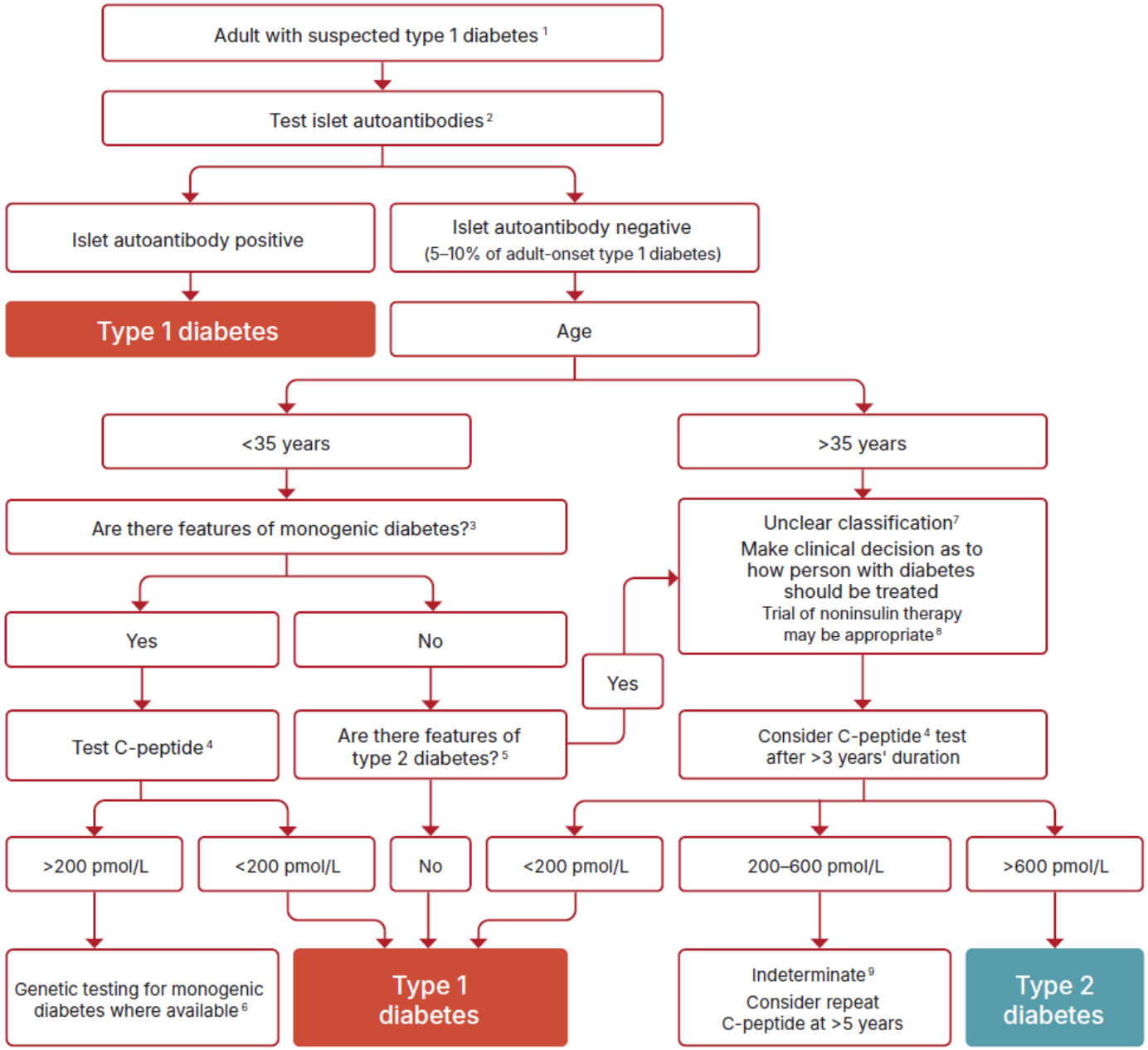
2.6 Screening for presymptomatic type 1 diabetes may be done by detection of autoantibodies to insulin, glutamic acid decarboxylase (GAD), islet antigen 2 (IA-2), or zinc transporter 8 (ZnT8). **B**

2.7 Autoantibody-based screening for presymptomatic type 1 diabetes should be offered to those with a family history of type 1 diabetes or otherwise known elevated genetic risk. **B**

2.8 Having multiple confirmed islet autoantibodies is a risk factor for clinical diabetes. Testing for dysglycemia may be used to further forecast near-term risk (**Table 2.4**). When multiple islet autoantibodies are identified, referral to a specialized center for further evaluation and/or consideration of a clinical trial or approved therapy to potentially delay development of clinical diabetes should be considered. **B**

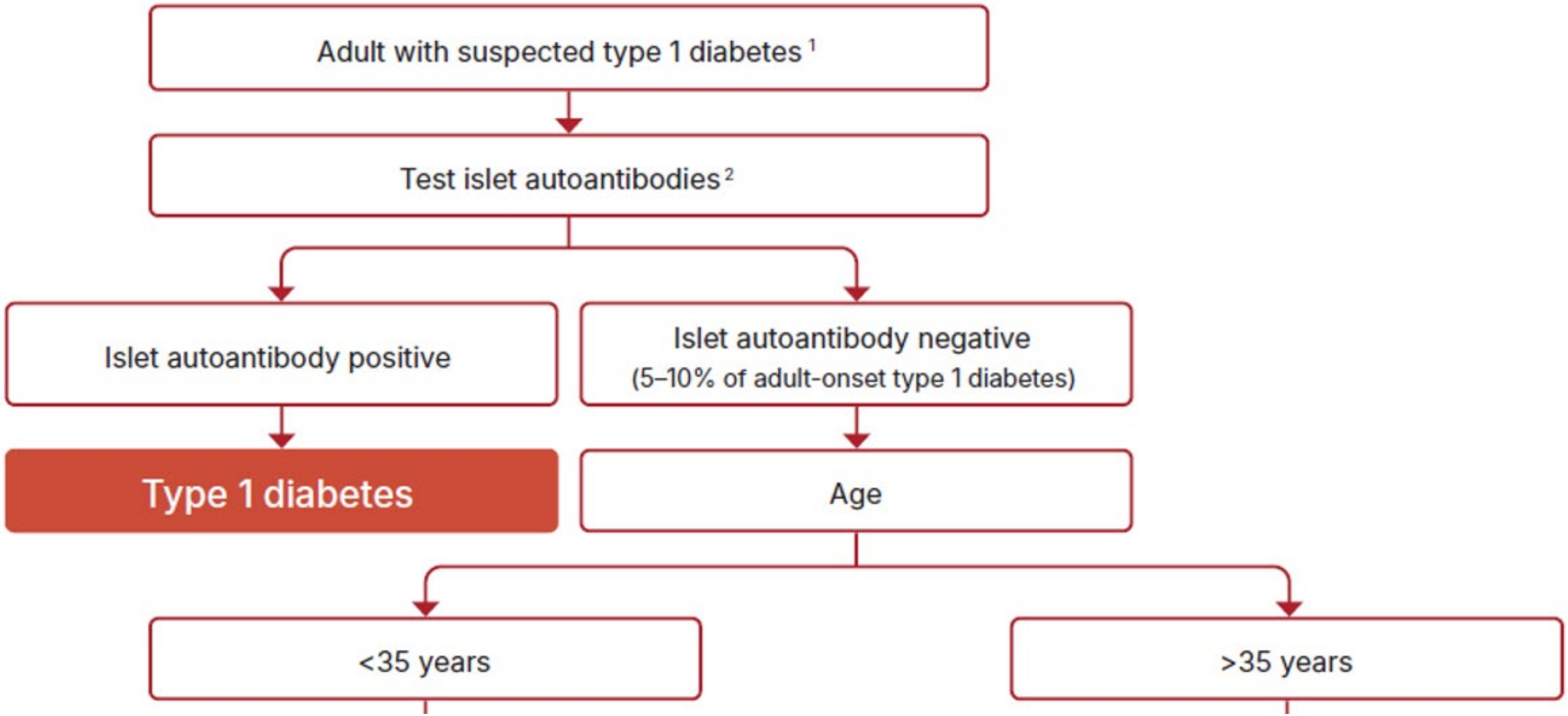
2.9 Standardized islet autoantibody tests are recommended for classification of diabetes in adults who have phenotypic risk factors that overlap with those for type 1 diabetes (e.g., younger age at diagnosis, unintentional weight loss, ketoacidosis, or short time to insulin treatment). **E**

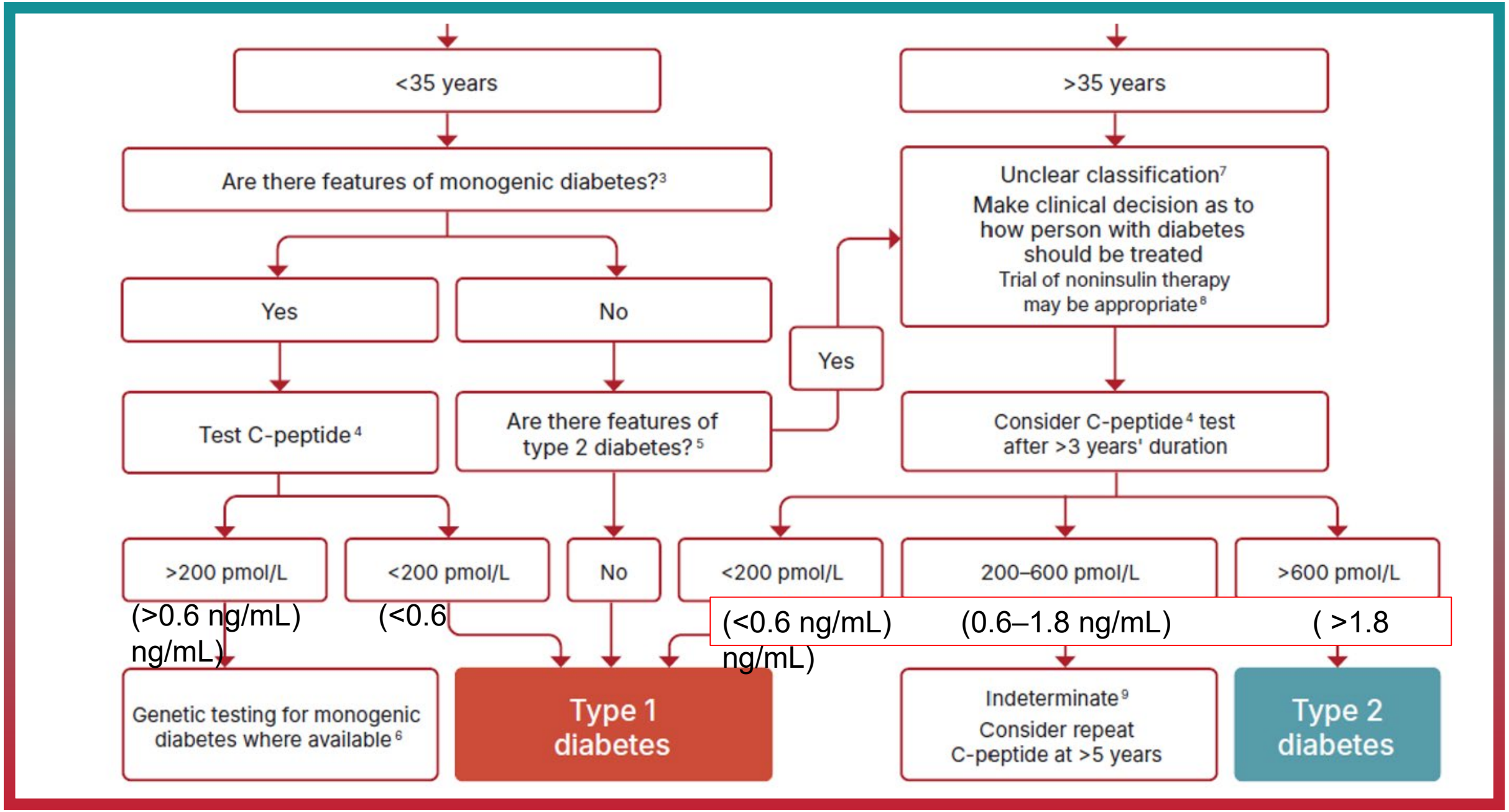
Flowchart for investigation of suspected type 1 diabetes in newly diagnosed adults, based on data from White European populations



Diagnosis and Classification of Diabetes:
Standards of Care in Diabetes - 2025. Diabetes Care 2025;48(Suppl. 1):S27-S49

Flowchart for investigation of suspected type 1 diabetes in newly diagnosed adults, based on data from White European populations




<35 years
Are there features of monogenic diabetes?[3]
Yes
No
Test C-peptide[4]
Are there features of type 2 diabetes?[5]
>200 pmol/L
(>0.6 ng/mL)
<200 pmol/L
(<0.6
ng/mL)
No
Genetic testing for monogenic diabetes where available[6]
Type 1 diabetes
>35 years
Unclear classification[7]
Make clinical decision as to how person with diabetes should be treated
Trial of noninsulin therapy may be appropriate[8]
Yes
Consider C-peptide[4] test after >3 years' duration
<200 pmol/L
(<0.6 ng/mL)
200–600 pmol/L
(0.6–1.8 ng/mL)
>600 pmol/L
(>1.8
ng/mL)
Indeterminate[9]
Consider repeat C-peptide at >5 years
Type 2 diabetes

Why Screen?

- Early identification may allow for intervention and delay progression

- Enrollment in monitoring or prevention trials

https://www.cdc.gov/diabetes/basics/quick-facts.html

Review Evidence-Based Management of T1DM

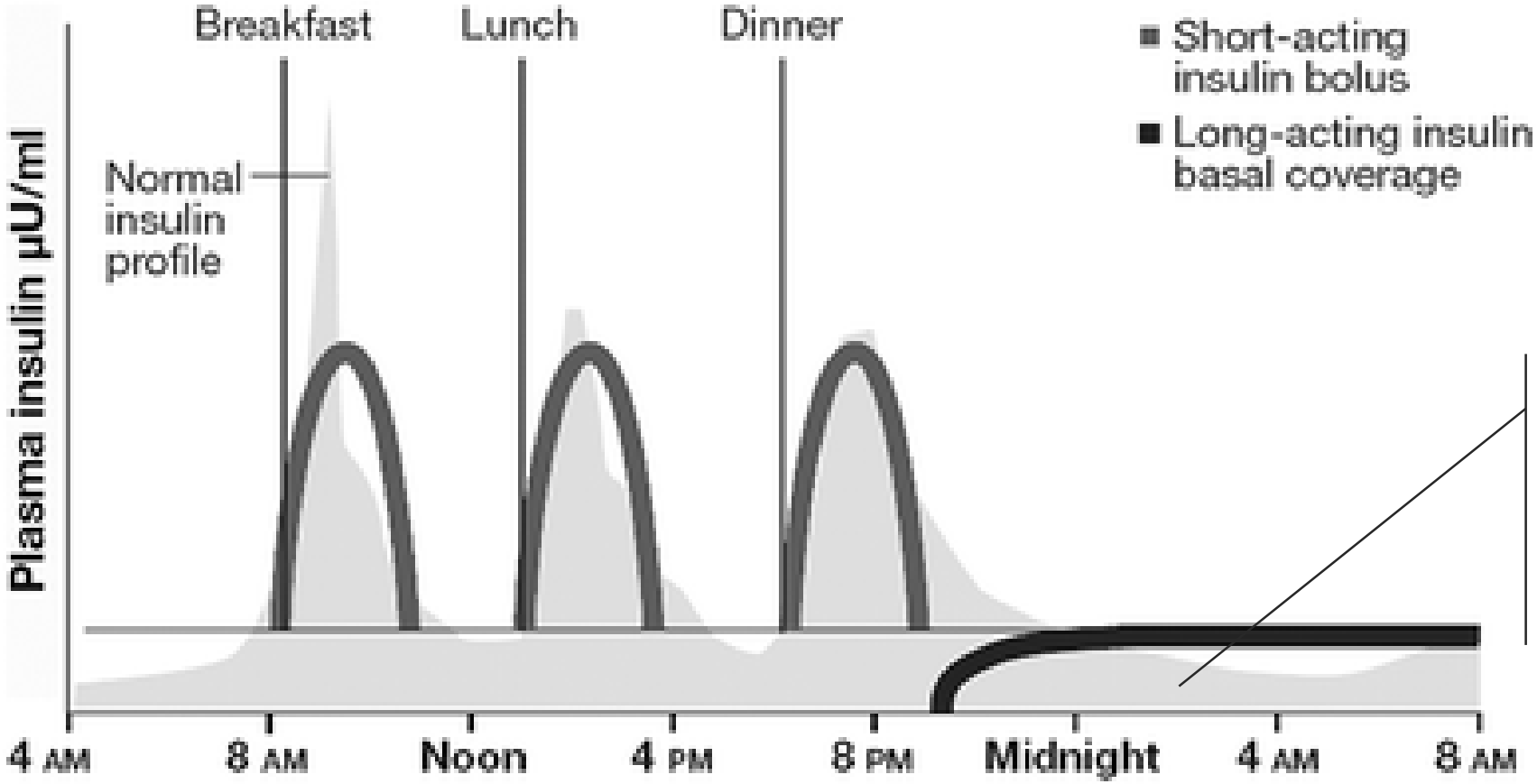
and

Optimizing Glycemic Control in T1DM

Insulin Therapy

- Basal-bolus therapy vs. Continuous Subcutaneous Insulin Infusion (CSII)
- Importance of individualized insulin regimens

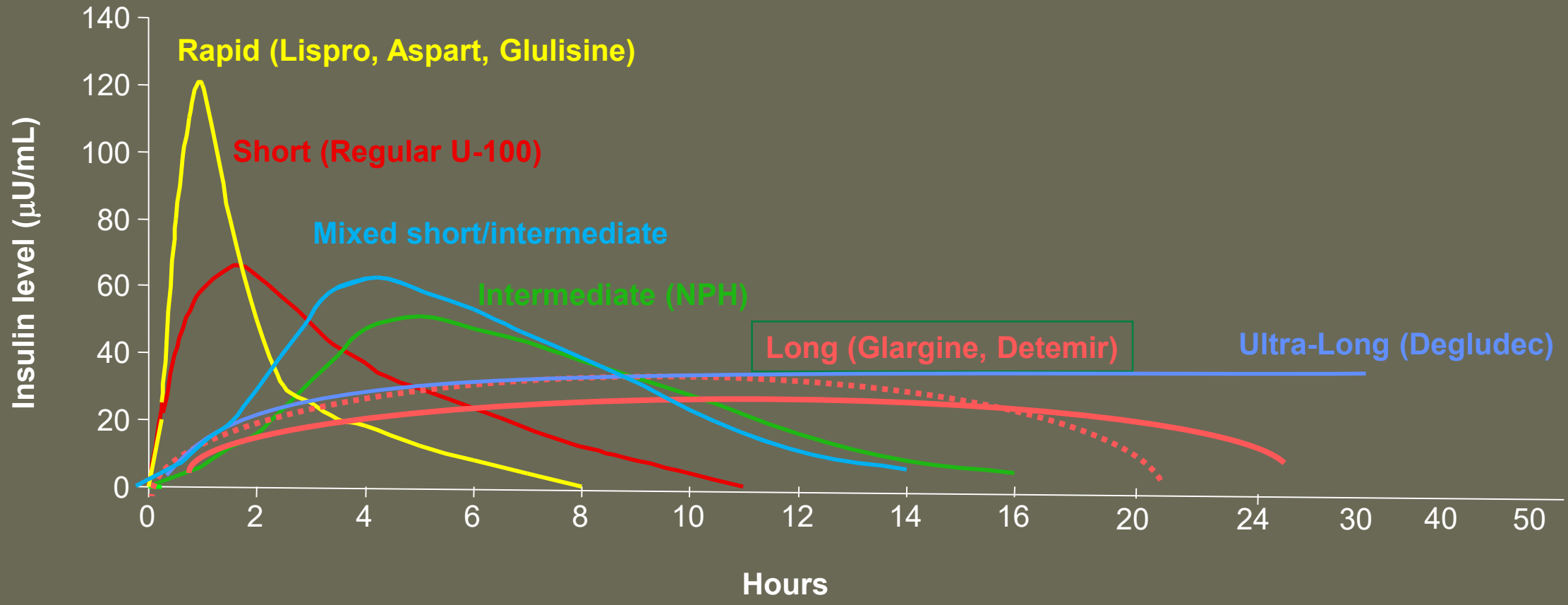
Basal-Bolus use



Do not use Rapid- and short-acting insulin at bedtime

Badlani et al. Diab and Metab D., 2014

Pharmacokinetics of Various Insulin Preparations



*Weekly Insulin icodec-duration >168 hrs

Technological Advances

- Continuous Glucose Monitoring (CGM)
- Automated insulin delivery and hybrid closed-loop systems

Primary Care Considerations

- Importance of patient education and shared decision-making
- Addressing barriers to insulin adherence and access to technology

Decision Cycle for Individualized Type 1 or 2 Diabetes Care

2

Individualize Treatment Selection by Considering

- Individualized glycemic goals
- Impact on hypoglycemia, weight, and CV risk
- Medication side effects, ease of use, and cost
- Medication route and social determinants

3

Collaborate with patients to design a personalized care plan by

- Shared decision-making and motivational interviewing
- Individual preferences and priorities
- DSMES access and education for self-management
- Personalized goals for lifestyle, medication, and glucose monitoring.

1

Evaluate Individual Factors by Considering

- Priorities, lifestyle, and social determinants
- Comorbidities (CVD, CKD, HF)
- Clinical markers (glucose, A1C, BP, weight)
- Barriers (motivation, depression, cognition)

4

Establish a mutually agreed-upon management plan by

- using **SMART** goal
  - ✓ **S**pecific
  - ✓ **M**easurable
  - ✓ **A**chievable
  - ✓ **R**ealistic and
  - ✓ **T**ime-bound—to guide effective diabetes care.

7

Review Management Plan

- Collaborate on adjustments
- Prevent treatment delays
- Ensure safe, effective care
- Integrate within the care system
- Review 1-2 times per year

5

Execute and Monitor the Plan

- Regularly review progress
- More frequent follow-ups initially to support diabetes self-management education and adherence.

6

Continue Ongoing Support by tracking

- Emotional well-being and lifestyle habits
- Health metrics (weight, A1C, BP, and lipids)
- Glucose (via BGM or CGM)
- Treatment tolerability

*Figure modified and adapted form ADA standards of care 2025

FDA NEWS RELEASE

FDA Approves First Drug That Can Delay Onset of Type 1 Diabetes

nents

For Immediate Release: November 17, 2022

Español

Today, the U.S. Food and Drug Administration approved Tzield (teplizumab-mzwv) injection to delay the onset of stage 3 type 1 diabetes in adults and pediatric patients 8 years and older who currently have stage 2 type 1 diabetes.

"Today's approval of a first-in-class therapy adds an important new treatment option for certain at-risk patients," said John Sharretts, M.D., director of the Division of Diabetes, Lipid Disorders, and Obesity in the FDA's Center for Drug Evaluation and Research. "The drug's potential to delay clinical diagnosis of type 1 diabetes may provide patients with months to years without the burdens of disease."

Content current as of:
11/17/2022

Regulated Product(s)
Drugs

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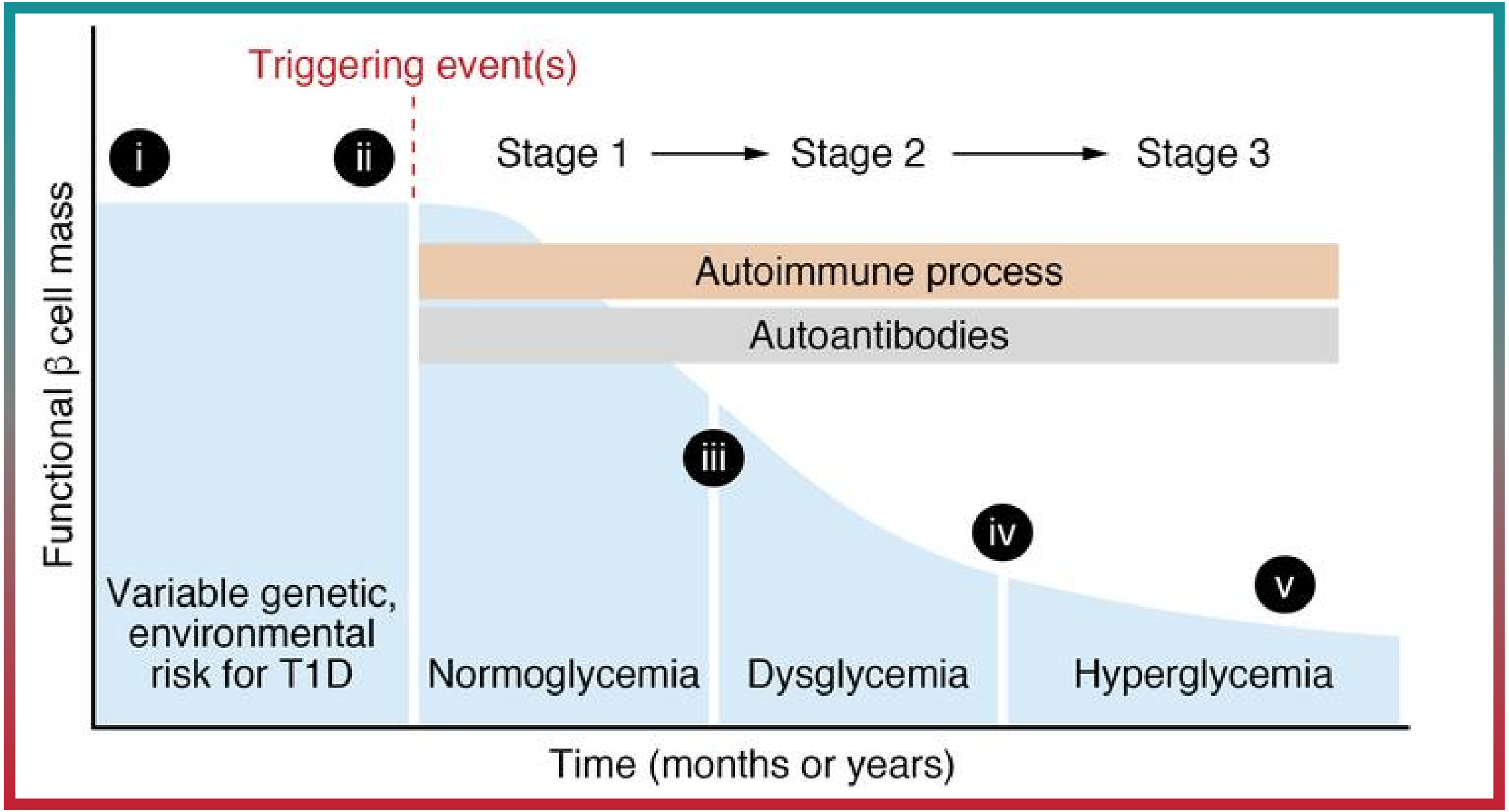
https://www.fda.gov/drugs/drug-approvals-and-databases/drug-trials-snapshots-tzield

Teplizumab-mzwv (TZIELD)

A monoclonal antibody that modulates T cells to delay the onset of Stage 3 T1DM

- Approved for use in individuals **≥8 years old** with **Stage 2 T1DM**
- Binds to CD3 on T cells, reducing autoimmune attack on pancreatic beta cells.
- Shown to **delay progression to Stage 3 T1DM** by **2-3 years** in high-risk individuals.
- **14-day IV infusion** (once daily over 30 minutes).
- Lymphopenia, rash, headache, cytokine release syndrome, elevated liver enzymes.



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Recognize Complications and Comorbidities

and

Managing Acute and Long-Term Complications in T1DM

Acute Complications

Diabetic Ketoacidosis (DKA): Early recognition and management

Remember to if patient has T1DM before starting SGLT-2 inhibitors

Hypoglycemia: Prevention strategies and treatment

Long-Term Complications

Microvascular: Retinopathy, nephropathy, neuropathy

Macrovascular: Cardiovascular disease risk

Preventive Strategies

Routine screenings for complications

Lifestyle interventions and adjunctive therapies

Coordination with endocrinologists and diabetes care teams

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Routine screenings for complications

Eye Exam (Diabetic Retinopathy): 5 years after diagnosis, then annually.

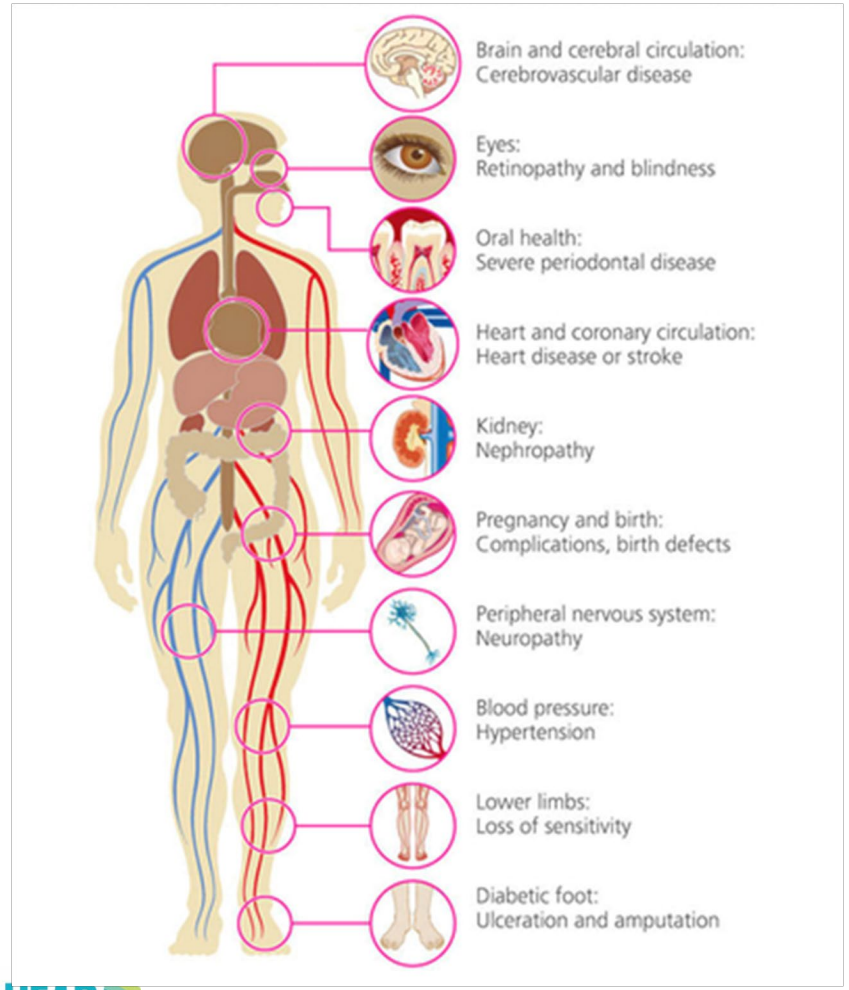
Foot Exam (Neuropathy & Ulcers): 5 years after diagnosis, then annually; visual inspection at every visit.

Kidney Screening (Albuminuria & eGFR): 5 years after diagnosis, then annually.

Blood Pressure Monitoring: At every visit.

Lipid Screening (Dyslipidemia): At diagnosis then every 1-3 years.

Taking Care of Diabetes Complications



- Eye care professional for annual dilated eye exam
- Family planning for women of reproductive age
- Registered dietitian for MNT
- DSMES
- Dentist for comprehensive dental and periodontal examination
- Mental health professional, if indicated

Achieving Healthy Eating Habits: *Plate Method*

Non-starchy vegetables

- Spinach
- Carrots
- Lettuce
- Greens
- Cabbage
- Green beans
- Broccoli
- Cauliflower
- Tomatoes

Grains and starchy foods

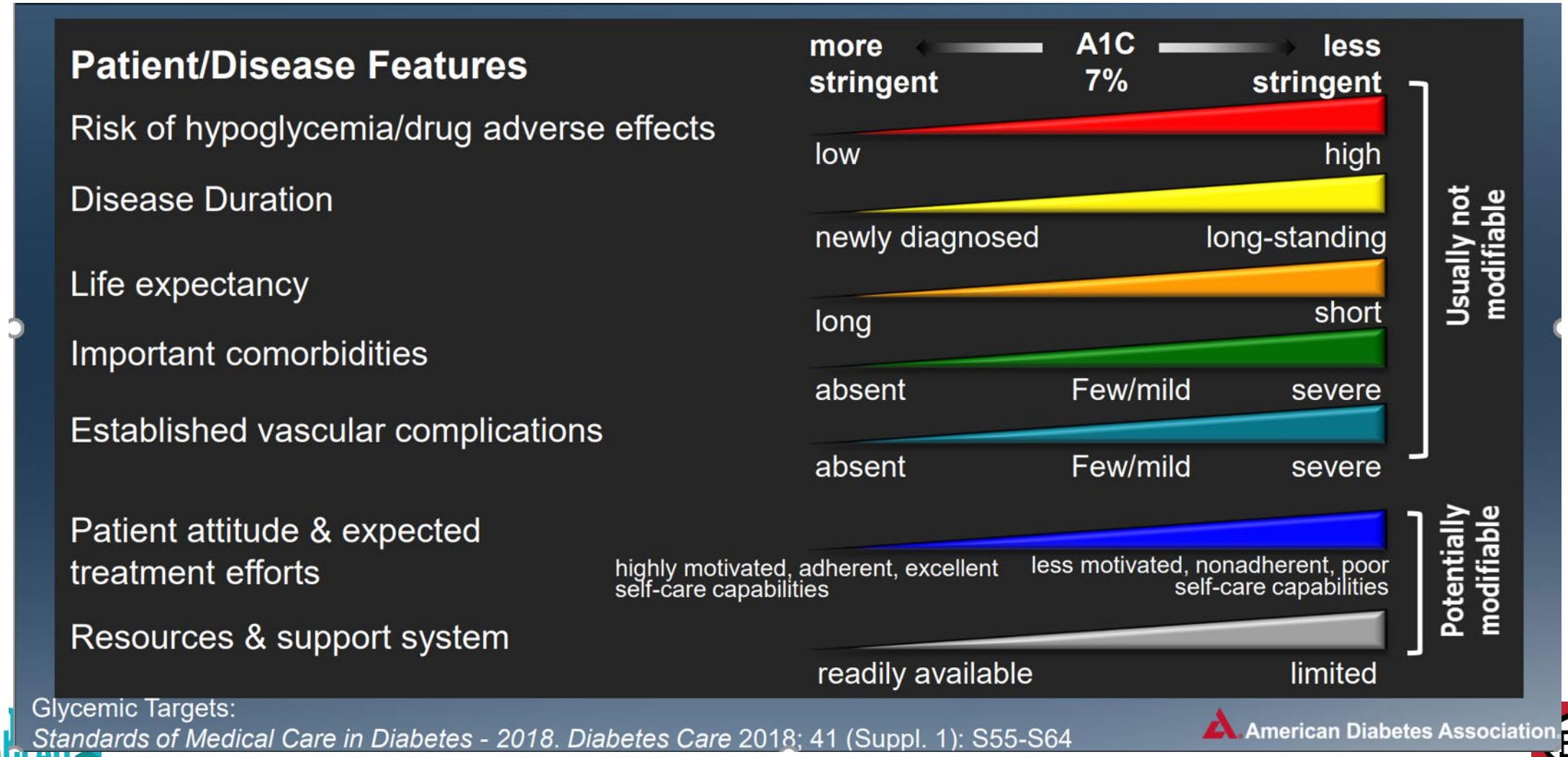
- Whole grain breads
- Sweet potatoes
- Corn
- High-fiber

Protein

- Chicken/turkey without skin
- Fish (tuna, salmon, cod, catfish)
- Tofu, eggs, low-fat cheese
- Lean beef and pork
- Beans

American Diabetes Association. Create your plate. Available at: diabetes.org/createyourplate/

Approach to the Management of Hyperglycemia



Glycemic Targets:
Standards of Medical Care in Diabetes - 2018. Diabetes Care 2018; 41 (Suppl. 1): S55-S64