
ADA Standards of Medical Care in Diabetes – 2021

Presentation to the

NC Diabetes Advisory Council

February 19, 2021

Laura Emerson Edwards, RN, MPA

*Slides adapted and used with permission of
Joanne Rinker, MS, RDN, CDCES, LDN,
FADCES

*This presentation also includes information
from the ADA's 2021 Highlights Webcast with
Robert Gabbay, MD, PhD

Standards of Medical Care in Diabetes – 2021



EVIDENCE



PROCESS



FUNDING



- Search of scientific diabetes literature over past year
- Recommendations revised per new evidence
- Professional Practice Committee
- Reviewed by ADA's Board of Directors
- Living Standards
- Funded out of ADA's general revenues
- Does not use industry support

Improving Care and Promoting Health in Populations

SOCIAL DETERMINANTS OF HEALTH.

Additional information has been included on social determinants of health in diabetes to reflect the evidence presented in “Social Determinants of Health in Diabetes: a Scientific Review,” including a change to Recommendation 1.5.

COST-RELATED MEDICATION NONADHERENCE.

The concept of “cost-related medication nonadherence” has been added to the “Cost Considerations” subsection.

Classification and Diagnosis of Diabetes

LADA.

More discussion about use of the term LADA (latent autoimmune diabetes in adults) has been added to the section.

POINT-OF-CARE A1C.

Guidance on use of point-of-care A1C assays for the diagnosis of diabetes has been clarified.

HIV.

A recommendation about screening for diabetes and prediabetes in patients with HIV (Recommendation 2.14), as well as the in-text discussion on the topic, has been moved to this section. This content was previously in Section 4, “Comprehensive Medical Evaluation and Assessment of Comorbidities”

Classification and Diagnosis of Diabetes (continued)

CYSTIC FIBROSIS-RELATED DIABETES.

Additional evidence has been added to the subsection “Cystic Fibrosis–Related Diabetes” (CFRD) regarding early diagnosis and treatment of CFRD and reported increases in CFRD.

POSTTRANSPLANTATION DIABETES MELLITUS.

Additional evidence has also been added to the “Posttransplantation Diabetes Mellitus” subsection.

Prevention or Delay of Type 2 Diabetes

LIFESTYLE BEHAVIOR CHANGE.

A new subsection, “Delivery and Dissemination of Lifestyle Behavior Change for Diabetes Prevention” was **created** to describe evidence for broader dissemination of and national efforts for lifestyle behavior change programs to prevent diabetes.

PREVENTION OF VASCULAR DISEASE AND MORTALITY.

Additional guidance and evidence have been added to the newly named “Prevention of Vascular Disease and Mortality” subsection (previously called “Prevention of Cardiovascular Disease”) and include data from longer-term follow up diabetes prevention studies.

Comprehensive Medical Evaluation and Assessment of Comorbidities

HEALTH STATUS AND RISK.

Regarding ongoing management, Recommendation 4.5 has been modified to include overall health status, risk of hypoglycemia, and cardiovascular risk using the risk calculator.

VACCINATIONS.

The “Immunizations” subsection has been significantly revised, and vaccine specific recommendations were removed. Table 4.5 was added containing Centers for Disease Control and Prevention-recommended vaccinations for people with diabetes. More information has been added to the discussion of each vaccine, including important considerations related to COVID-19

Comprehensive Medical Evaluation and Assessment of Comorbidities (continued)

PANCREATITIS.

The recommendation on pancreatitis was removed because the guidance is more appropriately covered in the discussion of the evidence in the subsection text.

SENSORY IMPAIRMENT.

Additional evidence on hearing impairment has been added to the “Sensory Impairment” subsection, and audiology has been added as a consideration to the table on referrals for initial care management (Table 4.4).

HIV.

The HIV recommendation and discussion were removed from this section and can now be found in section 2, “Classification and Diagnosis of Diabetes”

Table 4.4—Referrals for initial care management

- Eye care professional for annual dilated eye exam
 - Family planning for women of reproductive age
 - Registered dietitian nutritionist for medical nutrition therapy
 - Diabetes self-management education and support
 - Dentist for comprehensive dental and periodontal examination
 - Mental health professional, if indicated
 - Audiology, if indicated
-

Comprehensive Medical Evaluation and Assessment of Comorbidities (continued)

LOW TESTOSTERONE IN MEN.

More information on determining testosterone levels has been added to the “Low Testosterone in Men” subsection, and readers are now referred to the Endocrine Society Clinical Practice Guideline for more detailed recommendations.

MEDICAL EVALUATION.

Table 4.1, “Components of the Comprehensive Diabetes Medical Evaluation at Initial, Follow-up, and Annual Visits” was reorganized and revised to include a number of additional factors, including social determinants of health and identification of surrogate decision maker and advanced care plan.

Facilitating Behavior Change and Well- being to Improve Health Outcomes

DSMES

Based on “Diabetes Self-management Education and Support in Adults With Type 2 Diabetes: A Consensus Report of the American Diabetes Association, the Association of Diabetes Care & Education Specialists, the Academy of Nutrition and Dietetics, the American Academy of Family Physicians, the American Academy of PAs, the American Association of Nurse Practitioners, and the American Pharmacists Association,” published in June 2021. Recommendations 5.6 and 5.7 regarding barriers to DSMES have been added. The four critical times DSMES needs should be evaluated have been revised based on the consensus report. Additional evidence on the usefulness of DSMES and ways to address barriers has been included.

Four critical times to provide and modify DSMES



- 1) At diagnosis.
- 2) Annually and/or when not meeting treatment targets.
- 3) When complicating factors develop.
- 4) When transitions in life and care occur.

Facilitating Behavior Change and Well- being to Improve Health Outcomes (continued)

MACRONUTRIENTS.

The “Carbohydrates” and “Fats” subsections have been revised to include additional guidance and studies related to these macronutrients.

PHYSICAL ACTIVITY.

Recommendation 5.29 has been added to the “Physical Activity” subsection to address baseline physical activity and sedentary time and to encourage the promotion of nonsedentary activities above baseline for sedentary individuals with diabetes.

Facilitating Behavior Change and Well- being to Improve Health Outcomes (continued)

SMOKING CESSATION

Recommendation 5.34 has been added for smoking cessation, which can be addressed as part of diabetes education programs.

MINDFUL SELF-COMPASSION

The concept of mindful self-compassion has been added to the “Diabetes Distress” subsection, discussing its effects on diabetes.

Glycemic Targets

GLYCEMIC ASSESSMENT.

The “A1C” subsection was retitled “Glycemic Assessment,” with respective changes to Recommendations 6.1 and 6.2 to allow for other glycemic measures aside from A1C.

GLYCEMIC GOALS

The “Glycemic Goals” subsection has also been revised to include other glycemic measures, and the recommendation for glycemic goals for many nonpregnant adults without significant hypoglycemia has been divided in two parts (Recommendations 6.5a and 6.5b) to include time-in-range goals.

Estimated Average Glucose

Table 6.1—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)

Data in parentheses are 95% CI. A calculator for converting A1C results into eAG, in either mg/dL or mmol/L, is available at professional.diabetes.org/eAG. *These estimates are based on ADAG data of ~2,700 glucose measurements over 3 months per A1C measurement in 507 adults with type 1, type 2, or no diabetes. The correlation between A1C and average glucose was 0.92 (6,7). Adapted from Nathan et al. (6).

Glycemic Targets:

Standards of Medical Care in Diabetes - 2021. Diabetes Care 2021;44(Suppl. 1):S73-S84

Glycemic Targets (continued)

AGP REPORT.

Figure 6.1 has been revised and no longer includes example patient-specific data.

A1C AND MICROVASCULAR COMPLICATIONS.

More discussion has been added to the “A1C and Microvascular Complications” subsection.

HYPOGLYCEMIA ASSESSMENT

Recommendation 6.9 regarding hypoglycemia assessment has been revised and now recommends that occurrence of and risk for hypoglycemia should be reviewed at every encounter and investigated as indicated.

AGP Report

Name _____

MRN _____

GLUCOSE STATISTICS AND TARGETS

14 days
% Sensor Time

Glucose Ranges	Targets [% of Readings (Time/Day)]
Target Range 70–180 mg/dL	Greater than 70% (16h 48min)
Below 70 mg/dL	Less than 4% (58min)
Below 54 mg/dL	Less than 1% (14min)
Above 180 mg/dL	Less than 25% (6h)
Above 250 mg/dL	Less than 5% (1h 12min)

Each 5% increase in time in range (70–180 mg/dL) is clinically beneficial.

Average Glucose Glucose Management Indicator (GMI) Glucose Variability

Defined as percent coefficient of variation (%CV); target $\leq 36\%$

TIME IN RANGES

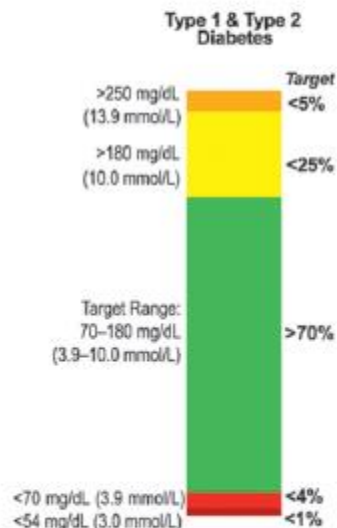


Figure 6.1—Key points included in standard ambulatory glucose profile (AGP) report. Adapted from Battelino et al. (26).

Diabetes Technology

CGM.

Recommendations 7.9–7.13 in the “Continuous Glucose Monitoring Devices” subsection have been revised, and “blinded” continuous glucose monitoring (CGM) is now referred to as “professional CGM,” which is clinic-based and can include blinded and real-time devices. Table 7.3 has been updated to reflect this change as well. Recommendations 7.9–7.11 now recommend CGM as useful for people with diabetes on multiple daily injections and continuous subcutaneous insulin infusions and other forms of insulin therapy (with different levels of evidence) not defined by type of diabetes or age.

Diabetes Technology (continued)

SKIN REACTIONS.

Recommendation 7.14 regarding skin Reactions with use of CGM has been added. This section has also been updated to include information on the evolving evidence and a new discussion on education and training.

INSULIN DELIVERY.

The “Insulin Delivery” subsection has also been revised, and the recommendation on examination of insulin injection/infusion site was removed.

Diabetes Technology (continued)

INPATIENT CARE.

Recommendation 7.27 regarding inpatient use of devices was moved to later in the section where use in the inpatient setting is more fully discussed. The use of CGM in the hospital during the COVID-19 pandemic is also reviewed in the “Inpatient Care” subsection.

INSULIN PUMPS.

Recommendation 7.21 on insulin pump use for people with type 2 diabetes and other forms of diabetes with multiple daily injections has been added to the “Insulin Pumps” subsection, with additional discussion. Information on insulin pump use in older adults has been added as well.

Diabetes Technology (continued)

TECHNOLOGY + ONLINE COACHING.

The possible benefit of systems that combine technology and online coaching has been added to Recommendation 7.26.

Obesity Management for the Treatment of Type 2 Diabetes

PATIENT-CENTERED COMMUNICATION.

The concept of patient-centered communication that uses nonjudgmental language has been added as Recommendation 8.1, with additional discussion in the “Assessment” subsection.

HEALTH OUTCOMES

The subsection on “Diet, Physical Activity, and Behavioral Therapy” has been updated, including more thorough discussion of health outcomes of weight loss.

Obesity Management for the Treatment of Type 2 Diabetes (continued)

SOCIAL DETERMINANTS OF HEALTH.

Based on the publication “Social Determinants of Health in Diabetes: A Scientific Review”, considerations related to social determinants of health have been added in this subsection as well.

PHARMACOTHERAPY.

More detail has been added to the “Pharmacotherapy” subsection, particularly focused on assessing efficacy and safety.

Pharmacologic Approaches to Glycemic Treatment

SENSOR AUGMENTED PUMPS.

Additional evidence has been added to the discussion of use of sensor-augmented insulin pumps..

OVER-BASALIZATION.

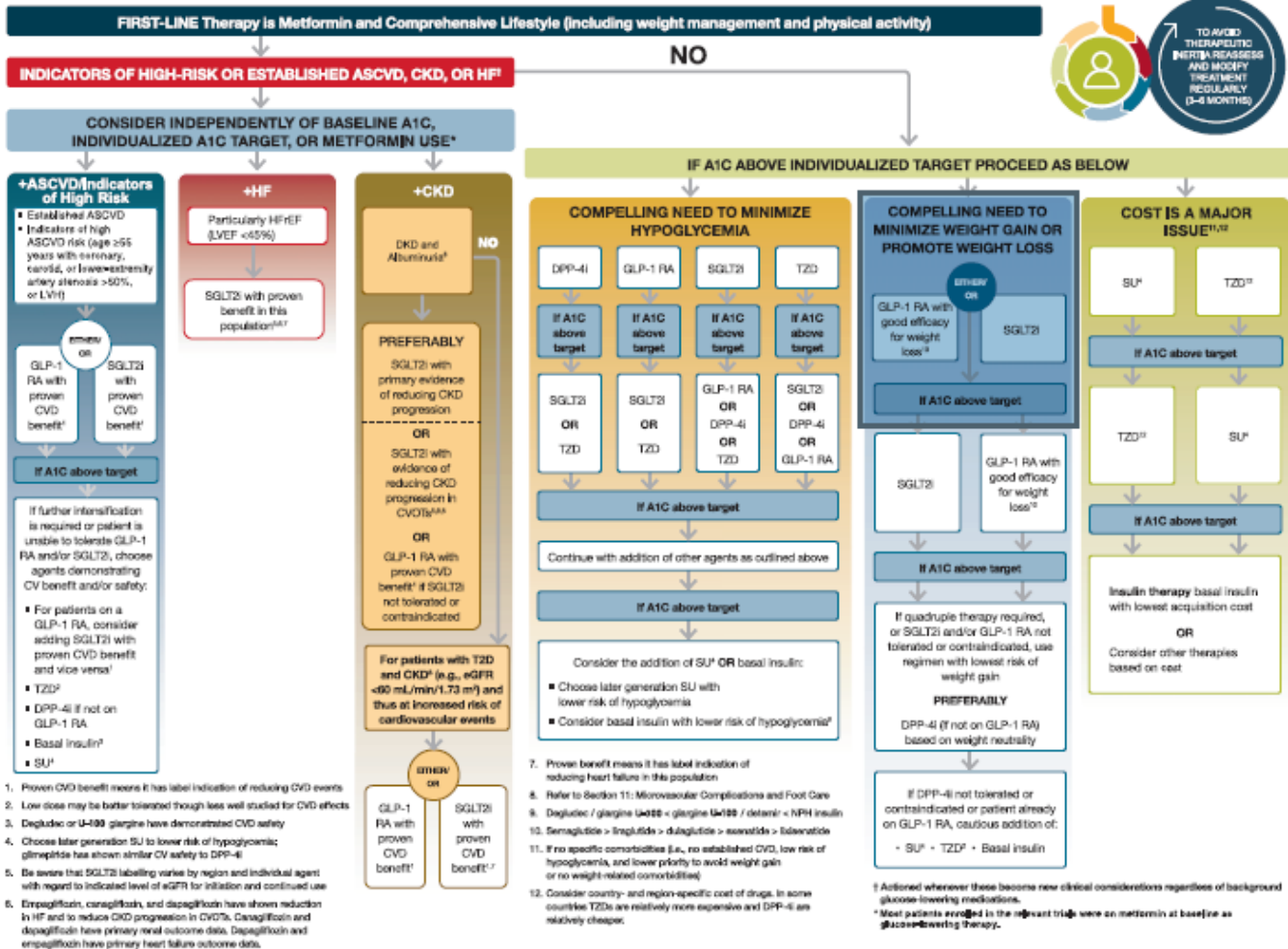
Recommendation 9.13 and the related discussion have been added cautioning providers of the potential for over-basalization with insulin therapy..

GLUCOSE LOWERING MEDICATIONS.

Table 9.1 has been updated.
Figure 9.1 has been revised to include a dedicated decision pathway for chronic kidney disease and a dedicated decision pathway for heart failure, with updates to reflect consensus interpretation of clinical trial data.

Glucose-lowering Medication in Type 2 Diabetes: 2021 ADA Professional Practice Committee (PPC) adaptation of Davies et al. and Buse et al.

Pharmacologic Approaches to Glycemic Management: *Standards of Medical Care in Diabetes - 2021. Diabetes Care 2021;44(Suppl. 1):S111-S124*

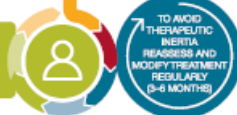


Pharmacologic Approaches to Glycemic Treatment (continued)

INTENSIFICATION TO INJECTABLE THERAPIES.

Figure 9.2 has also been revised to include assessment of adequacy of insulin dose and updates in regard to the use of glucagon-like peptide 1 receptor agonists.

Use Principles in Figure 9.1, including reinforcement of behavioral interventions (weight management and physical activity) and provision of DSMES to meet individualized treatment goals



If injectable therapy is needed to reduce A1C¹

Consider GLP-1 RA in most patients prior to insulin²

INITIATION: Initiate appropriate starting dose for agent selected (varies within class)
TITRATION: Titration to maintenance dose (varies within class)

If already on GLP-1 RA or if GLP-1 RA not appropriate OR insulin preferred

If above A1C target

Add basal insulin³

Choice of basal insulin should be based on patient-specific considerations, including cost. Refer to Table 9.3 for insulin cost information.

Add basal analog or bedtime NPH insulin

INITIATION: Start 10 IU a day OR 0.1-0.2 IU/kg a day

TITRATION:

- Set FPG target (see Section 6: Glycemic Targets)
- Choose evidence-based titration algorithm, e.g., increase 2 units every 3 days to reach FPG target without hypoglycemia
- For hypoglycemia determine cause, if no clear reason lower dose by 10-20%

Assess adequacy of basal insulin dose

Consider clinical signals to evaluate for overbasalization and need to consider adjunctive therapies (e.g., basal dose >0.5 IU/kg, elevated bedtime-morning and/or post-prandial differential, hypoglycemia [aware or unaware], high variability)

If above A1C target

Consider GLP-1 RA if not already in regimen

For addition of GLP-1 RA, consider lowering insulin dose dependent on current glycemic assessment and patient factors

Add prandial insulin⁴

Usually one dose with the largest meal or meal with greatest PPG excursion; prandial insulin can be dosed individually or mixed with NPH as appropriate

INITIATION:

- 4 IU a day or 10% of basal insulin dose
- If A1C <8% (64 mmol/mol) consider lowering the basal dose by 4 IU a day or 10% of basal dose

TITRATION:

- Increase dose by 1-2 IU or 10-15% twice weekly
- For hypoglycemia determine cause, if no clear reason lower corresponding dose by 10-20%

If on bedtime NPH, consider converting to twice-daily NPH regimen

Conversion based on individual needs and current glycemic control. The following is one possible approach:

INITIATION:

- Total dose = 80% of current bedtime NPH dose
- 2/3 given in the morning
- 1/3 given at bedtime

TITRATION:

- Titrate based on individualized needs

Cardiovascular Disease and Risk Management

ACC ENDORSEMENT.

This section is endorsed for the third consecutive year by the American College of Cardiology.

TYPE 1 DIABETES.

The section has been revised to acknowledge that few trials have been specifically designed to assess the impact of cardiovascular risk reduction strategies in patients with type 1 diabetes.

PREGNANCY & PREEXISTING HYPERTENSION

A lower limit has been added to Recommendation 10.6 regarding pregnant patients with diabetes and preexisting hypertension.

Cardiovascular Disease and Risk Management (continued)

HYPERTENSION AND CORONARY ARTERY DISEASE.

ACE inhibitors or angiotensin receptor blockers as first line therapy for hypertension in people with diabetes and coronary artery disease has been added as Recommendation 10.10, with additional discussion.

ODYSSEY OUTCOMES TRIAL.

The ODYSSEY OUTCOMES trial has been added to the “Combination Therapy for LDL Cholesterol Lowering” subsection.

Cardiovascular Disease and Risk Management (continued)

ANTIPLATELET AGENTS.

Recommendations 10.37 and 10.38 have been added to the “Antiplatelet Agents” subsection regarding long-term dual antiplatelet therapy and combination therapy with aspirin plus low dose rivaroxaban, respectively. New evidence from THEMIS, THEMIS-PCI, COMPASS, and VOYAGER PAD has also been added to the “Antiplatelet Agents” subsection.

CARDIOVASCULAR DISEASE.

Recommendations 10.43–10.47 regarding treatment in the “Cardiovascular Disease” subsection have been revised to include the evolving evidence from cardiovascular outcomes trials.

Cardiovascular Disease and Risk Management (continued)

CARDIOVASCULAR AND CARDIORENAL OUTCOMES TRIALS OF AVAILABLE ANTI- HYPERGLYCEMIC MEDICATIONS COMPLETED AFTER THE ISSUANCE OF THE FDA 2008 GUIDELINES DRUG CLASS TABLES.

Tables 10.3A, B, and C have been updated to include cardiorenal trial information. The following trials have been added to their respective drug class tables: CAROLINA, PIONEER-6, CREDESCENCE, DAPA-HF

Microvascular Complications and Foot Care

DIABETIC KIDNEY DISEASE.

Recommendation 11.3 on treatment for chronic kidney disease has been divided into three recommendations (11.3a, 11.3b, and 11.3c) to individualize treatment based on renal function and risk of cardiovascular disease.

Older Adults

HYPOGLYCEMIA.

Recommendations 12.4 and 12.5 and discussion in the “Hypoglycemia” subsection have been modified, and a new recommendation on the use of continuous glucose monitoring for the reduction of hypoglycemia has been added based on findings from the Wireless Innovation in Seniors with Diabetes Mellitus (WISDM) trial.

Older Adults

TREATMENT GOALS.

The reasonable A1C goal for older adults who are otherwise healthy with few coexisting chronic illnesses and intact cognitive function and functional status has been modified to A1C ,7.0–7.5% (53–58 mmol/mol). This change is reflected in Table 12.1 as well. Fasting or preprandial and bedtime glucose levels for healthy older adults have also been revised in this table.

LIFESTYLE MANAGEMENT.

Recommendation 12.12 and accompanying review of the evidence on weight loss has been added to the “Lifestyle Management” subsection.

Older Adults

PHARMACOTHERAPY.

In the “Pharmacologic Therapy” subsection, for the very complex older patient in poor health in Table 12.2, avoiding reliance on A1C and avoiding hypoglycemia and symptomatic hyperglycemia were added as a reasonable A1C/treatment goal. The example treatment goal for older adults who are otherwise healthy with few coexisting chronic illnesses and intact cognitive function and functional status has been modified to A1C ,7.0–7.5% (53–58 mmol/mol).

THERAPIES.

Additional considerations and discussion of findings have been added to the “Incretin-based Therapies” and “Sodium–Glucose Cotransporter 2 Inhibitors” subsections.

Children and Adolescents

SOCIAL DETERMINANTS OF HEALTH.

To incorporate social determinants of health, a new recommendation on assessment of food security, housing stability/homelessness, health literacy, financial barriers, and social/community support and its application to treatment decisions has been added to the type 1 (Recommendation 13.12) and type 2 diabetes (Recommendation 13.105) sections.

CGM.

Three new recommendations (Recommendations 12.20, 13.21, 13.27), one on real-time CGM, one on intermittently scanned CGM, and another on use of CGM metrics from the most recent 14 days, have been added to the type 1 diabetes “Glycemic Control” subsection.

Children and Adolescents (continued)

PHYSICAL ACTIVITY.

For physical activity in youth with prediabetes and type 2 diabetes, Recommendation 13.58 has been changed to at least 60 min daily, with bone and muscle strength training at least 3 days per week.

NEW-ONSET DIABETES IN YOUTH WITH OVERWEIGHT OR OBESITY

Figure 13.1 has been revised to better represent current guidance for management of new-onset diabetes in youth with overweight or obesity with clinical suspicion of type 2 diabetes.

Management of Diabetes in Pregnancy

INSULIN PHYSIOLOGY.

The information on insulin requirements during pregnancy in the “Insulin Physiology” subsection has been clarified.

GLYCEMIC TARGETS.

Lower limits have been added to the recommended glycemic targets for type 1 and type 2 diabetes in pregnancy, though they do not apply to diet-controlled type 2 diabetes in pregnancy.

CGM

More information on CGM in pregnancy, specifically on time in range and target ranges for women with type 1 diabetes in pregnancy, has been added.

Management of Diabetes in Pregnancy (continued)

HYBRID CLOSED LOOP.

The guidance on use of hybrid closed loop systems during pregnancy has been updated with new considerations.

PREECLAMPSIA & ASPIRIN.

Recommendation 14.18 and narrative in the “Preeclampsia and Aspirin” subsection have been revised to include more information on aspirin dosing and the insufficient data available on its use for pregnant women with preexisting diabetes.

CHRONIC HYPERTENSION

A lower limit has been added to Recommendation 14.19 regarding pregnant patients with diabetes and chronic hypertension.

Diabetes Care in the Hospital

ENTERAL & PARENTERAL FEEDING.

Additional information has been added on enteral and parenteral feeding and insulin requirements.

GLUCOCORTICOID THERAPY.

The “Glucocorticoid Therapy” subsection has been revised to include more guidance on use of NPH insulin with steroids.

Standards of Care Resources

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

Professional.Diabetes.org/SOC

Questions/Discussion

Thank you!