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PREGNANCY Society for Maternal-Fetal Medicine

SMFM SPECIAL STATEMENT

Society for Maternal-Fetal Medicine Special Statement: Revised updated checklist for antepartum care of pregestational diabetes mellitus

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Replaces Society for Maternal-Fetal Medicine Special Statement: Updated checklist for antepartum care of pregestational diabetes mellitus, 2020.

Abstract

Pregestational diabetes mellitus (type 1 or type 2 diabetes) is associated with increased risks of both maternal and neonatal complications due to maternal hyperglycemia and underlying chronic conditions and comorbidities. To reduce or mitigate these risks, numerous interventions are recommended at various stages of pregnancy. In 2020, the Society for Maternal-Fetal Medicine published an updated checklist for antepartum care of pregestational diabetes mellitus. A revised version of that checklist is presented here, along with suggestions for its integration into standard antenatal care for patients with type 1 and type 2 diabetes mellitus. This statement replaces the Society for Maternal-Fetal Medicine Special Statement: Updated checklist for antepartum care of pregestational diabetes mellitus, 2020.

KEYWORDS

diabetes mellitus type 1, diabetes mellitus type 2, patient education, prenatal care, prenatal screening

1 | INTRODUCTION

Diabetes mellitus (type 1 or type 2 diabetes) has a prevalence of about 5% among 18- to 44-year-old persons in the United States [1]. The prevalence is much higher in Black, Hispanic, Native American, Asian, and Pacific Islander persons than in White persons [2], likely because of social and environmental disparities rather than biological differences.

During pregnancy, type 1 and type 2 diabetes (pregestational diabetes) are associated with increased risks of both maternal and neonatal complications attributable to the degree of maternal hyperglycemia and associated chronic conditions and comorbidities of diabetes mellitus [3]. Maternal risks include higher rates of hypertensive disorders of pregnancy, including preeclampsia, and worsening of microvascular and macrovascular diseases, such as diabetic retinopathy, nephropathy, and diabetic ketoacidosis [4]. Perinatal risks include increased rates of miscarriage, congenital anomalies, stillbirth, preterm birth, fetal macrosomia, fetal growth restriction, fetal hypertrophic cardiomyopathy, neonatal hypoglycemia, hypocalcemia, hyperbilirubinemia, and respiratory distress syndrome [5]. Long-term risks to the offspring include increased rates of childhood obesity, childhood diabetes mellitus and prediabetes, and cardiovascular diseases in later life [5].

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Ideally, care of individuals with preexisting diabetes should begin in the preconception period [3]. During pregnancy, multiple evidence-based interventions are recommended by the American College of Obstetricians and Gynecologists (ACOG), the American Diabetes Association (ADA), and others to reduce or mitigate the risk of complications. These interventions include strict glycemic control [3, 6]; screening for comorbidities, including foot and eye examination; thyroid function testing; urinary protein evaluation; electrocardiography for those age 35 years or older or with cardiac risk factors [7]; pneumococcal vaccination [7]; detailed fetal anatomy ultrasonography [6]; fetal echocardiography [8]; preeclampsia prophylaxis with low-dose aspirin [3, 6, 9]; fetal surveillance [10]; and individualized delivery planning based on glycemic control, presence of vascular complications, and prior obstetrical history [6].

Given the numerous care elements involved and their distribution across the months of pregnancy, there is a risk that practitioners may inadvertently omit one or more components of care, thereby increasing the likelihood of adverse outcomes. A cognitive aid such as a checklist can help to minimize such errors of omission [11]. In 2020, the Society for Maternal-Fetal Medicine published an updated checklist for antepartum care of pregestational diabetes mellitus [12]. A revised version of the 2020 checklist is presented here, along with suggestions for how practices might incorporate it into standard antenatal care of patients with type 1 and type 2 diabetes mellitus.

2 | CHECKLIST

A sample checklist is shown in Figure 1. There are several updates from the 2020 version:

- Under "Initial Visit," removed assessment of proper fit of footwear, because this is beyond the scope of most obstetrical providers.
- Under "Patient education," added the option for a medical alert card as an alternative or addition to a bracelet or necklace. The ADA has a sample card that patients can print and fill in [13].
- Under "Laboratory tests," clarified that screening for thyroid dysfunction is only recommended for individuals with type 1 diabetes [7]. The ADA does not specify which test(s) should be ordered for this screening [7].
- Under "First Trimester," added recommendation to consider detailed first-trimester ultrasonography, depending on local resources and patient access.
- Under "Second Trimester," added "consider" before fetal echocardiography. ACOG recognizes that this procedure is not available in all settings, so some practices reserve it for those with increased risk, whereas others obtain routine fetal echocardiography for all persons with pregestational diabetes [6].
- Under "Third Trimester," specified starting time and frequency of antepartum fetal surveillance (twice weekly beginning at 32 weeks of gestation) as suggested by ACOG [10].

This checklist is intended as an example. Individual practices should customize it by adding or deleting specific items to align with their local management protocols. The design of the form adheres to the principles outlined in ACOG's Committee Opinion on developing and using checklists [14]. For example, the checklist uses a sans-serif font with black text on a white background; avoids the use of color; has a simple, uncluttered format; includes a version date; and omits routine items that are unlikely to be overlooked.

This checklist focuses on antepartum care. The ADA maintains a separate checklist for preconception care for women with diabetes mellitus [3].

3 | SUGGESTIONS FOR IMPLEMENTATION

The checklist is primarily designed for use in the outpatient setting. Its purpose is to enhance the likelihood that all recommended interventions to manage these complex pregnancies are consistently addressed.

Implementation typically begins with assembling a team of relevant and engaged personnel to lead the process. This team should ideally include at least one physician, a nurse, a diabetes mellitus educator, and a practice manager.

The team must first determine whether they expect obstetrical care professionals to actively use the checklist or rely solely on training and memory. Using the checklist may significantly reduce errors of omission. If the practice opts to implement the checklist, the team should review each item to ensure alignment with current local protocols. If discrepancies exist, either the checklist should be adapted to reflect actual practice or educational efforts should be made to harmonize practice with the checklist. The team should also decide whether to add items that we have omitted based on our assumption that they are so routine that they are unlikely to be overlooked (e.g., routine prenatal care items or teaching about glucose monitoring and diet).

A key consideration is the format and accessibility of the checklist. Practices must decide whether to integrate it as a digital form within the electronic health record, maintain it as a paper form in the physical chart, or use it as a

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Checklist for Antepartum Care of Pregestational (Type 1 or Type 2) Diabetes Mellitus

This checklist is designed to supplement routine prenatal care and routine diabetes management. Routine pregnancy care is assumed (e.g., complete history and examination, standard laboratory assessments, prenatal vitamins). Routine diabetes care is assumed (e.g., glucose monitoring, glycemic targets, and glucose-lowering medications as clinically indicated).

Initial Visit

- ☐ Record age at onset of diabetes
- ☐ Record history of diabetes complications:
  - o Ketoacidosis
  - o Hypoglycemia
  - o Gastroparesis
  - o Nephropathy
  - o Neuropathy
  - o Retinopathy
  - o Hypertension
  - o Coronary artery disease
  - o Arterial occlusive disease
- ☐ Physical examination of feet
  - o Perfusion (color, pulses)
  - o Sensory examination (touch, pain)
- ☐ Referral for retinal examination
- ☐ Pneumococcal vaccination or documentation of completion
- ☐ Patient education
  - o Relationship between glycemic control and adverse pregnancy outcomes (e.g., miscarriage, birth defects, fetal growth restriction, large-for-gestational-age, stillbirth, preterm birth)
  - o Maternal adverse effects (e.g., hypertension/preeclampsia, worsening retinopathy or nephropathy)
  - o Medical alert bracelet, necklace, or wallet card
- ☐ Family education
  - o Recognition and management of hypoglycemia
  - o Use of glucagon kit
- ☐ Laboratory tests
  - o Hemoglobin A1c
  - o Comprehensive metabolic panel
  - o For type 1 diabetes: screen for thyroid dysfunction (e.g., thyroid stimulating hormone, free T4 [thyroxine])
  - o Urinary albumin/creatinine or protein/creatinine ratio
  - o Electrocardiography if age 35 years or older, cardiac symptoms, or other risk factors

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FIGURE 1 Sample checklist for antepartum care of pregestational (type 1 or type 2) diabetes mellitus.

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First Trimester

☐ Consider detailed first trimester ultrasonography at 12 0/7 to 13 6/7 weeks of gestation, depending on local resources and patient access

Second Trimester

☐ Low-dose aspirin, 81 mg daily (start between 12 and 28 weeks of gestation, optimally before 16 weeks)
☐ Detailed fetal anatomy ultrasonography
☐ Consider fetal echocardiography

Third Trimester

☐ Antepartum fetal surveillance, twice weekly, starting at 32 weeks of gestation (e.g., nonstress test or biophysical profile)

Delivery Planning

☐ Ultrasonography for fetal growth assessment
  - Consider cesarean delivery if estimated fetal weight is greater than 4500 g

☐ Delivery timing
  - Good glycemic control, no vascular complications: deliver at 39 0/7 to 39 6/7 weeks of gestation
  - Poor glycemic control, vascular complications, or prior stillbirth: deliver at 36 0/7 to 38 6/7 weeks of gestation (individualize according to clinical scenario)
  - Pregnancy complications, such as fetal growth restriction or preeclampsia: delivery timing individualized depending on complication and severity

Postpartum

☐ Ensure transition of care to endocrinology or primary care provider

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FIGURE 1 Continued

reference tool without embedding it in individual patient records. Digital forms may require investment in developing a dedicated module within the electronic charting system. Paper chart forms may be relatively easier to implement, but raise logistical questions, such as whether each entry requires a signature, date, and time and where the forms should be stored in predominantly electronic systems. If used solely as a reference and not included in the patient chart, the checklist should be readily accessible (e.g., as a laminated sheet at workstations, a wall chart in diabetes education rooms, part of a practice protocol binder, or a digital file).

Finally, practices should consider how checklists initiated in outpatient clinics will be transferred to the hospital when patients are admitted for antepartum hospitalization or delivery. If both settings share a unified electronic record platform, integration of the checklist will be relatively straightforward, though technical support may be necessary. In cases where systems are not integrated, ensuring cross-site availability of the checklist may present additional challenges.

4 | QUALITY INDICATORS AND REVISIONS

Once the checklist has been implemented, the team should assess its effectiveness in clinical practice. If obstetrical care professionals are not using the checklist routinely, it is important to identify and address barriers to its adoption. Conducting targeted quality audits can help pinpoint areas requiring additional attention or support.

Useful indicators for monitoring checklist utilization may include the percentage of pregnant individuals with pregestational diabetes mellitus who

- initiated low-dose aspirin at 12–16 weeks of gestation (optimal timing) [9]

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- initiated low-dose aspirin at 12–28 weeks of gestation (acceptable timing) [9]
- underwent baseline assessment of urinary albumin or total protein excretion [3, 7]
- received pneumococcal vaccine or had documentation of previous vaccination [7]

Each of the above indicators should be stratified by race and ethnicity to ensure equitable implementation of the checklist and to identify any unintended disparities in care delivery across different populations.

Periodic revisions to the checklist may be necessary to enhance adherence, clarify areas of confusion, or incorporate updated clinical guidelines. When revisions are made, the version date should be updated accordingly, and all outdated versions should be removed from circulation to prevent inconsistencies in care.

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