Screening for Gestational Diabetes in Pregnancy

Obstetric Guideline for Health Care Providers

January 2024

Perinatal Services BC
Provincial Health Services Authority

Territory acknowledgement

We respectfully acknowledge that the document "Gestational Diabetes in Pregnancy: Obstetric Guideline for Health Care Providers" was developed at Perinatal Services BC on the unceded, traditional and ancestral territories of the Coast Salish People, specifically the xʷməθkʷəy̓əm (Musqueam), Sḵwx̱wú7mesh (Squamish) and səl̓ílwətaɬ (Tsleil-waututh) Nations who have cared for and nurtured the lands and waters around us for all time. We give thanks for the opportunity to live, work and support care here.

A note on gender inclusion and the language of this document

This document uses gender inclusive language as health care providers play a critical role in creating a supportive environment that meets the needs of transgender and gender non-conforming (TGNC) people. We encourage all health care providers to inquire with families on first consultation what language they use when referring to their pregnancy, parenting and infant feeding as well as their pronouns.

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Disclaimer:

The purpose of this guideline is to provide perinatal health care professionals with evidence-informed recommendations for the care of pregnant women/people in British Columbia (B.C.). While every attempt has been made to ensure that the information contained herein is clinically accurate and current, Perinatal Services BC acknowledge that many issues remain controversial, and therefore may be subject to practice interpretation.

Obstetric Guideline for
Health Care Providers

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1. Executive summary

Gestational diabetes mellitus (GDM) is defined as hyperglycemia diagnosed for the first time in pregnancy, is usually diagnosed in the 2nd or 3rd trimester, and resolves postpartum. GDM is differentiated from pre-existing diabetes in pregnancy which encompasses diabetes mellitus diagnosed prior to pregnancy (ie. type 1 (T1DM), type 2 (T2DM)).

Untreated hyperglycemia in pregnancy leads to increased maternal and perinatal morbidity. Treatment reduces the risk of adverse pregnancy outcomes. Treatment protocols include lifestyle modifications with glucose monitoring, and if glycemic criteria are not met, medication can be used. GDM is a risk factor for developing diabetes or cardiovascular disease later in life. Furthermore, a GDM diagnosis is a risk factor for the offspring to develop adiposity (obesity) and dysglycemia (diabetes or pre-diabetes).

2. Recommendations*

1. All pregnant individuals are eligible and should be offered gestational diabetes (GDM) screening. (strong, high)
2. GDM screening should occur **between 24–28 weeks of pregnancy**. (strong, high)
3. B.C. has recently changed to recommend a single, unified GDM screening and diagnostic strategy. All pregnant individuals should be offered GDM screening using a **2-step procedure** (the "preferred approach" per Diabetes Canada's 2018 guidelines). Screening uses a standardized non-fasting 50 g glucose challenge test (GCT) with a plasma glucose (PG) measured 1 hour later. (See Appendix A for screening and diagnostic algorithm). (strong, moderate)
    a. If 1 h plasma glucose < 7.8 mmol/L, no further testing required.
    b. If 1 h plasma glucose ≥ 7.8 mmol/L and <11.1 mmol/L, this test should be followed by a 75 g oral glucose tolerance test (OGTT) with a fasting plasma glucose (FPG), 1 hour plasma glucose (1 h PG), and 2 hour plasma glucose (2 h PG) measured. Gestational diabetes (GDM) is diagnosed if 1 or more values are met or exceeded:
        i. FPG ≥ 5.3 mmol/L
        ii. 1 h PG ≥ 10.6 mmol/L
        iii. 2 h PG ≥ 9.0 mmol/L
    c. If 1 h plasma glucose ≥ 11.1 mmol/L, GDM is diagnosed.
4. As per Diabetes Canada's 2018 guidelines, early pregnancy screening (prior to 20 weeks gestation) is indicated only for individuals at high risk of undiagnosed type 2 diabetes (T2DM) and uses a hemoglobin A1C (A1C) or fasting plasma glucose (FPG) (See Appendix B for T2DM risk factors). If A1C ≥ 6.5% or FPG ≥ 7.0 mmol/L, then refer to endocrinology or the locally available diabetes team. Otherwise, screen for GDM per usual at 24–28 weeks. (conditional, moderate)
5. All women or birthing people who were diagnosed with GDM are recommended to be re-screened for diabetes mellitus between 6 weeks and 6 months postpartum. (strong, moderate)

* Quality of evidence and strength of recommendations were rated using the Grading of Recommendations Assessment, Development, and Evaluation (GRADE) approach.[64] See Appendix D for definitions.

3. Introduction

3.1 Definition

Gestational diabetes mellitus (GDM) is defined as hyperglycemia with first onset or recognition during pregnancy, is usually diagnosed in the 2nd or 3rd trimester, and resolves postpartum.

3.2 Relevance

Gestational diabetes (GDM) is one of the most commonly diagnosed medical complications during pregnancy, affecting between 2–40% of pregnant individuals worldwide, depending on diagnostic criteria and population risk factors.[1] Overall, GDM diagnoses are increasing worldwide.[1–3] Changes in screening and diagnosis are the primary drivers[4] of this increase in prevalence, although contributing risk factors (e.g. adiposity) are also increasing.[5] Well-established risk factors for GDM include: being 35 years of age or older; from a high-risk ethnic group (Indigenous, Asian, Hispanic or African); having a body mass index greater than or equal to 30 kg/m^2; prediabetes; GDM in a previous pregnancy; given birth to a baby that weighed more than 4 kg; polycystic ovary syndrome or acanthosis nigricans[7]; using corticosteroid medication (maternal use in pregnancy); or having a 1st degree relative (parent, brother or sister) with T2DM or GDM.[7, 17, 25]

Gestational diabetes (GDM) is usually asymptomatic but is associated with an increased risk for pregnancy complications, perinatal morbidity and mortality. These can include pregnancy and maternal outcomes such as cesarean birth, shoulder dystocia, and hypertensive disorders of pregnancy, and fetal/neonatal outcomes such as stillbirth, birth injury, hypoglycemia, polycythemia, and hyperbilirubinemia.[1]

Gestational diabetes (GDM) is differentiated from "pre-existing diabetes in pregnancy" which includes any of type 1 and type 2 diabetes mellitus (T1DM or T2DM), maturity onset diabetes of the young (MODY) and mitochondrial diabetes.[6] GDM is also differentiated from "Overt Diabetes in Pregnancy" (ODiP) which refers to individuals with a hemoglobin A1C ≥ 6.5% or fasting plasma glucose (FPG) ≥ 7.0 mmol/L at any time in pregnancy. Within the population of all patients with diabetes in pregnancy, 80–95% have GDM, 5–15% have DM and 1–5% have ODiP.[1] Management of patients with pre-existing diabetes in pregnancy, ODiP or GDM are not the focus of this guideline.[7] Rather, this clinical guideline is focused on screening and diagnosis of GDM and reviews recent and local research evidence.

Notably, individuals diagnosed with gestational diabetes (GDM) include a heterogeneous group of patients with different metabolic profiles.[8, 9] These patients develop hyperglycemia when exposed to pregnancy hormones, but the underlying metabolic and genetic profiles leading to hyperglycemia differ. GDM subtypes include:

- Hyperglycemia that likely preceded the pregnancy (e.g. impaired glucose tolerance (IGT), elevated first trimester fasting glucose, overt diabetes in pregnancy, monogenic diabetes)
- Reduced and/or falling insulin secretory capacity (e.g. developing T1DM)
- Significant insulin resistance from early pregnancy (e.g. polycystic ovary syndrome, women with overweight or obesity, some specific ethnic groups)
- A combination of factors (e.g. family history of diabetes, previous GDM, genetic predisposition for GDM/T2DM)[8]

The original purpose of diagnosing gestational diabetes (GDM) was to identify prediabetic patients who might go on to develop diabetes following pregnancy.[10] However, research now supports treatment of GDM to reduce risks of adverse perinatal outcomes.[11–15] GDM is also associated with an increased risk of developing hypertensive disorders during pregnancy. However, the 'best' screening and diagnostic criteria for GDM remains controversial.[16] While current GDM management [7, 17] strategies are generally the same for all GDM subtypes, early research points to higher perinatal and long term T2DM risks in some GDM subtypes.[18, 19] Of note, the patients who have "overt diabetes in pregnancy" (ODiP) [20, 21] represent a very small group (1–4% of diabetes in pregnancy), however, many are likely to have postpartum dysglycemia and/or T2DM. Such patients benefit from earlier monitoring and treatment in pregnancy to reduce adverse perinatal risk.[22]

A diagnosis of gestational diabetes (GDM) is associated with an increased lifetime risk of type 2 diabetes and cardiovascular disease. [23, 24] Therefore, individuals who had GDM should be screened postpartum for diabetes, and, if a dysglycemic state is confirmed, then be offered education on healthy behavior interventions to reduce diabetes and cardiovascular disease risk.

4. Universal screening for gestational diabetes

Diabetes Canada recommends **universal screening of all pregnant women and birthing individuals for gestational diabetes (GDM)** regardless of presence or absence of risk factors [7] (unless already diagnosed with DM or ODiP). B.C. continues to endorse this recommendation.

5. Gestational diabetes screening and diagnostic overview

Screening approaches and diagnostic criteria for gestational diabetes (GDM) have changed over time [2, 3] and remain controversial.[11, 26] Some countries use risk-based screening only. Diagnosis may occur using a two-step (screening test first) or a one-step approach (only a diagnostic test). Different diagnostic tests and thresholds are in use worldwide.

The most stringent approach (per the International Association of Diabetes in Pregnancy Study Group [IADPSG] Recommendations from the 2008 Consensus Panel, published March 2010) [27, 28] increases the prevalence of GDM by lowering the threshold for a GDM diagnosis to include more individuals with mild hyperglycemia. Recent randomized trials have found no difference in perinatal health outcomes comparing the most stringent diagnostic criteria (IADPSG) to other screening and diagnostic approaches.[29–31] Because of this, health systems must carefully consider both benefits and harms [32] of increasing GDM diagnoses, as well as finite health system resources, when choosing a diagnostic and screening strategy.[11]

6. Patient voices and experiences

Qualitative literature on patient experiences of gestational diabetes (GDM) screening and diagnosis show mixed responses.[32–35] Generally, two-step screening is well-received by patients as it minimizes testing burden for the majority of patients.[31] Side effects from glucose challenge tests are experienced by up to 20% of people and include nausea, dizziness, syncope and hypoglycemia.[30, 36] These may be more pronounced with higher glucose loads and after fasting.

A Canadian study[37] among an ethnically diverse group from Toronto, Ontario found both positive and negative themes following a GDM diagnosis. Negative effects included feeling pressured to fill multiple roles, financial impacts related to increasing costs of food to meet dietary requirements and a disconnect between the diabetes recommendations and their cultural practices. Positive effects were that women felt motivated to make health behaviour changes after a diagnosis. Others report that GDM diagnoses can increase anxiety and perceived stigma, disrupt the pregnancy experience and be life-changing.[32, 38] Some patients reported that experiencing GDM treatment was especially difficult as it conflicted with cultural practices and they felt they had received biased treatment by professionals.[38] Canadian research also highlights a need for culturally safe diabetes management and counselling for Indigenous and other marginalized populations.[37, 39–42]

In 2019, 8% of pregnant individuals in B.C. with antenatal care initiated before 20 weeks did not complete recommended gestational diabetes (GDM) screening. Of these, half had an A1C and/or a random plasma glucose (fasting or non-fasting) and the remainder had no glucose test(s).[43] A qualitative study in B.C. on the experiences of declining care in pregnancy (births between 2010–2014), reported that GDM screening was declined in over 12% of pregnancies in their sample.[44] This was the most commonly declined *recommended* prenatal test (slightly fewer than those who declined prenatal genetic screening). Patient-reported barriers to completing GDM screening include travel distance,[45] social/mental health issues, discomfort with the test, socio-economic barriers,[33] and preference/choice.[46, 47]

Pregnant individuals are often aware of the lack of scientific consensus surrounding gestational diabetes. Health care providers might address this by openly acknowledging this controversy and explaining why they adhere to a particular approach.[48] This can foster trust between the patient and provider and is an important component of a shared-decision making process. Patient-provider discussions about gestational diabetes screening should be initiated before 24–28 weeks of gestation to allow adequate time for decision-making.

7. Diagnostic and screening changes in B.C.

Gestational diabetes (GDM) screening in B.C. has undergone several changes in the past 20 years.[49, 50] Recent research using population-based data examined the impact of these changes on GDM prevalence and perinatal outcomes in B.C.[4, 49, 50, 55] These local studies, combined with new randomized controlled trials,[29–31, 51] are the impetus for this updated B.C. guideline. This guideline also provides guidance on early pregnancy (1st trimester) screening for ODiP to standardize practice throughout the province and align with national (Diabetes Canada and SOGC) recommendations.

Prior to 2010, B.C. used a two-step approach, with initial screening using a 50 g GCT, and diagnosis with a 3 hour 100 g OGTT using the Carpenter-Coustan criteria.[10, 50] Of note, this two-step Carpenter-Coustan method continues to be the most frequently used approach in the United States and is recommended by the American College of Obstetricians and Gynecologists (ACOG).[25] In 2008, following the Hyperglycemia and Adverse Pregnancy Outcomes (HAPO) Study,[52] a new one-step approach to GDM was proposed by the International Association of Diabetes in Pregnancy Study Group (IADPSG) where individuals would be screened and diagnosed using a single 75 g, 2 hour OGTT and with updated diagnostic thresholds. The IADPSG acknowledged at the time that this would radically increase GDM prevalence but that this was justified by findings in the HAPO study[28] showing a continuous relationship between maternal glycemic levels and infant birth weight. In October 2010, B.C. recommended all individuals be screened using a one-step approach following the IADPSG consensus thresholds. Notably, no national Canadian guidelines recommended the IADPSG criteria at this time.

Following October 2010 in B.C., laboratory tests and all reference values across the province were changed to use a 75 g OGTT and the IADPSG reference criteria (GDM diagnosed if 1 value met or exceeded; fasting glucose (FG) ≥5.1 mmol/L; 1 h plasma glucose (PG) ≥10.0 mmol/L; 2 h PG ≥8.5 mmol/L). However, the 50 g GCT was not eliminated so clinicians could continue to use a two-step approach with the 75 g OGTT as a diagnostic test.[50] Early studies reported only a small increase in diagnostic prevalence of GDM in B.C. Because GDM screening information is not collected in B.C.'s perinatal datasets, these analyses could not assess changes in B.C. screening practices following the policy change in 2010.[50]

Recent research using linked administrative data was able to examine GDM screening across B.C. from 2005–2019.[53] GDM screening methods (one-step v. two-step) varied across years, regions of the province, by care provider type and by patient characteristics.[49] This inconsistency in screening likely creates confusion for patients and providers who may experience different testing recommendations depending on where they live in the province and who is their antenatal health care provider. A second analysis[4] found that changes in screening were the primary drivers of the two-fold increase in GDM in B.C. (from 7% in 2008, to 15% in 2019), not changes in population characteristics. Based on data from B.C., a switch to the IADPSG criteria for diagnosis increased prevalence of diet-controlled GDM while prevalence of medication-controlled GDM was unchanged.[49] GDM prevalence in B.C. is now among the highest in Canada leading to increased patient burden and potentially increased health system costs.[54]

From 2010 to 2023, B.C.'s approach to GDM screening and diagnosis differed from most other Canadian provinces with the IADPSG 75 g OGTT reference criteria (FPG ≥5.1 mmol/L; 1 h PG ≥10.0 mmol/L; 2 h PG ≥8.5 mmol/L) being applied for both 1-step and 2-step approaches. Notably, Diabetes Canada guidelines in 2013 first referred to the IADPSG reference criteria but recommended this as an "alternate" for use with 1-step approach. Diabetes Canada's "preferred" approach applied a higher reference criteria (FPG ≥5.3 mmol/L; 1 h PG ≥10.6 mmol/L; 2 h PG ≥9.0 mmol/L). Therefore, B.C.'s practice of using a 2-step approach with the more stringent IADPSG reference criteria has never been included in Canadian national guidelines.[55] The 2018 Diabetes Canada guidelines justify the IADPSG criteria as an "alternate" approach because, at the time, numerous studies showed an increased prevalence of GDM while impacts on perinatal outcomes were inconsistent.[7, 27, 56–59] Diabetes Canada authors noted that with a lack of evidence supporting one screening method over another, decisions about which screening method to use might be based on economic implications and health-system resources. Further, they noted additional adequately powered prospective studies are needed.[7]

Adding to the evidence from retrospective studies are several recent, well-designed randomized controlled trials[29–31] (RCTs). In general, the trials all compared a less stringent GDM screening and diagnostic approach to the most stringent approach (a one-step approach with an 75 g OGTT and IADPSG criteria). None of these RCTs demonstrated improvements in population-level perinatal or maternal outcomes when using the one-step IADPSG criteria. All noted a substantial increase in GDM diagnosis when using the more stringent IADPSG one-step method.

8. NEW — Recommended screening and diagnostic criteria for gestational diabetes in British Columbia

8.1 Target population

All pregnant women/individuals without pre-existing diabetes.

8.2 Timing of GDM screening in pregnancy

For all pregnant women/individuals not diagnosed with pre-existing diabetes or overt diabetes in pregnancy (ODiP), screening for GDM is recommended between 24–28 weeks of pregnancy.

8.3 Screening and diagnostic approach for GDM in pregnancy

Two-step screening per Diabetes Canada "preferred" pathway[7] (and visualized in Appendix A):

Step 1: The screening test is a standardized, **non-fasting** 50 g glucose challenge test (GCT) followed by a plasma glucose measured 1 hour later.

Following the 50 g glucose challenge, if the plasma glucose is:

- <**7.8 mmol/L**, screened negative, no further testing is required
- **7.8–11.0 mmol/L**, offer the 75 g oral glucose tolerance test (OGTT) (Step 2)
- **≥11.1 mmol/L**, GDM is diagnosed (confirmatory OGTT not required)

Step 2: If screened positive, 1 h plasma glucose 7.8–11.0 mmol/L on the GCT, proceed to Step 2. The 75 g OGTT diagnostic test consists of a fasting/baseline, 1 hour, and 2 hour plasma glucose. Fasting should occur for a minimum of 8 hours prior to the test. Following the 75 g OGTT, GDM is diagnosed if any 1 of the following criteria is met:

- **fasting plasma glucose ≥5.3 mmol/L**
- **1 hour plasma glucose ≥10.6 mmol/L**
- **2 hour plasma glucose ≥9.0 mmol/L**

8.4 Early pregnancy screening for overt diabetes in pregnancy (ODiP) [20, 21]

As per Diabetes Canada 2018 guidelines[7], early pregnancy screening may be offered based on the presence of any type 2 diabetes mellitus (T2DM) risk factors with a shared decision-making approach that considers local diabetes management resources, patient values and preferences. Risk factors include: GDM in a prior pregnancy, body mass index >30 kg/m², 1st degree relative with type 2 diabetes, high-risk ethnic group, or age ≥40 years (see Appendix B). Early pregnancy screening, if indicated, is either a hemoglobin A1C or a fasting plasma glucose (FPG) completed prior to 20 weeks.[7, 22, 60] Results should be interpreted as follows:

- **Hemoglobin A1C ≥6.5% or fasting plasma glucose ≥7.0 mmol/L:**
  - refer to diabetes specialist care (consistent with a diagnosis of ODiP)
  - does not need a 24–28 weeks GDM screening test
  - rescreen postpartum as not all patients will meet criteria for a diabetes diagnosis after pregnancy [7]
- **Hemoglobin A1C 6.0%–6.4% or fasting plasma glucose 6.1-6.9 mmol/L:**
  - consider for diabetes specialist care pending local resources, referral pathways and patients' interest in early treatment; evidence for early treatment in such patients is unclear [22, 60, 61]
  - lifestyle recommendations (dietary, exercise) and guidance on healthy gestational weight gain would be reasonable [62]
  - follow usual GDM screening (24–28 weeks)
- **Hemoglobin A1C <6.0% or fasting plasma glucose <6.1 mmol/L:**
  - follow usual GDM screening (24–28 weeks)

See also Diabetes Canada healthcare provider support tool for guidance in interpreting early pregnancy screening results (link in supporting material below).

8.5 Post-partum screening after GDM during a pregnancy

All individuals who were diagnosed with gestational diabetes (GDM) in pregnancy are recommended to be re-screened with a single 75 g OGTT between 6 weeks and 6 months postpartum. The purpose of postpartum screening is to identify new-onset T2DM or prediabetes.

Criteria for interpretation of the postpartum 75g OGTT are:

- **Pre-diabetes:**
  - Fasting plasma glucose: 6.1–6.9 mmol/L
  - 2 h plasma glucose: 7.8–11.0 mmol/L
- **Diabetes:**
  - Fasting plasma glucose: ≥7.0 mmol/L
  - 2 h plasma glucose: ≥11.1 mmol/L

8.6 Alternatives to recommended practices for screening

As with all health care, pregnant individuals are the ultimate decision-makers. If the pregnant individual requests care that is outside these guidelines (e.g. declines any screening, screening according to guidelines from another country, risk-based screening, alternate glucose loads for a GCT), then the health care provider should document all conversations, decision-making steps and final plan, as per local policies and procedures. Similarly, a provider may also support a pregnant individual who chooses to skip screening and go directly to the diagnostic test (75 g OGTT).

8.7 Key points to discuss with your patients

- Screening for gestational diabetes (GDM) is recommended for all pregnant patients to identify high blood sugar levels in pregnancy which could benefit from treatment.
- Gestational diabetes is more likely to occur in some people who have been identified as being at higher risk, but can also occur in people without known risk factors.
- Being diagnosed with gestational diabetes does indicate you have an increased risk of developing diabetes later in life compared with someone who did not develop GDM. This awareness can motivate healthy lifestyle changes.
- The screening and diagnostic tests may be unpleasant. Some people may experience nausea, vomiting and/or headache, although these symptoms should resolve soon after taking the test and resuming a normal diet.
- If you are diagnosed with GDM, you will be asked to monitor your blood sugar levels and make lifestyle modifications to help stabilize your blood glucose. If needed, medication may be recommended. Additional antenatal monitoring may be recommended during your pregnancy.

9. Resources / links

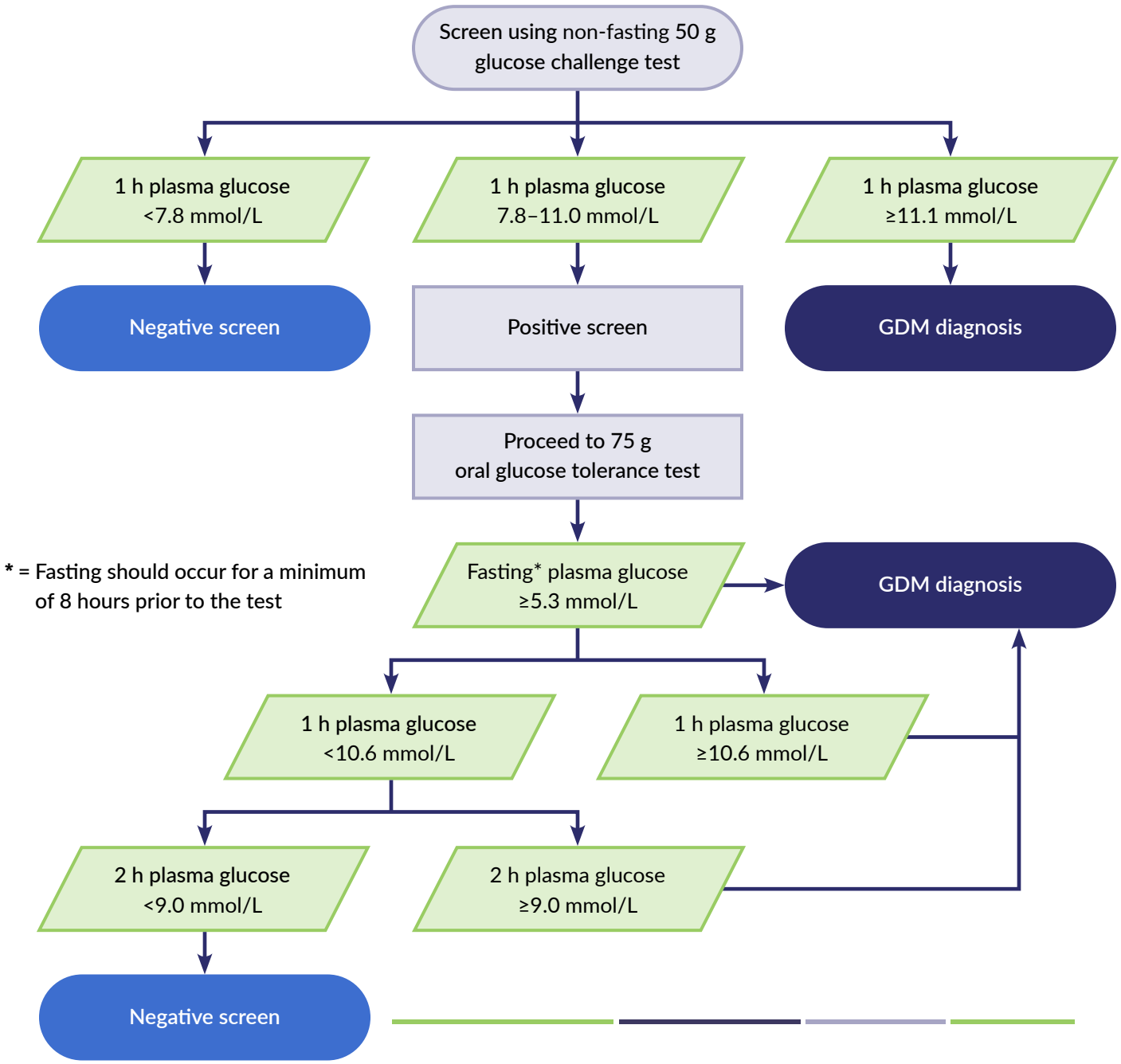
- Society of Obstetricians and Gynecologists of Canada Guideline No. 393 — Diabetes in Pregnancy (2019) https://www.jogc.com/article/S1701-2163(19)30298-1/fulltext
- Diabetes Canada
  - Gestational diabetes guidelines https://guidelines.diabetes.ca/cpg/chapter36
  - Health care provider tool for GDM screening: https://guidelines.diabetes.ca/health-care-provider-tools/gdm
- BC Women's Hospital Diabetes in Pregnancy Clinic http://www.bcwomens.ca/health-professionals/refer-a-patient/diabetes-clinic
- Association of Ontario Midwives Gestational Diabetes Backgrounder https://www.ontariomidwives.ca/sites/default/files/Gestational-diabetes-mellitus-backgrounder-PUB_0.pdf
- BC Antenatal Record https://cms.psbchealthhub.ca/sites/default/files/2023-11/Antenatal Record Part 1 and 2.pdf
- Ministry of Health Maternity Out-Patient Laboratory Requisition https://www2.gov.bc.ca/assets/gov/health/forms/1935fil.pdf

10. Appendix

Appendix A — Clinical algorithm for gestational diabetes mellitus (GDM) universal screening using 2-step procedure

All pregnant individuals are eligible and should be offered gestational diabetes (GDM) screening. GDM screening should occur **between 24–28 weeks of pregnancy.**

Ministry of Health Maternity Outpatient Lab Requisition:
https://www2.gov.bc.ca/assets/gov/health/forms/1935fil.pdf



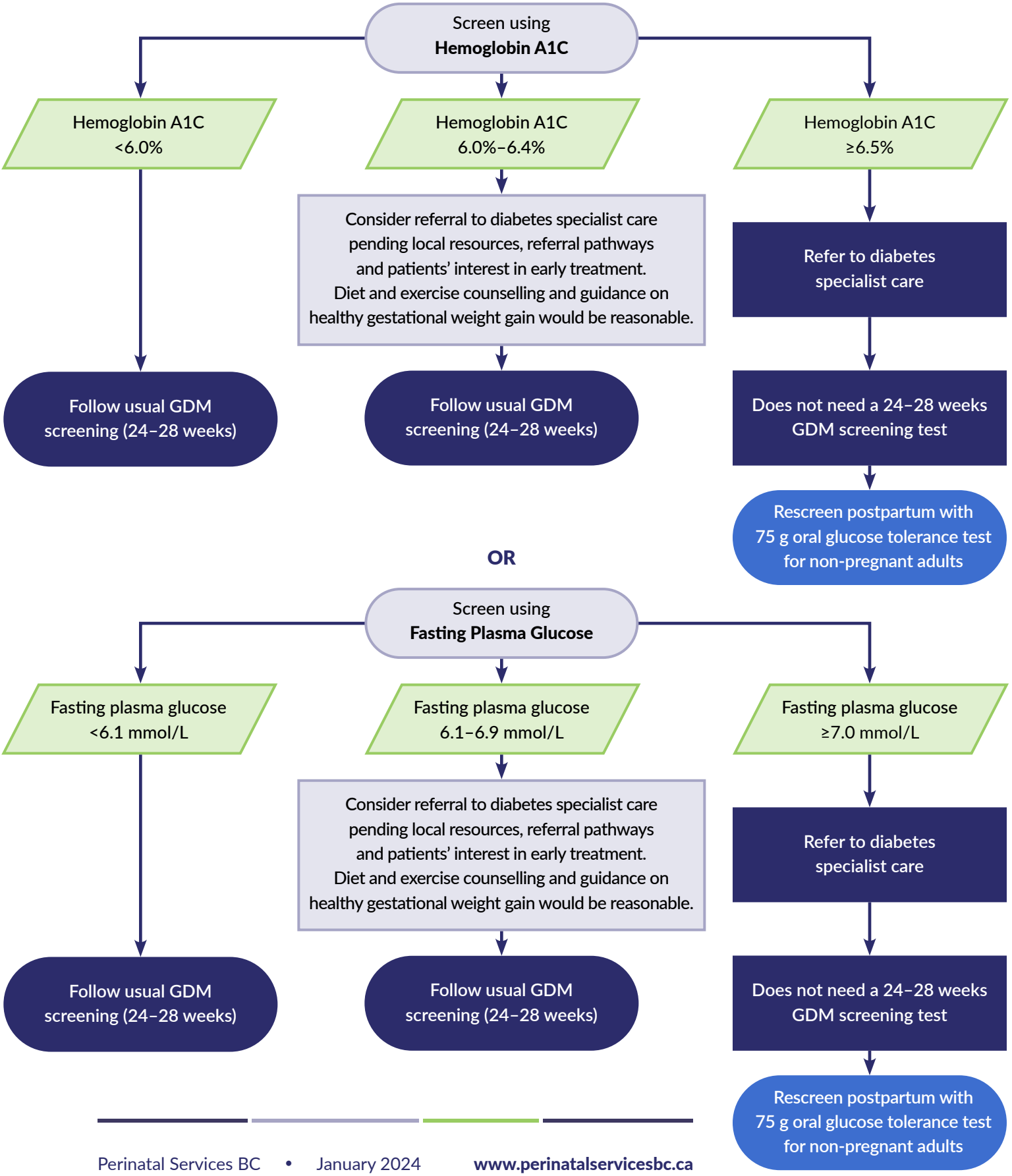
Appendix B — Risk factors for type 2 diabetes (T2DM) from Diabetes Canada [63]

Early pregnancy screening via hemoglobin A1C or fasting plasma glucose prior to 20 weeks gestation may be offered based on the presence of any of these T2DM risk factors:

- Age ≥40 years (at gestational time of assessment)
- First-degree relative with type 2 diabetes
- Member of high-risk population (e.g. African, Arab, Asian, Hispanic, Indigenous or South Asian descent, low socioeconomic status)
- History of prediabetes (impaired glucose tolerance, impaired fasting glucose, or A1C 6.0%–6.4%)
- History of GDM
- History of delivery of a macrosomic infant
- Presence of end organ damage associated with diabetes:
    - Microvascular (retinopathy, neuropathy, nephropathy)
    - Cardiovascular (coronary, cerebrovascular, peripheral)
- Presence of vascular risk factors:
    - High-density lipoprotein cholesterol (HDL-C) <1.0 mmol/L in males, <1.3 mmol/L in females
    - Triglycerides ≥1.7 mmol/L
    - Hypertension
    - Overweight
    - Abdominal obesity
    - Smoking
- Presence of associated diseases:
    - History of pancreatitis
    - Polycystic ovary syndrome
    - Acanthosis nigricans
    - Hyperuricemia/gout
    - Non-alcoholic steatohepatitis
    - Psychiatric disorders (bipolar disorder, depression, schizophrenia)
    - Human immunodeficiency virus-1 (HIV) infection
    - Obstructive sleep apnea
    - Cystic fibrosis
- Use of drugs associated with diabetes:
    - Glucocorticoids
    - Atypical antipsychotics
    - Statins
    - Highly active antiretroviral therapy
    - Anti-rejection drugs

Appendix C — Clinical algorithm for early pregnancy screening for overt diabetes in pregnancy (ODiP)

Early pregnancy screening, if indicated, is either an **hemoglobin A1C** or a **fasting plasma glucose (FPG)** completed prior to 20 weeks. Refer to Diabetes Canada for Risk Factors for Type 2 Diabetes (T2DM).



Appendix D — Key to Grading of Recommendations, Assessment, Development and Evaluation Quality of Evidence (GRADE criteria) (Adapted)[64, 65]

Grade	Definition
Strength of recommendation	
Strong	High level of confidence that the desirable effects outweigh the undesirable effects (strong recommendation for) or the undesirable effects outweigh the desirable effects (strong recommendation against).
Conditional	Desirable effects probably outweigh the undesirable effects (weak recommendation for) or the undesirable effects probably outweigh the desirable effects (weak recommendation against).
Quality of evidence	
High	We are very confident that the true effect lies close to that of the estimate of the effect.
Moderate	We are moderately confident in the effect estimate: The true effect is likely to be close to the estimate of the effect, but there is a possibility that it is substantially different.
Low	Our confidence in the effect estimate is limited: The true effect may be substantially different from the estimate of the effect.
Very low	We have very little confidence in the effect estimate: The true effect is likely to be substantially different from the estimate of effect.

11. Definitions

A1C = hemoglobin A1C
FPG = fasting plasma glucose
GCT = glucose challenge test
GDM = gestational diabetes mellitus
IADPSG = International Association of Diabetes in Pregnancy Study Group
IGT = impaired glucose tolerance
MODY = maturity onset diabetes of the young
ODiP = overt diabetes in pregnancy
OGTT = oral glucose tolerance test
PG = plasma glucose
RCT = randomized controlled trial
T1DM = type 1 diabetes mellitus
T2DM = type 2 diabetes mellitus

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