2012
CBHSSJB Protocol for the Management of:

Gestational Diabetes Mellitus (GDM)

and

Pre-existing diabetes during pregnancy

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Cree Board of Health and Social Services of James Bay

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TABLE OF CONTENTS

LIST OF ABBREVIATIONS & SYMBOLS

A1C	Glycated hemoglobin
AC	Ante Cibum (before meals)
ACE	Angiotensin Converting Enzyme
ARB	Angiotensin Receptor Blocker
BMI	Body Mass Index
CDA	Canadian Diabetes Association
CHR	Community Health Representative
CLE	Cree Leukoencephalopathy
DM	Diabetes Mellitus
DM2	Type 2 Diabetes Mellitus
GARE	Grossesse À Risque Élevé
GCT	Glucose Challenge Test
GDM	Gestational Diabetes Mellitus
H	Humalog (lispro insulin)
Hb	Hemoglobin
IADPSG	International Association of Diabetes in Pregnancy Study Group
IDF	International Diabetes Federation
IFG	Impaired Fasting Glucose
IGT	Impaired Glucose Tolerance
IUGR	Intrauterine Growth Retardation
MD	Physician
N	Insulin N (intermediate acting)
NPO	Nil per os (nothing by mouth)
NST	Non Stress Test
OHA	Oral Hypoglycemic Agent
OGTT	Oral Glucose Tolerance Test
PC	Post Cibum (after meals)
PCR	Protein Creatinine Ratio
PRN	Pro Re Nata (when necessary)
R	Insulin R (rapid acting)
SBGM	Self Blood Glucose Monitoring
TSH	Thyroid-Stimulating Hormone
US	Ultrasound
<	Less than
>	Greater than
≤	Less than or equal to
≥	Greater than or equal to

ACKNOWLEDGMENTS

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INTRODUCTION

- This protocol is an update of the 2002 CBHSSJB protocol, and is based on the 2009 **International Association of Diabetes in Pregnancy Study Group** (IADPSG) recommendations(2);
- The main differences between the two guidelines relate primarily to screening and diagnosis, and are as follows:
  - In addition to first trimester fasting (AC) blood sugar value, the first trimester A1C value can now be used to diagnose pre-existing diabetes
  - The 50-g screening glucose challenge test (GCT) is **no longer used at any time** during pregnancy
  - The diagnosis of Impaired Glucose Tolerance (IGT) of pregnancy has been eliminated
  - The threshold values for blood sugar levels and requirements for diagnosis have been modified (lowered)[1](3, 4)
  - A **single** abnormal result on the 75-g OGTT is now diagnostic for GDM
  - The net result will be a greater number of women diagnosed with GDM, and at an earlier stage of pregnancy
- These changes have been incorporated into the following guidelines (as have other modifications), and into the summary sheets and management algorithms.

Important note

Not all women with diabetes in pregnancy will require GARE (Grossesse à Risque Élevé) visits, or other specialized interventions

Their management depends on their level of glycemic control, and presence or absence of complications. Refer to section 5 (*Additional Monitoring*) for more details

[1] Studies have shown that treatment based on the lower blood glucose diagnostic thresholds (consisting of lifestyle modification in 92% and insulin in 8%) resulted in a significant decrease in fetal overgrowth, even if maternal outcomes were not affected. This important decrease in fetal overgrowth will hopefully have an effect on reducing future childhood obesity rates and the incidence of type 2 diabetes in the offspring.

SECTION 1: DEFINITIONS, RISKS & SCREENING TESTS

1. Gestational Diabetes Mellitus

1.1 Definition

- Gestational diabetes mellitus (GDM) is a type of glucose intolerance that begins during pregnancy and is usually reversible postpartum;
- This glucose intolerance is caused by hormones which are produced by the placenta;
- These hormones block the effect of insulin. As the placenta continues to grow, more hormones are produced and this further increases insulin resistance;
- Gestational diabetes develops if the pancreas is unable to respond and produce sufficient insulin to meet the increased insulin requirements;
- **All** pregnant women, from their first prenatal visit onward should be counseled in order to **prevent** the development of GDM;
- The emphasis should be on healthy eating habits, physical activity and appropriate weight gain;
- The handouts (in appendices) designed for women with GDM can be reviewed and given to all women to help prevent GDM.

1.2 Risks

Short-term risks of GDM to the mother include:

- Increased lower and upper urinary tract infections
- Development of pregnancy induced hypertension and (pre)eclampsia
- Pre-term labor and premature rupture of membranes
- Increased rate of cesarean section
- Increased duration of hospitalization
- Higher episiotomy rates
- Increased number and degree of perineal tears
- Uterine atony and postpartum hemorrhage

Short-term risks to the infant include:

- Macrosomia (wt > 4000 g) with resultant complications: shoulder dystocia, brachial plexus injuries, clavicle fractures, asphyxia
- Metabolic derangements: hypoglycemia, hypocalcemia, hypomagnesemia, polycythemia (↑ Hb), hyperbilirubinemia (jaundice)
- Respiratory distress syndrome
- Infections and sepsis
- Increased duration of hospitalization

- Studies show that the number and severity of these adverse outcomes correlate with the degree of glycemic control during the pregnancy and around the time of delivery(5);
- It has also been shown that with improved/normalized glucose control, these risks can be reduced.

Long-term risks to mother and infant include:

- Developing future type 2 diabetes
- Hypertension
- Obesity

- Women who have had GDM during one pregnancy are at a greater risk of developing it in a subsequent pregnancy (40% to 70% risk of recurrence) (6);
- Some studies show that up to 50% of mothers who have had gestational diabetes will develop type 2 diabetes **within the next 5 years**(7);
- There is growing evidence that alterations in maternal glycemia can modify the offspring's future health risks and increase the risk of type 2 diabetes in the offspring;
- Women should be advised about these long-term risks, and counseled about the steps she can take during the pregnancy to minimize them (i.e. normalize her blood glucose levels).

2. Pre-existing diabetes in pregnancy

- There is an increasing number of women of childbearing age on the territory who have been diagnosed with type 2 diabetes and many unaware they have type 2 diabetes;
- These women are at increased risk for miscarriages, congenital malformations, and perinatal deaths (in addition to the risks related to GDM as discussed above);
- Women with known diabetes **do not** require any of the screening tests discussed in the following section;
- All women with diabetes who are not planning a pregnancy should be encouraged to find a reliable method of birth control;

- To improve pregnancy outcomes, and minimize health risks, all women with pre-existing diabetes who are planning a pregnancy, or who are not using a reliable form of contraception, should be followed closely and referred to a physician for pre-conception counselling;
- In addition, they should:
    - Take folic acid supplement 5 mg/day, beginning prior to conception, and continuing for the first 12 weeks of pregnancy
    - Optimize blood glucose control prior to conception (A1C < 7.0% or < 6.0% if achievable); hyperglycemia is most teratogenic in the first trimester (often before women even know that they are pregnant)
    - Consider switching from oral hypoglycemic agents to insulin. This decision should be made on a case-to-case basis. Refer to physician for assessment
- Discontinue the following medications:
    - ACE inhibitors
    - Angiotensin Receptor Blockers (ARBs)
    - Statins, Fibrates, Niacin
- Assess and manage any complications (retinopathy, hypertension, nephropathy, cardiovascular disease). Refer to physician for assessment.

Please refer to Section 3: *Management Guidelines & Checklists for Visits*, for more details about the care of women with pre-existing diabetes who are planning a pregnancy, or who have become pregnant.

3. Screening tests for women without pre-existing diabetes

- All pregnant women on the territory without a known diagnosis of diabetes will be screened in their first trimester with two blood glucose measures:
    - **AC glucose**
    - **A1C**
- Women who have normal AC glucose and A1C levels in the first trimester will be screened again in the second trimester, with:
    - **75-g OGTT** at 22 weeks
    - If normal results at 22 weeks, repeat **75-g OGTT** at 28 weeks[2]

[2] The use of two 75-g OGTT is not part of the IADPSG recommendations. The ideal time for the 75-g OGTT is difficult to determine, as the earlier test will provide earlier diagnosis, but the later test may pick up more cases. The benefit of doing a routine second 28-wk OGTT will be evaluated after 6-12 months, and determined if it adds any diagnostic benefit.

3.1 Early (first trimester) AC glucose and A1C

- These glucose measures can identify both undiagnosed pre-existing diabetes and early gestational diabetes mellitus;
- Note that the normal blood glucose value for this test (< 5.1) is lower than that for the non-pregnant state (< 6.1). This is because the pregnant state is effectively a state of accelerated starvation, and so the new "normal" values for blood glucose are lower than in non-pregnant individuals;
- See Tables 1 and 2 for interpretation of the results of both AC glucose and A1C.

Table 1. Interpretation of results of AC glucose

AC (mmol/L)	Diagnosis	Action
< 5.1	Normal (unless A1C ≥ 6.5%*)	75-g OGTT at 22 weeks and repeat 75-g at 28 weeks (if first test normal)
5.1 – 6.9	Gestational Diabetes (unless A1C ≥ 6.5%*)	Begin treatment as per "*Management Guidelines and Checklists for Visits*" (page 26)
≥ 7.0*	Pre-existing Diabetes	Begin treatment as per "*Management Guidelines and Checklists for Visits*" (page 30)

Table 2. Interpretation of results of A1C

A1C	Diagnosis	Action
< 6.5%	Indeterminate	Management depends on AC glucose result (see above)
≥ 6.5%*	Pre-existing Diabetes (irrespective of AC result)	Begin treatment as per "*Management Guidelines and Checklists for Visits*" (page 30)

*Patients require repeat AC glucose and A1C testing within 1 wk to confirm diagnosis of diabetes (unless **both** the AC glucose ≥ 7.0 and A1C ≥ 6.5%. **If both test diagnostic, do not repeat test**)

3.2 Second trimester 75-g OGTT

- Women who have normal AC glucose and A1C levels in the first trimester will be screened again in the second trimester:
    - 75-g OGTT at 22 weeks
    - If results are normal at 22 weeks, repeat 75-g OGTT at 28 weeks
- There is no special diet required in the days preceding this test, however the patient must remain NPO overnight (water is permitted);
- For courtesy, advise the patient in advance that the test will take slightly over 2 hours to perform, and that she must remain in the clinic during that time (no food or exercise permitted);

- Tables 3 and 4 respectively give the normal values of 75-g OGTT, as well as how to interpret the results.

Table 3. Normal values of 75-g OGTT

AC	1-hr PC	2-hr PC
< 5.1 mmol/L	**< 10.0 mmol/L**	**< 8.5 mmol/L**

Table 4. Interpretation of results of 75-g OGTT

RESULTS	Diagnosis	Action
All values normal	Normal	If 22 weeks: repeat 75-g OGTT at 28 weeks If 28 weeks: no further testing necessary
1 or more abnormal value(s)	GDM	Begin treatment as per "*Management Guidelines and Checklists for Visits*" (page 26)

SECTION 2: PRINCIPLES & OVERVIEW OF MANAGEMENT

- This section will provide information about the mainstays of management of diabetes during pregnancy;
- For full details about the management, frequency and objectives of visits, refer to section 3 titled *Summary of Management guidelines & checklists for visits*.

1. Nutrition counselling(8-10)

- Pregnant women with GDM or pre-existing diabetes should be evaluated and followed by a nutritionist, either on site or by phone;
- However, any health care worker (CHR, nurse or MD) can start nutrition counselling, to encourage:
  - Optimal blood glucose control
  - Appropriate weight gain (adequate, but not excessive)
  - Good nutritional intake
- Counselling can begin with the *Basic Nutrition Guidelines* listed below;
- Detailed information about these guidelines is in the following sections.

Basic Nutrition Guidelines

- Don't eat for 2, eat 2 times better!
- Spread carbohydrates over 3 meals and 2 to 3 snacks per day (including an evening snack)
- Limit the amount of carbohydrate-rich foods at breakfast
- Add an extra 2 to 3 Food Guide Servings each day, such as a fruit and yogurt for a snack
- Avoid sweeteners containing saccharine or cyclamates. These are not safe during pregnancy
- Satisfy your thirst with water instead of juice or other drinks
- Be active everyday
- Vitamins to take every day:
  - 5 mg of folic acid until 12 weeks of pregnancy
  - One maternal multivitamin tablet/day for full pregnancy[3] (as tolerated)
- Eat according to *Eating Well with Canada's Food Guide - First Nations, Inuit and Métis*

[3] Take **only one** multivitamin per day, since taking too much vitamin A (or over 10000 UI) can increase the risk of birth defects. There is no risk to taking both 5 mg of folic acid and a multivitamin for the first 12 weeks of pregnancy.
Maternal multivitamin should always contain:
1.0 mg of folic acid
16 to 20 mg of iron
B12 vitamin

1.1 General advice to eat according to Canada's Food Guide (1, 9, 11-13)

- No food contains all the nutrients needed for good health. In order to meet the special nutritional needs during pregnancy, choose a variety of foods from the four food groups every day;
- *Vegetables and fruit*: The brightly colored fruits and vegetables contain more vitamins (e.g. broccoli, spinach, carrots, sweet potatoes, squash, romaine lettuce). Try to include some of these in all meals and snacks;
- *Grain products*: Choose "whole grain" products. These contain more fibre, that may help relief or prevent constipation;
- *Milk and alternatives*: Dairy products and enriched soy drinks are needed for the baby; they provide calcium and vitamin D to form healthy bones and teeth. They also help keep the mother's bones and teeth healthy;
- *Meat and alternatives*: Eating protein with all meals and snacks has several benefits:
    - Extra protein is needed during pregnancy for the baby to grow
    - Proteins satisfy the appetite and keep you feeling full for longer
    - Proteins do not cause fast or big increases in blood sugar level (they help keep the blood sugar level steady)
- For details on serving size or food groups, refer either to *Eating Well with Canada's Food Guide - First Nations, Inuit and Métis*, to the Nutrition section of chapter 3 of the *CBHSSJB Diabetes Program* manual, or section 3.5 of the *CBHSSJB Maternal and Child Health Program* manual.

Don't eat for 2, eat 2 times better!(1)

- More vitamins and minerals are needed during pregnancy, so choose foods carefully
- Pregnancy is a good opportunity to either keep up good eating habits, or to improve eating habits:
    - Women who already have a good quality of nutrition can focus on eating extra nutritious foods, rather than extra calories
    - For others, the priority may be to reduce intake of juice and non-nutritious foods like sugary drinks, salty snack foods, baked goods or fatty and rich convenience foods
- Eat lots of vegetables, fruits, whole grains, lean meats, non-predatory fish, meat alternatives (such as beans, peas, lentils, chick peas, nuts and seeds, tofu), low fat milk (2%, 1% or skim) and unsaturated oils
- These changes can help the woman and her growing baby stay healthy

1.2 Include 2 to 3 extra Food Guide servings each day (1, 9)

- Women usually need only a small increase in energy (calories) to meet the additional needs of pregnancy;
- Canada's Food Guide suggests adding a total of 2 to 3 extra servings each day[4] (choose from Table below);
- Pregnant women can choose nutritious foods from any of the four food groups to get their extra servings (calories);

Recommended Daily Food Guide Servings for Women

	Vegetables and Fruit	Grain Products	Milk and Alternatives	Meat and Alternatives
Teens 14-18 years old	7	6	3-4	2
Adults 19-50 years old	7-8	6-7	2	2

- Each of the following examples are nutritious foods that will add 2 to 3 food guide servings to the daily intake:
  - Snack of leftover wild meat or fish (about 3 oz), with a small piece of bannock (½ cup or 125 ml)
  - 1 cup of milk (250 ml) at lunchtime and suppertime
  - Snack of ½ cup whole grain cereals with 1 cup of milk and ½ cup sliced fruit
  - Morning snack of fruit with ¾ cup (175 g) yogurt and an additional serving (½ cup) of vegetables for supper
  - Snack of 1 whole grain toast with 2 tablespoons (30 ml) of peanut butter and a small banana (see visual example below)

[4] However, if a woman already eats more servings from the 4 food groups than what is recommended, adding extra servings could result in weight gain.

1.3 Spread carbohydrates throughout the day (8, 14-16)

- Insulin resistance slows down uptake of glucose to the cells after meals or snacks, so postprandial (PC) blood glucose levels tend to be elevated;
- In addition, high nocturnal levels of certain hormones in pregnancy may cause a rise in the morning glucose levels;
- Women with diabetes in pregnancy should follow these guidelines:
    - Between 40 to 45% of total energy should come from carbohydrate sources
    - A total of 175 g of carbohydrate is recommended every day. This represents 11 to 12 portions of 15g-carbohydrates
    - Distribution of carbohydrates throughout the day should be **individualized** and adjusted according to fasting blood glucose, one hour PC glucose, ketones and weight gain
    - In general, carbohydrates are distributed into 3 meals, and 2 to 3 snacks, including an evening snack (see example of distribution below)
    - Carbohydrate-rich foods at breakfast should be limited to 1 to 2 servings, if glucose intolerance is present in the morning (which is usually the case)

For women struggling to obtain good blood glucose levels, or who need tight glycemic control

- Explain *carb counting* based on CDA pamphlet titled *Beyond the basics* (Appendix 15)
- Aim for carbohydrate intake of 175 g per day (11 to 12 portions of 15 g)
- Spread carbohydrates throughout the day:

Breakfast	2 portions
AM snack	1 portion
Lunch	3 portions
PM snack	1 portion
Supper	3 portions
Evening snack	1-2 portion(s)

1.4 Non-nutritive sweeteners (8, 17)

- Aspartame (NutraSweet™ or Equal™), sucralose (Splenda™) or acesulfame potassium (Sunett™) are safe to consume during pregnancy;
- However, foods containing these three sweeteners should be eaten in moderation, so that they do not replace more nutritious foods and drinks;
- **Saccharin** (Hermesetas™) **and cyclamates** (Sucaryl™, Sugar Twin™ or Sweet'n low™) **are not safe during pregnancy.**

1.5 What to drink during pregnancy (12, 18-20)

- Water is the best choice, followed by milk;
- Other beverages will raise blood sugar level, even “unsweetened” or “all natural” juice;
- Caffeine should be limited to no more than 300 mg per day. This is the equivalent of 1 to 2 cups of coffee, or 2 to 3 cups of tea;
- Besides coffee and tea, caffeine is also found in cola, cocoa products (such as chocolate), and energy drinks;
- Some herbal tea, such as chamomile, are not good to take during pregnancy, as well as teas with aloe, coltsfoot, juniper berry, pennyroyal, buckthorn bark, comfrey, Labrador tea, sassafras, duck root, lobelia and senna leaves;
- Herb teas made from citrus peel, orange peel, ginger, linden flower[5], rose hip, or lemon balm are safe if taken in moderation (not more than 2 to 3 cups a day);
- Broth is also a good option, as well as hot water flavoured with lemon juice or ginger slices;
- **Pregnancy is an alcohol-free period**. There is no safe amount or safe time to drink alcohol during pregnancy.

1.6 Special nutrients

1.6.1 Folate (14, 21-23)

- Folate, also called folic acid or vitamin B_9, is essential for the baby’s brain and nervous system development;
- Adequate folate intake before and during the pregnancy decreases the risk of neural tube defects (NTDs): anencephaly and spina bifida;
- Folate in combination with multivitamin supplements may also reduce the risk for other congenital anomalies, such as heart defects, urinary tract anomalies, or oral facial clefts;
- Even a healthy folate-rich diets provide only a fraction of the level of folic acid needed to prevent NTDs;
- The Cree population is at high risk for NTDs, because of pre-existing diabetes, frequent BMI > 30, and genetic predisposition;
- Therefore, all Cree women should:
    - From 3 months preconception until 12 weeks of pregnancy, take 5.0 mg folic acid daily
    - For the full pregnancy until 6-week postpartum, or as long as breastfeeding continues, take a daily multivitamin containing 1.0 mg folic acid, that also includes vitamin B_{12}

[5] Linden flower is not recommended for people with pre-existing cardiac conditions.

1.6.2 Iron (14, 24)

- Pregnant women need more iron to increase the maternal red blood cell count, and to nourish the growing fetus and placenta;
- Recommended iron intake for pregnant women is 27 mg per day;
- Women should be encouraged to eat iron-rich foods (see Tables 5 and 6);
- In addition to an iron-rich diet, pregnant women should take a daily supplement (vitamin) containing 16 to 20 mg of iron;
- For best absorption of iron from diet:
    - Include a source of vitamin C at each meal (e.g. red pepper, orange, broccoli, strawberry, kiwi)
    - Consume tea or coffee with moderation and separate from the meals, since they can block iron absorption
- For best absorption of iron from supplement (vitamin):
    - Take the supplement on an empty stomach (2 hours after or 1 hour before meals)
    - Take it with a small amount of vitamin C (e.g. red pepper, orange, broccoli, strawberry, kiwi)

  This will also help prevent the side effect of constipation
- Do not take calcium supplements or multivitamins containing calcium with meals, since calcium may inhibit iron absorption.

Table 5. Sources of iron from animal-based foods (12, 25-27)

Food (cooked)	Amount of iron per 75 g serving
Wild duck	8.1 mg
Goose, fire-roasted, breast and skin	5.9 mg
Heart, kidney	4.3 - 6.6 mg
Oysters, mussels	5.0 - 8.9 mg
Moose, caribou meat	2.3 - 3.8 mg
Beef	1.7 - 2.3 mg
Shrimps	2.3 mg
Sardines, canned	1.7 mg
Chicken, light or dark meat, roasted	0.8 - 1.0 mg
Pork, roasted	0.7 - 0.9 mg
Salmon, trout, halibut, haddock[6]	0.5 - 1.0 mg

Note: Although liver is an excellent source of iron, it is not included in this list because it contains too much vitamin A for pregnant women(12)

[6] See advices for limiting exposure to mercury in food, in the section on omega-3 fatty acids.

Table 6. Sources of iron from plant-based foods(26)

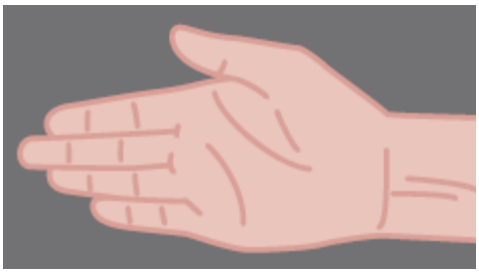
Food	Serving size	Amount of iron
Pumpkin seed kernels, roasted	60 ml	4.7 mg
Tofu, medium or firm	150 g	2.4 mg
Legumes (beans, lentils, chickpeas)	175 ml	2.3 - 4.9 mg
Oatmeal instant, prepared	175 ml	4.5 mg
Cold cereals (enriched with iron)	30 g	4.0 mg
Some vegetables (artichoke hearts, peas, spinach)	125 ml	1.2 - 3.4 mg
Nuts, peanuts, sunflower seeds	60 ml	0.8 - 2.2 mg
Eggs, large	2	1.1 mg
Pasta (enriched with iron)	125 ml	1.0 mg
Prune juice	125 ml	1.6 mg
Peanut butter, almond butter	30 ml	0.7 - 1.2 mg

1.7 Fish and omega-3 fatty acids (28, 29)

- Fish is an excellent food choice. It contains:
    - High-quality protein
    - Essential nutrients such as vitamin D, iron and zinc
    - Special fat profile: lower in saturated fat and higher in long-chain fatty acids, also called omega-3.
- Omega-3 fatty acids are important for the growth and development of fetal tissues, especially the fetal brain;
- Intake of omega-3 during pregnancy is recommended through consumption of at least 150 grams (5 ounces) of cooked fish from various types per week;
- Fish broth is an important traditional food and is good during pregnancy and breastfeeding; it contains calcium to make baby's bones and teeth strong;
- Woman may be concerned about the presence of contaminants in fish, especially methylmercury;
- Pregnant or breastfeeding women should not eat predatory fish (fish which eat smaller fish) **that are 1 foot long or longer**;
- These fish are higher in mercury:
    - Pike "Chinushaau"
    - Lake trout "Kukimaau"
    - Walleye "Ukaau"
- Smaller and younger fish have less mercury than larger and older fish;
- Fish caught in reservoirs contain more mercury;

- Pregnant or breastfeeding women can eat two meals per week of fish low in mercury such as:
    - Lake whitefish “Atihkimaakw”
    - Speckled trout (brook trout) “Maasimaakuus”
    - Sturgeon “Nimaau”
    - Any species of coastal fish (fish caught in salt water), including cisco “Nuutimiiwaasuu”
- Commercial fish (canned or frozen fish from the store) are generally low in contaminants. It is safe to eat:
    - Salmon, trout, herring, haddock, pollock (Boston bluefish), sole, flounder, anchovy, char, hake, mullet, smelt and Atlantic mackerel
    - For canned tuna, choose tuna marked “light” because it has less mercury than “white” tuna

Figure 1. Visual estimation of a fish meal



1 fish meal = size of the whole hand and thickness of the thumb

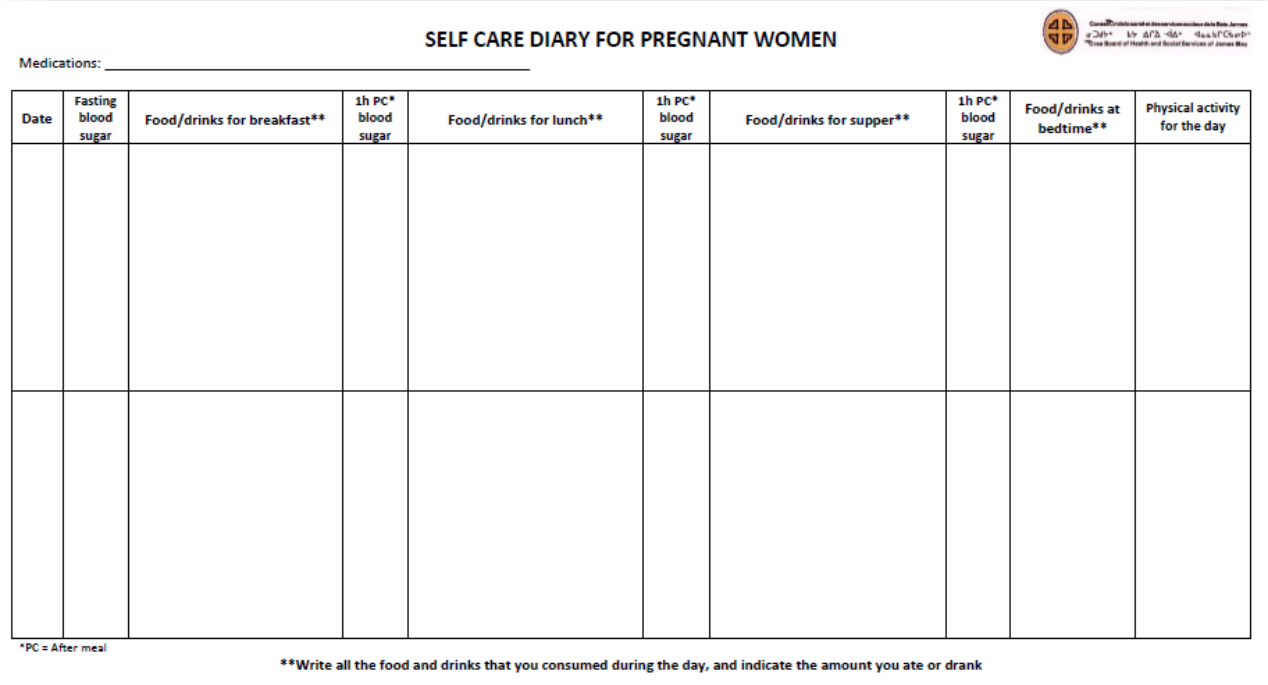
- More information and advice on limiting exposure to mercury from certain types of fish can either be found on www.healthcanada.gc.ca/mercuryandfish, or our website at www.creehealth.org.

1.8 Self-care diary (30)

- Food diaries provide useful information to the health care provider and to the patient. They help patients think more carefully about what and how they eat;
- Every pregnant woman with diabetes should be given and taught how to fill out the self-care diary (Figure 2);
- Information recorded by the patient should be as detailed as possible and include:
    - Medications
    - AC value at breakfast and 3 PC values (1 hour after each meal)
    - Quantity and kinds of ALL foods AND beverages consumed
    - Physical activity

- The self-care diary will help:
    - Provide the basis for individualized nutritional counselling by the health care worker
    - Assess the patient's level of understanding after a food education session
    - Explain why patient's glucose levels may be above or below the target level
    - Modify the rate of weight gain by adjusting consumption of calories

Figure 2. Sample of a self-care diary for pregnant woman



SELF CARE DIARY FOR PREGNANT WOMEN

Medications: _____

Date	Fasting blood sugar	Food/drinks for breakfast**	1h PC* blood sugar	Food/drinks for lunch**	1h PC* blood sugar	Food/drinks for supper**	1h PC* blood sugar	Food/drinks at bedtime**	Physical activity for the day

*PC = After meal

**Write all the food and drinks that you consumed during the day, and indicate the amount you ate or drank

1.9 Weight gain(1, 31-35)

- Throughout pregnancy, weight gain may be a useful indicator of:
    - Mother and developing foetus' general health
    - Adequate energy intake
- Set weight gain goals early in pregnancy, according to pre-pregnancy BMI. This will help the pregnant woman fall within the recommendations (Table 7) and prevent excessive weight gain;
- If no record of weight prior to pregnancy is available:
    - Measure weight and calculate BMI at the first prenatal visit
    - Record weight to the nearest 0.2 kg (½ lb) and height to the nearest 0.5 cm (¼ in)
    - Weigh woman in light clothing and without shoes on

Table 7. Recommended guidelines for weight gain during pregnancy(35)

Pre-pregnancy BMI	Mean[7] rate of weight gain in the 2nd and 3rd trimester		Recommended total weight gain[8]	
	kg/week	lb/week	kg	lbs
BMI < 18.5 (underweight)	0.5	1.0	12.5 - 18	28 - 40
BMI 18.5 - 24.9 (normal weight)	0.4	1.0	11.5 - 16	25 - 35
BMI 25.0 - 29.9 (overweight)	0.3	0.6	7 - 11.5	15 - 25
BMI ≥ 30.0[9] (obese)	0.2	0.5	5 - 9	11 - 20

- For women with pre-pregnancy or early BMI > 30:
  - Discourage weight **loss** or low-calorie diets during pregnancy, as such a diet may be deficient in nutrients such as protein and calcium
  - Ketones in the urine are an indication that caloric restriction is excessive
  - As long as urine screen for ketones remains negative, and there is no evidence of intrauterine growth retardation (IUGR), it is likely that caloric intake is sufficient, even if there is only modest (or no) weight gain. **DO NOT encourage these women to eat more**
  - Lifestyle interventions such as improving dietary quality, limiting portion sizes and being physically active can help prevent excessive weight gain
- For teenage pregnancies, use adult BMI categories (Table 4) to determine total weight gain;
- For women carrying twins or multiple fetuses, aim **at term**, for a gain between:
  - 17 and 25 kg (37-54 lbs) if normal weight
  - 14 and 23 kg (31-50 lbs) if overweight
  - 11 and 19 kg (25 - 42 lbs) if obese
- No guidelines are yet available for underweight women carrying twins or multiple fetuses.

[7] Rounded values.

[8] Calculations for the recommended weight gain range assume a gain of 0.5 to 2 kg (1.1 to 1.4 lbs) in the first trimester.

[9] A lower weight gain may be advised for women with a BMI of 35 or greater, based on clinical judgement and a thorough assessment of the risks and benefits to mother and child.

2 Physical activity(12, 23, 36-41)

- Physical activity during pregnancy has tremendous benefits, and should be encouraged for all women (in the absence of contraindications - see below);
- Physical activity can:
    - Lower blood sugar levels
    - Prevent excess weight gain
    - Improve bowel function (less constipation)
    - Increase energy, motivation, and general sense of well-being
    - Relieve tension and improve sleep
    - Ease recovery after delivery
    - Improve mood and self-image
- Contraindications to physical activity include:
    - Uncontrolled hypertension
    - Contractions
    - Suspected low fetal weight/intrauterine growth retardation (IUGR)
    - Fetal distress
    - Spotting or bleeding
    - Past or current history of incompetent cervix
- If there is any concern about the safety of physical activity for a particular patient, consult a physician.

2.1 General principles

- Light to moderate activity can be safely started or continued (and should be encouraged);
- Intensive exercise programs should not be begun during pregnancy, but may be continued if such a program is already established;
- Even strenuous exercise does not cause complications (early labour or rupture of membranes, poor fetal growth), in an otherwise healthy pregnancy;
- Avoid contact sports or activities with risks of falls (skiing, ice skating, cycling) later in pregnancy;
- Use caution if doing high impact aerobics. There is increased risk of strains since joints are looser during pregnancy;
- After the fourth month, avoid exercise when lying flat on the back as this may decrease blood flow to the uterus;
- Warm up and cool down properly. Drink plenty of water before, during, and after exercise;

- Aim for **daily** activity. It is better to exercise for a short time every day, than longer sessions once or twice a week. Try to time the activity during periods of the day when blood sugar levels are highest. A 10 minute (or more) walk after all meals may be the best, if possible;
- Recommended activities during pregnancy include:
    - Brisk walking
    - Swimming (if available)
    - Cycling
    - Snowshoeing
    - Low impact aerobics
    - Exercise machines (step machine, elliptical trainer, etc.)
    - Stretching, posture and muscle strengthening
- The patient handout *Safety Guidelines for Physical Activity during Pregnancy* (Appendix 5) should be reviewed with women and given to them to take home.

3. Dental

- According to our dental treatment statistics, a minority of adult clients receive adequate dental follow-up, including management of gum diseases and regular check-ups;
- Since general health is closely connected with dental health, all pregnant women or those planning to be pregnant need to be referred to the dental clinic for a complete dental assessment, and to make sure that they receive the dental care that they need;
- Women with diabetes or gestational diabetes require special attention because they are more prone to develop gum/periodontal diseases that are inflammatory processes by nature.

4. Self Blood Glucose Monitoring

- Self blood glucose monitoring (SBGM) is essential for the management of all pregnant women with pre-existing diabetes or GDM;
- SBGM results should be accurate to provide a guideline to make the necessary adjustments to the patient's treatment, i.e. diet or insulin;
- It is also a valuable teaching tool to help the patient learn how to control her blood sugar with diet and physical activity;
- Patients should always be encouraged to ask "why" their blood sugar values are at the level measured;
- Interpreting results is a very valuable skill and should be encouraged.

4.1 Benefits of Self Blood Glucose Monitoring

- SBGM provides immediate feedback which helps the patient to:
    - Learn the effect of food choices and portion sizes on blood glucose levels
    - Learn the effect of physical activity on blood glucose levels
    - Achieve and maintain target blood glucose levels
    - Prevent and detect mild hypoglycemia and avoid severe hypoglycemia (if on insulin)
    - Adjust diet and/or insulin during periods of acute illness

- SBGM provides guidelines for the health care worker to:
    - Reinforce the link between diet, physical activity and blood sugar levels
    - Adjust insulin dosing, as required

- Women with pre-existing diabetes or GDM should check their sugars at the following times (if not more frequently):
    - AC breakfast
    - 1 hour PC breakfast
    - 1 hour PC lunch
    - 1 hour PC supper

- A sheet to record glucose values (*SBGM Sheet* in Appendix 6) should be given to all women with their meters;
- At every clinic visit, the nurse or physician should record a summary of the SBGM results on the *Gestational Diabetes - Insulin/Blood Sugar Flow Sheet* (Appendix 8);
- This sheet should be added to the antenatal care sheets in the chart, as soon as a patient is diagnosed with either pre-existing diabetes or GDM.

BLOOD GLUCOSE TARGET GOALS

The blood glucose goals during pregnancy are **lower** than those in the non-pregnant state. The target glucose values are:

AC <5.3 mmol/L **1-hr PC <7.8 mmol/L** **2-hr PC <6.7 mmol/L**

70% of values should fall below these targets

(note: AC glu cutoff for *diagnosis* of GDM(<5.1 mmol/L) is different than the target for treatment.

- Note: It is important to check the accuracy of the reported glucose results by comparing them with the values in the meter's memory.

5. Ketone monitoring

- The urine should be checked for the presence of **ketones at all clinic visits**;
- If there is inadequate caloric intake, ketones will be detected as a result of the breakdown of stored fat;
- There is some evidence that if ketonuria is frequently present, those children may have somewhat lower intelligent quotients (IQs) on later testing;
- If ketonuria is detected, women should be advised to be less restrictive in their food intake.

6. Additional Monitoring (see Appendix 1)

- Check glucose and protein in the urine at all clinic visits;
- Additional monitoring includes appointments for blood tests, GARE (Grossesse À Risque Élevé), ultrasounds, NSTs, fetal kick count and ophthalmology;
- The need for some or all of these additional evaluations depends on the level of risk for poor outcome;
- This is determined by degree of glycemic control and the presence or absence of complications;
- Women with GDM, type 1 or type 2 diabetes can be roughly divided into low or high risk groups (see below).

6.1 Definition of the risk groups

GDM

- **LOW risk group GDM (DIET)**
  - Good glycemic control (>70% normal SBGM or A1C< 6.5%) **NOT** on insulin AND
  - **absence of all** of the following complications (see box below):
- **LOW risk group GDM (Insulin)**
  - Good glycemic control requiring insulin AND
  - **absence of all** of the following high risk complications,
- **HIGH risk group GDM**
  - Poor glycemic control (≥30% abnormal SBGM or A1C ≥ 6.5%) **OR**
  - **presence of ANY** of the following complication :

High risk complications

- Hypertension
- Overt proteinuria (PCR > 30 mg/mmol)
- Pre-existing nephropathy, or any chronic disease
- Severe obesity (BMI > 35)
- Retinopathy
- Any chronic illness
- Age > 40 years old

Type 1 or type 2 diabetes in pregnancy

- Majority of women with type 1 or type 2 diabetes during pregnancy are at high risk of complications;
- Women with A1C < 6.5% during the first trimester require slightly less investigations (see Table titled *Low risk women with DM2* in section 6.2, p22).

6.2 Type and frequency of monitoring

- Monitoring is summarized in Appendix 1 (*Summary of Monitoring)*
- Although clinical discretion must be used to evaluate each individual clinical case, the following general management guidelines should apply:

Low risk women with GDM (DIET) Routine monitoring (as with a normal pregnancy)

Monitoring	When
SBGM	SBGM qid AC breakfast and PC meals (**1-3 day/wk sufficient**)
Blood tests	A1C, electrolytes, creatinine, urine PCR: q trimester TSH once in pregnancy
Meds	Folic acid 5 mg qd until 12 weeks maternal multivitamin qd: full pregnancy
Ultrasound for fetal growth	Routine obstetrical ultrasounds
NSTs	None
Fetal kick count	From 28 weeks **IF** woman feels <6 fetal movements/2-hr period
GARE	**NOT** needed (if patient remains in low risk category)

Low risk women with GDM (INSULIN)

These women have a slight increased risk of placental insufficiency in 3rd trimester due to the insulin; monitoring is as follows:

Monitoring	When
SBGM	SBGM qid AC breakfast and PC meals
Blood tests	A1C, electrolytes, creatinine, urine PCR: q trimester TSH once in pregnancy
Meds	Folic acid 5 mg qd until 12 weeks maternal multivitamin qd: full pregnancy
Ultrasound for fetal growth	Routine obstetrical ultrasounds AND 32 weeks growth US (any institution) PRN (if suspect IUGR, polyhydramnios, or other indications)
NSTs	Weekly from 36 weeks
Fetal kick count	From 28 weeks **IF** woman feels <6 fetal movements/2-hr period
GARE	**NOT** needed if patient remains in low risk category and growth at 32 weeks US is normal

High risk women with GDM (DIET or INSULIN)

Monitoring	When
SBGM	SBGM qid AC breakfast and PC meals
Blood tests	A1C, Electrolytes, creatinine, urine PCR: q trimester TSH once in pregnancy
Meds	Folic acid 5 mg qd until 12 weeks maternal multivitamin qd: full pregnancy
Follow-up ultrasound for fetal growth	Routine obstetrical ultrasounds Additional growth ultrasounds at 28 weeks and 36 weeks (timing at physician's discretion) Occasional extra ultrasound at 32 weeks (if requested by GARE)
GARE	Usually at 28 - 32 weeks (28 weeks if very high risk) (timing at physician's discretion)
Fetal kick count	From 28 weeks **IF** woman feels <6 fetal movements/2-hr period
NSTs	Weekly from 36 weeks

Low risk women with DM1 or DM2

(1st trimester A1C < 6.5% **AND** absence of complications)

Monitoring	When
Blood tests	TSH: 1st trimester AFP : 2nd trimester A1C, electrolytes, creatinine, urine PCR: q trimester
Meds	Folic acid 5 mg qd until 12 weeks maternal multivitamin qd: full pregnancy ASA 80 mg qd: 12 to 36 weeks
Ophthalmological evaluation	Ideally in first trimester in their community Otherwise at time of 22-week ultrasound
Morphological fetal ultrasound	At 22 weeks (any institution)
Fetal echocardiogram	**NOT** needed
GARE appointment	28 weeks (Val d'Or), follow up as per GARE recommendation. Can request GARE at 22 weeks (at same hospital as morphology US) at physician's discretion.
Growth ultrasounds	28 weeks (with GARE) Follow up as prescribed by GARE
NSTs	Weekly from 32 weeks Twice per week from 36 weeks (or NST and biophysical profile each q 1 week, but on different days from 36 weeks)

High risk women with DM1 or DM2
(poor glycemic control **OR** presence of complications)

Monitoring	When
Blood tests	TSH: 1st trimester AFP : 2nd trimester A1C, electrolytes, creatinine, urine PCR: q trimester
Meds	Folic acid 5 mg qd until 12 weeks 1 maternal multivitamin qd: full pregnancy ASA 80 mg qd: 12 to 36 weeks
Ophthalmological evaluation	Ideally in first trimester in their community Otherwise at time of 22-week ultrasound
Morphological fetal ultrasound	22 weeks (Montreal General Hospital)
Fetal echocardiogram	22 weeks (Montreal Children Hospital)
GARE appointment	28 weeks (Val d'Or), follow up as per GARE. Can request GARE at 22 wks in Montreal at physician's discretion*
Growth ultrasounds	28 weeks (with GARE) Follow up as prescribed by GARE
NSTs	Weekly from 32 weeks Twice per week from 36 weeks (or NST and biophysical profile each q 1 week, but on different days from 36 weks)

*Woman will be seen by the diabetes clinic (endocrinology) in Montreal with their 22-week ultrasound, but will not see GARE unless requested by the physician.

7. Postpartum management

- Women with pregnancies complicated by gestational diabetes have a much higher risk of developing type 2 diabetes in the future;
- It is imperative that at every opportunity these women be educated about their future risks, and how they can decrease them;
- In addition, there are now many studies which link GDM with obesity, hypertension, and the development of DM2 in the children of affected women(42);
- **Breastfeeding** has been shown to lower the risk of developing future diabetes for the mother, and is possibly protective for the baby as well. Women should be strongly encouraged to breastfeed;
- Discuss contraception (consider Mirena®) or folic acid supplementation.

7.1 Postpartum screening for diabetes or pre-diabetes

- The Canadian Diabetes Association (CDA) and the International Diabetes Federation (IDF) recommend performing a 75-g OGTT (fasting and 2-hour PC only; the 1-hour PC is omitted) at 6-week postpartum on all women with GDM;
- This test is done to identify the small subset of women whose blood glucose does not normalize after delivery;
- A postpartum75-g OGTT is not required for women with DM1 or DM2 in pregnancy.

There are two important differences between the 75-g OGTT done during pregnancy, and the postpartum (non-pregnant) 75-g OGTT:

1. Normal values for these 2 tests are different
2. In the postpartum (non-pregnant) 75-g OGTT, only AC and 2-hr PC glucose levels are measured (during pregnancy AC, 1-hr and 2-hr PC glucose levels are measured)

- For this test, the patient must be fasting overnight (water is permitted), and must remain in the clinic for the duration of the test (slightly over 2 hours);
- If women miss their 75-g test at 6 wks, consider doing a PC glucose and A1C during 2-month old visit at the well-baby clinic;
- See Table 8 to interpret the results of a 75-g OGTT at 6-week postpartum;
- Annual A1C and AC glucose or 75-g OGTT (followed by a clinic visit to review the results of the tests) should be scheduled for all women with GDM;
- Women with DM1 or DM2 require routine diabetes management and follow up postpartum.

Table 8. Interpretation of the 6-week postpartum (NON PREGNANT) 75-g OGTT

		AC glucose result (mmol/L)		
		≤ 6.0	**6.1 – 6.9**	**≥ 7.0**
2hr PC glucose result (mmol/L)	**≤ 7.7**	**Normal** Repeat AC glucose in 1 year	**Pre-diabetes** Refer to physician	**Diabetes** (if confirmed by second test) Refer to physician
	7.8 – 11.0	**Pre-diabetes** Refer to physician	**Pre-diabetes** Refer to physician	**Diabetes** (if confirmed by second test) Refer to physician
	≥ 11.1	**Diabetes** (if confirmed by second test) Refer to physician	**Diabetes** (if confirmed by second test) Refer to physician	**Diabetes** (if confirmed by second test) Refer to physician

7.2 Management - post partum

- Women with normal 75-g OGTT result should have:
    - Non-urgent appointment with physician to review results, promote prevention.
    - AC glucose and A1C **or** 75-g OGTT screening annually
    - Nurse visit once a year following AC glucose test (if normal) for DM preventive counselling, and to encourage active, healthy living. This can be done as part of the *Well Woman Care program*
    - CHR and/or nutritionist visits as indicated (and depending on patient's willingness)
- Women with type 2 diabetes or pre-diabetes diagnosed by 75-g OGTT should be scheduled to see a physician at the earliest possible time. Repeat testing and subsequent management will be dictated by the physician;
- Women with type 2 diabetes should be scheduled for an ophthalmology visit in their community within one year postpartum.

7.3 Breastfeeding and oral hypoglycemic medications

- Although insulin is the best treatment, Metformin and glyburide may be considered for use during breastfeeding for woman who refuse insulin, although further long-term studies are needed to better clarify the safety of these drugs;
- Any woman requiring pharmacologic aid to manage her blood glucose levels should be referred to a physician for assessment.

SECTION 3: SUMMARY OF MANAGEMENT GUIDELINES & CHECKLISTS FOR VISITS

- This section will address the management of three groups of women:
  - Women with gestational diabetes (GDM)
  - Women with pre-existing diabetes who are planning a pregnancy
  - Women with pre-existing diabetes who are currently pregnant
- It is recommended to photocopy the relevant checklist pages and keep them in the patient's chart for the duration of the pregnancy, to ensure that all points are addressed (see Appendices 11 to 13).

1. Women with Gestational Diabetes Mellitus

VISIT 1 FOLLOWING DIAGNOSIS OF GDM

- Once a patient has been diagnosed with GDM, she should be scheduled for her first clinic visit as soon as possible (not more than one week after diagnosis);
- This clinic visit will consist of 2 parts:
  - Nurse visit
  - CHR visit
- The patient should also be referred to a nutritionist (if available) for initial assessment and ongoing follow-up.

GDM - Nurse objectives for first visit

- Provide a basic explanation of GDM
- Provide basic nutrition and physical activity counselling
- Give patient the handout *Information about Gestational Diabetes* (Appendix 3). Reviewing this handout with her will achieve the first two objectives
- Schedule patient for second visit one week later (with community MD and CHR)
- Refer patient to nutritionist (if available)
- Register patient on CDIS
- Arrange for:
  - 75-g OGTT at 6-week postpartum
  - Annual 75-g OGTT or AC glucose (with nurse or MD follow-up for results)
  - Nutritionist and/or CHR visit postpartum (and then as indicated)

GDM - CHR objectives for first visit

- Have the patient sign the *Glucometer Lending Contract* (Appendix 14)
- Teach the patient how to perform self blood glucose monitoring (SBGM)
- Give *SBGM Sheet* (Appendix 6) and advise patient to check and record glucose levels qid as follows:

  AC breakfast 1-hr PC lunch

  1-hr PC breakfast 1-hr PC supper
- Review targets with patient: AC < 5.3 1-hr PC < 7.8
- Give the patient a copy of the *Self-Care Diary for Pregnant Women* (appendix 7)
- Teach patient how to complete the diary in detail. **Remind her to include all beverages**
- Advise patient that they will have a follow-up clinic appointment in one week, and that they should bring their SBGM results sheet, blood glucose meter and diary

VISIT 2 FOLLOWING DIAGNOSIS OF GDM

- This second visit should be scheduled 1 week after the visit 1;
- This clinic visit will consist of 2 parts:
  - Physician visit
  - CHR visit
- In communities where physician is not available full time, a nurse should:
  - Perform this part of the visit
  - Discuss the case with a physician by phone
  - Possibly fax the SBGM results to the physician for review
  - Consider calling on of the diabetes educator through the Diabetes helpline

GDM - Physician objectives for second visit (nurse objectives in communities where physician is not available full time)

- Review and analyse patient's SBGM record, and target values
- Begin filling the *Gestational Diabetes - Insulin/Blood Sugar Flow Sheet* (Appendix 8), which should be kept in the chart with the antenatal care sheets
- Review and analyse patient's *Self-Care Diary for Pregnant Women*
- Provide more detailed individualized nutrition counselling, based on *Self-care diary*
- Perform remainder of routine prenatal visit, if timing is appropriate
- If a nurse is performing this visit, she should **discuss the case by phone with a physician**, and fax the SBGM results for review
- If the clinical situation dictates, it may occasionally be necessary to initiate insulin therapy at this time
- Determine if patient is high risk or low risk (see *Section 5)*, and arrange for ultrasound, NST and GARE appointments if indicated
- Schedule appointment for patient to see nutritionist (if available)

GDM - CHR objectives for second visit

- Provide detailed nutrition and physical activity counselling
- To achieve this objective, give and review the two handouts:
  - *Healthy Eating for Pregnant Women with Diabetes* (Appendix 4)
  - *Safety Guidelines for Physical Activity during Pregnancy* (Appendix 5)
- Review the *Self-care diary for pregnant women* and SBGM results with the patient
- Assess if dental referral done

SUBSEQUENT VISITS

- Subsequent visits should initially be scheduled:
  - Every week with physician, or nurse in communities where physician is not available full time
  - Low risk GDM with excellent glucose control can be seen every 3 to 4 weeks
  - Every 2 to 4 weeks with the CHR (depending on risk)
  - With a nutritionist, if available, at the frequency they recommend. If the patient is able to meet the nutritionist on a regular basis, the frequency of CHR visits may be decreased
- The frequency of physician visits may vary depending on level of glycemic control and presence or absence of other complications;
- The treating physician will dictate the timing of each subsequent visit;
- The physician may also refer the patient to the nurse for some follow-up visits if:
  - Patient has good glucose control and no other complications
  - There is no physician available in the community

GDM - Physician objectives for subsequent visits (nurse objectives in communities where physician is not available full time)

- Review and analyse patient's SBGM record, and target values
- Continue filling the *Gestational Diabetes - Insulin/Blood Sugar Flow Sheet* (Appendix 8), which should be kept in the chart with the antenatal care sheets
- Continue nutrition and physical activity counselling
- Discuss Fetal Kick Counting starting at 32 weeks (Appendix 16)
- Perform remainder of routine prenatal visit, if timing is appropriate
- Initiate or adjust insulin, if necessary. See *Section 4* (*Insulin therapy)*
- Re-evaluate whether patient is high risk or low risk (*Section 5*), and arrange for ultrasound and GARE appointments if indicated
- If a nurse is performing this visit, she should **discuss the case by phone with a physician**, and possibly fax the SBGM results for review

GDM - CHR objectives for subsequent visits

- Continue nutrition and physical activity counselling
- If insulin has been prescribed: review technique of administration, educate about symptoms of hypoglycemia, and answer any questions that patient may have

GDM - Nutritionist objectives for subsequent visits (if available)

- Assess nutritional status, continue individualized nutrition counselling, design personalized meal plans, etc.

2. Women with pre-existing diabetes who are planning a pregnancy

Nurse responsibilities

- Schedule appointment with physician within a few weeks, if possible
- Schedule appointment with nutritionist (if available)
- Schedule appointment with ophthalmologist, if no retinopathy assessment performed within last 12 months
- Do A1C initially, and then schedule for A1C every 3 months (if not already scheduled)
- Prescribe folic acid 5 mg/day. Explain rationale for supplementation and that this vitamin should be started at least **one month prior to conception**, and continued for the first 12 weeks of pregnancy
- If patient is taking oral hypoglycemic agents (e.g. metformin, glyburide):
  - **Refer to physician**
  - Do NOT stop oral medications. Hyperglycemia is teratogenic and the medications are probably safe during pregnancy
  - As well, metformin may be used by women with polycystic ovary (PCO) to induce ovulation
- The following medications **should be stopped:**
  - ACE inhibitors
  - ARBs
  - Statins, fibrates, niacin
- **Consult physician** to discuss blood pressure monitoring and initiation of alternate medications, if indicated
- Delay pregnancy (initiate or continue contraception) until both of the following criteria are met:
  - A1C < 7.0% (ideally < 6.0%, if achievable)
  - Patient has been taking folic acid supplements for at least one month

3. Women with pre-existing diabetes who are currently pregnant

- These women do not require **ANY** glucose screening during their pregnancy;
- In addition to the risks related to GDM, these women are at increased risk for miscarriages, congenital malformations, and perinatal deaths.

PRENATAL VISIT 1

- Pregnant women with pre-existing diabetes must be scheduled for their first prenatal visit **AS SOON AS POSSIBLE** (not more than a few days after diagnosis);
- This clinic visit will consist of 2 parts:
  - Nurse appointment
  - CHR appointment
- If one available, refer patient to a nutritionist at the earliest possible time.

Pre-existing diabetes - Nurse objectives for visit 1

Note that case must be discussed with a physician in person or by phone before the patient is sent home

- Provide basic nutrition and physical activity counselling
- Give and review the handout *Information about Gestational Diabetes* (Appendix 3)
- If patient is taking oral hypoglycemic agents (e.g. metformin, glyburide), in most cases they should be switched to insulin.
- **Do NOT stop oral medications before discussing case with physician**. Hyperglycemia is teratogenic and the medications are probably safe during pregnancy
- **Discussed with MD to stop immediately** the following medications**:**
  - ACE inhibitors
  - ARBs
  - Statins, fibrates, niacin
- **Consult physician** to discuss blood pressure monitoring and initiation of alternate medications, if indicated
- Prescribe folic acid 5 mg/day until 12-week gestation (as per Therapeutic Guide recommendations – Chapter 5, Obstetrics section)
- Prescribe 1 maternal multivitamin tablet/day for full pregnancy
- Schedule patient for second visit one week after first (with MD and CHR)
- Schedule appointment with nutritionist at the earliest possible time (if available)
- If patient is not already known for pre-existing diabetes, register her on the CDIS
- In addition to routine prenatal blood work, add:
  - A1C, electrolytes, creatinine and TSH level initially (if no value within past month available); then schedule for A1C, electrolytes and creatinine every 3 months
  - Urine PCR soon after presentation; then once each trimester
- Schedule for appointment with ophthalmologist (or tele-ophthalmology) to assess for retinopathy:
  - In community clinic as early as possible
  - If not possible before, refer to ophthalmology at time of 22-week ultrasound

Pre-existing diabetes - CHR objectives for visit 1

- Teach the patient how to perform self blood glucose monitoring (SBGM), if they do not already know how to do this
- Give *SBGM Sheet* (Appendix 6) and advise patient to check and record glucose levels qid as follows:
  - AC breakfast
  - 1-hr PC breakfast
  - 1-hr PC lunch
  - 1-hr PC supper
- Review targets with patient: AC < 5.3 (or AC < 5.0 if on insulin) 1-hr PC < 7.8
- Give the patient *Self-Care Diary for Pregnant Women* (Appendix 7) and teach her how to complete it
- Advise patient that they will have a follow-up clinic appointment in one week, and that they should bring their SBGM results sheet, blood glucose meter and *Self-Care Diary for Pregnant Women*
- If insulin has been prescribed:
  - Review technique of administration
  - Educate about symptoms of hypoglycemia
  - Answer any questions that patients may have

PRENATAL VISIT 2

- This second visit should be scheduled 1 week or less after visit 1;
- This clinic visit will consist of 2 parts:
  - Physician appointment
  - CHR appointment
- In communities where physician is not available full time, a nurse should:
  - Perform this part of the visit
  - Discuss the case with a physician by phone
  - Possibly fax SBGM results to the physician for review

Pre-existing diabetes - Physician objectives for visit 2 (nurse objectives in communities where physician is not available full time)

- Review and analyse patient's SBGM record, and target values
- Begin filling the *Gestational Diabetes - Insulin/Blood Sugar Flow Sheet* (Appendix 8), which should be kept in the chart with the antenatal care sheets
- Review and analyse patient's *Self-Care Diary for Pregnant Women* (Appendix 7)
- Provide more detailed individualized nutrition counselling, based on food record
- Perform remainder of routine prenatal visit, if timing is appropriate
- If a nurse is performing this visit, she should **discuss the case with a physician**, and possibly fax the SBGM results for review
- Initiate or adjust insulin, as indicated. See *Section 4* (*Insulin therapy)*
- Review and encourage patient to self-adjust insulin (see Appendix 9)
- Determine if patient is high risk or low risk (see *Section 5)*, and arrange for fetal echocardiogram and GARE appointments if indicated
- Ensure that scheduled for appointment with ophthalmologist (or tele-ophthalmology) to assess for retinopathy:
  - In community clinic as early as possible
  - If not possible before, refer to ophthalmology at time of 22-week ultrasound

Pre-existing diabetes - CHR objectives for visit 2

- Provide in depth nutrition and physical activity counselling; to achieve this objective, give and review the two handouts:
  - *Healthy Eating for Pregnant Women with Diabetes* (Appendix 4)
  - *Safety Guidelines for Physical Activity During Pregnancy* (Appendix 5)
  - Assess if dental referral done
- If insulin has been prescribed:
  - Review technique of administration
  - Educate about symptoms of hypoglycemia
  - Answer any questions that patient may have
- Consider faxing the *Self-care diary for pregnant women* and SBGM results to nutritionist, if unavailable in the community, or to one of the diabetes educators

SUBSEQUENT VISITS

- Subsequent visits should initially be scheduled:
  - Every week with the physician, or nurse (if physician unavailable)
  - Every 2 weeks with the CHR
  - With a nutritionist (if available), at the frequency they recommend. If the patient is able to meet the nutritionist on a regular basis, the frequency of CHR visits may be decreased
- The frequency of physician visits may vary depending on the degree of glycemic control and the presence or absence of complications;
- The treating physician will dictate the timing of each subsequent visit;
- The physician may also refer the patient to the nurse for some follow-up visits if the patient has excellent glucose control and no other complications of pregnancy, or if there is no physician available in the community.

Pre-existing diabetes - Physician objectives for subsequent visits (nurse objectives in communities where physician is not available full time)

- Review and analyse patient's SBGM record, and target values
- Continue filling the *Gestational Diabetes - Insulin/Blood Sugar Flow Sheet* (Appendix 8), which should be kept in the chart with the antenatal care sheets
- Continue nutrition and physical activity counselling
- Perform remainder of routine prenatal visit, if timing is appropriate
- Start ASA at 12 weeks until 36 weeks
- If a nurse is performing this visit, she should **discuss the case with a physician**, and possibly fax the SBGM results for review
- Adjust insulin, if necessary. See *Section 4* (*Insulin Therapy)*
- Re-evaluate whether patient is high risk or low risk (*Section 5*), and arrange for ultrasound, fetal echocardiogram and GARE appointments if indicated:
  - **ALL** will require follow-up ultrasound at 28 weeks for fetal growth
  - **ALL** will require GARE visit at 32 weeks
  - **ALL** will require weekly NSTs starting at 32 weeks
  - **High risk** will require fetal echocardiogram at 22 weeks and additional GARE, ultrasounds and other evaluations

Pre-existing diabetes - CHR objectives for subsequent visits

- Continue nutrition and physical activity counselling
- If insulin has been prescribed:
  - Review technique of administration
  - Educate about symptoms of hypoglycemia
  - Answer any questions that patient may have

SECTION 4: INSULIN THERAPY: INITIATION & ADJUSTMENTS

Initiation of insulin therapy must be considered for:

- Women with A1C > 6.5%
- Women with GDM who fail to achieve and maintain 70% of blood glucose values below the following values:
  - AC breakfast < 5.3
  - 1-hr PC meals < 7.8
  - 2-hr PC meals < 6.7 (if checked)

- The decision whether or not to initiate insulin, and the prescription for specific dosing, must be made by a physician;
- However, it is the nurses' responsibility to refer the above patients to the physician for assessment;
- This may be done in person, if a physician is available, or by faxing SBGM results to them (see Section 3: *Summary of Management Guidelines & Checklists for Visits*);
- Usually, patients will first attempt to reach target blood glucose levels through diet and physical activity;
- If they are unsuccessful at achieving good glycemic control after 1 or 2 weeks, or if their sugars are very high from the outset, insulin therapy should be considered;
- Humalog (Lispro Insulin):
  - Is ultra rapid insulin.
  - Has a peak of onset of approximately 15 minutes
  - Has a duration of action of approximately 3 to 4 hours
- Due to its rapid onset of action, it is important to take Humalog **at the same time** at the start of the meal, and NOT 30 to 45 minutes before the meal (as is the case with Regular insulin);
- Consider calling one of the diabetes educators through the *Diabetes Care Helpline* if you have any questions.

1. Starting Dose

- The dose for most women beginning insulin therapy should be:

0.3 units/kg body weight/day divided as (H – H – H) – (N)
30% 20% 20% 30%

- For example: A women weighing 100 kg should be started on approximately 30 units total of insulin/day;
- This should be divided as:
    - 9 units H **at the start of** breakfast
    - 6 units H **at the start of** lunch
    - 6 units H **at the start of** supper
    - 9 units N before bed
- Depending on blood glucose values, the physician may begin insulin therapy with higher or lower doses;
- Alternatively, the physician may prescribe an entirely different insulin regimen depending on the characteristics of the specific patient (e.g. bid dosing with mixture of insulins, etc);
- **It is better to start low and adjust frequently, than start too high and risk hypoglycemia.**

2. Patient education

- The following teaching points should be reviewed with patients using insulin:
    - The difference in onset and duration of action between insulin H (humalog) and insulin N
    - Timing of injections
    - Technique of injections
    - Storage of insulin
    - Signs and symptoms of hypoglycemia: how to recognize, avoid and treat it
    - Effects of insulin, diet, physical activity, illness, stress, sleeping patterns on blood glucose levels
    - Explain how to use the *Insulin Adjustment Algorithm* (page 37)
- Patients should be reminded that insulin therapy is **not a replacement for,** but merely an adjunct to, diet and physical activity;
- They should be strongly encouraged and supported in their ongoing efforts to control blood sugar levels with diet and physical activity.

3. Insulin adjustment(43)

- SBGM results should be evaluated on a continual basis, and insulin doses adjusted, in order to achieve and maintain optimal glycemic control;
- Toward this end, the *Insulin Adjustment Algorithm* on the next page may be used;
- The use of this algorithm is appropriate for both health care workers (nurse, CHR, physician) and patients who may be able to adjust their own insulin;
- For these women, a copy of the *Insulin Adjustment Sheet* (Appendix 9) should be given to them;
- However, all women should be encouraged to learn how to self-adjust insulin.

Important note

Insulin adjustment is required for AC glucose (AM) > 5.0 mmol/L

This glucose cut-off values for insulin adjustment is different than:

- AC glucose value used to determine if patient is required to start insulin (70% of AC glucose < 5.3 mmol/L or PC < 7.8 mmol/L)
- Cutoff of < 5.1 mmol/L to make a diagnosis of GDM

PRINCIPLES OF INSULIN ADJUSTMENT:

1. Dose adjustments should **not** be made based on a single glucose result (except in the case of a hypoglycemic reaction; see point 3 below);
2. Adjustments should be based on averages/patterns assessed after 2 or more days;
3. If hypoglycemic reaction occurred, and could not be explained by changes in diet (e.g. missed meal) or unusually high level of activity, then it must have been caused by an excess of insulin. In this case, the insulin dose should be reduced on the following day;
4. Only adjust 1 insulin dose each day.

   (Early in the course of insulin therapy, a physician may change more than 1 dose/day. However once a balance has been reached, or for patients adjusting their own insulin doses, only 1 change should be made each day).

►INSULIN ADJUSTMENT ALGORITHM

Past 2-day average blood sugar level **before breakfast** (AC)

	Action
Above 6.9	Add 4 units of N to bedtime dose
5.5 - 6.9	Add 2 units of N to bedtime dose
5.0 - 5.4	Add 1 unit of N to bedtime dose
4.1 - 4.9	Take same dose of N at bedtime
4.0 or less (even once)	Reduce bedtime N dose by 2 units

Past 2-day average blood sugar level **1 hour after breakfast** (PC)

	Action
Above 10.0	Add 2 units of H to breakfast dose
7.9 - 10.0	Add 1 unit of H to breakfast dose
5.6 - 7.8	Take same dose of H with breakfast
5.5 or less (even once)	Reduce breakfast dose of H by 2 units

Past 2-day average blood sugar level **1 hour after lunch** (PC)

	Action
Above 10.0	Add 2 units of H to lunch dose
7.9 - 10.0	Add 1 unit of H to lunch dose
5.6 - 7.8	Take same dose of H with lunch
5.5 or less (even once)	Reduce lunch dose of H by 2 units

Past 2-day average blood sugar level **1 hour after supper** (PC)

	Action
Above 10.0	Add 2 units of H to supper dose
7.9 - 10.0	Add 1 unit of H to supper dose
5.6 - 7.8	Take same dose of H with supper
5.5 or less (even once)	Reduce supper dose of H by 2 units

For very high blood glucose levels (AC > 8, or PC > 10), a physician should be consulted. Multiple, or higher, dose adjustments may be necessary.

APPENDICES

Appendix 1: Summary of Monitoring

Appendix 2: Summary of GDM Screening Tests and Treatment Goals

Appendix 3: Information about Gestational Diabetes

Appendix 4: Healthy Eating for Pregnant Women with Diabetes

Appendix 5: Safety Guidelines for Physical Activity during Pregnancy

Appendix 6: Self Blood Glucose Monitoring (SBGM) Sheet

Appendix 7: Self-Care Diary for Pregnant Women

Appendix 8: Gestational Diabetes - Insulin/Blood Sugar Flow Sheet

Appendix 9: Insulin Adjustment Sheet

Appendix 10: Diabetes in Pregnancy Flow Sheet

Appendix 11: Women with Gestational Diabetes Mellitus (checklist)

Appendix 12: Women with Pre-existing Diabetes, Planning a Pregnancy (checklist)

Appendix 13: Women with Pre-existing Diabetes, Currently Pregnant (checklist)

Appendix 14: Glucometer Lending Contract

Appendix 15: Beyond the Basics

Appendix 16: Fetal Kick Counting

Summary of monitoring: Gestational Diabetes Mellitus

(NOTE: Be aware for any high risk conditions)

Risk group	**Gestational Diabetes LOW RISK (Diet)**	**Gestational Diabetes LOW RISK (Insulin)**	**Gestational Diabetes HIGH RISK (Diet or insulin)**
Definition	• Target glucose control (> 70% normal SBGM or A1C < 6.5) • Absence of complications or comorbidities		**Presence of ANY of the following complications:** • Persistent poor glucose control (≥ 30% abnormal SBGM or A1C ≥ 6.5) • Hypertension • Nephropathy or retinopathy • PCR > 30 mg/mmol • Maternal age > 40 yrs • Severe obesity BMI > 35 • Any chronic illness
Clinic visits	q 1-4 wks until 32 weeks then q 1-2 wks between 32-36 wks - q 1 wk between 36-40 wks **(more frequent visits if poor control - ideally q wk if persistent poor glucose control)**		
Labs/Meds	Routine 1^{st} trimester prenatal labs + Labs DM[1] each trimester + TSH once in pregnancy Folic acid 5mg + 1 maternal multivitamin per day until 12 wks After 12 wks continue 1 maternal multivitamin per day		
Nutritionist[2] **Dentist[3]/Dental hygienist**	Yes	Yes	Yes
Ophthalmology	No	No	No
GARE **(obstetrical high-risk)**	No	No	Between 28-32 wks (aim for 28 wks if very high risk) Follow-up as per GARE
SBGM **AC breakfast+1hr PC**	QID 1-3 day/wk	QID	QID
Fetal kick count	From 28 wks, if less than <10 fetal movements/day then recommend fetal kick count daily		
Non stress test (NST)	No	36 wks 1x/wk	36 wks 1x/wk
Ultrasound (US)	Routine (same as non-GDM)	Routine (same as non-GDM) growth US PRN at 32 wks[4]	growth US at 28 and 36 wks as well as 32 wks if requested by GARE)
Induction	Routine	40 wks max If poor control: hospitalize at 38-39 wks (for glucose control prior to induction)	
Postpartum	75-g OGTT at 6 wks A1C and either AC glucose OR 75-g OGTT once a year with F/U with nurse or MD once a year Encourage loss of weight gained during pregnancy during first year postpartum Discuss contraception (consider Mirena®) at least once a year or folic acid supplementation if no birth control method used		

Summary of monitoring: ALL Type 1 or type 2 diabetes in pregnancy

(Note: Be aware of <u>any</u> high risk conditions)

Clinic visits	q 1-4 wks until 24 wks (ideally **q 1-3 days** if persistent poor glucose control in 1st trimester)	q 2 wks 24-31 wks (q 1 wk if poor glucose control)	q 1-2 wks 32-40 wks (q 1 wk if poor glucose control)
Labs/Meds	**1st trimester:** Routine labs + Labs DM[1] + TSH - ECG PRN **2nd trimester:** Labs DM[1] + AFP: 14-16 wks **3rd trimester:** Routine 28-wk labs + Labs DM[1]	Folic acid 5 mg + 1 maternal multivitamin/day until 12 wks ASA 80mg[5] per day 12 to 36 wks + 1 maternal multivitamin/day from 12 wks on	
Nutritionist[2] **Dentist[3]/Dental hygienist**	Yes		
Ophthalmology	Yes[6]		
GARE **(obstetrical high-risk)**	28 wks Follow-up according to GARE		
SBGM **AC breakfast + 1hr PC**	QID (AC breakfast and 1h PC meals) 3:00 AM glucose PRN		
Fetal kick counts	From 28 wks, if less than < 10 fetal movements/day then fetal kick count daily		
Non stress test (NST)	From 32 wks: 1x/wk From 36 wks: 2x/wk[7] OR alternate NST AND bio-physical profile (different days in the same week)		
Ultrasound (US)	Early dating US (if indicated) Morphology US 22 wks[8] + Fetal echocardiogram 22 wks[8] (**echocardiogram not needed if 1st trimester A1C<6.5%)** Growth US at 28 wks (32[4] as per GARE consult at 28 wks) and 36 wks		
Induction	39 wks - if cervix favorable 40 wks - irrespective of cervix If <38 wks and requires induction, consider amniocentesis to assess lung maturity		
Postpartum	Routine diabetes follow-up First year postpartum, encourage loss of weight gained during pregnancy Discuss contraception (consider Mirena®) at least once a year or folic acid supplementation if no birth control method used		

[1] Labs DM (each trimester): A1C, spot urine protein/creatinine ratio (24 hr urine protein if PCR > 30 mg/mmol), creatinine, electrolytes, urinalysis and culture

[2] If nutritionist available in the community, otherwise CHR

[3] All pregnant women should be advised to see the dentist during their pregnancy

[4] Growth ultrasound at 32 wks PRN (if suspect IUGR, polyhydramnios, or other indications)

[5] ASA does not increase the risk of PPH, because it has no effect on uterine contractions. Stop at 36 wks due to potential epidural or C-section

[6] Ophthalmology**:** ideally in 1st trimester in community, but can be done at 22 wks when patient sent to Montreal for fetal echocardiogram

[7] From 36 weeks: NST 2 x/wk or alternate NST and biophysical profile, each 1 x/wk on different days

[8] Morphology US done with the fetal echo (in Montreal) BUT if A1C < 6.5% in first trimester, then echo NOT needed, and morphology US can be done in Chisasibi, Val d'Or or Chibougamau

Appendix 2

SUMMARY OF GDM SCREENING TESTS AND TREATMENT GOALS

AC glucose - Interpretation of the early (first trimester) AC glucose screening test

AC (mmol/L)	Diagnosis	Action
< 5.1	Normal (unless A1C ≥ 6.5%*)	75-g OGTT at 22 weeks and repeat 75-g at 28 weeks (if first test normal)
5.1 – 6.9	Gestational Diabetes (unless A1C ≥ 6.5%*)	Begin treatment as per "*Management Guidelines and Checklists for Visits*"
≥ 7.0*	Pre-existing Diabetes	Begin treatment as per "*Management Guidelines and Checklists for Visits*"

*Patients require repeat AC glucose and A1C testing within 1 wk to confirm diagnosis of diabetes (unless **both** the AC glucose ≥ 7.0 and A1C ≥ 6.5%. **If both test diagnostic, do not repeat test**)

Early (First trimester) A1C - Interpretation of results

A1C	Diagnosis	Action
< 6.5%	Indeterminate	Management depends on AC glucose result (see above)
≥ 6.5%	Pre-existing Diabetes* (irrespective of AC result)	Begin treatment as per "*Management Guidelines and Checklists for Visits*"

*Patients require repeat AC glucose and A1C testing within 1 wk to confirm diagnosis of diabetes (unless **both** the AC glucose ≥ 7.0 and A1C ≥ 6.5%. **If both test diagnostic, do not repeat test**)

75-gm OGTT - Normal values

AC	1-hr PC	2-hr PC
< 5.1 mmol/L	**< 10.0 mmol/L**	**< 8.5 mmol/L**

75-gm OGTT - Interpretation of results

RESULTS	Diagnosis	Action
All values normal	Normal	If 22 weeks: repeat 75-g OGTT at 28 weeks If 28 weeks: no further testing necessary
1 or more abnormal value(s)	GDM	Begin treatment as per "*Management Guidelines and Checklists for Visits*"

SBGM - Goals

AC breakfast	1-hr PC	2-hr PC (not as accurate)
< 5.3 mmol/L (lifestyle treatment) **< 5.0 mmol/L** (insulin treatment)	**< 7.8 mmol/L**	**< 6.7 mmol/L**

Insulin therapy must be considered for women with poor glycemic control
(≥30% abnormal SBGM or A1C ≥ 6.5%)

INFORMATION ABOUT GESTATIONAL DIABETES

- Diabetes is when blood sugar (glucose) level is high because there is not enough insulin in the blood, or that the body does not respond well to insulin
- Insulin is a hormone; it is the key that will open the door to the cells and allow glucose to be used as energy

WHAT IS GESTATIONAL DIABETES?

- Gestational diabetes mellitus (GDM) is a type of diabetes that often starts during the second half of the pregnancy
- For most women, GDM ends after delivery (blood sugar is usually back to normal after pregnancy)
- We don't know what causes gestational diabetes, but we have some clues:
  - During pregnancy, hormones from the placenta help the baby to develop and grow
  - These hormones also block the normal action of insulin in the mother's body
  - This problem is called insulin resistance, and happens during ALL pregnancies
  - As the placenta continues to grow, more hormones are produced and this increases even more insulin resistance
  - Gestational diabetes develops when your body cannot meet the extra insulin needs of the pregnancy; blood sugar then becomes too high and there could be some risks to both you and your baby
- If diabetes doesn't go away after your baby is born, it is possible that you already had type 2 diabetes before your pregnancy but it never has been diagnosed

WHAT ARE THE DANGERS OF GESTATIONAL DIABETES?

For your baby:

- If you have high blood sugar levels, your baby may grow larger than usual. This is because the baby also has to make **extra** insulin to control the increased blood sugar, which causes more fat and tissue to be stored
- This may cause problems during the delivery. Baby may:
  - Get stuck (with need of a caesarian section)
  - Have injuries such as collarbone fracture
  - Suffer from a lack of oxygen at birth
- If your blood sugar levels are not well controlled during your pregnancy, during the first few days of life your baby is more likely to have periods of low blood sugar (hypoglycemia)
- This is because your baby will continue to make extra insulin after birth, causing his or her blood sugar level to go lower than normal
- The baby may also be at risk of having breathing problems, infections, and other medical problems soon after birth

What about you?

- If you have gestational diabetes, you may:
  - Have more infections during your pregnancy
  - Develop high blood pressure during pregnancy
  - Start your labor and deliver too early
  - Have a hard vaginal delivery or need a caesarian section
- If you had gestational diabetes during one pregnancy, you are at a greater risk of developing it in the next one
- Up to half of the mothers who had gestational diabetes will have type 2 diabetes **within the next 5 years. But, you can prevent type 2 diabetes. Talk to your clinic after your baby is born.**
- You and your baby may also have more risk of developing diabetes later in their lives, as well as obesity and high blood pressure
- The **good news** is that if the blood sugar levels are kept low during the pregnancy, many of the dangers can be avoided or minimized

HOW CAN WE KEEP OUR BLOOD SUGAR LOW?

- Although this is not the time to lose weight or go on a diet, you need to be very careful to eat well in order not to gain too much weight, and keep your blood sugar low
- Here is what you can do:
  - Choose healthy foods (see Appendix 2 *Healthy Eating for Pregnant Women with Diabetes*)*
  - Be active every day, so you will keep your blood sugar low, feel full of energy, and sleep well at night (see Appendix 3 *Safety Physical Activity Guidelines during Pregnancy*)*
  - Take your medication (if needed)

*These appendices will be given to you at your next visit

HEALTHY EATING FOR PREGNANT WOMEN WITH DIABETES

Don't eat for 2, eat 2 times better!

- Even at the end of pregnancy, the baby does not require that much extra food
- Follow *Eating Well with Canada's Food Guide – First Nations, Inuit and Métis*, and add 2 to 3 extra food guide servings each day, such as:
  - a snack of leftover wild meat with a small piece of bannock, or
  - a cup of milk at lunch and supper
- Do not skip meals. Eat small frequent meals and healthy snacks (eat every 3 to 4 hours)
- Include some protein at every meal and snack. Good high-protein choices are fish, game meat, goose, chicken, low-fat cheese and cottage cheese, nuts, peanut butter, eggs (boiled is best)
- Make sure you take a snack at bedtime, that contains some protein and carbs
- Choose high-fibre foods, such as whole-grain breads and cereals, vegetables and fruits, beans and legumes
- Eat homemade meals as much as possible. Commercial foods, such as cakes, chocolate, frozen meals, etc., and restaurant foods are often high in fat, calories and salt
- Water is the best choice to drink, followed by milk. Satisfy your thirst with water instead of juice or other sugary drinks (iced tea, regular pop, fruit punch, etc.)

What about foods that contain sugar?

- The form in which sugar is found in food is called carbohydrates or CARBS
- Some carbs are rapidly absorbed and cause your blood sugar to rise quickly; these are the sweets and concentrated sugars. It is best to limit them. They are found in all sugars including syrup and honey, chocolate, regular soft drinks, Kool-aid, iced tea and punch, juices, regular Jell-O, jams…
- Read the food labels: check for words like sucrose, fructose, corn syrup, dextrose, honey… they all mean "sugar"
- Other carbs may make your blood sugar rise more slowly if spread throughout the day (including an evening snack). These are grain products like bread, bannock, cereals, pasta, rice and fruits
- Fruit juices (even those labeled "natural", "no sugar added", "unsweetened", or "100% pure juice") contain at least 6 teaspoons of sugar per cup so you can drink them but in very small quantities
- Avoid sweeteners containing saccharine (Hermesetas™) or cyclamates (Sucaryl™, Sugar Twin™ or Sweet'n low™). These are not safe during pregnancy
- You may also have to limit the amount of carbohydrate-rich foods at breakfast

SAFETY GUIDELINES FOR PHYSICAL ACTIVITY DURING PREGNANCY

- Being active during pregnancy may bring you lots of benefits:
  - Lower your blood sugar levels
  - Keep you from gaining too much weight
  - Prevent you from being constipated
  - Increase your energy, motivation, and sense of feeling well
  - Relieve your tensions and improve your sleep
  - Ease your recovery after delivery
  - Improve your mood and self-image
- If you were active before your pregnancy, you can continue to be active, but do not start intense exercise during pregnancy if you were not active before
- Early in your pregnancy check with your doctor or nurse, if an exercise program can be initiated or if your actual program can be continued
- It may not be safe to exercise during pregnancy if you have difficulty to control your blood sugar levels or if you have high blood pressure, it is best to check with your doctor or nurse
- Aim for a **daily** activity:
  - It is better to exercise for a short time every day, than longer sessions once or twice a week
  - Try to do your activity when your blood sugar levels are highest (such as after meals or snacks)
  - A 10-minute (or more) walk after all meals may be the best
- Warm up and cool down well
- Drink plenty of water before, during, and after exercise
- Activities that are recommended during pregnancy:
  - Brisk walking
  - Swimming (if available)
  - Cycling
  - Snowshoeing
  - Low impact aerobics
  - Exercise machines (step machine, elliptical trainer, etc.)
  - Stretching, posture and muscle strengthening
- Avoid contact sports or activities with risks of falls (skiing, ice skating, cycling) later in pregnancy
- After the fourth month, do not exercise when lying flat on the back; this may reduce the flow of blood to the uterus

Appendix 6

SELF BLOOD GLUCOSE MONITORING (SBGM) SHEET FOR PREGNANT WOMEN WITH DIABETES NOT TAKING INSULIN

OPTIMAL BLOOD SUGAR
Before breakfast - less than 5.3 mmol/L
After meals - less than 7.8 mml/L

Name:_______________________________

Date	Glucose results				Comments
	Before breakfast	1-hr after breakfast	1-hr after lunch	1-hr after supper	

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Cree Board of Health and Social Services of James Bay

Appendix 7

SELF CARE DIARY FOR PREGNANT WOMEN

Name:____ Medications: ____

Date	Fasting blood sugar	Food/drinks for breakfast**	1h PC* blood sugar	Food/drinks for lunch**	1h PC* blood sugar	Food/drinks for supper**	1h PC* blood sugar	Food/drinks at bedtime**	Physical activity for the day

*PC = After meal

****Write all the food and drinks that you consumed during the day, and indicate the amount**

Appendix 8

Name:________________________

OPTIMAL BLOOD SUGAR
Before breakfast - less than 5.0 mmol/L
After meals - less than 7.8 mml/L

GESTATIONAL DIABETES – INSULIN/BLOOD SUGAR FLOW SHEET

DATE	INSULIN				BLOOD SUGAR				COMMENT
	H Breakfast	*H* Lunch	*H* Supper	*N* Bed	Before breakfast	1hr after breakfast	1hr after lunch	1hr after supper	

Approved by the CMDP 2012

Appendix 9

INSULIN ADJUSTMENT SHEET

Past 2-day average blood sugar level **before breakfast** (AC)

	Action
Above 6.9	Add 4 units of N to bedtime dose
5.5 - 6.9	Add 2 units of N to bedtime dose
5.0 - 5.4	Add 1 unit of N to bedtime dose
4.1 - 4.9	Take same dose of N at bedtime
4.0 or less (even once)	Reduce bedtime N dose by 2 units

Past 2-day average blood sugar level **1 hour after breakfast** (PC)

	Action
Above 10.0	Add 2 units of H to breakfast dose
7.9 - 10.0	Add 1 unit of H to breakfast dose
5.6 - 7.8	Take same dose of H with breakfast
5.5 or less (even once)	Reduce breakfast dose of H by 2 units

Past 2-day average blood sugar level **1 hour after lunch** (PC)

	Action
Above 10.0	Add 2 units of H to lunch dose
7.9 - 10.0	Add 1 unit of H to lunch dose
5.6 - 7.8	Take same dose of H with lunch
5.5 or less (even once)	Reduce lunch dose of H by 2 units

Past 2-day average blood sugar level **1 hour after supper** (PC)

	Action
Above 10.0	Add 2 units of H to supper dose
7.9 - 10.0	Add 1 unit of H to supper dose
5.6 - 7.8	Take same dose of H with supper
5.5 or less (even once)	Reduce supper dose of H by 2 units

For very high blood glucose levels (AC > 8 or PC > 10), a physician should be consulted
Multiple, or higher dose adjustments may be necessary

Clinic card

DIABETES IN PREGNANCY FLOW SHEET

Gestational Diabetes
Pre-existing type 2 diabetes

Labs	Date	Results		
Early fasting glucose		AC:		
A1C				
First 75-g OGTT (22 wk)		AC:	1hr PC:	2hr PC:
Second 75-g OGTT (28 wks)*		AC:	1hr PC:	2hr PC:

*only if required

Clinic visits:

Date of visit	Weeks gestation	Weight (kg)	Current treatment		# normal values / # total values		Comments/treatment changes
			Type	Dose	AC (<5.3)*	1hr PC (<7.8)	
			Lifestyle ☐ Insulin* ☐				
			Lifestyle ☐ Insulin* ☐				
			Lifestyle ☐ Insulin* ☐				
			Lifestyle ☐ Insulin* ☐				
			Lifestyle ☐ Insulin* ☐				
			Lifestyle ☐ Insulin* ☐				
			Lifestyle ☐ Insulin* ☐				
			Lifestyle ☐ Insulin* ☐				
			Lifestyle ☐ Insulin* ☐				
			Lifestyle ☐ Insulin* ☐				

***When patient is on insulin, optimal AC blood sugar should be <5.0**

6 wk postpartum 75-g OGTT:	AC glucose:	2hr PC:

Place in chart with antenatal care sheets

Accepted by the CMDP 2012

Fax completed sheet postpartum to diabetes research agent (418) 923-3375

Appendix 10 (page 2 of 2)

Clinic visits:

Date of visit	Weeks gestation	Weight (kg)	Current treatment		# normal values / # total values		Comments/treatment changes
			Type	Dose	AC (<5.3)*	1hr PC (<7.8)	
			Lifestyle ☐ Insulin* ☐		/	/	
			Lifestyle ☐ Insulin* ☐		/	/	
			Lifestyle ☐ Insulin* ☐		/	/	
			Lifestyle ☐ Insulin* ☐		/	/	
			Lifestyle ☐ Insulin* ☐		/	/	
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			Lifestyle ☐ Insulin* ☐		/	/	
			Lifestyle ☐ Insulin* ☐		/	/	

***When patient is on insulin, optimal AC blood sugar should be <5.0**

Place in chart with antenatal care sheets

Accepted by the CMDP 2012

Fax completed sheet postpartum to diabetes research agent (418) 923-3375

Women with Gestational Diabetes Mellitus

Visit 1 following diagnosis of GDM

GDM - **Nurse** objectives (visit 1)

- ☐ Provide a basic explanation of GDM and basic nutrition and physical activity counselling
- ☐ Review with patient the handout *Information about Diabetes in Pregnancy* (Appendix 3)
- ☐ Schedule patient for second visit one week later (with community MD and CHR)
- ☐ Refer patient to nutritionist (if available)
- ☐ Register patient on CDIS
- ☐ Arrange for:
  - 75-g OGTT at 6-week postpartum
  - Annual 75-g OGTT or AC glucose or (with nurse or MD follow-up for results)
  - Nutritionist and/or CHR visit postpartum (and then as indicated)

GDM - **CHR** objectives (visit 1)

- ☐ Have the patient sign the *Glucometer Lending Contract* (Appendix 14)
- ☐ Teach the patient how to perform self blood glucose monitoring (SBGM)
- ☐ Give *Self Blood Glucose Monitoring Sheet* (Appendix 6) and advise patient to check and record glucose levels 4 times/day as follows:
  - AC breakfast
  - 1-hr PC breakfast, lunch and supper
- ☐ Review targets with patient: AC < 5.3 (or AC < 5.0 if on insulin) 1-hr PC < 7.8
- ☐ Give the patient a copy of the *Self-Care Diary for Pregnant Women* (Appendix 7)
- ☐ Teach patient how to complete the diary in detail. Remind her to include all beverages
- ☐ Advise patient that she will have a follow-up clinic appointment in one week, and that she should bring their SBGM results sheet, blood glucose meter and diary

Women with Gestational Diabetes Mellitus

Visit 2 following diagnosis of GDM – 1 week after visit 1

GDM - **MD** objectives (visit 2 - nurse objectives in communities where MD is not available full time)

- ☐ Review and analyse patient's SBGM record, and target values
- ☐ Begin filling the *Gestational Diabetes - Insulin/Blood Sugar Flow Sheet* (Appendix 8), kept in the chart
- ☐ Review and analyse patient's *Self-care Diary for Pregnant Women* (1 to 3 days)
- ☐ Provide basic nutrition counselling, based on *Self-care Diary for Pregnant Women*
- ☐ Perform remainder of routine prenatal visit, if timing is appropriate
- ☐ If a nurse is performing this visit, **discuss the case with MD**, fax SBGM for review
- ☐ If clinical situation dictates, it may occasionally be necessary to initiate insulin therapy at this time
- ☐ Determine if patient is high risk or low risk (*Section 5)*, arrange for ultrasound and GARE appointments if indicated
- ☐ All patients will require weekly NSTs from 36 weeks onward
- ☐ Schedule appointment for patient to see nutritionist (if available)

GDM - **CHR** objectives (visit 2)

- ☐ Provide detailed nutrition and physical activity counselling
- ☐ To achieve this objective, give and review the two handouts:
  - *Healthy Eating for Pregnant Women with Diabetes* (Appendix 4)
  - *Safety Physical Activity Guidelines during Pregnancy* (Appendix 5)
- ☐ Review the *Self-care Diary for Pregnant Women* and SBGM results with the patient
- ☐ Assess if dental referral done

Women with Gestational Diabetes Mellitus

Subsequent visits

Subsequent visits should initially be scheduled:

- Every week with MD, or nurse (if MD not available full time)
- Every 2 weeks with the CHR
- With a nutritionist, if available, at the frequency they recommend. If the patient is able to meet the nutritionist on a regular basis, the frequency of CHR visits may be decreased

GDM - **MD** objectives (subsequent visits - nurse objectives in communities where MD is not available full time)

- ☐ Review and analyse patient's SBGM record, and target values
- ☐ Continue filling the *Gestational Diabetes - Insulin/Blood Sugar Flow Sheet* (Appendix 8), which should be kept in the chart with the antenatal care sheets
- ☐ Continue nutrition and physical activity counselling
- ☐ Discuss *Fetal Kick Counting* starting at 32 weeks (Appendix 16)
- ☐ Perform remainder of routine prenatal visit, if timing is appropriate
- ☐ Initiate or adjust insulin, if necessary. See *Section 4* (*Insulin therapy)*
- ☐ Re-evaluate whether patient is high risk or low risk (*Section 5*), and arrange for ultrasound and GARE appointments if indicated
- ☐ If a nurse is performing this visit, she should **discuss the case with a MD**, and possibly fax the SBGM results for review

GDM - **CHR** objectives (subsequent visits)

- ☐ Continue nutrition and physical activity counselling
- ☐ If insulin has been prescribed: review technique of administration, educate about symptoms of hypoglycemia, and answer any questions that patients may have

GDM - **Nutritionist** objectives (subsequent visits)

- ☐ Assess nutritional status, continue individualized nutrition counselling, design personalized meal plans, etc.

Women with pre-existing diabetes, planning a pregnancy

Type 2 DM - **Nurse** responsibilities

- ☐ Schedule appointment with MD within one month, if possible
- ☐ Schedule appointment with nutritionist (if available)
- ☐ Schedule appointment with ophthalmologist (if no retinopathy assessment performed within last 12 months)
- ☐ Do A1C initially, and then schedule for A1C every 3 months (if not already scheduled)
- ☐ Prescribe folic acid 5 mg/day, as per Therapeutic Guide recommendations (See Chapter 5, Obstetrics section). Explain rationale for supplementation and that this vitamin should be started **immediately**, and continued for the first 12 weeks of pregnancy
- ☐ If patient is taking oral hypoglycemic agents (e.g. metformin, glyburide):
    - **Refer to MD**
    - Do NOT stop oral medications. Hyperglycemia is teratogenic and the medications are probably safe during pregnancy
    - As well, metformin may be used by women with polycystic ovary (PCO) to induce ovulation
- ☐ **Discussed with MD to stop immediately** the following medications**:**
    - ACE inhibitors
    - ARBs
    - Statins, fibrates, niacin

  Consult MD to discuss blood pressure monitoring and initiation of alternate medications, if indicated
- ☐ Delay pregnancy (initiate or continue contraception) until both of the following criteria are met:
    - A1C < 7.0% (ideally < 6.0%, if achievable)
    - Patient has been taking folic acid supplements for at least one month

Women with pre-existing diabetes, currently pregnant

Visit 1 - AS SOON AS POSSIBLE

- This clinic visit will consist of 2 parts: Nurse appointment and CHR appointment
- The patient should also be referred to a nutritionist at the earliest possible time (if available)

Pre-existing DM - **Nurse** objectives (visit 1)

Note that case must be discussed with a MD in person or by phone before the patient is sent home

☐ Provide basic nutrition and physical activity counselling

☐ Give and review the handout *Information about Diabetes in Pregnancy* (Appendix 3)

☐ If patient is taking oral hypoglycemic agents (e.g. metformin, glyburide), in most cases she should be switched to insulin. **Discuss case with MD**

Do NOT stop oral medications. Hyperglycemia is teratogenic and the medications are probably safe during pregnancy

☐ Discuss with MD to **stop immediately** the following medications**:**

- ACE inhibitors, ARBs, Statins, fibrates, niacin

Consult MD to discuss blood pressure monitoring and initiation of alternate medications, if indicated

☐ Prescribe folic acid 5 mg/day until 12-week gestation

☐ Prescribe 1 maternal multivitamin tablet/day for full pregnancy

☐ Schedule patient for second visit one week after first (with MD and CHR)

☐ If patient is not already known for pre-existing diabetes, register her on the CDIS

☐ In addition to routine prenatal labs, add:

- A1C, electrolytes, creatitine and TSH levels initially (if no value within past month available); then schedule for A1C, electrolytes and creatinine every 3 months
- Random Urine Protein/Creatinine ratio initially; then once each trimester

☐ Schedule for appointment with ophthalmologist (or tele-ophthalmology) to assess for retinopathy:

- In community clinic as early as possible

- If not possible before, refer to ophthalmology at time of 22-week ultrasound

Women with pre-existing diabetes, currently pregnant

Visit 1- AS SOON AS POSSIBLE

Pre-existing DM - **CHR** objectives (visit 1)

- ☐ Teach the patient how to perform self blood glucose monitoring (SBGM), if she does not already know how to do this
- ☐ Give *Self Blood Glucose Monitoring Sheet* (Appendix 6) and advise patient to check and record glucose levels four times/day as follows:
  - AC breakfast
  - 1-hr PC breakfast, lunch and supper
- ☐ Review targets with patient: AC < 5.3 (or AC < 5.0 if on insulin) 1-hr PC < 7.8
- ☐ Give the patient *Self-care Diary for Pregnant Women* (Appendix 7) and teach her how to complete it
- ☐ Advise patient that she will have a follow-up clinic appointment in one week, and that she should bring her SBGM results sheet, blood glucose meter and *Self-care Diary for Pregnant Women*
- ☐ If insulin has been prescribed:
  - Review technique of administration
  - Educate about symptoms of hypoglycemia
  - Answer any questions that patients may have

Women with pre-existing diabetes, currently pregnant

Visit 2 - one week after visit 1

Pre-existing DM **- MD** objectives (visit 2 - nurse objectives in communities where MD is not available full time)

- ☐ Review and analyse patient's SBGM record, and target values
- ☐ Begin filling the *Gestational Diabetes - Insulin/Blood Sugar Flow Sheet* (Appendix 8), kept in the chart
- ☐ Review and analyse patient's *Self-care Diary for Pregnant Women* (Appendix 7)
- ☐ Provide more detailed individualized nutrition counselling, based on food record
- ☐ Perform remainder of routine prenatal visit, if timing is appropriate
- ☐ If a nurse is performing this visit, she should **discuss the case with a MD**, and possibly fax the SBGM results for review
- ☐ Initiate or adjust insulin, as indicated. See *Section 4* (*Insulin therapy)*
- ☐ Determine if patient is high risk or low risk (see *Section 5)*, and arrange for fetal echocardiogram and GARE appointments if indicated
- ☐ Ensure that scheduled for appointment with ophthalmologist (or tele-ophthalmology) to assess for retinopathy:
  - In community clinic as early as possible
  - If not possible before, refer to ophthalmology at time of 22-week ultrasound

Pre-existing DM **- CHR** objectives (visit 2)

- ☐ Provide in depth nutrition and physical activity counselling; to achieve this objective, give and review the two handouts:
  - *Healthy Eating for Pregnant Women with Diabetes* (Appendix 4)
  - *Safety Physical Activity Guidelines During Pregnancy* (Appendix 5)
- ☐ Assess if dental referral done
- ☐ If insulin prescribed:
  - Review technique of administration
  - Educate about symptoms of hypoglycemia
  - Answer any questions that patients may have
- ☐ Consider faxing the *Self-care Diary for Pregnant Women* and SBGM results to nutritionist, if available in the community, or to one of the diabetes educators

Appendix 13 (page 4 of 4)

Women with pre-existing diabetes, currently pregnant

Subsequent visits

Pre-existing DM - **MD** objectives (subsequent visits every week with MD, or nurse in communities where MD is not available full time)

- ☐ Review and analyse patient's SBGM record, and target values
- ☐ Continue filling the *Gestational Diabetes - Insulin/Blood Sugar Flow Sheet* (Appendix 8), which should be kept in the chart with the antenatal care sheets
- ☐ Continue nutrition and physical activity counselling
- ☐ Perform remainder of routine prenatal visit, if timing is appropriate
- ☐ Start ASA at 12 weeks until 36 weeks
- ☐ If a nurse is performing this visit, she should **discuss the case with a physician**, and possibly fax the SBGM results for review
- ☐ Adjust insulin, if necessary. See *Section 4* (*Insulin Therapy)*
- ☐ Re-evaluate whether patient is high risk or low risk (*Section 5*)
- ☐ Arrange for appointments if indicated:
  - **ALL** will require follow-up ultrasound at 28 weeks for fetal growth
  - **ALL** will require GARE visit at 32 weeks
  - **ALL** will require weekly NSTs starting at 32 weeks
  - **High risk** will require fetal echocardiogram at 22-week and additional GARE, ultrasounds and other evaluations

Pre-existing DM – **CHR** objectives (subsequent visits every 2 weeks)

- ☐ Continue nutrition and physical activity counselling
- ☐ If insulin prescribed:
  - Review technique of administration
  - Educate about symptoms of hypoglycemia
  - Answer any questions that patient may have

Glucometer lending contract

Patient's name _____

Patient's phone number _____

Glucometer record # _____

Reason for lending GDM ☐ Other ☐ _____

I agree to return this glucometer with any unused strips, after my delivery, or once my blood glucose has returned to normal levels.

Patient's signature _____

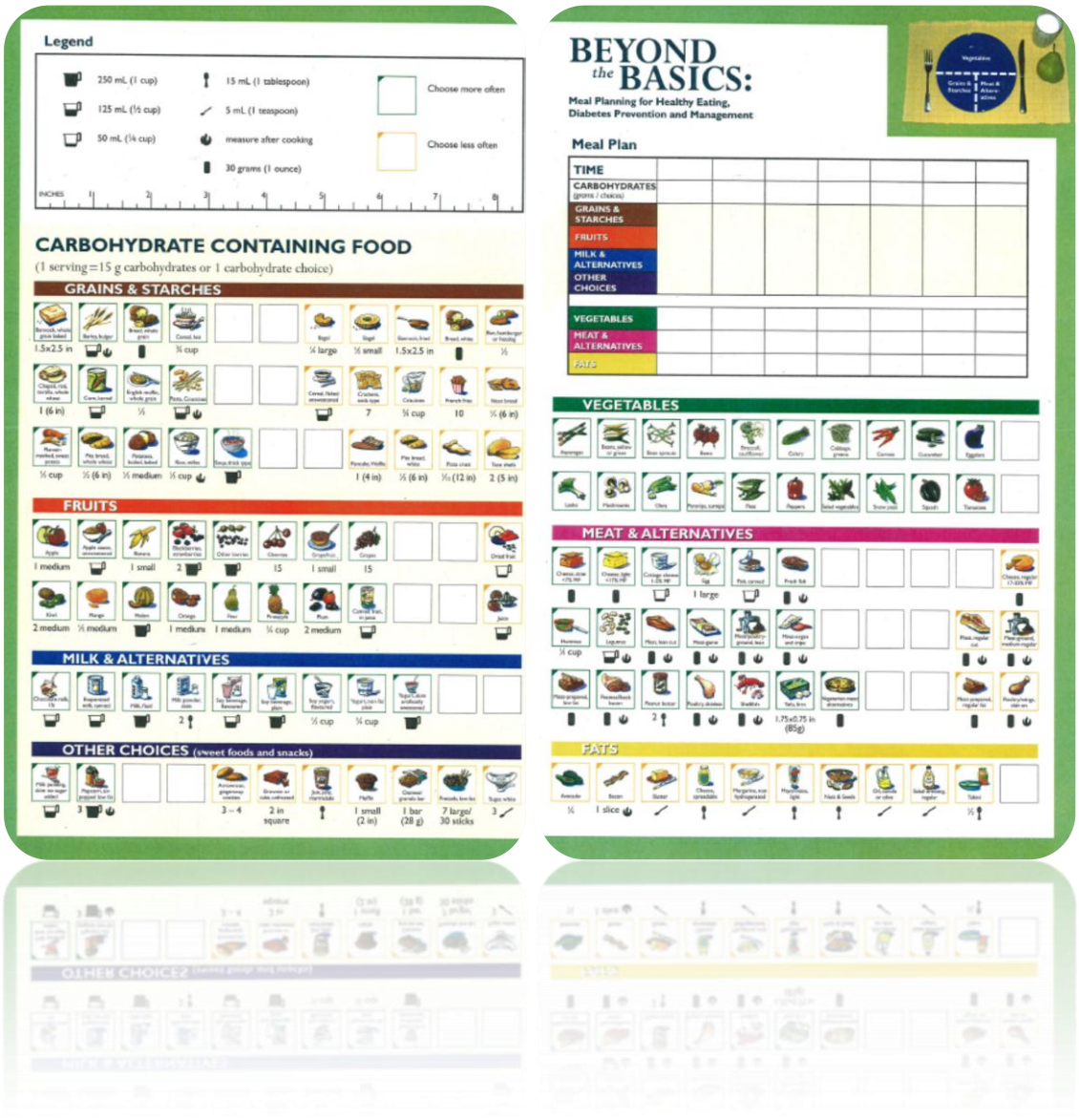
Checked out by _____Date_____

Returned _____Date_____

Appendix 15

BEYOND THE BASICS

(See next page for a copy of the resource)



Source: Canadian Diabetes Association, June 2005

Canadian Diabetes Association

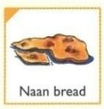
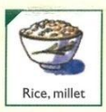
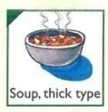
Legend

250 mL (1 cup)
125 mL (½ cup)
50 mL (¼ cup)
15 mL (1 tablespoon)
5 mL (1 teaspoon)
measure after cooking
30 grams (1 ounce)
Choose more often
Choose less often

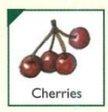
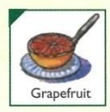
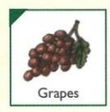
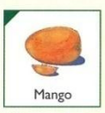
CARBOHYDRATE CONTAINING FOOD

(1 serving = 15 g carbohydrates or 1 carbohydrate choice)

GRAINS & STARCHES

 Bannock, whole grain baked	 Barley, bulgur	 Bread, whole grain	 Cereal, hot			 Bagel	 Bagel	 Bannock, fried	 Bread, white	 Bun, hamburger or hotdog
1.5x2.5 in			¾ cup			¼ large	½ small	1.5x2.5 in		½
 Chapati, roti, tortilla, whole wheat	 Corn, kernel	 English muffin, whole grain	 Pasta, Couscous			 Cereal, flaked unsweetened	 Crackers, soda type	 Croutons	 French fries	 Naan bread
1 (6 in)		½					7	⅔ cup	10	¼ (6 in)
 Plantain mashed, sweet potato	 Pita bread, whole wheat	 Potatoes, boiled, baked	 Rice, millet	 Soup, thick type			 Pancake, Waffle	 Pita bread, white	 Pizza crust	 Taco shells
⅓ cup	½ (6 in)	½ medium	⅓ cup				1 (4 in)	½ (6 in)	1/12 (12 in)	2 (5 in)

FRUITS

 Apple	 Apple sauce, unsweetened	 Banana	 Blackberries, strawberries	 Other berries	 Cherries	 Grapefruit	 Grapes			 Dried fruit
1 medium		1 small	2		15	1 small	15			
 Kiwi	 Mango	 Melon	Orange	Pear	Pineapple	Plum	Canned fruit, in juice			Juice
2 medium	½ medium		1 medium	1 medium	¾ cup	2 medium				

MILK & ALTERNATIVES

Chocolate milk, 1%	Evaporated milk, canned	Milk, fluid	Milk powder, skim	Soy beverage, flavoured	Soy beverage, plain	Soy yogurt, flavoured	Yogurt, non fat plain	Yogurt, skim artificially sweetened		
			2			⅓ cup	¾ cup			

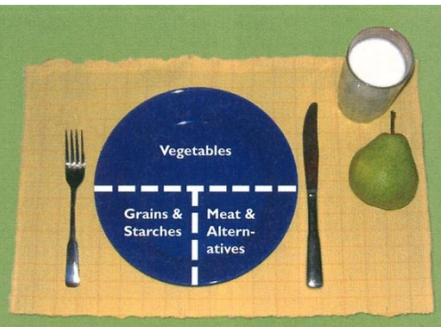
OTHER CHOICES (sweet foods and snacks)

Milk pudding, skim no sugar added	Popcorn, air-popped low fat			Arrowroot, gingersnap cookies	Brownie or cake, unfrosted	Jam, jelly, marmalade	Muffin	Oatmeal granola bar	Pretzels, low fat	Sugar, white
	3			3 – 4	2 in square		1 small (2 in)	1 bar (28 g)	7 large/ 30 sticks	3

BEYOND *the* BASICS:

Meal Planning for Healthy Eating, Diabetes Prevention and Management

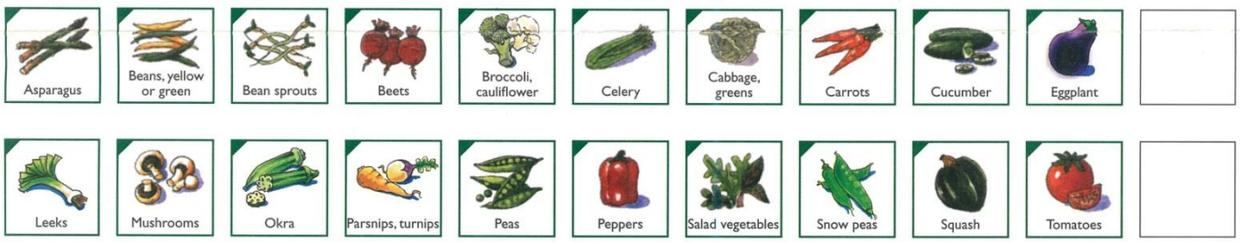
Canadian Diabetes Association



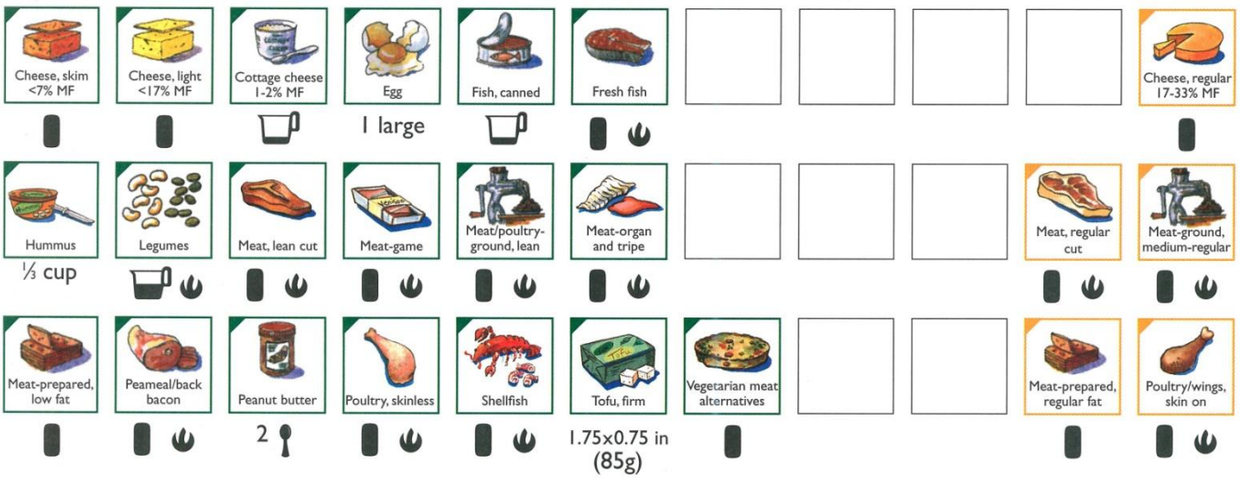
Meal Plan

TIME							
CARBOHYDRATES *(grams / choices)*							
GRAINS & STARCHES							
FRUITS							
MILK & ALTERNATIVES							
OTHER CHOICES							
VEGETABLES							
MEAT & ALTERNATIVES							
FATS							

VEGETABLES



MEAT & ALTERNATIVES



FATS

Appendix 16

FETAL KICK COUNTING

Clinic card

You are asked, within a period of **2 hours**, to note **fetal movements** you feel

Once the six are obtained, the count is done for the day. You restart the next day

Every day, the sheet must be initialed by a nurse

Date ↓ / Mvt →		Hr start	1	2	3	4	5	6	Hr end	Nurse's initials
Example:		9:30	✓	✓	✓	✓	✓	✓	11:15	Dr
MONTH: _____ YEAR: _____	1									
	2									
	3									
	4									
	5									
	6									
	7									
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	31									

Discard this sheet after delivery

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