
MATERNITY UNIT

GUIDELINE: NUTRITIONAL MANAGEMENT OF DIABETES IN PREGNANCY

SCOPE: Obstetricians, midwives and nurses working in antenatal clinic, community and the maternity unit.

AUTHOR: Diabetes in pregnancy working group

PURPOSE: To inform all health professionals of the appropriate advice to give to women with diabetes during pregnancy regarding their nutritional requirements.

DEFINITIONS:

GESTATIONAL DIABETES MELLITUS (GDM)

GDM is defined as “any degree of glucose intolerance with onset or first recognition during pregnancy”. The definition applies whether or not insulin is used for treatment or hyperglycaemia persists after pregnancy. It does not exclude the possibility that unrecognised glucose intolerance may have predated the pregnancy.

GDM occurs in 1 to 14 percent of all pregnancies, depending on the population and diagnostic criteria used. It is associated with significant risk of maternal and perinatal complications.

GDM is more likely to be present if there is a history of:

- Obesity
- Previous large babies
- Previous GDM
- Previous unexplained perinatal loss, miscarriage and premature deliveries.

Glucose tolerance often returns to normal after birth, but there is a high risk of subsequently developing type 2 diabetes (up to at least 50 percent).

TYPE 1 DIABETES

Type 1 diabetes is of auto-immune or viral aetiology with other environmental and genetic factors involved. Incidence of type 1 diabetes peaks in childhood and in the elderly. It usually presents acutely. Islet cell antibodies, IA2 antibodies and/or glutamic acid decarboxylase (GAD) antibodies are often present. Individuals with type 1 diabetes cannot produce adequate insulin levels and consequently are dependent upon insulin injections to control their blood sugar. If their blood sugars are not controlled they are at risk for coma and death.

TYPE 2 DIABETES

The cause of type 2 diabetes remains unknown although an inherited predisposition and lifestyle factors such as obesity contribute. It is more common for members of families with a history of diabetes. However, it is less likely among those of European descent. There is a general increase in the prevalence of **Type 2 diabetes worldwide. Type 2 diabetes is associated with significant morbidity and mortality.** The goal of treatment is to prevent long term complications and symptoms of diabetes.

Women with type 2 diabetes are frequently first diagnosed with this condition during pregnancy. It can be difficult to differentiate between gestational diabetes and previously undiagnosed type 2 diabetes. A definitive diagnosis can only be made after delivery.

Women with type 2 diabetes may be able to control their blood sugars with diet alone but most will also need oral medications and/or insulin. The pancreas produces insulin however the cells are resistant to the action of insulin. Consequently they often need oral medications to sensitize them to insulin, such as Metformin or Glibenclamide, or insulin itself. They rarely suffer from DKA though it is not impossible.

GUIDELINE:

AIMS OF NUTRITIONAL CARE:

1. To achieve optimal nutrition, weight and glycaemic control for women with pre-existing diabetes prior to conception.
2. To provide adequate energy and nutrients during pregnancy for optimal maternal and fetal health.
3. To normalise maternal blood glucose levels.
4. To reduce the risk to the mother of developing diabetes later in life through healthy eating habits and weight in order to reduce the risk of obesity.

PRE-CONCEPTION NUTRITION

- Women should be encouraged to eat a balanced and varied diet, consistent with national nutrition goals and guidelines for healthy adult New Zealanders.
- Increased folate requirements cannot be met by dietary means alone and a folate supplement of 0.8mg per day is recommended for women with pre-existing diabetes which is diet controlled or on metformin; a folate supplement of 5mg per day is recommended for women with pre-existing diabetes which is requiring insulin therapy.
- For women with Type 1 DM a review of carbohydrate consumption and ability to match insulin to carbohydrate intake should be undertaken, with a view to optimising post prandial blood glucose control.
- For women with Type 2 DM who are overweight, a weight loss programme will help reduce insulin resistance **prior to conception** and help moderate its effect during pregnancy. Weight loss of 5-10% of the initial weight has been shown to have beneficial effects.
- Women with Type 2 DM also need review and education about the impact of carbohydrate on blood glucose control, to help them achieve optimal control.

OPTIMAL NUTRITION DURING PREGNANCY:

- New Zealand nutrition guidelines for eating for healthy pregnant women apply to all pregnant women whether they have diabetes or not.
- Women should be encouraged to eat a balanced and varied diet.
- Increased needs for folate, iodine, protein, iron and other micronutrients during pregnancy are the same for women with diabetes as for the general pregnancy population.
- Energy requirements are determined by weight, age, height and activity levels. Modest energy restriction (a reduction of 30%) is not thought to cause problems with ketosis or fetal development in overweight pregnant women as long as baby's growth is being monitored by the MDT.
- There are no increased energy requirements during first trimester of pregnancy; 1400kJ (340kcal) extra per day during second trimester and 1900kJ (452kcal) extra per day during third trimester.

- Carbohydrate may contribute 45-60% of daily energy. The amount of carbohydrate that is tolerated per meal or snack differs between individuals. Factors influencing carbohydrate requirements include weight, activity levels, insulin regimen and preferred food choices. A minimum of 175g carbohydrate is required per day during pregnancy. Reported intake at lower levels than this may reflect extreme restriction or substantial under-reporting.
- Regular visits to see the dietitian in pregnancy will be needed in order to manage carbohydrate requirements and educate the woman on her choices.

NORMALISE BLOOD GLUCOSE LEVELS:

Type 1 Diabetes

- Flexible insulin regimens with rapid acting insulin analogues, or insulin pumps, allow greatest scope for matching insulin to carbohydrate intake. (Other regimens may require a specific distribution of carbohydrate through the day, in set amounts, in order to match the action of the insulin).
- Carbohydrate intake needs to be calculated and insulin doses adjusted accordingly.
- The carbohydrate counting skills of all women with Type 1 DM should be reviewed in pregnancy.
- Carbohydrate-to-insulin ratios will often change as the pregnancy progresses and should be reviewed regularly.
- For those not able to accurately adjust insulin to varying carbohydrate intake, standard amounts of carbohydrate at each meal and snack may be more appropriate. Variety can still be provided by 'spending' carbohydrate allowances on different foods.
- Supper is important for the prevention of nocturnal hypoglycaemia and has the effect of reducing the likelihood of fasting ketosis.
- Weight gain during pregnancy should be appropriate for baseline weight (see overleaf).

Type 2 Diabetes and GDM

- Whether controlled by diet alone or insulin, women with Type 2 DM and GDM need to have a clear understanding of the direct role of basic food groups in the management of blood glucose levels
- Levels of education about carbohydrate range from basic concepts and principles through to detailed carbohydrate counting and should be matched to the individual's skills and motivation.
- Linking carbohydrate intake as reported in food records to blood glucose levels post prandially, will help identify if intake is problematic. Elevated post prandial blood glucose levels with carbohydrate intakes as low as 30-40g per meal suggest that insulin is required.
- Given that the majority of individuals with Type 2 DM are overweight, weight gain during pregnancy should be at the lower end of the acceptable weight gain scale (see below).
- Weight gain from diagnosis through the last 10-12 weeks of pregnancy should be monitored in women with GDM. Excessive weight gain will make achieving glycaemic targets more difficult and a lack of weight gain or weight loss may suggest the woman is being overly restrictive with her intake, possibly to avoid the use of insulin.
- Limiting weight gain can be achieved by controlling total energy intake. Reducing fat consumption aids energy restriction. Foods that promote satiety (fibre rich or low Glycaemic Index) may also help limit net intake.
- Distributing food intake evenly across the day with regular meals and snacks will help avoid large fluctuations in blood glucose levels and may help moderate appetite.

RECOMMENDED TOTAL WEIGHT GAINS DURING PREGNANCY (FROM CONCEPTION TO DELIVERY)

The following are the current recommendations for maximal weight gain in New Zealand:

Pre-pregnancy or early pregnancy (less than 10 weeks) BMI (kg/m ²)	Total weight gain range
Underweight (<18.5)	12.5 kg–18 kg
Healthy weight (18.5 - 24.9)	11.5 kg–16 kg
Overweight (25.0 - 29.9)	7 kg–11.5 kg
Obese (≥ 30.0)	5 kg–9 kg

Source: IOM and NRC 2009

Note: Weight management during pregnancy is important, as it is a time of potential excess weight gain. Lesser weight gains are increasingly being recommended. Being overweight has implications for the development of GDM itself during pregnancy and increases the risk of overt diabetes over a women's lifetime. Current research suggests that weight gain should be as near the lower end of the recommended ranges as possible especially for women whose pre-pregnancy weight is at the upper end of each BMI range. Further research is needed to re-define acceptable weight gain recommendations in pregnancy.

POST PREGNANCY NUTRITION

Type 1 & Type 2 Diabetes

Nutritional requirements are the same as for all new mothers (depending on whether they are breast feeding or not).

- Breastfeeding requires approximately an extra 50-75g (476-500kcal) CARBOHYDRATE per day, which may need to be built into the Type 1 DM woman's diet.
- Returning to a healthy weight post pregnancy is important for all women with diabetes.

Women with Normal Glucose Tolerance Post Pregnancy

Diet and lifestyle has been shown to reduce the risk of developing overt diabetes by almost 60%. Women who have had diabetes during pregnancy are in a high risk category and would all benefit from following risk reducing practices, namely:

- Weight reduction to normal BMI or a weight loss of 5-7 %
- Increase vegetables and fruit consumption
- Diet low in saturated fat
- Diet high in fibre
- 30 minutes of exercise daily

ASSOCIATED DOCUMENTS:

[Diabetes Ante-natal Blood Glucose Monitoring.pdf](#)

[Diabetes in Pregnancy Intrapartum Care.pdf](#)

[Diabetes Insulin Therapy in Gestational Diabetes.pdf](#)

[Diabetes Maternal Postnatal Management.pdf](#)

[Diabetes Nutritional Management of Diabetes in Pregnancy.pdf](#)

REFERENCES:

Ministry of Health. 2006 (revised 2008). Food and Nutrition Guidelines for Healthy Pregnant and Breastfeeding Women: A background paper. Wellington: Ministry of Health.

Ministry of Health. 2015. Eating and Activity Guidelines for New Zealand Adults. Wellington: Ministry of Health.

Dietitians NZ (2016) Nutritional Management of Gestational Diabetes.

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