Dietary Approaches to Diabetes in Pregnancy

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Registered Dietitians

What society thinks I do.

What chefs think I do.

What patients think I do.

What physicians think I do.

What I think I do.

What I actually do.

- Optimal nutrition for mother and growing fetus– what is the right diet?
- Maternal euglycaemia – how is this achieved?
- Achieving appropriate weight gain……
- Establishing good nutrition patterns for whole family.

Dietitian's role within the team

- Promote healthy eating principles
- Carbohydrate awareness – T2DM and GDM
- Meal planning (guidance on portion size, snacks)
- Carbohydrate counting for T1DM
- Assist in optimizing glycaemic control
- Analysing BG results and trends
- Insulin dose adjustment

Healthy Eating principles in Pregnancy

- Dispel myth about eating for two
- Food safety including foods to avoid
- Vitamin supplementation - folic acid (higher dose of 5mg) and 10ug/d vitamin D (NICE 2008)
- Caffeine recommendations
- Encourage consumption of nuts!
- Exercise encouraged

Carbohydrate counting

- Allows greater flexilbility of CHO intake at meals
- Educate women on how to count using food labels,
  CHO content of a weighed portion of food (pasta,cereals)
- Total carbohydrate content of meal matched with
  a dose of Quick Acting insulin
- Carbohydrates counted in portions “CP”
- Pre pregnancy insulin to CHO ratio 1:1, can rise to 8:1

Nutrition

Typical values	100g contains	Each slice (typically 44g) contains	% RI*	RI* for an average adult
Energy	985kJ 235kcal	435kJ 105kcal	5%	8400kJ 2000kcal
Fat	1.5g	0.7g	1%	70g
of which saturates	0.3g	0.1g	1%	20g
Carbohydrate	45.5g	20.0g		
of which sugars	3.8g	1.7g	2%	90g
Fibre	2.8g	1.2g		
Protein	7.7g	3.4g		
Salt	1.0g	0.4g	7%	6g

This pack contains 16 servings

*Reference intake of an average adult (8400kJ / 2000kcal)

- Need to advise women on increased risk of hypoglycaemia
  and how to treat


Blood Glucose Monitoring System
Test Strips
Glucose Meter
Lancing Device
Lancet Drum
Control Solution


Fruit and vegetables
Bread, rice, potatoes, pasta and other starchy foods
Meat, fish, eggs, beans and other non-dairy sources of protein
Food and drinks high in fat and/or sugar
Milk and dairy foods

Type, amount and distribution of carbohydrate is key to achieving normoglycaemia

Type of Carbohydrate

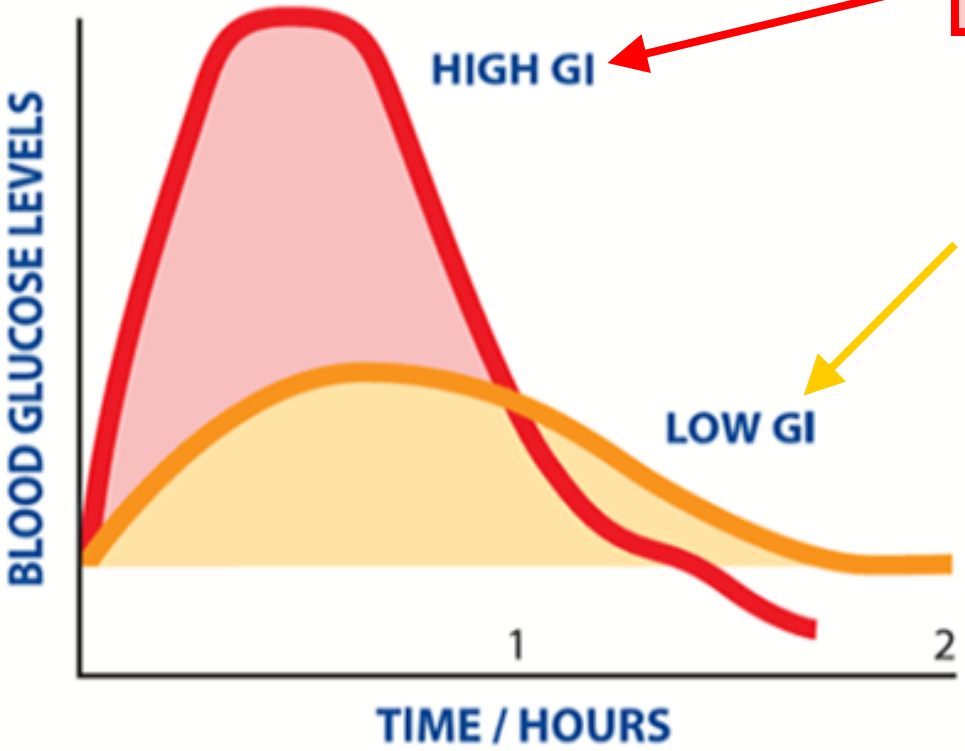
NICE CG63 2008

'diet that is high in carbohydrate of low GI improves overall glucose control and reduces post-prandial glucose excursions.

NICE NG3 2015

- Foods with a low glycaemic index (GI) should replace those with a high glycaemic index.
- Refer all women with gestational diabetes to a dietitian.
- A meta-analysis found low GI diets reduced HbA1c by 0.43 percentage points (95% CI 0.72 to 0.13) over and above that produced by high GI diets.
- Low glycaemic index diets appear to reduce postprandial hyperglycaemia and use of low GI diets have been shown to be associated with less frequent insulin use and lower birthweights

Effect of GI on blood sugar



A high GI food raises blood sugar levels quickly

A low GI food raises blood sugar levels slowly

Rapid rises and falls in blood sugar affect energy levels which may cause cravings and trigger overeating

Low GI swaps

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To avoid;

- Sugar/Jaggery used in drinks and cooking
- Condensed milk
- Honey
- Fruit juice/Ribena/Full sugar squash
- Normal fizzy drinks e.g. Coke, lemonade
- Jams and marmalade
- Sweet biscuits
- Cake and sweet bread
- Tinned fruit in syrup
- Chocolate and sweets
- Indian sweets e.g. Burfi, jellabi
- Supermalt
- Sports drinks e.g. Lucozade, Gatorade

Switch **FROM** these foods:	**TO** these lower GI options:
Bread White bread Brown bread Wholemeal bread	Multigrain/granary/seeded Rye/Pumpernickel Wholemeal pita Ryvita crispbread with seeds Oatcakes
Rice and grains Instant Long grain Jasmine Sticky	Basmati Brown Pearl barley Buckwheat
Pasta	All versions are OK Try wholewheat versions
Cereal Cornflakes Rice pops Chocolate/honey covered Dried fruit containing	Porridge (jumbo oats rather than sachets) Muesli – opt for no added sugar, and nut based rather than those containing lots of dried fruit All Bran
Potatoes Mashed	Sweet potato/yam New potato (Leave skin on for added fibre)
Fruit Fruit juice	All fruits are good but berries, cherries and grapefruit are lowest GI (Only one portion at a time as they contain natural sugar)
Vegetables	Include all (Not juiced)
Beans/lentils/pulses	Include all of these – very low GI

Type, **amount** and distribution of carbohydrate is key to achieving normoglycaemia

- Wide variablility in clinical practice – no set evidence or guidance

- **DoH**: at least 50% of energy should come for carbohydrate
- **US Guidelines** – ADA minimum of 175g CHO/day – no science to support this
- Varying amounts of CHO stated in the research papers from 35-40% (Jovanovic, 2011) to >55% (Langer 1996). Greater use of insulin with higher CHO intakes

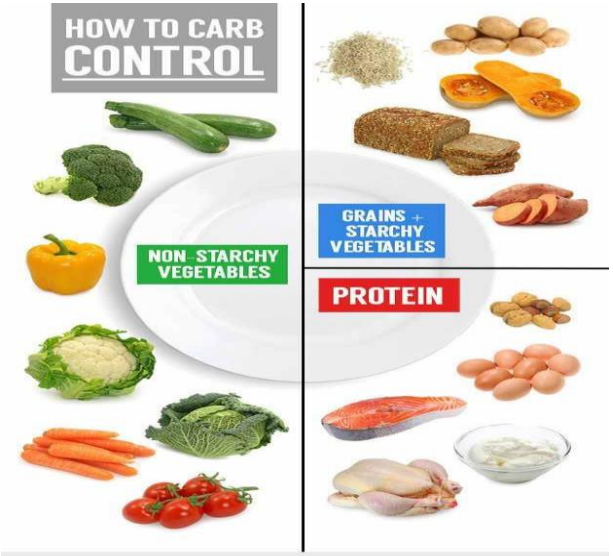
- **NICE NG3 2015:** "Advise women with gestational diabetes to eat a healthy diet during pregnancy, and emphasise that foods with a low glycaemic index should replace those with a high glycaemic index".

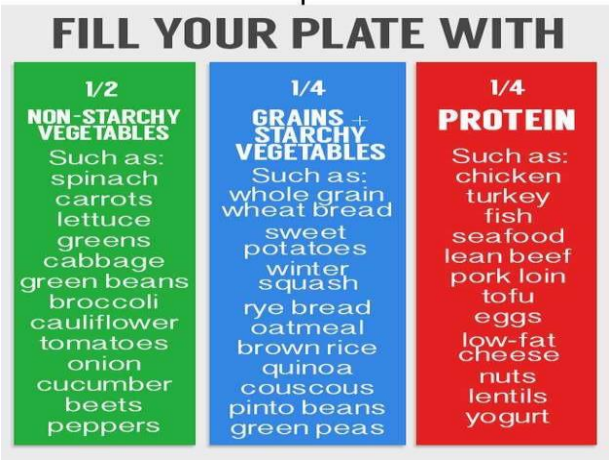
In practice….

- We aim for minimum of 150g per day of CHO

Type, amount and **distribution** of carbohydrate is key to achieving normoglycaemia

- 3 meals (20-30g B, 40-50g L/EM) and 3 small snacks (10-20g)
- Inclusion of protein with carbohydrate to blunt post prandial glucose rise
- Use of low GI CHO sources





Typical daily intake

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B'fast:	200g Greek or natural yogurt, handful of berries and sprinkling of nuts and seeds	25g CHO
Mid-am:	apple and handful of nuts	15-20g CHO
Lunch:	2 medium slices of Granary bread with egg and salad 1 medium apple/pear or handful of grapes	50g CHO
Mid-pm:	3 Oatcakes and avocado or nut based cereal bar	15g CHO
Dinner:	Vegetable/meat chilli with 1 tortilla or 3-4 tablespoon cooked rice	30-40g CHO
Bedtime:	Glass milk and plain biscuit/slice of toast	20g CHO

Total 155-170g CHO

Snacks

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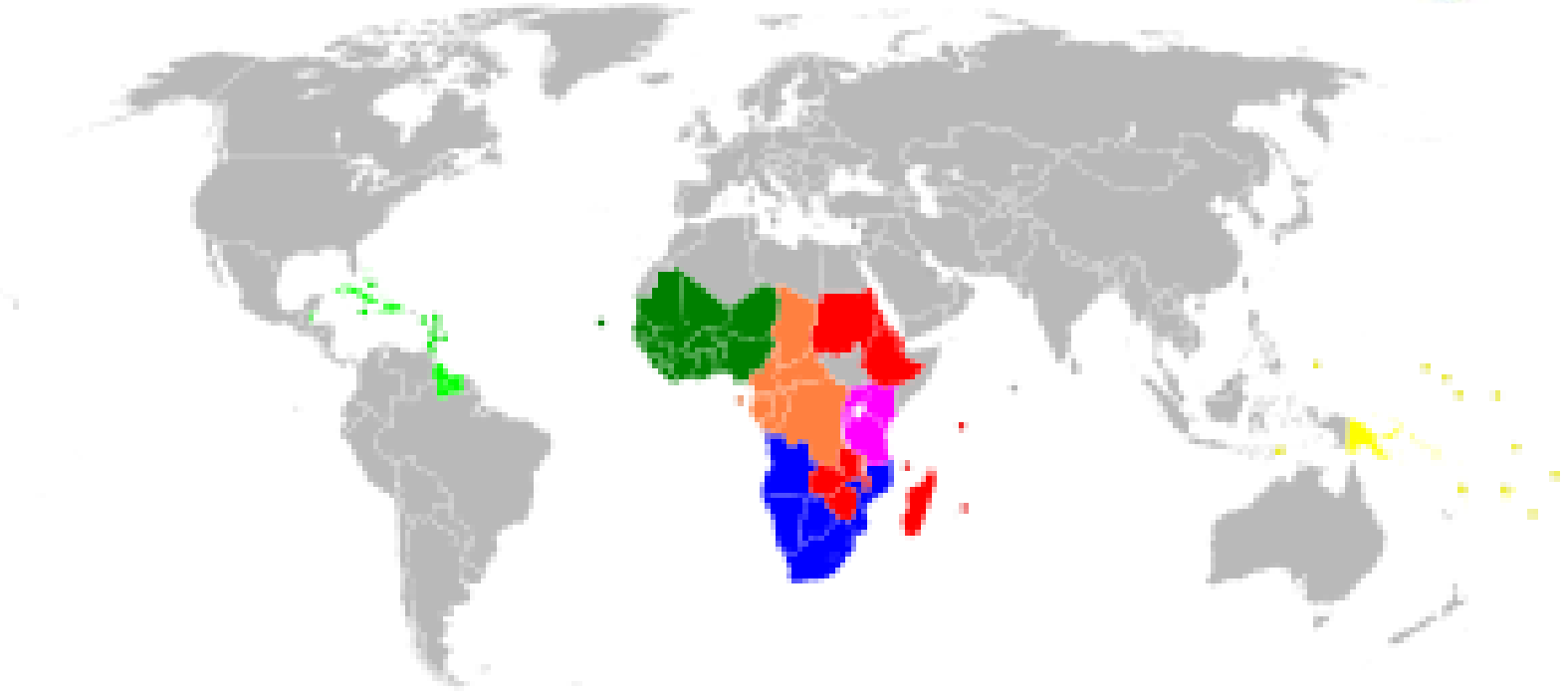
- Small pot of diet yogurt (<15g carbohydrate) or bowl of Greek yogurt (200-250g pot)
- Fruit – e.g. 1 medium apple/1 small banana/2 small fruits e.g. plums, kiwis or 150g berries +/- wedge of cheese/nuts
- 1-2 Oatcakes/Ryvita/2-3 rice cakes/1 slice wholegrain bread with hummus/peanut butter/cottage cheese/mashed avocado/mashed sardines

- Sachet of cup a soup (<15g carbohydrate)/homemade soup
- 1 plain biscuit e.g. Digestive/Hobnob
- Packet of wotsits/french fries/quavers
- 200ml glass of semi-skimmed milk
- 30g plain popcorn
- Sachet of low fat hot chocolate made with water e.g. Cadbury's highlights/Options
- Sugar free jelly and berries
- Olives
- Crudites and hummous
- Boiled eggs
- Cereal bars made with nuts and seeds such as 9bar, Nature valley protein

Ethnic groups




All
Nigerian
Recipes


Original
INTERNATIONAL JUICE
CARROT JUICE
JUS DE CAROTTE


Nestlé
Carnation
Sweetened
Condensed Milk


MOIR'S
Custard
Powder
250g

Weight gain?

Is it harmful for women to lose weight in pregnancy?

What is an appropriate Gestational Weight Gain or loss?

- Greatest determinant of health outcomes for mother and baby is pre pregnancy weight (CMACE, 2010)

- Women with high GWG tend to retain more weight at 15year follow up (Linne et al, 2004)
- More likely to enter next pregnancy with higher BMI

- Basal metabolic rates and Total Energy Expenditure in women vary dramatically (Prentice et al, 1996)
- EAR 2000kcals plus 200kcals in last trimester (DRV 1991)
- Weighing is an inexact method of monitoring weight gain as GWG is not just fat mass….extracellular fluid volumes can vary greatly.

2009 IOM GWG Recommendations USA

Pre-pregnancy BMI category	Total weight gain (kg)	Rate of weight gain 2nd and 3rd trimester (kg/wk)
Underweight (< 18.5 kg/m^2)	12.5-18	0.51 (0.44-0.58)
Normal-weight (18.5-24.9 kg/m^2)	11.5-16	0.42 (0.35-0.50)
Overweight (25.0-29.9 kg/m^2)	7-11.5	0.28 (0.23-0.33)
Obese (≥ 30.0 kg/m^2)	5-9	0.22 (0.17-0.27)

*Calculations assume a first-trimester weight gain of 0.5-2.0 kg

NICE, 2008: women with a BMI>27kgm2 during pregnancy moderate calorie restriction improves glycaemic control without ketonaemia.
restrict calorie intake 25kcal/kg and 30minutes exercise/day

RCOG, 2009: little evidence of harm of calorie restriction in 1st half of pregnancy
2nd half of pregnancy concerns arise due to dieting. Development of lipolysis and ketonaemia which has an inverse relationship to mental and development index scores in new born
" however by making healthy changes to your diet you may not gain any weight during pregnancy and you may even lose a small amount. This is not harmful

NICE, 2010: no evidence based UK guidelines on recommended weight gain ranges during pregnancy
Dieting during pregnancy is not recommended as it may harm the health of unborn child
Dispel myths around nutrition in pregnancy e.g "eating for two“

We don’t know the effects on the newborn?

But in practice….

- Encourage to eat to appetite
- Weigh at each visit and check for urinary ketones
- Dietary review – quality of diet, inclusion of main food groups
- More frequent growth scans
- Weight maintenance

Breastfeeding

- Post birth insulin levels fall dramatically so greater risk of hypoglycaemia
- Encourage small snack before feeding and ensure high GI CHO to hand
- Lower insulin needs because some blood glucose needed for milk production
- However lactation hormones counteract insulin action so women often need some with their meals

GDM: diabetes medication stopped

T2DM/T1DM: pre pregnancy medication

References

- Catalano PM, Mele L, Landon MB, et al. Inadequate weight gain in overweight and obese pregnant women: what is the effect on fetal growth? Am J Obstet Gynecol 2014; 211: 137.e1-7
- CMACE/Centre for Maternal and Child Enquiries and the Royal College of Obstetricians and Gynaecologists (2010).Joint Guideline – Management of women with obesity in pregnancy. London. Centre for Maternal and Child Enquiries and the Ryal College of Obstetricians and Gynaecologists.
- Department of Health. Report 41. Dietary refercne values for food energy and nutrients for the United Kingdom. Chapter 2. Section 2.4
- Diabetes in Pregnancy. NICE clinical guideline 63 (2008)
- Diabetes in pregnancy: management of diabetes and its complications from preconception to the postnatal period. NICE guideline 3 (2015)

- Nutrition recommendations and interventions for Diabetes. A position statement of the American Diabetes Association. Diabetes Care, volume 1, supplement 1 s61-s78. 2008
- www.nutrition.org.uk
- Nutrition in Pregnancy. Royal College of Obstetricians and Gynaecologist. Scientific Impact Paper No. 18 Revised September 2010
- Prentice AM, Spaaij CJ, Goldberg GR, Poppitt SD, van Raaij JM, Totton M, et al. Energy requirements of pregnant and lactating women. Eur J Clin Nutr 1996;50 Suppl 1:S82–111.
- Weight gain during pregnancy: reexamining the guidelines. IOM 2009
- Weight management before, during and after pregnancy. NICE public health guidance 27 (2010)