

# Children and Type 1 – a question of diet

**Gráinne Mallon** explains how healthy eating can be used to improve blood glucose control in children with Type 1

Nutrition management is one of the cornerstones of diabetes care and education. The role of a paediatric dietitian experienced in diabetes is to offer evidence-based dietary advice to optimise blood glucose levels.

Education about nutrition and diabetes management should begin as soon as possible after diagnosis. Regular review with a dietitian is recommended during the first year and annually thereafter to keep track of growth and lifestyle changes and to identify dietary issues, such as disordered eating patterns.

At diagnosis, a dietitian will cover key education, which includes:

- Healthy eating principles for the whole family
- Types of carbohydrate foods and their effects on blood glucose
- How much carbohydrate is in foods and how to balance carbohydrates with insulin to prevent hypo and hyperglycaemia
- How to calculate insulin doses using carbohydrate counting
- How to manage occasions such as exercise, birthday parties and eating out.

**Table 1: Key dietary messages for improving blood glucose levels**

- Bolus insulin should always be given before eating
- Carbohydrate counting using insulin-to-carbohydrate ratios should be used from diagnosis
- Establish a meal routine based on healthy eating principles from diagnosis
- Prioritise low GI foods and high-quality carbohydrates at meals
- Consider insulin dose adjustments for fat and protein
- Regular dietetic review with a paediatric dietitian specialising in diabetes

All children newly diagnosed with Type 1 are currently provided with an information pack which has been funded by the HSE.

This family resource pack was developed jointly by paediatric clinical nurse specialists and dietitians working in diabetes services across Ireland. It includes information on all aspects of diabetes management including diet, insulin and exercise and is available to download at [www.diabetes.ie](http://www.diabetes.ie)

### Healthy eating

Dietary recommendations for children with diabetes are based on healthy eating principles for all children and adults and therefore the whole family. Establishing healthy eating habits, meal routines and positive relationships with food from diagnosis through the life cycle is important for young people with diabetes.

Healthy eating means enjoying food and making the right choices to promote good blood glucose levels, prevent excess weight gain and for overall good health. The food pyramid is a fun and practical way of teaching healthy

eating to families. Choosing a variety of foods as recommended from each shelf ensures the diet is balanced and healthy for everyone in the family. More information on healthy meal plans for different ages and portion sizes are available to download on [www2.hse.ie/wellbeing/how-to-eat-well.html](http://www2.hse.ie/wellbeing/how-to-eat-well.html)

### Carbohydrates and glycaemic index

Carbohydrates (starchy and sugary foods) are the main source of glucose in children with Type 1 diabetes. They are an important source of energy and therefore form a major part of a child's diet. Carbohydrate should provide approximately 45-50% of total energy requirements.

The amount of carbohydrate a child needs depends on their age, sex, physical activity and previous intake. For example, 50% of estimated energy from carbohydrate for a five-year old is 170g carbohydrate per day and for a 10-year old, 250g of carbohydrate per day. Good quality carbohydrate foods such as wholegrain bread and cereals, legumes, fruit, vegetables and low-fat dairy products are recommended to reduce changes in

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blood glucose levels after meals.

In addition to promoting healthy carbohydrate choices, the use of glycaemic index (GI) has been shown to provide additional benefit to blood glucose control. Foods causing a rapid rise in blood glucose is termed high GI and foods

low GI. To help minimise blood glucose rises after meals and to improve overall quality of the diet, low GI foods are recommended at meals.

## Carbohydrate counting

Carbohydrates are the main nutrient that affects blood glucose as their consumption results in the release of glucose into the bloodstream. Using an insulin-to-carbohydrate ratio, the amount of insulin given at a meal is matched to the amount of carbohydrate that is eaten.

To work out total carbohydrates in a meal or snack, various techniques such as reading food labels, weighing scales and pictorial carbohydrate books/apps are used. Carbohydrate counting enables insulin doses to be adjusted to each meal or snack while aiming to achieve blood glucose in the normal range and avoiding swings in blood glucose levels.

## Low carbohydrate diets

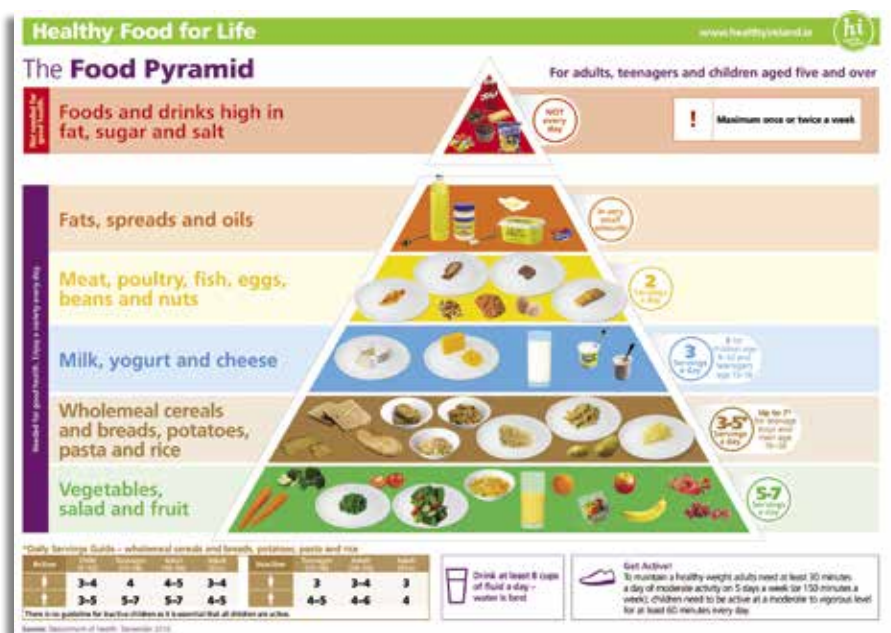
There is an emerging trend for children and young people with diabetes to follow low carbohydrate diets. While some studies in adults have suggested blood glucose benefits may result from carbohydrate restriction, there are no equivalent studies in children.

Restricting carbohydrates in children and young people has been linked with poor growth, diets lower in fibre, vitamin and minerals and an increased risk of eating disorders.

A consultation with a paediatric diabetes dietitian is recommended for any families expressing an interest in or currently following a low carbohydrate diet.

## Protein and fat counting

The increased use of continuous glucose monitors (CGM) has led to better understanding of the impact of fat and protein on blood glucose levels. Several studies have shown meals high in fat and protein had greatest effect on blood glucose three to six hours after a meal is



The Food Pyramid, available at [healthycleland.ie](http://healthycleland.ie) or [www2.hse.ie/wellbeing/how-to-eat-well.html](http://www2.hse.ie/wellbeing/how-to-eat-well.html)

consumed.

Once you are carbohydrate counting, insulin adjustments based on meal composition should be considered. As a conservative starting point, the International Society for Paediatric and Adolescent Diabetes (ISPAD) recommends an additional 15-20% bolus insulin for high fat, high protein meals.

## Latest technology

The term 'diabetes technology' refers to devices such as insulin pumps, CGMs and software that people with Type 1 diabetes use to help manage blood glucose levels. As technology evolves, the post-meal response to foods becomes clearer and allows us to see the effects of different foods on blood sugar.

Time in range (TIR) is the percentage of time spent with blood glucose levels in the right range. Post-meal blood glucose contributes to TIR and is therefore a target for improving blood glucose control. Food choices, meal planning and eating routines are all factors that impact on blood glucose for young people with Type 1 diabetes using diabetes technology.

Dietitians provide advice on these dietary factors and how they can be best managed to help optimise blood glucose levels following meals (see Table 1).

## Structured education programmes

Dietitians, along with diabetes nurse specialists, are involved in organising structured education programmes. One such programme, called CHOICE, has been run in several children's hospitals throughout Ireland. These group programmes provide participants with the knowledge and skills to make sense of blood glucose monitoring, match insulin doses to carbohydrate and adjust insulin doses as needed.

The benefits of attending such a programme include peer support for the young person with diabetes and improved confidence in self-managing the condition.

## Conclusion

Dietary advice and nutritional care are essential for all children with diabetes from diagnosis and through the toddler to teenage years. Early referral to a paediatric dietitian is crucial in helping to establish lifelong healthy eating habits, promote mealtime routines and teach skills such as carbohydrate counting, which have all been shown to help optimise diabetes care.

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