
Dietary therapy for epilepsy management

When anti-seizure medications alone do not work, your doctor may suggest using dietary therapy. Dietary therapy can help manage seizures in children and adults; however, they should not replace anti-seizure medications. If dietary therapy is effective in reducing seizures, with the guidance of your doctor and dietitian, you may be able to reduce or modify your anti-seizure medication. If you are wondering whether dietary therapy might be suitable for yourself or your child, talk to your specialist. You will need a referral to a specialist dietary therapy clinic, which has doctors and dietitians who have expertise in providing dietary treatment for epilepsy. This is to ensure the diet is safe and effective.



The primary dietary therapies used for epilepsy management include:

- Classic ketogenic diet
- Modified ketogenic diet
- Low glycaemic index treatment
- Medium-chain triglyceride supplements

Types of dietary therapy

There are several dietary therapies used for epilepsy management. These diets are all high in fat and low in carbohydrates. Each diet type has a specific prescription for the proportions of fat, protein, and carbohydrates. Usually, the brain uses glucose (or sugar) from carbohydrates for energy. When you decrease the amount of carbohydrates you consume and increase your intake of fats, your body breaks down the fats and produces ketones. When your body is in a state of ketosis, your brain can utilise these ketones as a source of energy. The changes associated with the brain using ketones instead of glucose is the reason why dietary therapies for seizure management work.

Primary dietary therapies

Dietary Therapies	Nutritional information			Description
	Fat	Protein	Carbohydrates	
Classic ketogenic diet	90%	7%	3%	All food and drinks are provided in a specified ratio.* All food and drinks need to be weighed and measured.
Modified ketogenic diet	75%	20%	5%	Daily targets for grams of fat, protein, and carbohydrates are provided. Food and drinks can be weighed or measured, or household measures, such as cups or tablespoons can be used.
Low glycaemic index treatment	60%	30%	10%	Carbohydrate intake is limited to food with a glycaemic index of less than 50. This diet allows for a more generous intake of protein and fats, which is encouraged. Food and drink can be estimated using household measures, such as cups or tablespoons.

*The ratio for each diet is the amount of fat in grams compared to the amount of protein and carbohydrate combined (in grams). For example, on the classic ketogenic diet, a 4:1 ratio = 4 grams of fat: 1 gram of protein and carbohydrate combined.

Classic ketogenic diet

The classic ketogenic diet can be used at any age and is often recommended for young children and infants.

The classic ketogenic diet changes how your body gets energy from food. Usually, the body uses carbohydrates for energy. With this diet, you consume up to 90% of your total energy from fats. It has a good amount of protein but is very low in carbohydrates. A dietitian must determine how many kilojoules are needed in your (or your child's) diet. Once this is determined, a meal plan is created. All meals in the diet must be weighed and measured. All food and fluids are provided in a specific ratio of fats to protein and carbohydrates combined, e.g. 4:1 or 3:1.

The classic ketogenic diet may be started as an outpatient, where the diet is introduced over a few weeks. In some circumstances, the diet may need to be started in the hospital. The diet must be supervised by a dietitian and epilepsy team with expertise in dietary therapy management. The classic ketogenic diet for epilepsy management is different from a weight-loss diet.

Modified ketogenic diet

The modified ketogenic diet is often recommended for adults but can be considered for older children or teenagers (in consultation with your dietitian and epilepsy specialist).

The modified ketogenic diet changes the way your body gets energy from food and follows similar principles to the classic ketogenic diet. However, the modified ketogenic diet is more flexible with meal choices and uses portion guides and household measures (e.g. measuring cups and tablespoons) to monitor food intake rather than all food needing to be weighed and measured.

On this diet, you will consume up to 75% of your total energy from fats. It has a good amount of protein but is low in carbohydrates. A dietitian must determine your or your child's total energy (kilojoules or calories) needs. They will then create a meal plan with you and teach you how to calculate the correct portion sizes of fats, protein, and carbohydrates at each meal.



The modified ketogenic diet can be commenced at home. The modified ketogenic diet for epilepsy management is not like a typical diet for weight loss (however, if you would like to lose weight you can also discuss this with your dietitian).

A specialist dietitian and medical team are needed to create and monitor the progress of the diet.

Low glycaemic index treatment

The low glycaemic index treatment (LGIT) is a low carbohydrate diet that allows small amounts of specific types of carbohydrates that are known to only have a minor effect on blood sugar levels. This diet is also high in fat and includes a good amount of protein.

Children or adults who have successfully reduced their seizures for a number of years by following either the classic ketogenic or modified ketogenic diets may be able to move on to the less restrictive LGIT.

The glycaemic index (GI) is a way of ranking foods based on how much they raise your blood sugar levels over time. Low glycaemic index foods only have a small effect on blood sugar levels – these foods can be included in small amounts on the LGIT. High glycaemic index foods have a larger effect on blood sugar levels and need to be avoided. Foods are given a glycaemic index ranking between 0-100; the lower the number, the lower the GI of the food.

The LGIT allows small amounts of carbohydrate foods that have a GI ranking of 50 or lower. Your dietitian will teach you which carbohydrate foods are low GI, and which are high GI, and they will calculate how many low GI carbohydrate portions are safe for you or your child to include on the LGIT.

The LGIT encourages you to eat foods containing fat at each meal. Protein is not restricted. Your dietitian will work with you to develop a meal plan.

The LGIT is more flexible than the classic or modified ketogenic diets. It allows for more variety in food choices and uses portion guides and household measures when preparing meals. Food does not need to be weighed. You can start this diet at home, and you can remain on a LGIT indefinitely.

If you are on a low GI diet as a treatment for your epilepsy this will continue to be monitored and evaluated by a specialist epilepsy team.

Medium-chain triglyceride (MCT) supplements

All fats are made up of different chain lengths, with most fat that we eat being long-chain fatty acids. Medium-chain triglycerides (MCTs) specifically refer to fats with a chain length of between 6-12 carbons. The MCTs are absorbed quickly and converted to ketones more readily

than long-chain fats. The MCTs come as supplements in the form of oils, emulsions or powders. They are usually used as part of another dietary treatment, such as with the classic ketogenic, modified ketogenic or LGIT. The addition of MCTs can boost ketosis and allow for some flexibility in carbohydrate and protein intake. Medium-chain triglyceride supplements can cause an upset stomach and diarrhoea. The dietitian will assist you with advice on the dosage, type and timing of taking MCT supplements.

Things to consider when on diet therapy

- Some diets, like the classic ketogenic diet, require you to weigh and measure all your food carefully.
- It's very important to follow the diet exactly – every day, for every meal.
- You will also need to check the ingredients in medicines with sugar, usually avoiding liquid forms.
- You will probably be given a vitamin and mineral supplement to take regularly to prevent any nutritional deficiencies.
- You will need to check for ketones in your urine or blood. Your doctor, dietitian or nurse will show you how to do this. Keep track of your body weight, too.
- You will need to have regular blood tests, usually every 3-6 months to monitor for any side-effects related to the diet.

Other things to consider

- You must read the food labels of what you eat with any of these diets to keep track of all the ingredients.
- Most people continue with their anti-seizure medication while on dietary therapy.
- You will need to schedule follow-up visits with your medical team to ensure things are going well.

What are the side-effects of dietary therapies?

Side-effects of dietary therapies may include:

- hunger
- constipation
- weight changes
- kidney stones
- high cholesterol.

You'll need regular blood and urine tests to check for potential issues.

Children on the ketogenic diet may grow more slowly than other children. Your child's height and weight will be regularly checked to monitor their development.

How effective are dietary therapies?

Research shows that all four major epilepsy diets have good results in improving epilepsy management. Many people who try dietary therapy have fewer seizures, and some may become seizure-free. Dietary therapy has been shown to lower seizures by 50% or more in half of those who try it, with 10-15% becoming seizure-free. Due to fewer seizures, the specialist may also reduce the dose of anti-seizure medications. Dietary therapy may be used for people with specific epilepsy syndromes or other epilepsy diagnoses. These include:

- Drug-resistant epilepsy, where two or more medications have been trialed at a therapeutic dose, but seizures continue.
- Angelman syndrome
- Febrile infection-related epilepsy syndrome
- Ohtahara syndrome
- Super-refractory status epilepticus
- Dravet syndrome
- Doose syndrome
- Glut-1 deficiency syndrome
- Infantile spasms
- Pyruvate dehydrogenase deficiency
- Tuberous sclerosis complex.

When and how can I stop dietary therapy?

Every person's dietary management journey will be different. Some people stay on their dietary therapy for many years. Other people may stop after a few years if seizures are well controlled. Before stopping dietary therapy, you may need to do the following:

- An electroencephalogram (EEG) may be needed to see if it is safe to stop the diet.
- Your specialist and dietitian will develop a plan to help you stop slowly over several weeks. Suddenly stopping dietary therapy can sometimes make seizures worse.

Other resources

- **The Royal Children's Hospital Melbourne**
www.rch.org.au/neurology/patient_information/ketogenic_diet
- **Ketocooking book**
www.genes4epilepsy.org/ketogenic-diet-cookbook
- **Ketogenic diet webinar**
www.youtube.com/watch?v=fz6Y6cnSCB0
- **Matthew's Friends**
www.matthewsfriends.org
- **Charlie Foundation**
www.charlifoundation.org
- **International League Against Epilepsy**
www.ilae.org/patient-care/ketogenic-diet-therapies

Epilepsy support

The National Epilepsy Support Service (NESS) is available Mon – Sat 9am – 7pm (AEST) to provide support and information across Australia. Phone: 1300 761 487. Email: support@epilepsysmart.org.au

Lived experience

We recognise all people living with epilepsy and the impact it has on their lives. We take a moment to acknowledge the lived experience they have shared with us. In sharing their stories, we acknowledge the strength and resilience people living with epilepsy have shown in the face of not getting a fair go.

A medical note

The information contained in this publication provides general information about epilepsy. It does not provide specific advice. Specific health and medical advice should always be obtained from a qualified health professional.

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