

FREQUENTLY ASKED QUESTIONS

What is the difference between the Classical and the MCT Diet?

Answered By: Professor Helen Cross

The main difference between the two diets is the type of fat that is given. In the classical diet, the main source is long chain fat found in foodstuffs readily available eg. Cheese, cream and butter. The ratio of 3 or 4:1 is based on the total calories from fat as a ratio to that in the diet from carbohydrate. The latter includes protein although minimal recommended requirements are given to children.

The MCT or medium chain triglyceride diet uses MCT as the main fat source; meals still require calculation but MCT is given to boost the ketosis. There is now evidence that both diets work equally well.

How is calculating a Classical Diet different from calculating an MCT diet?

Answered by Dr. Elizabeth Neal RD

Calculation of a classical diet prescription is based on a ratio of long-chain fat to carbohydrate and protein, usually 3:1 or 4:1.

Calculation of the MCT diet prescription is based on the percentages of energy provided from the medium chain fat (MCT), carbohydrate, protein and long-chain fat. The way these calculated prescriptions are translated into meals also differs in the two diets; the classical diet usually uses strict meal recipes, all in the correct ratio, whereas the MCT diet often employs exchanges, which can be more flexible, although ideally should be structured over the day to ensure the correct balance of MCT and long chain fat to carbohydrate and protein at each meal or snack.

There has also been a tendency to be more relaxed with the calorie prescription on the MCT diet, although there is little literature evidence for this idea.

Can you Specialise the diet even further - i.e. dairy free, gluten free, halal and Kosher Keto diets?

Answered by: Dr. R. Schwartz

These diets can be adapted to special dietary requirements. Kosher and Halal are no problem as Liquigen can be used instead of milk products and is Kosher. A milk free diet similarly can be done using fat substitutes. Gluten free is also possible and I have done a milk free gluten free diet successfully but it is very complex to calculate and a very experienced dietitian is needed.

Supplements To be Given and Tests to be Carried Out Whilst on the Diet.

What supplements have to be given on the Ketogenic diet?

Answered By: Dr. Elizabeth Neal RD

Full vitamin and mineral supplements are required. Forceval Junior is the most often used in UK, although needs additional calcium if requirements not met on the diet (which it never will be on classical diet), also extra magnesium if continuing to follow the diet for a significant period of time. Forceval Junior also does not contain phosphorus, this is rarely supplemented in the UK, although perhaps should be! All supplements should be carb-free.

Does Carnitine need to be Supplemented?

Answered by: Professor Cross

Carnitine is not routinely supplemented in many centres in the USA or elsewhere. Where measured, no specific carnitine deficiency has been seen. It therefore remains debatable whether it is routinely required, accepting in some individual cases there may be benefit. This subject however, remains under discussion - meanwhile we try and keep supplementation to a minimum. There is recommendations regarding Carnitine on the Medical Section of this website.

How much calcium and Vitamin D do our children need whilst on and off the diet?

Answered by: Jan Chapple RD

Calcium requirements, as with most other nutrients vary with age. There would be no increase to requirements on the Ketogenic diet. We use supplements to ensure adequate amounts of nutrients are consumed as the ketogenic diet restricts many of the foods which would give us supplies of vital nutrients.

Additional Calcium is used as some of the multivitamin and mineral supplements used do not contain sufficient amounts of calcium (Calcium usually makes the tablet larger)

Vitamin D is actually manufactured in the body by a process dependant on our skin being exposed to sunlight. There will be some vitamin D in most supplements and as long as your child goes out doors there should be no need for additional supplementation – although discussion on this supplementation is always ongoing depending in which part of the world you live.

Do we need to consider the balance of calcium usage to magnesium/Vit D and phosphate levels also?

Answered by: Jan Chapple RD

Everything should be considered in a balance and this is why your dietitian will recommend a Multivitamin and mineral supplements which is suitable. These supplements ensure most nutrients are provided in appropriate amounts.

Giving larger amounts of some vitamins and minerals can upset normal nutrient balance in the body and in some instances can be harmful.

Always ask your dietitian before initiating additional supplements.

Should we be concerned about children losing these salts in their urine if this is the period in their life that they should be laying down bone mass? Do children need a density scan?

Answered by: Jan Chapple RD

Everyone will lose a certain percentage of the salts consumed in their urine, the body absorbs what it needs and what it doesn't comes out the other end.

Bone is constantly mineralising and demineralising, which means building up and breaking down. All through childhood and until around 30yrs you are mineralising more than demineralising and after that the balance shifts the other way.

At different periods of growth the body can actually absorb more efficiently to cope with its increased demands.

DEXA scanning or bone density scanning has been suggested in different groups of children with chronic diseases which reduce absorption of nutrient such as Gastrointestinal diseases. If your child is not having symptoms of poor absorption and your dietitian is monitoring them for appropriate supplementation this should not be necessary.

Every child is individual, so if you do have any concerns ask for advice at your Ketogenic centre.

Side Effects of the Ketogenic Diet/Length of Time on the Diet

What are the most common side effects of the Classical Ketogenic Diet?

Answered by: Dr. Elizabeth Neal RD

Constipation is by far the most common side effect of the Ketogenic diet. Many foods which are naturally high in fibre are restricted on the Ketogenic diet, high fat diets can also slow down bowel function. This effect can be worsened if the child is fluid restricted.

This is usually resolved by ensuring adequate fluid intake, introducing a fibre supplement which is suitable on the ketogenic diet or by using a form of suitable Laxative, the Ketogenic team can advise on the best treatments for each child.

When initiating Ketogenic diet there is a risk of Hypoglycaemia (low blood sugars) and Acidosis (increased acid levels in blood), this is more of a risk if the child is fasted prior to introducing Ketogenic meals. At initiation your child would be monitored closely and treated if necessary.

A few children have problems with tolerance of the high fat Ketogenic meals, this can in some cases lead to vomiting or diarrhoea. Your dietitian can advise what to do if this occurs, often we introduce meals at a reduced ratio which means the fat content is a little more tolerable, or attempt meals in smaller portions and increase to full meals as tolerance improves.

There are some other complications which have been reported in children on Ketogenic diet, they include Kidney stones, Increase Cholesterol levels, Poor height growth, increased infections, Bleeding abnormalities and Heart complications. However all of these are rare.

Like many drug treatments there is quite a long list, however these complications are not experienced by all children on the Ketogenic diet, in fact few will be affected.

Your Ketogenic team will be well aware of the possible side effects of Ketogenic diet and your child will be monitored regularly to rule these out.

What are the most common side effects of the MCT Ketogenic Diet?

Answered by; Dr. Elizabeth Neal RD

In theory, diarrhoea and abdominal discomfort due to intolerance of the MCT oil. In practice, I have more commonly seen constipation again!

Obviously there are a number of other side effects reported in medical literature, but much less common

Some families notice a difference in their child's hair once they are on the Diet, either it becoming more brittle, thinner or even losing their hair. What causes this and what can be done to rectify it?

Answered by: Carrie Loughran RD

There are many "issues" that could lead to hair loss.

1. Inadequate protein/calories (can check this with an albumin level or pre-albumin level in your lab work)
2. Stress
3. Sodium Valproate (Epilim) can chelate with Zinc and Selenium, which can make for "brittle hair" that falls off.
4. The diet is also known to be insufficient with these minerals as well, so make sure the supplementation has 15-220mg zinc sulphate (provides 50 mg of elemental zinc) and 25-150mcg (micrograms) of selenium.
5. Hormones
6. Seasonal (our hair tends to grow faster in the summer)

I have read that good effects of the ketogenic diet are short lived and can wear off after 2-3 years - is this true?

Answered by: Dr. R. Schwartz

This is true of many treatments and I do not think that the dietary effects are different from many drugs. If the effects are not as good as they were after 2 years one needs to look to see why it is not as effective - clinical situation has changed, the diet is no longer being measured as accurately. The child has grown etc

How long should your child be on the Ketogenic diet?

Answered by: Dr. R. Schwartz

A difficult question – a minimum initiation phase of 3 months is usually recommended to establish the diet. If the diet is effective it can be continued for as long as it is needed (I've had one patient who took it for nearly 20 years). Anti-epileptic drugs should be discontinued when a paediatric patient has been free of seizures for 2 years and I follow the same rule for the diet, if the patient has been seizure free for 2 years on the diet then a slow wean off the diet can commence, however if seizures do appear once again then the diet can be tightened up and continued – so long as there is medical supervision.

[Anti-Epileptic Medication and the Ketogenic Diet](#)

What AED's (anti-epileptic drugs) interact with the diet?

Answered by: Professor Cross

Little is known about interaction of AED's with the diet. We do not know how absorption of the AEDs with a high fat diet may be affected for example. However, we do have evidence that sodium valproate may interfere with the anti-convulsant action of the diet; some children and it is not possible to predict who, gain better seizure control on weaning this anti-convulsant once established on the diet. There is also a suggestion of interaction between the diet and Topiramate; when starting on the diet whilst on Topiramate, particularly the classical diet, there appears quite a profound response with rapid development of ketosis. This can lead to apparent non responsiveness, and concern about possible non convulsive status epilepticus. This usually resolves with careful management, usually supplementing with orange juice. Occasionally we need to reduce the medication a little earlier than planned.

Can you recommend a keto-friendly anti-biotic?

Answered by; Professor Cross

Erythromycin tablets have minimal carbohydrate content.

Other Medications and the Ketogenic Diet

Please also check the list of keto-friendly recommended medications in the Medical Board Section of this website – this list is also reviewed regularly and added to. It has been prepared by the Pharmacy at Great Ormond Street Hospital – Many thanks to them.

Puberty and the Ketogenic Diet

All answers in this section given by Dr. Eric Kossoff from Johns Hopkins.

Can puberty upset the balance of the diet? Some parents have reported seizures coming back or increasing during this time and some have reported ketones being lost even though they say nothing has actually changed with the diet.

Yes, but has never been studied. Probably more likely that seizures are changing, which is very very common with puberty. Sometimes for the better, sometimes for the worst. I've never heard of ketosis being lost with puberty, but there are theories the diet works via neurosteroids, and as hormones are neurosteroids, it's certainly possible.

I have also asked my dietician as well...the other thought was perhaps with a growth spurt (if present), the child might need a bit more calories.

Sometimes the teens need extra ketotic "fuel" and we'll give a high fat snack once or twice throughout the day to bump ketones.

I wouldn't necessarily blame lower ketosis for seizures: try to correlate with a calendar to make sure it's related (e.g. low ketones=more seizures) first. There are definitely cases where over-ketosis can lead to increased seizures and we'll lower the ratio.

If puberty does upset the balance, is it advisable for a med to be added on to the diet to go through the puberty stage and then the med be weaned off after?

I usually don't.

Can seizure freedom/reduction return once the child has gone through puberty?

That would be what I'd advise. If your child is doing well, I wouldn't get overly concerned about ketosis (which is what I advise most of my patients anyway). Ketosis is probably over-rated beyond the first month or so (in my opinion...)