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Reply from Professor Taylor on frequent questions asked

Further information on the research on Reversing Type 2 Diabetes

Thank you for contacting me about the study on reversing type 2 diabetes. This has caused great interest amongst people with diabetes, and as of 2015, I have received around 2,800 enquiries and messages. Although I have replied to most of these personally, I am sorry to say that it is no longer feasible to do this. The research continues. Only your Doctor can provide personal medical advice and you should consult him/her about the factual information given on these pages. I hope the following items will provide some useful information.

What were the main findings?

1. The study was in people who had type 2 diabetes of up to 4 years. There is good reason to believe that longer duration type 2 diabetes can be reversible, although after 10 – 15 years of diabetes it is likely that not everyone will be able to achieve a return to normal glucose control, despite major weight loss.
2. It is possible to wake up the insulin producing cells of the pancreas by a consistent diet.
3. This happened at the same time as the fat content in the pancreas decreased. Previous studies have shown that fat stops insulin release, so it is reasonable to deduce that the removal of fat from the pancreas allowed insulin release to normalise.

Could it work for me?

- This research is in “type 2 diabetes”, the usual common form of diabetes. There are some rare forms of diabetes which may be incorrectly called type 2 diabetes:
 - a) Diabetes occurring after several attacks of pancreatitis is likely to be due to direct damage to the pancreas (known as “pancreatic diabetes”)
 - b) Secondly, people who are slim and are diagnosed with diabetes in their teens and twenties, with a very strong family history of diabetes, may have a genetic form (known as “monogenic diabetes”)
 - c) Thirdly, type 1 diabetes sometimes comes on slowly in adults, and these people usually require insulin therapy within a few years of diagnosis (“slow onset type 1”)

None of these will respond in the same way as the common, true type 2 diabetes.

- So, if you have the common form of type 2 diabetes, this could work for you. However, you should not underestimate just how much change in your day to day life will be necessary to bring this about. It requires motivation and persistence.

Could it work for people with a normal BMI?

- Yes, most certainly, provided that the diagnosis of type 2 diabetes is correct. Some people are unable to cope with even moderate amounts of fat in their liver and pancreas. Type 2 diabetes

only happens when a Personal Fat Threshold is exceeded. Losing weight within the range which is “normal” for the general population is then essential for health. See the online article by [Richard Doughty](#).

Practical advice

- The particular diet used in the study was designed to mimic the sudden reduction of calorie intake that occurs after gastric bypass surgery. By using such a vigorous approach, we were testing whether we could reverse diabetes in a similar short time period to that observed after surgery.
- The essential point is that substantial weight loss must be achieved. The time course of weight loss is much less important.
- It is a simple fact that the fat stored in the wrong parts of the body (inside the liver and pancreas) is used up first when the body has to rely upon its own stores of fat to burn. Any pattern of eating which brings about substantial weight loss over a period of time will be effective. Different approaches suit different individuals best.
- It is also very important to emphasise that sustainability of weight loss is the most important thing to ensure that diabetes stays away after the initial weight loss. Previous research has shown that steady weight loss over a 5 – 6 month period is more likely to be successful in keeping weight down in the long term. For this reason, ordinary steady weight loss may be preferable. However, if you are not able to lose around 2½ stone over, say, six months by this approach, then the very low calorie diet may be best for you.

The standard approach would involve:

- a) Decreasing total food (and alcohol) intake by about one half
- b) Using smaller plates
- c) Eating more slowly
- d) Recognising that the sensation of hunger is sign of success, not a signal to eat
- e) Enjoy that hunger. Celebrate with a glass of water; maybe fizzy water

However, if a person finds this difficult, the liquid meal approach could be used.

More details about steady, sustainable weight loss are available on the [Diabetes UK website](#).

The research diet

To carry out the research study, the following diet was used:

- One sachet of a liquid formula diet three times per day. The study used Optifast, but there are several other brands.
- Three portions of non-starchy vegetables per day. Lack of variety was a big problem of the diet, so we devised a few recipes to make the vegetables more interesting. The range of possibilities is infinite, but you can find the recipes we used on the website - <http://www.ncl.ac.uk/magres/research/diabetes/reversal.htm>.
- No alcohol (merely because alcohol itself is so calorific – 7 calories in every gram).
- As outlined above, a more gradual approach to calorie restriction may be preferable. You must consult your doctor before embarking upon any very low calorie diet. In particular, any medication you are taking may need to be adjusted. Some general information about this is also on the website. None of this information is a substitute for proper, individual medical advice.

- Our research subjects found the diet challenging to stick to. Motivated people were selected, and support from the team was given frequently. Support from the families of the research volunteers was very important in helping them comply with the diet. Hunger was not a particular problem after the first few days, but the complete change in social activities (not going to the pub, not joining in the family meals etc.) was a challenge over the eight weeks.

Optifast

Although Optifast was used in the study, this is not readily available in the UK unless on prescription. An alternative liquid food supplement of similar calorific content is equally suitable. These are available from most local supermarkets; you should try several brands to find one most suited to your taste. Do not be concerned by the high sugar content as after the first day of very low calorie diet your body is able to handle this reasonably well. Ideally, the low calorie meal replacement would be made up with water; should this be completely unpalatable, then using skimmed milk is reasonable, although the period required to achieve weight loss will be slightly longer.

After achieving your target weight - how do you keep your weight down in the long term?

1. Once you are at your personal target weight, the critical thing now is to become accustomed to eating approximately $\frac{2}{3}$ of the total amount you used to eat. There need be no restriction upon any particular food stuffs, although naturally foods that are very calorie-dense are best avoided. The goal is keeping the weight down [you may find your weight increases 1 – 2 kg over a few days on returning to a higher calorie intake; this is because your glycogen stores return to normal and glycogen is stored in the water inside your body].
2. If you are increasing your exercise, do not adjust your calorie intake, as it is so easy to over-compensate for exercise.
3. Most people maintain a consistent healthy weight; most successfully by:
 - a) Weigh weekly - and write it down
 - b) Walk, cycle, stairs. Maintain a high level of everyday physical activity
 - c) Party but payback. Enjoy life and especially occasions to celebrate, but there is a price. You must eat only about half your current intake for a few days

What research is going on?

- A study to find out how well people with longer duration type 2 diabetes can achieve normal glucose control. This study will be completed by mid-2014.
- Diabetes UK have funded a major 5 year study to find out how many people can reverse or improve their diabetes by a low calorie liquid diet. This will be carried out entirely in Primary Care. It is planned to get underway in April 2014. Further details are available on the [Diabetes UK website](#).

Future volunteers?

Thanks to all who offered to help with future studies. At present, we are not looking for further volunteers as the Diabetes UK study is recruiting participants by a carefully controlled randomised method.

Any other information?

- Further information will be posted on the website www.ncl.ac.uk/magres/research/diabetes.
- Already available are the links to the full scientific paper describing the reversibility of diabetes study and also the scientific review of the existing knowledge in 2008, which described the “twin cycle hypothesis” which we have now tested. An up-to-date review of how weight loss works was added in 2013.
- Also available is a paper which describes what happened to diabetes when weight loss was achieved at home. This information was provided by many people around the world using email.
- Also, all information will be added to the website, which is updated from time to time.
- Please remember that this website and its links provide information and not personal medical advice. Do consult your Doctor for personal advice.

Thank you for your interest in this work.

With best wishes,

Roy Taylor 22.06.2015