



DEMENTIA and HOPE

Dr Richard J Coleman, 128 Millhouse Drive, Howick, Auckland. Phone 09 537 4980

The information below was originally published in 2013 in two editions of the Millhouse Integrative Newsletter, a monthly publication, primarily designed for clinic patients, highlighting useful strategies which may help prevent disease and improve health.

Food changes can be very successful in treating many conditions from childhood epilepsy, asthma, irritable bowel, to cancer and even Alzheimer Disease.

PART ONE

Ketogenic Diet and Epilepsy

In 2012 I viewed a [promotional video](#) that honoured Oscar winner Meryl Streep for her role in the film 'First Do No Harm'. Some of you may remember this 1997 television movie where Streep portrays a mother whose child suffers from severe epilepsy which is unresponsive to treatment. The parents do not accept that "nothing can be done" and begin a quest to find a cure for their son. They discover medical evidence that suggests a low carbohydrate diet might be helpful, but their doctors are extremely reluctant to endorse this action. Finally they decide to introduce food changes to their son's diet which brings about immediate remission from his brain seizures.

The film mirrors the true story of Charlie Abraham, the movie producer's own son, who had severe intractable epilepsy which was unresponsive to all medications and brain surgery, but who at the age of 20 months was amazingly healed by the introduction of a ketogenic diet. In 1994 the Abraham family established the [Charlie Foundation](#) to raise community awareness, and to educate doctors and dietitians in using a ketogenic diet to treat epilepsy, particularly where anticonvulsant treatment has failed.

Over the last 90 years the medical literature has reported success in using a **ketogenic diet**, a low-carbohydrate, high-fat and high-protein regime, in treating epilepsy, but doctors have been - and still are - reluctant to recommend this therapy to patients, particularly where medication has failed. From multiple studies we now know that slightly more than half the children on a ketogenic diet will have a 50 percent improvement in their seizures, one-third will have greater than 90 percent improvement, and 10-15 percent will be seizure-free.ⁱ

I remember well a woman with uncontrollable epilepsy, with depression and gluten intolerance, whose seizures stopped and her mental state improved when she maintained her gluten-free ketogenic diet. The success in using a ketogenic diet in epilepsy does require the commitment, determination and faith of the entire family.

Ketogenic Diet and Alzheimer Disease

I first read the remarkable story of a middle-aged man who suffered from severe Alzheimer's Disease (AD) and then [dramatically improved on a ketogenic diet](#) in the *Health & Healing October 2009* newsletter. In 2011 Dr Mary Newport, a neonatal paediatrician, published the account of her husband's devastating neurological condition and his journey of change on her book [Alzheimers Disease: What if there was a cure?](#)ⁱⁱ

[Before highlighting Steve Newport's story, let me say that conventional therapies for Alzheimer's dementia may bring only slight short-term improvement, and show little promise in restoring neurological function or halting disease progression.]

Steve Newport, an accountant, probably began having memory problems as early as his teenage years (this may be a characteristic of some with this condition) but they became more noticeable in his forties and early fifties, when he also developed severe depression and other concerning symptoms.



Extensive investigation at age 53 led to the diagnosis of Alzheimer's Disease. After a period of observation he commenced taking the medication donepezil (which slows the breakdown of acetyl choline and improve nerve communication). Memantine (which appears to protect nerve cells against the toxic effects of glutamate; not available in NZ) was added later.

Dr Mary Newport extensively researched the medical literature and discovered a small study using a compound called AC-1202. The research subjects showed memory improvement and the drug also appeared to halt disease progression in patients already taking Alzheimer's medication. She learned that AC-1202 was a medium-chain triglyceride (MCT) - a fat derived from coconut and palm oil - which is easily absorbed and is used as a nutritional resource to improve the health of premature babies. (MCTs are also found in human breast milk.)

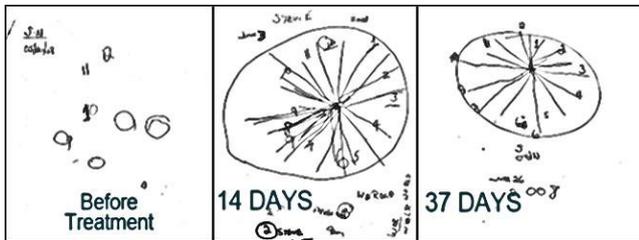


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Steve started a low-carbohydrate organic diet and began taking coconut oil, two tablespoons with his breakfast cereal and also used it as a cooking oil throughout the day. On Day 3 after Steve commenced this therapy, Dr Mary noted that he become more alert, smiling, talkative and happy. His tremor improved and his walking rhythm returned to normal. By Day 6 his dreams had returned and he vacuumed the house. At Day 10 he began mowing the lawns.



At two months his Mini-Mental Score had increased for the better and his drawing skills improved as evidenced by the clock diagrams left. MCT oil (available in NZ on prescription) was added to the coconut oil. At three months he was able to run and read again, his depression lifted, and over a year he continued to make steady progress. During the second year he volunteered for warehouse work. In

the third year (when Steve was 60) Dr Mary noted "the personality and sense of humour that make Steve 'Steve' resurfaced ...my husband came back to me and he has not left."

Steve's progress has not always shown improvement. A minor hiccup occurred when he developed a cold and took decongestant medication; more pronounced setbacks were experienced when he had a prolonged cold sore (herpes simplex) infection, at the time of his father's death, and during a gout attack when he was prescribed steroid medication. The last reports on Steve in 2011 (61 years) show him running and walking normally, mowing lawns and doing household chores, performing volunteer work and participating actively in overseas trips. Steve's eating regime consists of an organic ketogenic diet with 50:50 mixture of coconut and MCT oils, three tablespoons at each meal and two at bedtime, as well as nutritional supplements.

Alzheimer Disease described as Type 3 diabetes

Dr Suzanne de la Monte in 2006 described Alzheimer Dementia (AD) as '[Diabetes 3](#)' (Type 1 is insulin dependent diabetes & Type 2 is non-insulin adult diabetes) because ineffective insulin in the brain causes a deficit in the availability of glucose, the primary fuel source. In the [November 2012 newsletter](#) I discussed the importance of the communicating hormone insulin, which docks at the receptor site on the cell membrane wall, stimulating the glucose transport proteins (GLUT) to carry glucose into the cell. There it is used immediately for energy, changed to glycogen for easy-access fuel or stored as fat for future use. When insulin receptors are blocked or absent, glucose cannot enter the cell.

Up until the publication of the De la Monte group's research, insulin production was thought only to occur in the pancreas, but they had found that the brain itself makes insulin, as well as some insulin-like growth factors. They realised there is gradual progression of insulin deficiency and insulin resistance in parts of the brain in Alzheimer Dementia. Therefore, brain insulin deficiency will decrease glucose transportation into the cell, limit energy production, and impair cognition, and the ability to think and memorise. They also noticed the loss of insulin and neurons (brain cells) with insulin growth factor began early in the course of the dementia.

What causes the brain insulin deficit is not well understood, but is probably due to inflammation caused by various agents such as: trauma, infection (herpes & cold viruses), toxic heavy metals & chemicals (pesticides, alcohol, food nitrosamines & ceramides). Dietary deficiencies may aggravate and hereditary factors appear to be important (ApoE4 genotype). The

Alzheimer's Disease (AD) & Dementia

- German physician Dr Alois Alzheimer in 1906 described this progressive brain disease in Augustus Deter, a 51 year old lady who presented with impaired memory, difficulty speaking, disorientation and psychosocial incompetence.
- Hallmarks of AD are brain amyloid plaques and neurofibrillary tangles.
- Involves increased risk/association with diabetes, brain trauma, heavy metals & chemical exposure, herpes simplex infection, ApoE4 gene.
- Other causes of dementia include vascular disease (impaired blood & oxygen flow), toxic influences (alcohol, drugs - recreational & prescription, gluten, heavy metals, smoking) nutritional deficiencies (B12 & folate), other brain degeneration conditions (Parkinson's & Huntington's disease, Downs syndrome), infection (prion disease, HIV-AIDS, syphilis, herpes), head injury and brain tumours.
- Incidence of AD doubles every 5 years after individual turns 65 years. There is a 50% chance of having AD in those over 85yr.
- In 2011 approx. 48,000 New Zealanders had AD & 300,000 had dementia.
- In 2050 it is predicted NZ will have 148,000 with AD. 2.6% of the population.



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characteristic Alzheimers amyloid plaques may well be accumulated cellular inflammatory waste, and the neurofibrillary tangles the dead remaining skeleton of cells.

Ketones - an alternative brain fuel

Fatty acids in the body are transported to the liver, to be broken down into ketones (ketogenesis), released into the blood and rapidly transported into brain cells where they are converted by the cell mitochondria into energy. Fatty acids come from body cells but may also be provided from the diet as available MCT's (medium chain triglycerides like coconut). The ketones they produce are an alternative fuel source to glucose, more efficient in energy production and a factor in increased brain blood flow. Ketones are the body's survival mechanism in times of starvation. Veech 2003 gives a detailed explanation of ketones, ketogenesis and the ketogenic diet.ⁱⁱⁱ Coconut oil is antibacterial, antifungal and antiviral in action, and these actions may also be important in AD.

PART TWO

Ketogenic Diet in Epilepsy

So far I have written about the beneficial use of a ketone-producing diet (where ketones act as an alternative brain cell fuel for glucose). That material was included in the [March 2013](#) newsletter and following its publication I was contacted by Susan of Howick. She told me of her son who suffered uncontrolled epilepsy from a young age, despite using anticonvulsant therapy, but who has found relief from seizures by adopting a ketogenic diet. Susan has partnered with UK charity [Matthew's Friends](#) - a sister organisation to the USA-based [Charlie Foundation](#) - to support and promote the use of ketogenic diets here in New Zealand. These diets are especially useful treating intractable epilepsy, and some other conditions amenable to ketone therapy. Both organisations have useful information on their websites about commencing a ketogenic diet, food choices and recipes, and a support blog for parents.

Susan has made it her mission to have ketogenic therapy reinstated at Starship Children's Hospital; parents who choose this treatment for children with epilepsy will now be given more effective education and nutritional support. I recounted last month how children with epilepsy who adopt a ketogenic diet show that slightly more than half will have 50 per cent improvement in their seizures, one-third will have greater than 90 per cent improvement, and about one in six become seizure-free.

Dietary Therapies

There is often reluctance to introduce dietary changes to relieve a medical condition. It is hard work to change ingrained patterns of eating, learn new ways of preparing and cooking food, and adjust to different taste sensations. If you embark on a diet change, do involve your family, tell them what and why you are doing this, and ask for their support in your journey to improve health.

Food changes can be very successful in treating many conditions from childhood epilepsy, asthma, irritable bowel, cancer and even Alzheimer's disease.

The Steve Newport Story

I have already introduced above the amazing story of Steve Newport, who was diagnosed with Alzheimer's Disease at 53 years. When he adopted an organic ketone-producing diet (i.e. a ketogenic diet his cognitive function and mental well-being amazingly improved. The new epidemic we now face is Alzheimer Disease (AD) which affects 50% of all people living beyond 85. It is predicted that by 2050, 2.6% of New Zealanders (148,000 people) will have the disease. AD will place an increasing financial burden on our health resources, and limit spending in other areas.

The important question we must ask now is: Are there strategies we can adopt to prevent AD?

Can Alzheimer Disease be prevented?

I recently attended the Science and Nutrition in Medicine Conference in Sydney, where presenters discussed ways of preventing cognitive decline and Alzheimer Disease in the elderly. I was reminded that with normal ageing our brain slowly shrinks, at about 0.5% each year, but in those with memory loss (cognitive impairment) the rate is found to be 1%, while in Alzheimer's Disease (AD) the shrinkage has accelerated to 3% annually. The AD brain is slowly destroyed (see graphic) as beta amyloid protein accumulates in critical areas over a twenty-year period and by the time diagnosis is made medication is rarely successful in restoring cognitive function. The table below outlines risk factors and protective influences for the development and prevention of AD.



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Predisposing Risk Factors in AD

- Increasing age
- Strong family history of AD
- Genetic – Downs Syndrome, ApoE4
- Mild cognitive impairment.
- Repeated head trauma (blood iron released causes cellular damage; also occurs in hemochromatosis iron storage disease).
- Diabetes & obesity
- Excessive alcohol & recreational drugs
- Vascular risk factors - smoking, blood pressure, raised cholesterol, diabetes, lack of exercise, poor social engagement & depression.
- Raised homocysteine & low B12 levels
- Low testosterone levels & high luteinising hormone levels (affect memory)
- Toxic environmental chemicals (heavy metals, nitrosamines & ceramides especially from food processing)
- Microbiological agents (herpes virus)

Protective Factors in AD

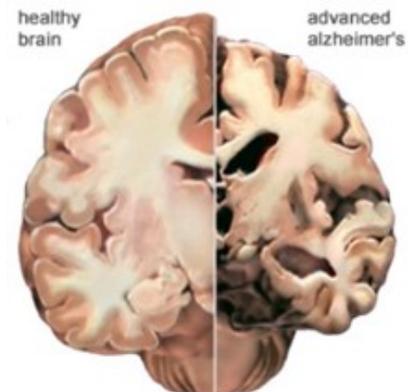
- Mediterranean diet with a phytochemical enriched vegetables & fruits.
- Protective nutrients which include B vitamins, vitamin D, turmeric/curcumin, resveratrol, DHA-omega 3 fish oil, green tea & pomegranate juice.
- Performing vigorous exercise
- Lifelong learning and social engagement

Professor David Smith from Oxford University discussed the importance of lowering homocysteine levels in the elderly. Homocysteine is a breakdown product, formed after the sulphur-containing amino acid methionine releases a methyl (CH₃) group that acts as a switch, turning on important cell-building activities like cell division). In the 1960's doctors in Belfast and London studied children with homocysteinuria, a rare genetic disorder routinely identified by routine testing at birth, causing high homocysteine levels in the urine. They looked at ten children who had died from blood clots in the brain, heart and kidneys. and found hardened arteries with fibrous plaque formation. More recently, researchers have wondered if the slightly raised levels of homocysteine found in 10% of the population (due to genetic mutation, vitamin deficiencies and lifestyle factors) might also cause artery disease as we age. So far no preventative trial has been done but intervention studies lowering homocysteine in patients with vascular disease have been equivocal.

Does homocysteine affect cognitive decline in ageing?

In 2010, Professor Smith published the results from the [VITACOG trial](#) where 168 elderly with mild memory impairment were either given B vitamins (pyridoxine 20mg, folic acid 0.8mg & B12 500microgm daily) to lower homocysteine levels, or no treatment.^{iv} After two years brain scans revealed that the B vitamin group had reduced brain shrinkage particularly in those who formerly had high homocysteine levels; 53% less change was observed in those with levels over 13.

Professor Smith believes that lowering homocysteine reduces the formation of neurofibrillary tangles and brain atrophy seen in Alzheimer's disease. His advice is that low-cost B vitamin therapy is given to elderly folk who have a homocysteine level greater than 11. He also recommends serum B12 levels in older persons be maintained above 300pgm/ml to prevent cognitive decline. ^v (Currently B12 deficiency is defined as <180)





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Recommendations to prevent/treat Cognitive Decline and Alzheimer Disease:

- Reduce your risk factors if at all possible. See table above.
- At risk elderly could consider blood testing for ApoE4, homocysteine, B12 & folic acid, CRP (inflammation), ferritin (iron) gluten/gliadin, testosterone & LH (in males) as well as the usual tests for diabetes, cholesterol, liver & kidney function.
- Consult a neurologist if you are concerned, and consider having an MRI brain scan.

A Healthier Diet:

- To prevent AD adopt a Mediterranean diet rich in vegetables, dark fruits, spices, nuts & seeds, with olive oil, fish, organic meats, milk and eggs.
- If you have been diagnosed with AD, trial a ketogenic diet with added coconut oil for 3-4 months. Involve your family in the food preparation and cooking. The diabetic drug metformin may also improve brain glucose energy use.

Exercise & Lifestyle:

- Perform short bursts of vigorous exercises that are suitable for you, 2-3 x weeks. See a personal trainer for advice.
- Keep your mind active with puzzles, pastimes and hobbies. Be a lifelong learner and engage with people daily.
- Avoid drugs that may impair memory and aggravate AD. Discuss medications with your doctor.

Consider nutritional supplements: (Nutriceutical trials are underway in Australia & USA for AD)

- B vitamins - B6, Folic acid and B12. Niacinamide (B3) increases cell energy production.
- Melatonin, an antioxidant hormone produced by the pineal gland, protects the hippocampus memory centre from damage.
- Reduce brain inflammation & oxidative damage by using turmeric (active ingredient curcumin). Also consider Resveratrol or Enzogenol, Vitamin D, DHA omega fish oils, Vitamin C, natural mixed Vitamin E, Coenzyme Q10, Magnesium. The botanicals of Gingko, Rosemary & Sage may be useful.
- Increase glutathione brain cell detoxification with Alpha lipoic acid & N-acetyl cysteine.

I am hopeful that in the future we will know even more about these degenerative diseases.

ⁱ Freeman, John; Kossoff MD, Eric; R.D. Millicent T. Kelly; Jennifer B. Freeman Ketogenic Diets 5th Edition 2011 (Demos Health) also available on Kindle

ⁱⁱ Newport, Mary T. Alzheimer's Disease: What If There Was a Cure? 2nd edition 2013 (Basic Health Publications) also available on Kindle

ⁱⁱⁱ http://www.coconutketones.com/pdfs/Veech%202004_therapeutic_implications.pdf

^{iv} <https://pharm.ox.ac.uk/research/smith-group-oxford-project-to-investigate-memory-and-ageing-optima-and-b-vitamin-research-group>

^v Smith and Refsum Do we need to reconsider the desirable blood level of B12? J Int Med 2011;179-182

Video about Meryl Streep film is at http://www.youtube.com/watch?v=tPa5s_GXZci&noredirect=1