In 2004 an exciting scientific paper by Peckerman et al was published which has significantly influenced the thinking of leading researchers and clinicians in the treatment of CFS. The paper has put a completely different slant on the understanding and treatment of ME/CFS. Peckerman’s paper showed that patients with CFS have a lowered cardiac output. A healthy person pumps 7 litres of blood per minute through their heart when lying down. This naturally reduces to 5 litres per minute when standing. CFS patients were found to have a cardiac output lying down of 5 litres per minute and standing up was just 3.7 litres per minute. This reduced blood flow means that many organs are starved of blood and oxygen leading to partial multiple organ failure when they stand up. It explains why so many CFS patients feel better lying down than standing up! Peckerman et al found that the level of impairment of cardiac output also correlated with the severity of symptoms observed in the patient. Lowered cardiac output, leading to poor blood supply to bodily organs explains many of the symptoms CFS patients suffer—see below for further explanation.

CFS/ME and your Heart

Peckerman’s finding has lead to some experts concluding that CFS is a mild form of heart failure. Cardiologists wont have picked this up because in CFS the cause of the heart problem is not due to blocked arteries or poor blood supply to the heart itself. It is caused by poor muscle function - this is known as a cardiomyopathy. In non-CFS patients diagnosed with cardiomyopathy—35% will die within 5 years if they do not receive a heart transplant. To date there has never been any CFS patient that has required a heart transplant as far as we know—and the reason may be extraordinary. It is the chronic fatigue itself which protects the heart from complete heart failure. The cause of cardiomyopathy is explained under the section below called “Mitochondrial Malfunction.”

Your CFS symptoms explained

Part of the job of the heart is to maintain blood pressure. If the muscle of the heart is not working properly, the only way to maintain blood pressure is to reduce the blood supply to the body (resulting in lowered cardiac output). This results in a lack of blood supply to many organs of the body - resulting in many of the symptoms suffered by CFS patients. Organs are shut down in order of priority:

First: The Skin - is the job of the skin to help control body temperature. Poor blood supply to the skin means you stop being able to tolerate heat or cold. If your body heats up too much—micro-circulation to the surface of the skin fails due to lowered cardiac, so you do not sweat to reduce body heat. Not sweating can also result in a build up of toxins in the body as sweating is one of the most important ways the body excretes toxins. Finally, if your core body temperature increases—your body cannot tolerate this, so your thyroid gland may reduce its function in order to compensate for the high body temperature –so you develop “compensatory hypothyroid.”

Second: The Muscles—next you would develop exercise intolerance. Lack of blood supply to the muscles means they have to function without oxygen, this leads to quick build up of lactic acid which can create pain, weakness and burning.

Third: The liver and gut—poor blood supply to the gut results in inefficient digestion, poor production of digestive juices and leaky gut syndrome. Leaky gut syndrome causes many other problems such as allergies, autoimmunity, malabsorption, etc., which further compound the problems of CFS. If liver circulation is inadequate, this will result in poor detoxification, not just of heavy metals, pesticides and volatile organic compounds, but also toxins produced as a result of fermentation in the gut.
The Possible Cause of Cardiomyopathy—Mitochondrial Malfunction

So why may CFS sufferers have cardiomyopathy—and how does it develop? **The underlying cause of problems with the heart muscle is due to “mitochondrial malfunction.”** Really CFS can almost entirely be attributed to mitochondrial problems—the heart problem is a secondary problem to this hugely important cell organelle known as the mitochondria.

It is vital to understand what mitochondria are to understand CFS. Every part of your body is made of trillions of cells. Most of these cells have a sub-section in them which is the part responsible for energy production. This part of your cell is called the “mitochondria.” Mitochondria are commonly known as the “powerhouse” of the cells. This diagram shows what they look like. It is the job of the mitochondria to produce adenosine triphosphate (ATP). ATP is the energy currency of your cells. ATP is used in muscle cells to contract and relax the muscle. It just so happens that many mitochondria are found in the muscles of your body. The heart muscle has a particularly high number of mitochondria. Hence poor mitochondrial function can explain possible cardiomyopathy in CFS patients.

Some medical scientific research in CFS has started to focus on mitochondrial malfunction as the cause of CFS. It would make sense that patients complaining of energy problems and post exertional fatigue would be likely to have a problem with mitochondrial function.

**What can deplete your mitochondrial function?**

- **Lowered immunity** (which may be due to stress, poor diet and lifestyle or genetics). Lowered immunity can result in viruses and chronic infections. Viruses are one of the most potent destroyers of mitochondrial function. Chronic infections can lead to a state of chronic inflammation which increases free radical stress and wipes out mitochondrial function.

- **Stress and anxiety** - many CFS patients talk about an extremely stressful period in the run up to catching a virus then developing CFS. This is why CFS is also known as post-viral stress syndrome. Stress lowers your immune system making you more prone to catching viruses and bacterial infections. Furthermore, once you have developed CFS, constant stress and anxiety reduces you body’s ability to heal through distorting brainwaves, lowering immunity and reducing digestive function.
The Possible Cause of Cardiomyopathy—Mitochondrial Malfunction

- **Environmental pollution.** In the clinic we regularly test patients and find levels of all kinds of pesticides, flame retardants, copper, nickel, mercury and cadmium toxicity and numerous other heavy metals and volatile toxic organic chemicals. These toxins “gum up” mitochondrial function in CFS sufferers and require elimination. Gulf war syndrome which is essentially post viral stress syndrome probably results from a combination of stress and the environment pollution soldiers were exposed to during the war. Researchers know that a subgroup of CFS patients have suffered organophosphate (pesticide) poisoning.

- **Genetic propensity.** Humans all have different levels of adaptive capacity when it comes to their health. Many people are exposed to the same negative stimuli but do not develop CFS. Only 10% of gulf war veterans developed CFS for example. In our view, CFS patients do not have the adaptive capacity to deal with certain stresses on their systems. It is our belief that CFS patients are like the canaries we used to take down mines to test for gas leaks. The bird would die in exposure to small gas leaks which would not affect us humans. A number of humans developing CFS is perfectly understandable and even inevitable in the context of the modern day pollution, stress and poor diets which are at epidemic levels in the West today.

Testing Mitochondrial Function

So how can you check your mitochondrial function—and more importantly, how can you improve its function?

Biolab Medical Testing lab in London have developed a comprehensive test for mitochondrial function explained below. Some of the treatment to improve mitochondrial function is based on the work of cardiac surgeons in the United States (a book called The Sinatra Solution explains much of the treatment). It turns out there are some key nutrients which can profoundly impact and improve the efficiency of mitochondrial function. When understanding test results, it is important to remember the job of the mitochondria is to produce ATP—the energy currency of the body.

Biolab Medical Testing

The basic test is called the “ATP Profile.” The test is a blood test. The first part of the test checks if you are deficient in:

- D Ribose
- Carnitine
- Vitamin B 3
- Co enzyme A
- Magnesium
- Co enzyme Q 10

Patients may be prescribed any or all of these supplements depending on their test results. Specific forms and dosages are required for the treatment to be effective. It should only be done once a patient has completed our foundation nutrition programme which covers diet and basic nutrient levels as well as basic clinical testing and examination. Your body can make all these raw materials itself from nutrients from food—but ATP or energy is required to metabolise these nutrients. If your mitochondria are functioning very poorly, the body can stop producing the very raw materials required for ATP production—hence taking this cocktail of supplements can break this pattern. Mitochondria may also be “blocked” rather than just being short of raw materials. This can also be tested by Biolab.
The second part of the Biolab testing checks what may be blocking mitochondrial function. It is called the TL Protein study.

**Possible Blocks to Mitochondrial function and Treatments:**

- Pesticides—lipoic acid, glutathione vitamin c and a range of detoxing protocols including the use of far infra red sauna, dry skin brushing and other cleanses
- Other organic toxins including PCCs, PBBs—similar treatment as pesticides
- Heavy Metals: mercury, copper, nickel, cadmium, lead, arsenic, aluminium—treatment is similar to pesticides with some additional food and supplement recommendations
- Liver detoxification problems and oxidative stress—increase anti-oxidants and liver support nutritionally
- Leaky gut and poor protein metabolism—treat gut probiotics, glutamine, proteolytic enzymes and so on
- Fat metabolism problems—use of omega 3 oils and nutritional liver support
- Ongoing viral or bacterial infections—boost immune system nutritionally

To listen to an audio interview with Niki our Director of Nutrition about Mitochondrial function and our nutrition protocols as a whole, please visit the Interactive section of our new website www.FreedomFromME.co.uk

**Does treatment work and how long does it take?**

**Does it work?**

We know through experience that patients can experience significant improvements in their quality of life when following this programme. Patients do best when they are also working on their levels of stress or anxiety, are doing yoga and/or breathing exercises and are following a pacing programme. Our clinic is now working with Goldsmith’s University in London to complete a scientific study to measure the success of both the nutritional and psychology treatment for CFS in our clinic. Biolab is also involved in a scientific study to validate their testing in relation to CFS. Like all scientific studies, they can take 3-5 years to complete, so studies will take sometime to be published. We are in the process of collating feedback from patients in the form of testimonials to provide more information for other prospective patients.

**How long does it take before improvement?**

Patients can report improvements anywhere between 1-3 months. We are still working to establish if patients should take supplements longer than 3 months in order to best support their recovery. We are currently looking at patients recovering purely from heart problems. Some of these patient suffer from severe fatigue and can take 8 months to 1 year to recover. For CFS patients improvement and recovery is linked to their age and length of time of illness as well.

To discuss whether this exciting new approach could be of benefit to you, please arrange a free 15 minute chat with our Director of Nutrition Niki Gratrix, either by e-mailing niki@TheOptimumHealthClinic.com or by calling 0845 226 1762.

**References**

The Sinatra Solution  Metabolic Cardiology by Stephen Sinatra available through Amazon