Evidence that ME/CFS is not a somatisation disorder

Margaret Williams 26th April 2009

Myalgic Encephalomyelitis / Chronic Fatigue Syndrome (ME/CFS) is not a somatisation disorder. That ME/CFS is not a somatisation disorder is not simply a matter of belief or opinion but is a matter of substantive fact.

ME has been internationally classified since 1969 by the World Health Organisation (WHO) as a disease of the Nervous System. There are now over 5,000 peer-reviewed published scientific papers which demonstrate unequivocally that it is not a somatisation disorder. To assert otherwise signifies either a serious failure to keep up-to-date with medical science (as NHS Consultants are – or used to be – contractually required to do), or a perverse and irrational denial of a large body of biomedical evidence that shows ME/CFS to be a complex neuroimmune disorder affecting every major bodily system and that recovery is rare.

The wealth of scientific biomarkers that distinguish ME/CFS from "chronic fatigue" (which may indeed be a somatisation disorder) include the following:

- abnormal brain scans (SPECT & PET scans) and MRI scans that are consistent with organic brain syndrome, showing focal demyelination and/or oedema in the sub-cortical area
- a dysregulated HPA axis
- a dysregulated antiviral pathway (RNase-L)
- cardiac abnormalities
- abnormal capillary flow
- low circulating blood volume
- abnormal ergometry test (indicating immediate anaerobic threshold)
- haemodynamic instability
- abnormal immune profile
- gene profiling (in one US study, Sorensen et al demonstrated that expression of several complement genes remains at a higher level in ME/CFS subjects before and post-exercise, which may lead to uncontrollable inflammation-mediated tissue damage. In the UK, Kerr has demonstrated differential expression in 88 genes [85 up-regulated and 3 down-regulated] indicating haematological disease and function, immunological disease and function, cancer, cell death, and infection [J Infect Dis 2008:197(8):1171-1184], all of which are seen in ME/CFS but not in states of psychiatric fatigue).

All the above investigations are specifically not recommended by NICE in its Clinical Guideline 53 on CFS that was published on 22nd August 2007. This means that they are effectively proscribed in the UK, as no Primary Care Trust (PCT) will fund them if NICE

does not recommend them (and NICE Guidelines are to become legally enforceable in 2009).

As long ago as 18th February 1993, Dr Paul Cheney (Professor of Medicine at Capital University) testified before the US FDA Scientific Advisory Committee that:

" I have evaluated over 2,500 cases. At best, it is a prolonged post-viral syndrome with slow recovery. At worst, it is a nightmare of increasing disability with both physical and neurocognitive components. The worst cases have both an MS-like and an AIDS-like clinical appearance. We have lost five cases in the last six months. The most difficult thing to treat is the severe pain. Half have abnormal MRI scans. 80% have abnormal SPECT scans. 95% have abnormal cognitive-evoked EEG brain maps. Most have abnormal neurological examination. 40% have impaired cutaneous skin test responses to multiple antigens. Most have evidence of T-cell activation. 80% have evidence of an up-regulated 2-5A antiviral pathway. 80% of cases are unable to work or attend school. We admit regularly to hospital with an inability to care for self".

Signs and symptoms seen in ME/CFS are legion (signs are observable by clinicians and symptoms are reported by patients).

Documented and observable physical signs include a typically swinging low-grade temperature, nystagmus; sluggish visual accommodation; abnormality of vestibular function with a positive Romberg test; abnormal tandem or augmented tandem stance; abnormal gait; hand tremor; incoordination; cogwheel movement of the leg on testing; muscular twitching or fasciculation; hyper-reflexia without clonus; facial vasculoid rash; vascular demarcation which can cross dermatomes with evidence of Raynaud's syndrome and / or vasculitis; mouth ulcers; hair loss; a markedly labile blood pressure (sometimes as low as 84/48 in an adult at rest); flattened or even inverted T-waves on 24 hour Holter monitoring (a standard 12 lead ECG is usually normal); orthostatic tachycardia; shortness of breath (patients show significant reduction in all lung function parameters tested); abnormal glucose tolerance curves; liver involvement (an enlarged liver or spleen may not be looked for in ME/CFS, so missed) and destruction of fingerprints (atrophy of fingerprints is due to perilymphocytic vasculitis and vacuolisation of fibroblasts).

Well-documented symptoms include: frequency of micturition, including nocturia (bladder and bowel control may be insecure); abdominal pain and diarrhoea (there are usually chronic problems with diarrhoea); persistent headache (vascular headaches are common and recurring); generalised myalgia, described as intense and burning; muscles are tender to palpation and muscle spasm is not uncommon; there may be severe, intractable pain in particular groups of muscles, most notably in the neck and in the shoulder and pelvic girdles; the more severely affected patients are unable to stand unsupported for more than a few minutes; there is sometimes segmental pain in the chest wall.

In the more severely affected patients, dizziness is a particularly striking and chronic feature, as is persisting dysequilibrium and ataxia, with patients frequently bumping into

things and becoming bruised. Attacks of vertigo may be incapacitating. There is impaired neuromuscular coordination, particularly with fine finger movements. In the severely affected, there may be difficulty with swallowing; choking fits are not infrequent. There may be difficulty with voice production, particularly if speaking is sustained.

There may be seizures, although these are found only in the most severe cases.

In the most severe cases, photophobia and hyperacusis are common, as is tinnitus; often there is parasthesia.

Hypersomnia is prevalent, especially in the early stages of the disorder; this may be replaced by reversed sleeping patterns, with vivid and disturbing dreams; unrefreshing sleep is common.

Cardiac arrythmias are very common, with pronounced tachycardia and an uncomfortably pounding heart; there may be paroxysmal attacks of angina-like chest pain. Cardiac pain is a recognised feature: patients may be convinced they are suffering a heart attack. Myocarditis was a common symptom in an analysis of 1,000 ME/CFS patients seen in Glasgow, where clinicians were struck by the often-occurring association of patients with ME/CFS with acute chest pain resembling coronary thrombosis.

In the more severely affected, palindromic arthropathies regularly recur; spontaneous periarticular bleeds are frequent, especially in the fingers, which become swollen and painful, making the patient appear even more clumsy.

Pancreatitis is not uncommon and may cause acute, severe pain and illness: pancreatic exocrine insufficiency leads to malabsorption, which is a well-recognised feature found in the more severely affected; some patients have almost non-existent pancreatic exocrine function. Some patients have been shown to have achlorhydria.

Food intolerance is a prominent feature across all degrees of severity: multiple sensitivities to normal foods and household chemicals (including perfumes, chemical treatments of furniture and carpets such as flame-retardants and glues in chipboard), petrol and agricultural chemicals are frequent.

Intolerance to alcohol and to medicinal drugs, particularly to antidepressants, is virtually pathognomonic. Patients have to be cautious about all drugs but especially those acting on the central nervous system (ie. anaesthetics), as there is an increased occurrence of adverse reaction.

ME/CFS affects not only the central nervous system but the autonomic and peripheral nervous systems as well. Sympathetic nervous system dysfunction is integral to ME/CFS pathology and includes blurred and double vision, with difficulty in focusing and visual accommodation; eyes may be dry and eyelids are often swollen and painful. Typical autonomic symptoms include alternate sweating and shivering, with marked thermodysregulation. Patients experience orthostatic hypotension and symptoms of

hypovolaemia, with blood pooling in the legs and insufficient blood flow to the brain: patients may feel faint, shaky and nauseous; they can be tearful and observably pale and they may experience severe distress. Patients are often understandably anxious and afraid.

In the more severely affected, commonly there is difficulty with breathing, with sudden attacks of breathlessness and dyspnoea on minimal effort; the administration of oxygen may be necessary.

Rashes may occur; mouth ulcers may be recurrent and may be painful and severe to the extent that speaking and eating may be affected.

Hands and feet are frequently cold, blanched and / or purple, with painful vascular spasms seen in the fingers.

In females, ovarian-uterine dysfunction is not uncommon; in males, prostatitis and impotence may occur.

Many patients can walk only very short distances and require a wheelchair. There is difficulty with simple tasks such as climbing stairs and dressing.

Problems with short-term memory are common: cognitive impairment is significant and includes difficulty with memory sequencing, processing speed, word searching; dyslogia, spatial organisation, calculation (dyscalculia), and particularly with decision-making. In relation to the degree of cognitive impairment, American researchers found that:

"the performance of the (ME/CFS) patients was sevenfold worse than either the control or the depressed group. These results indicated that the memory deficit in (ME/CFS) was more severe than assumed by the CDC criteria. A pattern emerged of brain behaviour relationships supporting neurological compromise in (ME/CFS)".

Uncharacteristic emotional lability is very common; there may be an increased irritability.

There may be significant and permanent damage to skeletal or cardiac muscle as well as to other end-organs including the liver, pancreas, endocrine glands and lymphoid tissues, with evidence of dysfunction in the brain stem. Injury to the brain stem results in disturbance of the production of cortisol (required for stress control) via damage to the hypothalamus and to the pituitary and adrenal glands, and patients react extremely adversely to stress.

Cycles of severe relapse are characteristic and common, together with the evolution of further symptoms over time. ME/CFS is rarely listed as the cause of death, although after decades of illness, death from end-organ damage (mainly cardiac or pancreatic failure) is known to occur.

Suicide rates are high and are said to be the most common cause of death in ME/CFS and to be related to the current climate of disbelief and rejection of welfare support.

A major Report by the charity Action for ME (2001) found that 77 % of sufferers experienced severe pain; over 80% had felt suicidal as a result of the illness; 70% are either never able, or are sometimes too unwell to attend a doctor's clinic; 65% (nearly two out of three) have received no advice from their GP on managing this illness; 80% of those who are currently bedridden by ME report that a request for a home visit by a doctor has been refused; many people do not receive state benefits to which they are clearly entitled.

Despite all the verifiable and authenticated international research, much of the current perception of ME/CFS, both medical and lay, is beset by confusion and misinformation.

A (documented) major cause of death in ME/CFS is heart failure.

International ME/CFS expert Paul Cheney's focus is based on the paper by Dr Ben Natelson (neurologist and Professor of Neurology) and Dr Arnold Peckerman (cardiopulmonary physiologist) at New Jersey Medical Centre (ref: "Abnormal Impedance Cardiography Predicts Symptom Severity in Chronic Fatigue Syndrome": Peckerman et al: The American Journal of the Medical Sciences: 2003:326:(2):55-60).

Cheney says that, without exception, every disabled CFIDS (Chronic Fatigue Immune Dysfunction Syndrome ie. ME/CFS) patient is in heart failure.

The New Jersey team looked at many things in CFIDS patients and they found something: a "Q" problem. "Q" stands for *cardiac output in litres per minute*. In CFIDS patients, Q values correlated -- with great precision – with the level of disability. Q was measured using impedance cardiography, a clinically validated and Government agency-recognised algorithm that is not experimental.

Normal people pump 7 litres per minute through their heart, with very little variance, and when they stand up, that output drops to 5 litres per minute (a full 30% drop, but this is normal). Those two litres are rapidly pooled in the lower extremities and capacitance vessels. Normal people do not sense that 30% drop in cardiac output when they stand up because their blood pressure either stays normal or rises when they stand up -- the body will defend blood pressure beyond anything else in order to keep the pulse going.

However, what the New Jersey team found in people with CFIDS was astonishing –when disabled CFIDS patients stand up, they are on the edge of organ failure due to extremely low cardiac output as their Q drops to 3.7 litres per minute (a 50% drop from the normal of 7 litres per minute). These patients do not have adequate Q to function. The lower the Q, the more time the patient will spend lying down because lying down is the only time they come close to having sufficient cardiac output to survive.

The disability level was exactly proportional to the severity of their Q defect, without exception and with scientific precision.

The New Jersey team then looked to see if there were any symptoms that were observable in disabled CFIDS patients but not in others and they found that there was only one such symptom that was seen in patients with a Q problem: post-exertional fatigue. To quote Cheney: "That is, **when you push yourself physically, you get worse"**.

CFIDS patients have a big Q problem; to quote Cheney again: "**all disabled CFIDS patients, all of whom have post-exertional fatigue, have low Q and are in heart failure"**.

Post-exertional fatigue (long documented as the cardinal feature of ME/CFS but not of other, non-specific, states of chronic fatigue) is the one symptom that correlates with Q. Among disabled CFIDS patients, 80% had muscle pain; 75% had joint pain; 72% had memory and concentration problems; 70% had unrefreshing sleep; 68% had fever and chills; 62% had generalised weakness; 60% had headaches, but 100% had post-exertional fatigue.

Cheney posits that when faced with a low Q, the body sacrifices tissue perfusion in order to maintain blood pressure: ie. microcirculation to the tissues of the body is sacrificed to maintain blood pressure so that the person does not die in the face of too a low Q (Q being cardiac output in litres per minute). This compensation is what is going on in the CFIDS (ME/CFS) patient.

(ME)CFS patients have a high heart rate but a low cardiac output. In (ME)CFS there is a cardiac dimension
that is independent of (but not excluding) autonomic function or blood volume.

82% of patients have abnormal cardiac impedence.

Cheney states that it is important to note that the body does not sacrifice tissue perfusion equally across all organ systems: instead, it prioritises the order of sacrifice and one can observe the progression of ME/CFS by noting this prioritisation.

<u>Order of sacrifice in cases of declining microcirculation:</u> first is the skin; second is the muscles and joints;
third is the liver and gut (patients can usually only tolerate a few foods); fourth is the brain; fifth is the heart;
sixth is the lung and lastly is the kidney.

<u>The first is the skin</u>: if the microcirculation of the skin is compromised, several problems can arise. One is that without adequate microcirculation to the skin, the body cannot thermoregulate anymore: the patient cannot stand heat or cold and if the core temperature rises, the patient will not be able to sleep and the immune system will be activated. In order to regulate that problem, the body will kick in thyroid regulation which will down-

regulate in order to keep the body temperature from going too high. The result of this is that the patient develops compensatory hypothyroidism, which means that now the patient will have trouble with feeling cold. Also, the body will not be able to eliminate VOCs (volatile organic compounds), which are shed in the skin's oil ducts, so VOCs build up in the body's fat stores and the patient becomes progressively chemically poisoned by whatever is present in the environment -- in other words, the patient develops Multiple Chemical Sensitivity.

The second effect: if things get worse, the next microcirculation to be sacrificed is that to the muscles and the patient will have exercise intolerance and s/he cannot go upstairs. If things get still worse, the patient begins to get fibromyalgic pain in the muscles. Cheney posits that if microcirculation to the joints becomes compromised, it may precipitate pyrophosphoric acid and uric acid crystals and the patient starts to have arthralgia linked to this circulatory defect.

The next system to be compromised is the liver and gut. One of the first things the patient may notice in this stage of disease progression is that there are fewer and fewer foods s/he will be able to tolerate, partly because microcirculation is necessary for proper digestion. Also the body will not secrete digestive juices so whatever food is tolerated will not be digested: if food cannot be digested, there will be peptides that are only partially digested and therefore are highly immune-reactive; they will leak out of the gut into the bloodstream, resulting in food allergies and / or sensitivities. The body will be unable to detoxify the gut ecology, so the gut will begin to poison the patient, who will feel a sense of toxic malaise, with diarrhoea, constipation, flatulence and all kinds of gut problems. If this gets worse, a malabsorption syndrome will develop, resulting in increasing toxicity in which the patient feels "yucky" and which can manifest as a variety of skin disturbances (for instance, a rash), as well as problems in the brain.

The fourth affected system is the brain: Cheney posits that there is a devastating effect in the brain as a result of liver / gut dysfunction, which can quickly toxify the brain, resulting in disturbances of memory and of processing speed. Also, the hypothalamus begins to destabilise the patient from the autonomic nervous system perspective. In all probability, the brain and heart suffer simultaneous compromise, but patients usually notice the brain being affected much earlier than the heart – this is because heart muscle cells have the greatest mitochondrial content of any tissue in the body, so when the mitochondria are impaired, the heart muscle has the greatest reserve. Even if the patient is sedentary with not too much demand on the heart, s/he can still think and make great demands on the brain, and energy is energy, whether it is being used physically or cognitively.

The fifth affected system is the heart: Cheney posits that the effect of compromised microcirculation upon the heart has an "a" part and a "b" part: part "a" is the manifestation of microcirculation impairment and part "b" is "the event horizon".

Part "a": manfestation of microcirculation impairment: the initial manifestation of microcirculatory impairment of the heart is arrhythmia with exercise intolerance: when

the patient goes upstairs, more cardiac output is needed but the patient cannot sustain it. As it gets worse, there will be mitral valve prolapse (MVP) because of inadequate capillary function. Finally, when there are even more severe microcirculatory problems, the patient starts to get chest pain as the myocardial cells die because they cannot get adequate oxygen.

Part "b": the event horizon: (once this line is passed, there is no going back): Cheney's view is that the "event horizon" with respect to the heart is this: when the microcirculation defect within the heart itself begins to impact Q itself, a vicious circle begins – microcirculation impairment reduces the Q, which produces more microcirculation impairment, which produces even more Q problems, so down goes the patient into the next phase of cardiac failure, which is the lung.

The sixth affected system is the lung and kidney: cardiac failure in the lung produces Congestive Heart Failure (CHF) and pulmonary oedema, then the kidney is affected (the kidney is the last to go because it has the RAS back-up system). Combined with liver impairment, this stage is known as hepatorenal failure, which is the requisite cause of death due to Compensated Idiopathic Cardiomyopathy.

The message from Professor Cheney is clear: in order to stay relatively stable, it is essential for the
ME/CFS patient not to create metabolic demand that the low cardiac output cannot match.

Cheney states that the cardiac index of ME/CFS patients is so severe that it falls between the value of patients with myocardial infarction (heart attack) and those in shock.

According to Cheney, it is difficult to talk about a low cardiac output without talking about the involvement
of the brain and the adrenal glands.

If the cardiac output goes down, in order not to die, there is a rise in noradrenergic tone (also involving the
adrenal glands) to bring the output back up. In ME/CFS, this is a serious problem, because when the adrenals
are exhausted, there will be low cardiac output.

There is no such thing as an ME/CFS patient who is NOT hypothyroid: this has nothing to do with thyroid
failure, but everything to do with matching metabolic demand and cardiac output.

A mismatch between metabolic demand and cardiac output, even very briefly, will kill.

Given the significant body of published international evidence that ME/CFS is a complex chronic multi-system disorder, it is disturbing that **there are still doctors who dismiss**

the condition as non-existent or as a somatisation disorder. Such a view does not accord with the evidence of experts in ME/CFS, for example:

1988

"Any kind of muscle exercise can cause the patient to be almost incapacitated for some days afterward. In severe cases, the patient is usually confined to bed. What is certain is that when one reviews (the) clinical features and laboratory results, it becomes plain that this is an organic illness in which muscle metabolism is severely affected". (Postviral fatigue syndrome PO Behan WMH Behan Crit Rev Neurobiol 1988:4:2:157-178)

1989

"Our investigations suggest that (ME)CFS is characterized by objective laboratory abnormalities and that the currently used names for the syndrome are inappropriate. A more appropriate name for this syndrome would be chronic fatigue-immune dysfunction syndrome (CFIDS), since immune dysfunction appears to be the hallmark of the disease process". (Natural Killer Cell Activity in the Chronic Fatigue-Immune Dysfunction Syndrome. Nancy Eby, Seymour Grufferman et al. In: Natural Killer Cells and Host Defense. Ed: Ades EW and Lopez C. 5th International Natural Killer Cell Workshop. Pub: Karger, Basel, 1989:141-145)

1989

"**Many of the immunological and physical features of ME/CFS cannot be explained by mental illness"** (Stephen E Straus of the National Institutes for Allergy and Infectious Diseases, USA, Progress toward an answer to Chronic Fatigue: an interview with "USA Today", 13th April, 1989: reported in CFIDS Chronicle, Spring 1989, pp77-78)

1989

"The abnormalities we found provide evidence for central nervous system and neuromuscular involvement" (Carolyn L Warner: Neurology, March 1989:39:3: Suppl 1: 420; Presentation at the American Academy of Neurology Conference, Chicago, April 1989)

1990

"Patients with the chronic fatigue syndrome have reduced aerobic work capacity compared with normal subjects. We found that patients with the chronic fatigue syndrome have a lower exercise tolerance than either normal subjects or patients with the irritable bowel syndrome. Previous studies have shown biochemical and structural abnormalities of muscle in patients with the chronic fatigue syndrome" (Aerobic work capacity in patients with chronic fatigue syndrome MS Riley DR McClusky et al BMJ:1990:301:953-956)

1992

"57% of patients were bed-ridden, shut in or unable to work. Immunologic (lymphocyte phenotying) studies revealed a significantly increased CD4 / CD8 ratio. Magnetic resonance scans of the brain showed punctate, subcortical areas of high signal intensity consistent with oedema or demyelination in 78% of patients. Neurologic symptoms, MRI findings, and lymphocyte phenotyping studies suggest that the patients may have been experiencing a chronic, immunologically-mediated inflammatory process of the central nervous system". (A chronic illness characterized by fatigue, neurologic and immunologic disorders, and active human herpes Type 6 infection. Dedra Buchwald, Paul Cheney, Robert Gallo *(co-discoverer of the HIV virus)*, Anthony L Komaroff et al Ann Intern Med 1992:116:2:103-113)

1992

"CFIDS has an organic basis; it is not a psychiatric illness. Our Surveillance Study does not support the notion that (ME)CFS is a psychiatric illness, and in fact, suggests that it has an organic basis" (Dr Walter Gunn, Principal Investigator of (ME)CFS studies at the US Centres for Disease Control: CFIDS Chronicle, February 1992, page 1)

1994

"Abnormalities of immune function, hypothalamic and pituitary function, neurotransmitter regulation and cerebral perfusion have been found in patients with (ME/CFS). Recent research has yielded remarkable data. The symptoms of (ME)CFS have long been viewed as a neurologic pattern, as confirmed by other names such as myalgic encephalomyelitis. A link is being forged between the symptoms pattern of (ME)CFS and objective evidence of central nervous system dysfunction. The view that (ME)CFS is a primary emotional illness has been undermined by recent research" (Dr David S Bell: Instructor in Paediatrics, Harvard Medical School: Chronic fatigue syndrome update: Findings now point to CNS involvement: Postgraduate Medicine 1994:98:6:73-81)

1995

"In my experience, (ME/CFS) is one of the most disabling diseases that I care for, far exceeding HIV disease except for the terminal stages" (Dr Daniel L Peterson: Introduction to Research and Clinical Conference, Fort Lauderdale, Florida, October 1994; published in JCFS 1995:1:3-4:123-125)

1997

"The findings suggest that quality of life is particularly and uniquely disrupted in (ME)CFS. 90% of the sample group experienced frequent feelings of isolation, alienation and inadequacy due to (ME)CFS. All participants stated that (ME)CFS had had a profound impact on every aspect of their lives in ways they had never imagined possible. All participants related profound and multiple losses, including the loss of jobs, relationships, financial security, future plans, daily routines, hobbies, stamina and spontaneity, and even their sense of self because of (ME)CFS. Activity was reduced to basic survival needs in some subjects. Symptoms were

reported to be multiple, diverse, variable and pervasive. Symptom variability also made it impossible for those with (ME)CFS to predict their level of functioning, which interfered with efforts to plan activities. For this reason, symptom variability was regarded as an especially frustrating aspect of (ME)CFS, and the uncertainty was one of the most difficult aspects to deal with. All participants (100%) felt that (ME)CFS had devastated social relationships and activities. The extent of the losses experienced in (ME)CFS was devastating, both in number and in intensity. Participants described a sense of hopelessness that was integral to the illness due to symptom variability, length of illness and repeated relapses. Over time, those who were initially optimistic became emotionally exhausted. The impact of (ME)CFS on patients' life was so total and so devastating that participants had difficulty in accepting their illness and its consequences. (ME)CFS is a poorly understood and often trivialized illness, which in reality causes marked disruption and devastation". (The Quality of Life of Persons with Chronic Fatigue Syndrome. JS Anderson CE Ferrans. The Journal of Nervous and Mental Disease l997:185:5:359-367)

1998

"The results showed that in (ME)CFS patients, a lower stroke volume was highly predictive of illness severity: across three different postures, the most severely affected (ME)CFS patients were found to have a lower stroke volume and cardiac output compared with those with more moderate illness. These findings suggest a low flow circulatory rate in the most severe cases of (ME)CFS; this may indicate a defect in the higher cortical modulation of cardiovascular autonomic control. In the most severely affected, situations may arise where a demand for blood flow to the brain may exceed the supply, with a possibility of ischaemia and a decrement of function". (CFS severity is related to reduced stroke volume and diminished blood pressure responses to mental stress. Arnold Peckerman Benjamin Natelson et al. Presented at the Fourth International AACFS Research & Clinical Conference on CFIDS, Mass. USA 1998: Abstract page 47)

1999

"Complaints of muscle weakness and pain are common, and abnormal muscle metabolism has been reported to occur in (ME)CFS. (ME)CFS patients had recovery rates for oxygen saturation that were 60% lower than those for recovery of oxygen saturation in normal subjects. The present study has demonstrated direct impairments in oxygen delivery in (ME)CFS patients compared with normal controls. These impairments were more clearly seen after exercise". (Impaired oxygen delivery to muscle in chronic fatigue syndrome. Kevin K McCully Benjamin H Natelson Clinical Science 1999:97:603-608)

1999

"The use of 31 P-nuclear magnetic resonance (31 P-NMR) has now provided positive evidence of

defective oxidative capacity in (ME)CFS. Patients with (ME)CFS reach exhaustion more rapidly than normal subjects, in keeping with an abnormality in oxidative

metabolism and a resultant acceleration of glyolysis in the working skeletal muscles. When the rate of resynthesis of phosphocreatinine (PCr) following exercise is measured, this abnormality is confirmed. (This) provides a conclusive demonstration that recovery is significantly delayed in patients with (ME)CFS. The results demonstrate that patients with (ME)CFS fail to recover properly from fatiguing exercise and that this failure is more pronounced 24 hours after exercise". (Demonstration of delayed recovery from fatiguing exercise in chronic fatigue syndrome. Lorna Paul Leslie Wood Wilhemina M.H.Behan William M.Maclaren European Journal of Neurology 1999:6:63-69)

1999

"Within the homogenous group of severe (ME)CFS patients, the prognosis for recovery was poor". (Natural History of Severe Chronic Fatigue Syndrome. NF Hill, LA Tiersky, BH Natelson et al. Arch Phys Med Rehab 1999:80:1090-1094)

2000

"Our patients with (ME)CFS had an average VO_2 max just below 20 mL/kg per minute, representing significant impairment relative to the controls. Comparing the exercise capacity in our patients with data from other studies shows a functionality similar to that of individuals with chronic heart failure, patients with chronic obstructive pulmonary disease, and those with skeletal muscle disorder". (Exercise Capacity in Chronic Fatigue Syndrome. Pascale de Becker Neil McGregor Kenny De Meirleir et al. Arch Intern Med 2000:160:3270-3277)

2001

"In ME, there are chronic sequelae and the effects may be neurological, hormonal, autoimmune and myalgic, which may affect the myocardium" (Dr John Richardson: Enteroviral and Toxin Mediated Myalgic Encephalomyelitis / Chronic Fatigue Syndrome and Other Organ Pathologies. The Haworth Press Inc, New York, 2001)

2001

"In ME/CFS, convincing evidence of cardiovascular impairment can be demonstrated". ("Research Update on ME/CFS". Behan WHM. Professor of Pathology, Glasgow. Extracts from Over-view of the Alison Hunter Memorial Foundation ME/CFS Clinical and Scientific Meeting, December 2001, Sydney, Australia. For the complete over-view, see http://listserv.nodak.edu/cgi-bin/wa.exe?A2=ind0207c&L=co-cure&T=0&F=&S=&P=3579

2002

"Several cardiopulmonary and neurological symptoms in the present investigation occurred with higher frequency and uniquely differentiated the (ME)CFS group from the controls. Shortness of breath, chest pain, dizziness after standing, skin sensations, general dizziness, dizzy moving the head, and alcohol intolerance uniquely differentiate those with (ME)CFS from controls. Results of the current investigation also indicated that muscle weakness differentiated the (ME)CFS group from controls. Furthermore, it appeared that the muscle weakness in the (ME)CFS

group occurred at multiple sites, with weak legs being the most frequently reported form of weakness. These findings concur with those of Hartz et al (1998), and therefore provide further support for the inclusion of muscle weakness in the case definition of (ME)CFS". (Symptoms occurrence in persons with chronic fatigue syndrome. LA Jason et al. Biological Psychology 2002:59:1:15-27

2003

"The patients with (ME)CFS (indicated) profound physical impairment. These scores tended to be below the published norm for patients with Type II diabetes, cancer, congestive heart failure and myocardial infarction" (Functional Status, Neuropsychological Functioning and Mood in Chronic Fatigue Syndrome. LA Tiersky, Benjamin Natelson et al. J Nerv Ment Dis 2003:191:324-331)

2003

"ME in adults is associated with measurable changes in the central nervous system and autonomic function and injury to the cardiovascular, endocrine and other organs and systems. The patient with the diagnosis of ME/CFS is chronically and potentially seriously ill. These ME/CFS patients require a total investigation and essentially a total body mapping to understand the pathophysiology of their illness and to discover what other physicians may have missed. A patient with ME is a patient whose primary disease is central nervous system change, and this is measurable. The belief that ME/CFS is a psychological illness is the error of our time". (The Complexities of Diagnosis. Byron Hyde. In: Handbook of Chronic Fatigue Syndrome. Leonard A Jason et al. John Wiley & Sons, Inc. 2003)

2004

"In comparison with other chronic illnesses such as multiple sclerosis, end-stage renal disease and heart disease, patients with (ME)CFS show markedly higher levels of disability" (Quality of Life and Symptom Severity for Individuals with Chronic Fatigue Syndrome: Findings from a Randomised Clinical Trial. RR Taylor. American Journal of Occupational Therapy 2004:58:35-43)

2005

"Our patients are terribly ill, misunderstood, and suffer at the hands of a poorly informed medical establishment and society" (Professor Nancy Klimas, University of Miami, AACFS In-coming Presidential Address: Co-Cure, 21 March 2005: http://www.co-cure.org)

2006

"There is evidence that the patients with this illness experience a level of disability that is equal to that of patients with late-stage AIDS, patients undergoing chemotherapy (and) patients with multiple sclerosis" (Professor Nancy Klimas, University of Miami, speaking at the launch of the US CDC campaign to raise awareness of ME/CFS, 3 November 2006, National Press Club, Washington DC)

(This document has been compiled from various fully-referenced documents including "What is ME? What is CFS?" by Professor Malcolm Hooper; "The MRC – Profits before Patients?"; "Facts from Florida" and "Quotable Quotes about ME/CFS". All are available online at http://www.meactionuk.org.uk).