DISCLAIMER

The information contained within this document does not constitute medical advice or diagnosis and is intended for education and information purposes only. It was current at the time of publication and every effort is made to keep the document up to date.

The information contained herein includes both psychological and non psychological interventions. The delivery of psychological services requires a medical referral whilst non psychological services do not.

Each person is an individual and has a unique psychological profile, biochemistry, developmental and social history. As such, advice will not be given over the internet and recommendations and interventions within this website cannot be taken as a substitute for a thorough medical or allied health professional assessment or diagnosis.

Date Document Updated : March 2005

Chronic Fatigue Syndrome

Article QUICK LINKS :

INTRODUCTION

Chronic Fatigue Syndrome (CFS) is characterised clinically by constant, incapacitating fatigue (usually experienced as exhaustion and poor stamina) which is not relieved by bed rest and of at least six months duration. Onset is usually abrupt and often accompanies illness due to infection. Symptoms often wax and wane, but are usually severely debilitating and may last many months or even years.

The 17th Edition of The Merck Manual of Diagnosis and Therapy lists CFS in its "Syndromes of Uncertain Origin" section and goes on to say that there is considerable heterogeneity among those who meet the definition of CFS, and that etiology is controversial.[1]

Chronic Fatigue Syndrome was formally defined in 1988 by a consensus panel convened by the Centres For Disease Control (CDC) and a formal and controversial set of diagnostic criteria was established. One of the main complaints laid down against the set of criteria was that it was better suited to research than for clinical purposes.[2]

DIAGNOSTIC CRITERIA FOR CHRONIC FATIGUE SYNDROME IN AUSTRALIA (After Faduka, et al. 1994)[3]

FATIGUE

Clinically evaluated, unexplained, persistent or relapsing fatigue persistent for six months or more, that:

- Is of new or definite onset;
- Is not the result of ongoing exertion;
- Is not substantially alleviated by rest;
- Results in substantial reduction in previous levels of occupational, educational, social or personal activities;

and

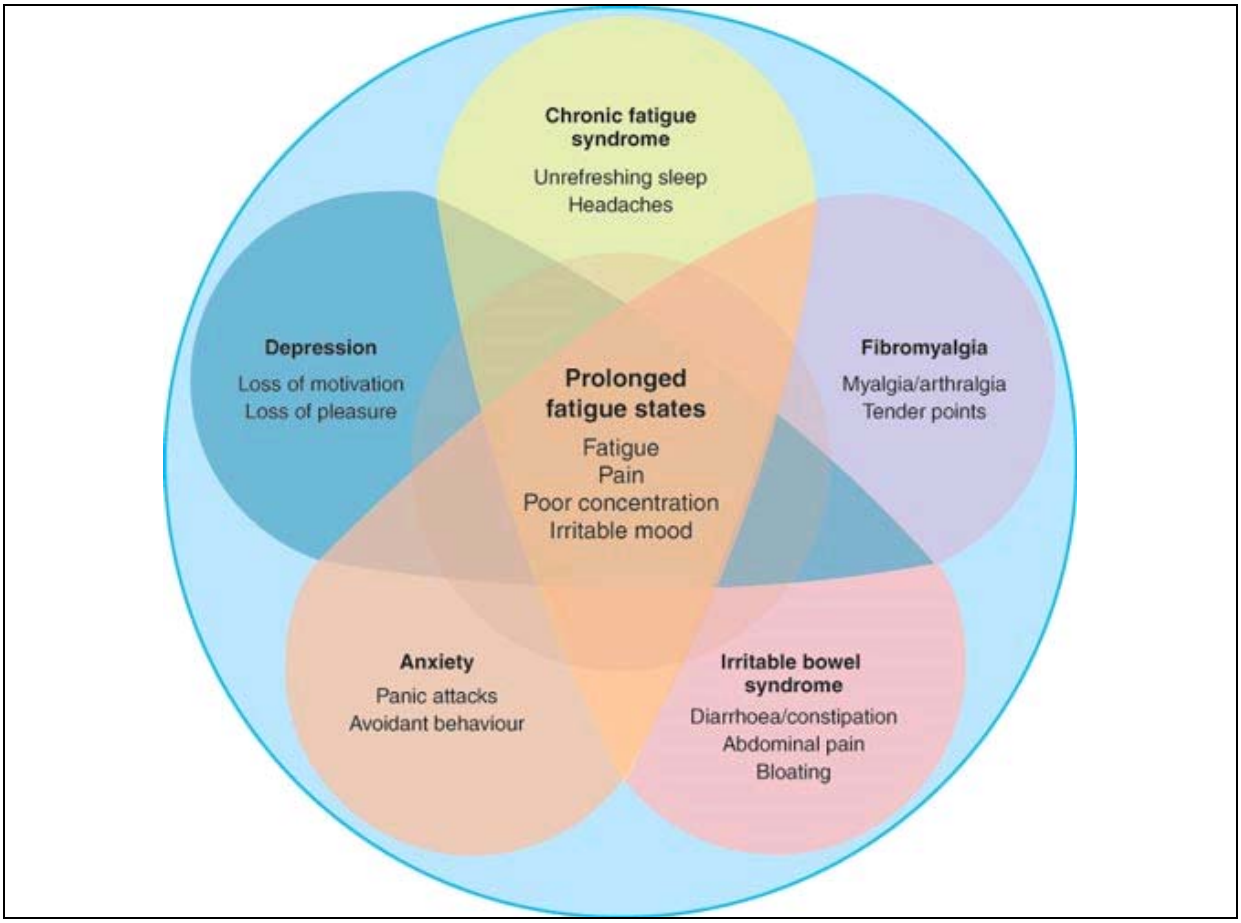
OTHER SYMPTOMS

Four or more of the following symptoms that are concurrent, persistent for six months or more and which did not predate the fatigue:

- Impaired short term memory or concentration;
- Sore Throat;
- Tender cervical or auxiliary lymph nodes;
- Muscle Pain;
- Multi-joint pain without arthritis;
- Headaches of a new type, pattern, or severity;
- Unrefreshing Sleep;
- Post-exertional malaise lasting more than 24 hours.

Prolonged fatigue states are found in fibromyalgia, irritable bowel syndrome, anxiety and depression, as well as in chronic fatigue syndrome.[4]

The following diagram from the above Medical Journal of Australia paper clearly illustrates this:



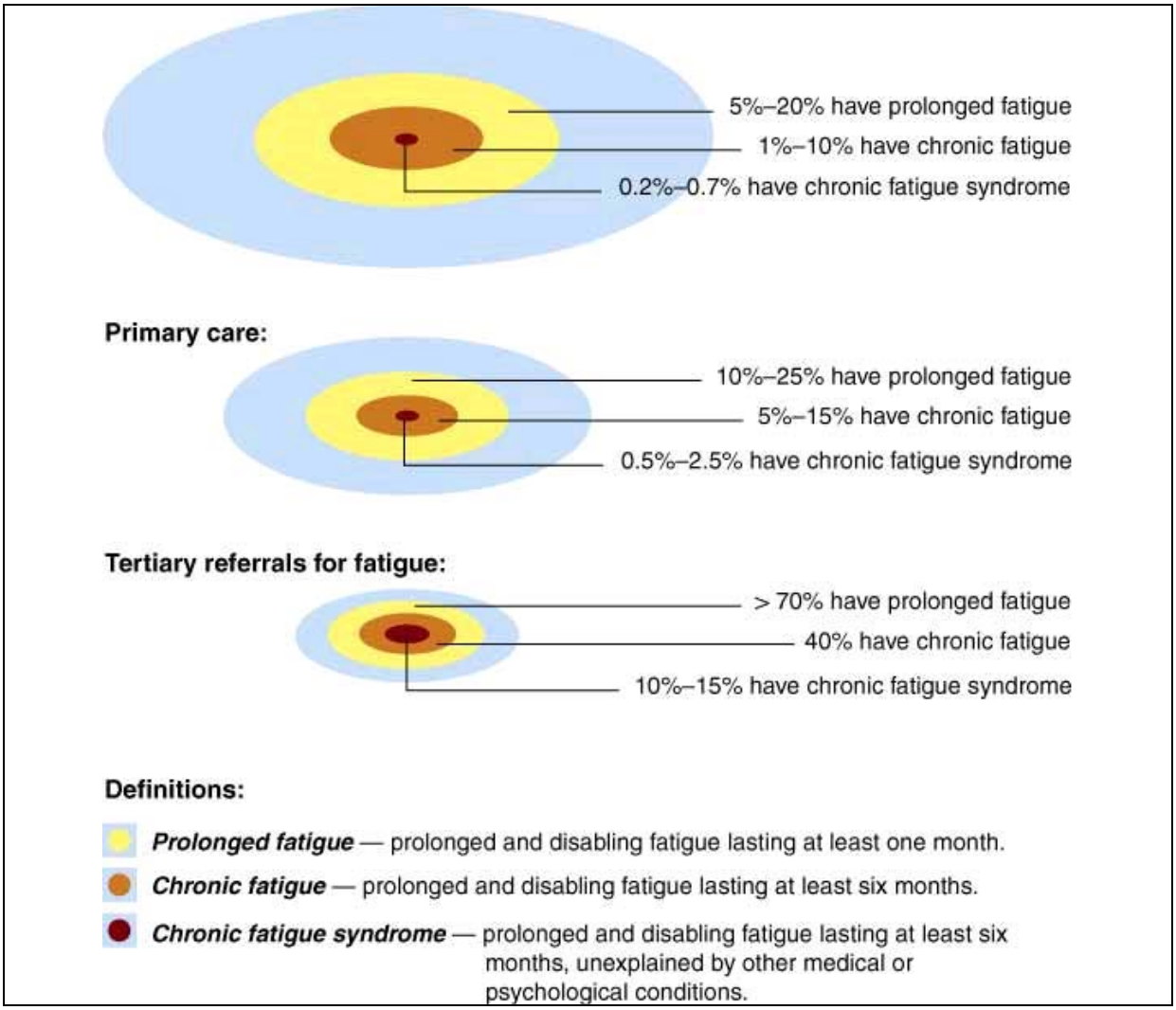
SO WHAT EXACTLY IS CFS?

Syndromal diagnoses like CFS have a long history of use in clinical medicine. CFS by its nature cannot be classified medically as a disease and yet it is characterised by a set of "recognisable symptoms that cannot be attributed to any alternative condition".[4] Symptoms of CFS are currently believed to be the result of disturbed brain function and the pathophysiology of CFS is currently unknown. Therefore, CFS is probably best regarded as "disease" a subjective state that can only be defined by reference to the person, rather than a "disease". As yet, no medication has been shown to provide long term remission or "cure" in people with CFS. Therefore, conventional medical treatments for CFS are empirical and careful monitoring is required to ensure that the symptomatic benefits outweigh any side effects. Furthermore, many people with CFS report an increased susceptibility to drug side effects.[4]

INCIDENCE

CFS is more common in women than men and in young adults. About 10-25% of patients presenting to general practitioners are diagnosed with CFS.

The Prevalence of Fatigue States



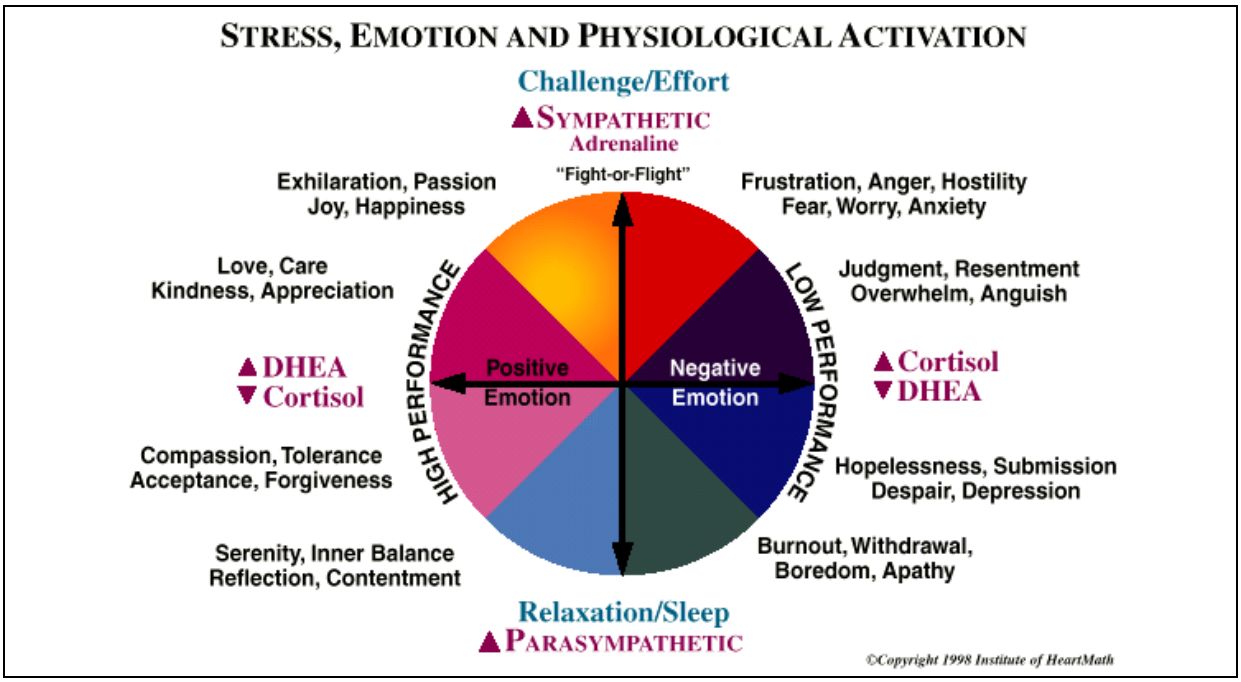
Since children and adolescents are in a dynamic developmental state, early diagnosis and intervention is vital when persistent, unexplained fatigue exists for three months or more (rather than six months as is the case with adults). Issues such as autonomy, self-esteem, body image, socialisation, sexuality and academic goals are of central importance and the longer the diagnosis is delayed, the greater the adverse consequences of these issues.[4]

NEUROLOGICAL CONSIDERATIONS

Neurologically, CFS is considered a disorder of the management of sensory input by the brain, whereby control of the sensory input/output to and from the brain is dysfunctional.[5] What this means is that information from both inside and outside the body is misperceived by the brain, which results in inappropriate sensations being experienced by the person. For instance, the sensation of touch may be experienced as being painful; certain odours may cause the person to experience discomfort and even illness; walking up a flight of stairs may feel like they are climbing Mt. Everest.

This "brain misperception" seems to be centered in the prefrontal cortex which regulates sensory gating as well as neurotransmitter secretion by neurons which secrete the excitatory amino acid glutamate resulting in a decrease of the neurotransmitter norepinephirine.

Norepinepherine enhances the signal to noise ratio in the processing of sensory input by the brain.[5] Signal to noise ratio is inherently low in CFS sufferers. Norepinepherine and Substance P (which is largely involved in the sensation of pain) are reciprocal in relation to one another, in that if one is high, the other is low. Other substances which tend to be reciprocal in balance are the hormones Dehydroepiandrosterone (DHEA) and Cortisol (Cortisol is sometimes known as the stress hormone). Stress has an adverse reaction in the balance of Substance P/Norepinepherine and Cortisol / DHEA as indicated in the chart below from The Institute of HeartMath.



The vertical axis shows the activation of the Autonomic Nervous System (ANS), ranging from arousal (fight-flight) to relaxation. The ANS is a quick-acting system that affects the heart, digestive system, adrenaline secretion and many other bodily functions. Perceptions and emotions activate the ANS and subsequently affect the balance between its sympathetic and parasympathetic branches.[6]

The horizontal axis represents what is called the hypothalamic-pituitary-adrenal or HPA system, which coordinates the release of several of the body's major hormones, including cortisol which is commonly referred to as the stress hormone. This axis is influenced by the quality of our emotions, it is a slower-acting system than the ANS, but its effects are longer-lasting. DHEA promotes the healthy maintenance and regeneration of the body's systems, including activation of osteoblasts and the inhibition of Interlukin-6 implicated in osteoporosis. Dysfunction of the HPA axis is implicated in CFS.[7]

The cause of this type of prefrontal cortex dysfunction is usually an interaction of genetic, developmental and environmental factors. Additionally, due to the inherent reduction in neural plasticity associated with this type of dysfunction, there is usually an increased susceptibility to environmental stressors.

Neural plasticity is the ability of the brain to cope with changing demands by creating and doing away with neural pathways as necessary to meet those demands. This relates to the concept of allostatic loads being exceeded beyond the coping capacity of the person.

Quantitative Electroencephalographic (QEEG) comodulation analysis of CFS sufferers indicates an increase in alpha in parietal regions and an anterior-posterior disconnection is present. Therefore, QEEG may be useful in evaluating the disorder.[8] (See the QEEG article for more information)

Potential central nervous system pathways to chronic fatigue syndrome

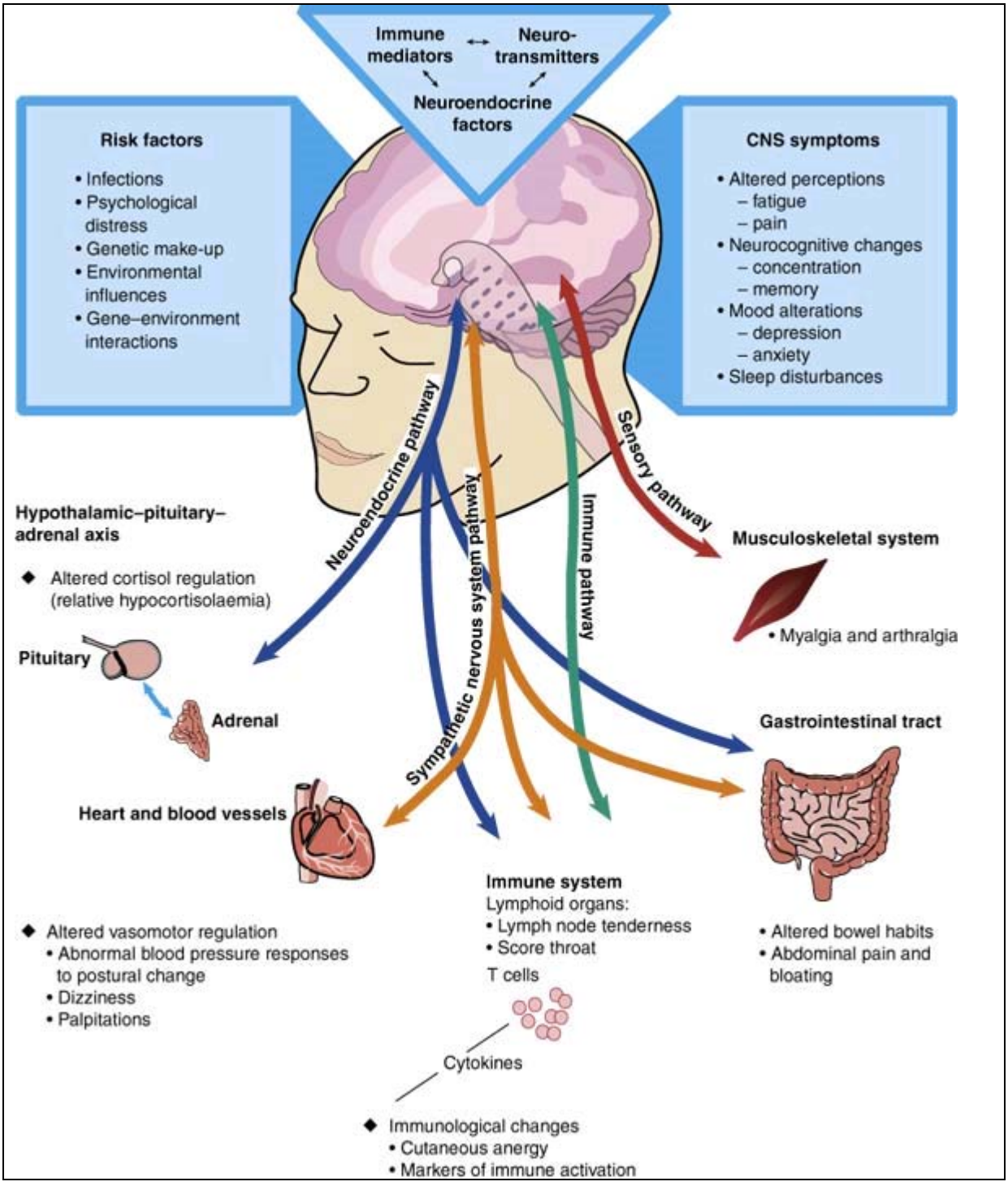


Diagram from: The Medical Journal of Australia- CFS: Clinical Practice Guidelines 2002

FOOD AND ENVIRONMENTAL INTOLERANCES

People with chronic fatigue often report that food intolerances that can exacerbate their symptoms.[9, 10] (See the Dietary and Food Allergies articles for more information on this and Nutritional Factors below). Further, some clinical studies have suggested an overlap between CFS and multiple chemical sensitivity (MCS).[11,12]

An Australian study in 2002 reports that excessive 50Hz magnetic field exposure may contribute to the symptoms of CFS and decreased immune function.[13] (See the Electro Magnetic Fields and Your Health article for more information on this)

Sick Building Syndrome (SBS) is also another environmental factor which needs serious consideration in CFS. According to the Health Protection Agency in Washington, the following can be causes:

- **Chemical contaminants from outdoor sources:** Outdoor air that enters a building can also be a source of indoor pollution. Pollutants from motor vehicle exhausts, plumbing vents, and building exhausts (bathrooms and kitchens) can enter the building through poorly located air intake vents, windows, and other openings. Combustion by products can also enter a building from a nearby garage.

- **Chemical contaminants from indoor sources:** Most indoor air pollution comes from sources inside the building. For example, adhesives, upholstery, carpeting, copy machines, manufactured wood products, cleaning agents and pesticides may emit volatile organic compounds (VOCs) including formaldehyde. Research shows that some VOCs can cause chronic and acute health effects at high concentrations, and some are known carcinogens. Low to moderate levels of multiple VOCs may also produce acute reactions in sensitive individuals. Environmental tobacco smoke and combustion products from stoves, fireplaces, and unvented space heaters all can put chemical contaminants into the air. It can also come from synthetic fragrances in personal care products or in cleaning and maintenance products

- **Biological contaminants:** Biological contaminants include pollen, bacteria, viruses, and moulds. These contaminants can breed in stagnant water that has accumulated in humidifiers, drain pans, and ducts, or where water has collected on ceiling tiles, insulation, or carpet. Biological contaminants can cause fever, chills, cough, chest tightness, muscle aches, and allergic reactions. One indoor air bacterium, Legion Ella, has caused both Pontiac Fever and Legionnaire's Disease.

- **Inadequate ventilation:** In the 1970s building designers were led to make buildings more airtight, with less outdoor air ventilation, in order to improve energy efficiency. These reduced ventilation rates have been found to be, in many cases, inadequate to maintain the health and comfort of building occupants.

It should also be noted that excessive exposure to cool white fluorescent light can cause fatigue as well as decreased immune function.[14] Therefore, cool white fluorescents should be replaced with full spectrum fluorescents which approximate the spectrum of light found in daylight.

NUTRITIONAL FACTORS

Studies have shown that CFS sufferers are deficient in one or more vitamins and minerals including:

- Salt[15];
- Certain B Vitamins [16, 17, 18, 19 , 20 , 21 , 22];
- Vitamin C[23, 24];
- Magnesium[17 , 25 , 26 , 26 , 27 , 28];
- Malate [29];
- Zinc[17, 30];
- Beta-carotene[31, 32 , 33];
- Carnitine[34 , 35, 36];
- Coenzyme Q10[37];
- Essential fatty acids[38, 39 , 40]

As mentioned earlier, many sufferers report food intolerances and some of these include sugar, processed foods (additives), refined grains including wheat, maize and rice, milk, beef, pumpkins, tomatoes and pineapple. Provocative testing of CFS sufferers found that in many instances, specific foods are associated with specific symptoms.[41]

INTERVENTIONS

In light of the above Nutritional Factors, a full metabolic workup will be necessary in order to formulate an individualised diet and supplementation regime specific to the needs of each individual.

A complete developmental and medical history during the diagnostic interview will need to be undertaken in order to better understand the underlying dynamics of your condition so as to plan the best approach for your individual needs.

Since neural plasticity is compromised as noted in the neurological considerations of this article, eeg biofeedback (Neurofeedback) based upon QEEG findings will need to be undertaken. EEG biofeedback normalises sleep patterns and allows the brain to become self-regulating and more adaptive rather than being reactive and "stuck". (See the EEG Biofeedback article for more information).

Breathing, posture, moderate levels of exercise and gentle bodywork therapies have profound effects upon the body, generating a whole body response by activating the relaxation response to allow healing to take place.

As chronic fatigue syndrome involves devitalisation and many bodily systems may be compromised, herbal medicine strategies have been developed.[41, 42, 43, 44, 45, 46, 47, 48, 49] Which might include: revitalising energy levels with herbal tonics; restoring depleted adrenal reserves with specific adrenal tonics; balancing immune function with immune modulating herbs; addressing any viral associations using antiviral, herbs; boosting mood and vitality with nervine tonics; assisting cerebral blood flow and tissue perfusion; and enhancing memory and cognitive function.

FURTHER READING SUGGESTIONS

- QEEG and Neurofeedback - diagnostic and training modalities for the enhancement of CNS functioning in ADHD and other disorders
- Food Allergies, Coeliac Disease, Milk Intolerance & Nutritional Issues
- Electro Magnetic Fields and Your Health
- Neurofeedback - EEG Biofeedback - a Drug-Free Strategy for ADHD, Learning Disorders and Other Conditions

LINKS

PLEASE NOTE :
Learning Discoveries offers the links below as a convenience to our clients and the users of this website. However, we do not control third party websites and we are not responsible for the websites content.

- Environmental Protection Agency, USA

  http://www.epa.gov/iaq/

  Responsible for implementing EPA's Indoor Environments Program, a voluntary (non-regulatory) program to address indoor air pollution.

For more information or to make an appointment please contact us on (02) 9637 9998 during business hours.

REFERENCES

1. 17th Edition of The Merck Manual of Diagnosis and Therapy

2. Murray, M & Pizzorno, J., The Encyclopedia of Nutritional Medicine, 2000, Little, Brown & Co. London, UK.

3. Fukuda K, Straus SE, Hickie I, et al. The chronic fatigue syndrome: a comprehensive approach to its definition and study. International Chronic Fatigue Sydnrome Study Group. Ann Intern Med 1994; 121: 953-959.

4. Chronic fatigue syndrome, Clinical practice guidelines — 2002, MJA 6 May 2002 176 (9 Suppl): S17-S55

5. Goldstein, J.A., Betrayal by the Brain, 1996, Haworth Medical Press, Binghampton, New York.

6. Childre, D.& Martin, H., The HeartMath Solution., 1999, Harpers Publishers, San Francisco.

7. Demitrack, M. A., et al. Evidence for impaired activation of the hypothalamic-pituitary-adrenal axis in patients with chronic fatigue syndrome. J Clin Endocrinol Metab. 73:1224-1234, 1991.

8. Lorensen, T. D. & Gow, K, M., Quantitative Electroencehalographic Comudulation: An investigation of patterns in Chronic Fatigue Syndrome., Journal of Neurotherapy, Vol. 7, No. 1, 3-18, 2003.

9. Loblay RH, Swain AR. The role of food intolerance in chronic fatigue syndrome. In: Hyde BM, editor. The clinical and scientific basis of myalgic encephalomyelitis/chronic fatigue syndrome. New York: The Nightingale Research Foundation, 1992.

10. Manu P, Matthews DA, Lane TJ. Food intolerance in patients with chronic fatigue. Int J Eat Disord 1993; 13: 203-209.

11. Aaron LA, Buchwald D. A review of the evidence for overlap among unexplained clinical conditions. Ann Intern Med 2001; 134: 868-881.

12. Jason LA, Taylor RR, Kennedy CL. Chronic fatigue syndrome, fibromyalgia, and multiple chemical sensitivities in a community-based sample of persons with chronic fatigue syndrome-like symptoms. Psychosom Med 2000; 62: 655-663.

13. Maisch, D., Podd, J. & Rapley, B., Changes in health status in a group of CFS and CF patients following removal of excessive 50Hz magnetic field exposure., J. Aust. Coll. Nutr. & Env. Med. Vol. 21. No. 1. April 2002.

14. In-Tele-Health., Hyperhealth - Natural Health and Nutrition CD ROM- Fitzroy, Victoria. 2004.

15. Bou-Holaigah, I., et al., The relationship between neurally mediated hypotension and the chronic fatigue syndrome. JAMA, 274(12):961-7, 1995.

16. Jacobson, W., et al., Serum folate and chronic fatigue syndrome., Neurology, 43(12):2645-7, 1993.

17. Grant, J.E., et al., Analysis of dietary intake and selected nutrient concentrations in patients with chronic fatigue syndrome. J. Am. Diet. Assoc., 96(4):383-6, 1996.

18. Regland, B., et al., Increased concentrations of homocystine in the cerebrospinal fluid in patients with fibromyalgia and chronic fatigue syndrome. Scand. J. Rheumatol., 26(4):301-7, 1997.

19. Lapp, C.W. & Cheney, P.R., The ratinale for using high dose cobalamin (Vit B 12). The CFIDS Chronicle Physicians Forum, pp 19-20, Fall, 1993.

20. Dettori, A.G. & Ponari, O., Effeto antalgico della cobalamide in corso di neuropatie periferiche di diversa etiopatogenesi. Minerva Med., 64:1077-82, 1973. (In Italian)

21. Hank, A. & Weiser, H., Analgesic and antiinflammatory properties of vitamins., Int J. Vitam. Nutr. Res. (suppl)27:189-206, 1995.

22. Simpson, L.O., et al., Red cell shape changes following trigger finger fatigue in subjects with chronic fatigue tiredness and healthy controls., N.Z. Med. J., 106:104-7, 1993

23. Ali, M., Ascorbic acid reverses abnormal erythrocyte morphology in chronic fatigue syndrome. Am. J. Cin. Pathol., 94:515, 1990.

24. Ali, M., Hypothesis. Chronic Fatigue is a state of accelerated oxidative molecular injury. J. Advancment Med., 6(2):83-96, 1993.

25. Cox, I.M., et al., Red blood cell magnesium and chronic fatigue syndrome., Lancet, 337:757-60, 1991.

26. Howard, J.M., et al., Magnesium and chronic fatigue syndrome, Lancet, 340:426, 1992.

27. Seelig, M., Presentation to the 37th annual meeting, American College of Nutrition., Oct. 13, 1996.

28. Durlach, J., Chronic Fatigue Syndrome and chronic primary magnesium deficiency (CFS and CPMD)., Magnes. Res., 5(1):68, 1992.

29. Russell, I.J., et al., Treatment of fibromyalgia and chronic fatigue syndrome with Super Malic: a randomised, double blind placebo contreolled, crossover pilot study. J Rheumatol. 22(5):953-8, 1995.

30. Jessop, C., Super Malate and Chronic Fatigue, Fibromyalgia Network Newsletter, compendium#2, Oct 1990-Jan. 1992.

31. Toth, J., NK cells and their characteristics and immunogenetic aspects. Bratisl Lek Listy, 95(5):212-23, 1994.

32. Caligiuri, M., et al., Phenotypic and functional deficiency of natural killer cells in patients with chronic fatigue syndrome., J Immunol, 139:3306-13, 1987.

33. Cunha, B.A., Beta-carotene stimulation of natural killer cell activity in adult patients with chronic fatigue syndrome, TheCFIDS Chronicle Physicians Forum, pp 18-19, Fall, 1993.

34. Kuratsune, H., et al., Acylcarnitine deficiency in chronic fatigue syndrome, Clin Infect Dis. 18(suppl 1):S62-7, 1994.

35. Plioplys, A.V. & Plioplys, S., Serum levels of carnitine in chronic fatigue syndrome: clinical correlates, Neuropsychobiology, 32(3):132-8, 1995

36. Plioplys, A.V. & Plioplys, S., Amantadine and L-carnitine treatment of chronic fatigue syndrome, Neuropsychobiology, 35(1):16-23, 1997

37. Judy, W., South Eastern Institute of Biomedical Research, Bratenden Florida, Presentation to the 37th annual meeting, American College of Nutrition, Oct, 13, 1996.

38. Gray, J.B. & Martinovic, A.M., Eicosinoids and essential fatty acid modulation in chronic disease and the chronic fatigue syndrome, Med. Hypotheses, 43(1):31-42, 1994.

39. Horrobin, D.F., Post-viral fatigue syndrome, viral infections in atopic eczema and essential fatty acids, Med. Hypotheses, 32(3):211-17, 1990.

40. Behan, P.O., et al., Effect of high doses of essential fatty acids on the post viral fatigue syndrome, Acta. Neurol, Cand. 82(3):209-16, 1990.

41. Werbach, M., Textbook of Nutritional Medicine, Third Line Press, California, 1999.

42. Mills, S. & Bone, K., Principles and Practice of Phytotherapy, Churchill Livingstone Publishers, 2000.

43. Bone, K., A Clinical Guide To Blending Liquid Herbs, Churchill Livingstone Publishers, 2003.

44. Weiss, R.F. & Fintelmann, V., Herbal Medicine, Thieme Press, Stuttgart, 2000.

45. Spinella, M., The Psychopharmacology of Herbal Medicine, MIT Press, 2001.

46. Murray, M., The Healing Power of Herbs, Prima Publishing, 1995.

47. Walker, L.P. & Hdgson-Brown, E., Nature's Pharmacy, Reward Books, 1998.

48. Mills, S. The Essential Book of Herbal Medicine, Penguin, 1991.

49. van Wyk, B.E. & Wink, M., Medicinal Plants of the World, Briza Publications, 2004.