

*Review*

# **Chronic Fatigue Syndrome Diagnosis and Treatment - Part 1**



**Part 1 – February 2009  
Definition, Prevalence,  
Diagnosis**

**Part 2 - March 2009  
Etiology (Cause)**

**Part 3 - April 2009  
Treatment**

## What is CFS?

Chronic Fatigue Syndrome (CFS) is an illness primarily characterized by profound, debilitating fatigue which has been ongoing for at least 6 months and is not relieved by rest.[1] Other symptoms include:[1]

- Cognitive difficulties, impaired memory, and poor concentration.
- Postexertional malaise (exhaustion and increased symptoms) lasting more than 24 hours following physical or mental exercise.
- Unrefreshing sleep.
- Joint pain (without redness or swelling).
- Persistent muscle pain.
- Headaches of a new type or severity.
- Tender cervical or axillary lymph nodes.
- Sore throat.

The dramatic decline in activity level and stamina is often severe enough to result in substantial occupational, educational, and social limitations that lead to defining CFS as a major functional impairment.[1] At least one quarter of those afflicted are either unemployed or on disability.[1]

Some patients may also experience:[1]

- irritable bowel, abdominal pain, nausea, diarrhea or bloating
- chills and night sweats
- brain fog
- chest pain
- shortness of breath
- chronic cough
- visual disturbances (blurring, sensitivity to light, eye pain or dry eyes)
- allergies or sensitivities to foods, alcohol, odors, chemicals, medications or noise
- difficulty maintaining upright position (orthostatic instability, irregular heartbeat, dizziness, balance problems or fainting)
- psychological problems (depression, irritability, mood swings, anxiety, panic attacks)
- jaw pain
- weight loss or gain

An intermittent pattern of relapse is common in CFS[2] as is an overall lower level of performance and activity than sufferers were capable of prior to the illness. [3,4]

## Prevalence

More than 4 million Americans suffer from CFS and over 2.5% of the population aged 18-59 years meet the diagnostic criteria.[1,5] Only 20% have been properly diagnosed.[6] Though more frequent in women aged 40-59 years, people of all ages, ethnicity, economic status, and gender may develop CFS.[6,7]

## Diagnosis

The onset of CFS may be acute or gradual over a period of a few months.[1] Under current diagnostic strategies for CFS, a diagnosis is made after other diagnoses have been eliminated and two criteria are met: [1]

1. Unexplained, persistent fatigue that is not due to ongoing exertion, is not substantially relieved by rest, is of new onset (not lifelong), and results in a significant reduction in previous levels of activity.
2. Four or more of the following symptoms are present for 6 months or more:
  - Impaired memory or concentration
  - Postexertional malaise (extreme, prolonged exhaustion and exacerbation of symptoms following physical or mental exertion)
  - Unrefreshing sleep
  - Muscle pain
  - Multijoint pain without swelling or redness
  - Headaches of a new type or severity
  - Sore throat that is frequent or recurring
  - Tender cervical or axillary lymph nodes

As of the writing of this paper, two new biomarkers have been discovered for CFS and confirmatory clinical tests have been developed.[8,9]

The “ATP profile” test confirms a CFS diagnosis for patients who have insufficient energy due to mitochondrial cellular respiration dysfunction.[8] The function of mitochondria in producing ATP (adenosine triphosphate) for energy and recycling ADP (adenosine diphosphate) to replenish the ATP supply is determined by the ATP profile.[8] Patients who are not diagnosed with CFS by the ATP profile may not have CFS or may suffer from energy wastage due to other factors.[8]

The “serum chemokine and cytokine profile” shows a distinct pathogen associated signature for the inflammatory serum chemokines IL-8, IP-10, MIP-a and MIP-1b, as well as the pro inflammatory cytokines IL-6, TNFa and IL-1b.[9] Cytokine and chemokine patterns can be used diagnostically for CFS in subgroups.[9]

Other disorders may resemble CFS and these include multiple sclerosis, mononucleosis, hypothyroidism, Lyme, and lupus, as well as sleep disorders, certain prescription medications, and major depressive disorders.[1]

Tests which may be run to exclude other fatiguing conditions include urinalysis, total protein, glucose, c-reactive protein, phosphorus, electrolytes, complete blood count (CBC) with leukocyte differential, alkaline phosphatase (ALP), creatinine, blood urea nitrogen (BUN), albumin, globulin, calcium, alanine aminotransferase (ALT) or aspartate transaminase serum level (AST), thyroid function tests (TSH and free T4), ANA, rheumatoid factor (if indicated), and lyme serology (if indicated).[1]



## CoMorbidity

“Comorbid conditions that clinicians should be alert for include fibromyalgia, irritable bowel syndrome, multiple chemical sensitivity, Gulf War syndrome, temporomandibular joint disorder, and overactive bladder or interstitial cystitis.”[1]

## References

1. Centers for Disease Control and Prevention. Chronic Fatigue Syndrome. 2008, November 18. Retrieved January 21, 2009, from FirstGov -- The U.S. Government's Official Web Portal Department of Health and Human Services “Safer Healthier People” Centers for Disease Control and Prevention. Web site: <http://www.cdc.gov/cfs/>
2. Nisenbaum R, Jones JF, Unger ER, Reyes M, Reeves WC. A population based study of the clinical course of chronic fatigue syndrome. *Health Qual Life Outcomes*. 2003;1:49.
3. Buchwald D, Pearlman T, Umali J, Schmaling K, Katon W. Functional status in patients with chronic fatigue syndrome. *Am J Med*. 1996;101:364-370.
4. Christodoulou C, DeLuca J, Lange G, et al. Relation between neuropsychological impairment and functional disability in patients with chronic fatigue syndrome. *J Neurol Neurosurg Psychiatr*. 1998;64:431-434.
5. Reeves WC, Jones JF, Maloney E, et al. Prevalence of chronic fatigue syndrome in metropolitan, urban, and rural Georgia. *Popul Health Metr*. 2007;5:5.
6. Reyes M, Nisenbaum R, Hoaglin DC, et al. Prevalence and incidence of chronic fatigue syndrome in Wichita, Kansas. *Arch Intern Med*. 2003;163:1530-1536.
7. Jones JF, Nisenbaum R, Solomon L, Reyes M, Reeves WC. Chronic fatigue syndrome and other fatiguing illnesses in adolescents: a population based study. *J Adolesc Health*. 2004;35:34-40.
8. Myhill S, Booth NE, McLauren-Howard, J. Chronic Fatigue Syndrome and Mitochondrial Dysfunction. *Int J Clin Exp Med* (2009) 2, 1-16.
9. Lombardi VC, Redelman D, White DC, Fremont M, DeMerirleir K, Peterson D, and Mikovits JA. Serum cytokine and chemokine profiles of individuals with myalgic encephalomyelitis (ME) reveal distinct pathogen associated signatures. September 2008;43(3):245.