

Legal and Scientific Considerations of the Exercise Stress Test

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ABSTRACT. This article examines the legal and scientific bases on which an exercise stress test can provide medically acceptable evidence of disability for the Chronic Fatigue Syndrome (CFS) patient. To qualify for disability benefits, a claimant must establish the existence of a serious medically determinable impairment (MDI) that causes the inability to work. The single stress test has been used to objectively establish whether a claimant can engage in “substantial gainful employment” and is an important determinant of the award or denial of benefits. A review of case law indicates problems associated with a single test protocol that may be remedied by a “test-retest” protocol. The results of a preliminary study employing this approach indicate that the test-retest protocol addresses problems inherent in a single test and therefore provides an assessment of CFS related disability consistent with both medical and legal considerations. doi:10.1300/J092v14n02_06 [Article copies available for a fee from The Haworth Document Delivery Service: 1-800-HAWORTH. E-mail address: <docdelivery@haworthpress.com> Website: <<http://www.HaworthPress.com>> © 2007 by The Haworth Press. All rights reserved.]

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INTRODUCTION

Denial of Benefits: Typical Scenario

Denial of related disability benefits is a common problem for the patient with a medical diagnosis of Chronic Fatigue Syndrome (CFS). The typical scenario can be described as follows: Debilitating fatigue prevents continued work and the CFS patient reports the diagnosis to his or her employer. The patient becomes a “claimant” upon application for related disability benefits from the Social Security Administration (SSA) and/or a private insurance carrier. The initial burden is on the claimant who must objectively establish the existence of a medically determinable impairment (MDI) that is serious enough to cause the inability to engage in any “substantial gainful employment.” Claimant fails to provide sufficient objective evidence and disability for the inability to work is successfully challenged resulting in the denial of benefits. Appeals are available but the burden rests with the claimant to pursue a reversal of the denial.

At the appeal and regardless of the agency involved, a review of the medical record fails to provide sufficient objective evidence of a serious impairment that causes disability. While the diagnosis is accepted, the central legal issue is whether the claimant can work on a regular and ongoing basis. The medical record documents that the diagnosis is largely based on self-reports by the patient to the treating physician and that the symptoms upon which a diagnosis or MDI is made overlap with other illnesses. This makes it difficult to distinguish CFS from other illnesses. It is undisputed that there is no widely accepted definitive laboratory test for CFS. However, the record used to objectively document a FRC that precludes the ability to work on a regular and ongoing basis includes a single exercise stress test. The test shows diminished metabolic capability consistent with the ability to do at least sedentary work and the benefits are denied.

Problem: The Single Stress Test

The single stress test has been utilized to assess Function Residual Capacity (FRC) and therefore determine whether a claimant can work. The problem is that a review of case law documents that both good and poor results of a single stress test have been used to deny benefits. A good result contradicts the diagnosis of disability because it appears to show the ability to work. A poor result is subject to the criticism that the

claimant malingered by deliberately failing to exert maximal effort on the test.

It is our position that utilization of a single test fails to objectively establish disability from both a legal and clinical perspective. We premise this paper on the assertion that “post-exertional malaise” is the cornerstone symptom of CFS related disability. The objective assessment of the fatigue suffered following a test is critical to the determination of ability to work on a regular and ongoing basis. Such an assessment requires integration of law and science if meaningful consequences are to result for the CFS patient.

SSA explicitly states that continued research will produce new evidence to “clarify the nature of CFS and provide greater specificity regarding the clinical and laboratory diagnostic techniques that should be used to document this disorder” (1). The purpose of this paper is to explore the utilization of a “test-retest” protocol consistent with such a mandate. The legal considerations relevant to the use of a single stress test protocol will be discussed followed by a report of preliminary “test-retest” research conducted at the Pacific Fatigue Laboratory.

LEGAL CONSIDERATIONS

Social Security Administration (SSA) Policy

Social Security Ruling (SSR) 99-2p (1999)
Mettlen v. Commissioner of the SSA (2003)

Social Security rulings constitute general policy statements but they do not have the full force and effect of law. While SSA rulings are not binding upon a court, courts in fact frequently rely upon them. This reliance is evident in a review of appeals denying benefits involving both SSA and private insurance companies. For this reason, SSA policy for evaluating CFS disability claims is briefly reviewed here.

SSA accepts the definition of CFS established by an international group convened by the Centers for Disease Control and Prevention (CDC). Under the CDC definition, the hallmark of CFS is the presence of clinically evaluated and debilitating chronic fatigue that cannot be explained by another physical or mental disorder. SSA requires a dual process in the establishment of CFS disability in that a claimant must prove (1) the existence of a “medically determinable impairment” (MDI) and (2) the inability to engage in any substantial employment.

1. *Establishing the MDI.* Physicians sometimes cannot make a conclusive diagnosis of CFS and there is no “dipstick” laboratory test for diagnosing the condition. SSA accepts the symptom-based criteria for the diagnosis of CFS established by the CDC,¹ but requires a strict timeline for the concurrence of at least four symptoms that include post-exertional malaise lasting more than 24 hours. Of the listed symptoms, post-exertional malaise is considered to represent the cornerstone symptom of CFS and is therefore especially relevant to this paper.

While diagnosis may be based primarily on self-reported symptoms, disability requires objective evidence. For example, SSA policy explicitly disallows a finding of disability based solely on *subjectively* allegations of symptoms or impairments. A serious impairment (MDI) must be *objectively* proven. Since the medical community has not reached agreement on a definitive test, SSA allows reliance on “certain” listed laboratory findings to establish the existence of the MDI.² The list of enumerated laboratory findings includes “*an abnormal stress test*” using a “medically accepted” protocol.

2. *Establishing the ability to engage in any substantial employment.* SSA policy considers whether a claimant has the ability to engage in “substantial gainful employment,” i.e., whether the claimant can sustain work-related activities in a work setting on a regular and continuing basis. Residual functional capacity (FRC) laboratory test assesses whether the claimant, in spite of a serious impairment, has the physical and mental ability to perform activities required by competitive, remunerative work. If an applicant’s FRC fails to meet the requirements of regular, previous employment, then the burden is on the Commissioner to show that the claimant can do work as it is generally performed in the “national economy” (*Mettlen v. Commissioner of the SSA*, 2003).

Examples of Appeals Using the Exercise Stress Test

The most common use of the stress test in appeals is to objectively establish FRC and work capacity by assessing the metabolic onset of fatigue. A single stress test is ineffective in establishing a MDI because it cannot document post-exertional malaise, a cornerstone symptom used to diagnose CFS, and does not distinguish between CFS and other illnesses. It further fails to effectively assess disability in that both good and poor performances have been used to dispute an inability to work and deny benefits. The following cases illustrate the problems when a single stress test protocol is used.

Problems Associated with a Good Result on a Single Stress Test

O'Sullivan v. The Prudential Insurance Co. of America (2002)
Marshall v. Sullivan (1990)

In *O'Sullivan v. Prudential* (2002), the former director of human resources in a New York City hotel (claimant) appealed a private insurance company's denial of long-term benefits. Prudential discontinued the long-term disability benefits after claimant, a CFS patient with overlapping symptoms of fibromyalgia, alleged total disability. Prudential had the medical records of the claimant reviewed by a consulting physician asking her to answer two specific questions: (1) what objective medical evidence existed that rendered claimant unable to perform the sedentary duties of her job and (2) based on the medical evidence in the record, did the claimant have any restrictions or limitations of her functional ability?

The response to both questions focused in part upon the results of a single exercise stress test in which the claimant's relatively good performance appeared to demonstrate the ability to work. With regard to claimant's ability to work, Prudential's consulting physician concluded that no objective evidence existed to support claimant's inability to perform a sedentary desk job. "She was able to reach 9 METs of exercise on a stress test . . . more than what is generally considered minimally necessary for a sedentary job." With regard to functional ability, the physician stated that "very little documentation of [claimant's] actual physical abilities is available in the medical records. . . The treadmill test documented that she is able to walk uphill for nearly 8 minutes at a time . . ."

During the proceedings, Prudential did not contest claimant's complaints of pain and fatigue or the fibromyalgia diagnosis. Instead, Prudential simply maintained that there was no objective medical evidence which established how the claimant's condition rendered her totally disabled.

The court addressed the question of disability by considering two issues: (1) whether claimant was unable to perform the duties of her job due to sickness and (2) whether the claimant was unable to perform the duties of any job consistent with her education, training, or experience. The court found the record devoid of any evidence that the claimant's treating physicians were aware of the duties of the claimant's job and further concluded that they were apparently ignorant of her level of education, training, and experience. The court found that the claimant's

treating physicians offered “little more than conclusionary assertions that do not establish that [claimant] is totally disabled.” Here, while claimant was granted SSA benefits, Prudential’s denial of long-term benefits was upheld.

In *Marshall v. Sullivan* (1990),³ claimant appealed SSA denial of benefits for chronic fatigue. Claimant was a 68-year-old accountant for the state of Virginia who was initially diagnosed with chronic infectious mononucleosis related to Epstein-Barr virus (EBV). Her treating physician concluded that she was totally disabled based upon her reports of debilitating fatigue following routine exertion and lab results showing persistent elevation of EBV antibody titers. It should be noted that by the end of her appeal EBV and mononucleosis were ruled out as causing disability and the proper diagnosis of Chronic Fatigue Immune Dysfunction Syndrome (CFIDS) was made.

In addition to her treating physicians, three additional physicians examined claimant (one each from SSA, a private insurance carrier, and the state retirement board) and all agreed that claimant was disabled. The only report to contradict claimant’s disability came from the medical advisor for SSA who neither treated nor examined claimant. According to the medical advisor, the results of the treadmill test revealed a lack of disability and he found that claimant had the capacity “for at least light work.” The claimant’s high level of performance on the treadmill proved that she had the “residual functional capacity” to work comfortably at lower levels of activity. The Administrative Law Judge (ALJ) relied primarily on the medical advisor’s opinions and the results of the treadmill test in finding claimant not disabled.

At the appeal, the ALJ was found to have improperly analyzed claimant’s fatigue.

In his decision, the ALJ refers to that test [treadmill test] as ‘an objective tool by which the Administrative Law Judge can measure the claimant’s fatigue.’ This is clearly not the case; Marshall’s [claimant’s] performance on the treadmill revealed nothing about the increased fatigue she suffered following the test.

It was determined that the treadmill test failed to provide persuasive evidence to contradict the treating and examining physicians. Therefore, the SSA decision to deny benefits was reversed and claimant was awarded benefits. While the outcome was good for the claimant in this particular case, the risk and burden on the claimant was clear. The objective results of a single test resulted in an initial denial of benefits and

the claimant was forced to pursue two appeals in order to ultimately prevail. This might have been avoided altogether had the claimant participated in a second test to objectively document the fatigue that she suffered following the first test. See discussion below.

Problems Associated with a Poor Result on a Stress Test

Coffman v. Metropolitan (2002)

In *Coffman v. Metropolitan* (2002), claimant appealed the denial of long-term benefits from a private insurance company. Claimant worked as a drug representative for a major company and was subsequently diagnosed with CFS, hypothyroidism, vertigo, and other conditions. Metropolitan denied disability benefits claiming the medical record had “insufficient objective clinical findings” to support claimant’s subjective complaints and did not support that [claimant] was “unable to perform the duties of his job.” Further, Metropolitan offered expert testimony that the fatigue of a chronic nature experienced by claimant was more likely due to other conditions.

At trial, claimant offered the results of a cardiopulmonary stress test to prove a significant impairment of functional aerobic work. Claimant’s treating physician stated that maximal oxygen consumption was only 61% of predicted for sedentary individuals and that this poor performance showed the inability of claimant to “sustain work.”

Metropolitan responded that these conclusions were wrong because they were based on “a test which clearly revealed less than maximal effort” noting that claimant reached only 73% of his predicted maximal heart rate. Claimant’s treating physician responded to the criticism asserting that claimant was on cardiac drugs (calcium channel blockers) that may have blunted heart rate and that excellent effort on the test was observed in blood pressure readings that increased from 120/80 to 200/94 and increases in oxygen pulse and respiratory rate. He further stated that hyperventilation due to anxiety accounted for a respiratory quotient (RQ) greater than one at the beginning of the test.

Metropolitan used video-surveillance showing claimant running errands with his wife, driving a car, attending church, carrying two tote bags, etc. This direct observation of claimant’s activities was effectively used to contradict the claim that physical limitations precluded work and provided additional support for Metropolitan’s challenge to the results of the stress test. A Metropolitan expert testified that claimant’s functional capacities were “compatible with the Department of

Labor Work Category definition of light to medium work.” The shadow cast upon the results of the stress test and the lack of objective medical evidence to support disability resulted in a ruling that upheld Prudential’s denial of benefits.

Relevance to the Need for a Test-Retest Protocol

In good result/performance cases, a claim for benefits is compromised when a single exercise stress test provides apparent and objective evidence of the ability to work that conflict with the medical record. In such cases, the record is typically replete with subjective evidence of claimant’s debilitating fatigue following routine exertion that includes walks, running errands, doing household chores, etc. The failure to objectively document post-exertional malaise is a failure to distinguish fatigue from disability. As a cornerstone symptom of CFS, it is imperative to document post-exertional malaise in order to objectively demonstrate the inability to work on a regular and continuing basis. If post-exertional malaise effectively means that the patient who works on Monday will then suffer uncompromising fatigue for several days thereafter, then it is reasonable to assert that there can be no reasonable expectation of regular participation in the national economy.

Poor result/performance cases provide objective evidence for disability but have been successfully challenged on the basis that the claimant malingered on the test. This raises the important issue of the endpoint used to determine both effort and fatigue. End point respiratory quotients (RQs) are widely accepted as objective markers of effort and fatigue. RQs exceeding 1.09 at the end of an 8-12 minute test indicate that peak aerobic capacity has been met and that anaerobic metabolism explains continued participation in the test. An RQ exceeding one coupled with evidence that either (1) Peak VO_2 or (2) heart rates meeting or exceeding 85% of predicted maximal rates is compelling evidence of maximal effort on a stress test.

The ability to do errands and chores is often used as evidence of the ability to work a job every day. Video-surveillance and third-party testimony is permitted to document a claimant’s daily activities, e.g., doing household chores, shopping, running errands, attending church, driving a car, etc. (*Coffman v. Metropolitan*, 2002). However, at least one appeal ruled that the ability to do limited daily activities is not inconsistent evidence of disability. In *Smith v. Barnhart* (2003), the ALJ found claimant not markedly impaired because she was able to care for her personal needs, perform some household tasks, and regularly attend

church and a Bible study. At appeal, this decision was found not to reflect whether the ALJ considered evidence showing that the claimant had difficulty performing her limited daily tasks. The court cited authority that the ALJ must assess such activities by their independence, appropriateness, effectiveness, and sustainability. Additionally, the ALJ did not analyze why claimant's daily activities were inconsistent with her ability to work. "The fact that a claimant is able to engage in limited daily activities, such as washing dishes, doing laundry, and cooking meals does not necessarily demonstrate that she is not disabled."

Nonetheless, specific reference in the medical record of the caloric or metabolic requirements to perform specific jobs or tasks is important. *O'Sullivan v. Prudential* (2002) explicitly commented on the need for the medical record to specifically document the physician's knowledge of the metabolic requirements for certain jobs. A poor performance on a stress test may not defeat an argument that sedentary work is within the metabolic capability of a claimant. This argument may be supported by reference to Department of Labor Work Category or specific lists of routine and unskilled jobs within the capabilities of persons with aerobic impairments, e.g., stationary security guard, toll booth operator, ticket taker, car lot attendant (*Swenson v. Sullivan*, 1989). Evidence of the caloric requirements associated with various tasks/jobs and claimant's metabolic capability to perform would greatly support a rebuttal to the argument. This requires a test-retest protocol that measures oxygen consumption values that are readily translated into caloric equivalents.

The following preliminary study conducted at the Pacific Fatigue Laboratory is directly relevant to the issues raised above. The study examines the test-retest protocol and discussion of the results directly connects the legal and scientific considerations relevant to stress testing.

PACIFIC FATIGUE LABORATORY STUDY

Results/Methods

In this study, the exercise test-retest protocol was examined. The objective of the study was to determine whether objective findings of post-exertional malaise could be documented and to determine whether a serial stress test could objectively distinguish fatigue caused by CFS as opposed to fatigue caused by other illnesses. A brief summary is shown in Table 1.

TABLE 1. A summary of the results of the preliminary study with 6 CFS patients and 6 control subjects. The values for peak oxygen consumption (VO_2 Peak) oxygen consumption at the anaerobic threshold ($VO_2@AT$), peak respiratory quotient (Peak RQ) and the percent of age-predicted maximal heart rate attained at peak exercise (Predicted HR%) are shown for the first exercise test (Test 1) and the second exercise test (Test 2) administered 24 hours later. The percent variability (Var) between Test 1 and Test 2 is shown to illustrate the magnitude of the difference in between the metabolic responses.

	CONTROLS			CFS PATIENTS		
	Test 1	Test 2	(Var)	Test 1	Test 2	(Var)
VO_2 Peak	28.4	28.9	(2%)	26.2	20.5	(-22%)
$VO_2@AT$	17.5	18.0	(3%)	15.0	11.0	(-27%)
Peak RQ	1.19	1.21	(2%)	1.15	1.09	(5%)
Predicted HR%	94.8	97.6	(3%)	87.0	87.8	(1%)

A standardized bicycle protocol was used in six CFS patients and six normal controls. Expired gases were collected throughout the test so that the following values could be determined: Peak oxygen consumption (VO_{2peak} ml/kg/min), oxygen consumption at anaerobic threshold ($VO_2@AT$ ml/kg/min), peak respiratory quotient (RQ), and percentage of predicted heart rate (beats/min). The premise of the study was that test-retest variability in these values should not exceed 8% (2). The rationale for examining these values in a serial protocol is as follows:

Peak VO_2 documents maximal aerobic capacity that can be used to measure fatigue, post-exertional fatigue and determine functional work capacity. Oxygen consumption values can be translated into estimates of kilocalories that in turn can be used to compare the energy requirements of various tasks. This allows for an objective determination of the ability to do work and therefore support or deny the existence of disability. Further, evidence of the attainment of Peak VO_2 is one factor that documents maximal exertion in a test.

$VO_2@AT$ is the intensity of physical work when anaerobic metabolism takes on a significant and increasing role in providing the energy necessary to continue work. Subjectively, this is the point in work that feels as if exhaustion will occur within a relatively short time in the ab-

sence of rest or a reduced workload. Objectively, $VO_2@AT$ documents one parameter on which to explain level of work that cannot be tolerated for long periods because it represents a point when fatigue begins to lead to exhaustion. This too may be translated into one's ability to produce and expend energy (kilocalories) at the onset of fatigue allowing for comparison with the energy requirements of various tasks.

Peak RQ values objectively document the relative contribution of aerobic and anaerobic metabolism at the end of a stress test. Values exceeding one indicate Peak VO_2 has been met and that anaerobic metabolism preferentially contributes to the energy necessary to continue work. Values over 1.0 are widely accepted as an important factor that shows maximal effort was exerted on a test.

85% of Predicted Maximal Heart Rate is a commonly accepted endpoint representing fatigue and true effort in a stress test. There should not be exclusive or even preferential reliance on heart rate. While heart rate objectively reflects workload, it is also influenced by other factors, e.g., emotional status, influence of drugs, state of hydration. Further, it has been argued that blunted heart rates are characteristic of the CFS patient (3). Heart rate is important but should not be exclusively relied upon, especially under circumstances where objective documentation of effort is important.

DISCUSSION OF CLINICAL AND LEGAL ISSUES RELEVANT TO THE RESULTS AND A CFS DIAGNOSIS

1. Establishment of an MDI

Can the Test-Retest Protocol Support a Diagnosis by Showing Post-Exertional Malaise?

On Test 1, a side-by-side comparison of Controls and CFS patients shows the relatively "good performance" similar to the discussion above examining legal appeals. In *O'Sullivan v. Prudential* (2002), claimant had a maximal MET level of 9. Here, Test 1 Peak VO_2 values represent maximal MET levels of 8.11 and 7.48, respectively for Controls and CFS patients. Test 1 values alone are not compelling evidence that the CFS patients are significantly more impaired than Controls. Additionally, Peak VO_2 , $VO_2@AT$, and RQ values show no significant differences between the two groups. This further suggests that metabolic abnormalities are absent.

It is the comparison between tests that shows a disturbing difference between the two groups. Variability from Test 1 to Test 2 in Peak VO_2 and VO_2 @AT values documents impairment in CFS patient but not the controls. Controls show only 2-3% variability while CFS patients declined by an average of 22-27%. Based upon the premise that test-retest variability should not exceed 8%, this study indicates significant impaired metabolic capability as well as an atypical recovery response in the CFS patient but not the Controls. This is directly relevant to a finding of post-exertional malaise.

This type of analysis is precluded when only the results of a single test are available. A serial protocol is required to document debilitating fatigue. The test-retest protocol does what the single test cannot do, namely objectively document post-exertional malaise, a cornerstone symptom upon which a CFS diagnosis can be founded.

Can the Test-Retest Protocol Distinguish CFS from Other Illnesses?

There remains the problem of distinguishing CFS from other illnesses. This raises the question of what results might occur when CFS patients are compared to patients with other illnesses. Wasserman argues that test-retest variability should not exceed 8% in Peak VO_2 and VO_2 @AT values in clinical and normal groups. Weisman reports a summary of five prior studies that examined test-retest variability in patients with different illnesses. The averaged variability in Peak VO_2 and VO_2 @AT among patients suffering from chronic obstructive pulmonary disease (COPD), interstitial lung disease (ILD), and chronic heart failure (CHF) was 7.2% (2).

It is our contention that the dramatic decline in Peak VO_2 and VO_2 @AT values in CFS patients documented in the Pacific study is unique to CFS and, therefore, represents a basis on which to distinguish fatigue caused by CFS as opposed to fatigue caused by other illnesses. Further research is necessary but based on the results of Pacific's study, the potential to better understand and therefore articulate the nature of CFS to both medical and legal arenas is clearly possible.

2. Establishment of the Ability to Work

Can the Test-Retest Protocol More Effectively Document Functional Impairment/Ability to Work?

Metabolic charts state the caloric requirements for certain tasks and VO_2 and VO_2 @AT values can be translated into calorically based docu-

mentation of an individual's metabolic ability or state of fatigue in any number of tasks and jobs. Laboratory stress tests that produce such information may provide explicit documentation of specific tasks that may be reasonably and regularly done by the claimant. This goes to the heart of the ability to work every day at a given job and therefore "engage in substantial employment."

This is illustrated using data from the Pacific study from CFS Patients on Test 2 values of Peak VO_2 , an $\text{VO}_2@AT$ and a hypothetical CFS patient weighing 150 pounds (68 kg). Oxygen consumption data is translated into Calories on the premise that one liter of oxygen consumed is the equivalent of approximately 5 calories produced and expended.

For example, Peak VO_2 averaged 20.5 ml/kg/min which translates to a maximal ability to aerobically produce and expend 7kcal/min. $\text{VO}_2@AT$ work capacity averaged 11 ml/kg/min which translates into 3.74 kcal/min³.

It is imperative to distinguish the ability to work a regular job from engaging in daily activities that permit frequent and extended rest periods. Providing specific metabolic information from a test-retest format allows discussion of job requirements in terms of Caloric requirements. This is terminology familiar even to the lay person and provides documentation required by policy, law, and precedent.

Can the Test-Retest Protocol Distinguish Maximal Exertion from Malingered Effort?

Peak RQ values with minimal variability and with values ranging from 1.09-1.21 give strong objective support that both groups in both tests exerted maximal effort. Unlike the Controls, the CFS Patients experienced a dramatic decline in $\text{VO}_2@AT$ values between tests suggesting impaired metabolism sufficiently serious to result in the onset of fatigue at a significantly lower workload. This data is the type of objective documentation that can support self-reports by CFS Patients of debilitating fatigue following routine exertion.

CONCLUSION

Proving CFS disability is a mandate for a claimant seeking associated benefits. Examination of legal considerations relevant to the proof of disability and the process of securing benefits is important to CFS re-

search. The alliance of science and law allows for consideration of the development of laboratory findings that have the potential to better understand the nature of CFS and to provide objective and acceptable evidence for CFS disability.

It is our contention that the Pacific study on serial testing reflects this alliance. It is clear that the Pacific study is preliminary and begs further review. But the initial data suggests that the test-retest format offers a superior basis on which to establish disability consistent with SSA policy and other relevant case law. If the preliminary data holds, the contribution to the CFS patient may be immeasurable.

NOTES

1. Diagnosis requires concurrence of at least four self-reported symptoms that include: (1) short-term memory loss or impaired concentration that causes substantial reduction in previous levels of performance in work, social or personal activities; (2) sore throat; (3) tender lymph nodes in the neck or auxiliary area; (4) muscle pain; (5) joint pain without redness or swelling; (6) non-refreshing sleep; and (7) post-exertional malaise lasting more than 24 hours. *Social Security Ruling (SSR) 99-2p* (1999).

2. The following lab findings establish the existence of a MDI in CFS patients: An elevated antibody titer to Epstein-Barr virus capsid antigen equal to or greater than 1:5120, or early antigen equal to or greater than 1:640; An abnormal MRI brain scan; Neurally mediated hypotension as shown by tilt table testing or another clinically accepted form of testing; or, Any other lab findings that are consistent with medically accepted clinical practice and are consistent with the other evidence in the case record; for example, *an abnormal exercise stress test* or abnormal sleep studies. *Social Security Ruling (SSR) 99-2p* (1999).

3. Unpublished dispositions when used in this paper are not included as legal precedent. Rather, they are included because they offer insight into the legal use and interpretation of stress tests for the CFS patient.

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