

levels reflects general improvement in pain, function, and psychological status rather than any direct interference with cytokines controlling fatigue (11). Medications used to treat comorbidities of rheumatic conditions (i.e., depression, sleep disturbance) may worsen fatigue due to their mechanisms of action. And lastly, too much exercise can lead to a phenomenon called overtraining, which may lead to an increase in fatigue.

MEASUREMENT

Accurate measurement of fatigue is important for several reasons: 1) to understand the relationship of fatigue with other symptoms, such as pain and depression, 2) to monitor its natural history over time, 3) to screen or classify, 4) to assess individual health status, 5) to distinguish between disease conditions, 6) to guide management decisions, and 7) to evaluate the magnitude of change in response to treatment. Furthermore, it is often the most difficult symptom to control and most bothersome to our patients. In addition to assessing degree, duration, and severity of fatigue, several related areas need to be analyzed. Key questions to ask patients presenting with fatigue are: "What is the status of your rheumatic disease? Do you have any associated disorder(s), such as hypothyroidism? How well do you sleep?" Other factors to be assessed include minor or major mood disturbance, psychosocial stressors, and exercise and physical activity levels.

Familiarity with the several different fatigue measurement tools allows clinicians and researchers to select the scale that best meets their and their patients' needs (21,22). Table 1 includes a listing of published instruments used to measure fatigue that have been developed and tested in the rheumatic diseases. Resources exist such as the *Arthritis and Rheumatism (Arthritis Care and Research)* special issue "Patient Outcomes in Rheumatology: A Review of Measures," which provides a review of instruments that purport to measure fatigue and similar constructs (23). Instruments with multiple items typically measure different dimensions of fatigue, such as severity, intensity, distress, and impact. Single-item measures have also been used to assess fatigue in rheumatic diseases and are suitable for routine use in clinical care. One question frequently used to evaluate outcomes in clinical trials is how many hours elapse from the time of arising to the time of fatigue onset. Various scales have been used to measure fatigue or energy, such as determining energy level on an 11-point scale ranging from "not at all" to "a lot" or a 0 (none) to 10 (most) scale, or by determining fatigue intensity on a 4-point scale from "none" to "severe." Single-item visual analog scales

perform as well as or better than longer scales in respect to sensitivity to change, and are as correlated with clinical variables as longer scales (24). The overall purpose of the investigation should drive the selection of using a single- or multiple-item instrument to measure fatigue.

MANAGEMENT STRATEGIES

Treatment goals for the management of fatigue include resolving the underlying problem(s), helping the patient better understand fatigue, and reducing or alleviating the fatigue. If there is a single underlying problem causing fatigue, such as hypothyroidism, sleep disturbance/apnea, or anemia, it should be diagnosed and treated. If there is a component of depression, the patient should receive counseling and, if appropriate, antidepressant medication. The clinician and patient need to develop mutually agreed-upon treatment goals and identify strategies to reduce or alleviate fatigue. Strategies to reduce fatigue are listed.

Increasing Physical Activity Levels

Individuals with rheumatic disease who are involved in aerobic exercise of moderate intensity notice improvements in pain and fatigue. Additionally, improvements have been noted in muscle strength and functional status. Providers should encourage patients with arthritis to safely increase their activity level. The level of aerobic conditioning also has a significant influence on performance capability. Individuals with limited aerobic capacity due to pathologic state or a sedentary lifestyle can increase their endurance through training. After evaluation of the cardiorespiratory and musculoskeletal systems, and with consultation from an exercise specialist, patients can start a training program. Training produces improved heart rate, ventilation, and oxygen transport and utilization. Specific improvements in coordination and functional efficiency also occur, depending on type of activity and muscle groups trained. Endurance training lowers energy expenditure for a given effort, resulting in reduced fatigue and enhanced performance.

Participation in a Self-Help Program

Patients with arthritis who participate in the Arthritis Self-Management Program or a Chronic Disease Self-Management Program report positive outcomes, including reduced fatigue, compared with those

Table 1. Instruments that measure fatigue in the rheumatic diseases

Instrument	Description	Number and type of items	Comments
Multidimensional Assessment of Fatigue (9)	Measures 5 dimensions of fatigue: degree, severity, distress, impact on daily activities, and frequency	16-item instrument that uses numerical rating scales with endpoints of 1 (not at all) to 10 (a great deal)	Developed in RA and healthy adults; tested in other chronic conditions; translated into 25 languages.
Fatigue Severity Scale (13)	Measures symptoms associated with fatigue and its impact on work, family, and social life	9-item instrument that uses numerical rating scales with endpoints of 1 (low) to 7 (high)	Based on the characteristics of fatigue in systemic lupus erythematosus and multiple sclerosis.
Fatigue subscale; Profile of Mood States (POMS) (33)	Measures fatigue severity; the fatigue subscale is one of the 6 POMS subscales	7-item subscale that uses numerical rating scales with endpoints of 1 (not at all) to 5 (all the time)	Tested in a variety of clinical populations and healthy adults.
Fatigue Scale (34)	Measures physical and mental symptoms associated with the presentation of fatigue	14-item instrument that uses numerical rating scales on a continuum with 1 (better than usual) to 4 (much worse than usual)	Developed in chronic fatigue syndrome and patients attending a medical clinic
Profile of Fatigue-Related Symptoms (35)	Assesses the severity and pattern of illness and evaluates the effects of treatment	96-item multidimensional illness-specific instrument	Developed for use in chronic fatigue syndrome