Health outcomes are the changes in a person’s health as a direct result of health-care intervention.\textsuperscript{1,2} They are the end result of health care and help drive our intervention strategies (Figure 1). Outcomes are rooted in clinical practice and, regardless of whether they are used for outcomes research, represent a key component in establishing evidence-based medicine. Although the concept of measuring health to determine treatment efficacy appears simple, it does present a challenging question: How do we quantify health?

For chronic diseases or degenerative conditions, health can often be quantified through mortality rates, disease remission, and scales that rate activities of daily living. In the realm of athletic therapy, however, these same basic health measures are typically not applicable. Athletic rehabilitation is relatively shorter in duration, with disability ending in an uninhibited return to athletic participation or physical activity. To accurately assess the health status of the physically active, the appropriate outcome-measurement tools must be implemented to address health domains relevant to athletes.

The purpose of this article is to identify the issues to consider when selecting outcome-measurement instruments appropriate for athletic therapy. A discussion of the various domains of health, the types of outcome measures available, and criteria for selecting an effective outcome instrument are presented.

**Health Domains:**

What Are We Trying to Measure?

An important consideration when quantifying health is recognizing the multiple health-related domains. One distinction is the concept of assessing disability versus impairment only.\textsuperscript{3,4} Impairment is the loss, reduced capacity, or altered state of a specific physiological ability.\textsuperscript{5} Impairments that are common in athletic therapy include weakness, range-of-motion limitation, atrophy, postural malalignment, diminished sensation, effusion, and pain. Athletic therapists usually assess these during the initial evaluation and throughout rehabilitation. According to Jette,\textsuperscript{3} changes in impairment...
were too often the focus of traditional rehabilitation research. Disability, however, incorporates functional limitations or behavioral changes. The International Classification of Functioning, Disability, and Health (ICF: World Health Organization, Geneva, 2001) classified disability as an “umbrella” term under which impairments, activity limitations, and participation restrictions are included. When assessing disability, the patient’s ability to perform activities and functional tasks is considered. Like impairment, disability can be measured objectively by observing the athlete performing specific functional tasks or subjectively through the use of self-assessment questionnaires. Examples of basic disability measures in general medicine include activities of daily living (feeding oneself, brushing one’s hair, walking, getting dressed, etc.) and participation in specific events (recreational hobbies, maintaining employment, driving a car, etc.). In athletic therapy, activities could include running, jumping, and throwing, with participation measures incorporating sport-specific tests that ultimately peak with an uninhibited return to sport participation or exercise (see the sidebar).

Exclusively assessing impairments, either for research or in daily practice, is problematic because there is not always a linear relationship between impairment and disability. In athletic therapy, deficits or improvements in impairments do not necessarily indicate the nature of the disability. A classic example was the emphasis placed on open-chain isokinetic strength testing to determine the functional status of an athlete returning from anterior cruciate ligament reconstruction. Although strength measurement is an important consideration when assessing outcomes, strength (impairment) alone is not a sufficient indicator of an athlete’s participation status. Therefore measures of disability such as functional testing should be incorporated with specific measures of impairment (strength, neuromuscular control, range of motion) when assessing the health status of the physically active. If deficits are identified by sport-specific functional testing, impairments such as weakness and limited range of motion can be reassessed and addressed. The ideal outcomes model for quantifying the health of the physically active will incorporate measures of impairment, disability, and participation status.

Outcome Instruments: What Types of Measures Are Available?

Outcome measures can be assessed through two methods: objectively by the athletic therapist or subjectively by the athlete’s own self-report. Whereas objective measures are often considered the “gold standard” in athletic therapy, self-report instruments have gained acceptance as valid measures in determining changes in health status. Self-report measures have gained popularity because of the efficiency with which they can be administered and scored when compared with certain objective measures. Unlike physical-performance tests, they can also be administered in the early stages of rehabilitation, without the risk of exacerbating the injury. Self-report instruments typically assess clinical indicators such as activities of daily living, general health, work activities, and psychosocial status, as well as specific impairments such as pain and fatigue. These instruments can be generic, condition specific, or patient specific. The correlation

---

Example of the ICF Disability Levels Associated With a Lateral Ankle Sprain

Health condition: lateral ankle sprain
Impairment(s): loss of motion, pain, effusion
Activity limitation: unable to walk without ambulatory aid
Participation restriction: unable to exercise or participate in athletics

Note: Adapted from WHO: International Classification of Functioning, Disability & Health, 2001.