

---

# Health-Related Quality of Life in the Evaluation of Medical Therapy for Chronic Illness

Dennis A. Revicki, PhD  
Washington, DC

*Health care professionals are increasingly convinced that the major objective of medical care for chronic diseases is the enhancement of health-related quality of life (HQOL) rather than the cure of disease or increased survival. HQOL is a multi-dimensional concept that includes the physical, psychological, and social functioning associated with an illness or its treatment. The inclusion of both biomedical and HQOL outcome measures in randomized clinical trials of new treatments assist physicians in selecting treatments that alleviate disease and improve the functional capability and well-being of patients.*

Advances in medical research and therapy have shifted health care resources from the diagnosis and treatment of infectious diseases to the prevention and control of chronic diseases. More than 80% of the health care resources in the United States are currently concentrated in the clinical management and biomedical research involving chronic diseases.<sup>1</sup> In addition, the increase in the proportion of elderly individuals in the United States population, combined with extended lifespan, means that family physicians will be treating a larger number of patients with chronic diseases and for a longer time. Because of the change in focus from acute infectious to chronic illnesses, there is an interest in extending measures of effectiveness used in clinical trials of new medical and surgical treatment beyond biomedical outcomes to functional status and health-related quality-of-life (HQOL) outcomes.

For most patients with chronic disease, it is often not possible to eliminate or cure their disease. The goal of treatment is the improvement of functioning through reduction of the symptoms or the severity of an illness, or the limitation of disease progression.<sup>2</sup> In this case, there may be a direct relationship between the functional improvement that is due to therapeutic intervention and changes in the HQOL. Despite the effectiveness of some therapies in

eliminating symptoms of disease, some clinically effective therapies may also create residual limitations in functional ability. The evaluation of new therapeutic interventions requires a more complete understanding of the entire impact of different treatments on the patient's physical, social, and psychological status. This combination of social, biomedical, and behavioral outcomes, or total psychosocial and physical well-being, is called health-related quality of life.

Health-related quality of life and functional life status are emerging as important variables for evaluating the outcome of health care interventions for chronic disease.<sup>2-10</sup> Two conferences have recently been held on quality of life and advances in health status assessment to clarify conceptual issues and examine methods for measuring HQOL.<sup>7,8</sup> The use of quality-of-life measures in the evaluation of medical therapy is important, as few chronic diseases or health care interventions have only a single clinical effect. In addition, there is an interest in determining the physical, psychological, and social impact of alternative therapies. Using HQOL measures, it is possible to differentiate the outcomes of different treatments for a medical condition or disease.

Family physicians and other medical care providers need to be informed about the various dimensions of HQOL so that they can make decisions about alternative medical treatment for different chronic illnesses. HQOL information is particularly important when a number of different and equally effective therapies are available for a specific disease. For example, although different antihypertensive drugs currently available are effective in reduc-

---

Submitted February 10, 1989.

From the Department of Family Medicine, University of Maryland School of Medicine, Baltimore, and Battelle Human Affairs Research Centers. Requests for reprints should be addressed to Dr Dennis A. Revicki, Battelle Human Affairs Research Centers, 370 L'Enfant Promenade, SW, Washington, DC 20024-2115.

© 1989 Appleton & Lange

ing blood pressure, significant differences have been found with respect to their effects on HQOL.<sup>2,3</sup> Selecting the best antihypertensive treatment for a particular patient may therefore involve decisions about potential effects on HQOL as well as the control of hypertension. A drug that is effective in reducing blood pressure and that creates difficulties for the patients in terms of sleep disturbances and general well-being may not be taken, reducing its effectiveness and increasing use of health services and the risk of cardiovascular disease. Patient compliance is directly associated with the treatment's effects on HQOL.

**DEFINITION OF HEALTH-RELATED QUALITY OF LIFE**

Health-related quality of life is a multidimensional concept that encompasses the physical, emotional, and social components associated with an illness or its treatment (Table 1). There are five main dimensions of HQOL: (1) physical functioning, (2) psychological functioning, (3) social functioning, (4) cognitive functioning, and (5) general well-being. Social functioning, for example, includes various aspects of social role performance, sexual functioning, home management, work activities and performance, and participation in recreational and social activities. In the area of physical functioning, does the treatment increase or decrease limitations in activities of daily living, energy or fatigue, and other physical symptoms? The HQOL outcomes related to a new treatment may originate from its clinical effectiveness, iatrogenic effects, or some combination of clinical and iatrogenic effects.

HQOL includes a broad range of functional limitations, capabilities, and perceptions that may influence an individual's performance and satisfaction with life. In assessing health-related quality of life, it is important to measure not only the actual functional capability, but also the individual's perceptions of the impact of these abilities or disabilities on his or her life. Subjective as well as objective measures are required for a comprehensive evaluation of HQOL.

Changes in HQOL as a result of exposure to a new therapy may be positive or negative. In many situations, there may not be a clear advantage for one therapy compared with another therapy across all five dimensions of HQOL; rather there often is a profile of different outcomes by dimension. Positive effects may be due to reduction in symptoms, increased functional ability, or an improved perception of well-being. Conversely, negative effects in HQOL may arise if the treatment causes additional symptoms, decreased functional capability, or a reduced sense of well-being because of adverse effects of the therapy. Even though there may be a considerable evidence for the clinical

**TABLE 1. DIMENSIONS OF QUALITY OF LIFE**

Dimension	Examples
Physical functioning	Mobility, self-care, ability to perform activities of daily living, physical symptoms
Psychological functioning	Depression, anger, anxiety, helplessness, expectations about the future
Social functioning	Participation in social activities, sexual functioning, family relationships, recreational activities
Cognitive functioning	Memory, alertness, judgment
General well-being	General health perceptions, life satisfactions

efficacy of a new therapy, it may not be used by physicians unless it does not adversely affect dimensions of HQOL that are important to the patient.

**HEALTH-RELATED QUALITY OF LIFE IN CLINICAL TRIALS**

The addition of HQOL measures to clinical trials involving new therapeutic interventions assists in characterizing the advantages and disadvantages of alternative, competing therapies. HQOL assessment is very useful in the following situations:

1. When slight differences in survival exist between the alternative therapies under comparison
2. When several equally effective therapies are available for a specific disease or condition
3. When the therapy is effective in decreasing mortality but is fairly toxic, leading to additional morbidity
4. When the therapy is lifelong, the disease complication rate is low, and patients are asymptomatic or only mildly symptomatic<sup>2</sup>

Understanding the impact of a therapy on the patient's physical, psychological, and social functioning may help physicians evaluate the utility of various competing therapeutic regimens.

For asymptomatic medical conditions, a therapeutic intervention may be very effective, but concerns about HQOL may discourage its use. Although there may be physiological changes (eg, lowered blood pressure, decreased serum cholesterol) associated with the treatment,

patients often do not perceive any change in their health or psychological well-being. Any improvement or reduction in HQOL may be entirely due to the therapy. There are practical and ethical reasons for examining HQOL in patients treated for an asymptomatic condition. A therapy must demonstrate an absence of or minimal impact on HQOL to ensure that patients are not placed at additional risk over and above that expected from the condition itself.

For example, a new drug may be demonstrated to be effective and safe in reducing total serum cholesterol concentration; however, it will not reduce or prevent the incidence of cardiovascular disease in patients with hypercholesterolemia unless it is prescribed by physicians and accepted by patients. This acceptance may, in part, be determined by the drug's effect on HQOL. For asymptomatic conditions, such as hypercholesterolemia or mild hypertension, physicians may be reluctant to increase doses even when the condition is not yet under control unless there is sufficient information on HQOL. Physicians are genuinely concerned that higher doses may produce adverse side effects that reduce the patient's physical or psychological well-being.

Patients may also be overly cautious about treatment for an asymptomatic condition. Some hypertensive patients view the use of medications to be more troubling than their relatively symptomless disease, resulting in noncompliance and ineffective long-term treatment.<sup>2,3</sup> Valid and reliable information on HQOL associated with different therapies may increase patient compliance and the benefits of the treatment.

## MEASURING HEALTH-RELATED QUALITY OF LIFE

A number of different methods are available for measuring health-related quality of life including both generic and disease-specific measures. Several recently published books and journals provide excellent introductions to this area and summaries of the available measures.<sup>2,7,11,12</sup> Among the most widely used general health status measures are the Sickness Impact Profile,<sup>13</sup> the Quality of Well-Being Scale,<sup>14</sup> the McMaster Health Index Questionnaire,<sup>15</sup> and the General Health Rating Index.<sup>16</sup> For example, the Sickness Impact Profile assesses illness-related dysfunction in physical function (ie, ambulation, mobility, body care, and movement), psychosocial function (ie, social interaction, alertness behavior, emotional behavior, communication), and independent categories of work, eating, sleep and rest, home management, and recreation and pastimes.

Most of the general measures assess several HQOL dimensions and, therefore, are quite lengthy. Short forms are available for the General Health Rating Index<sup>17</sup> and the

Sickness Impact Profile for patients with low back pain.<sup>18</sup> In addition, there are a number of short scales that are designed to measure only one or a limited number of health-related quality-of-life dimensions, such as the Center for Epidemiologic Studies Depression scale<sup>19</sup> and the Activities of Daily Living Scale.<sup>20</sup> The selection of the measures for a HQOL study depends upon the purpose of the investigation, the suspected HQOL effects of the treatment, the attributes of the study population, the psychometric characteristics of the measures, and resource limitations.

Although not explicitly discussed in most HQOL studies, the measures can be selected by developing a theoretical model, based on existing research evidence, concerning the probable relationship between the therapy of interest and patient social, physical, and psychological functioning. Discussion with physicians directly involved with care for patients with the disease of interest is also valuable for the identification of potential HQOL benefits. The list of potential benefits and adverse effects can then be used to select the relevant dimensions of HQOL and the scales for measuring these dimensions. The specific scales are chosen based on the match between their content and the objective of the study, their psychometric characteristics (ie, reliability, validity, sensitivity to change), and aspects of their mode of administration (eg, respondent burden, clarity, self-report, interview).

## EXAMPLE OF A HEALTH-RELATED QUALITY OF LIFE STUDY

Several well-designed HQOL studies have appeared in the published medical literature concerning antihypertensive therapy,<sup>3</sup> therapy for insulin-dependent diabetes mellitus,<sup>21</sup> treatment for end-stage renal disease,<sup>5</sup> and therapy for rheumatoid arthritis.<sup>6</sup> Croog et al<sup>3</sup> designed a study to examine explicitly the quality-of-life effects of three antihypertensive drugs (captopril, propranolol, methyldopa). They selected a number of measures of different quality-of-life dimensions that were thought to be affected by drug treatment for high blood pressure: general well-being, sleep dysfunction, sexual problems, work performance, social activity participation, physical distress, and cognitive function. The measures of HQOL were administered to hypertensive patients on the three treatment regimens three times over a 12-month period.

The investigators found that there were significant differences in various aspects of HQOL despite comparable efficacy of the drugs in decreasing blood pressure. There were no differences between the treatment groups on measures of sleep dysfunction, social participation, and visual memory. The captopril group had higher scores on measures of general well-being and physical distress symptoms

compared with the propranolol and methyldopa groups. The findings of this study demonstrate that different antihypertensive drugs have different effects on health-related quality of life and that these effects can be measured with existing instruments.<sup>3</sup>

## CONCLUSIONS

The pharmaceutical industry is continuing to support the incorporation of health-related quality-of-life measures into randomized clinical trials of recently developed drugs.<sup>22</sup> The results of HQOL studies are used to demonstrate the relative advantages and disadvantages of one treatment compared with another for the same indication. Additional information concerning the effects of different drugs on physical, psychological, and social functioning will be useful to the family physician in making treatment decisions. The judicious use of the findings of these studies may assist the physician in identifying the HQOL implications associated with the prescription of a particular therapeutic regimen.

Health care professionals are increasingly convinced that one of the major objectives of health and medical care is the enhancement of quality of life rather than the cure of disease or increased survival.<sup>23,24</sup> The development and adoption of numerous life-saving medical technologies into the health care system requires the evaluation of whether these new technologies improve the HQOL of their recipients as well as increase their survival. The incorporation of biomedical and HQOL outcome measures in randomized clinical trials of new medical technologies will provide family physicians and health care decision-makers with sufficient information to compare alternative therapies for a specific medical condition or illness. In this way, judgments regarding the use of alternative treatments can be made based on the clinical efficacy and impact of the therapy on the patient's physical, social, and psychological status. Information on HQOL will assist physicians, as well as their patients and patient's families, in selecting treatments that alleviate disease and improve the functional capability and well-being of their patients.

## References

- Cluff LE: Chronic disease, function, and the quality of care. *J Chronic Dis* 1981; 34:299-304
- Wenger NK, Mattson ME, Furberg CD, Elinson J (eds): *Assessment of Quality of Life in Clinical Trials of Cardiovascular Therapies*. New York, Le Jacq, 1984
- Croog SH, Levine S, Testa MA, et al: The effects of antihypertensive therapy on the quality of life. *N Engl J Med* 1986; 314:1657-1664.
- Revicki DA, Underwood C: *Quality of Life and Non-Insulin Dependent Diabetes Mellitus*. Washington, DC, Battelle Human Affairs Research Centers, 1988
- Evans R, Manninen D, Garrison L, et al: The quality of life of patients with end-stage renal disease. *N Engl J Med* 1985; 312:540-553
- Bombadier C, Ware J, Russell I, et al: Auranofin therapy and quality of life in patients with rheumatoid arthritis: Results of a multicenter trial. *Am J Med* 1986; 81:565-578
- Katz S (ed): *The Portugal conference: Measuring quality of life and functional status in clinical and epidemiological research*. *J Chronic Dis* 1987; 40:459
- Lohr KN, Ware JE (eds): *Proceedings of the advances in health assessment conference*. Palm Springs, California, February 19-21, 1986. *J Chronic Dis* 1987; 40:1s-191s
- Najman JM, Levine S: Evaluating the impact of medical care and technologies on the quality of life: A review and critique. *Soc Sci Med* 1981; 15:107-155
- Hollandsworth JG: Evaluating the impact of medical treatment on the quality of life: A 5-year update. *Soc Sci Med* 1988; 26:425-434
- McDowell I, Newell C: *Measuring Health: A Guide to Rating Scales and Questionnaires*. New York, Oxford University Press, 1987
- Walker SR, Rosser RM (eds): *Quality of Life: Assessment and Application*. Lancaster, England, MTP Press, 1988
- Bergner MB, Bobbitt RA, Carter WB, Gilson BS: *The Sickness Impact Profile: Development and final revision of a health status measure*. *Med Care* 1981; 19:787-805
- Kaplan RM, Anderson JP: *The Quality of Well-Being Scale: Rationale for a single quality of life index*. In SR Walker, RM Rosser (eds): *Quality of Life: Assessment and Application*. Lancaster, England, MTP Press, 1988
- Chambers LW: *The McMaster Health Index Questionnaire: An update*. In SR Walker, RM Rosser (eds): *Quality of Life: Assessment and Application*. Lancaster, England, MTP Press, 1988
- Brook RH, Ware JE, Davies-Avery A, et al: Overview of adult health status measures fielded in Rand's Health Insurance Study. *Med Care* 1979; 17(suppl):1-131
- Stewart AL, Hays RD, Ware JE: *The MOS Short-Form General Health Survey: Reliability and validity in a patient population*. *Med Care* 1988; 26:724-735
- Roland M, Morris R: A study of the natural history of back pain: Development of a reliable and sensitive measure of disability in low-back pain. *Spine* 1983; 8:141-144
- Radloff LS: *The CES-D scale: A self-report depression scale for research in the general population*. *Appl Psychol Meas* 1977; 1:385-401
- Katz S, Akpom CA: *Index of ADL*. *Med Care* 1976; 14:116-118
- DCCT Research Group: *Reliability and validity of a quality of life measure for the Diabetes Control and Complications Trial (DCCT)*. *Diabetes Care* 1988; 11:725-732
- Luce BR, Wecshler JM, Underwood C: *The Use of Quality of Life Measures in the Private Sector*. Washington, DC, Battelle Human Affairs Research Centers, 1988
- Friedls JF: Aging, natural death, and the compression of morbidity. *N Engl J Med* 1980; 303:130-135
- Levine S, Croog SH: What constitutes quality of life? A conceptualization of the dimensions of life quality in healthy populations and patients with cardiovascular disease. In Wenger N, Mattson M, Furberg CD, Elinson J (eds): *Assessment of Quality of Life in Clinical Trials of Cardiovascular Therapies*. New York, Le Jacq, 1984