Quality of Life Assessment in Interventional Radiology

Wayne L. Monsky, MD, PhD, Derek Khorsand, BS, Timothy Nolan, MD, David Douglas, MD, Pavan Khanna, MD

The aim of this review was to describe quality of life (QoL) questionnaires relevant to interventional radiology.

Interventional radiologists perform a large number of palliative procedures. The effect of these therapies on QoL is important. This is particularly true for cancer therapies where procedures with marginal survival benefits may result in tremendous QoL benefits. Image-guided minimally invasive procedures should be compared to invasive procedures, with respect to QoL, as part of comparative effectiveness assessment. A large number of questionnaires have been validated for measurement of overall and disease-specific quality of life.

Use of applicable QoL assessments can aid in evaluating clinical outcomes and help to further substantiate the need for minimally invasive image-guided procedures.

Key Words: Quality of life; interventional radiology.

Many therapies affect quality of life (QoL) and survival. QoL measurements have become increasingly important end points in patient care and clinical trials. These measurements may be more relevant to patient well-being compared to traditional disease-specific end points, such as laboratory or imaging-based end points particularly when procedures are being performed for symptomatic relief. For example, catheter-directed and percutaneous ablative cancer therapies may result in marginal survival benefits but tremendous improvements in QoL. QoL metrics are now commonplace in cancer therapeutic clinical trials. Interventional radiologists can easily incorporate QoL assessments into periprocedural clinical care. QoL assessments may also aid in procedural selection. For example, Salem et al. (1) recently used the Functional Assessment of Cancer Therapy-Hepatobiliary (FACT-Hep) (http://www.facit.org) survey as well as their embolotherapy-specific score to compare QoL in patients with hepatocellular carcinoma (HCC) undergoing transarterial chemo embolization (TACE) versus radioembolization. They found that patients undergoing radioembolization had improved QoL whereas TACE treatment was associated with worsening of QoL.

Because of the relative paucity of literature regarding QoL measurements in interventional radiology, it can be difficult to determine the suitable QoL measurement tool. The purpose of this article is to describe commonly used QoL tools that the interventional radiologist may incorporate into clinical care and comparative effectiveness assessment.

METHODS

A systematic literature review of general and disease-specific QoL assessment questionnaires, relevant to interventional radiology, was conducted to identify those most frequently used. MEDLINE (National Center for Biotechnology Information, U.S. National Library of Medicine 8600 Rockville Pike, Bethesda MD, 20894 USA) was used to identify a comprehensive group of relevant articles. All articles that addressed interventional radiology and QoL were included. The reference lists of included articles were also assessed for additional publications. The most commonly used, previously validated, QOL surveys were included.

QUALITY OF LIFE QUESTIONNAIRE DESIGN AND CONDUCT

An effective QoL measurement tool must be reliable, interpretable, and validated to be useful in clinical practice (2). A reliable instrument ideally demonstrates that stable patients should have similar results on repeat evaluations. Interpretability infers that a particular score should stratify patients according to disease severity. Validity indicates that the tool is appropriately measuring what it is intended to measure. The validity of a QoL measurement tool is the most important attribute and can be difficult to determine, especially if a gold standard does not exist. The measurement tool can be validated by

Acad Radiol 2014; 21:407–414

From the Department of Radiology, University of Washington Medical Center, 1959 Pacific Ave NE, Box 357115, Seattle, WA 98195 (W.L.M., T.N.); University of Washington School of Medicine, Seattle, WA (D.K.); and Department of Radiology, University of California Davis Medical Center, Sacramento, CA (D.D., P.K.). Received November 4, 2013; accepted December 9, 2013. **Address correspondence to:** W.L.M. e-mail: wmonsky@u.washington.edu or wemonsky@msn.com

http://dx.doi.org/10.1016/j.acra.2013.12.005

comparing results to that of a gold standard measurement routinely used for that particular disease process, assuming that a gold standard exists. If repeat testing demonstrates that the results of the measurement tool and that of the standard are concordant, then the tool is considered valid. If a gold standard does not exist, then the measurement tool can only be validated after systematic testing. Testing should demonstrate that the tool is appropriate, comprehensive, and free of bias in measuring the intended outcome variable. Finally, an effective QoL measurement tool should be easy to complete (2).

A simple example to highlight the attributes of an effective QoL measurement tool is the visual analog scale (VAS) (http://www.vicburns.org.au/management-of-a-patient-with-a-minor-burn-injury/pain-management/pain-assessment.html). This widely used instrument asks patients to rate their pain on a 0–10 scale with zero indicating no pain and 10 indicating severe pain (3). This instrument is reliable, easy to use, and the results are simple for the clinician to interpret. No gold standard exists for testing pain but this instrument is considered valid because of its simplicity and appropriateness for its intended goal of measuring patients' pain.

The choice between different treatment options can be made on the basis of QoL measurements as a primary outcome variable and in combination with other outcome indices including socioeconomic variables when used for comparative effectiveness analysis. The Institute of Medicine has defined comparative effectiveness research as "the generation and synthesis of evidence that compares the benefits and harms of alternative methods to prevent, diagnose, treat, and monitor a clinical condition or to improve the delivery of care." Many QoL measurement tools are available to clinicians to help evaluate the impact of various treatment modalities on their patients. Careful consideration should be exercised when selecting an evaluation tool to ensure that it is appropriate for the intended patient population and procedure and that it has been validated for the disease being evaluated. Some modalities lend themselves more to comparative effectiveness research, whereas others are better suited for longitudinal patient observation (4).

Although there are many QoL assessment systems in place, there is increasing focus on the necessity to create more patient-centered metrics that take into account patients' individualized perceptions of QoL (5). A recent policy statement from the American Heart Association not only underscores the crucial part that QoL plays in comparative effectiveness but also highlights how significant of an impact comparative effectiveness can have on clinical practice (6). Considering how robustly the results of comparative effectiveness research can alter treatment guidelines, care must be taken to ensure that measurement tools for QoL within those assessments are valid and well-suited to the outcomes we seek to evaluate.

Discussed in the following sections are some of the widely accepted QoL measurement tools, including both non–disease-specific (Table 1) and disease-specific (Table 2) metrics, which may be applicable to the practice of interventional radiology. These assessment questionnaires can be self-completed by the patient, administered in periprocedural clinics by the physician or physician extender, or administered by phone. To avoid interviewer-induced bias, it may be beneficial to have a physician, who is not a member of their procedural team, administer the survey. Baseline preprocedural questionnaires are administered with follow-up surveys at an interval approximating times when changes would be expected. In our practice, this has most commonly been performed at 1 month and then at 3 to 6 month intervals. Most of the described questionnaires also include standardized data and scoring sheets for tabulation of results, available on the websites included in the descriptions throughout this review.

Non–disease-specific Tools

SF-36 v2. The Short Form 36 version 2 (SF-36 v2) (Quality Metric Lincoln, RI) (www.sf-36.org) was created in 1999 as an improvement on an earlier metric developed by the RAND Corporation and Medical Outcomes Study (7). It features 36 total questions among 11 sections. Sections 1 and 2 include a current health state assessment and a relative health change valuation compared to the previous year. Sections 3 and 4 quantify how the patient's health state has impacted functional ability, whereas section 5 analyzes the level to which emotional status impacts work and activities. Section 6 deals with health status and its impact on social activities. Sections 7 and 8 include questions about pain and its impact on normal work ability. Section 9 includes general questions about mental health and emotions, whereas section 10 quantifies the frequency with which physical or emotional problems have impacted social activities. Section 11 deals with health status relative to others. Questions can be answered on a 1–5 scale and patients are asked to respond with the past 4 weeks in mind. These points may be totaled for each assessment and then used to calculate relative improvement or decline in QoL. Alternatively, changes in individual measurements may be compared over time. Normative values have been calculated for this assessment. The SF-36 is very commonly used in QoL research and has been used by interventional radiologists to quantify the improvement in QoL resulting from several procedures, including transjugular intrahepatic portosystemic shunt (TIPS) (8) (Table 1).

EQ-5d. The EQ-5D, developed by the EuroQoL group, is used extensively in Europe as a simple health outcome metric (9) (EuroQol Group Rotterdam,The Netherlands) (www.euroqol.org). The descriptive system contains five health status dimensions: mobility, self-care, usual activities, pain/discomfort, and anxiety/depression. These dimensions are always presented in the same order, each one with three degrees of severity: 1 if no problems, 2 if some or moderate problems, and 3 if extreme problems. Responses are based on their current health status. The VAS component of the EQ-5D is a vertical scale divided into millimeters along a 20-cm-long thermometer where the two ends are labeled "worst imaginable health state" and "best imaginable health state" with a score of 0 and 100, respectively. The respondent marks the point on the thermometer which, in their opinion, best