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Health-Related Quality of Life in Cardiac Patients

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Introduction

Increased longevity and the development of sophisticated healthcare technologies and treatments mean that many people now live with chronic health conditions such as cardiovascular disease over extended periods of their lives. In this context, health-related quality of life (HRQoL) has become an important endpoint in evaluations of health interventions. Its use reflects an increasingly biopsychosocial perspective in modern healthcare. HRQoL research first developed in cancer settings where the balance of quality and duration of life became a key concern in decisions to use novel treatments with very serious side-effects and only partial efficacy. However, over the past 20 years there has been a burgeoning of research activity in every major chronic illness category. In cancer, the European Organisation for Research on the Treatment of Cancer (EORTC) has been established by interested professionals.[1] They have developed a core HRQoL measure and disease-specific modules for various types of cancer. In rheumatology, there is an international, professionally endorsed cooperative called OMERACT (Outcome Measures in Rheumatoid Arthritis Clinical Trials).[2] They seek to improve HRQoL outcome measurement through consensus. The cardiology area is less well integrated. There is general support for HRQoL assessment. For instance, the US research funding agency, the National Heart Lung and Blood Institute, requires almost all clinical trials and many epidemiological studies that it funds to have an HRQoL component. The mission statement of the European Society of Cardiology, sets HRQoL as its primary goal:

> To improve the quality of life of the European population by reducing the impact of cardiovascular disease.

However, there has been less attention to developing consensus on assessment with the result that many differing instruments are used across studies and it is not easy to identify and summarize findings in the area. These issues are discussed later after an introduction to the concept of HRQoL and to the range of instruments suitable for use in cardiac settings.

Defining Health-Related Quality of Life

There are many definitions of generic quality of life (QoL). Some mention specific aspects of life while others identify the relative nature of QoL – the fact that QoL requires a comparison between a present and an aspirational or ideal state. A widely adopted approach has been to acknowledge that it is not practical (or perhaps possible) to assess all that is meant by QoL in health research and to use a more limited and focused definition. The argument is that since health interventions have been developed to address health-related aspects of an individual's life, they should be judged against the yardstick of HRQoL. The widely accepted definition of HRQoL is:

> The value assigned to the duration of life as modified by the impairments, functional states, perceptions and

social opportunities that are influenced by disease, injury, treatment or policy.[3]

Roles of Health-Related Quality of Life Assessment in Cardiac Populations

There are four main uses of HRQoL assessments in cardiac settings:

- To enable treatment comparisons in clinical trials.
- To guide the treatment focus in individual patient care.
- To assess the gap between the HRQoL of patients and age- and gender-matched samples of the general population.
- To enable clinical and economic evaluations to determine the best use of healthcare resources involving cardiac and other patient populations.

HRQoL work has to date focused mainly on the group and research context rather than on informing individual patient care decisions. Only in the area of cancer care has there been much development in individual care use of HRQoL information. Examples of the other types of uses are presented through the rest of this chapter in reference to specific presentations of coronary disease. First, the types of measures available are described.

Health-Related and General Quality of Life Measurement Instruments

QoL instruments can be divided into five main categories: generic, disease specific, dimension specific, individualized, and utility.[4] These types of measures are outlined in Table 31-1 with illustrations focusing on cardiac-related QoL research. This illustrates the wide variety of instrument types and instruments that can be used in a specific setting such as the cardiac patient population.

The types of measures outlined above are now discussed in relation to their particular uses and constraints.

Table 31-1. Typology of quality of life instruments illustrated with examples that can be used in research with cardiac patients

Type of instrument	Examples of instruments used in cardiac research
Generic: can be used across patient and general population groups	Short-Form 36 (SF-36)[5] Nottingham Health Profile (NHP)[6]
Disease specific: focus on aspects of QoL relevant to particular health problems	Seattle Angina Questionnaire (SAQ)[7] MacNew Heart Disease HRQoL Questionnaire (MacNew)[8,9] Minnesota Living with Heart Failure (MLHF)[10]
Dimension specific: focus on a particular component of QoL	Cardiac Depression Scale[11] Global Mood Scale[12] Heart Patients Psychological Questionnaire[13] Hospital Anxiety and Depression Scale[14,15]
Individualized: focus on aspects of life selected by the individual being assessed	Schedule for the Evaluation of Individual Quality of Life (SEIQoL)[16,17] Quality of Life Index (QLI-cardiac)[18]
Utility: focus on hierarchy of preferences assigned by general population or patients for particular health states	EuroQoL (EQ-5D)[19] Quality of Well-being Scale (QWB)[20]

Generic Measures

Generic measures of HRQoL can be used in both general or disease-focused population studies. They are typically profile measures, i.e. they assess a number of dimensions of HRQoL but do not usually sum them into one single scale. The general assumption is that scores on separate dimensions, for example sleep and social function, cannot readily be added together in a meaningful way. The three most commonly used generic instruments, as found in a recent review,[4] are outlined in Table 31-2. The Functional Limitations Profile (an English adaptation of an American instrument – the Sickness Impact Profile)[21] is an early and lengthy instrument that, despite its name (SIP), can be completed by any member of the adult population. Another long-established measure is the Nottingham Health Profile (NHP).[6] More recently the Short-Form 36 item scale has been developed from a large American series of studies. The SF-36 has become the most widely used measure internationally and has been translated and validated in many languages.[5] The measures have differing strengths and weaknesses. The FLP is clearly very broad in its coverage but is also very long. It does not have a pain subscale, which may be important in some cardiac conditions. The NHP focuses on more severe levels of disability and thus is likely to be less sensitive to change in conditions where effects are in the milder range. Conversely, the SF-36 is more sensitive to lower levels of disability. An illustrative study in relation to heart disease used the SF-36

Table 31-2. Scale profiles of three commonly used generic health-related quality of life questionnaires

	Functional Limitations Profile (FLP)[21]	Nottingham Health Profile (NHP)[6]	Medical Outcomes Study Short-Form 36 (SF-36)[5]
Number of items	136	38 (part 1)	36
Number of subscales	12	7 (part 2)	8
Subscale summary scores?	Physical Psychosocial	No	Physical component Mental health component
Total score?	Yes	No	No
Subscales	Ambulation	Energy	Physical functioning
	Body care and movement	Pain	Role limitations due to physical problems
	Mobility	Emotional reactions	Role limitations due to emotional problems
	Household management	Sleep	Social functioning
	Recreation and pastimes	Social isolation	Mental health
	Social interaction	Physical mobility	Energy/vitality
	Emotion		Pain
	Alertness		General health perception
	Sleep and rest		
	Eating		
	Communication		
	Work		

to provide a profile of nine common chronic medical conditions.[22] This showed that cardiac conditions such as myocardial infarction and congestive heart failure had a greater overall negative impact on HRQoL than did other chronic conditions such as diabetes.

The next types of instrument discussed are heart disease specific.

Heart-Disease-Specific Measures

There now exists a large body of research on instruments developed to measure aspects of HRQoL for specific diseases. Here the focus is on those aspects of HRQoL seen as most relevant to the particular health problem. There are excellent summaries of many of the available instruments.[23,24] Examples in the cardiac area are given in Table 31-3.

Disease-specific instruments are developed to be sensitive to change (i.e. have high responsiveness) in aspects of life believed to be most affected by the condition concerned and its treatments. The research challenge when using specific instruments is that it is never possible to determine how different a group is in function from the general population. This makes such assessment problematic from a health comparison perspective – for instance if the aim is to show how disabled particular groups of heart failure patients are in terms of seeking resources for their care in a broader healthcare environment, this cannot easily be done in a comparative way with disease-specific measures. On the other hand, if the research is to detect small but important differences in two pharmacological regimens for heart failure patients, disease-specific instruments are more likely to give meaningful information. Many studies combine specific and generic measures in order to be able to make reference to patient function in relation to the general population while also having useful disease-specific information.

The challenge when doing this of course is to have questionnaires that do not place excessive burden on participants because of their length. This is one issue to consider when deciding if and how to assess QoL in a given health setting. Where HRQoL is an important variable, it is worth considering that many of the other assessments in clinical settings are complex (e.g. requiring laboratory assessment and specific equipment and training to assess and interpret) and that many of these will be repeated at regular intervals to monitor progress in the patient's condition. QoL may be the only assessment that offers the patient an opportunity to provide his or her perspective on the success or otherwise of the treatment being provided.

Dimension-Specific Measures

Many dimensions that contribute to HRQoL have been identified as important in patient

Table 31-3. Scale profiles of three disease-specific quality of life questionnaires

	MacNew Quality of Life after Myocardial Infarction (MacNew QLMI)[9]	Seattle Angina Questionnaire (SAQ)[7]	Minnesota Living with Heart Failure Questionnaire (MLHF)[10]
Number of items	27	19	21
Number of subscales	3	5	3
Subscale summary scores?	Yes	Yes	No
Total score?	Yes	No	Yes
Subscales	Physical Social Emotional	Physical limitations Anginal stability Anginal frequency Treatment satisfaction Disease perception	Physical Psychological

populations. Some of these have been widely studied before the concept of HRQoL was popularized. In the cardiac situation, the dimensions focus on social and emotional aspects of well-being. Some examples were highlighted in Table 31-1. This gives some idea of the variety of instruments – for instance in the area of emotional well-being there is a generic measure of depression available since 1983 (the Hospital Anxiety and Depression Scale,[14,15] a cardiac-specific measure of depression developed in the mid-1990s (Cardiac Depression Scale[11]), a measure of positive and negative affect developed with cardiac patients but not exclusive to them (the Global Mood Scale),[12] and the Heart Patients' Psychological Questionnaire – a disease-specific measure including subscales on well-being, feelings of disability, despondency, and social inhibition.[13] Use of these scales will depend on the focus of the research – for instance a cardiac rehabilitation intervention might aim to increase HRQoL for the overall sample while seeking to also reduce depression in the subgroup with clinically serious symptoms at the start of the program. Hence a broad assessment such as the SF-36 might be used in conjunction with the Depression subscale of the Hospital Anxiety and Depression Scales or the Cardiac Depression Scale. Debate on use of these instruments in part revolves on the perceived nature of HRQoL – for some HRQoL is seen as an amalgamation of many of these concepts while for others HRQoL is seen as an independent variable which is influenced by these concepts. This theoretical debate is ongoing. Use of these measures is considered further in the cardiac rehabilitation section.

Individualized Measures

Acknowledging the relative and variable nature of QoL across individuals and circumstances, a number of research teams have attempted to develop instruments to assess QoL which have a standardized framework but which allow individualization in various aspects of the assessment.[25] Possibly the most individualized QoL assessment system is the Schedule for the Evaluation of Individual Quality of Life (SEIQoL)[16] and its briefer direct weighting procedure.[17] The SEIQoL philosophy on QoL proposes that the definition of QoL is individual in nature, that the individual assesses his or her QoL on the basis of evaluation of current status on salient aspects of life and compared with his or her own set of standards concerning optimal function. The SEIQoL assessment asks individuals to nominate the five aspects of their life which most contribute to their overall QoL (these do not have to be health-related). They then rate current function from "best possible" to "worst possible" on each and provide relative values of weights to the separate areas. A summary QoL score is derived from this process. Studies have shown that SEIQoL is more sensitive to change than generic or illness-related measures, that health is not always listed as one of the salient aspects of QoL, even for groups with chronic health conditions assessed in medical settings, and that QoL rated in this way can remain high even in very ill patients.[25] The measure has been used with cardiac patients.[26–28]

Some instruments include some rather than total individualization. For instance, the Quality of Life Index has a cardiac-specific version (QLI-III)[18] – 32 preselected items in four domains of life to rate – health and functioning, social and economic, psychological/spiritual, and family. Each is rated twice – once to indicate level of satisfaction with the specific aspect of life and once to rate the importance of the aspect for the individual. Scoring is a sum of each item function by its weighting or importance. QLI-III has been used in various cardiac populations.[29–31]

Utility Measures

Utility measures have been developed from a health economics perspective (see also Chapter 60). They focus on a hierarchy of preferences assigned usually by general population samples for particular health or illness states. Their aim is to assess the value of health or other interventions in terms of a combination of increased QoL and length of life. The challenge here is how to combine changes in length and quality of life, for instance how to compare two treatments for advanced cardiovascular disease – a surgical one which extends life by 5 years but with some early surgical risk and then a risk of cognitive impair-

ment as a side-effect with a pharmacological intervention which will extend life by 3 years with minimal side-effects. The main way in which this has been done is to calculate quality-adjusted life years (QALYs). QALYs are an estimation of the number of life years gained (or lost) because of illness or health intervention multiplied by the change in the HRQoL of those treated. QALYs are calculated from population rather than individual data. HRQoL is rated from 1.0 (best possible life) to 0.0 (dead). Thus a treatment which lengthened life by 5 years and restored or maintained a person in perfect health ($5 \times 1.0 = 5.0$) would provide a health system gain of 5.0 QALYs. The cost per QALY can be calculated from the cost of the treatment in a traditional health economic calculation. Different treatments can thus be compared for the cost per QALY of the treatment. Comparisons can be done concerning the same patients, for example the cost of treating cardiac patients by medication, angioplasty or coronary artery bypass surgery.

QALYs have been criticized because the weights used in calculations are derived from general population rather than patient samples. Ratings might be quite different if the raters had some personal experience of the health condition. Furthermore, QALYs are inherently ageist since any improvement in HRQoL from a treatment, when multiplied by the number of subsequent years of life the individual can expect to benefit, will automatically indicate that the treatment is better value when provided to younger individuals. Such criticisms notwithstanding, the need for methods to inform explicit and objective criteria for societal spending on interventions to improve health is obvious. The most widely used utility measure is the EuroQoL Five Dimensions (EQ-5D). It comprises five questions and a visual analogue scale.[19] The person rates the severity of their problems for five dimensions of health – mobility, self-care, usual activities, pain/discomfort, and anxiety/depression. These can then be classified into 243 (3^5) health states which have pre-assigned population-based ratings. All five are summed to give an overall score. The visual analogue scale is a 100-point health rating from full health to worst imaginable health state. EQ-5D has been used in many cardiac studies.[32,33]

HRQoL Studies in Cardiac Conditions and Interventions

Having outlined the types of measures available to assess HRQoL in cardiac settings, an outline of studies and findings in this area follows. A thorough review of the areas is not possible because of the now extensive literature in many specific aspects. For instance, a recently completed literature review of HRQoL intervention studies in heart failure identified 151 studies.[34] The studies selected are thus illustrative of relatively recent research in the various presentations of cardiac conditions and the interventions provided for these conditions. Reviews are signaled where available.

Angina Pectoris

A variety of approaches including generic and utility HRQoL instruments have been used to evaluate HRQoL in patients with angina, as recently reviewed.[35] Two disease-specific HRQoL instruments have been developed for patients with angina[7,36] with one – the Seattle Angina Questionnaire (SAQ)[7] – being used increasingly in clinical studies. The SAQ is a symptom-specific HRQoL measure comprising 19 items in five domains: physical limitations, anginal stability, anginal frequency, treatment satisfaction, and disease perception.[7] There is evidence of the validity, reliability, and responsiveness of the scale from clinical trials and comparative studies.[7,37,38] In one intervention study, for instance, the SAQ demonstrated clinically meaningful improvement in levels over a one-year period for patients with refractory angina attending a coordinated program of activities.[39] Findings on the generic SF-12 also showed benefit for the intervention. Assessment of HRQoL (via the SF-36) has also been seen to add important clinical information to clinical evaluation of angina patients.[40]

Myocardial Infarction

Research in this area has been recently summarised.[41] Some studies of HRQoL following a myocardial infarction (MI) have used generic or utility instruments.[42–44] Others have opted for

heart-disease-specific instruments.[8,9,12,13] A widely used MI-specific HRQoL instrument is the Quality of Life after Myocardial Infarction (QLMI) questionnaire.[8] Since development, it has been further modified to a version called the MacNew QLMI.[9] This consists of 26 items in three dimensions – Limitations, Emotions, and Social – with an overall HRQoL score as the sum of the MacNew QLMI dimensions (see Hoefer et al.[45] for a review). A number of studies with the MacNew QLMI have shown it predicts later adverse health events.[46,47] Predictors of quality of life have also been examined for MI patients. In a large British study, 288 MI patients were followed over the subsequent year. Levels of depression and anxiety during hospitalization did not predict mortality but did predict HRQoL, measured with a generic instrument, at one year.[48]

Heart Failure

A 1999 review summarized instruments used in clinical studies up to then.[49] A review to 2005 identified over 150 intervention studies in heart failure using HRQoL assessments.[34] This reflects in part the increased attention to pharmacological management of this population. Heart failure groups have been examined using a number of generic HRQoL instruments.[50,51] A number of disease-specific HRQoL measures have been published for use with patients with heart failure, for instance the Chronic Heart Failure Questionnaire,[52] the Minnesota Living With Heart Failure Questionnaire (MLHF),[10] and the Kansas City Cardiomyopathy Questionnaire (KCCQ).[53] The MLHF is the most widely used but there are promising psychometric profiles emerging in work with the more recently developed KCCQ. The MLHF questionnaire is a 21-item instrument which includes physical and psychological impairments that patients often relate to their heart failure. The KCCQ contains 23 items and measures physical limitations, symptoms, self-efficacy, social interference, and quality of life. Both have good psychometric properties and have been used in longitudinal evaluations of patient status and in clinical intervention trials (MLHF[54–56]; KCCQ[57–59]). For instance MLHF scores showed significant increases in heart failure patients randomized to an exercise training[55] or cardiac rehabilitation program.[56] The KCCQ demonstrated the HRQoL advantage of reminder-based interventions to improve self-care management in a randomized study of heart failure patients.[58] It was also used to demonstrate the absence of a detrimental effect of moderate alcohol use on heart failure patients.[59]

An example of the use of a utility-based HRQoL instrument to "anchor" the severity of heart failure against other serious medical conditions is the use of the EQ-5D in the CArdiac REsynchronisation in Heart Failure (CARE-HF) clinical trial.[32] This study included patients with advanced heart failure (NYHA class III or IV) on optimal medical therapy. Baseline scores on the EQ-5D showed the major negative impact on HRQoL of this condition – patients were found to be equivalent to patients with moderate motor neuron disease, Parkinson's disease, those with non-small cell lung cancer, or patients 3 months after ischemic stroke. This type of information is important in educating both professionals and policy makers about the adverse impact of heart failure.

Other Cardiac Conditions

Research has shown the HRQoL improvements for a variety of other conditions and procedures such as cardiomyopathy, congenital heart disease, heart transplantation, and ICD implantation.[60–65] For instance, a major study of over 500 adults with congenital heart disease was conducted recently using individualized QoL assessment.[61] Since this type of research allowed key issues for these patients to emerge, this work is particularly valuable with a group about which less is known than the more common presentations of cardiovascular disease. A parallel study assessed factors determining generic QoL in adults with the condition.[62] Depressive disposition and experienced social support were more related to QoL than was the level of organic dysfunction.

Percutaneous Coronary Interventions

Percutaneous coronary interventions (PCI) are now very widely used with cardiac patients. In an early study demonstrating the value of HRQoL, the physical function scale of the SF-36 was found

to be more responsive to change after angioplasty than was the Canadian Cardiovascular Society anginal classification.[66] A number of studies have compared stent-assisted PCI with coronary artery bypass grafting (CABG) surgery for multivessel disease, for example the "Stent or Surgery" trial.[67] Using the SAQ, CABG patients showed greater improvements and better HRQoL at 6 months and a year later (although differences decreased somewhat between 6 and 12 months). The advantage in HRQoL outcomes for CABG patients mirrored that found on clinical variables. A recent randomized trial reflects current developments in relation to PCI. It compared PCI with conservative strategies for management of acute coronary syndromes. It showed greater benefits for PCI at 4 months and one year.[33] These were evident on both disease-specific (SAQ) and generic (EQ-5D) measures.

Cardiac Surgery

A series of clinical studies has compared PCI with CABG with most finding an HRQoL benefit for CABG.[68,69] The benefits of cardiac surgery appear to extend even into very old age. A Swedish study of octogenarians undergoing CABG or aortic valve replacement found that their HRQoL was equivalent to age-matched controls almost a decade later.[70] HRQoL has been shown to predict mortality following CABG. In a follow-up of 2480 patients completing the SF-36, preoperative scores on the Physical Component Summary score (but not the Mental Component Summary score) were an independent predictor of 6-month mortality following CABG surgery.[71] The authors noted the potential value of having a patient self-report measure that can assist in risk classification in cardiac settings.

Cardiac Rehabilitation

The explicit goals of cardiac rehabilitation are to promote secondary prevention and to improve quality of life.[72] Hence HRQoL is a key outcome in this area. Many, but not all, cardiac rehabilitation intervention studies have found HRQoL to be improved in the intervention group compared with controls.[73–76] For instance, a recent 8-week program for MI or PCI patients resulted in HRQoL increases still evident after 2 years when compared with randomized controls in Hong Kong.[76] The HRQoL improvements complemented lower costs per QALY gained. Some did not report benefits.[77,78] Somewhat in between, a study using the QLMI found early benefits for the intervention group in a cardiac rehabilitation trial but found no differences between groups at one year.[8] This issue also arose in a number of studies as outlined earlier – where differences between intervention and reference group reduced over time. Some of this effect may be a consequence of cross-contamination of groups, for example. a patient randomised to PCI who later has CABG surgery. More may be due to questionnaire items selected as sensitive to differing aspects or stages in time of the rehabilitation and recovery process. This needs further investigation. One dimension that is important to consider in HRQoL assessment is whether socio-demographic factors influence outcomes. Gender and age are briefly considered here as illustrations. While changes in the more physical components of HRQoL with cardiac interventions appear to occur across age groups, changes in more mental health components in HRQoL appear more common in older patients.[79,80] For instance, Lavie and Milani[79] found a smaller level of improvement in physical components (exercise capacity and peak oxygen consumption) in those over age 70 attending cardiac rehabilitation but conversely a larger improvement in HRQoL (SF-36) than in younger groups. In parallel, there is observational evidence that HRQoL is more negatively affected by the onset of cardiac conditions, such as MI, in younger groups.[81] A large 2-year follow-up study of angina or acute coronary syndrome patients undergoing coronary interventions found that, controlling for baseline scores, HRQoL scores improved most for men, younger patients, and those of higher socioeconomic status.[82] These population distribution issues are important to consider when comparing across studies.

Despite the many studies available, HRQoL has not been routinely measured in most clinical or research settings. The Cochrane review of trials of exercise rehabilitation found HRQoL measures used in only 11 studies.[83] Eighteen instruments were used so there was little opportunity to build an overall profile of HRQoL effects. In parallel

work, a systematic review of HRQoL assessment in cardiac rehabilitation from 1986 to 1995 reported a wide variety of instruments in use with few instruments used in more than two or three studies.[84] The review also identified the low responsiveness of instruments in many studies. HRQoL instruments that are not responsive to change are unsuitable as outcome tools in cardiac rehabilitation as they underestimate the HRQoL benefits of program attendance. A follow-on study to address this issue selected the best performing instruments in terms of responsiveness from the systematic review and compared their performance within a single cardiac rehabilitation program format in over 700 patients.[85] Nine published instruments (including 27 subscales) were assessed and a high degree of variability in responsiveness was observed. This in effect means that choice of instrument could underestimate the HRQoL benefits of a program – a serious problem in an era of accountability and provision of only those services demonstrated to show benefit. The most responsive scale was the Global Mood Scale (the positive affect subscale). The Global Mood Scale (GMS) comprises 10 negative and 10 positive mood terms.[12] Thus the biggest difference in those attending cardiac rehabilitation versus usual care was in a positive sense of well-being. This encourages useful reflection on what exactly is measured in HRQoL instruments. While the phrase "quality of life" has positive connotations, many of the issues measured focus on negative experience or its absence. Since the majority of cardiac patients do not present with clinical levels of negative affect, instruments that focus only on this dimension may not adequately capture the benefits of interventions on HRQoL. The importance of resolving measurement challenges in HRQoL are considered next.

Measuring Health-Related Quality of Life in Cardiac Populations: The Importance of Getting Consensus

As highlighted in a recent editorial,[86] cardiology is behind other specialties such as rheumatology and oncology in having a coherent approach to HRQoL assessment. Lack of consensus on instrument use limits comparability across studies, conditions, and interventions. This slows the development of a cumulative evidence base on HRQoL in cardiac conditions. This is problematic both within cardiology but also in resource-related discussions with policy makers and health planners, and in projects that advise on instrument selection and use for the future. Among a range of international activities, a project called EuroCardioQoL has been developed to address this challenge.[87] Its aim is to develop a single core coronary heart-disease-specific HRQoL questionnaire, to be called the HeartQoL, and ultimately to be available in 13 European languages. This will allow comparison of outcomes with the same, or different, treatments among pure or mixed populations of patients such as myocardial infarction, angina pectoris, and heart failure. The major advantage of having a single core heart disease HRQoL instrument is to optimize efficiency of inter- and intra-study comparisons by being able to make both across-diagnosis, within-treatment comparisons, and also across-treatment, within-diagnosis comparisons with the same instrument. It thus will create a common HRQoL "language" across cardiac conditions which will enable information to be combined and expertise pooled much more efficiently and effectively in the future.

Conclusion

There is now a burgeoning literature on HRQoL in cardiac conditions and it is increasingly accepted as an important outcome in health settings. The challenge for the cardiology community is to synthesize and build on the research to date in order to be able to use HRQoL information in a more routine and informed manner to guide policy and practice in the future.

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